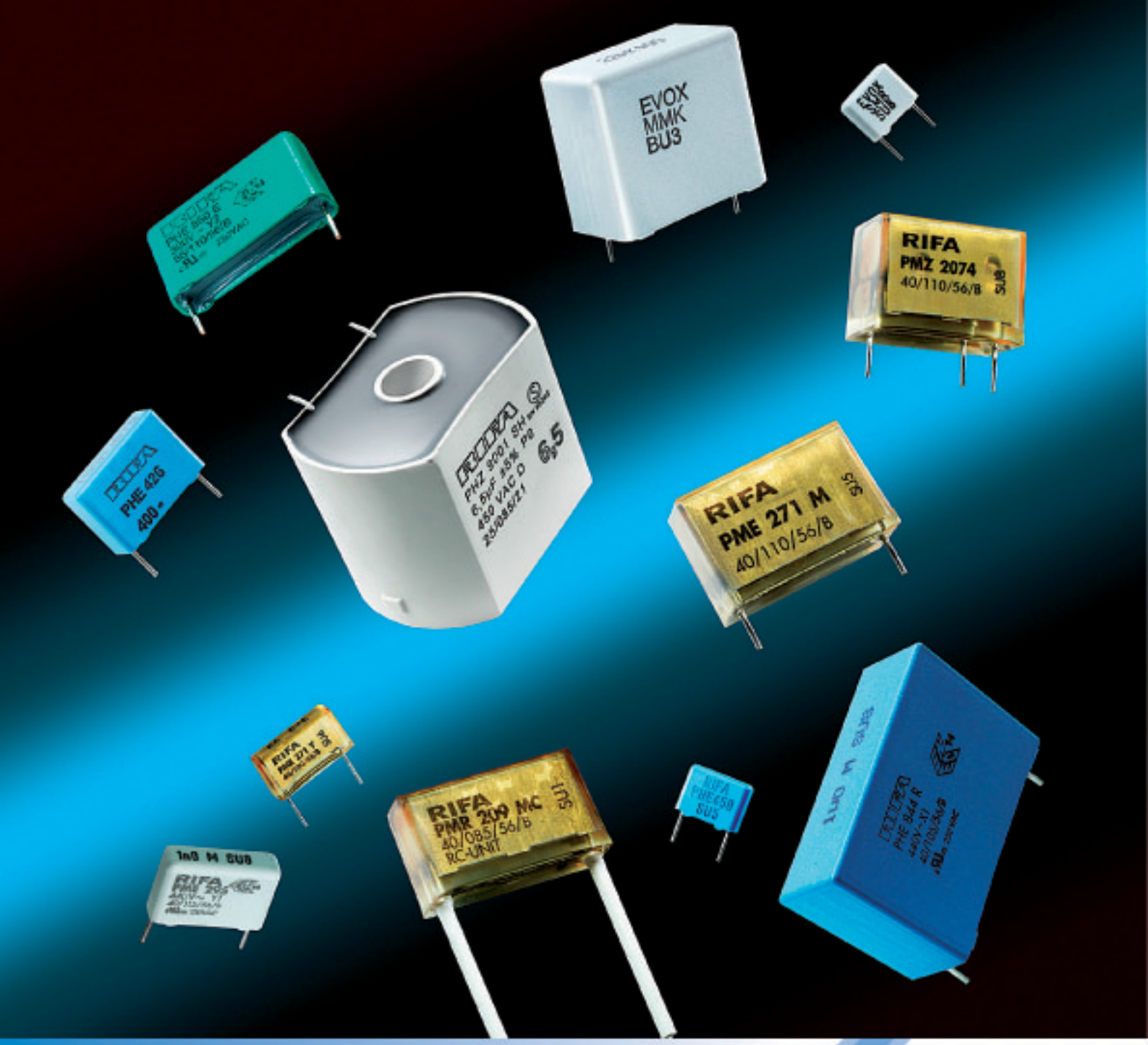

Evox Rifa Leaded Film Capacitors

www.kemet.com
F3294 9/08

The Capacitance Company
KEMET
CHARGED.™

QUALITY POLICY

KEMET exceeds customer expectations through operational excellence and continuous improvement.

- Zero Defects
- 100% On-Time Delivery
- Technology Leader
- Lowest Total Cost of Ownership
- Six Sigma Process Capability
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KEMET conducts its business in a manner designed to protect the health and safety of our employees, our customers, the public, and the environment.

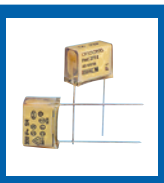
Evox Rifa
Leaded Film Capacitors

For other products, latest changes and updates visit our web site: **www.kemet.com**

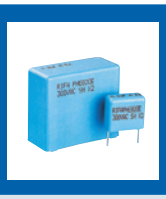
Specifications are subject to change without notice.

INDEX

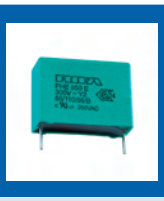
EMI SUPPRESSION CAPACITORS

	X1					X2	
	Metallized Paper (MP)		MKP			MP	
							
TYPE:	**PME271E**	**PME278**	**PHE841**	**PHE844**	**PHE845**	**PME271M**	**PME264**
International standard	EN/IEC 60384-14:2005 Across-the-line X1	EN/IEC 60384-14:2005 Across-the-line X1	EN/IEC 60384-14:2005 Across-the-line X1	EN/IEC 60384-14:2005 Across-the-line X1	EN/IEC 60384-14:2005 Across-the-line X1	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2
Capacitance range, µF	0.01-0.22	0.001-0.15	0.01-2.2	0.1-2.2	0.01-1.0	0.001-0.6	0.001-0.1
Capacitance tolerance, ±%	20, 10	20	20, 10	20, 10	20, 10	20, 10	20
Rated voltage, VAC VDC	**300**	**440**	**330**	**440/480**	**760/600**	**275**	**660 1600**
Test voltage (factory test)	2150 VDC	2700 VDC	3000 VDC	3000 VDC	4250 VDC	2150 VDC	3000 VDC
Climatic Category according to IEC 60068	40/110/56/B	40/110/56/B	40/100/56/B	40/105/56/B	40/105/56/B	40/110/56/B	40/085/56/B
Pulse rise time, V/µs max. dU/dt in operation	400-1200	600-2000	100	100	100	400-1200	600-2000
Lead spacing, mm	15.2, 20.3, 22.5, 25.4	10.2, 15.2, 20.3, 22.5, 25.4	10, 15, 22.5 27.5, 37.5	22.5, 27.5, 37.5	22.5, 27.5, 37.5	10.2, 15.2, 20.3, 22.5, 25.4	15.2, 20.3, 25.4
Approvals/ Remarks	ENEC, UL	ENEC	ENEC, UL, cUL	ENEC, UL, cUL	ENEC, UL, cUL	ENEC, UL, CSA	ENEC, UL
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels
Page	63	69	53	55	57	65	61

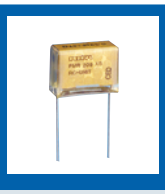
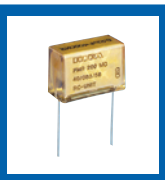
EMI SUPPRESSION CAPACITORS

	X2					
	Metallized Polyester (MKT)		Metallized Polypropylene (MKP)		MP	MKP
						
TYPE:	**PHE820M**	**PHE820E**	**PHE840E**	**PHE840M**	**PMZ2074**	**PHZ9004**
International standard	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Across-the-line X2
Capacitance range, µF	0.01-2.2	0.01-2.2	0.01-10.0	0.01-10.0	C1: 0.15-0.22 C2: 0.033-0.1	3 x 1.0
Capacitance tolerance, ±%	20, 10	20, 10	20, 10	20, 10, 5	20, 10, -5/+15	20
Rated voltage, VAC VDC	**275**	**300**	**300**	**275/280**	**275**	**300**
Test voltage (factory test)	2150 VDC	2150 VDC	2200 VDC	2200 VDC	2150 VDC	2200 VDC
Climatic Category according to IEC 60068	40/100/56/B	40/100/56/B	55/105/56/B	55/105/56/B	40/110/56/B	55/105/56
Pulse rise time, V/µs max. dU/dt in operation	100	100	100	100	C_1: 600 C_2: 1200	
Lead spacing, mm	15.0, 22.5, 27.5, 37.5	15.0, 22.5, 27.5, 37.5	10.0, 15.0, 22.5, 27.5, 37.5	7.5, 10.0, 15.0, 22.5 27.5, 37.5	20.3	27.5
Approvals/ Remarks	ENEC, UL, CSA	ENEC, UL, CSA	ENEC, UL, cUL	ENEC, UL, cUL	ENEC	
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes	Bulk in boxes
Page	47	47	49	51	76	78

EMI SUPPRESSION CAPACITORS

	Y1	Y2			X2 + 2 x Y2
	Metallized Paper (MP)			MKP	Metallized Paper (MP)
					 
TYPE:	**PME295**	**PME271Y**	**PME271Y (A-E)**	**PHE850**	**SMP253**	**PZB300**
International standard	EN/IEC 60384-14:2005 Line-to-earth Y1	EN/IEC 60384-14:2005 Line-to-earth Y2	EN/IEC 60384-14:2005 Line-to-earth Y2	EN/IEC 60384-14:2005 Line-to-earth Y2	EN/IEC 60384-14:2005 Line-to-earth Y2	EN/IEC 60384-14:2005 X2+2Y2, Delta
Capacitance range, µF	0.47-4.7nF	0.001-0.1	0.001-0.15	0.001-1.0	0.001-0.0047	X2: 0.1, 0.15 Y2: 0.0022, 0.0033, 0.0047
Capacitance tolerance, ±%	20	20, 10	20, 10	20	20	20
Rated voltage, VAC VDC	**440/480**	**250**	**300**	**300/480**	**250**	**275**
Test voltage (factory test)	4000 VAC	3000 VDC	3000 VDC	5000 VDC 2500 VAC	3000 VDC	X2: 2150 VDC Y2: 3000 VDC
Climatic Category according to IEC 60068	40/115/56/B	40/100/56/B	40/115/56/B	55/110/56/B	40/100/56/B	40/100/56/B
Pulse rise time, V/µs max.dU/dt in operation	2000	400-2000	400-2000	100	2000	X2: 600 Y2: 1000
Lead spacing, mm	15.0	10.2, 15.2, 20.3 25.4	10.2, 15.2, 20.3 22.5, 25.4	10.0, 15.0, 22.5 27.5, 37.5	12.7 (Chip length)	20.0
Approvals/ Remarks	ENEC, UL, cUL	ENEC, UL, CSA	ENEC, UL, CSA	ENEC, UL, cUL	ENEC, UL, cUL	ENEC, UL, CSA
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Taped for automatic insertion, bulk in boxes	Bulk in boxes
Page	71	67	67	59	SMD catalogue	74

EMI SUPPRESSION CAPACITORS

	RC				General Purpose		
	Metallized Paper (MP)						
							
TYPE:	**PMR205**	**PMR209**	**PMR210**	**PMZ2035**	**PME261**		
International standard	–	EN/IEC 60384-14:2005 Across-the-line X2	EN/IEC 60384-14:2005 Line-to-earth X1	EN/IEC 60384-14:2005			
Capacitance range, µF	0.1-1.0 R: 22-680 Ω	0.047-0.47 R: 22-470 Ω	0.022-0.1 R: 100 Ω	0.1 R: 150 Ω	0.0082 -1.0	0.001 -0.15	0.001 -0.1
Capacitance tolerance, ±%	20 R: 30	20 R: 30	20 R: 30	20 R: 30	10, 5	20, 10	20, 10
Rated voltage, VAC VDC	**125 250**	**250 630**	**250**	**440**	**220 400**	**300 630**	**500 1000**
Test voltage (factory test)	375 VDC	1800 VDC	3000 VDC 2000 VAC	1800 VDC	800 VDC	1250 VDC	2000 VDC
Climatic Category according to IEC 60068	40/085/56/B	40/085/56/B	40/085/56/B	40/085/56/B	40/070/56		
Pulse rise time, V/µs max. dU/dt in operation					220-2000		
Lead spacing, mm	15.2, 20.3, 25.4	15.2, 20.3, 25.4	15.2, 20.3, 25.4	25.4	10.2, 15.2, 20.3, 25.4		
Approvals/ Remarks	Integrated resistor	ENEC, UL Integrated resistor	ENEC, UL Integrated resistor.	ENEC Integrated resistor			
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels		
Page	84	86	88	90	41		

PULSE AND HIGH FREQUENCY CAPACITORS

	Metallized Polypropylene (MKP)			Polypropylene Film/Foil	
				KP/MKP	KP
					
TYPE:	**PHE426**	**PHE429**	**PHE450**	**PHE448**	**PFR**
International standard	IEC 60384-16 Grade 1.1	IEC 60384-16 Grade 1.1	IEC 60384-17 Grade 1.1	IEC 60384-17 Grade 1.1	IEC 60384-13
Capacitance range, µF	0.001-27.0	0.047-0.47	0.00033-10	0.1-22 nF	0.0001-0.022
Capacitance tolerance, ±%	10, 5, 3.5, 2.5, 2	10, 5	10, 5, 3.5, 2.5, 2	10, 5, 3.5, 2.5, 2	10, 5, 2.5, 2, 1
Rated voltage, VDC **VAC**	**100-2000** **63-700**	**420-630** **220-275**	**250-3000** **180-1000**	**1600-2000** **650-700**	**63-1000** **40-250**
Climatic Category according to IEC 60068	55/105/56/B	55/110/56	55/105/56/B	55/105/56	55/100/56
Pulse rise time, V/µs	30-1500	150-250	200-2500	15000-25000	1000
Lead spacing, mm	5.0, 7.5, 10.0, 15.0, 22.5, 27.5, 37.5	15.0	7.5, 10.0, 15.0, 22.5, 27.5, 37.5	15.0	5.0
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels automatic insertion	Bulk in boxes Available taped for automatic insertion	Bulk in boxes Available taped for
Page	96	103	107	105	115

COUPLING/DECOUPLING CAPACITORS

STABLE HIGH TEMP. CAPACITORS

	Polyester Metallized (MKT)	Metallized PPS (MKI)
		
TYPE:	**MMK**	**SMR**
International standard	CECC 30401-042 IEC 60384-2 DIN 44122	–
Capacitance range, µF	0.001-82	0.001-22
Capacitance tolerance, ±%	20, 10, 5	20, 10, 5, 2.5
Rated voltage, VDC **VAC**	**50-1000** **30-250**	**50-400** **30-200**
Climatic Category according to IEC 60068	55/100/56 (FME/DIN)	55/150/56 (FKD/DIN)
Pulse rise time, V/µs	2-100	2-40
Lead spacing, mm	5.0, 7.5, 10.0, 15.0, 22.5, 27.5, 37.5	5.0, 7.5, 10.0, 15.0, 22.5, 27.5
Approvals/Remarks	CECC 30401-042	Polyphenylene sulfide High temperature applications to +150°C
Packing	Bulk in boxes, on tray or taped on reels	Bulk in boxes, on tray or taped on reels
Page	22	33

CUSTOMIZED SOLUTIONS

Evox Rifa has designed several engineered capacitor solutions based on specific customer requirements. Some examples of customised EMI suppression capacitors are presented on pages 77 to 83 in this catalogue.

Together with our customers, we have designed and developed for instance:

- Special capacitor designs
- Capacitors in customized housing
- Low profile capacitors
- Multiple capacitors in one unit
- Snubber capacitors
- Complete PCB supply

If you have any special requirements that are not covered in our standard product range, please do not hesitate to contact us. We will be happy to work with you to create new optimized solutions for your applications.

SMD Film Capacitors

	Metallized PET (MKT)		Metallized PEN (MKN)		Metallized PPS (MKI)		
							
TYPE:	**MMC**	**GMC**	**GMW**	**GPC**	**SPC**	**SMC**	**SMW**
International standard	IEC 60384-19	IEC 60384-23	IEC 60384-23	IEC 60384-23	IEC 60384-20	IEC 60384-20	IEC 60384-20
Capacitance range, µF	0.001-15	0.001-5.6	0.001-0.47	0.00047-1.0	0.00047-0.68	0.001-3.3	0.001-0.56
Capacitance tolerance, ±%	10, 5	10, 5	20, 10, 5	20, 10	20, 10, 5	5, 2.5, 2	10, 5, 2.5, 2
Rated voltage, VDC VAC	**50-400 30-200**	**50-630 30-300**	**63-630 40-220**	**63-1000 40-350**	**100-630 63-350**	**50-400 30-200**	**50-400 30-200**
Climatic Category according to IEC 60068	55/100/56	55/125/56	55/125/21	55/125/56	55/125/56	55/125/56	55/125/56
Pulse rise time, V/µs	5-50	5-50	20-50	100-2200	150-2000	2-40	8-20
Chip length, mm	5.7, 7.3, 10.2, 12.7, 16.5	5.7, 7.3, 10.2, 12.7, 16.5	5.7	7.3, 10.2, 12.7 16.5	7.3, 10.2, 12.7 16.5	5.7, 7.3, 10.2, 12.7, 16.5	5.7, 7.3
Features/Applications	Coupling / decoupling	Coupling / decoupling High temp.	Coupling / decoupling High temp.	Pulse High temp.	Pulse, High freq. High temp., High stability	High freq.,High temp High stability	High freq.,High temp High stability
Packing	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes	Taped for automatic insertion, bulk in boxes

DIL CAPACITORS

	Metallized Polyester (MKT)		
			
TYPE:	**MDC**	**MDK**	**MDS**
International standard			
Capacitance range, µF	0.033-15	0.033-15	0.033-6.8
Capacitance tolerance, ±%	10, 5	10, 5	10, 5
Rated voltage, VDC VAC	**50-630 30-220**	**50-630 30-220**	**50-630 30-220**
Climatic Category according to IEC 60068	55/125/56	55/125/56	55/125/56
Lead spacing, mm	10.0, 15.0	10.0, 15.0	10.0, 15.0
Approvals/Remarks	SMD	Through-hole	SMD
Packing	In tube; taped on reels on request	In tube; taped on reels on request	In tube; taped on reels on request

POWER CAPACITORS

	Metallized Polypropylene (MKP)	
		
TYPE:	**PHG491**	**PHG495**
Capacitance range, µF	0.15-10 0.22-6 0.5-4	13-25 9-18 5-10
Capacitance tolerance, ±%	5	5
Rated voltage, Us (V), non repetitive	**1500, 2000, 2500**	**1500, 2000, 2500**
U_{RMS} (VAC, 50 Hz)	550, 650, 750	
U_{DC} (V)	1200, 1600, 2000	1000, 1350, 1650
Climatic Category according to IEC 60068	40/085/56	40/085/56
Max RMS current, A	7-80	50-80
Pulse rise time, V/µs	500-750	25-55
Mounting/ terminations	Screw M6, M8 inner thread	Screw M6, M8 inner thread
Page	119	121

HOW TO ORDER EVOX CAPACITORS

The **Evox** article code includes all the information needed to specify the product characteristics and type of packing. This article code construction applies for the following products in this catalogue: **MMK, SMR** and **PFR**.

MMK **5** **104** **K** **63** **J01** **L16.5** **TA18**

Capacitor type
The first letter specifies the dielectric material:
M = Polyester (PET)
P = Polypropylene (PP)
G = Polyethylene naphthalate (PEN)
S = Polyphenylene sulphide (PPS)
The second letter indicates the electrode construction:
M = Metallized film
F = Metal foil

Lead spacing in mm

Capacitance tolerance
M = ± 20 %
V = -0%, +20 %
P = -0%, +10 %
L = -10%, +0 %
K = ± 10 %
J = ± 5 %
X = ± 3.5 %
H = ± 2.5 %
G = ± 2 %
F = ± 1 %

Rated voltage in DC Volts

Capacitor size code
See size codes on page 12.

Rated capacitance
Expressed in picofarads. Three digit code where the first two digits indicate the two most significant digits of the capacitance value in pF. The third digit is the number of following zeroes.
103 = 10000 pF = 10 nF = 0.01 µF
104 = 100000 pF = 100 nF = 0.1 µF
106 = 10000000 pF = 10000 nF = 10 µF
When three significant digits are needed to express the capacitance value, a four digit code is used. The last digit gives the amount of numbers after the two most significant digits. Example:
4582 = 4580 pF = 4.58 nF = 0.00458 µF
= 146000 pF = 146 nF = 0.146 µF

Lead length
Letter L followed by lead length in mm and a tolerance code according to the table below. L3.5E = lead length 3.5 +0/-0.7 mm.
Exceptions:
- Only L4 for std 4 mm lead length and std tolerance.
- L16.5 for taped parts on reel or ammo. L16.5C for bulk parts with 16.5 ±0.5 mm leads.

Tolerance Code	mm	
A	+1, -0	Std for Evox parts in bulk and tray
B	+0.3, -0.1	
C	±0.5	
E	+0, -0.7	
F	±3.2	
G	±0.4	
J	+0, -1	
K	+0.3, -0.2	
L	+5, -0	
M	±0.25	
P	+2, -0	

Packaging

BULK [1]	Loose capacitors in a box
TRAY [1]	Capacitors with 22.5 to 37.5 mm lead spacing on a tray.
TR16 [1]	Taped on reel; ∅ 360 mm, H*)=16.5 mm
TR18 [1]	Taped on reel; ∅ 360 mm, H*)=18.5 mm
LR18 [2]	Taped on reel; ∅ 500 mm, H*)=18.5 mm
XR18 [3]	Taped on reel; ∅ 360 mm, H*)=18.5 mm, crimped leads with F*)=7.5 mm
XA18 [3]	Taped, packed in ammo, H*)=18.5 mm, crimped leads with F*)=7.5 mm
TA16 [1]	Taped, packed in ammo, H*)=16.5 mm
TA18 [1]	Taped, packed in ammo, H*)=18.5 mm

[1] Quantity/package according to article table
[2] Quantity/package according to article table x 2
[3] Quantity/package according to table below
*) See figure on page 13.

Size code **)	Quantity/package XR18	XA18
B04	550	570
B05	550	570
B15	450	520
B10	450	480
B06	350	378
B12	350	351
B11	350	324
B14	250	297
B16	250	252
B17	200	216

**) See page 12.

Standard lead length and packaging

Part	Lead spacing mm	Standard lead length mm	Standard packaging	Taping lead length mm
Evox capacitors	≤ 15.0	4	bulk	16.5 [1]
Evox capacitors	22.5-27.5	4	tray	16.5

[1] 24.5 mm lead length for capacitors with crimped leads and taped

HOW TO ORDER RIFA CAPACITORS

The **Rifa** article code includes all the information needed to specify the product characteristics and type of packing. This article code construction applies for the following products in this catalogue: **PHE820, PHE840E, PHE840M, PHE841, PHE844, PHE845, PHE850, PME261, PME264, PME271, PME278, PME295, PZB300, PMZ2074, PHZ9004, PMR205, PMR209, PMR210, PMZ2035, PHE426, PHE429, PHE448, PHE450**.

PHE450 **H** **B** **6470** **J** **(B14)** **R17** **T0**

Capacitor type

Rated voltage

C	= 63 VDC		
D	= 100 VDC	**EMI capacitors**	
F	= 160 VDC	**have the rated**	
H	= 250 VDC	**voltage expressed**	
J	= 300 VDC	**in volts AC:**	
K	= 400 VDC	**A**	= 125 VAC
L	= 450 VDC	**K**	= 220 VAC
M	= 630 VDC	**M**	= 250-275 VAC
P	= 1000 VDC	**E**	= 300-330 VAC
R	= 1600 VDC	**R**	= 440VAC
S	= 2000 VDC	**J**	= 500 VAC
T	= 2500 VDC	**N**	= 660 VAC
X	= 3000 VDC	**V**	= 760 VAC

Lead spacing

J	= 5.0 mm
K	= 7.5 mm
A	= 10.0 or 10.2 mm
B	= 15.0 or 15.2 mm
C	= 20.3 mm
D	= 22.5 mm
E	= 25.4 mm
F	= 27.5 mm
R	= 37.5 mm

Rated capacitance

Expressed in picofarads. Four digit code where the first digit is the number of digits in the capacitance value in pF. The next three digits are the three significant digits in the capacitance value.
6100 = 100000 pF = 0.1 µF
4625 = 6250 pF = 0.00625 µF

Capacitance tolerance

M	= ± 20 %
N	= ± 15 %
V	= -0%, +20 %
P	= -0%, +10 %
L	= -10%, +0 %
K	= ± 10 %
J	= ± 5 %
X	= ± 3.5 % *)
T	= ± 3 %
H	= ± 2.5 %
G	= ± 2 %
R	= ± 1.25 %
F	= ± 1 %

*) For paper capacitors (PME series), the X as tolerance code can have other meanings than ± 3.5 %.

Capacitor size code

See size codes on page 12.

Lead length

Letter R followed by a 3 digit integer, lead length in tenths of millimetres, and a tolerance code according to the table below. R035E = lead length 3.5 +0/-0.7 mm.
Exception:
- When std tolerance and the lead length is an integer in mm, only 2 digits for the length and no tolerance code. R05 = lead length 5 +0/-1 mm.

Tolerance Code	mm	
A	+1, -0	
B	+0.3, -0.1	
C	±0.5	
E	+0, -0.7	
F	±3.2	
G	±0.4	
J	+0, -1	Std for Rifa parts with lead length < 30 mm
K	+0.3, -0.2	
L	+5, -0	Std for Rifa parts with lead length = 30 mm
M	±0.25	
P	+2, -0	
Q	±1	

Packaging

L1 [1]	Bulk; parts with lead lengths >20 mm loose in a box, for box sizes D13 to D20 **).
No code [1]	Bulk; loose parts in a box, for all other box sizes.
L2 [1]	PHE parts in 22.5 to 37.5 mm lead spacing on tray.
T0 [1]	Taped on reel; ∅ 360 mm, H*)=18.0 mm
T1 [2]	Taped on reel; ∅ 500 mm, H*)=18.0 mm
TA [3]	Taped, packed in ammo
X2 [4]	Taped on reel; ∅ 360 mm, crimped leads with F*)=7.5 mm
X3 [4]	As for code X2, but P_0*)=12.7 mm
XA [4]	Taped, packed in ammo, crimped leads with F*)=7.5 mm

[1] Quantity/package according to article table
[2] Quantity/package according to article table x 2
[3] Quantity per package according to table on page 12.
[4] Quantity/package according to table below
*) See figure on page 13

Size code **)	Quantity/package X2, X3	XA
B04	550	570
B05	550	570
B15	450	520
B10	450	480
B06	350	378
B12	350	351
B11	350	324
B14	250	297
B16	250	252
B17	200	216

**) See page 12.

Standard lead length and packaging

Part	Lead spacing mm	Standard lead length mm	Standard packaging	Taping lead length mm [3]
PME, PMR	≤ 15.2	30	bulk	19
PME, PMR	≥ 20.3	30	bulk [1]	19
PHE426-PHE450	5.0 to 10.0	5	bulk	17
PHE426-PHE450	15.0	6	bulk	17
PHE820-PHE845	≤ 15.0	17	bulk	17
All PHE	≥ 22.5	6	tray [2]	17

[1] packed on tray if lead length ≤ 6 mm
[2] max lead length 6 mm for tray packaging in 22.5 mm lead spacing, bulk for longer leads
[3] 25 mm lead length for capacitors with crimped leads and taped

SIZE CODES OF LEADED CAPACITORS

A size code has been added to the following leaded Evox Rifa capacitors: **MMK, SMR, PHE840E, PHE840M, PHE850, PFR**. The size code determines the size of the component and the packing quantities. The size codes are as follows:

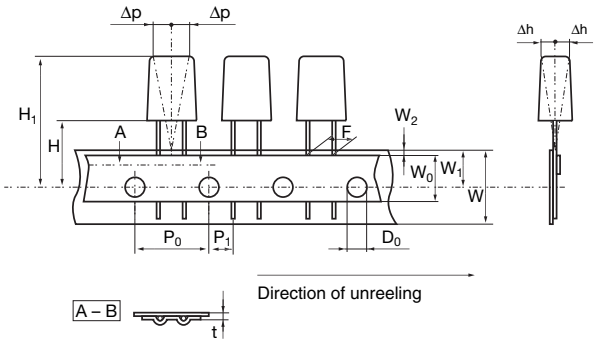
Size code in Article Code	Box dimensions in mm B_{max}	H_{max}	L_{max}	p	Typical weight [1] g	Quantity per package Bulk [1]	Bulk [2]	Tray	Reel ∅360	Reel ∅500	Ammo [3]
A01	4.0	9.0	13.0	10.0	0.6	1000	1000		900	1800	
A02	4.5	10.5	13.0	10.0	0.9	1000	1000		800	1600	
A03	5.0	11.0	13.0	10.0	1.0	800	800		700	1400	
A04	6.0	12.0	13.0	10.0	1.3	600	600		500	1000	
A05	9.5	7.5	13.0	10.0	1.2	600	600		350	700	
A06	4.0	8.0	13.0	10.0	0.5	1000	1000		900	1800	
B04	5.5	10.5	18.0	15.0	1.5	1000	800		600	1200	
B05	5.5	12.5	18.0	15.0	1.7	1000	800		600	1200	
B06	7.5	14.5	18.0	15.0	2.7	800	400		400	800	
B10	6.5	12.5	18.0	15.0	2.0	1000	600		500	1000	
B11	8.5	16.0	18.0	15.0	3.4	600	400		400	800	
B12	8.0	15.0	18.0	15.0	3.0	600	400		400	800	
B14	9.5	17.5	18.0	15.0	4.2	500	300		350	700	
B15	6.0	12.0	18.0	15.0	1.7	1000	800		500	1000	
B16	11.0	19.0	18.0	15.0	4.4	450	250		300	600	
B17	13.0	12.5	18.0	15.0	3.4	400	300		250	500	
D13	6.5	14.5	26.0	22.5	2.7		450 [4]	234	300	600	
D14	8.0	16.0	26.0	22.5	3.8		350 [4]	186	250	500	
D15	9.0	18.5	26.0	22.5	5.0		250 [4]	308	250	500	
D16	11.0	21.5	26.0	22.5	6.6		200 [4]	253			
D17	7.0	16.5	26.0	22.5	3.2		350 [4]	216	300	600	
D18	10.5	19.0	26.0	22.5	5.8		250 [4]	264			
D19	15.5	24.5	26.0	22.5	10.0		125 [4]	176			
D20	13.5	23.0	26.0	22.5	8.2		150 [4]	209			
F03	13.5	23.0	31.5	27.5	10.8			171			
F11	10.5	20.5	31.5	27.5	8.0			216			
F12	11.5	22.5	31.5	27.5	9.1			198			
F13	14.5	24.5	31.5	27.5	14.5			153			
F14	17.5	28.0	31.5	27.5	17.0			126			
F15	19.0	29.0	31.5	27.5	19.5			117			
F16	21.0	30.0	31.5	27.5	22.6			108			
F17	21.0	12.5	31.5	27.5	9.0			108			
F18	31.0	19.0	31.5	27.5	20.0			72			
F19	27.5	16.0	31.5	27.5	17.0			81			
J01	2.5	6.5	7.2	5.0	0.2	2000	2000		2500	5000	3000
J02	3.5	8.0	7.2	5.0	0.3	2000	2000		2000	4000	2000
J03	4.5	9.0	7.2	5.0	0.4	1000	1000		1500	3000	1700
J04	5.0	10.0	7.2	5.0	0.5	1000	1000		1300	2600	1500
J05	6.0	11.0	7.2	5.0	0.6	1000	1000		1000	2000	1200
J06	7.2	13.0	7.2	5.0	0.9	1000	1000		800	1600	
J11	4.5	6.0	7.2	5.0	0.3	1000			1500	3000	1700
J12	5.5	7.0	7.2	5.0	0.4	1000			1200	2400	1300
J13	6.5	8.0	7.2	5.0	0.5	1000			900	1800	1100
K00	2.5	6.0	10.0	7.5	0.3	2000	2000		2500	5000	3000
K01	4.0	8.0	10.0	7.5	0.5	1000	1000		1700	3400	1900
K03	5.0	11.0	10.0	7.5	0.8	1000	1000		1300	2600	1500
K04	6.0	12.0	10.5	7.5	1.0	1000	1000		1000	2000	1200
R02	16.5	32.0	41.0	37.5	23.0			105			
R03	19.0	36.0	41.0	37.5	28.5			91			
R04	15.0	26.0	41.0	37.5	17.0			119			
R05	13.0	24.0	41.0	37.5	14.0			140			
R06	21.0	38.0	41.0	37.5	34.4			84			
R08	28.0	43.0	41.0	37.5	53.0			63 [1]			

[1] Capacitors with lead length of 4 to 6 mm according to the data sheet.
[2] Capacitors with lead length of 16.5 mm or 17.0 mm according to the data sheet.
[3] For Ammo packaging of parts in 10 mm and 15 mm lead spacing, please ask KEMET Customer Service.
[4] Capacitors with lead length of > 20 mm.

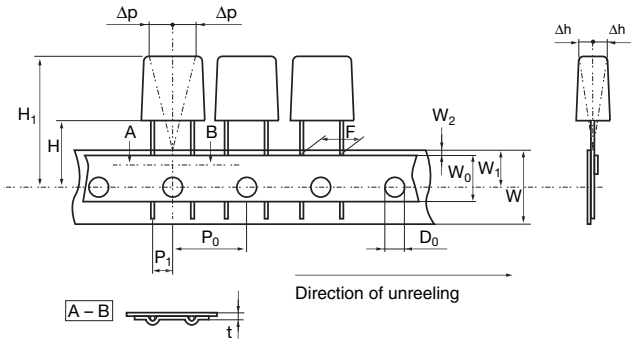
TAPING OF EVOX RIFA RADIAL CAPACITORS

The taping is carried out in accordance with IEC 60286-2.

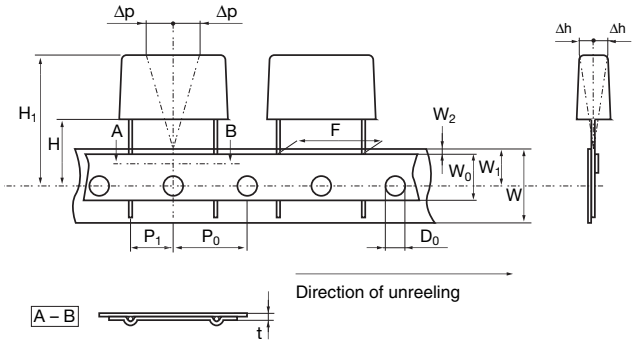
Lead spacing 5 mm



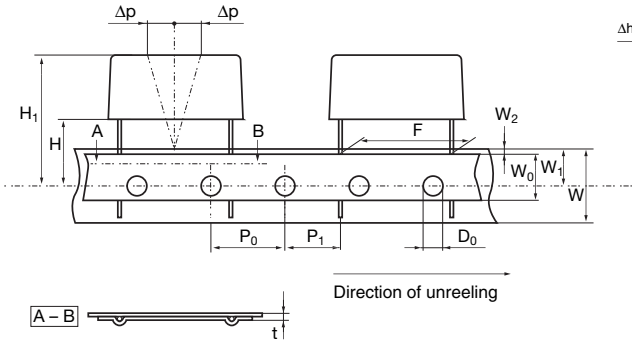
Lead spacing 7.5 mm



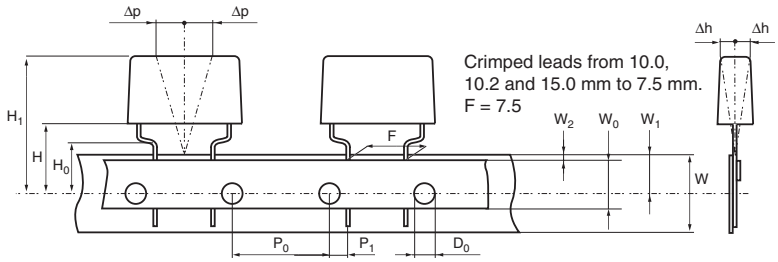
Lead spacing 10 and 15 mm



Lead spacing 22.5 and 27.5 mm



Crimped leads

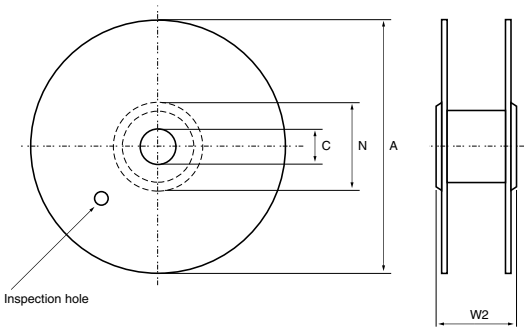


Taping specification Dimensions in mm							Standard IEC 60286-2
Lead spacing, $^{+0.6}_{-0.1}$	F	5.0/7.5	7.5 $^{+0.6}_{-0.1}$ Crimped leads	10.0/15.0	22.5/27.5	10.2/15.2/20.3 Paper capacitors	F
Carrier tape width, ±0.5	W	18	18	18	18	18	18 $^{+1.0}_{-0.5}$
Hold-down tape width, ±0.3	W_0	9	12	12	12	12	
Position of sprocket hole, ±0.5	W_1	9	9	9	9	9	9 $^{+0.75}_{-0.5}$
Distance between tapes, max	W_2	3	3	3	3	3	3
Sprocket hole diameter, ±0.2	D_0	4	4	4	4	4	4
Feed hole pitch, ±0.3	P_0 [1]	12.7	15/12.7	12.7	12.7	12.7	12.7/15
Distance lead – feed hole, ±0.7	P_1	3.85/3.75	3.75	7.7/5.2	5.3	7.6/5.1/8.9	P_1
Max deviation tape – plane	Δp	1.3	1.3	1.3	1.3	1.3	1.3
Max lateral deviation	Δh	2	2	2	2	2	2
Total thickness, ±0.2	t	0.7	0.7	0.7	0.9 max	0.7	0.9 max
Sprocket hole/cap body	H [2]	18.5 ±0.5 16.5 ±0.5		18.5 ±0.5 16.5 ±0.5	18.5 ±0.5	18.0 $^{+2}_{-0}$	18.0 $^{+2}_{-0}$
Sprocket hole/crimped leads	H_0 [2]		16 ±0.5 18 ±0.5				16 ±0.5
Sprocket hole/top of cap body, max	H_1 [3]	32/31 max	40 max	43 max	58	35 max	58 max

[1] Cumulative pitch error
[2] Alternatives for different insertion machines
[3] Depending on case size
[4] Crimped leads available on request

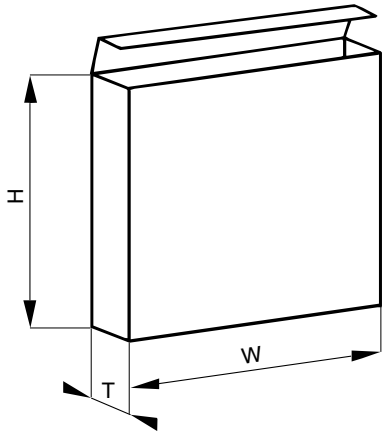
TAPING OF EVOX RIFA RADIAL CAPACITORS

Reel specification			
Reel dimensions in mm			Tol.
Reel diameter	A	360/500	max
Hub diameter	N	80	min
Arbor hole	C	30	± 1
Total reel width measured at hub	W2	58	max
The standard packing for lead space ≤ 15 mm is 360 mm reel and for lead space > 15 mm 500 mm reel.			



Ammo pack specification

Ammo pack dimensions in mm		Lead spacing, mm 5, 7.5 10	15, 22.5, 27.5, 37.5
Height	H	330	(135 or 200 for CQ depending on capacitance value)
Width	W	330	(335 for CQ)
Thickness	T	50	



THE MANUFACTURING CODE Y Z, ACCORDING TO IEC 60062

where Y = year, Z = month.

Year	Code	Year	Code	Year	Code	Month	Code	Month	Code
1991	B	2001	N	2011	B	Jan	1	July	7
1992	C	2002	P	2012	C	Febr	2	Aug	8
1993	D	2003	R	2013	D	March	3	Sept	9
1994	E	2004	S	2014	E	April	4	Oct	O
1995	F	2005	T	2015	F	May	5	Nov	N
1996	H	2006	U	2016	H	June	6	Dec	D
1997	J	2007	V	2017	J				
1998	K	2008	W	2018	K				
1999	L	2009	X	2019	L				
2000	M	2010	A	2020	M				

TERMS AND DEFINITIONS

Rated capacitance (C_R)
The rated capacitance of a capacitor is the value which is indicated upon it. The capacitance is measured at 1 kHz and +23°C.

Rated voltage (U_R)
The rated voltage is the maximum direct voltage or the maximum RMS alternating voltage which may be applied continuously to the terminals of the capacitor at any temperature within the rated temperature range.

Rated temperature
The rated temperature is the maximum ambient temperature at which the rated voltage can be continuously applied.

Climatic category
The climatic category states the category temperature range and the humidity class. For example 40/085/56 stands for –40°C to +85°C; 56 states that the steady state humidity test should take 56 days.

Tangent of the loss angle (Dissipation factor, tanδ)
The tangent of the loss angle is the power loss of the capacitor divided by the reactive power of the capacitor at a sinusoidal voltage of specified frequency. The tangent of loss angle is given in percent (Eg 0.01 tanδ=1%).
The dissipation factor is of interest especially when the capacitor is operated on AC. The dielectric loss causes heating of the capacitor which under unfavourable circumstances may lead to a destructive breakdown. This will not happen if the capacitor is used within specified limits. The ability to withstand short duration thermal and voltage overload is greater for small capacitors than for large ones.

Insulation resistance
The values given in the catalogue indicate the insulation resistance after one minute of electrification at +23°C with the following voltages: 100 VDC for capacitors rated at 100 to 500 VDC and 500 VDC for capacitors rated at 500 VDC. Insulation resistance is temperature dependent and is approximately halved for each 7 °C of temperature rise. Multilayer construction provides insulation resistance higher than that of single-layer types.

Temperature derated voltage
For any temperature between the rated temperature and the upper category temperature, the temperature derated voltage is the maximum voltage that may be applied continuously to the terminals of the capacitor.

Pulse operation
Capacitors loaded with pulses with fast rise or fall times (high dU/dt) will be exposed to high current pulses. In order not to overload the internal connections the current must be limited. The current limits for a specific type are dependent upon:
- Amplitude and form of the pulse
- Rated voltage of the capacitor
- Capacitance
- Geometrical configuration of the winding

$dU/dt = U_R/(R \times C)$

U_R = Rated voltage
R = Discharge resistor
C = Rated capacitance

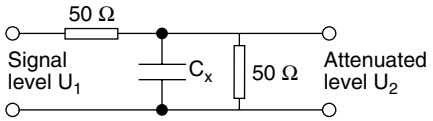
At repeated pulse operation, self-heating, ambient temperature and cooling set the load limit.
Pulse current limits are commonly expressed in the form of maximum permitted dU/dt in volts per microsecond. The figures stated in the type specifications refer to an unlimited number of pulses charging or discharging from rated voltage U_R.

Self-healing
A break-through in a plastic film/foil capacitor leads to a permanent short circuit of the capacitor due to a carbon bridge which is built up in the break-down channel due to the high temperature rise and carbon content of the dielectric. A metallized capacitor can withstand a break-through without a permanent short circuit because of its self-healing ability. The metallized layer is between 0.02 – 0.1 µm. At a weak point in the dielectric, or because of a transient, a break-down may occur. The thin metal layer around the weak point is evaporated and the weak point is isolated. The capacitor has self-healed thereby.

Active flammability
The ability of a capacitor to burn with a flame as a consequence of electrical loading.

Passive flammability
The ability of a capacitor to burn with a flame as a consequence of the application of an external source of heat.

Attenuation
The attenuation of a capacitor is measured in a 50 Ω system.
The highest attenuation is achieved at the resonant frequency.



Attenuation $a = 20 \log U_1/2U_2$ dB

Resonance frequency
The resonance frequency of a capacitor is reached when

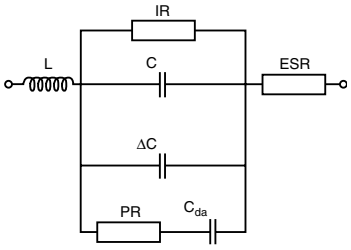
$\omega L = 1/\omega C$

$\omega = 2\pi f$ (f = frequency)
L = inductance caused by the winding and the length of the leads
C = the capacitance at f.

Dielectric absorption (DA)
Dielectric absorption describes the dielectric material's properties to "remember" the applied voltage. One method to define DA is:
The capacitor is to be charged for one hour at rated voltage DC (U_R) then discharged through a resistor of 5 ohms for 10 seconds. The discharge resistor must then be disconnected and the recovery voltage U_r measured 15 minutes after disconnection. The dielectric absorption is defined by:
$DA = (U_r/U_R) \times 100\%$

More specific terms and definitions for EMI, RC and Pulse capacitors can be found in the beginning of respective sections.

CAPACITOR EQUIVALENT DIAGRAM



C = nominal value of the capacitor
L = inductance (leads, metallization, winding)
ESR = equivalent series resistance (leads, metallization, metal spraying)
IR = insulation resistance (properties of the dielectric material)

ΔC = capacitance change (depending on changes in temperature, DC voltage and/or frequency)
PR = dielectric polarization resistance
C_{da} = dielectric absorption

PROPERTIES OF DIELECTRICS

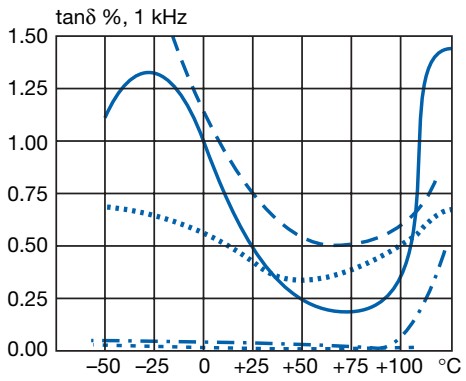
POLYESTER
(Polyethylene Terephthalate, PET)
Metallized and Film/foil
High dielectric constant and high dielectric strength provides good volumetric efficiency for metallized polyester film capacitors. Metallized polyester film has excellent self-healing properties.
Typical applications: Bypassing, coupling, filtering.

POLYESTER
(Polyethylene Naphthalate, PEN)
Metallized
High temperature Polyester. Relatively high dielectric constant and dielectric strength, and availability of thin films, provide good volymeric efficiency for metallized construction. High melting point allowes SMD constructions and service in high ambient temperatures. General purpose capacitor.

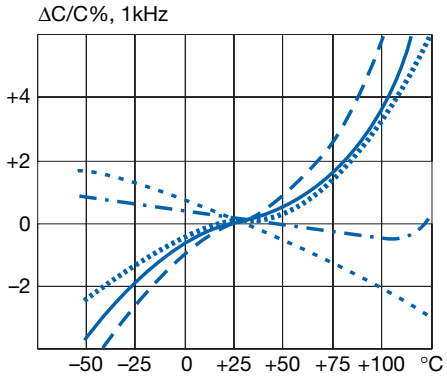
POLYPROPYLENE (PP)
Metallized and Film/foil
Very low losses, low dielectric absorption, high dielectric strength, very high insulation resistance, and negative temperature coefficient.
Typical applications: Stable oscillators and filters. Sample & hold circuits, pulse handling circuits, AC applications and mains filtering.

POLYPHENYLENE SULPHIDE (PPS)
Metallized
Low losses, wide operating temperature range, low temperature coefficient, good stability.
Typical applications: Timers and filters. Automotive and other applications in high ambient temperatures.

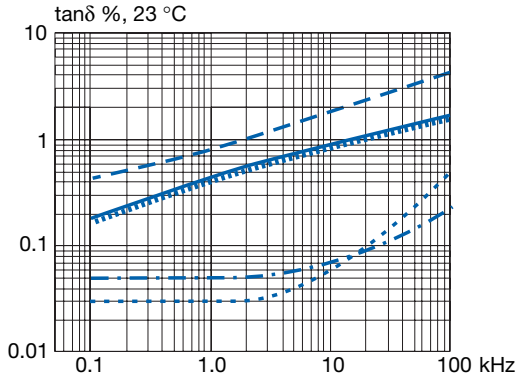
PAPER
Metallized
High dielectric constant. Excellent self-healing properties and transient handling capability. High ionisation level due to impregnated dielectric material. Outstanding reliability in mains connected and other low frequency applications.



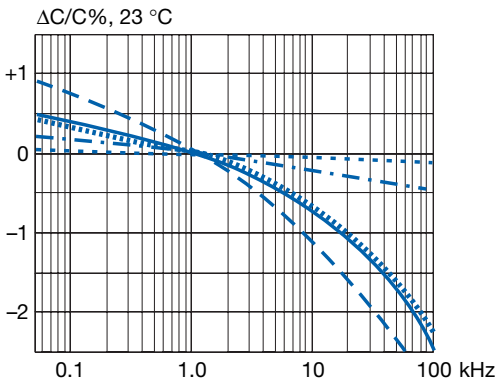
Dissipation factor vs. temperature



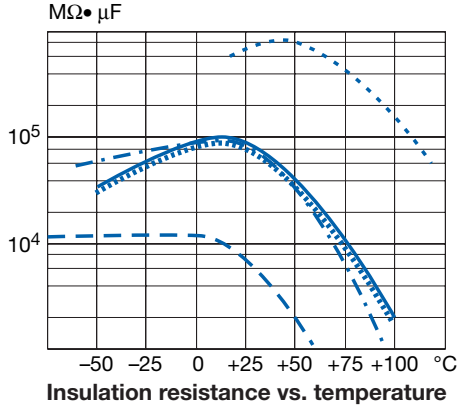
Capacitance vs. temperature



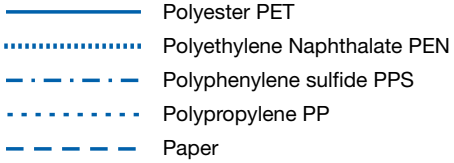
Dissipation factor vs. frequency



Capacitance vs. frequency



Insulation resistance vs. temperature



RELIABILITY

The reliability of a capacitor is mainly a function of:
- The construction; dielectric material and its thickness
- The manufacturing process
- The application; electrical stress and temperature

The failure rate, λ, vs. voltage and temperature for the most common dielectric materials is shown in the diagrams below. U_R = rated voltage.

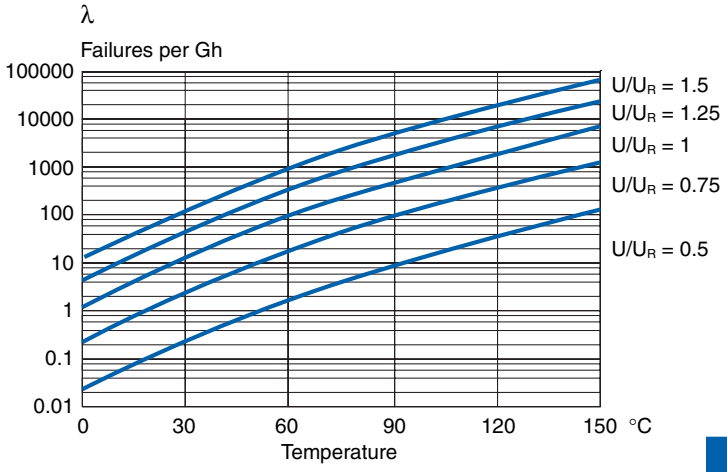
The operating life (L) can be calculated as:

$$L = \frac{1}{\lambda} \times \ln \frac{1}{1 - F}$$

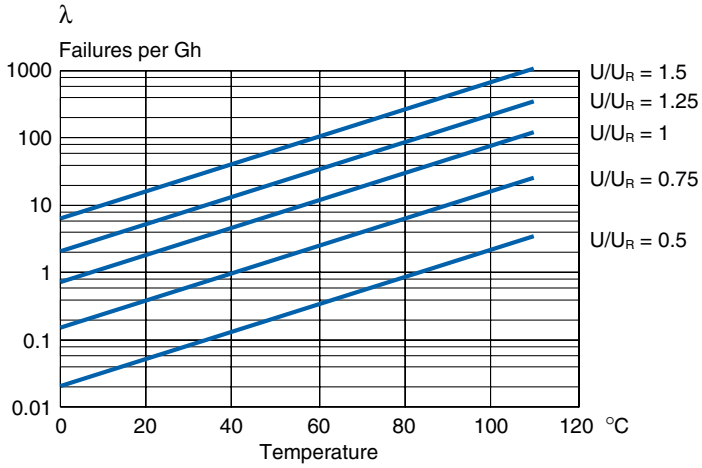
where F is the expected probability of failures.
Example: If $\lambda = 20 \times 10^{-9}$ it takes 6 years to have
F = 0.001 (0.1% failures) and 300 years to have
F = 0.05 (5% failures)

MTBF (mean time between failures) = 1 / λ

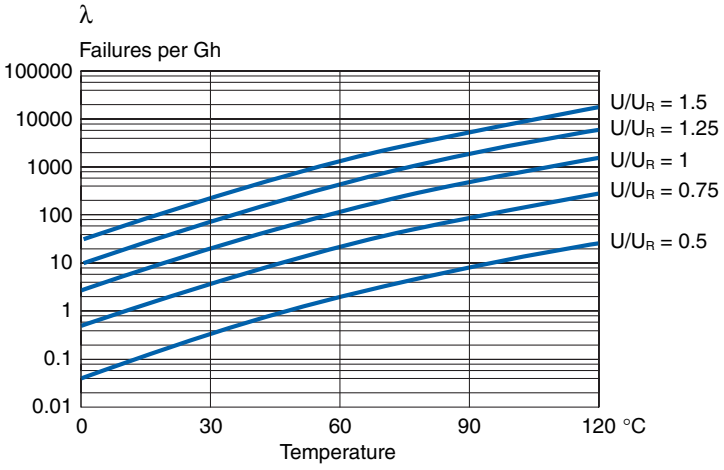
Failure rates vs. temperature and voltage
Polyethylene Naphthalate (PEN)



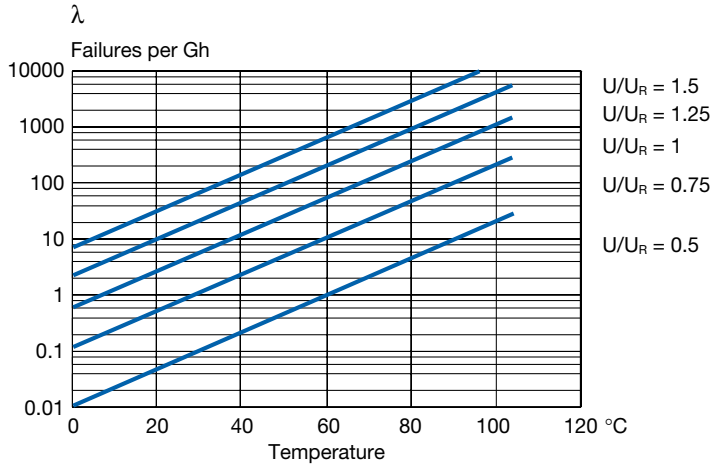
Failure rates vs. temperature and voltage
Paper



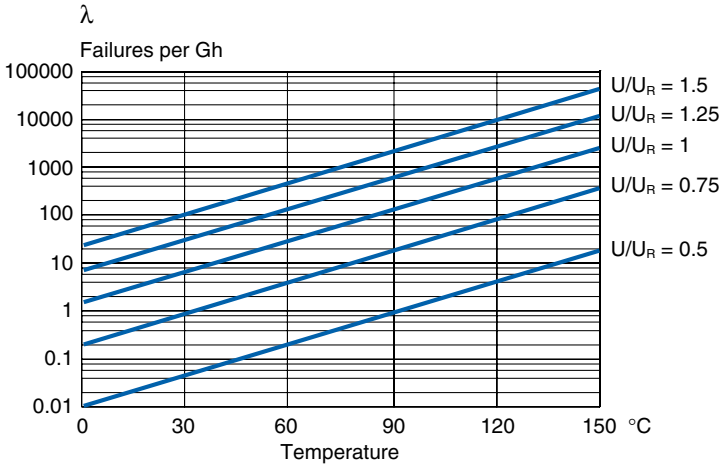
Failure rates vs. temperature and voltage
Polyester



Failure rates vs. temperature and voltage
Polypropylene



Failure rates vs. temperature and voltage
Polyphenylene sulfide



NUMERICAL COMPARISON OF FILM MATERIALS

Material (Trade names)	Abbreviation	Min. film thickness (µm)	Dielectric constant at 1 kHz, +23°C	Operating temperature (°C)	Temperature coefficient (ppm/°C)	Dissipation factor at 1 kHz, +23°C	Insulation time constant (s) at +23°C	Dielectric absorption %
Polyester (Mylar, Lumirror, Hostaphan, Diafoil)	PET	0.9	3.3	–55 ... +100 (... +125)	+400 (±200)	0.5%	25 000	0.5
Polyethylene Naphthalate (Teonex)	PEN	1.4	3.0	–55 ... +125 (... +150)	+200 (±150)	0.4%	25 000	1.2
Polyphenylene sulfide (Torelina)	PPS	1.2	3.0	–55 ... +125 (... +150)	0 (-50) -55°C to +100°C 550 (±50) +100°C to +150°C 0 (+50) +150°C to +200°C	0.06%	25 000	0.05
Polypropylene (Torayfan, Trespaphan)	PP	3.0	2.2	–55 ... +110	–200 (–100, +50) almost linear	0.03%	100 000	0.01
Paper Impregnated	P	7.0	5.5	–40 ... +115	+1200 (±200)	0.8%	15 000	

ENVIRONMENTAL COMMITMENT

As an environmentally conscious company, Evox Rifa (including BHC Components) is working continuously with improvements concerning the environmental effects of both our capacitors and the production of them.

In Europe (RoHS Directive) and in some other geographical areas like China, legislation has been put on place to prevent the use of some hazardous materials, like Lead (Pb), in electronic equipment. All products in this catalogue are produced to help our customer's obligations to guarantee their products to fulfil these legislative requirements. The only material of concern in our products has been Lead (Pb), which has been removed from all designs to fulfil the requirement of containing less than 0,1% of Lead in any homogeneous material.

Evox Rifa will follow closely any changes in legislation world wide, and makes any necessary changes in its products, whenever needed.

Some customer segments like Medical, Military and Automotive Electronics may still require e.g. the use of Lead in electrode coatings. To clarify the situation, and to distinguish products from each other, a special symbol is used on the packaging labels for RoHS compatible capacitors. See pictures to the right.

Because of customer requirements there may appear additional markings like LF = Lead Free or LFW = Lead Free Wires on the label.

Examples of RoHS Compliance markings on packaging labels

WARNING

The implementation of RoHS Directive has forced to select SnAuCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183 °C for SnPb eutectic alloy to 217 – 221 °C for the new alloys. This means that the heat stress to components, even in Wave Soldering, has increased considerably due to higher pre-heat and wave temperatures.

The Polypropylene Capacitors are especially sensitive to heat (melting point of Polypropylene is 160 – 170 °C). The Wave Soldering can be destructive especially for mechanically small Polypropylene Capacitors (Lead spacings 5-10 mm), and great care has to be taken when soldering them. The recommended solder profiles from Evox Rifa should be used. In case of doubt, Evox Rifa should be consulted. In general the Wave Soldering curve from IEC Publ. 61760-1 edition 2 gives a good guideline for successful soldering. See Figure 1.

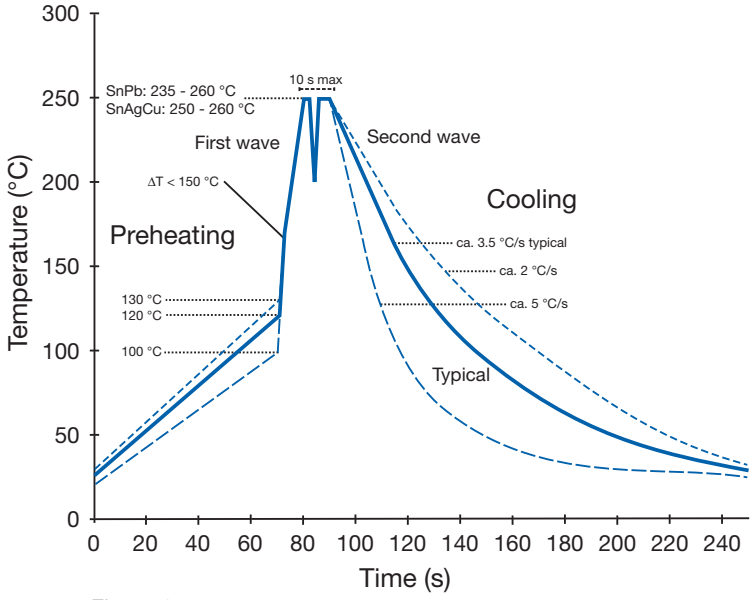


Figure 1

EVOX RIFA QUALITY

The quality of Evox Rifa's products and services is based on a continuous strive towards excellency throughout the whole organization. Skilled and motivated personnel, technical know-how and modern equipment combined with extensive quality assurance make Evox Rifa the supplier of components of the highest quality.

The up-to date quality tools like Statistical Process Control (SPC) in various forms, Failure Mode and Effect Analysis (FMEA), Accelerated Reliability Testing and Zero Defect Acceptance concept in final testing are the corner stones of the every day quality work. Cross-functional teams are routinely used in Problem Solving (8D method) with effective Failure Analysis support.

As a visible evidence of our quality, all the manufacturing units world wide are certified according to ISO 9001. In addition to that, the relevant factories have the automotive industry's ISO TS 16949 certifications. The Finnish factory has also IECQ approval. Our well known EMI suppression capacitors carry the important safety marks for world wide applications.

Evox Rifa companies have the following certificates:

ISO 14001
P.T. Evox Rifa, Batam, Indonesia
ISO 9001
BHC Components
Evox Rifa AB, Gränna, Sweden
Evox Rifa Oy, Suomussalmi, Finland
Nantong Evox Rifa Electrolytics, P.R. China
P.T. Evox Rifa, Batam, Indonesia
ISO TS 16949
Evox Rifa AB, Gränna, Sweden
Evox Rifa Oy, Suomussalmi, Finland
Nantong Evox Rifa Electrolytics, P.R. China
P.T. Evox Rifa, Batam, Indonesia
IECQ
Evox Rifa Oy, Suomussalmi Finland

Customer in Focus

The only real measure of our total quality performance is the acceptance of our customers.

Evox Rifa's quality work has always been focused on the customer. We have actively made quality agreements with ambitious goal settings with World-Class Companies – small and large.

This active quality cooperation has been most fruitful to Evox Rifa by bringing in most modern quality tools, but especially by providing us with reliable feedback on the performance quality of our products and services.

The cooperation has not only lead to continuous improvement of the quality of our products, but sometimes also helped our customers to spot some weaknesses in their designs. A visible sign of these close links between Evox Rifa and various customers is the numerous prestigious customer approvals and the performance awards addressed to Evox Rifa and BHC Components.

IN-HOUSE RESEARCH AND DEVELOPMENT FOR TOMORROW'S NEEDS

Evox Rifa has over sixty years accumulated experience in developing a wide range of world-class capacitor products. Our leading position in the market with a wide product range is based on our deep knowledge of the materials and ways in which they can be used in capacitor designs to provide the best possible solutions.

Evox Rifa invests substantial human and financial resources in finding new highly reliable and cost effective solutions for today's and tomorrow's needs. Our R&D department can simulate most operational conditions and apply our products to the envisaged working environment, giving to the customer optimized capacitors for a particular specification.

The simulation capabilities substantially shorten the design cycle of capacitors.

To assist in shortening the design cycle of our customers, we have brought our R&D department to our customers by providing them with a CAD software, which allows them to select the most suitable capacitors for their application (Fig. 1). For easy calculation of signal stresses, there is also a fast Fourier transform software available. In this software complicated signal forms can easily be simulated and analysed (Fig. 2 and 3).

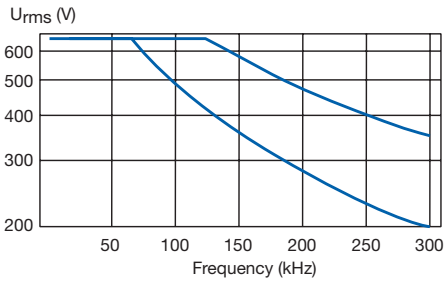


Fig. 1. From CAD software, showing max U_{rms} vs. frequency for two different capacitors

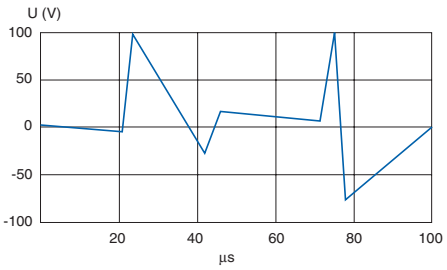


Fig. 2. Signal s (t)

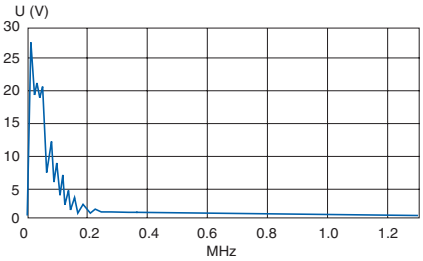


Fig. 3. Frequency spectrum

PRODUCT SPECIFICATION

All descriptions, drawings and other particulars (including dimensions, materials and performance data) given by Evox Rifa are as accurate as possible but, being given for general information, are not binding on Evox Rifa unless specifically agreed in writing. All dimensions and materials are, unless otherwise stated, subject to reasonable variations resulting from the raw material available or arising in the ordinary course of manufacture. Any performance data are based upon Evox Rifa's experience and are such as Evox Rifa normally expects to achieve.

WARRANTY, PRODUCT LIABILITY

Evox Rifa warrants that the goods manufactured by Evox Rifa are free from defects in design, material and workmanship.

Evox Rifa's liability under this warranty shall be limited to replacement or repair free of charge, at one of Evox Rifa's factories selected by Evox Rifa, provided that notification of such failure or defect is given to Evox Rifa immediately upon the same becoming apparent and that on Evox Rifa's request and instruction the goods are promptly returned to Evox Rifa carriage paid by buyer.

In case the goods thus returned as defective, prove to be without fault or defect, Evox Rifa is entitled to charge buyer 100% of the value of the returned goods.

If the goods supplied or part thereof are not manufactured by or branded Evox Rifa, Evox Rifa will only extend to the buyer the benefit of the warranty granted by the manufacturer of the goods.

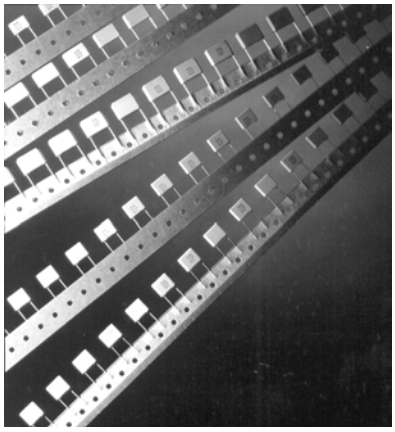
Evox Rifa's liability is further limited to a period of 12 months from the date of shipment to buyer.

Evox Rifa shall not be liable for any defect which is due to accident, fair wear and tear, negligent use, tampering, improper handling, improper use, improper operation or improper storage or any other default on the part of any person other than Evox Rifa.

Evox Rifa shall have no other liabilities in case of defective goods than those stated above and shall under no circumstances be liable for any consequential loss or damage arising from the use of goods sold by Evox Rifa. Liability under paragraph 823 BGB is expressly excluded.

The above limitations of Evox Rifa's liability for defective goods shall apply also with regard to product liability, and Evox Rifa shall have no responsibility for injury to persons or for damage to goods or property of any kind.

In case of product liability claims from third parties against Evox Rifa, not falling within Evox Rifa's liability in accordance with the above, buyer shall hold Evox Rifa harmless.



General Purpose Capacitors

This section covers metallized film, film/foil and impregnated metallized paper capacitors with outstanding reliability in DC and AC applications.

Type	Dielectric	Rated voltage		Capacitance	Page
		VDC	VAC	µF	
MMK5 - 37.5	MKT	50 - 1000	30 - 250	0.001-82	**22**
SMR5 - 27.5	MKI	50 - 400	30 - 200	0.001-22	**33**
PME261	MP	400 - 1000	220 - 500	0.001-1.0	**41**

MMK

- Metallized polyester
- According to CECC 30401-042, IEC 60384-2, DIN 44122

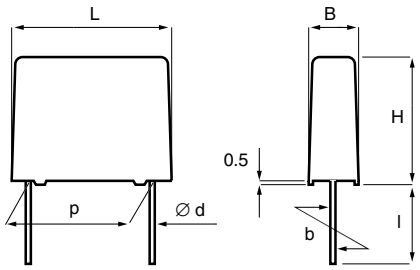
RoHS Compliant

TYPICAL APPLICATIONS

Bypassing, signal coupling. General purpose for highest reliability.

CONSTRUCTION

Metallized polyester film capacitor. Radial leads of tinned wire are electrically welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



p	d	std l	max l	b
5.0 ± 0.4	0.5	4^{+1}	20	± 0.4
7.5 ± 0.4	0.6	4^{+1}	20	± 0.4
10.0 ± 0.4	0.6	4^{+1}	30	± 0.4
15.0 ± 0.4	0.8	4^{+1}	30	± 0.4
22.5 ± 0.4	0.8	4^{+1}	30	± 0.4
27.5 ± 0.4	0.8	4^{+1}	30	± 0.4
37.5 ± 0.5	1.0	4^{+1}	30	± 0.7

TECHNICAL DATA

Rated voltage U_R, VDC	50	63	100	250	400	630	1000
Rated voltage U_R, VAC	30	40	63	160	200	220	250
Capacitance, µF	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	–10.0	–82	–82	–39	–18	–6.8	–4.7

Capacitance tolerance
±20%, ±10% standard, ±5%.

Category temperature range
–55 ... +100°C

Voltage derating
Above +85°C DC and AC voltage derating is 1.25%/°C.

Rated temperature
+85°C

Climatic category
IEC 60068-1, 55/100/56
DIN 40040, FME
–55 ... +100°C (+125°C)
Average relative humidity ≤ 75 %
RH = 95% for 30 days per year.
RH = 85% for further days limited by average value per year, occasional slight condensation permitted.

Test voltage
1.6 x U_R VDC for 2s

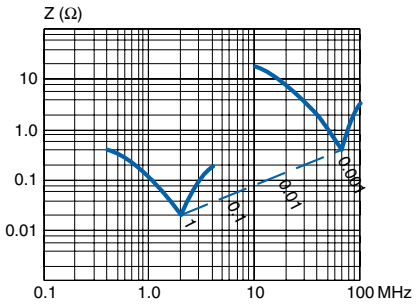
Capacitance drift
Max. 2% after a 2 year storage period at a temperature of +10 ... +40°C and a relative humidity of 40...60%.

Reliability
Operational life > 200 000 h.
Failure rate < 3 FIT, T = +40°C, U = 0.5 x U_R.
Failure criteria according to DIN 44122.

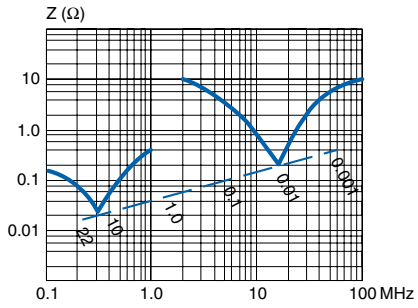
Maximum pulse steepness:
dU/dt according to article table. For peak to peak voltages lower than rated voltage (U_{PP} < U_R), the specified dU/dt can be multiplied by the factor U_R/U_{PP}.

Temperature coefficient
+400 (±200) ppm/°C at 1 kHz

Self inductance
Approximately 6 nH/cm for the total length of capacitor winding and the leads.



Resonance frequencies MMK 5



Resonance frequencies MMK7.5 ... 37.5

ENVIRONMENTAL TEST DATA

Damp heat test	**Test conditions:**	T = +40°C, RH = 93%, t = 56 days.
	Test criteria:	Δ C/C ≤ ±5%, Δ tanδ ≤ 0.005 (1kHz), IR after test 0.5 x IR min.
Endurance test	**Test conditions:**	T = +100°C, U = 1.25 x (0.8 x U_R),
	Test criteria:	t = 2000 h. Δ C/C ≤ ±5%, Δ tanδ ≤ 0.005 (1kHz) Δ tanδ ≤ 0.010 (100kHz) IR after test 0.5 x IR min.

TECHNICAL DATA

Dissipation factor tanδ

Maximum values at +23°C

		C ≤ 0.1 µF	0.1 µF < C ≤ 1.0 µF	C > 1.0 µF
MMK5	1 kHz	0.8%	0.8%	0.8%
	10 kHz	1.2%	1.2%	1.5%
	100 kHz	2.5%	3.0%	
MMK7.5 ... 37.5	1 kHz	0.8%	0.8%	1.0%
	10 kHz	1.5%	1.5%	
	100 kHz	3.0%		

Insulation resistance

Minimum values between terminals.
Measured at +20°C, according to IEC 60384-2.

	C ≤ 0.33 µF	C > 0.33 µF
$U_R \leq 100V$	15000 MΩ	5000 s
$U_R > 100V$	30000 MΩ	10000 s

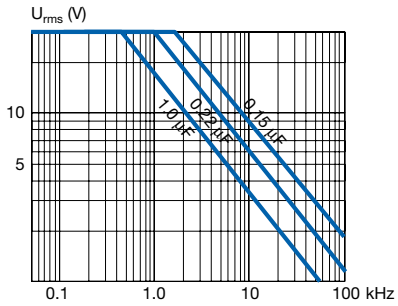
ORDERING INFORMATION

See article table and pages 10 to 14 for options and article code construction.

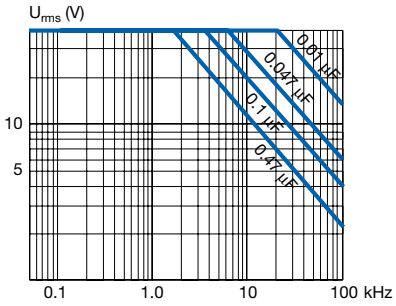
MARKING

- Capacitance
- Tolerance code
- Rated voltage
- Capacitor family code MMK
- Manufacturing date code

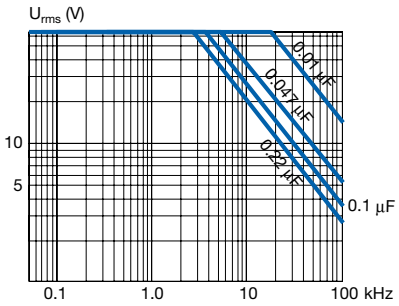
RATED AC VOLTAGE VS. FREQUENCY



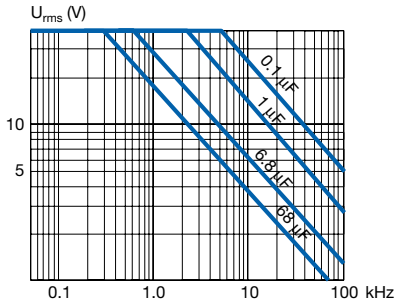
MMK5 50/30



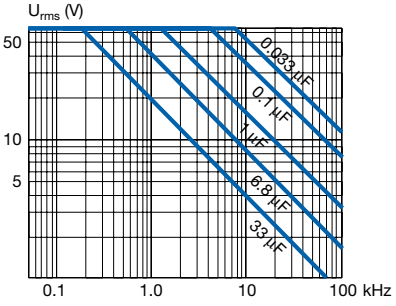
MMK5 63/40



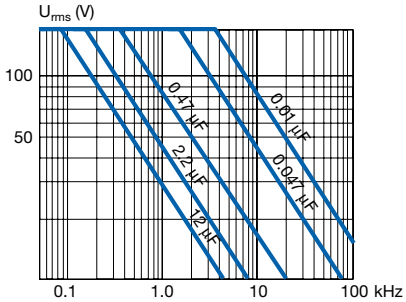
MMK5 100/63



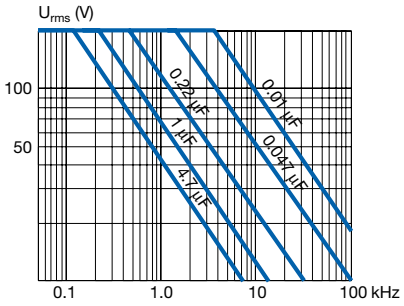
MMK7.5 ... 37.5 63/40



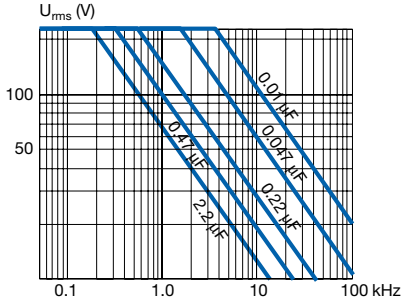
MMK7.5 ... 37.5 100/63



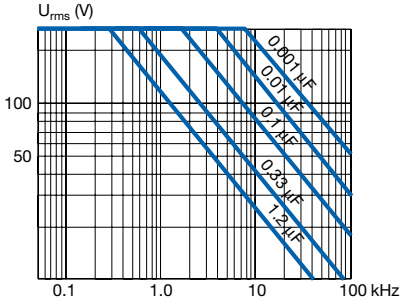
MMK7.5 ... 37.5 250/160



MMK7.5 ... 37.5 400/200



MMK7.5 ... 37.5 630/220



MMK7.5 ... 37.5 1000/250

ARTICLE TABLE

50 VDC/30 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	12	MMK5 102K50J01L4 BULK
0.0012	J01	2.5	6.5	7.2	12	MMK5 122K50J01L4 BULK
0.0015	J01	2.5	6.5	7.2	12	MMK5 152K50J01L4 BULK
0.0018	J01	2.5	6.5	7.2	12	MMK5 182K50J01L4 BULK
0.0022	J01	2.5	6.5	7.2	12	MMK5 222K50J01L4 BULK
0.0027	J01	2.5	6.5	7.2	12	MMK5 272K50J01L4 BULK
0.0033	J01	2.5	6.5	7.2	12	MMK5 332K50J01L4 BULK
0.0039	J01	2.5	6.5	7.2	12	MMK5 392K50J01L4 BULK
0.0047	J01	2.5	6.5	7.2	12	MMK5 472K50J01L4 BULK
0.0056	J01	2.5	6.5	7.2	12	MMK5 562K50J01L4 BULK
0.0068	J01	2.5	6.5	7.2	12	MMK5 682K50J01L4 BULK
0.0082	J01	2.5	6.5	7.2	12	MMK5 822K50J01L4 BULK
0.010	J01	2.5	6.5	7.2	12	MMK5 103K50J01L4 BULK
0.012	J01	2.5	6.5	7.2	12	MMK5 123K50J01L4 BULK
0.015	J01	2.5	6.5	7.2	12	MMK5 153K50J01L4 BULK
0.018	J01	2.5	6.5	7.2	12	MMK5 183K50J01L4 BULK
0.022	J01	2.5	6.5	7.2	12	MMK5 223K50J01L4 BULK
0.027	J01	2.5	6.5	7.2	12	MMK5 273K50J01L4 BULK
0.033	J01	2.5	6.5	7.2	12	MMK5 333K50J01L4 BULK
0.039	J01	2.5	6.5	7.2	12	MMK5 393K50J01L4 BULK
0.047	J01	2.5	6.5	7.2	12	MMK5 473K50J01L4 BULK
0.056	J01	2.5	6.5	7.2	12	MMK5 563K50J01L4 BULK
0.068	J01	2.5	6.5	7.2	12	MMK5 683K50J01L4 BULK
0.082	J01	2.5	6.5	7.2	12	MMK5 823K50J01L4 BULK
0.10	J01	2.5	6.5	7.2	12	MMK5 104K50J01L4 BULK
0.12	J01	2.5	6.5	7.2	12	MMK5 124K50J01L4 BULK
0.15	J01	2.5	6.5	7.2	12	MMK5 154K50J01L4 BULK
0.18	J01	2.5	6.5	7.2	12	MMK5 184K50J01L4 BULK
0.22	J01	2.5	6.5	7.2	12	MMK5 224K50J01L4 BULK
0.27	J01	2.5	6.5	7.2	12	MMK5 274K50J01L4 BULK
0.33	J01	2.5	6.5	7.2	12	MMK5 334K50J01L4 BULK
0.39	J01	2.5	6.5	7.2	12	MMK5 394K50J01L4 BULK
0.47	J01	2.5	6.5	7.2	12	MMK5 474K50J01L4 BULK
0.56	J02	3.5	8.0	7.2	12	MMK5 564K50J02L4 BULK
0.68	J02	3.5	8.0	7.2	12	MMK5 684K50J02L4 BULK
0.82	J02	3.5	8.0	7.2	12	MMK5 824K50J02L4 BULK
1.0	J02	3.5	8.0	7.2	12	MMK5 105K50J02L4 BULK
1.2	J03	4.5	9.0	7.2	12	MMK5 125K50J03L4 BULK
1.5	J03	4.5	9.0	7.2	12	MMK5 155K50J03L4 BULK
1.8	J04	5.0	10.0	7.2	12	MMK5 185K50J04L4 BULK
2.2	J04	5.0	10.0	7.2	12	MMK5 225K50J04L4 BULK
2.7	J05	6.0	11.0	7.2	12	MMK5 275K50J05L4 BULK
3.3	J05	6.0	11.0	7.2	12	MMK5 335K50J05L4 BULK
3.9	J06	7.2	13.0	7.2	12	MMK5 395K50J06L4 BULK
4.7	J06	7.2	13.0	7.2	12	MMK5 475K50J06L4 BULK
5.6	J06	7.2	13.0	7.2	12	MMK5 565K50J06L4 BULK
6.0	J06	7.2	13.0	7.2	12	MMK5 605K50J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	5	MMK7.5 102K50K00L4 BULK
0.0012	K00	2.5	6.0	10.0	5	MMK7.5 122K50K00L4 BULK
0.0015	K00	2.5	6.0	10.0	5	MMK7.5 152K50K00L4 BULK
0.0018	K00	2.5	6.0	10.0	5	MMK7.5 182K50K00L4 BULK
0.0022	K00	2.5	6.0	10.0	5	MMK7.5 222K50K00L4 BULK
0.0027	K00	2.5	6.0	10.0	5	MMK7.5 272K50K00L4 BULK
0.0033	K00	2.5	6.0	10.0	5	MMK7.5 332K50K00L4 BULK
0.0039	K00	2.5	6.0	10.0	5	MMK7.5 392K50K00L4 BULK
0.0047	K00	2.5	6.0	10.0	5	MMK7.5 472K50K00L4 BULK
0.0056	K00	2.5	6.0	10.0	5	MMK7.5 562K50K00L4 BULK
0.0068	K00	2.5	6.0	10.0	5	MMK7.5 682K50K00L4 BULK
0.0082	K00	2.5	6.0	10.0	5	MMK7.5 822K50K00L4 BULK
0.010	K00	2.5	6.0	10.0	5	MMK7.5 103K50K00L4 BULK
0.012	K00	2.5	6.0	10.0	5	MMK7.5 123K50K00L4 BULK
0.015	K00	2.5	6.0	10.0	5	MMK7.5 153K50K00L4 BULK
0.018	K00	2.5	6.0	10.0	5	MMK7.5 183K50K00L4 BULK
0.022	K00	2.5	6.0	10.0	5	MMK7.5 223K50K00L4 BULK
0.027	K00	2.5	6.0	10.0	5	MMK7.5 273K50K00L4 BULK
0.033	K00	2.5	6.0	10.0	5	MMK7.5 333K50K00L4 BULK
0.039	K00	2.5	6.0	10.0	5	MMK7.5 393K50K00L4 BULK
0.047	K00	2.5	6.0	10.0	5	MMK7.5 473K50K00L4 BULK
0.056	K00	2.5	6.0	10.0	5	MMK7.5 563K50K00L4 BULK
0.068	K00	2.5	6.0	10.0	5	MMK7.5 683K50K00L4 BULK
0.082	K00	2.5	6.0	10.0	5	MMK7.5 823K50K00L4 BULK
0.10	K00	2.5	6.0	10.0	5	MMK7.5 104K50K00L4 BULK
0.12	K00	2.5	6.0	10.0	5	MMK7.5 124K50K00L4 BULK
0.15	K00	2.5	6.0	10.0	5	MMK7.5 154K50K00L4 BULK
0.18	K00	2.5	6.0	10.0	5	MMK7.5 184K50K00L4 BULK
0.22	K00	2.5	6.0	10.0	5	MMK7.5 224K50K00L4 BULK
0.27	K00	2.5	6.0	10.0	5	MMK7.5 274K50K00L4 BULK
0.33	K00	2.5	6.0	10.0	5	MMK7.5 334K50K00L4 BULK
0.39	K01	4.0	8.0	10.0	5	MMK7.5 394K50K01L4 BULK
0.47	K01	4.0	8.0	10.0	5	MMK7.5 474K50K01L4 BULK
0.56	K01	4.0	8.0	10.0	5	MMK7.5 564K50K01L4 BULK
0.68	K01	4.0	8.0	10.0	5	MMK7.5 684K50K01L4 BULK
0.82	K01	4.0	8.0	10.0	5	MMK7.5 824K50K01L4 BULK
1.0	K01	4.0	8.0	10.0	5	MMK7.5 105K50K01L4 BULK
1.2	K03	5.0	11.0	10.0	5	MMK7.5 125K50K03L4 BULK
1.5	K03	5.0	11.0	10.0	5	MMK7.5 155K50K03L4 BULK
1.8	K03	5.0	11.0	10.0	5	MMK7.5 185K50K03L4 BULK
2.2	K04	6.0	12.0	10.5	5	MMK7.5 225K50K04L4 BULK
2.7	K04	6.0	12.0	10.5	5	MMK7.5 275K50K04L4 BULK
3.3	K04	6.0	12.0	10.5	5	MMK7.5 335K50K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.0	A01	4.0	9.0	13.0	4	MMK10 105K50A01L4 BULK
1.2	A01	4.0	9.0	13.0	4	MMK10 125K50A01L4 BULK
1.5	A02	4.5	10.5	13.0	4	MMK10 155K50A02L4 BULK
1.8	A03	5.0	11.0	13.0	4	MMK10 185K50A03L4 BULK
2.2	A03	5.0	11.0	13.0	4	MMK10 225K50A03L4 BULK
2.7	A04	6.0	12.0	13.0	4	MMK10 275K50A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
2.0	B04	5.5	10.5	18.0	3	MMK15 205K50B04L4 BULK
2.2	B04	5.5	10.5	18.0	3	MMK15 225K50B04L4 BULK
2.7	B05	5.5	12.5	18.0	3	MMK15 275K50B05L4 BULK
3.3	B05	5.5	12.5	18.0	3	MMK15 335K50B05L4 BULK
3.9	B10	6.5	12.5	18.0	3	MMK15 395K50B10L4 BULK
4.7	B06	7.5	14.5	18.0	3	MMK15 475K50B06L4 BULK
5.6	B06	7.5	14.5	18.0	3	MMK15 565K50B06L4 BULK
6.8	B12	8.0	15.0	18.0	3	MMK15 685K50B12L4 BULK
8.2	B11	8.5	16.0	18.0	3	MMK15 825K50B11L4 BULK
10.0	B14	9.5	17.5	18.0	3	MMK15 106K50B14L4 BULK

ARTICLE TABLE

63 VDC/40 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	25	MMK5 102K63J01L4 BULK
0.0012	J01	2.5	6.5	7.2	25	MMK5 122K63J01L4 BULK
0.0015	J01	2.5	6.5	7.2	25	MMK5 152K63J01L4 BULK
0.0018	J01	2.5	6.5	7.2	25	MMK5 182K63J01L4 BULK
0.0022	J01	2.5	6.5	7.2	25	MMK5 222K63J01L4 BULK
0.0027	J01	2.5	6.5	7.2	25	MMK5 272K63J01L4 BULK
0.0033	J01	2.5	6.5	7.2	25	MMK5 332K63J01L4 BULK
0.0039	J01	2.5	6.5	7.2	25	MMK5 392K63J01L4 BULK
0.0047	J01	2.5	6.5	7.2	25	MMK5 472K63J01L4 BULK
0.0056	J01	2.5	6.5	7.2	25	MMK5 562K63J01L4 BULK
0.0068	J01	2.5	6.5	7.2	25	MMK5 682K63J01L4 BULK
0.0082	J01	2.5	6.5	7.2	25	MMK5 822K63J01L4 BULK
0.010	J01	2.5	6.5	7.2	25	MMK5 103K63J01L4 BULK
0.012	J01	2.5	6.5	7.2	25	MMK5 123K63J01L4 BULK
0.015	J01	2.5	6.5	7.2	25	MMK5 153K63J01L4 BULK
0.018	J01	2.5	6.5	7.2	25	MMK5 183K63J01L4 BULK
0.022	J01	2.5	6.5	7.2	25	MMK5 223K63J01L4 BULK
0.027	J01	2.5	6.5	7.2	25	MMK5 273K63J01L4 BULK
0.033	J01	2.5	6.5	7.2	25	MMK5 333K63J01L4 BULK
0.039	J01	2.5	6.5	7.2	25	MMK5 393K63J01L4 BULK
0.047	J01	2.5	6.5	7.2	25	MMK5 473K63J01L4 BULK
0.056	J01	2.5	6.5	7.2	25	MMK5 563K63J01L4 BULK
0.068	J01	2.5	6.5	7.2	25	MMK5 683K63J01L4 BULK
0.082	J01	2.5	6.5	7.2	25	MMK5 823K63J01L4 BULK
0.10	J01	2.5	6.5	7.2	25	MMK5 104K63J01L4 BULK
0.12	J01	2.5	6.5	7.2	25	MMK5 124K63J01L4 BULK
0.15	J01	2.5	6.5	7.2	25	MMK5 154K63J01L4 BULK
0.18	J01	2.5	6.5	7.2	25	MMK5 184K63J01L4 BULK
0.22	J01	2.5	6.5	7.2	25	MMK5 224K63J01L4 BULK
0.27	J02	3.5	8.0	7.2	25	MMK5 274K63J02L4 BULK
0.33	J02	3.5	8.0	7.2	25	MMK5 334K63J02L4 BULK
0.39	J02	3.5	8.0	7.2	25	MMK5 394K63J02L4 BULK
0.47	J02	3.5	8.0	7.2	25	MMK5 474K63J02L4 BULK
0.56	J03	4.5	9.0	7.2	25	MMK5 564K63J03L4 BULK
0.68	J03	4.5	9.0	7.2	25	MMK5 684K63J03L4 BULK
0.82	J04	5.0	10.0	7.2	25	MMK5 824K63J04L4 BULK
1.0	J04	5.0	10.0	7.2	25	MMK5 105K63J04L4 BULK
1.2	J05	6.0	11.0	7.2	25	MMK5 125K63J05L4 BULK
1.5	J05	6.0	11.0	7.2	25	MMK5 155K63J05L4 BULK
1.8	J06	7.2	13.0	7.2	25	MMK5 185K63J06L4 BULK
2.2	J06	7.2	13.0	7.2	25	MMK5 225K63J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	10	MMK7.5 102K63K00L4 BULK
0.0012	K00	2.5	6.0	10.0	10	MMK7.5 122K63K00L4 BULK
0.0015	K00	2.5	6.0	10.0	10	MMK7.5 152K63K00L4 BULK
0.0018	K00	2.5	6.0	10.0	10	MMK7.5 182K63K00L4 BULK
0.0022	K00	2.5	6.0	10.0	10	MMK7.5 222K63K00L4 BULK
0.0027	K00	2.5	6.0	10.0	10	MMK7.5 272K63K00L4 BULK
0.0033	K00	2.5	6.0	10.0	10	MMK7.5 332K63K00L4 BULK
0.0039	K00	2.5	6.0	10.0	10	MMK7.5 392K63K00L4 BULK
0.0047	K00	2.5	6.0	10.0	10	MMK7.5 472K63K00L4 BULK
0.0056	K00	2.5	6.0	10.0	10	MMK7.5 562K63K00L4 BULK
0.0068	K00	2.5	6.0	10.0	10	MMK7.5 682K63K00L4 BULK
0.0082	K00	2.5	6.0	10.0	10	MMK7.5 822K63K00L4 BULK
0.010	K00	2.5	6.0	10.0	10	MMK7.5 103K63K00L4 BULK
0.012	K00	2.5	6.0	10.0	10	MMK7.5 123K63K00L4 BULK
0.015	K00	2.5	6.0	10.0	10	MMK7.5 153K63K00L4 BULK
0.018	K00	2.5	6.0	10.0	10	MMK7.5 183K63K00L4 BULK

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LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.022	K00	2.5	6.0	10.0	10	MMK7.5 223K63K00L4 BULK
0.027	K00	2.5	6.0	10.0	10	MMK7.5 273K63K00L4 BULK
0.033	K00	2.5	6.0	10.0	10	MMK7.5 333K63K00L4 BULK
0.039	K00	2.5	6.0	10.0	10	MMK7.5 393K63K00L4 BULK
0.047	K00	2.5	6.0	10.0	10	MMK7.5 473K63K00L4 BULK
0.056	K00	2.5	6.0	10.0	10	MMK7.5 563K63K00L4 BULK
0.068	K00	2.5	6.0	10.0	10	MMK7.5 683K63K00L4 BULK
0.082	K00	2.5	6.0	10.0	10	MMK7.5 823K63K00L4 BULK
0.10	K00	2.5	6.0	10.0	10	MMK7.5 104K63K00L4 BULK
0.12	K00	2.5	6.0	10.0	10	MMK7.5 124K63K00L4 BULK
0.15	K00	2.5	6.0	10.0	10	MMK7.5 154K63K00L4 BULK
0.18	K00	2.5	6.0	10.0	10	MMK7.5 184K63K00L4 BULK
0.22	K01	4.0	8.0	10.0	10	MMK7.5 224K63K01L4 BULK
0.27	K01	4.0	8.0	10.0	10	MMK7.5 274K63K01L4 BULK
0.33	K01	4.0	8.0	10.0	10	MMK7.5 334K63K01L4 BULK
0.39	K01	4.0	8.0	10.0	10	MMK7.5 394K63K01L4 BULK
0.47	K01	4.0	8.0	10.0	10	MMK7.5 474K63K01L4 BULK
0.56	K03	5.0	11.0	10.0	10	MMK7.5 564K63K03L4 BULK
0.68	K03	5.0	11.0	10.0	10	MMK7.5 684K63K03L4 BULK
0.82	K03	5.0	11.0	10.0	10	MMK7.5 824K63K03L4 BULK
1.0	K03	5.0	11.0	10.0	10	MMK7.5 105K63K03L4 BULK
1.2	K04	6.0	12.0	10.5	10	MMK7.5 125K63K04L4 BULK
1.5	K04	6.0	12.0	10.5	10	MMK7.5 155K63K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	8	MMK10 102K63A01L4 BULK
0.0012	A01	4.0	9.0	13.0	8	MMK10 122K63A01L4 BULK
0.0015	A01	4.0	9.0	13.0	8	MMK10 152K63A01L4 BULK
0.0018	A01	4.0	9.0	13.0	8	MMK10 182K63A01L4 BULK
0.0022	A01	4.0	9.0	13.0	8	MMK10 222K63A01L4 BULK
0.0027	A01	4.0	9.0	13.0	8	MMK10 272K63A01L4 BULK
0.0033	A01	4.0	9.0	13.0	8	MMK10 332K63A01L4 BULK
0.0039	A01	4.0	9.0	13.0	8	MMK10 392K63A01L4 BULK
0.0047	A01	4.0	9.0	13.0	8	MMK10 472K63A01L4 BULK
0.0056	A01	4.0	9.0	13.0	8	MMK10 562K63A01L4 BULK
0.0068	A01	4.0	9.0	13.0	8	MMK10 682K63A01L4 BULK
0.0078	A01	4.0	9.0	13.0	8	MMK10 782K63A01L4 BULK
0.0082	A01	4.0	9.0	13.0	8	MMK10 822K63A01L4 BULK
0.010	A01	4.0	9.0	13.0	8	MMK10 103K63A01L4 BULK
0.012	A01	4.0	9.0	13.0	8	MMK10 123K63A01L4 BULK
0.015	A01	4.0	9.0	13.0	8	MMK10 153K63A01L4 BULK
0.018	A01	4.0	9.0	13.0	8	MMK10 183K63A01L4 BULK
0.022	A01	4.0	9.0	13.0	8	MMK10 223K63A01L4 BULK
0.027	A01	4.0	9.0	13.0	8	MMK10 273K63A01L4 BULK
0.033	A01	4.0	9.0	13.0	8	MMK10 333K63A01L4 BULK
0.039	A01	4.0	9.0	13.0	8	MMK10 393K63A01L4 BULK
0.047	A01	4.0	9.0	13.0	8	MMK10 473K63A01L4 BULK
0.056	A01	4.0	9.0	13.0	8	MMK10 563K63A01L4 BULK
0.068	A01	4.0	9.0	13.0	8	MMK10 683K63A01L4 BULK
0.082	A01	4.0	9.0	13.0	8	MMK10 823K63A01L4 BULK
0.10	A01	4.0	9.0	13.0	8	MMK10 104K63A01L4 BULK
0.12	A01	4.0	9.0	13.0	8	MMK10 124K63A01L4 BULK
0.15	A01	4.0	9.0	13.0	8	MMK10 154K63A01L4 BULK
0.18	A01	4.0	9.0	13.0	8	MMK10 184K63A01L4 BULK
0.22	A01	4.0	9.0	13.0	8	MMK10 224K63A01L4 BULK
0.27	A01	4.0	9.0	13.0	8	MMK10 274K63A01L4 BULK
0.33	A01	4.0	9.0	13.0	8	MMK10 334K63A01L4 BULK
0.39	A01	4.0	9.0	13.0	8	MMK10 394K63A01L4 BULK
0.47	A01	4.0	9.0	13.0	8	MMK10 474K63A01L4 BULK

ARTICLE TABLE

63 VDC/40 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.56	A01	4.0	9.0	13.0	8	MMK10 564K63A01L4 BULK
0.68	A01	4.0	9.0	13.0	8	MMK10 684K63A01L4 BULK
0.82	A01	4.0	9.0	13.0	8	MMK10 824K63A01L4 BULK
1.0	A02	4.5	10.5	13.0	8	MMK10 105K63A02L4 BULK
1.2	A02	4.5	10.5	13.0	8	MMK10 125K63A02L4 BULK
1.5	A03	5.0	11.0	13.0	8	MMK10 155K63A03L4 BULK
1.8	A04	6.0	12.0	13.0	8	MMK10 185K63A04L4 BULK
2.2	A04	6.0	12.0	13.0	8	MMK10 225K63A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.68	B04	5.5	10.5	18.0	5	MMK15 684K63B04L4 BULK
0.82	B04	5.5	10.5	18.0	5	MMK15 824K63B04L4 BULK
1.0	B04	5.5	10.5	18.0	5	MMK15 105K63B04L4 BULK
1.2	B04	5.5	10.5	18.0	5	MMK15 125K63B04L4 BULK
1.5	B04	5.5	10.5	18.0	5	MMK15 155K63B04L4 BULK
1.8	B04	5.5	10.5	18.0	5	MMK15 185K63B04L4 BULK
2.0	B05	5.5	12.5	18.0	5	MMK15 205K63B05L4 BULK
2.2	B05	5.5	12.5	18.0	5	MMK15 225K63B05L4 BULK
2.7	B10	6.5	12.5	18.0	5	MMK15 275K63B10L4 BULK
3.3	B10	6.5	12.5	18.0	5	MMK15 335K63B10L4 BULK
3.9	B06	7.5	14.5	18.0	5	MMK15 395K63B06L4 BULK
4.7	B06	7.5	14.5	18.0	5	MMK15 475K63B06L4 BULK
5.6	B11	8.5	16.0	18.0	5	MMK15 565K63B11L4 BULK
6.8	B14	9.5	17.5	18.0	5	MMK15 685K63B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
3.3	D13	6.5	14.5	26.0	3	MMK22.5 335K63D13L4 TRAY
3.9	D13	6.5	14.5	26.0	3	MMK22.5 395K63D13L4 TRAY
4.7	D13	6.5	14.5	26.0	3	MMK22.5 475K63D13L4 TRAY
5.6	D17	7.0	16.5	26.0	3	MMK22.5 565K63D17L4 TRAY
6.8	D17	7.0	16.5	26.0	3	MMK22.5 685K63D17L4 TRAY
8.2	D14	8.0	16.0	26.0	3	MMK22.5 825K63D14L4 TRAY
10	D15	9.0	18.5	26.0	3	MMK22.5 106K63D15L4 TRAY
12	D18	10.5	19.0	26.0	3	MMK22.5 126K63D18L4 TRAY
15	D16	11.0	21.5	26.0	3	MMK22.5 156K63D16L4 TRAY
18	D20	13.5	23.0	26.0	3	MMK22.5 186K63D20L4 TRAY
22	D19	15.5	24.5	26.0	3	MMK22.5 226K63D19L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
8.2	F11	10.5	20.5	31.5	2	MMK27.5 825K63F11L4 TRAY
10	F11	10.5	20.5	31.5	2	MMK27.5 106K63F11L4 TRAY
12	F11	10.5	20.5	31.5	2	MMK27.5 126K63F11L4 TRAY
15	F12	11.5	22.5	31.5	2	MMK27.5 156K63F12L4 TRAY
15	F17	21.0	12.5	31.5	2	MMK27.5 156K63F17L4 TRAY
18	F12	11.5	22.5	31.5	2	MMK27.5 186K63F12L4 TRAY
22	F13	14.5	24.5	31.5	2	MMK27.5 226K63F13L4 TRAY
27	F14	17.5	28.0	31.5	2	MMK27.5 276K63F14L4 TRAY
33	F14	17.5	28.0	31.5	2	MMK27.5 336K63F14L4 TRAY
33	F19	27.5	16.0	31.5	2	MMK27.5 336K63F19L4 TRAY
39	F15	19.0	29.0	31.5	2	MMK27.5 396K63F15L4 TRAY
47	F16	21.0	30.0	31.5	2	MMK27.5 476K63F16L4 TRAY
47	F18	31.0	19.0	31.5	2	MMK27.5 476K63F18L4 TRAY

63 VDC/40 VAC

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
27	R05	13.0	24.0	41.0	1	MMK37.5 276K63R05L4 TRAY
33	R04	15.0	26.0	41.0	1	MMK37.5 336K63R04L4 TRAY
39	R04	15.0	26.0	41.0	1	MMK37.5 396K63R04L4 TRAY
47	R02	16.5	32.0	41.0	1	MMK37.5 476K63R02L4 TRAY
56	R03	19.0	36.0	41.0	1	MMK37.5 566K63R03L4 TRAY
68	R03	19.0	36.0	41.0	1	MMK37.5 686K63R03L4 TRAY
82	R06	21.0	38.0	41.0	1	MMK37.5 826K63R06L4 TRAY

100 VDC/63 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	30	MMK5 102K100J01L4 BULK
0.0012	J01	2.5	6.5	7.2	30	MMK5 122K100J01L4 BULK
0.0015	J01	2.5	6.5	7.2	30	MMK5 152K100J01L4 BULK
0.0018	J01	2.5	6.5	7.2	30	MMK5 182K100J01L4 BULK
0.0022	J01	2.5	6.5	7.2	30	MMK5 222K100J01L4 BULK
0.0027	J01	2.5	6.5	7.2	30	MMK5 272K100J01L4 BULK
0.0033	J01	2.5	6.5	7.2	30	MMK5 332K100J01L4 BULK
0.0039	J01	2.5	6.5	7.2	30	MMK5 392K100J01L4 BULK
0.0047	J01	2.5	6.5	7.2	30	MMK5 472K100J01L4 BULK
0.0056	J01	2.5	6.5	7.2	30	MMK5 562K100J01L4 BULK
0.0068	J01	2.5	6.5	7.2	30	MMK5 682K100J01L4 BULK
0.0082	J01	2.5	6.5	7.2	30	MMK5 822K100J01L4 BULK
0.010	J01	2.5	6.5	7.2	30	MMK5 103K100J01L4 BULK
0.012	J01	2.5	6.5	7.2	30	MMK5 123K100J01L4 BULK
0.015	J01	2.5	6.5	7.2	30	MMK5 153K100J01L4 BULK
0.018	J01	2.5	6.5	7.2	30	MMK5 183K100J01L4 BULK
0.022	J01	2.5	6.5	7.2	30	MMK5 223K100J01L4 BULK
0.027	J01	2.5	6.5	7.2	30	MMK5 273K100J01L4 BULK
0.033	J01	2.5	6.5	7.2	30	MMK5 333K100J01L4 BULK
0.039	J01	2.5	6.5	7.2	30	MMK5 393K100J01L4 BULK
0.047	J01	2.5	6.5	7.2	30	MMK5 473K100J01L4 BULK
0.056	J01	2.5	6.5	7.2	30	MMK5 563K100J01L4 BULK
0.068	J01	2.5	6.5	7.2	30	MMK5 683K100J01L4 BULK
0.082	J01	2.5	6.5	7.2	30	MMK5 823K100J01L4 BULK
0.10	J01	2.5	6.5	7.2	30	MMK5 104K100J01L4 BULK
0.12	J02	3.5	8.0	7.2	30	MMK5 124K100J02L4 BULK
0.15	J02	3.5	8.0	7.2	30	MMK5 154K100J02L4 BULK
0.18	J02	3.5	8.0	7.2	30	MMK5 184K100J02L4 BULK
0.22	J02	3.5	8.0	7.2	30	MMK5 224K100J02L4 BULK
0.27	J03	4.5	9.0	7.2	30	MMK5 274K100J03L4 BULK
0.33	J03	4.5	9.0	7.2	30	MMK5 334K100J03L4 BULK
0.39	J04	5.0	10.0	7.2	30	MMK5 394K100J04L4 BULK
0.47	J04	5.0	10.0	7.2	30	MMK5 474K100J04L4 BULK
0.56	J05	6.0	11.0	7.2	30	MMK5 564K100J05L4 BULK
0.68	J05	6.0	11.0	7.2	30	MMK5 684K100J05L4 BULK
0.82	J06	7.2	13.0	7.2	30	MMK5 824K100J06L4 BULK
1.0	J06	7.2	13.0	7.2	30	MMK5 105K100J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	20	MMK7.5 102K100K00L4 BULK
0.0012	K00	2.5	6.0	10.0	20	MMK7.5 122K100K00L4 BULK
0.0015	K00	2.5	6.0	10.0	20	MMK7.5 152K100K00L4 BULK
0.0018	K00	2.5	6.0	10.0	20	MMK7.5 182K100K00L4 BULK
0.0022	K00	2.5	6.0	10.0	20	MMK7.5 222K100K00L4 BULK
0.0027	K00	2.5	6.0	10.0	20	MMK7.5 272K100K00L4 BULK
0.0033	K00	2.5	6.0	10.0	20	MMK7.5 332K100K00L4 BULK
0.0039	K00	2.5	6.0	10.0	20	MMK7.5 392K100K00L4 BULK
0.0047	K00	2.5	6.0	10.0	20	MMK7.5 472K100K00L4 BULK
0.0056	K00	2.5	6.0	10.0	20	MMK7.5 562K100K00L4 BULK

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
100 VDC/63 VAC						
LEAD SPACING 7.5 MM						
0.0068	K00	2.5	6.0	10.0	20	MMK7.5 682K100K00L4 BULK
0.0082	K00	2.5	6.0	10.0	20	MMK7.5 822K100K00L4 BULK
0.010	K00	2.5	6.0	10.0	20	MMK7.5 103K100K00L4 BULK
0.012	K00	2.5	6.0	10.0	20	MMK7.5 123K100K00L4 BULK
0.015	K00	2.5	6.0	10.0	20	MMK7.5 153K100K00L4 BULK
0.018	K00	2.5	6.0	10.0	20	MMK7.5 183K100K00L4 BULK
0.022	K00	2.5	6.0	10.0	20	MMK7.5 223K100K00L4 BULK
0.027	K00	2.5	6.0	10.0	20	MMK7.5 273K100K00L4 BULK
0.033	K00	2.5	6.0	10.0	20	MMK7.5 333K100K00L4 BULK
0.039	K00	2.5	6.0	10.0	20	MMK7.5 393K100K00L4 BULK
0.047	K00	2.5	6.0	10.0	20	MMK7.5 473K100K00L4 BULK
0.056	K00	2.5	6.0	10.0	20	MMK7.5 563K100K00L4 BULK
0.068	K00	2.5	6.0	10.0	20	MMK7.5 683K100K00L4 BULK
0.082	K00	2.5	6.0	10.0	20	MMK7.5 823K100K00L4 BULK
0.10	K00	2.5	6.0	10.0	20	MMK7.5 104K100K00L4 BULK
0.12	K01	4.0	8.0	10.0	20	MMK7.5 124K100K01L4 BULK
0.15	K01	4.0	8.0	10.0	20	MMK7.5 154K100K01L4 BULK
0.18	K01	4.0	8.0	10.0	20	MMK7.5 184K100K01L4 BULK
0.22	K01	4.0	8.0	10.0	20	MMK7.5 224K100K01L4 BULK
0.27	K01	4.0	8.0	10.0	20	MMK7.5 274K100K01L4 BULK
0.33	K03	5.0	11.0	10.0	20	MMK7.5 334K100K03L4 BULK
0.39	K03	5.0	11.0	10.0	20	MMK7.5 394K100K03L4 BULK
0.47	K03	5.0	11.0	10.0	20	MMK7.5 474K100K03L4 BULK
0.56	K03	5.0	11.0	10.0	20	MMK7.5 564K100K03L4 BULK
0.68	K03	5.0	11.0	10.0	20	MMK7.5 684K100K03L4 BULK
0.82	K04	6.0	12.0	10.5	20	MMK7.5 824K100K04L4 BULK
1.0	K04	6.0	12.0	10.5	20	MMK7.5 105K100K04L4 BULK
LEAD SPACING 10 MM						
0.0010	A01	4.0	9.0	13.0	12	MMK10 102K100A01L4 BULK
0.0012	A01	4.0	9.0	13.0	12	MMK10 122K100A01L4 BULK
0.0015	A01	4.0	9.0	13.0	12	MMK10 152K100A01L4 BULK
0.0018	A01	4.0	9.0	13.0	12	MMK10 182K100A01L4 BULK
0.0022	A01	4.0	9.0	13.0	12	MMK10 222K100A01L4 BULK
0.0027	A01	4.0	9.0	13.0	12	MMK10 272K100A01L4 BULK
0.0033	A01	4.0	9.0	13.0	12	MMK10 332K100A01L4 BULK
0.0039	A01	4.0	9.0	13.0	12	MMK10 392K100A01L4 BULK
0.0047	A01	4.0	9.0	13.0	12	MMK10 472K100A01L4 BULK
0.0056	A01	4.0	9.0	13.0	12	MMK10 562K100A01L4 BULK
0.0068	A01	4.0	9.0	13.0	12	MMK10 682K100A01L4 BULK
0.0078	A01	4.0	9.0	13.0	12	MMK10 782K100A01L4 BULK
0.0082	A01	4.0	9.0	13.0	12	MMK10 822K100A01L4 BULK
0.010	A01	4.0	9.0	13.0	12	MMK10 103K100A01L4 BULK
0.012	A01	4.0	9.0	13.0	12	MMK10 123K100A01L4 BULK
0.015	A01	4.0	9.0	13.0	12	MMK10 153K100A01L4 BULK
0.018	A01	4.0	9.0	13.0	12	MMK10 183K100A01L4 BULK
0.022	A01	4.0	9.0	13.0	12	MMK10 223K100A01L4 BULK
0.027	A01	4.0	9.0	13.0	12	MMK10 273K100A01L4 BULK
0.033	A01	4.0	9.0	13.0	12	MMK10 333K100A01L4 BULK
0.039	A01	4.0	9.0	13.0	12	MMK10 393K100A01L4 BULK
0.047	A01	4.0	9.0	13.0	12	MMK10 473K100A01L4 BULK
0.056	A01	4.0	9.0	13.0	12	MMK10 563K100A01L4 BULK
0.068	A01	4.0	9.0	13.0	12	MMK10 683K100A01L4 BULK
0.082	A01	4.0	9.0	13.0	12	MMK10 823K100A01L4 BULK
0.10	A01	4.0	9.0	13.0	12	MMK10 104K100A01L4 BULK
0.12	A01	4.0	9.0	13.0	12	MMK10 124K100A01L4 BULK
0.15	A01	4.0	9.0	13.0	12	MMK10 154K100A01L4 BULK
0.18	A01	4.0	9.0	13.0	12	MMK10 184K100A01L4 BULK
0.22	A01	4.0	9.0	13.0	12	MMK10 224K100A01L4 BULK
0.27	A01	4.0	9.0	13.0	12	MMK10 274K100A01L4 BULK
0.33	A01	4.0	9.0	13.0	12	MMK10 334K100A01L4 BULK
0.39	A01	4.0	9.0	13.0	12	MMK10 394K100A01L4 BULK
0.47	A01	4.0	9.0	13.0	12	MMK10 474K100A01L4 BULK
0.56	A02	4.5	10.5	13.0	12	MMK10 564K100A02L4 BULK
0.68	A02	4.5	10.5	13.0	12	MMK10 684K100A02L4 BULK
0.82	A02	4.5	10.5	13.0	12	MMK10 824K100A02L4 BULK
1.0	A04	6.0	12.0	13.0	12	MMK10 105K100A04L4 BULK
100 VDC/63 VAC						
LEAD SPACING 15 MM						
0.27	B04	5.5	10.5	18.0	8	MMK15 274K100B04L4 BULK
0.33	B04	5.5	10.5	18.0	8	MMK15 334K100B04L4 BULK
0.39	B04	5.5	10.5	18.0	8	MMK15 394K100B04L4 BULK
0.47	B04	5.5	10.5	18.0	8	MMK15 474K100B04L4 BULK
0.56	B04	5.5	10.5	18.0	8	MMK15 564K100B04L4 BULK
0.68	B04	5.5	10.5	18.0	8	MMK15 684K100B04L4 BULK
0.82	B04	5.5	10.5	18.0	8	MMK15 824K100B04L4 BULK
1.0	B04	5.5	10.5	18.0	8	MMK15 105K100B04L4 BULK
1.2	B05	5.5	12.5	18.0	8	MMK15 125K100B05L4 BULK
1.5	B10	6.5	12.5	18.0	8	MMK15 155K100B10L4 BULK
1.8	B06	7.5	14.5	18.0	8	MMK15 185K100B06L4 BULK
2.2	B06	7.5	14.5	18.0	8	MMK15 225K100B06L4 BULK
2.7	B12	8.0	15.0	18.0	8	MMK15 275K100B12L4 BULK
3.3	B11	8.5	16.0	18.0	8	MMK15 335K100B11L4 BULK
3.9	B14	9.5	17.5	18.0	8	MMK15 395K100B14L4 BULK
LEAD SPACING 22.5 MM						
1.2	D13	6.5	14.5	26.0	5	MMK22.5 125K100D13L4 TRAY
1.5	D13	6.5	14.5	26.0	5	MMK22.5 155K100D13L4 TRAY
1.8	D13	6.5	14.5	26.0	5	MMK22.5 185K100D13L4 TRAY
2.0	D13	6.5	14.5	26.0	5	MMK22.5 205K100D13L4 TRAY
2.2	D13	6.5	14.5	26.0	5	MMK22.5 225K100D13L4 TRAY
2.7	D13	6.5	14.5	26.0	5	MMK22.5 275K100D13L4 TRAY
3.3	D17	7.0	16.5	26.0	5	MMK22.5 335K100D17L4 TRAY
3.9	D14	8.0	16.0	26.0	5	MMK22.5 395K100D14L4 TRAY
4.7	D15	9.0	18.5	26.0	5	MMK22.5 475K100D15L4 TRAY
5.6	D15	9.0	18.5	26.0	5	MMK22.5 565K100D15L4 TRAY
6.8	D18	10.5	19.0	26.0	5	MMK22.5 685K100D18L4 TRAY
8.2	D16	11.0	21.5	26.0	5	MMK22.5 825K100D16L4 TRAY
10.0	D20	13.5	23.0	26.0	5	MMK22.5 106K100D20L4 TRAY
12.0	D19	15.5	24.5	26.0	5	MMK22.5 126K100D19L4 TRAY
15.0	D19	15.5	24.5	26.0	5	MMK22.5 156K100D19L4 TRAY
LEAD SPACING 27.5 MM						
3.9	F11	10.5	20.5	31.5	3	MMK27.5 395K100F11L4 TRAY
4.7	F11	10.5	20.5	31.5	3	MMK27.5 475K100F11L4 TRAY
5.6	F11	10.5	20.5	31.5	3	MMK27.5 565K100F11L4 TRAY
6.8	F11	10.5	20.5	31.5	3	MMK27.5 685K100F11L4 TRAY
8.2	F11	10.5	20.5	31.5	3	MMK27.5 825K100F11L4 TRAY
10	F12	11.5	22.5	31.5	3	MMK27.5 106K100F12L4 TRAY
10	F17	21.0	12.5	31.5	3	MMK27.5 106K100F17L4 TRAY
12	F12	11.5	22.5	31.5	3	MMK27.5 126K100F12L4 TRAY
15	F13	14.5	24.5	31.5	3	MMK27.5 156K100F13L4 TRAY
18	F14	17.5	28.0	31.5	3	MMK27.5 186K100F14L4 TRAY
22	F14	17.5	28.0	31.5	3	MMK27.5 226K100F14L4 TRAY
22	F19	27.5	16.0	31.5	3	MMK27.5 226K100F19L4 TRAY
27	F15	19.0	29.0	31.5	3	MMK27.5 276K100F15L4 TRAY
27	F18	31.0	19.0	31.5	3	MMK27.5 276K100F18L4 TRAY
33	F16	21.0	30.0	31.5	3	MMK27.5 336K100F16L4 TRAY

ARTICLE TABLE

100 VDC/63 VAC

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
12	R05	13.0	24.0	41.0	2	MMK37.5 126K100R05L4 TRAY
15	R05	13.0	24.0	41.0	2	MMK37.5 156K100R05L4 TRAY
18	R05	13.0	24.0	41.0	2	MMK37.5 186K100R05L4 TRAY
22	R04	15.0	26.0	41.0	2	MMK37.5 226K100R04L4 TRAY
27	R04	15.0	26.0	41.0	2	MMK37.5 276K100R04L4 TRAY
33	R02	16.5	32.0	41.0	2	MMK37.5 336K100R02L4 TRAY
39	R03	19.0	36.0	41.0	2	MMK37.5 396K100R03L4 TRAY
47	R03	19.0	36.0	41.0	2	MMK37.5 476K100R03L4 TRAY
56	R06	21.0	38.0	41.0	2	MMK37.5 566K100R06L4 TRAY
68	R08	28.0	43.0	41.0	2	MMK37.5 686K100R08L4 TRAY
82	R08	28.0	43.0	41.0	2	MMK37.5 826K100R08L4 TRAY

250 VDC/160 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	MMK5 102K250J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	MMK5 122K250J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	MMK5 152K250J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	MMK5 182K250J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	MMK5 222K250J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	MMK5 272K250J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	MMK5 332K250J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	MMK5 392K250J01L4 BULK
0.0047	J01	2.5	6.5	7.2	40	MMK5 472K250J01L4 BULK
0.0056	J01	2.5	6.5	7.2	40	MMK5 562K250J01L4 BULK
0.0068	J01	2.5	6.5	7.2	40	MMK5 682K250J01L4 BULK
0.0082	J01	2.5	6.5	7.2	40	MMK5 822K250J01L4 BULK
0.010	J01	2.5	6.5	7.2	40	MMK5 103K250J01L4 BULK
0.012	J01	2.5	6.5	7.2	40	MMK5 123K250J01L4 BULK
0.015	J01	2.5	6.5	7.2	40	MMK5 153K250J01L4 BULK
0.018	J01	2.5	6.5	7.2	40	MMK5 183K250J01L4 BULK
0.022	J01	2.5	6.5	7.2	40	MMK5 223K250J01L4 BULK
0.027	J02	3.5	8.0	7.2	40	MMK5 273K250J02L4 BULK
0.033	J02	3.5	8.0	7.2	40	MMK5 333K250J02L4 BULK
0.039	J02	3.5	8.0	7.2	40	MMK5 393K250J02L4 BULK
0.047	J02	3.5	8.0	7.2	40	MMK5 473K250J02L4 BULK
0.056	J02	3.5	8.0	7.2	40	MMK5 563K250J02L4 BULK
0.068	J02	3.5	8.0	7.2	40	MMK5 683K250J02L4 BULK
0.082	J03	4.5	9.0	7.2	40	MMK5 823K250J03L4 BULK
0.10	J03	4.5	9.0	7.2	40	MMK5 104K250J03L4 BULK
0.12	J04	5.0	10.0	7.2	40	MMK5 124K250J04L4 BULK
0.15	J04	5.0	10.0	7.2	40	MMK5 154K250J04L4 BULK
0.18	J05	6.0	11.0	7.2	40	MMK5 184K250J05L4 BULK
0.22	J05	6.0	11.0	7.2	40	MMK5 224K250J05L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	30	MMK7.5 102K250K00L4 BULK
0.0012	K00	2.5	6.0	10.0	30	MMK7.5 122K250K00L4 BULK
0.0015	K00	2.5	6.0	10.0	30	MMK7.5 152K250K00L4 BULK
0.0018	K00	2.5	6.0	10.0	30	MMK7.5 182K250K00L4 BULK
0.0022	K00	2.5	6.0	10.0	30	MMK7.5 222K250K00L4 BULK
0.0027	K00	2.5	6.0	10.0	30	MMK7.5 272K250K00L4 BULK
0.0033	K00	2.5	6.0	10.0	30	MMK7.5 332K250K00L4 BULK
0.0039	K00	2.5	6.0	10.0	30	MMK7.5 392K250K00L4 BULK
0.0047	K00	2.5	6.0	10.0	30	MMK7.5 472K250K00L4 BULK
0.0056	K00	2.5	6.0	10.0	30	MMK7.5 562K250K00L4 BULK
0.0068	K00	2.5	6.0	10.0	30	MMK7.5 682K250K00L4 BULK
0.0082	K00	2.5	6.0	10.0	30	MMK7.5 822K250K00L4 BULK
0.010	K00	2.5	6.0	10.0	30	MMK7.5 103K250K00L4 BULK
0.012	K00	2.5	6.0	10.0	30	MMK7.5 123K250K00L4 BULK

250 VDC/160 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.015	K00	2.5	6.0	10.0	30	MMK7.5 153K250K00L4 BULK
0.018	K00	2.5	6.0	10.0	30	MMK7.5 183K250K00L4 BULK
0.022	K00	2.5	6.0	10.0	30	MMK7.5 223K250K00L4 BULK
0.027	K00	2.5	6.0	10.0	30	MMK7.5 273K250K00L4 BULK
0.033	K00	2.5	6.0	10.0	30	MMK7.5 333K250K00L4 BULK
0.039	K01	4.0	8.0	10.0	30	MMK7.5 393K250K01L4 BULK
0.047	K01	4.0	8.0	10.0	30	MMK7.5 473K250K01L4 BULK
0.056	K01	4.0	8.0	10.0	30	MMK7.5 563K250K01L4 BULK
0.068	K01	4.0	8.0	10.0	30	MMK7.5 683K250K01L4 BULK
0.082	K01	4.0	8.0	10.0	30	MMK7.5 823K250K01L4 BULK
0.10	K01	4.0	8.0	10.0	30	MMK7.5 104K250K01L4 BULK
0.12	K03	5.0	11.0	10.0	30	MMK7.5 124K250K03L4 BULK
0.15	K03	5.0	11.0	10.0	30	MMK7.5 154K250K03L4 BULK
0.18	K03	5.0	11.0	10.0	30	MMK7.5 184K250K03L4 BULK
0.22	K03	5.0	11.0	10.0	30	MMK7.5 224K250K03L4 BULK
0.27	K04	6.0	12.0	10.5	30	MMK7.5 274K250K04L4 BULK
0.33	K04	6.0	12.0	10.5	30	MMK7.5 334K250K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	20	MMK10 102K250A01L4 BULK
0.0012	A01	4.0	9.0	13.0	20	MMK10 122K250A01L4 BULK
0.0015	A01	4.0	9.0	13.0	20	MMK10 152K250A01L4 BULK
0.0018	A01	4.0	9.0	13.0	20	MMK10 182K250A01L4 BULK
0.0022	A01	4.0	9.0	13.0	20	MMK10 222K250A01L4 BULK
0.0027	A01	4.0	9.0	13.0	20	MMK10 272K250A01L4 BULK
0.0033	A01	4.0	9.0	13.0	20	MMK10 332K250A01L4 BULK
0.0039	A01	4.0	9.0	13.0	20	MMK10 392K250A01L4 BULK
0.0047	A01	4.0	9.0	13.0	20	MMK10 472K250A01L4 BULK
0.0056	A01	4.0	9.0	13.0	20	MMK10 562K250A01L4 BULK
0.0068	A01	4.0	9.0	13.0	20	MMK10 682K250A01L4 BULK
0.0082	A01	4.0	9.0	13.0	20	MMK10 822K250A01L4 BULK
0.010	A01	4.0	9.0	13.0	20	MMK10 103K250A01L4 BULK
0.012	A01	4.0	9.0	13.0	20	MMK10 123K250A01L4 BULK
0.015	A01	4.0	9.0	13.0	20	MMK10 153K250A01L4 BULK
0.018	A01	4.0	9.0	13.0	20	MMK10 183K250A01L4 BULK
0.022	A01	4.0	9.0	13.0	20	MMK10 223K250A01L4 BULK
0.027	A01	4.0	9.0	13.0	20	MMK10 273K250A01L4 BULK
0.033	A01	4.0	9.0	13.0	20	MMK10 333K250A01L4 BULK
0.039	A01	4.0	9.0	13.0	20	MMK10 393K250A01L4 BULK
0.047	A01	4.0	9.0	13.0	20	MMK10 473K250A01L4 BULK
0.056	A01	4.0	9.0	13.0	20	MMK10 563K250A01L4 BULK
0.068	A01	4.0	9.0	13.0	20	MMK10 683K250A01L4 BULK
0.082	A01	4.0	9.0	13.0	20	MMK10 823K250A01L4 BULK
0.10	A01	4.0	9.0	13.0	20	MMK10 104K250A01L4 BULK
0.12	A01	4.0	9.0	13.0	20	MMK10 124K250A01L4 BULK
0.15	A01	4.0	9.0	13.0	20	MMK10 154K250A01L4 BULK
0.18	A01	4.0	9.0	13.0	20	MMK10 184K250A01L4 BULK
0.22	A02	4.5	10.5	13.0	20	MMK10 224K250A02L4 BULK
0.27	A03	5.0	11.0	13.0	20	MMK10 274K250A03L4 BULK
0.33	A04	6.0	12.0	13.0	20	MMK10 334K250A04L4 BULK
0.39	A04	6.0	12.0	13.0	20	MMK10 394K250A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.082	B04	5.5	10.5	18.0	12	MMK15 823K250B04L4 BULK
0.10	B04	5.5	10.5	18.0	12	MMK15 104K250B04L4 BULK
0.12	B04	5.5	10.5	18.0	12	MMK15 124K250B04L4 BULK
0.15	B04	5.5	10.5	18.0	12	MMK15 154K250B04L4 BULK
0.18	B04	5.5	10.5	18.0	12	MMK15 184K250B04L4 BULK
0.22	B04	5.5	10.5	18.0	12	MMK15 224K250B04L4 BULK
0.27	B04	5.5	10.5	18.0	12	MMK15 274K250B04L4 BULK

ARTICLE TABLE

250 VDC/160 VA

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.33	B04	5.5	10.5	18.0	12	MMK15 334K250B04L4 BULK
0.39	B04	5.5	10.5	18.0	12	MMK15 394K250B04L4 BULK
0.47	B05	5.5	12.5	18.0	12	MMK15 474K250B05L4 BULK
0.56	B10	6.5	12.5	18.0	12	MMK15 564K250B10L4 BULK
0.68	B10	6.5	12.5	18.0	12	MMK15 684K250B10L4 BULK
0.82	B06	7.5	14.5	18.0	12	MMK15 824K250B06L4 BULK
1.0	B06	7.5	14.5	18.0	12	MMK15 105K250B06L4 BULK
1.2	B12	8.0	15.0	18.0	12	MMK15 125K250B12L4 BULK
1.5	B14	9.5	17.5	18.0	12	MMK15 155K250B14L4 BULK
1.8	B14	9.5	17.5	18.0	12	MMK15 185K250B14L4 BULK

LEAD SPACING 22.5 MM

0.47	D13	6.5	14.5	26.0	8	MMK22.5 474K250D13L4 TRAY
0.56	D13	6.5	14.5	26.0	8	MMK22.5 564K250D13L4 TRAY
0.68	D13	6.5	14.5	26.0	8	MMK22.5 684K250D13L4 TRAY
0.82	D13	6.5	14.5	26.0	8	MMK22.5 824K250D13L4 TRAY
1.0	D13	6.5	14.5	26.0	8	MMK22.5 105K250D13L4 TRAY
1.2	D17	7.0	16.5	26.0	8	MMK22.5 125K250D17L4 TRAY
1.5	D14	8.0	16.0	26.0	8	MMK22.5 155K250D14L4 TRAY
1.8	D15	9.0	18.5	26.0	8	MMK22.5 185K250D15L4 TRAY
2.0	D15	9.0	18.5	26.0	8	MMK22.5 205K250D15L4 TRAY
2.2	D15	9.0	18.5	26.0	8	MMK22.5 225K250D15L4 TRAY
2.7	D18	10.5	19.0	26.0	8	MMK22.5 275K250D18L4 TRAY
3.3	D16	11.0	21.5	26.0	8	MMK22.5 335K250D16L4 TRAY
3.9	D20	13.5	23.0	26.0	8	MMK22.5 395K250D20L4 TRAY
4.7	D19	15.5	24.5	26.0	8	MMK22.5 475K250D19L4 TRAY
5.6	D19	15.5	24.5	26.0	8	MMK22.5 565K250D19L4 TRAY

LEAD SPACING 27.5 MM

1.5	F11	10.5	20.5	31.5	5	MMK27.5 155K250F11L4 TRAY
1.8	F11	10.5	20.5	31.5	5	MMK27.5 185K250F11L4 TRAY
2.0	F11	10.5	20.5	31.5	5	MMK27.5 205K250F11L4 TRAY
2.2	F11	10.5	20.5	31.5	5	MMK27.5 225K250F11L4 TRAY
2.5	F11	10.5	20.5	31.5	5	MMK27.5 255K250F11L4 TRAY
2.7	F11	10.5	20.5	31.5	5	MMK27.5 275K250F11L4 TRAY
3.3	F11	10.5	20.5	31.5	5	MMK27.5 335K250F11L4 TRAY
3.3	F17	21.0	12.5	31.5	5	MMK27.5 335K250F17L4 TRAY
3.9	F12	11.5	22.5	31.5	5	MMK27.5 395K250F12L4 TRAY
4.7	F03	13.5	23.0	31.5	5	MMK27.5 475K250F03L4 TRAY
5.6	F13	14.5	24.5	31.5	5	MMK27.5 565K250F13L4 TRAY
6.8	F14	17.5	28.0	31.5	5	MMK27.5 685K250F14L4 TRAY
8.2	F15	19.0	29.0	31.5	5	MMK27.5 825K250F15L4 TRAY
8.2	F19	27.5	16.0	31.5	5	MMK27.5 825K250F19L4 TRAY
10	F16	21.0	30.0	31.5	5	MMK27.5 106K250F16L4 TRAY
10	F18	31.0	19.0	31.5	5	MMK27.5 106K250F18L4 TRAY

LEAD SPACING 37.5 MM

4.7	R05	13.0	24.0	41.0	3	MMK37.5 475K250R05L4 TRAY
5.6	R05	13.0	24.0	41.0	3	MMK37.5 565K250R05L4 TRAY
6.8	R05	13.0	24.0	41.0	3	MMK37.5 685K250R05L4 TRAY
8.2	R04	15.0	26.0	41.0	3	MMK37.5 825K250R04L4 TRAY
10	R04	15.0	26.0	41.0	3	MMK37.5 106K250R04L4 TRAY
12	R02	16.5	32.0	41.0	3	MMK37.5 126K250R02L4 TRAY
15	R02	16.5	32.0	41.0	3	MMK37.5 156K250R02L4 TRAY
18	R03	19.0	36.0	41.0	3	MMK37.5 186K250R03L4 TRAY
22	R06	21.0	38.0	41.0	3	MMK37.5 226K250R06L4 TRAY
27	R08	28.0	43.0	41.0	3	MMK37.5 276K250R08L4 TRAY
33	R08	28.0	43.0	41.0	3	MMK37.5 336K250R08L4 TRAY
39	R08	28.0	43.0	41.0	3	MMK37.5 396K250R08L4 TRAY

400 VDC/200 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	50	MMK5 102K400J01L4 BULK
0.0012	J01	2.5	6.5	7.2	50	MMK5 122K400J01L4 BULK
0.0015	J01	2.5	6.5	7.2	50	MMK5 152K400J01L4 BULK
0.0018	J01	2.5	6.5	7.2	50	MMK5 182K400J01L4 BULK
0.0022	J01	2.5	6.5	7.2	50	MMK5 222K400J01L4 BULK
0.0027	J01	2.5	6.5	7.2	50	MMK5 272K400J01L4 BULK
0.0033	J01	2.5	6.5	7.2	50	MMK5 332K400J01L4 BULK
0.0039	J01	2.5	6.5	7.2	50	MMK5 392K400J01L4 BULK
0.0047	J01	2.5	6.5	7.2	50	MMK5 472K400J01L4 BULK
0.0056	J01	2.5	6.5	7.2	50	MMK5 562K400J01L4 BULK
0.0068	J01	2.5	6.5	7.2	50	MMK5 682K400J01L4 BULK
0.0082	J01	2.5	6.5	7.2	50	MMK5 822K400J01L4 BULK
0.010	J01	2.5	6.5	7.2	50	MMK5 103K400J01L4 BULK
0.012	J01	2.5	6.5	7.2	50	MMK5 123K400J01L4 BULK
0.015	J01	2.5	6.5	7.2	50	MMK5 153K400J01L4 BULK
0.018	J02	3.5	8.0	7.2	50	MMK5 183K400J02L4 BULK
0.022	J02	3.5	8.0	7.2	50	MMK5 223K400J02L4 BULK
0.027	J03	4.5	9.0	7.2	50	MMK5 273K400J03L4 BULK
0.033	J03	4.5	9.0	7.2	50	MMK5 333K400J03L4 BULK
0.039	J03	4.5	9.0	7.2	50	MMK5 393K400J03L4 BULK
0.047	J03	4.5	9.0	7.2	50	MMK5 473K400J03L4 BULK
0.056	J05	6.0	11.0	7.2	50	MMK5 563K400J05L4 BULK
0.068	J05	6.0	11.0	7.2	50	MMK5 683K400J05L4 BULK
0.082	J06	7.2	13.0	7.2	50	MMK5 823K400J06L4 BULK
0.10	J06	7.2	13.0	7.2	50	MMK5 104K400J06L4 BULK
0.12	J06	7.2	13.0	7.2	50	MMK5 124K400J06L4 BULK

LEAD SPACING 7.5 MM

0.0010	K00	2.5	6.0	10.0	40	MMK7.5 102K400K00L4 BULK
0.0012	K00	2.5	6.0	10.0	40	MMK7.5 122K400K00L4 BULK
0.0015	K00	2.5	6.0	10.0	40	MMK7.5 152K400K00L4 BULK
0.0018	K00	2.5	6.0	10.0	40	MMK7.5 182K400K00L4 BULK
0.0022	K00	2.5	6.0	10.0	40	MMK7.5 222K400K00L4 BULK
0.0027	K00	2.5	6.0	10.0	40	MMK7.5 272K400K00L4 BULK
0.0033	K00	2.5	6.0	10.0	40	MMK7.5 332K400K00L4 BULK
0.0039	K00	2.5	6.0	10.0	40	MMK7.5 392K400K00L4 BULK
0.0047	K00	2.5	6.0	10.0	40	MMK7.5 472K400K00L4 BULK
0.0056	K00	2.5	6.0	10.0	40	MMK7.5 562K400K00L4 BULK
0.0068	K00	2.5	6.0	10.0	40	MMK7.5 682K400K00L4 BULK
0.0082	K00	2.5	6.0	10.0	40	MMK7.5 822K400K00L4 BULK
0.010	K00	2.5	6.0	10.0	40	MMK7.5 103K400K00L4 BULK
0.012	K00	2.5	6.0	10.0	40	MMK7.5 123K400K00L4 BULK
0.015	K00	2.5	6.0	10.0	40	MMK7.5 153K400K00L4 BULK
0.018	K01	4.0	8.0	10.0	40	MMK7.5 183K400K01L4 BULK
0.022	K01	4.0	8.0	10.0	40	MMK7.5 223K400K01L4 BULK
0.027	K01	4.0	8.0	10.0	40	MMK7.5 273K400K01L4 BULK
0.033	K01	4.0	8.0	10.0	40	MMK7.5 333K400K01L4 BULK
0.039	K01	4.0	8.0	10.0	40	MMK7.5 393K400K01L4 BULK
0.047	K03	5.0	11.0	10.0	40	MMK7.5 473K400K03L4 BULK
0.056	K03	5.0	11.0	10.0	40	MMK7.5 563K400K03L4 BULK
0.068	K03	5.0	11.0	10.0	40	MMK7.5 683K400K03L4 BULK
0.082	K03	5.0	11.0	10.0	40	MMK7.5 823K400K03L4 BULK
0.10	K03	5.0	11.0	10.0	40	MMK7.5 104K400K03L4 BULK
0.12	K04	6.0	12.0	10.5	40	MMK7.5 124K400K04L4 BULK
0.15	K04	6.0	12.0	10.5	40	MMK7.5 154K400K04L4 BULK

LEAD SPACING 10 MM

0.0010	A01	4.0	9.0	13.0	30	MMK10 102K400A01L4 BULK
0.0012	A01	4.0	9.0	13.0	30	MMK10 122K400A01L4 BULK
0.0015	A01	4.0	9.0	13.0	30	MMK10 152K400A01L4 BULK

ARTICLE TABLE

400 VDC/200 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0018	A01	4.0	9.0	13.0	30	MMK10 182K400A01L4 BULK
0.0022	A01	4.0	9.0	13.0	30	MMK10 222K400A01L4 BULK
0.0027	A01	4.0	9.0	13.0	30	MMK10 272K400A01L4 BULK
0.0033	A01	4.0	9.0	13.0	30	MMK10 332K400A01L4 BULK
0.0039	A01	4.0	9.0	13.0	30	MMK10 392K400A01L4 BULK
0.0047	A01	4.0	9.0	13.0	30	MMK10 472K400A01L4 BULK
0.0056	A01	4.0	9.0	13.0	30	MMK10 562K400A01L4 BULK
0.0068	A01	4.0	9.0	13.0	30	MMK10 682K400A01L4 BULK
0.0078	A01	4.0	9.0	13.0	30	MMK10 782K400A01L4 BULK
0.0082	A01	4.0	9.0	13.0	30	MMK10 822K400A01L4 BULK
0.010	A01	4.0	9.0	13.0	30	MMK10 103K400A01L4 BULK
0.012	A01	4.0	9.0	13.0	30	MMK10 123K400A01L4 BULK
0.015	A01	4.0	9.0	13.0	30	MMK10 153K400A01L4 BULK
0.018	A01	4.0	9.0	13.0	30	MMK10 183K400A01L4 BULK
0.022	A01	4.0	9.0	13.0	30	MMK10 223K400A01L4 BULK
0.027	A01	4.0	9.0	13.0	30	MMK10 273K400A01L4 BULK
0.033	A01	4.0	9.0	13.0	30	MMK10 333K400A01L4 BULK
0.039	A01	4.0	9.0	13.0	30	MMK10 393K400A01L4 BULK
0.047	A01	4.0	9.0	13.0	30	MMK10 473K400A01L4 BULK
0.056	A01	4.0	9.0	13.0	30	MMK10 563K400A01L4 BULK
0.068	A01	4.0	9.0	13.0	30	MMK10 683K400A01L4 BULK
0.082	A02	4.5	10.5	13.0	30	MMK10 823K400A02L4 BULK
0.10	A03	5.0	11.0	13.0	30	MMK10 104K400A03L4 BULK
0.12	A03	5.0	11.0	13.0	30	MMK10 124K400A03L4 BULK
0.15	A04	6.0	12.0	13.0	30	MMK10 154K400A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.047	B04	5.5	10.5	18.0	20	MMK15 473K400B04L4 BULK
0.056	B04	5.5	10.5	18.0	20	MMK15 563K400B04L4 BULK
0.068	B04	5.5	10.5	18.0	20	MMK15 683K400B04L4 BULK
0.082	B04	5.5	10.5	18.0	20	MMK15 823K400B04L4 BULK
0.10	B04	5.5	10.5	18.0	20	MMK15 104K400B04L4 BULK
0.12	B04	5.5	10.5	18.0	20	MMK15 124K400B04L4 BULK
0.15	B04	5.5	10.5	18.0	20	MMK15 154K400B04L4 BULK
0.18	B05	5.5	12.5	18.0	20	MMK15 184K400B05L4 BULK
0.22	B05	5.5	12.5	18.0	20	MMK15 224K400B05L4 BULK
0.27	B10	6.5	12.5	18.0	20	MMK15 274K400B10L4 BULK
0.33	B06	7.5	14.5	18.0	20	MMK15 334K400B06L4 BULK
0.39	B06	7.5	14.5	18.0	20	MMK15 394K400B06L4 BULK
0.47	B11	8.5	16.0	18.0	20	MMK15 474K400B11L4 BULK
0.56	B11	8.5	16.0	18.0	20	MMK15 564K400B11L4 BULK
0.68	B14	9.5	17.5	18.0	20	MMK15 684K400B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.18	D13	6.5	14.5	26.0	10	MMK22.5 184K400D13L4 TRAY
0.22	D13	6.5	14.5	26.0	10	MMK22.5 224K400D13L4 TRAY
0.27	D13	6.5	14.5	26.0	10	MMK22.5 274K400D13L4 TRAY
0.33	D13	6.5	14.5	26.0	10	MMK22.5 334K400D13L4 TRAY
0.39	D13	6.5	14.5	26.0	10	MMK22.5 394K400D13L4 TRAY
0.47	D13	6.5	14.5	26.0	10	MMK22.5 474K400D13L4 TRAY
0.56	D17	7.0	16.5	26.0	10	MMK22.5 564K400D17L4 TRAY
0.68	D14	8.0	16.0	26.0	10	MMK22.5 684K400D14L4 TRAY
0.82	D15	9.0	18.5	26.0	10	MMK22.5 824K400D15L4 TRAY
1.0	D15	9.0	18.5	26.0	10	MMK22.5 105K400D15L4 TRAY
1.2	D18	10.5	19.0	26.0	10	MMK22.5 125K400D18L4 TRAY
1.5	D16	11.0	21.5	26.0	10	MMK22.5 155K400D16L4 TRAY
1.8	D20	13.5	23.0	26.0	10	MMK22.5 185K400D20L4 TRAY
2.2	D19	15.5	24.5	26.0	10	MMK22.5 225K400D19L4 TRAY
2.7	D19	15.5	24.5	26.0	10	MMK22.5 275K400D19L4 TRAY

400 VDC/200 VAC

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.68	F11	10.5	20.5	31.5	8	MMK27.5 684K400F11L4 TRAY
0.82	F11	10.5	20.5	31.5	8	MMK27.5 824K400F11L4 TRAY
1.0	F11	10.5	20.5	31.5	8	MMK27.5 105K400F11L4 TRAY
1.2	F11	10.5	20.5	31.5	8	MMK27.5 125K400F11L4 TRAY
1.5	F11	10.5	20.5	31.5	8	MMK27.5 155K400F11L4 TRAY
1.8	F11	10.5	20.5	31.5	8	MMK27.5 185K400F11L4 TRAY
1.8	F17	21.0	12.5	31.5	8	MMK27.5 185K400F17L4 TRAY
2.2	F12	11.5	22.5	31.5	8	MMK27.5 225K400F12L4 TRAY
2.7	F03	13.5	23.0	31.5	8	MMK27.5 275K400F03L4 TRAY
3.3	F14	17.5	28.0	31.5	8	MMK27.5 335K400F14L4 TRAY
3.9	F14	17.5	28.0	31.5	8	MMK27.5 395K400F14L4 TRAY
3.9	F19	27.5	16.0	31.5	8	MMK27.5 395K400F19L4 TRAY
4.7	F15	19.0	29.0	31.5	8	MMK27.5 475K400F15L4 TRAY
5.6	F16	21.0	30.0	31.5	8	MMK27.5 565K400F16L4 TRAY
5.6	F18	31.0	19.0	31.5	8	MMK27.5 565K400F18L4 TRAY

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.8	R05	13.0	24.0	41.0	5	MMK37.5 185K400R05L4 TRAY
2.2	R05	13.0	24.0	41.0	5	MMK37.5 225K400R05L4 TRAY
2.7	R05	13.0	24.0	41.0	5	MMK37.5 275K400R05L4 TRAY
3.3	R05	13.0	24.0	41.0	5	MMK37.5 335K400R05L4 TRAY
3.9	R04	15.0	26.0	41.0	5	MMK37.5 395K400R04L4 TRAY
4.7	R04	15.0	26.0	41.0	5	MMK37.5 475K400R04L4 TRAY
5.6	R02	16.5	32.0	41.0	5	MMK37.5 565K400R02L4 TRAY
6.8	R03	19.0	36.0	41.0	5	MMK37.5 685K400R03L4 TRAY
8.2	R03	19.0	36.0	41.0	5	MMK37.5 825K400R03L4 TRAY
10	R06	21.0	38.0	41.0	5	MMK37.5 106K400R06L4 TRAY
12	R08	28.0	43.0	41.0	5	MMK37.5 126K400R08L4 TRAY
15	R08	28.0	43.0	41.0	5	MMK37.5 156K400R08L4 TRAY
18	R08	28.0	43.0	41.0	5	MMK37.5 186K400R08L4 TRAY

630 VDC/220 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	80	MMK5 102K630J01L4 BULK
0.0012	J01	2.5	6.5	7.2	80	MMK5 122K630J01L4 BULK
0.0015	J01	2.5	6.5	7.2	80	MMK5 152K630J01L4 BULK
0.0018	J01	2.5	6.5	7.2	80	MMK5 182K630J01L4 BULK
0.0022	J01	2.5	6.5	7.2	80	MMK5 222K630J01L4 BULK
0.0027	J01	2.5	6.5	7.2	80	MMK5 272K630J01L4 BULK
0.0033	J01	2.5	6.5	7.2	80	MMK5 332K630J01L4 BULK
0.0039	J01	2.5	6.5	7.2	80	MMK5 392K630J01L4 BULK
0.0047	J02	3.5	8.0	7.2	80	MMK5 472K630J02L4 BULK
0.0056	J02	3.5	8.0	7.2	80	MMK5 562K630J02L4 BULK
0.0068	J02	3.5	8.0	7.2	80	MMK5 682K630J02L4 BULK
0.0082	J02	3.5	8.0	7.2	80	MMK5 822K630J02L4 BULK
0.010	J02	3.5	8.0	7.2	80	MMK5 103K630J02L4 BULK
0.012	J03	4.5	9.0	7.2	80	MMK5 123K630J03L4 BULK
0.015	J03	4.5	9.0	7.2	80	MMK5 153K630J03L4 BULK
0.018	J03	4.5	9.0	7.2	80	MMK5 183K630J03L4 BULK
0.022	J04	5.0	10.0	7.2	80	MMK5 223K630J04L4 BULK
0.027	J05	6.0	11.0	7.2	80	MMK5 273K630J05L4 BULK
0.033	J05	6.0	11.0	7.2	80	MMK5 333K630J05L4 BULK
0.039	J06	7.2	13.0	7.2	80	MMK5 393K630J06L4 BULK
0.047	J06	7.2	13.0	7.2	80	MMK5 473K630J06L4 BULK

ARTICLE TABLE

630 VDC/220 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K00	2.5	6.0	10.0	60	MMK7.5 102K630K00L4 BULK
0.0012	K00	2.5	6.0	10.0	60	MMK7.5 122K630K00L4 BULK
0.0015	K00	2.5	6.0	10.0	60	MMK7.5 152K630K00L4 BULK
0.0018	K00	2.5	6.0	10.0	60	MMK7.5 182K630K00L4 BULK
0.0022	K00	2.5	6.0	10.0	60	MMK7.5 222K630K00L4 BULK
0.0027	K00	2.5	6.0	10.0	60	MMK7.5 272K630K00L4 BULK
0.0033	K00	2.5	6.0	10.0	60	MMK7.5 332K630K00L4 BULK
0.0039	K00	2.5	6.0	10.0	60	MMK7.5 392K630K00L4 BULK
0.0047	K01	4.0	8.0	10.0	60	MMK7.5 472K630K01L4 BULK
0.0056	K01	4.0	8.0	10.0	60	MMK7.5 562K630K01L4 BULK
0.0068	K01	4.0	8.0	10.0	60	MMK7.5 682K630K01L4 BULK
0.0082	K01	4.0	8.0	10.0	60	MMK7.5 822K630K01L4 BULK
0.010	K01	4.0	8.0	10.0	60	MMK7.5 103K630K01L4 BULK
0.012	K01	4.0	8.0	10.0	60	MMK7.5 123K630K01L4 BULK
0.015	K03	5.0	11.0	10.0	60	MMK7.5 153K630K03L4 BULK
0.018	K03	5.0	11.0	10.0	60	MMK7.5 183K630K03L4 BULK
0.022	K03	5.0	11.0	10.0	60	MMK7.5 223K630K03L4 BULK
0.027	K03	5.0	11.0	10.0	60	MMK7.5 273K630K03L4 BULK
0.033	K04	6.0	12.0	10.5	60	MMK7.5 333K630K04L4 BULK
0.039	K04	6.0	12.0	10.5	60	MMK7.5 393K630K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	A01	4.0	9.0	13.0	40	MMK10 102K630A01L4 BULK
0.0012	A01	4.0	9.0	13.0	40	MMK10 122K630A01L4 BULK
0.0015	A01	4.0	9.0	13.0	40	MMK10 152K630A01L4 BULK
0.0018	A01	4.0	9.0	13.0	40	MMK10 182K630A01L4 BULK
0.0022	A01	4.0	9.0	13.0	40	MMK10 222K630A01L4 BULK
0.0027	A01	4.0	9.0	13.0	40	MMK10 272K630A01L4 BULK
0.0033	A01	4.0	9.0	13.0	40	MMK10 332K630A01L4 BULK
0.0039	A01	4.0	9.0	13.0	40	MMK10 392K630A01L4 BULK
0.0047	A01	4.0	9.0	13.0	40	MMK10 472K630A01L4 BULK
0.0056	A01	4.0	9.0	13.0	40	MMK10 562K630A01L4 BULK
0.0068	A01	4.0	9.0	13.0	40	MMK10 682K630A01L4 BULK
0.0078	A01	4.0	9.0	13.0	40	MMK10 782K630A01L4 BULK
0.0082	A01	4.0	9.0	13.0	40	MMK10 822K630A01L4 BULK
0.010	A01	4.0	9.0	13.0	40	MMK10 103K630A01L4 BULK
0.012	A01	4.0	9.0	13.0	40	MMK10 123K630A01L4 BULK
0.015	A01	4.0	9.0	13.0	40	MMK10 153K630A01L4 BULK
0.018	A01	4.0	9.0	13.0	40	MMK10 183K630A01L4 BULK
0.022	A01	4.0	9.0	13.0	40	MMK10 223K630A01L4 BULK
0.027	A02	4.5	10.5	13.0	40	MMK10 273K630A02L4 BULK
0.033	A02	4.5	10.5	13.0	40	MMK10 333K630A02L4 BULK
0.039	A03	5.0	11.0	13.0	40	MMK10 393K630A03L4 BULK
0.047	A04	6.0	12.0	13.0	40	MMK10 473K630A04L4 BULK
0.056	A04	6.0	12.0	13.0	40	MMK10 563K630A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.027	B04	5.5	10.5	18.0	25	MMK15 273K630B04L4 BULK
0.033	B04	5.5	10.5	18.0	25	MMK15 333K630B04L4 BULK
0.039	B04	5.5	10.5	18.0	25	MMK15 393K630B04L4 BULK
0.047	B04	5.5	10.5	18.0	25	MMK15 473K630B04L4 BULK
0.056	B04	5.5	10.5	18.0	25	MMK15 563K630B04L4 BULK
0.068	B05	5.5	12.5	18.0	25	MMK15 683K630B05L4 BULK
0.082	B10	6.5	12.5	18.0	25	MMK15 823K630B10L4 BULK
0.10	B10	6.5	12.5	18.0	25	MMK15 104K630B10L4 BULK
0.12	B06	7.5	14.5	18.0	25	MMK15 124K630B06L4 BULK

630 VDC/220 VAC

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.15	B06	7.5	14.5	18.0	25	MMK15 154K630B06L4 BULK
0.18	B12	8.0	15.0	18.0	25	MMK15 184K630B12L4 BULK
0.22	B14	9.5	17.5	18.0	25	MMK15 224K630B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.082	D13	6.5	14.5	26.0	12	MMK22.5 823K630D13L4 TRAY
0.10	D13	6.5	14.5	26.0	12	MMK22.5 104K630D13L4 TRAY
0.12	D13	6.5	14.5	26.0	12	MMK22.5 124K630D13L4 TRAY
0.15	D13	6.5	14.5	26.0	12	MMK22.5 154K630D13L4 TRAY
0.18	D17	7.0	16.5	26.0	12	MMK22.5 184K630D17L4 TRAY
0.22	D17	7.0	16.5	26.0	12	MMK22.5 224K630D17L4 TRAY
0.27	D14	8.0	16.0	26.0	12	MMK22.5 274K630D14L4 TRAY
0.33	D15	9.0	18.5	26.0	12	MMK22.5 334K630D15L4 TRAY
0.39	D18	10.5	19.0	26.0	12	MMK22.5 394K630D18L4 TRAY
0.47	D16	11.0	21.5	26.0	12	MMK22.5 474K630D16L4 TRAY
0.56	D20	13.5	23.0	26.0	12	MMK22.5 564K630D20L4 TRAY
0.68	D20	13.5	23.0	26.0	12	MMK22.5 684K630D20L4 TRAY
0.82	D19	15.5	24.5	26.0	12	MMK22.5 824K630D19L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.33	F11	10.5	20.5	31.5	10	MMK27.5 334K630F11L4 TRAY
0.39	F11	10.5	20.5	31.5	10	MMK27.5 394K630F11L4 TRAY
0.47	F11	10.5	20.5	31.5	10	MMK27.5 474K630F11L4 TRAY
0.56	F11	10.5	20.5	31.5	10	MMK27.5 564K630F11L4 TRAY
0.56	F17	21.0	12.5	31.5	10	MMK27.5 564K630F17L4 TRAY
0.68	F12	11.5	22.5	31.5	10	MMK27.5 684K630F12L4 TRAY
0.82	F03	13.5	23.0	31.5	10	MMK27.5 824K630F03L4 TRAY
1.0	F13	14.5	24.5	31.5	10	MMK27.5 105K630F13L4 TRAY
1.2	F14	17.5	28.0	31.5	10	MMK27.5 125K630F14L4 TRAY
1.5	F14	17.5	28.0	31.5	10	MMK27.5 155K630F14L4 TRAY
1.5	F19	27.5	16.0	31.5	10	MMK27.5 155K630F19L4 TRAY
1.8	F15	19.0	29.0	31.5	10	MMK27.5 185K630F15L4 TRAY
2.2	F16	21.0	30.0	31.5	10	MMK27.5 225K630F16L4 TRAY
2.2	F18	31.0	19.0	31.5	10	MMK27.5 225K630F18L4 TRAY

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.82	R05	13.0	24.0	41.0	8	MMK37.5 824K630R05L4 TRAY
1.0	R05	13.0	24.0	41.0	8	MMK37.5 105K630R05L4 TRAY
1.2	R05	13.0	24.0	41.0	8	MMK37.5 125K630R05L4 TRAY
1.5	R04	15.0	26.0	41.0	8	MMK37.5 155K630R04L4 TRAY
1.8	R04	15.0	26.0	41.0	8	MMK37.5 185K630R04L4 TRAY
2.2	R02	16.5	32.0	41.0	8	MMK37.5 225K630R02L4 TRAY
2.7	R03	19.0	36.0	41.0	8	MMK37.5 275K630R03L4 TRAY
3.3	R03	19.0	36.0	41.0	8	MMK37.5 335K630R03L4 TRAY
3.9	R06	21.0	38.0	41.0	8	MMK37.5 395K630R06L4 TRAY
4.7	R06	21.0	38.0	41.0	8	MMK37.5 475K630R06L4 TRAY
5.6	R08	28.0	43.0	41.0	8	MMK37.5 565K630R08L4 TRAY
6.8	R08	28.0	43.0	41.0	8	MMK37.5 685K630R08L4 TRAY

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1000 VDC/250 VAC						
LEAD SPACING 5 MM						
0.0010	J01	2.5	6.5	7.2	100	MMK5 102K1000J01L4 BULK
0.0012	J02	3.5	8.0	7.2	100	MMK5 122K1000J02L4 BULK
0.0015	J02	3.5	8.0	7.2	100	MMK5 152K1000J02L4 BULK
0.0018	J02	3.5	8.0	7.2	100	MMK5 182K1000J02L4 BULK
0.0022	J02	3.5	8.0	7.2	100	MMK5 222K1000J02L4 BULK
0.0027	J02	3.5	8.0	7.2	100	MMK5 272K1000J02L4 BULK
0.0033	J02	3.5	8.0	7.2	100	MMK5 332K1000J02L4 BULK
0.0039	J03	4.5	9.0	7.2	100	MMK5 392K1000J03L4 BULK
0.0047	J03	4.5	9.0	7.2	100	MMK5 472K1000J03L4 BULK
0.0056	J03	4.5	9.0	7.2	100	MMK5 562K1000J03L4 BULK
0.0068	J04	5.0	10.0	7.2	100	MMK5 682K1000J04L4 BULK
0.0082	J05	6.0	11.0	7.2	100	MMK5 822K1000J05L4 BULK
0.010	J05	6.0	11.0	7.2	100	MMK5 103K1000J05L4 BULK
0.012	J06	7.2	13.0	7.2	100	MMK5 123K1000J06L4 BULK
0.015	J06	7.2	13.0	7.2	100	MMK5 153K1000J06L4 BULK
LEAD SPACING 7.5 MM						
0.0010	K00	2.5	6.0	10.0	80	MMK7.5 102K1000K00L4 BULK
0.0012	K00	2.5	6.0	10.0	80	MMK7.5 122K1000K00L4 BULK
0.0015	K00	2.5	6.0	10.0	80	MMK7.5 152K1000K00L4 BULK
0.0015	K01	4.0	8.0	10.0	80	MMK7.5 152K1000K01L4 BULK
0.0018	K01	4.0	8.0	10.0	80	MMK7.5 182K1000K01L4 BULK
0.0022	K01	4.0	8.0	10.0	80	MMK7.5 222K1000K01L4 BULK
0.0027	K01	4.0	8.0	10.0	80	MMK7.5 272K1000K01L4 BULK
0.0033	K01	4.0	8.0	10.0	80	MMK7.5 332K1000K01L4 BULK
0.0039	K01	4.0	8.0	10.0	80	MMK7.5 392K1000K01L4 BULK
0.0047	K01	4.0	8.0	10.0	80	MMK7.5 472K1000K01L4 BULK
0.0056	K01	4.0	8.0	10.0	80	MMK7.5 562K1000K01L4 BULK
0.0068	K03	5.0	11.0	10.0	80	MMK7.5 682K1000K03L4 BULK
0.0082	K03	5.0	11.0	10.0	80	MMK7.5 822K1000K03L4 BULK
0.010	K03	5.0	11.0	10.0	80	MMK7.5 103K1000K03L4 BULK
0.012	K03	5.0	11.0	10.0	80	MMK7.5 123K1000K03L4 BULK
0.015	K04	6.0	12.0	10.5	80	MMK7.5 153K1000K04L4 BULK
0.018	K04	6.0	12.0	10.5	80	MMK7.5 183K1000K04L4 BULK
LEAD SPACING 10 MM						
0.0010	A01	4.0	9.0	13.0	60	MMK10 102K1000A01L4 BULK
0.0012	A01	4.0	9.0	13.0	60	MMK10 122K1000A01L4 BULK
0.0015	A01	4.0	9.0	13.0	60	MMK10 152K1000A01L4 BULK
0.0018	A01	4.0	9.0	13.0	60	MMK10 182K1000A01L4 BULK
0.0022	A01	4.0	9.0	13.0	60	MMK10 222K1000A01L4 BULK
0.0027	A01	4.0	9.0	13.0	60	MMK10 272K1000A01L4 BULK
0.0033	A01	4.0	9.0	13.0	60	MMK10 332K1000A01L4 BULK
0.0039	A01	4.0	9.0	13.0	60	MMK10 392K1000A01L4 BULK
0.0047	A01	4.0	9.0	13.0	60	MMK10 472K1000A01L4 BULK
0.0056	A01	4.0	9.0	13.0	60	MMK10 562K1000A01L4 BULK
0.0068	A01	4.0	9.0	13.0	60	MMK10 682K1000A01L4 BULK
0.0082	A01	4.0	9.0	13.0	60	MMK10 822K1000A01L4 BULK
0.010	A02	4.5	10.5	13.0	60	MMK10 103K1000A02L4 BULK
0.012	A02	4.5	10.5	13.0	60	MMK10 123K1000A02L4 BULK
0.015	A03	5.0	11.0	13.0	60	MMK10 153K1000A03L4 BULK
0.018	A04	6.0	12.0	13.0	60	MMK10 183K1000A04L4 BULK
0.022	A04	6.0	12.0	13.0	60	MMK10 223K1000A04L4 BULK
LEAD SPACING 15 MM						
0.0082	B04	5.5	10.5	18.0	30	MMK15 822K1000B04L4 BULK
0.010	B04	5.5	10.5	18.0	30	MMK15 103K1000B04L4 BULK
0.012	B04	5.5	10.5	18.0	30	MMK15 123K1000B04L4 BULK
0.015	B04	5.5	10.5	18.0	30	MMK15 153K1000B04L4 BULK

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1000 VDC/250 VAC						
LEAD SPACING 15 MM						
0.018	B04	5.5	10.5	18.0	30	MMK15 183K1000B04L4 BULK
0.022	B04	5.5	10.5	18.0	30	MMK15 223K1000B04L4 BULK
0.027	B05	5.5	12.5	18.0	30	MMK15 273K1000B05L4 BULK
0.033	B10	6.5	12.5	18.0	30	MMK15 333K1000B10L4 BULK
0.039	B10	6.5	12.5	18.0	30	MMK15 393K1000B10L4 BULK
0.047	B06	7.5	14.5	18.0	30	MMK15 473K1000B06L4 BULK
0.056	B06	7.5	14.5	18.0	30	MMK15 563K1000B06L4 BULK
0.068	B11	8.5	16.0	18.0	30	MMK15 683K1000B11L4 BULK
0.082	B14	9.5	17.5	18.0	30	MMK15 823K1000B14L4 BULK
0.10	B14	9.5	17.5	18.0	30	MMK15 104K1000B14L4 BULK
LEAD SPACING 22.5 MM						
0.033	D13	6.5	14.5	26.0	15	MMK22.5 333K1000D13L4 TRAY
0.039	D13	6.5	14.5	26.0	15	MMK22.5 393K1000D13L4 TRAY
0.047	D13	6.5	14.5	26.0	15	MMK22.5 473K1000D13L4 TRAY
0.056	D13	6.5	14.5	26.0	15	MMK22.5 563K1000D13L4 TRAY
0.068	D13	6.5	14.5	26.0	15	MMK22.5 683K1000D13L4 TRAY
0.082	D13	6.5	14.5	26.0	15	MMK22.5 823K1000D13L4 TRAY
0.10	D13	6.5	14.5	26.0	15	MMK22.5 104K1000D13L4 TRAY
0.12	D17	7.0	16.5	26.0	15	MMK22.5 124K1000D17L4 TRAY
0.15	D17	7.0	16.5	26.0	15	MMK22.5 154K1000D17L4 TRAY
0.18	D14	8.0	16.0	26.0	15	MMK22.5 184K1000D14L4 TRAY
0.22	D15	9.0	18.5	26.0	15	MMK22.5 224K1000D15L4 TRAY
0.27	D18	10.5	19.0	26.0	15	MMK22.5 274K1000D18L4 TRAY
0.33	D16	11.0	21.5	26.0	15	MMK22.5 334K1000D16L4 TRAY
0.39	D20	13.5	23.0	26.0	15	MMK22.5 394K1000D20L4 TRAY
0.47	D20	13.5	23.0	26.0	15	MMK22.5 474K1000D20L4 TRAY
0.56	D19	15.5	24.5	26.0	15	MMK22.5 564K1000D19L4 TRAY
LEAD SPACING 27.5 MM						
0.33	F11	10.5	20.5	31.5	12	MMK27.5 334K1000F11L4 TRAY
0.39	F11	10.5	20.5	31.5	12	MMK27.5 394K1000F11L4 TRAY
0.39	F17	21.0	12.5	31.5	12	MMK27.5 394K1000F17L4 TRAY
0.47	F12	11.5	22.5	31.5	12	MMK27.5 474K1000F12L4 TRAY
0.56	F03	13.5	23.0	31.5	12	MMK27.5 564K1000F03L4 TRAY
0.68	F13	14.5	24.5	31.5	12	MMK27.5 684K1000F13L4 TRAY
0.82	F14	17.5	28.0	31.5	12	MMK27.5 824K1000F14L4 TRAY
0.82	F19	27.5	16.0	31.5	12	MMK27.5 824K1000F19L4 TRAY
1.0	F14	17.5	28.0	31.5	12	MMK27.5 105K1000F14L4 TRAY
1.2	F15	19.0	29.0	31.5	12	MMK27.5 125K1000F15L4 TRAY
1.2	F18	31.0	19.0	31.5	12	MMK27.5 125K1000F18L4 TRAY
1.5	F16	21.0	30.0	31.5	12	MMK27.5 155K1000F16L4 TRAY
LEAD SPACING 37.5 MM						
0.68	R05	13.0	24.0	41.0	10	MMK37.5 684K1000R05L4 TRAY
0.82	R05	13.0	24.0	41.0	10	MMK37.5 824K1000R05L4 TRAY
1.0	R04	15.0	26.0	41.0	10	MMK37.5 105K1000R04L4 TRAY
1.2	R04	15.0	26.0	41.0	10	MMK37.5 125K1000R04L4 TRAY
1.5	R02	16.5	32.0	41.0	10	MMK37.5 155K1000R02L4 TRAY
1.8	R02	16.5	32.0	41.0	10	MMK37.5 185K1000R02L4 TRAY
2.2	R03	19.0	36.0	41.0	10	MMK37.5 225K1000R03L4 TRAY
2.7	R06	21.0	38.0	41.0	10	MMK37.5 275K1000R06L4 TRAY
3.3	R08	28.0	43.0	41.0	10	MMK37.5 335K1000R08L4 TRAY
3.9	R08	28.0	43.0	41.0	10	MMK37.5 395K1000R08L4 TRAY
4.7	R08	28.0	43.0	41.0	10	MMK37.5 475K1000R08L4 TRAY

SMR

RoHS Compliant

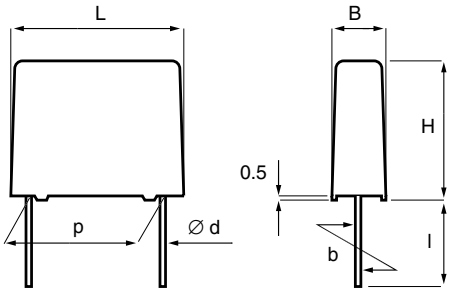
- **Metallized polyphenylene sulfide**
- **Stable +150 °C high temperature capacitor**

TYPICAL APPLICATIONS

Automotive and other applications with high ambient temperatures. Applications requiring high stability and low losses. Offers excellent sound quality in audio applications.

CONSTRUCTION

Polyphenylene sulphide film capacitor with vacuum-evaporated aluminum electrodes. Radial leads of tinned wire are electrically welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



p	d	std l	max l	b
5.0 ± 0.4	0.5	4^{+1}	30	± 0.4
7.5 ± 0.4	0.6	4^{+1}	30	± 0.4
10.0 ± 0.4	0.6	4^{+1}	30	± 0.4
15.0 ± 0.4	0.8	4^{+1}	30	± 0.4
22.5 ± 0.4	0.8	4^{+1}	30	± 0.4
27.5 ± 0.4	0.8	4^{+1}	30	± 0.4

TECHNICAL DATA

Rated voltage U_R, VDC	50	63	100	250	400
Rated voltage U_R, VAC	30	40	63	160	200
Capacitance, µF	0.001 - 22	0.001 - 22	0.001 - 12	0.001 - 3.9	0.001 - 1.8

Capacitance tolerance
± 20 %, ± 10 %, ± 5 %, ± 2.5 %

Category temperature range
–55 ... +150°C

Rated temperature
-55 ... +125 °C

Voltage derating
From +125°C, the voltage derating is 2%/°C.

Climatic category
IEC 60068-1, 55/150/56
DIN 40040, FKD

Test voltage
1.6 x U_R for 2s.

Reliability
Operational life > 200 000 h.
Failure rate < 3 FIT, T = +40°C, U = 0.5 x U_R.
Failure criteria according to DIN 44122.

Capacitance drift
Max. 0.3% after a 2 year storage period at a temperature of +10° ... +40°C and a relative humidity of 40 ... 60 %.

Dissipation factor tanδ
Maximum values at +23°C

		C ≤ 0.1µF	0.1µF < C ≤ 1.0µF	C > 1.0µF
SMR5	1 kHz	0.15 %	0.15 %	0.15 %
	10 kHz	0.25 %	0.25 %	0.35 %
	100 kHz	0.50 %	0.60 %	
SMR7.5...27.5	1 kHz	0.15 %	0.15 %	0.15 %
	10 kHz	0.25 %	0.25 %	
	100 kHz	0.60 %		

Insulation resistance
Minimum values between terminals.
Measured at +20°C, according to IEC 60384-1

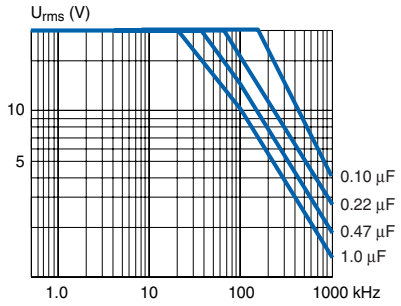
	C ≤ 0.33 µF	C > 0.33 µF
U_R ≤ 100 V	15 000 MΩ	5 000 s
U_R > 100 V	30 000 MΩ	10 000 s

ENVIRONMENTAL TEST DATA

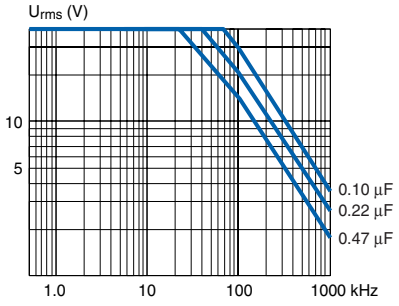
Damp heat test
Test conditions: T = +40°C, RH = 93%, t = 56 days.
Test criteria:
ΔC/C ≤ ±3%,
Δ tanδ ≤ 0.0025 (1kHz)
IR after test 0.5 x IR min.

Endurance test
Test conditions: T = +125°C, U = 1.25 x (0.5 x U_R),
Test criteria:
t = 2000 h.
ΔC/C ≤ ±3%,
Δ tanδ ≤ 0.002 (1kHz), C > 1 µF
Δ tanδ ≤ 0.003 (10kHz), C ≤ 1 µF
IR after test 0.5 x IR min.

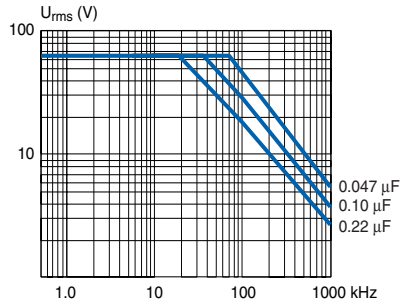
DERATING OF U_{RMS} VS FREQUENCY, +100°C AMBIENT TEMPERATURE AND 20°C INTERNAL HEATING, TYPICAL VALUES



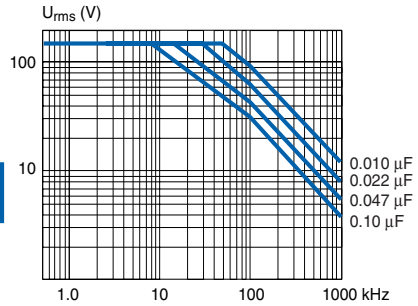
SMR5 **50/30**



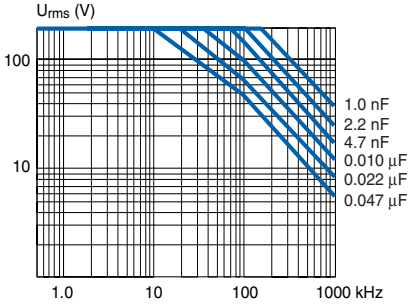
SMR5 **63/40**



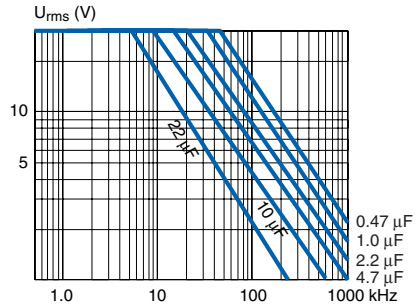
SMR5 **100/63**



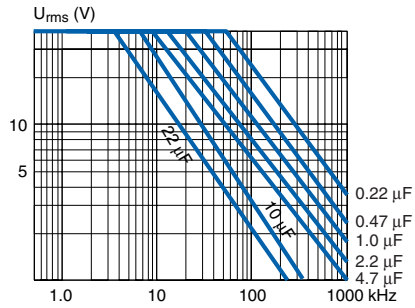
SMR5 **250/160**



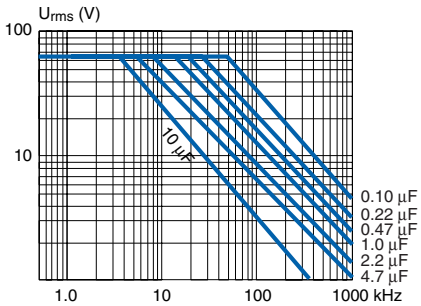
SMR5 **400/200**



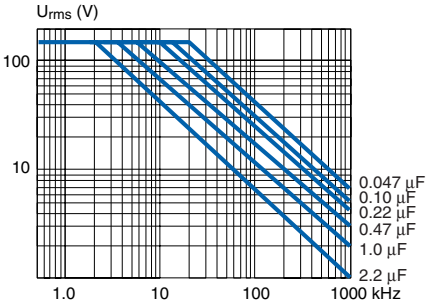
SMR7.5 ... 27.5 **50/30**



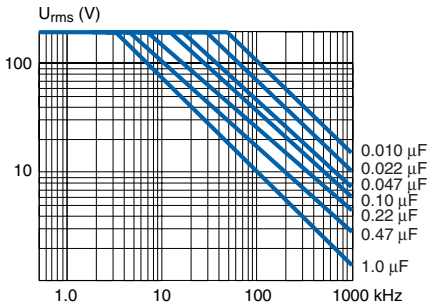
SMR7.5 ... 27.5 **63/40**



SMR7.5 ... 27.5 **100/63**



SMR7.5 ... 27.5 **250/160**



SMR7.5 ... 27.5 **400/200**

ORDERING INFORMATION

See article table and pages 10 to 14 for options and article code construction.

MARKING

- Capacitance
- Tolerance code
- Rated voltage
- Capacitor family code SMR
- Manufacturing date code

ARTICLE TABLE

50 VDC/30 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	SMR5 102K50J01L4BULK
0.0012	J01	2.5	6.5	7.2	40	SMR5 122K50J01L4BULK
0.0015	J01	2.5	6.5	7.2	40	SMR5 152K50J01L4BULK
0.0018	J01	2.5	6.5	7.2	40	SMR5 182K50J01L4BULK
0.0022	J01	2.5	6.5	7.2	40	SMR5 222K50J01L4BULK
0.0027	J01	2.5	6.5	7.2	40	SMR5 272K50J01L4BULK
0.0033	J01	2.5	6.5	7.2	40	SMR5 332K50J01L4BULK
0.0039	J01	2.5	6.5	7.2	40	SMR5 392K50J01L4BULK
0.0047	J01	2.5	6.5	7.2	20	SMR5 472K50J01L4BULK
0.0056	J01	2.5	6.5	7.2	20	SMR5 562K50J01L4BULK
0.0068	J01	2.5	6.5	7.2	20	SMR5 682K50J01L4BULK
0.0082	J01	2.5	6.5	7.2	20	SMR5 822K50J01L4BULK
0.010	J01	2.5	6.5	7.2	20	SMR5 103K50J01L4BULK
0.012	J01	2.5	6.5	7.2	15	SMR5 123K50J01L4BULK
0.015	J01	2.5	6.5	7.2	15	SMR5 153K50J01L4BULK
0.018	J01	2.5	6.5	7.2	15	SMR5 183K50J01L4BULK
0.022	J01	2.5	6.5	7.2	15	SMR5 223K50J01L4BULK
0.027	J01	2.5	6.5	7.2	15	SMR5 273K50J01L4BULK
0.033	J01	2.5	6.5	7.2	15	SMR5 333K50J01L4BULK
0.039	J01	2.5	6.5	7.2	15	SMR5 393K50J01L4BULK
0.047	J01	2.5	6.5	7.2	6	SMR5 473K50J01L4BULK
0.056	J01	2.5	6.5	7.2	6	SMR5 563K50J01L4BULK
0.068	J01	2.5	6.5	7.2	6	SMR5 683K50J01L4BULK
0.082	J01	2.5	6.5	7.2	6	SMR5 823K50J01L4BULK
0.10	J01	2.5	6.5	7.2	6	SMR5 104K50J01L4BULK
0.12	J01	2.5	6.5	7.2	6	SMR5 124K50J01L4BULK
0.15	J02	3.5	8.0	7.2	6	SMR5 154K50J02L4BULK
0.18	J02	3.5	8.0	7.2	6	SMR5 184K50J02L4BULK
0.22	J02	3.5	8.0	7.2	6	SMR5 224K50J02L4BULK
0.27	J02	3.5	8.0	7.2	6	SMR5 274K50J02L4BULK
0.33	J03	4.5	9.0	7.2	6	SMR5 334K50J03L4BULK
0.39	J03	4.5	9.0	7.2	6	SMR5 394K50J03L4BULK
0.47	J04	5.0	10.0	7.2	6	SMR5 474K50J04L4BULK
0.56	J04	5.0	10.0	7.2	6	SMR5 564K50J04L4BULK
0.68	J05	6.0	11.0	7.2	6	SMR5 684K50J05L4BULK
0.82	J05	6.0	11.0	7.2	6	SMR5 824K50J05L4BULK
1.0	J06	7.2	13.0	7.2	6	SMR5 105K50J06L4BULK
1.2	J06	7.2	13.0	7.2	6	SMR5 125K50J06L4BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K01	4.0	8.0	10.0	30	SMR7.5 102K50K01L4BULK
0.0012	K01	4.0	8.0	10.0	30	SMR7.5 122K50K01L4BULK
0.0015	K01	4.0	8.0	10.0	30	SMR7.5 152K50K01L4BULK
0.0018	K01	4.0	8.0	10.0	30	SMR7.5 182K50K01L4BULK
0.0022	K01	4.0	8.0	10.0	30	SMR7.5 222K50K01L4BULK
0.0027	K01	4.0	8.0	10.0	30	SMR7.5 272K50K01L4BULK
0.0033	K01	4.0	8.0	10.0	30	SMR7.5 332K50K01L4BULK
0.0039	K01	4.0	8.0	10.0	30	SMR7.5 392K50K01L4BULK
0.0047	K01	4.0	8.0	10.0	30	SMR7.5 472K50K01L4BULK
0.0056	K01	4.0	8.0	10.0	30	SMR7.5 562K50K01L4BULK
0.0068	K01	4.0	8.0	10.0	30	SMR7.5 682K50K01L4BULK
0.0082	K01	4.0	8.0	10.0	30	SMR7.5 822K50K01L4BULK
0.010	K01	4.0	8.0	10.0	30	SMR7.5 103K50K01L4BULK
0.012	K01	4.0	8.0	10.0	30	SMR7.5 123K50K01L4BULK
0.015	K01	4.0	8.0	10.0	30	SMR7.5 153K50K01L4BULK
0.018	K01	4.0	8.0	10.0	30	SMR7.5 183K50K01L4BULK
0.022	K01	4.0	8.0	10.0	30	SMR7.5 223K50K01L4BULK
0.027	K01	4.0	8.0	10.0	20	SMR7.5 273K50K01L4BULK
0.033	K01	4.0	8.0	10.0	20	SMR7.5 333K50K01L4BULK

50 VDC/30 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.039	K01	4.0	8.0	10.0	20	SMR7.5 393K50K01L4BULK
0.047	K01	4.0	8.0	10.0	20	SMR7.5 473K50K01L4BULK
0.056	K01	4.0	8.0	10.0	15	SMR7.5 563K50K01L4BULK
0.068	K01	4.0	8.0	10.0	15	SMR7.5 683K50K01L4BULK
0.082	K01	4.0	8.0	10.0	15	SMR7.5 823K50K01L4BULK
0.10	K01	4.0	8.0	10.0	15	SMR7.5 104K50K01L4BULK
0.12	K01	4.0	8.0	10.0	15	SMR7.5 124K50K01L4BULK
0.15	K01	4.0	8.0	10.0	10	SMR7.5 154K50K01L4BULK
0.18	K01	4.0	8.0	10.0	10	SMR7.5 184K50K01L4BULK
0.22	K01	4.0	8.0	10.0	10	SMR7.5 224K50K01L4BULK
0.27	K01	4.0	8.0	10.0	10	SMR7.5 274K50K01L4BULK
0.33	K01	4.0	8.0	10.0	10	SMR7.5 334K50K01L4BULK
0.39	K01	4.0	8.0	10.0	10	SMR7.5 394K50K01L4BULK
0.47	K03	5.0	11.0	10.0	10	SMR7.5 474K50K03L4BULK
0.56	K03	5.0	11.0	10.0	10	SMR7.5 564K50K03L4BULK
0.68	K03	5.0	11.0	10.0	10	SMR7.5 684K50K03L4BULK
0.82	K03	5.0	11.0	10.0	10	SMR7.5 824K50K03L4BULK
1.0	K04	6.0	12.0	10.5	10	SMR7.5 105K50K04L4BULK
1.2	K04	6.0	12.0	10.5	10	SMR7.5 125K50K04L4BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0027	A01	4.0	9.0	13.0	25	SMR10 272K50A01L4BULK
0.0033	A01	4.0	9.0	13.0	25	SMR10 332K50A01L4BULK
0.0039	A01	4.0	9.0	13.0	25	SMR10 392K50A01L4BULK
0.0047	A01	4.0	9.0	13.0	25	SMR10 472K50A01L4BULK
0.0056	A01	4.0	9.0	13.0	25	SMR10 562K50A01L4BULK
0.0068	A01	4.0	9.0	13.0	25	SMR10 682K50A01L4BULK
0.0082	A01	4.0	9.0	13.0	25	SMR10 822K50A01L4BULK
0.010	A01	4.0	9.0	13.0	25	SMR10 103K50A01L4BULK
0.012	A01	4.0	9.0	13.0	25	SMR10 123K50A01L4BULK
0.015	A01	4.0	9.0	13.0	25	SMR10 153K50A01L4BULK
0.018	A01	4.0	9.0	13.0	25	SMR10 183K50A01L4BULK
0.022	A01	4.0	9.0	13.0	25	SMR10 223K50A01L4BULK
0.027	A01	4.0	9.0	13.0	25	SMR10 273K50A01L4BULK
0.033	A01	4.0	9.0	13.0	25	SMR10 333K50A01L4BULK
0.039	A01	4.0	9.0	13.0	15	SMR10 393K50A01L4BULK
0.047	A01	4.0	9.0	13.0	15	SMR10 473K50A01L4BULK
0.056	A01	4.0	9.0	13.0	15	SMR10 563K50A01L4BULK
0.068	A01	4.0	9.0	13.0	15	SMR10 683K50A01L4BULK
0.082	A01	4.0	9.0	13.0	10	SMR10 823K50A01L4BULK
0.10	A01	4.0	9.0	13.0	10	SMR10 104K50A01L4BULK
0.12	A01	4.0	9.0	13.0	10	SMR10 124K50A01L4BULK
0.15	A01	4.0	9.0	13.0	10	SMR10 154K50A01L4BULK
0.18	A01	4.0	9.0	13.0	10	SMR10 184K50A01L4BULK
0.22	A01	4.0	9.0	13.0	10	SMR10 224K50A01L4BULK
0.27	A01	4.0	9.0	13.0	8	SMR10 274K50A01L4BULK
0.33	A01	4.0	9.0	13.0	8	SMR10 334K50A01L4BULK
0.39	A01	4.0	9.0	13.0	8	SMR10 394K50A01L4BULK
0.47	A01	4.0	9.0	13.0	8	SMR10 474K50A01L4BULK
0.56	A01	4.0	9.0	13.0	8	SMR10 564K50A01L4BULK
0.68	A01	4.0	9.0	13.0	8	SMR10 684K50A01L4BULK
0.82	A02	4.5	10.5	13.0	8	SMR10 824K50A02L4BULK
1.0	A03	4.5	10.5	13.0	8	SMR10 105K50A03L4BULK
1.2	A03	5.0	11.0	13.0	8	SMR10 125K50A03L4BULK
1.5	A04	6.0	12.0	13.0	8	SMR10 155K50A04L4BULK
1.8	A04	6.0	12.0	13.0	8	SMR10 185K50A04L4BULK

ARTICLE TABLE

50 VDC/30 VAC

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
2.2	B10	6.5	12.5	18.0	6	SMR15 225K50B10L4BULK
2.7	B06	7.5	14.5	18.0	6	SMR15 275K50B06L4BULK
3.3	B06	7.5	14.5	18.0	6	SMR15 335K50B06L4BULK
3.9	B12	8.0	15.0	18.0	6	SMR15 395K50B12L4BULK
4.7	B11	8.5	16.0	18.0	6	SMR15 475K50B11L4BULK
5.6	B14	9.5	17.5	18.0	6	SMR15 565K50B14L4BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
6.8	D14	8.0	16.0	26.0	3	SMR22.5 685K50D14L4TRAY
8.2	D15	9.0	18.5	26.0	3	SMR22.5 825K50D15L4TRAY
10.0	D18	10.5	19.0	26.0	3	SMR22.5 106K50D18L4TRAY
12.0	D16	11.0	21.5	26.0	3	SMR22.5 126K50D16L4TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
15.0	F11	10.5	20.5	31.5	2	SMR27.5 156K50F11L4TRAY
18.0	F12	11.5	22.5	31.5	2	SMR27.5 186K50F12L4TRAY
22.0	F13	14.5	24.5	31.5	2	SMR27.5 226K50F13L4TRAY

63 VDC/40 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	SMR5 102K63J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	SMR5 122K63J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	SMR5 152K63J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	SMR5 182K63J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	SMR5 222K63J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	SMR5 272K63J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	SMR5 332K63J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	SMR5 392K63J01L4 BULK
0.0047	J01	2.5	6.5	7.2	20	SMR5 472K63J01L4 BULK
0.0056	J01	2.5	6.5	7.2	20	SMR5 562K63J01L4 BULK
0.0068	J01	2.5	6.5	7.2	20	SMR5 682K63J01L4 BULK
0.0082	J01	2.5	6.5	7.2	20	SMR5 822K63J01L4 BULK
0.010	J01	2.5	6.5	7.2	20	SMR5 103K63J01L4 BULK
0.012	J01	2.5	6.5	7.2	15	SMR5 123K63J01L4 BULK
0.015	J01	2.5	6.5	7.2	15	SMR5 153K63J01L4 BULK
0.018	J01	2.5	6.5	7.2	15	SMR5 183K63J01L4 BULK
0.022	J01	2.5	6.5	7.2	15	SMR5 223K63J01L4 BULK
0.027	J01	2.5	6.5	7.2	15	SMR5 273K63J01L4 BULK
0.033	J01	2.5	6.5	7.2	15	SMR5 333K63J01L4 BULK
0.039	J01	2.5	6.5	7.2	15	SMR5 393K63J01L4 BULK
0.047	J01	2.5	6.5	7.2	6	SMR5 473K63J01L4 BULK
0.056	J01	2.5	6.5	7.2	6	SMR5 563K63J01L4 BULK
0.068	J01	2.5	6.5	7.2	6	SMR5 683K63J01L4 BULK
0.082	J02	3.5	8.0	7.2	6	SMR5 823K63J02L4 BULK
0.10	J02	3.5	8.0	7.2	6	SMR5 104K63J02L4 BULK
0.12	J02	3.5	8.0	7.2	6	SMR5 124K63J02L4 BULK
0.15	J02	3.5	8.0	7.2	6	SMR5 154K63J02L4 BULK
0.18	J03	4.5	9.0	7.2	6	SMR5 184K63J03L4 BULK
0.22	J03	4.5	9.0	7.2	6	SMR5 224K63J03L4 BULK
0.27	J04	5.0	10.0	7.2	6	SMR5 274K63J04L4 BULK
0.33	J04	5.0	10.0	7.2	6	SMR5 334K63J04L4 BULK
0.39	J05	6.0	11.0	7.2	6	SMR5 394K63J05L4 BULK
0.47	J05	6.0	11.0	7.2	6	SMR5 474K63J05L4 BULK
0.56	J06	7.2	13.0	7.2	6	SMR5 564K63J06L4 BULK
0.68	J06	7.2	13.0	7.2	6	SMR5 684K63J06L4 BULK

63 VDC/40 VAC

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K01	4.0	8.0	10.0	30	SMR7.5 102K63K01L4 BULK
0.0012	K01	4.0	8.0	10.0	30	SMR7.5 122K63K01L4 BULK
0.0015	K01	4.0	8.0	10.0	30	SMR7.5 152K63K01L4 BULK
0.0018	K01	4.0	8.0	10.0	30	SMR7.5 182K63K01L4 BULK
0.0022	K01	4.0	8.0	10.0	30	SMR7.5 222K63K01L4 BULK
0.0027	K01	4.0	8.0	10.0	30	SMR7.5 272K63K01L4 BULK
0.0033	K01	4.0	8.0	10.0	30	SMR7.5 332K63K01L4 BULK
0.0039	K01	4.0	8.0	10.0	30	SMR7.5 392K63K01L4 BULK
0.0047	K01	4.0	8.0	10.0	30	SMR7.5 472K63K01L4 BULK
0.0056	K01	4.0	8.0	10.0	30	SMR7.5 562K63K01L4 BULK
0.0068	K01	4.0	8.0	10.0	30	SMR7.5 682K63K01L4 BULK
0.0082	K01	4.0	8.0	10.0	30	SMR7.5 822K63K01L4 BULK
0.010	K01	4.0	8.0	10.0	30	SMR7.5 103K63K01L4 BULK
0.012	K01	4.0	8.0	10.0	30	SMR7.5 123K63K01L4 BULK
0.015	K01	4.0	8.0	10.0	30	SMR7.5 153K63K01L4 BULK
0.018	K01	4.0	8.0	10.0	30	SMR7.5 183K63K01L4 BULK
0.022	K01	4.0	8.0	10.0	30	SMR7.5 223K63K01L4 BULK
0.027	K01	4.0	8.0	10.0	20	SMR7.5 273K63K01L4 BULK
0.033	K01	4.0	8.0	10.0	20	SMR7.5 333K63K01L4 BULK
0.039	K01	4.0	8.0	10.0	20	SMR7.5 393K63K01L4 BULK
0.047	K01	4.0	8.0	10.0	20	SMR7.5 473K63K01L4 BULK
0.056	K01	4.0	8.0	10.0	15	SMR7.5 563K63K01L4 BULK
0.068	K01	4.0	8.0	10.0	15	SMR7.5 683K63K01L4 BULK
0.082	K01	4.0	8.0	10.0	15	SMR7.5 823K63K01L4 BULK
0.10	K01	4.0	8.0	10.0	15	SMR7.5 104K63K01L4 BULK
0.12	K01	4.0	8.0	10.0	15	SMR7.5 124K63K01L4 BULK
0.15	K01	4.0	8.0	10.0	10	SMR7.5 154K63K01L4 BULK
0.18	K01	4.0	8.0	10.0	10	SMR7.5 184K63K01L4 BULK
0.22	K01	4.0	8.0	10.0	10	SMR7.5 224K63K01L4 BULK
0.27	K01	4.0	8.0	10.0	10	SMR7.5 274K63K01L4 BULK
0.33	K03	5.0	11.0	10.0	10	SMR7.5 334K63K03L4 BULK
0.39	K03	5.0	11.0	10.0	10	SMR7.5 394K63K03L4 BULK
0.47	K03	5.0	11.0	10.0	10	SMR7.5 474K63K03L4 BULK
0.56	K03	5.0	11.0	10.0	10	SMR7.5 564K63K03L4 BULK
0.68	K04	6.0	12.0	10.5	10	SMR7.5 684K63K04L4 BULK
0.82	K04	6.0	12.0	10.5	10	SMR7.5 824K63K04L4 BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0027	A01	4.0	9.0	13.0	25	SMR10 272K63A01L4 BULK
0.0033	A01	4.0	9.0	13.0	25	SMR10 332K63A01L4 BULK
0.0039	A01	4.0	9.0	13.0	25	SMR10 392K63A01L4 BULK
0.0047	A01	4.0	9.0	13.0	25	SMR10 472K63A01L4 BULK
0.0056	A01	4.0	9.0	13.0	25	SMR10 562K63A01L4 BULK
0.0068	A01	4.0	9.0	13.0	25	SMR10 682K63A01L4 BULK
0.0082	A01	4.0	9.0	13.0	25	SMR10 822K63A01L4 BULK
0.010	A01	4.0	9.0	13.0	25	SMR10 103K63A01L4 BULK
0.012	A01	4.0	9.0	13.0	25	SMR10 123K63A01L4 BULK
0.015	A01	4.0	9.0	13.0	25	SMR10 153K63A01L4 BULK
0.018	A01	4.0	9.0	13.0	25	SMR10 183K63A01L4 BULK
0.022	A01	4.0	9.0	13.0	25	SMR10 223K63A01L4 BULK
0.027	A01	4.0	9.0	13.0	25	SMR10 273K63A01L4 BULK
0.033	A01	4.0	9.0	13.0	25	SMR10 333K63A01L4 BULK
0.039	A01	4.0	9.0	13.0	15	SMR10 393K63A01L4 BULK
0.047	A01	4.0	9.0	13.0	15	SMR10 473K63A01L4 BULK
0.056	A01	4.0	9.0	13.0	15	SMR10 563K63A01L4 BULK
0.068	A01	4.0	9.0	13.0	15	SMR10 683K63A01L4 BULK
0.082	A01	4.0	9.0	13.0	10	SMR10 823K63A01L4 BULK
0.10	A01	4.0	9.0	13.0	10	SMR10 104K63A01L4 BULK
0.12	A01	4.0	9.0	13.0	10	SMR10 124K63A01L4 BULK
0.15	A01	4.0	9.0	13.0	10	SMR10 154K63A01L4 BULK

ARTICLE TABLE

63 VDC/40 VAC

LEAD SPACING 10MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.18	A01	4.0	9.0	13.0	10	SMR10 184K63A01L4 BULK
0.22	A01	4.0	9.0	13.0	10	SMR10 224K63A01L4 BULK
0.27	A01	4.0	9.0	13.0	8	SMR10 274K63A01L4 BULK
0.33	A01	4.0	9.0	13.0	8	SMR10 334K63A01L4 BULK
0.39	A01	4.0	9.0	13.0	8	SMR10 394K63A01L4 BULK
0.47	A02	4.5	10.5	13.0	8	SMR10 474K63A02L4 BULK
0.56	A02	4.5	10.5	13.0	8	SMR10 564K63A02L4 BULK
0.68	A03	5.0	11.0	13.0	8	SMR10 684K63A03L4 BULK
0.82	A04	6.0	12.0	13.0	8	SMR10 824K63A04L4 BULK
1.0	A04	6.0	12.0	13.0	8	SMR10 105K63A04L4 BULK

LEAD SPACING 15 MM

0.68	B04	5.5	10.5	18.0	8	SMR15 684K63B04L4 BULK
0.82	B04	5.5	10.5	18.0	8	SMR15 824K63B04L4 BULK
1.0	B05	5.5	12.5	18.0	8	SMR15 105K63B05L4 BULK
1.2	B10	6.5	12.5	18.0	6	SMR15 125K63B10L4 BULK
1.5	B10	6.5	12.5	18.0	6	SMR15 155K63B10L4 BULK
1.8	B06	7.5	14.5	18.0	6	SMR15 185K63B06L4 BULK
2.2	B12	8.0	15.0	18.0	6	SMR15 225K63B12L4 BULK
2.7	B11	8.5	16.0	18.0	6	SMR15 275K63B11L4 BULK
3.3	B14	9.5	17.5	18.0	6	SMR15 335K63B14L4 BULK

LEAD SPACING 22.5 MM

2.7	D13	6.5	14.5	26.0	3	SMR22.5 275K63D13L4 TRAY
3.3	D17	7.0	16.5	26.0	3	SMR22.5 335K63D17L4 TRAY
3.9	D14	8.0	16.0	26.0	3	SMR22.5 395K63D14L4 TRAY
4.7	D15	9.0	18.5	26.0	3	SMR22.5 475K63D15L4 TRAY
5.6	D15	9.0	18.5	26.0	3	SMR22.5 565K63D15L4 TRAY
6.8	D18	10.5	19.0	26.0	3	SMR22.5 685K63D18L4 TRAY
8.2	D16	11.0	21.5	26.0	3	SMR22.5 825K63D16L4 TRAY

LEAD SPACING 27.5 MM

10.0	F12	11.5	22.5	31.5	2	SMR27.5 106K63F12L4 TRAY
12.0	F13	14.5	24.5	31.5	2	SMR27.5 126K63F13L4 TRAY
15.0	F13	14.5	24.5	31.5	2	SMR27.5 156K63F13L4 TRAY
18.0	F14	17.5	28.0	31.5	2	SMR27.5 186K63F14L4 TRAY
22.0	F14	17.5	28.0	31.5	2	SMR27.5 226K63F14L4 TRAY

100 VDC/63 VAC

LEAD SPACING 5 MM

0.0010	J01	2.5	6.5	7.2	40	SMR5 102K100J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	SMR5 122K100J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	SMR5 152K100J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	SMR5 182K100J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	SMR5 222K100J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	SMR5 272K100J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	SMR5 332K100J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	SMR5 392K100J01L4 BULK
0.0047	J01	2.5	6.5	7.2	20	SMR5 472K100J01L4 BULK
0.0056	J01	2.5	6.5	7.2	20	SMR5 562K100J01L4 BULK
0.0068	J01	2.5	6.5	7.2	20	SMR5 682K100J01L4 BULK
0.0082	J01	2.5	6.5	7.2	20	SMR5 822K100J01L4 BULK
0.010	J01	2.5	6.5	7.2	20	SMR5 103K100J01L4 BULK
0.012	J01	2.5	6.5	7.2	15	SMR5 123K100J01L4 BULK

100 VDC/63 VAC

LEAD SPACING 5 MM

0.015	J01	2.5	6.5	7.2	15	SMR5 153K100J01L4 BULK
0.018	J01	2.5	6.5	7.2	15	SMR5 183K100J01L4 BULK
0.022	J01	2.5	6.5	7.2	15	SMR5 223K100J01L4 BULK
0.027	J01	2.5	6.5	7.2	15	SMR5 273K100J01L4 BULK
0.033	J01	2.5	6.5	7.2	15	SMR5 333K100J01L4 BULK
0.039	J01	2.5	6.5	7.2	15	SMR5 393K100J01L4 BULK
0.047	J02	3.5	8.0	7.2	15	SMR5 473K100J02L4 BULK
0.056	J03	4.5	9.0	7.2	15	SMR5 563K100J03L4 BULK
0.068	J03	4.5	9.0	7.2	15	SMR5 683K100J03L4 BULK
0.082	J03	4.5	9.0	7.2	15	SMR5 823K100J03L4 BULK
0.10	J03	4.5	9.0	7.2	15	SMR5 104K100J03L4 BULK
0.12	J04	5.0	10.0	7.2	15	SMR5 124K100J04L4 BULK
0.15	J05	6.0	11.0	7.2	15	SMR5 154K100J05L4 BULK
0.18	J05	6.0	11.0	7.2	15	SMR5 184K100J05L4 BULK
0.22	J06	7.2	13.0	7.2	15	SMR5 224K100J06L4 BULK
0.27	J06	7.2	13.0	7.2	15	SMR5 274K100J06L4 BULK
0.33	J06	7.2	13.0	7.2	15	SMR5 334K100J06L4 BULK

LEAD SPACING 7.5 MM

0.0010	K01	4.0	8.0	10.0	30	SMR7.5 102K100K01L4 BULK
0.0012	K01	4.0	8.0	10.0	30	SMR7.5 122K100K01L4 BULK
0.0015	K01	4.0	8.0	10.0	30	SMR7.5 152K100K01L4 BULK
0.0018	K01	4.0	8.0	10.0	30	SMR7.5 182K100K01L4 BULK
0.0022	K01	4.0	8.0	10.0	30	SMR7.5 222K100K01L4 BULK
0.0027	K01	4.0	8.0	10.0	30	SMR7.5 272K100K01L4 BULK
0.0033	K01	4.0	8.0	10.0	30	SMR7.5 332K100K01L4 BULK
0.0039	K01	4.0	8.0	10.0	30	SMR7.5 392K100K01L4 BULK
0.0047	K01	4.0	8.0	10.0	30	SMR7.5 472K100K01L4 BULK
0.0056	K01	4.0	8.0	10.0	30	SMR7.5 562K100K01L4 BULK
0.0068	K01	4.0	8.0	10.0	30	SMR7.5 682K100K01L4 BULK
0.0082	K01	4.0	8.0	10.0	30	SMR7.5 822K100K01L4 BULK
0.010	K01	4.0	8.0	10.0	30	SMR7.5 103K100K01L4 BULK
0.012	K01	4.0	8.0	10.0	30	SMR7.5 123K100K01L4 BULK
0.015	K01	4.0	8.0	10.0	30	SMR7.5 153K100K01L4 BULK
0.018	K01	4.0	8.0	10.0	30	SMR7.5 183K100K01L4 BULK
0.022	K01	4.0	8.0	10.0	30	SMR7.5 223K100K01L4 BULK
0.027	K01	4.0	8.0	10.0	20	SMR7.5 273K100K01L4 BULK
0.033	K01	4.0	8.0	10.0	20	SMR7.5 333K100K01L4 BULK
0.039	K01	4.0	8.0	10.0	20	SMR7.5 393K100K01L4 BULK
0.047	K01	4.0	8.0	10.0	20	SMR7.5 473K100K01L4 BULK
0.056	K01	4.0	8.0	10.0	15	SMR7.5 563K100K01L4 BULK
0.068	K01	4.0	8.0	10.0	15	SMR7.5 683K100K01L4 BULK
0.082	K01	4.0	8.0	10.0	15	SMR7.5 823K100K01L4 BULK
0.10	K01	4.0	8.0	10.0	15	SMR7.5 104K100K01L4 BULK
0.12	K01	4.0	8.0	10.0	15	SMR7.5 124K100K01L4 BULK
0.15	K03	5.0	11.0	10.0	15	SMR7.5 154K100K03L4 BULK
0.18	K03	5.0	11.0	10.0	15	SMR7.5 184K100K03L4 BULK
0.22	K03	5.0	11.0	10.0	15	SMR7.5 224K100K03L4 BULK
0.27	K03	5.0	11.0	10.0	15	SMR7.5 274K100K03L4 BULK
0.33	K04	6.0	12.0	10.5	15	SMR7.5 334K100K04L4 BULK
0.39	K04	6.0	12.0	10.5	15	SMR7.5 394K100K04L4 BULK
0.47	K04	6.0	12.0	10.5	15	SMR7.5 474K100K04L4 BULK

LEAD SPACING 10 MM

0.0027	A01	4.0	9.0	13.0	25	SMR10 272K100A01L4 BULK
0.0033	A01	4.0	9.0	13.0	25	SMR10 332K100A01L4 BULK
0.0039	A01	4.0	9.0	13.0	25	SMR10 392K100A01L4 BULK
0.0047	A01	4.0	9.0	13.0	25	SMR10 472K100A01L4 BULK

ARTICLE TABLE

100 VDC/63 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0056	A01	4.0	9.0	13.0	25	SMR10 562K100A01L4 BULK
0.0068	A01	4.0	9.0	13.0	25	SMR10 682K100A01L4 BULK
0.0082	A01	4.0	9.0	13.0	25	SMR10 822K100A01L4 BULK
0.010	A01	4.0	9.0	13.0	25	SMR10 103K100A01L4 BULK
0.012	A01	4.0	9.0	13.0	25	SMR10 123K100A01L4 BULK
0.015	A01	4.0	9.0	13.0	25	SMR10 153K100A01L4 BULK
0.018	A01	4.0	9.0	13.0	25	SMR10 183K100A01L4 BULK
0.022	A01	4.0	9.0	13.0	25	SMR10 223K100A01L4 BULK
0.027	A01	4.0	9.0	13.0	25	SMR10 273K100A01L4 BULK
0.033	A01	4.0	9.0	13.0	25	SMR10 333K100A01L4 BULK
0.039	A01	4.0	9.0	13.0	15	SMR10 393K100A01L4 BULK
0.047	A01	4.0	9.0	13.0	15	SMR10 473K100A01L4 BULK
0.056	A01	4.0	9.0	13.0	15	SMR10 563K100A01L4 BULK
0.068	A01	4.0	9.0	13.0	15	SMR10 683K100A01L4 BULK
0.082	A01	4.0	9.0	13.0	10	SMR10 823K100A01L4 BULK
0.10	A01	4.0	9.0	13.0	10	SMR10 104K100A01L4 BULK
0.12	A01	4.0	9.0	13.0	10	SMR10 124K100A01L4 BULK
0.15	A01	4.0	9.0	13.0	10	SMR10 154K100A01L4 BULK
0.18	A01	4.0	9.0	13.0	10	SMR10 184K100A01L4 BULK
0.22	A01	4.0	9.0	13.0	10	SMR10 224K100A01L4 BULK
0.27	A02	4.5	10.5	13.0	10	SMR10 274K100A02L4 BULK
0.33	A03	5.0	11.0	13.0	10	SMR10 334K100A03L4 BULK
0.39	A03	5.0	11.0	13.0	10	SMR10 394K100A03L4 BULK
0.47	A04	6.0	12.0	13.0	10	SMR10 474K100A04L4 BULK
0.56	A04	6.0	12.0	13.0	10	SMR10 564K100A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.27	B04	5.5	10.5	18.0	8	SMR15 274K100B04L4 BULK
0.33	B04	5.5	10.5	18.0	8	SMR15 334K100B04L4 BULK
0.39	B04	5.5	10.5	18.0	8	SMR15 394K100B04L4 BULK
0.47	B04	5.5	10.5	18.0	8	SMR15 474K100B04L4 BULK
0.56	B05	5.5	12.5	18.0	8	SMR15 564K100B05L4 BULK
0.68	B10	6.5	12.5	18.0	8	SMR15 684K100B10L4 BULK
0.82	B06	7.5	14.5	18.0	8	SMR15 824K100B06L4 BULK
1.0	B06	7.5	14.5	18.0	8	SMR15 105K100B06L4 BULK
1.2	B12	8.0	15.0	18.0	8	SMR15 125K100B12L4 BULK
1.5	B11	8.5	16.0	18.0	8	SMR15 155K100B11L4 BULK
1.8	B14	9.5	17.5	18.0	8	SMR15 185K100B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.5	D13	6.5	14.5	26.0	4	SMR22.5 155K100D13L4 TRAY
1.8	D17	7.0	16.5	26.0	4	SMR22.5 185K100D17L4 TRAY
2.2	D14	8.0	16.0	26.0	4	SMR22.5 225K100D14L4 TRAY
2.7	D15	9.0	18.5	26.0	4	SMR22.5 275K100D15L4 TRAY
3.3	D18	10.5	19.0	26.0	4	SMR22.5 335K100D18L4 TRAY
3.9	D18	10.5	19.0	26.0	4	SMR22.5 395K100D18L4 TRAY
4.7	D16	11.0	21.5	26.0	4	SMR22.5 475K100D16L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
5.6	F12	11.5	22.5	31.5	3	SMR27.5 565K100F12L4 TRAY
6.8	F13	14.5	24.5	31.5	3	SMR27.5 685K100F13L4 TRAY
8.2	F13	14.5	24.5	31.5	3	SMR27.5 825K100F13L4 TRAY
10.0	F14	17.5	28.0	31.5	3	SMR27.5 106K100F14L4 TRAY
12.0	F14	17.5	28.0	31.5	3	SMR27.5 126K100F14L4 TRAY

250 VDC/160 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	SMR5 102K250J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	SMR5 122K250J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	SMR5 152K250J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	SMR5 182K250J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	SMR5 222K250J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	SMR5 272K250J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	SMR5 332K250J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	SMR5 392K250J01L4 BULK
0.0047	J01	2.5	6.5	7.2	20	SMR5 472K250J01L4 BULK
0.0056	J01	2.5	6.5	7.2	20	SMR5 562K250J01L4 BULK
0.0068	J01	2.5	6.5	7.2	20	SMR5 682K250J01L4 BULK
0.0082	J01	2.5	6.5	7.2	20	SMR5 822K250J01L4 BULK
0.010	J01	2.5	6.5	7.2	20	SMR5 103K250J01L4 BULK
0.012	J01	2.5	6.5	7.2	20	SMR5 123K250J01L4 BULK
0.015	J02	3.5	8.0	7.2	20	SMR5 153K250J02L4 BULK
0.018	J02	3.5	8.0	7.2	20	SMR5 183K250J02L4 BULK
0.022	J02	3.5	8.0	7.2	20	SMR5 223K250J02L4 BULK
0.027	J02	3.5	8.0	7.2	20	SMR5 273K250J02L4 BULK
0.033	J03	4.5	9.0	7.2	20	SMR5 333K250J03L4 BULK
0.039	J03	4.5	9.0	7.2	20	SMR5 393K250J03L4 BULK
0.047	J03	4.5	9.0	7.2	20	SMR5 473K250J03L4 BULK
0.056	J04	5.0	10.0	7.2	20	SMR5 563K250J04L4 BULK
0.068	J05	6.0	11.0	7.2	20	SMR5 683K250J05L4 BULK
0.082	J05	6.0	11.0	7.2	20	SMR5 823K250J05L4 BULK
0.10	J06	7.2	13.0	7.2	20	SMR5 104K250J06L4 BULK
0.12	J06	7.2	13.0	7.2	20	SMR5 124K250J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K01	4.0	8.0	10.0	30	SMR7.5 102K250K01L4 BULK
0.0012	K01	4.0	8.0	10.0	30	SMR7.5 122K250K01L4 BULK
0.0015	K01	4.0	8.0	10.0	30	SMR7.5 152K250K01L4 BULK
0.0018	K01	4.0	8.0	10.0	30	SMR7.5 182K250K01L4 BULK
0.0022	K01	4.0	8.0	10.0	30	SMR7.5 222K250K01L4 BULK
0.0027	K01	4.0	8.0	10.0	30	SMR7.5 272K250K01L4 BULK
0.0033	K01	4.0	8.0	10.0	30	SMR7.5 332K250K01L4 BULK
0.0039	K01	4.0	8.0	10.0	30	SMR7.5 392K250K01L4 BULK
0.0047	K01	4.0	8.0	10.0	30	SMR7.5 472K250K01L4 BULK
0.0056	K01	4.0	8.0	10.0	30	SMR7.5 562K250K01L4 BULK
0.0068	K01	4.0	8.0	10.0	30	SMR7.5 682K250K01L4 BULK
0.0082	K01	4.0	8.0	10.0	30	SMR7.5 822K250K01L4 BULK
0.010	K01	4.0	8.0	10.0	30	SMR7.5 103K250K01L4 BULK
0.012	K01	4.0	8.0	10.0	30	SMR7.5 123K250K01L4 BULK
0.015	K01	4.0	8.0	10.0	30	SMR7.5 153K250K01L4 BULK
0.018	K01	4.0	8.0	10.0	30	SMR7.5 183K250K01L4 BULK
0.022	K01	4.0	8.0	10.0	30	SMR7.5 223K250K01L4 BULK
0.027	K01	4.0	8.0	10.0	20	SMR7.5 273K250K01L4 BULK
0.033	K01	4.0	8.0	10.0	20	SMR7.5 333K250K01L4 BULK
0.039	K01	4.0	8.0	10.0	20	SMR7.5 393K250K01L4 BULK
0.047	K01	4.0	8.0	10.0	20	SMR7.5 473K250K01L4 BULK
0.056	K03	5.0	11.0	10.0	20	SMR7.5 563K250K03L4 BULK
0.068	K03	5.0	11.0	10.0	20	SMR7.5 683K250K03L4 BULK
0.082	K03	5.0	11.0	10.0	20	SMR7.5 823K250K03L4 BULK
0.10	K03	5.0	11.0	10.0	20	SMR7.5 104K250K03L4 BULK
0.12	K04	6.0	12.0	10.5	20	SMR7.5 124K250K04L4 BULK
0.15	K04	6.0	12.0	10.5	20	SMR7.5 154K250K04L4 BULK

ARTICLE TABLE

250 VDC/160 VAC

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0027	A01	4.0	9.0	13.0	25	SMR10 272K250A01L4 BULK
0.0033	A01	4.0	9.0	13.0	25	SMR10 332K250A01L4 BULK
0.0039	A01	4.0	9.0	13.0	25	SMR10 392K250A01L4 BULK
0.0047	A01	4.0	9.0	13.0	25	SMR10 472K250A01L4 BULK
0.0056	A01	4.0	9.0	13.0	25	SMR10 562K250A01L4 BULK
0.0068	A01	4.0	9.0	13.0	25	SMR10 682K250A01L4 BULK
0.0082	A01	4.0	9.0	13.0	25	SMR10 822K250A01L4 BULK
0.010	A01	4.0	9.0	13.0	15	SMR10 103K250A01L4 BULK
0.012	A01	4.0	9.0	13.0	15	SMR10 123K250A01L4 BULK
0.015	A01	4.0	9.0	13.0	15	SMR10 153K250A01L4 BULK
0.018	A01	4.0	9.0	13.0	15	SMR10 183K250A01L4 BULK
0.022	A01	4.0	9.0	13.0	15	SMR10 223K250A01L4 BULK
0.027	A01	4.0	9.0	13.0	15	SMR10 273K250A01L4 BULK
0.033	A01	4.0	9.0	13.0	15	SMR10 333K250A01L4 BULK
0.039	A01	4.0	9.0	13.0	15	SMR10 393K250A01L4 BULK
0.047	A01	4.0	9.0	13.0	15	SMR10 473K250A01L4 BULK
0.056	A01	4.0	9.0	13.0	15	SMR10 563K250A01L4 BULK
0.068	A01	4.0	9.0	13.0	15	SMR10 683K250A01L4 BULK
0.082	A02	4.5	10.5	13.0	15	SMR10 823K250A02L4 BULK
0.10	A02	4.5	10.5	13.0	15	SMR10 104K250A02L4 BULK
0.12	A03	5.0	11.0	13.0	15	SMR10 124K250A03L4 BULK
0.15	A04	6.0	12.0	13.0	15	SMR10 154K250A04L4 BULK
0.18	A04	6.0	12.0	13.0	15	SMR10 184K250A04L4 BULK

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.10	B04	5.5	10.5	18.0	10	SMR15 104K250B04L4 BULK
0.12	B04	5.5	10.5	18.0	10	SMR15 124K250B04L4 BULK
0.15	B04	5.5	10.5	18.0	10	SMR15 154K250B04L4 BULK
0.18	B05	5.5	12.5	18.0	10	SMR15 184K250B05L4 BULK
0.22	B10	6.5	12.5	18.0	10	SMR15 224K250B10L4 BULK
0.27	B06	7.5	14.5	18.0	10	SMR15 274K250B06L4 BULK
0.33	B06	7.5	14.5	18.0	10	SMR15 334K250B06L4 BULK
0.39	B12	8.0	15.0	18.0	10	SMR15 394K250B12L4 BULK
0.47	B11	8.5	16.0	18.0	10	SMR15 474K250B11L4 BULK
0.56	B14	9.5	17.5	18.0	10	SMR15 564K250B14L4 BULK

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.47	D13	6.5	14.5	26.0	8	SMR22.5 474K250D13L4 TRAY
0.56	D17	7.0	16.5	26.0	8	SMR22.5 564K250D17L4 TRAY
0.68	D17	7.0	16.5	26.0	8	SMR22.5 684K250D17L4 TRAY
0.82	D15	9.0	18.5	26.0	8	SMR22.5 824K250D15L4 TRAY
1.0	D15	9.0	18.5	26.0	8	SMR22.5 105K250D15L4 TRAY
1.2	D18	10.5	19.0	26.0	8	SMR22.5 125K250D18L4 TRAY
1.5	D16	11.0	21.5	26.0	8	SMR22.5 155K250D16L4 TRAY

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
1.5	F11	10.5	20.5	31.5	6	SMR27.5 155K250F11L4 TRAY
1.8	F11	10.5	20.5	31.5	6	SMR27.5 185K250F11L4 TRAY
2.2	F12	11.5	22.5	31.5	6	SMR27.5 225K250F12L4 TRAY
2.7	F13	14.5	24.5	31.5	6	SMR27.5 275K250F13L4 TRAY
3.3	F14	17.5	28.0	31.5	6	SMR27.5 335K250F14L4 TRAY
3.9	F14	17.5	28.0	31.5	6	SMR27.5 395K250F14L4 TRAY

400 VDC/200 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	J01	2.5	6.5	7.2	40	SMR5 102K400J01L4 BULK
0.0012	J01	2.5	6.5	7.2	40	SMR5 122K400J01L4 BULK
0.0015	J01	2.5	6.5	7.2	40	SMR5 152K400J01L4 BULK
0.0018	J01	2.5	6.5	7.2	40	SMR5 182K400J01L4 BULK
0.0022	J01	2.5	6.5	7.2	40	SMR5 222K400J01L4 BULK
0.0027	J01	2.5	6.5	7.2	40	SMR5 272K400J01L4 BULK
0.0033	J01	2.5	6.5	7.2	40	SMR5 332K400J01L4 BULK
0.0039	J01	2.5	6.5	7.2	40	SMR5 392K400J01L4 BULK
0.0047	J02	3.5	8.0	7.2	40	SMR5 472K400J02L4 BULK
0.0056	J02	3.5	8.0	7.2	40	SMR5 562K400J02L4 BULK
0.0068	J02	3.5	8.0	7.2	40	SMR5 682K400J02L4 BULK
0.0082	J02	3.5	8.0	7.2	40	SMR5 822K400J02L4 BULK
0.010	J02	3.5	8.0	7.2	40	SMR5 103K400J02L4 BULK
0.012	J02	3.5	8.0	7.2	40	SMR5 123K400J02L4 BULK
0.015	J03	4.5	9.0	7.2	40	SMR5 153K400J03L4 BULK
0.018	J03	4.5	9.0	7.2	40	SMR5 183K400J03L4 BULK
0.022	J04	5.0	10.0	7.2	40	SMR5 223K400J04L4 BULK
0.027	J04	5.0	10.0	7.2	40	SMR5 273K400J04L4 BULK
0.033	J05	6.0	11.0	7.2	40	SMR5 333K400J05L4 BULK
0.039	J05	6.0	11.0	7.2	40	SMR5 393K400J05L4 BULK
0.047	J06	7.2	13.0	7.2	40	SMR5 473K400J06L4 BULK
0.056	J06	7.2	13.0	7.2	40	SMR5 563K400J06L4 BULK

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0010	K01	4.0	8.0	10.0	30	SMR7.5 102K400K01L4BULK
0.0012	K01	4.0	8.0	10.0	30	SMR7.5 122K400K01L4BULK
0.0015	K01	4.0	8.0	10.0	30	SMR7.5 152K400K01L4BULK
0.0018	K01	4.0	8.0	10.0	30	SMR7.5 182K400K01L4BULK
0.0022	K01	4.0	8.0	10.0	30	SMR7.5 222K400K01L4BULK
0.0027	K01	4.0	8.0	10.0	30	SMR7.5 272K400K01L4BULK
0.0033	K01	4.0	8.0	10.0	30	SMR7.5 332K400K01L4BULK
0.0039	K01	4.0	8.0	10.0	30	SMR7.5 392K400K01L4BULK
0.0047	K01	4.0	8.0	10.0	30	SMR7.5 472K400K01L4BULK
0.0056	K01	4.0	8.0	10.0	30	SMR7.5 562K400K01L4BULK
0.0068	K01	4.0	8.0	10.0	30	SMR7.5 682K400K01L4BULK
0.0082	K01	4.0	8.0	10.0	30	SMR7.5 822K400K01L4BULK
0.010	K01	4.0	8.0	10.0	30	SMR7.5 103K400K01L4BULK
0.012	K01	4.0	8.0	10.0	30	SMR7.5 123K400K01L4BULK
0.015	K01	4.0	8.0	10.0	30	SMR7.5 153K400K01L4BULK
0.018	K01	4.0	8.0	10.0	30	SMR7.5 183K400K01L4BULK
0.022	K01	4.0	8.0	10.0	30	SMR7.5 223K400K01L4BULK
0.027	K03	5.0	11.0	10.0	30	SMR7.5 273K400K03L4BULK
0.033	K03	5.0	11.0	10.0	30	SMR7.5 333K400K03L4BULK
0.039	K03	5.0	11.0	10.0	30	SMR7.5 393K400K03L4BULK
0.047	K03	5.0	11.0	10.0	30	SMR7.5 473K400K03L4BULK
0.056	K04	6.0	12.0	10.5	30	SMR7.5 563K400K04L4BULK
0.068	K04	6.0	12.0	10.5	30	SMR7.5 683K400K04L4BULK

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.0027	A01	4.0	9.0	13.0	25	SMR10 272K400A01L4BULK
0.0033	A01	4.0	9.0	13.0	25	SMR10 332K400A01L4BULK
0.0039	A01	4.0	9.0	13.0	25	SMR10 392K400A01L4BULK
0.0047	A01	4.0	9.0	13.0	25	SMR10 472K400A01L4BULK
0.0068	A01	4.0	9.0	13.0	25	SMR10 682K400A01L4BULK
0.0082	A01	4.0	9.0	13.0	25	SMR10 822K400A01L4BULK
0.010	A01	4.0	9.0	13.0	25	SMR10 103K400A01L4BULK
0.012	A01	4.0	9.0	13.0	25	SMR10 123K400A01L4BULK
0.015	A01	4.0	9.0	13.0	25	SMR10 153K400A01L4BULK
0.018	A01	4.0	9.0	13.0	25	SMR10 183K400A01L4BULK

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
400 VDC/200 VAC						
LEAD SPACING 10 MM						
0.022	A01	4.0	9.0	13.0	25	SMR10 223K400A01L4BULK
0.027	A01	4.0	9.0	13.0	25	SMR10 273K400A01L4BULK
0.033	A01	4.0	9.0	13.0	25	SMR10 333K400A01L4BULK
0.039	A02	4.5	10.5	13.0	25	SMR10 393K400A02L4BULK
0.047	A03	5.0	11.0	13.0	25	SMR10 473K400A03L4BULK
0.056	A03	5.0	11.0	13.0	25	SMR10 563K400A03L4BULK
0.068	A04	6.0	12.0	13.0	25	SMR10 683K400A04L4BULK
0.082	A04	6.0	12.0	13.0	25	SMR10 823K400A04L4BULK
LEAD SPACING 15 MM						
0.047	B04	5.5	10.5	18.0	15	SMR15 473K400B04L4BULK
0.056	B04	5.5	10.5	18.0	15	SMR15 563K400B04L4BULK
0.068	B04	5.5	10.5	18.0	15	SMR15 683K400B04L4BULK
0.082	B05	5.5	12.5	18.0	15	SMR15 823K400B05L4BULK
0.10	B10	6.5	12.5	18.0	15	SMR15 104K400B10L4BULK
0.12	B06	7.5	14.5	18.0	15	SMR15 124K400B06L4BULK
0.15	B06	7.5	14.5	18.0	15	SMR15 154K400B06L4BULK
0.18	B12	8.0	15.0	18.0	15	SMR15 184K400B12L4BULK
0.22	B11	8.5	16.0	18.0	15	SMR15 224K400B11L4BULK
0.27	B14	9.5	17.5	18.0	15	SMR15 274K400B14L4BULK

ARTICLE TABLE

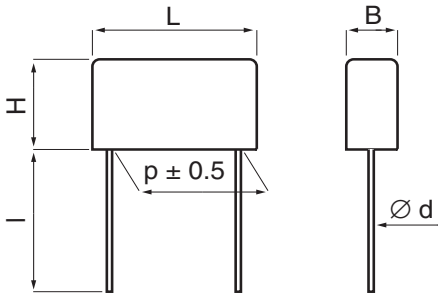
Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
400 VDC/200 VAC						
LEAD SPACING 22.5 MM						
0.15	D13	6.5	14.5	26.0	10	SMR22.5 154K400D13L4TRAY
0.18	D13	6.5	14.5	26.0	10	SMR22.5 184K400D13L4TRAY
0.22	D13	6.5	14.5	26.0	10	SMR22.5 224K400D13L4TRAY
0.27	D17	7.0	16.5	26.0	10	SMR22.5 274K400D17L4TRAY
0.33	D14	8.0	16.0	26.0	10	SMR22.5 334K400D14L4TRAY
0.39	D15	9.0	18.5	26.0	10	SMR22.5 394K400D15L4TRAY
0.47	D15	9.0	18.5	26.0	10	SMR22.5 474K400D15L4TRAY
0.56	D18	10.5	19.0	26.0	10	SMR22.5 564K400D18L4TRAY
0.68	D16	11.0	21.5	26.0	10	SMR22.5 684K400D16L4TRAY
LEAD SPACING 27.5 MM						
0.47	F11	10.5	20.5	31.5	8	SMR27.5 474K400F11L4TRAY
0.56	F11	10.5	20.5	31.5	8	SMR27.5 564K400F11L4TRAY
0.68	F11	10.5	20.5	31.5	8	SMR27.5 684K400F11L4TRAY
0.82	F12	11.5	22.5	31.5	8	SMR27.5 824K400F12L4TRAY
1.0	F12	11.5	22.5	31.5	8	SMR27.5 105K400F12L4TRAY
1.2	F13	14.5	24.5	31.5	8	SMR27.5 125K400F13L4TRAY
1.5	F14	17.5	28.0	31.5	8	SMR27.5 155K400F14L4TRAY
1.8	F14	17.5	28.0	31.5	8	SMR27.5 185K400F14L4TRAY

PME261

- **General purpose AC/DC**
- **Metallized paper**

RoHS Compliant

- IEC Publ. 166 Type 1
- High dU/dt capability.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- Approved according to SE-MIL-QPL.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.



d = 0.6 for p = 10.2
0.8 for p = 15.2 and 20.3
1.0 for p = 25.4

l = standard: 30 +5/–0 mm

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TYPICAL APPLICATIONS

For general use in DC and low frequency pulse applications.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.

TECHNICAL DATA

	PME261 K	PME261 E	PME261 J
Rated voltage U_R, VAC **Rated voltage U_R, VDC**	220 400	300 630	500 1000
Capacitance range, µF	0.0082 - 1.0	0.001 - 0.15	0.001 - 0.1
Capacitance tolerance	— ± 10% code K ± 5% code J	± 20% code M ± 10% code K —	± 20% code M ± 10% code K —

Temperature range
AC application -40 to +70°C
DC application -40 to + 100°C

Climatic category
IEC 40/070/56

Dissipation factor
≤ 1.3 % at 1 kHz

Insulation resistance
C ≤ 0.33 µF 12000 MΩ
C > 0.33 µF 4000 s
PME261 K measured at 100 VDC after 60 s, +23°C
PME261 E and J measured at 500 VDC after 60 s, +23°C

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Passive flammability	IEC 60695-2-2		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

MARKING

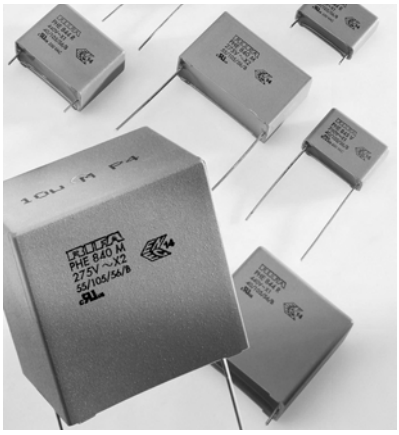
- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage AC/DC
- MP, for metallized paper
- Climatic category according to IEC 60068-, appendix A
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

ARTICLE TABLE

Capacitance µF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	Max dU/dt V/µs	Article code
220 VAC / 400 VDC PME261 K										
LEAD SPACING 10.2 MM										
0.0082	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261KA4820KR30
0.010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261KA5100KR30
0.015	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261KA5150KR30
0.022	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261KA5220KR30
LEAD SPACING 15.2 MM										
0.033	5.2	10.5	18.5	15.2	500	1000	600	1.7	1600	PME261KB5330KR30
0.047	5.2	10.5	18.5	15.2	500	1000	600	1.7	1300	PME261KB5470KR30
0.068	7.3	13.0	18.5	15.2	400	800	400	3.0	1100	PME261KB5680KR30
0.10	7.3	13.0	18.5	15.2	400	800	400	3.0	850	PME261KB6100KR30
LEAD SPACING 20.3 MM										
0.15	7.6	14.0	24.0	20.3	250	1500	250	4.0	700	PME261KC6150KR30
0.22	8.4	14.0	24.0	20.3	200	1500	250	4.5	560	PME261KC6220KR30
0.33	11.3	16.5	24.0	20.3	150	1000	180	7.0	430	PME261KC6330KR30
LEAD SPACING 25.4 MM										
0.47	10.6	17.3	30.5	25.4	100	1000		8.0	370	PME261KE6470KR30
0.68	15.3	22.0	30.5	25.4	75	600		15.0	300	PME261KE6680KR30
1.0	15.3	22.0	30.5	25.4	75	600		15.0	220	PME261KE7100KR30
300 VAC / 630 VDC PME261 E										
LEAD SPACING 10.2 MM										
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4100MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4150MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4220MR30
0.0033	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4330MR30
0.0047	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4470MR30
0.0068	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261EA4680MR30
0.010	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261EA5100KR30
0.015	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261EA5150KR30
LEAD SPACING 15.2 MM										
0.022	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME261EB5220KR30
0.033	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME261EB5330KR30
0.047	7.3	13.0	18.5	15.2	400	800	400	3.0	1600	PME261EB5470KR30
0.068	7.3	13.0	18.5	15.2	400	800	400	3.0	1200	PME261EB5680KR30
LEAD SPACING 20.3 MM										
0.10	7.6	14.0	24.0	20.3	250	1500	250	4.0	900	PME261EC6100KR30
0.15	9.0	15.0	24.0	20.3	200	1200	250	5.0	650	PME261EC6150KR30
500 VAC/ 1000 VDC PME261 J										
LEAD SPACING 10.2 MM										
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261JA4100MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261JA4150MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261JA4220MR30
0.0033	3.9	7.5	13.5	10.2	1000	2000	700	0.7	2000	PME261JA4330MR30
0.0047	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261JA4470MR30
0.0068	5.1	10.5	13.5	10.2	800	1600	600	1.2	2000	PME261JA4680MR30
LEAD SPACING 15.2 MM										
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME261JB5100KR30
0.015	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME261JB5150KR30
0.022	7.3	13.0	18.5	15.2	400	800	400	3.0	2000	PME261JB5220KR30
0.033	7.8	13.5	18.5	15.2	400	800	400	3.3	2000	PME261JB5330KR30
LEAD SPACING 20.3 MM										
0.047	7.6	14.0	24.0	20.3	250	1500	250	4.0	2000	PME261JC5470KR30
0.068	9.0	15.0	24.0	20.3	200	1200	250	5.0	1400	PME261JC5680KR30
0.10	11.3	16.5	24.0	20.3	150	1000	180	7.0	950	PME261JC6100KR30



EMI Suppressors

This section covers capacitors mainly intended for electromagnetic interference suppression in AC applications.

SMP253 is a class Y2 EMI Suppressor. Please see the product data in our SMD Film Capacitors Catalogue or www.kemet.com

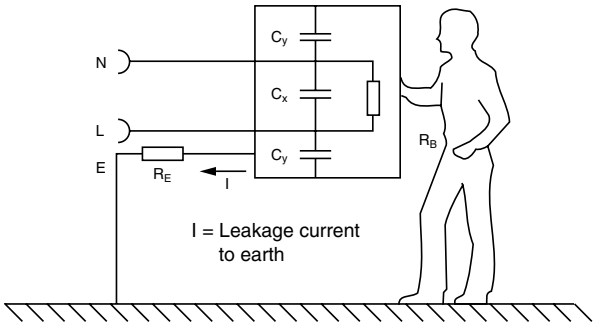
Type	Class	Rated voltage VAC	Max temperature °C	Capacitance range µF		Dielectric	Page
PME271E	X1	300	110	0.01	- 0.22	Metallized Paper	63
PME278	X1	440	110	0.01	- 0.15	Metallized Paper	69
PHE841	X1	330	100	0.01	- 2.2	Metallized Polypropylene	53
PHE844	X1	440/480	105	0.1	- 2.2	Metallized Polypropylene	55
PHE845	X1	760/600	105	0.01	- 1.0	Metallized Polypropylene	57
PHE820E	X2	300	100	0.01	- 2.2	Metallized Polyester	47
PHE820M	X2	275	100	0.01	- 2.2	Metallized Polyester	47
PHE840M	X2	275/280	105	0.01	- 10.0	Metallized Polypropylene	51
PHE840E	X2	300	105	0.01	- 10.0	Metallized Polypropylene	49
PME264	X2	660	85	0.001	- 0.1	Metallized Paper	61
PME271M	X2	275	110	0.01	- 0.6	Metallized Paper	65
PME295	Y1	440/480	115	0.00047	- 0.0047	Metallized Paper	71
PHE850	Y2	300/480	110	0.0015	- 1.0	Metallized Polypropylene	59
PME271Y	Y2	250	100	0.001	- 0.1	Metallized Paper	67
PME271YA-E	Y2	300	115	0.001	- 0.15	Metallized Paper	67
SMP253	Y2	250	100	0.001	- 0.0047	Metallized Paper	SMD catalogue

SAFETY CONSIDERATIONS

A capacitor for Electromagnetic Interference Suppression must be approved by a relevant authority either as a electromagnetic interference capacitor or as part of a complete unit of equipment.
Standards for EMI Capacitors:
EN/IEC 60384-14:2005
The capacitors are subdivided into two groups, X and Y.
X capacitors are for use in positions where a failure of the capacitor would not expose anybody to danger of electric shock. There are three sub-classes of X capacitors.
Y capacitors are for use in positions where a failure of the capacitor could expose somebody to dangerous electric shock. There are four sub-classes of Y capacitors.

Sub-class	Type of insulation bridged	Rated voltage	Peak impulse voltage before endurance test
Y1	Double insulation or reinforced insulation	≤ 500 V	8.0 kV
Y2	Basic insulation or supplementary insulation	≥ 150 V, ≤ 300 V	5.0 kV
Y3	Basic insulation or supplementary insulation	≥ 150 V, ≤ 250 V	none
Y4	Basic insulation or supplementary insulation	< 150 V	2.5 kV

Note: A short circuit of a Y capacitor, or a too high capacitance, is hazardous if the earth line should be open circuit or connected to earth through a too high resistance. The National Approval Boards stipulate the maximum permitted current towards earth for different applications. A frequent current value for household equipment and portable tools is ≤ 0.5 mA.



Sub-class	Peak pulse voltage in service	IEC 60664 installation category	Application	Peak impulse voltage V_p applied before endurance test
X1	> 2.5 kV ≤ 4.0 kV	III	High pulse application	For C ≤ 1.0 µF: U_p = 4 kV For C > 1.0 µF: $U_p = 4/\sqrt{C}$ kV
X2	≤ 2.5 kV	II	General purpose	For C ≤ 1.0 µF: U_p = 2.5 kV For C > 1.0 µF: $U_p = 2.5/\sqrt{C}$ kV
X3	≤ 1.2 kV	–	General purpose	none

SAFETY APPROVALS

Type	Class *	ENEC	UL1283	UL1414	CSA 22.2 #1	CSA 22.2 #8
PME271E	X1	•	•			
PME278	X1	•				
PHE841	X1	•	•	•	•	•
PHE844	X1	•	•	•	•	•
PHE845	X1	•	•			•
PHE820E	X2	•		•		•
PHE820M	X2	•	•	•	•	•
PHE840M	X2	•	•	•	•	•
PHE840E	X2	•	•	•	•	•
PME264	X2	•	•			
PME271M	X2	•	•	•	•	
PME295	Y1	•		•	•	•
PME271Y	Y2	•	•			•
PME271YA-E	Y2	•	•			•
PHE850	Y2	•	•	•	•	•
SMP253 *	Y2	•		•	•	
PZB300	X2, Y2	•	•			•
PMZ2074	X2	•				
PHZ9004	X2					

* See Evox Rifa SMD Film Capacitors Catalogue

ELECTRICAL PROPERTIES

Self-healing
If a conducting particle or a voltage surge punctures the dielectric, an arc occurs at the point of failure melting the surrounding metal and insulating the area of the breakdown.
The self-healing mechanism works differently in different kinds of metallized dielectrics. In the metallized paper capacitor as processed by Evox Rifa a breakdown caused by a short transient normally results in an improvement of the insulation resistance. In metallized plastic film dielectrics a breakdown causes a reduction of the insulation resistance due to a higher carbon deposit in the breakdown channel than for paper. Consequently, metallized paper capacitors are to be preferred if the capacitor is to be used where uncontrolled transient voltages can occur.

Rated voltage (U_R)
The rated voltage is the maximum RMS alternating voltage (AC) which may be applied continuously to the terminals of the capacitor at any temperature within the rated temperature range.
In EN/IEC 60384-14:2005 it is stated that: Electromagnetic Interference suppression capacitors shall be chosen to have a rated voltage equal to or greater than the nominal voltage of the supply system to which they are connected. The design of the capacitors should take into account the possibility that the voltage of the system may rise by up to 10% above its nominal voltage.

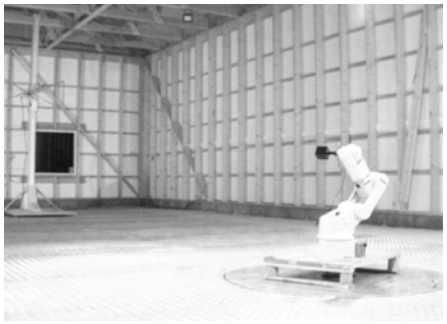
Test voltage
Test voltages according to EN/IEC 60384-14:2005 for qualification approval, periodic testing and lot-by-lot testing, see table to the right.
Repeated high voltage tests should as far as possible be avoided as it is more or less destructive regardless of type of dielectric or manufacturer. This is also pointed out in the standards for EMI Suppression capacitors.
DC is preferable to AC. The ionization caused by AC voltage increases the risk of permanent impairment of the test object. The test equipment is to be designed to avoid unspecified stresses of the test object, for example transients, when connecting or disconnecting the voltage. A DC test equipment must not have a tank capacitor. The test voltage must be applied with a certain rise time which is normally specified in the relevant standard.
All Evox Rifa capacitors in this catalogue are tested in production (factory test) with a DC voltage specified for each type. Unless something else is specified the user can apply the same voltage 1–2 times during some seconds.

Corona resistance
The Evox Rifa impregnation technique for metallized paper capacitors eliminates pin-holes, thus also eliminating potential gas cells. This process cannot entirely eliminate the possibility of weak points in the winding. These could result in a glow discharge, but the occurence of such a discharge will, due to good self-healing, eliminate the weak point and improve the insulation resistance thereafter.

Pulse durability
Laboratory tests and application reports verify that metallized paper capacitors can withstand very high levels of dU/dt. This property is unique for metallized paper capacitors.

Class	Rated voltage	Terminal to terminal	Terminal to case
X1 **X2** **X3**	≤ 760 V	4.3 U_R (DC)	2.0 U_R + 1500 V (AC) with a minimum of 2000 V (AC)
Y1	≤ 500 V	4000 V (AC)	4000 V (AC)
Y2	≥ 150 V, ≤ 300 V	1500 V (AC) [1]	2.0 U_R + 1500 V (AC)
Y3	≥ 150 V, ≤ 250 V		with a minimum of 2000 V (AC) [1]
Y4	< 150 V	900 V (AC) [1]	900 V (AC) [1]
[1]	For lot-by-lot tests of class Y2-, Y3- and Y4-capacitors the AC test voltage may be replaced by a DC voltage of 1.5 times the prescribed AC voltage.		

EMC COMPETENCE



The European EMC Directive prescribes Electromagnetic Compatibility for all electronic and electric equipment placed on the market of Europe.

Electromagnetic compatibility itself is defined as: “the ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.” (IEC)

Any electromagnetic emission, natural or ‘man-made’, is potentially a disturbance to any other susceptible device in the environment. It may either put it out of action or, in many cases a worse problem, cause it to malfunction. So there are two sides to the EMC equation:

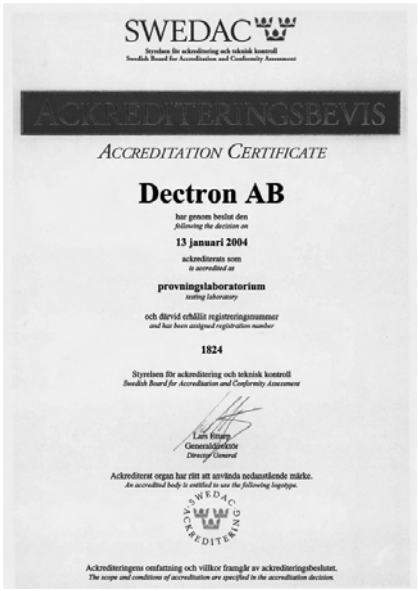
- **Emissions**. Source equipment whose controllable emissions must be limited
- **Immunity**. Equipment that needs to have adequate immunity to those disturbances in its environment.

The Swedish company Dectron AB is a part of the Evox Rifa Group. Dectron has a complete EMC testing laboratory and expertise for rectifying a range of interference problems. Dectron is accredited to the most common standards within EMC.

Together with our customers, Evox Rifa and Dectron have the unique opportunity to solve many problems regarding electromagnetic interference. Apart from professional advice, Dectron has the ability to manufacture customized interference filters.

Many years experience of EMI capacitors and EMC testing guarantees the customer a professional solution.

For more information, please contact Evox Rifa or find information at www.dectron.se


SWEDAC

ACKREDITERINGSBEVIS

ACCREDITATION CERTIFICATE

Dectron AB

har genom beslut den
following the decision on

13 januari 2004

ackrediterats som
is accredited as

provningslaboratorium
testing laboratory

och därvid erhållit registreringsnummer
and has been assigned registration number

1824

Styrelsen för ackreditering och teknisk kontroll
Swedish Board for Accreditation and Conformity Assessment

Lars Finnp
Generaldirektör
Director General

Ackrediterat organ har rätt att använda nedanstående märke.
An accredited body is entitled to use the following logotype.

SWEDAC ACKREDITERING

Ackrediteringens omfattning och villkor framgår av ackrediteringsbeslutet.
The scope and conditions of accreditation are specified in the accreditation decision.

QUALITY TESTS AND REQUIREMENTS

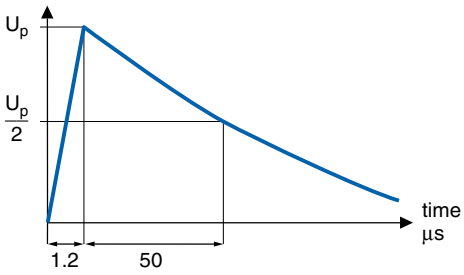
The tests described below are the most important for EMI capacitors.

Test	Publication	Procedure	Requirements
Impulse voltage	EN/IEC 60384-14: 2005	According to fig. 1 Before Endurance	No permanent breakdown or flashover
Endurance	EN/IEC 60384-14: 2005	According to fig. 2 with U_2 = 1000 VAC X: U_1 = 1.25 x U_R VAC Y: U_1 = 1.7 x U_R VAC	Voltage proof C, DF and Insulation
Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hours each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068-2-14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1s for d > 0.8 < 1.5s
Passive flammability	EN/IEC 60384-14: 2005	Flame exposure time depending on severity class	3, 10 or 30 s burning time depending on flammability
Active flammability	EN/IEC 60384-14: 2005 (Fig 3.)	Surge pulses U_i + U_R AC	No flame
Humidity	IEC 60068-2-3 Test Ca	+ 40°C and 90 – 95% R.H.	21 or 56 days

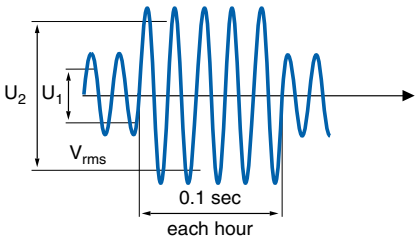
Impulse voltage test (fig. 1)
According to EN/IEC 60384-14:2005

Capacitor class	U_p kV
X1	4
X2	2.5
X3	none
Y1	8
Y2	5
Y3	none
Y4	2.5

Fig. 1



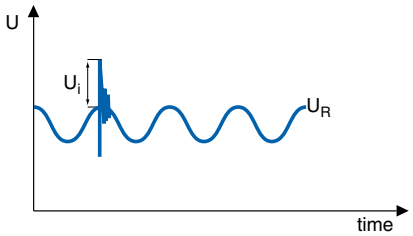
Endurance test (fig. 2)
According to EN/IEC 60384-14:2005
Fig. 2



Active flammability (fig. 3)
According to EN/IEC 60384-14:2005
U_R VAC is connected to the capacitor. With an interval of 5 s, 20 pulses (U_i) are placed on the capacitor. The capacitor may not burn.

Capacitor class	U_i kV
Y2	5
X1	4
X2, Y3, Y4	2.5
X3	1.2
Y1	not tested

Fig. 3



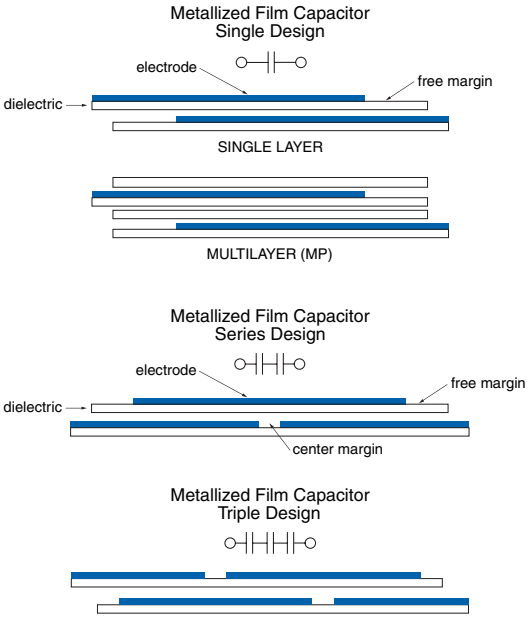
BASIC DESIGN

The capacitor consists of a winding which, for a single layer capacitor, comprises two strips of metallized dielectric. On the metallized dielectric a margin is left on one side, and the strips are so arranged, that the metal coating on one strip extends to one edge of the finished winding, and the metal coating on the next strip extends to the other edge.

Connections to the electrodes are made by spraying a layer of metal on the ends of the winding, to which the terminating wires can subsequently be attached by welding or soldering.

During manufacture the capacitor is connected to a DC supply to clear the metal layer around pin-holes and other weak spots in the dielectric to ensure a high and stable insulation in the capacitor. To meet high voltage and safety demands some capacitors have a series winding construction.

In metallized paper capacitors intended for higher voltages one or more layers of plain paper are inserted between the metallized papers to reinforce the dielectric (multi-layer). The MP winding is impregnated with epoxy resin in vacuum.



PHE820

- **EMI suppressor, class X2, metallized polyester**
- **0.01 – 2.2 µF, 275/300 VAC, +100°C**

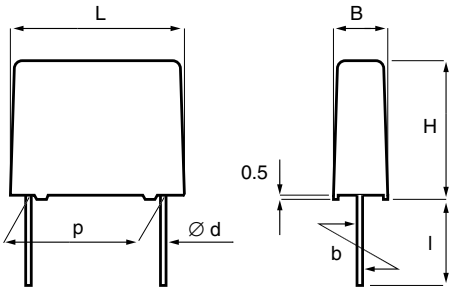
RoHS Compliant

TYPICAL APPLICATIONS

The capacitors are intended for use as Interference suppressor in X2 and across-the-line applications.

CONSTRUCTION

Series winding of metallized polyester, encapsulated in self-extinguishing material meeting the requirements of UL 94V-0.



p	d	std l	max l	b
15.0 ± 0.4	0.8	17	30	±0.4
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

	PHE820 M	PHE820 E
Rated voltage	275 VAC 50/60 Hz	300 VAC 50/60 Hz
Capacitance range	0.01 – 2.2 µF	0.01 – 2.2 µF
Capacitance tolerance	± 20% standard, ± 10% option	
Temperature range	–40 to +100°C	
Climatic category	40/100/56/B	
Approvals	ENEC, UL, CSA	
Dissipation factor tanδ	≤ 1.0% at 1 kHz	
Insulation resistance	C ≤ 0.33 µF ≥ 30 000 MΩ C > 0.33 µF ≥ 10 000 s	
Resonance frequency	Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.	
Test voltage between terminals	The 100% screening factory test is carried out at 2150 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.	
In DC applications	Recommended voltage ≤ 760 VDC	

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14: 2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temp.	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10 – 55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14: 2005		
Passive flammability	EN/IEC 60384-14: 2005		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance* µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
275 VAC, PHE820M							
LEAD SPACING 15 MM							
0.010	B04	5.5	10.5	18.0	13	100	PHE820MB5100MR17
0.015	B04	5.5	10.5	18.0	11	100	PHE820MB5150MR17
0.022	B04	5.5	10.5	18.0	9.0	100	PHE820MB5220MR17
0.033	B05	5.5	12.5	18.0	7.5	100	PHE820MB5330MR17
0.047	B10	6.5	12.5	18.0	6.5	100	PHE820MB5470MR17
0.068	B06	7.5	14.5	18.0	5.5	100	PHE820MB5680MR17
0.10	B11	8.5	16.0	18.0	4.5	100	PHE820MB6100MR17
LEAD SPACING 22.5 MM							
0.10	D13	6.5	14.5	26.0	4.5	100	PHE820MD6100MR06L2
0.15	D14	8.0	16.0	26.0	3.9	100	PHE820MD6150MR06L2
0.22	D15	9.0	18.5	26.0	2.7	100	PHE820MD6220MR06L2
0.33	D16	11.0	21.5	26.0	2.5	100	PHE820MD6330MR06L2
LEAD SPACING 27.5 MM							
0.47	F12	11.5	22.5	31.5	1.9	100	PHE820MF6470MR06L2
0.68	F13	14.5	24.5	31.5	1.6	100	PHE820MF6680MR06L2
1.0	F14	17.5	28.0	31.5	1.3	100	PHE820MF7100MR06L2
LEAD SPACING 37.5 MM							
1.5	R02	16.5	32.0	41.0	0.75	100	PHE820MR7150MR06L2
2.2	R03	19.0	36.0	41.0	0.65	100	PHE820MR7220MR06L2
300 VAC, PHE820E							
LEAD SPACING 15 MM							
0.010	B04	5.5	10.5	18.0	13	100	PHE820EB5100MR17
0.015	B04	5.5	10.5	18.0	11	100	PHE820EB5150MR17
0.022	B04	5.5	10.5	18.0	9.0	100	PHE820EB5220MR17
0.033	B05	5.5	12.5	18.0	7.5	100	PHE820EB5330MR17
0.047	B10	6.5	12.5	18.0	6.5	100	PHE820EB5470MR17
0.068	B06	7.5	14.5	18.0	5.5	100	PHE820EB5680MR17
0.10	B11	8.5	16.0	18.0	4.5	100	PHE820EB6100MR17
LEAD SPACING 22.5 MM							
0.10	D13	6.5	14.5	26.0	4.5	100	PHE820ED6100MR06L2
0.15	D14	8.0	16.0	26.0	3.9	100	PHE820ED6150MR06L2
0.22	D15	9.0	18.5	26.0	2.7	100	PHE820ED6220MR06L2
0.33	D16	11.0	21.5	26.0	2.5	100	PHE820ED6330MR06L2
LEAD SPACING 27.5 MM							
0.33	F11	10.5	20.5	31.5	2.4	100	PHE820EF6330MR06L2
0.47	F12	11.5	22.5	31.5	1.9	100	PHE820EF6470MR06L2
0.68	F13	14.5	24.5	31.5	1.6	100	PHE820EF6680MR06L2
1.0	F14	17.5	28.0	31.5	1.3	100	PHE820EF7100MR06L2
LEAD SPACING 37.5 MM							
1.5	R02	16.5	32.0	41.0	0.75	100	PHE820ER7150MR06L2
2.2	R03	19.0	36.0	41.0	0.65	100	PHE820ER7220MR06L2

*The complete serie includes C values according to the E12 series. Details on request.

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 250 VAC)
	UL 1414	(U_R = 250 VAC)
CSA	C 22.2 No.8	
	C 22.2 No.1	(U_R = 125 VAC) ($\leq$ 0.47 µF)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X2
- Approval marks
- Manufacturing code (year, month)
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PHE840E

RoHS Compliant

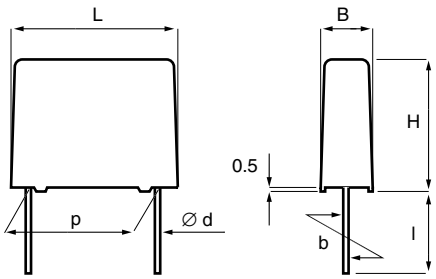
- **EMI suppressor, class X2, metallized polypropylene**
- **0.01 – 10 µF, 300 VAC, +105°C**
- **New improved design: small dimensions including low profile capacitors**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X2 and across-the-line applications.

CONSTRUCTION

Metallized polypropylene winding, encapsulated in self-extinguishing material meeting the requirements of UL 94 V–0.



P	d	std l	max l	b
10.0 ± 0.4	0.6	17	30	±0.4
15.0 ± 0.4	0.8	17	30	±0.4
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
300 VAC 50/60 Hz

Capacitance range
0.01 – 10 µF

Capacitance tolerance
± 20% standard, ± 10% option

Temperature range
–55 to +105°C

Climatic category
55/105/56/B

Approvals
ENEC, UL, cUL
related to rated voltage and climatic category

Dissipation factor tanδ
Maximum values at +23°C

	C ≤ 0.1 µF	0.1µF < C ≤ 1 µF	C > 1 µF
1 kHz	0.1%	0.1%	0.1%
10 kHz	0.2%	0.4%	0.8%
100 kHz	0.6%	–	–

Test voltage between terminals
The 100% screening factory test is carried out at 2200 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

Resonance frequency
Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 ΩF

In DC applications
Recommended voltage ≤ 760 VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 10 MM							
0.010	A01	4.0	9.0	13.0	11	100	PHE840EA5100MA01R17
0.012	A01	4.0	9.0	13.0	10	100	PHE840EA5120MA01R17
0.015	A01	4.0	9.0	13.0	9.4	100	PHE840EA5150MA01R17
0.018	A01	4.0	9.0	13.0	8.9	100	PHE840EA5180MA01R17
0.022	A01	4.0	9.0	13.0	8.6	100	PHE840EA5220MA01R17
0.027	A02	4.5	10.5	13.0	8.1	100	PHE840EA5270MA02R17
0.033	A02	4.5	10.5	13.0	7.6	100	PHE840EA5330MA02R17
0.039	A03	5.0	11.0	13.0	6.6	100	PHE840EA5390MA03R17
0.047	A03	5.0	11.0	13.0	6.1	100	PHE840EA5470MA03R17
0.056	A04	6.0	12.0	13.0	5.6	100	PHE840EA5560MA04R17
0.068	A04	6.0	12.0	13.0	5.0	100	PHE840EA5680MA04R17
LEAD SPACING 15 MM							
0.033	B04	5.5	10.5	18.0	5.9	100	PHE840EB5330MB04R17
0.039	B04	5.5	10.5	18.0	5.4	100	PHE840EB5390MB04R17
0.047	B04	5.5	10.5	18.0	5.0	100	PHE840EB5470MB04R17
0.056	B04	5.5	10.5	18.0	4.6	100	PHE840EB5560MB04R17
0.068	B04	5.5	10.5	18.0	4.2	100	PHE840EB5680MB04R17
0.082	B05	5.5	12.5	18.0	3.9	100	PHE840EB5820MB05R17
0.10	B05	5.5	12.5	18.0	3.7	100	PHE840EB6100MB05R17
0.12	B10	6.5	12.5	18.0	3.3	100	PHE840EB6120MB10R17
0.15	B10	6.5	12.5	18.0	2.8	100	PHE840EB6150MB10R17
0.18	B06	7.5	14.5	18.0	2.7	100	PHE840EB6180MB06R17
0.22	B06	7.5	14.5	18.0	2.6	100	PHE840EX6220MB06R17 *
0.22	B17	13.0	12.5	18.0	2.5	100	PHE840EQ6220MB17R17
0.22	B12	8.0	15.0	18.0	2.5	100	PHE840EB6220MB12R17
0.27	B11	8.5	16.5	18.0	2.3	100	PHE840EB6270MB11R17
0.33	B11	8.5	16.5	18.0	2.2	100	PHE840EX6330MB11R17*
0.33	B17	13.0	12.5	18.0	2.2	100	PHE840EH6330MB17R17
0.33	B14	9.5	17.5	18.0	2.0	100	PHE840EB6330MB14R17
0.39	B16	11.0	19.0	18.0	1.9	100	PHE840EB6390MB16R17
0.47	B16	11.0	19.0	18.0	1.8	100	PHE840EB6470MB16R17
LEAD SPACING 22.5 MM							
0.22	D13	6.5	14.5	26.0	2.1	100	PHE840ED6220MD13R06L2
0.27	D17	7.0	16.5	26.0	1.9	100	PHE840ED6270MD17R06L2
0.33	D17	7.0	16.5	26.0	1.8	100	PHE840ED6330MD17R06L2
0.39	D14	8.0	16.0	26.0	1.7	100	PHE840ED6390MD14R06L2
0.47	D14	8.0	16.0	26.0	1.6	100	PHE840EY6470MD14R06L2*
0.47	D15	9.0	18.5	26.0	1.5	100	PHE840ED6470MD15R06L2
0.56	D15	9.0	18.5	26.0	1.4	100	PHE840ED6560MD15R06L2
0.68	D15	9.0	18.5	26.0	1.3	100	PHE840EY6680MD15R06L2*
0.68	D18	10.5	19.0	26.0	1.2	100	PHE840ED6680MD18R06L2
0.82	D16	11.0	21.5	26.0	1.1	100	PHE840ED6820MD16R06L2
1.0	D16	11.0	21.5	26.0	1.1	100	PHE840EY7100MD16R06L2*
1.0	D20	13.5	23.0	26.0	1.0	100	PHE840ED7100MD20R06L2
1.2	D19	15.5	24.5	26.0	0.90	100	PHE840ED7120MD19R06L2
1.5	D19	15.5	24.5	26.0	0.85	100	PHE840ED7150MD19R06L2
LEAD SPACING 27.5 MM							
0.82	F11	10.5	20.5	31.5	1.0	100	PHE840EF6820MF11R06L2
1.0	F11	10.5	20.5	31.5	1.0	100	PHE840EZ7100MF11R06L2*
1.0	F12	11.5	22.5	31.5	0.95	100	PHE840EF7100MF12R06L2
1.0	F17	21.0	12.5	31.5	0.95	100	PHE840ET7100MF17R06L2
1.2	F03	13.5	23.0	31.5	0.82	100	PHE840EF7120MF03R06L2
1.5	F13	14.5	24.5	31.5	0.73	100	PHE840EF7150MF13R06L2
1.8	F14	17.5	28.0	31.5	0.65	100	PHE840EF7180MF14R06L2
2.2	F14	17.5	28.0	31.5	0.64	100	PHE840EZ7220MF14R06L2*
2.2	F15	19.0	29.0	31.5	0.62	100	PHE840EF7220MF15R06L2
2.2	F19	27.5	16.0	31.5	0.62	100	PHE840ET7220MF19R06L2
2.7	F15	19.0	29.0	31.5	0.58	100	PHE840EF7270MF15R06L2
3.3	F15	19.0	29.0	31.5	0.54	100	PHE840EZ7330MF15R06L2*
3.3	F16	21.0	30.0	31.5	0.50	100	PHE840EF7330MF16R06L2
3.3	F18	31.0	19.0	31.5	0.50	100	PHE840ET7330MF18R06L2
LEAD SPACING 37.5 MM							
1.8	R05	13.0	24.0	41.0	0.60	100	PHE840ER7180MR05R06L2
2.2	R05	13.0	24.0	41.0	0.58	100	PHE840ER7220MR05R06L2
2.7	R04	15.0	26.0	41.0	0.53	100	PHE840ER7270MR04R06L2
3.3	R04	15.0	26.0	41.0	0.49	100	PHE840ER7330MR04R06L2
3.9	R02	16.5	32.0	41.0	0.46	100	PHE840ER7390MR02R06L2
4.7	R03	19.0	36.0	41.0	0.44	100	PHE840ER7470MR03R06L2
5.6	R06	21.0	38.0	41.0	0.41	100	PHE840ER7560MR06R06L2
6.8	R06	21.0	38.0	41.0	0.39	100	PHE840ER7680MR06R06L2
8.2	R08	28.0	43.0	41.0	0.30	100	PHE840ER7820MR08R06L2
10	R08	28.0	43.0	41.0	0.26	100	PHE840ER8100MR08R06L2

* Only ± 20% tolerance

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283 UL 1414	(U_R = 250 VAC)
cUL recognition	C 22.2 No. 8 C 22.2 No. 1	

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X2
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PHE840M

RoHS Compliant

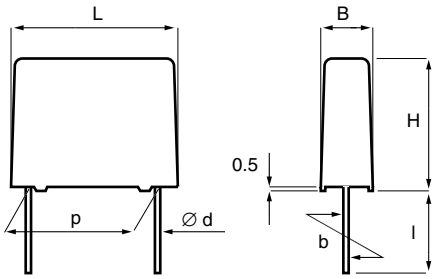
- **EMI suppressor, class X2, metallized polypropylene**
- **0.01 – 10.0 µF, 275/280 VAC, +105°C**
- **Small dimensions including low profile capacitors**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X2 and across-the-line applications.

CONSTRUCTION

Metallized polypropylene film encapsulated with selfextinguishing epoxy resin in a box of material recognized to UL 94 V–0.



p	d	std l	max l	b
7.5 ± 0.4	0.6	17	20	±0.4
10.0 ± 0.4	0.6	17	30	±0.4
15.0 ± 0.4	0.8	17	30	±0.4
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
275 VAC 50/60 Hz (ENEC)
280 VAC 50/60 Hz (UL, CSA)

Capacitance range
0.01 – 10.0 µF

Capacitance tolerance
± 20% standard, ± 10% option, ± 5% on request

Temperature range
–55 to +105°C

Climatic category
55/105/56/B

Approvals
ENEC, UL, cUL

Dissipation factor
Maximum values at +23°C

	C ≤ 0.1 µF	0.1µF < C ≤ 1 µF	C > 1 µF
1 kHz	0.1%	0.1%	0.1%
10 kHz	0.2%	0.4%	0.8%
100 kHz	0.6%	–	–

Test voltage between terminals
The 100% screening factory test is carried out at 2200 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 s

In DC applications
Recommended voltage ≤ 760 VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
0.010	K01	4.0	8.0	10.0	14	100	PHE840MK5100MK01R17
0.012	K01	4.0	8.0	10.0	13	100	PHE840MK5120MK01R17
0.015	K01	4.0	8.0	10.0	12	100	PHE840MK5150MK01R17
0.018	K03	5.0	11.0	10.0	11	100	PHE840MK5180MK03R17
0.022	K03	5.0	11.0	10.0	10	100	PHE840MK5220MK03R17
0.027	K03	5.0	11.0	10.0	9.5	100	PHE840MK5270MK03R17
0.033	K03	5.0	11.0	10.0	8.8	100	PHE840MK5330MK03R17
0.039	K03	5.0	11.0	10.0	8.3	100	PHE840MK5390MK03R17
0.047	K04	6.0	12.0	10.0	7.5	100	PHE840MK5470MK04R17

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
0.022	A01	4.0	9.0	13.0	8.5	100	PHE840MA5220MA01R17
0.027	A01	4.0	9.0	13.0	8.0	100	PHE840MA5270MA01R17
0.033	A01	4.0	9.0	13.0	7.6	100	PHE840MA5330MA01R17
0.039	A02	4.5	10.5	13.0	6.7	100	PHE840MA5390MA02R17
0.047	A02	4.5	10.5	13.0	5.9	100	PHE840MA5470MA02R17
0.056	A03	5.0	11.0	13.0	5.5	100	PHE840MA5560MA03R17
0.068	A03	5.0	11.0	13.0	4.9	100	PHE840MA5680MA03R17
0.082	A04	6.0	12.0	13.0	4.4	100	PHE840MA5820MA04R17
0.10	A05	9.5	7.5	13.0	4.0	100	PHE840MP6100MA05R17
0.10	A04	6.0	12.0	13.0	4.0	100	PHE840MA6100MA04R17

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
0.047	B04	5.5	10.5	18.0	5.0	100	PHE840MB5470MB04R17
0.056	B04	5.5	10.5	18.0	4.6	100	PHE840MB5560MB04R17
0.068	B04	5.5	10.5	18.0	4.2	100	PHE840MB5680MB04R17
0.082	B05	5.5	12.5	18.0	3.9	100	PHE840MB5820MB05R17
0.10	B05	5.5	12.5	18.0	3.7	100	PHE840MB6100MB05R17
0.12	B10	6.5	12.5	18.0	3.3	100	PHE840MB6120MB10R17
0.15	B10	6.5	12.5	18.0	2.8	100	PHE840MB6150MB10R17
0.18	B06	7.5	14.5	18.0	2.7	100	PHE840MB6180MB06R17
0.22	B06	7.5	14.5	18.0	2.6	100	PHE840MX6220MB06R17*
0.22	B17	13.0	12.5	18.0	2.5	100	PHE840MQ6220MB17R17
0.22	B12	8.0	15.0	18.0	2.5	100	PHE840MB6220MB12R17
0.27	B11	8.5	16.0	18.0	2.3	100	PHE840MB6270MB11R17
0.33	B11	8.5	16.0	18.0	2.2	100	PHE840MX6330MB11R17*
0.33	B17	13.0	12.5	18.0	2.2	100	PHE840MH6330MB17R17*
0.33	B14	9.5	17.5	18.0	2.0	100	PHE840MB6330MB14R17
0.39	B16	11.0	19.0	18.0	1.9	100	PHE840MB6390MB16R17
0.47	B16	11.0	19.0	18.0	1.8	100	PHE840MB6470MB16R17

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
0.22	D13	6.5	14.5	26.0	2.1	100	PHE840MD6220MD13R06L2
0.27	D17	7.0	16.5	26.0	1.9	100	PHE840MD6270MD17R06L2
0.33	D17	7.0	16.5	26.0	1.8	100	PHE840MD6330MD17R06L2
0.39	D14	8.0	16.0	26.0	1.7	100	PHE840MD6390MD14R06L2
0.47	D14	8.0	16.0	26.0	1.6	100	PHE840MY6470MD14R06L2*
0.47	D15	9.0	18.5	26.0	1.5	100	PHE840MD6470MD15R06L2
0.56	D15	9.0	18.5	26.0	1.4	100	PHE840MD6560MD15R06L2
0.68	D15	9.0	18.5	26.0	1.3	100	PHE840MY6680MD15R06L2*
0.68	D18	10.5	19.0	26.0	1.2	100	PHE840MD6680MD18R06L2
0.82	D16	11.0	21.5	26.0	1.1	100	PHE840MD6820MD16R06L2
1.0	D16	11.0	21.5	26.0	1.1	100	PHE840MY7100MD16R06L2*
1.0	D20	13.5	23.0	26.0	1.0	100	PHE840MD7100MD20R06L2
1.2	D19	15.5	24.5	26.0	0.90	100	PHE840MD7120MD19R06L2
1.5	D19	15.5	24.5	26.0	0.85	100	PHE840MD7150MD19R06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
0.82	F11	10.5	20.5	31.5	1.0	100	PHE840MF6820MF11R06L2
1.0	F11	10.5	20.5	31.5	1.0	100	PHE840MZ7100MF11R06L2 *
1.0	F12	11.5	22.5	31.5	0.95	100	PHE840MF7100MF12R06L2
1.2	F03	13.5	23.0	31.5	0.82	100	PHE840MF7120MF03R06L2
1.5	F13	14.5	24.5	31.5	0.73	100	PHE840MF7150MF13R06L2
1.8	F14	17.5	28.0	31.5	0.65	100	PHE840MF7180MF14R06L2
2.2	F14	17.5	28.0	31.5	0.64	100	PHE840MZ7220MF14R06L2 *
2.2	F15	19.0	29.0	31.5	0.62	100	PHE840MF7220MF15R06L2
2.7	F15	19.0	29.0	31.5	0.58	100	PHE840MF7270MF15R06L2
3.3	F15	19.0	29.0	31.5	0.54	100	PHE840MZ7330MF15R06L2 *
3.3	F16	21.0	30.0	31.5	0.50	100	PHE840MF7330MF16R06L2
3.3	F18	31.0	19.0	31.5	0.50	100	PHE840MT7330MF18R06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
1.8	R05	13.0	24.0	41.0	0.60	100	PHE840MR7180MR05R06L2
2.2	R05	13.0	24.0	41.0	0.58	100	PHE840MR7220MR05R06L2
2.7	R04	15.0	26.0	41.0	0.53	100	PHE840MR7270MR04R06L2
3.3	R04	15.0	26.0	41.0	0.49	100	PHE840MR7330MR04R06L2
3.9	R02	16.5	32.0	41.0	0.46	100	PHE840MR7390MR02R06L2
4.7	R03	19.0	36.0	41.0	0.44	100	PHE840MR7470MR03R06L2
5.6	R06	21.0	38.0	41.0	0.41	100	PHE840MR7560MR06R06L2
6.8	R06	21.0	38.0	41.0	0.39	100	PHE840MR7680MR06R06L2
8.2	R08	28.0	43.0	41.0	0.30	100	PHE840MR7820MR08R06L2
10.0	R08	28.0	43.0	41.0	0.26	100	PHE840MR8100MR08R06L2

* Only ± 20% tolerance

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 280 VAC)
	UL 1414	(U_R = 250 VAC)
cUL recognition	C 22.2 No. 8	(U_R = 280 VAC)
	C 22.2 No. 1	(U_R = 250 VAC)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X2
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PHE841

RoHS Compliant

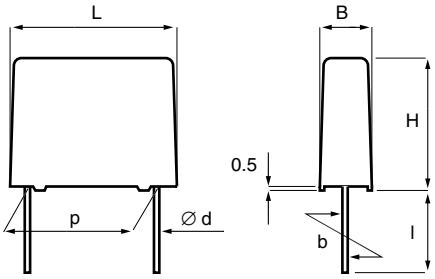
- **EMI suppressor, class X1, metallized polypropylene**
- **0.01 – 2.2 µF, 330 VAC, +100°C**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and across-the-line applications.

CONSTRUCTION

Metallized polypropylene winding, encapsulated in self-extinguishing material meeting the requirements of UL 94 V–0.



p	d	std l	max l	b
10.0 ± 0.4	0.6	17	30	±0.4
15.0 ± 0.4	0.8	17	30	±0.4
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
330 VAC 50/60 Hz

Capacitance range
0.01 – 2.2 µF

Capacitance tolerance
± 20% standard, ± 10% option

Temperature range
–40 to +100°C

Climatic category
40/100/56/B

Approvals
ENEC, UL, cUL

Dissipation factor tanδ
Maximum values at +23°C

	C ≤ 0.1 µF	0.1µF < C ≤ 1 µF	C > 1 µF
1 kHz	0.1%	0.1%	0.1%
10 kHz	0.2%	0.4%	0.8%
100 kHz	0.6%	–	–

Test voltage between terminals
The 100% screening factory test is carried out at 3000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

Resonance frequency
Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 s

In DC applications
Recommended voltage: ≤ 1000 VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 10 MM							
0.010	A02	4.5	10.5	13.0	11	100	PHE841EA5100MR17
0.012	A03	5.0	11.0	13.0	10	100	PHE841EA5120MR17
0.015	A03	5.0	11.0	13.0	9.4	100	PHE841EA5150MR17
0.018	A04	6.0	12.0	13.0	8.7	100	PHE841EA5180MR17
0.022	A04	6.0	12.0	13.0	8.1	100	PHE841EA5220MR17
LEAD SPACING 15 MM							
0.010	B04	5.5	10.5	18.0	10	100	PHE841EB5100MR17
0.012	B04	5.5	10.5	18.0	9.4	100	PHE841EB5120MR17
0.015	B04	5.5	10.5	18.0	8.7	100	PHE841EB5150MR17
0.018	B04	5.5	10.5	18.0	7.9	100	PHE841EB5180MR17
0.022	B05	5.5	12.5	18.0	7.2	100	PHE841EB5220MR17
0.027	B15	6.0	12.0	18.0	6.5	100	PHE841EB5270MR17
0.033	B10	6.5	12.5	18.0	5.9	100	PHE841EB5330MR17
0.039	B06	7.5	14.5	18.0	5.4	100	PHE841EB5390MR17
0.047	B06	7.5	14.5	18.0	5.0	100	PHE841EB5470MR17
0.056	B12	8.0	15.0	18.0	4.6	100	PHE841EB5560MR17
0.068	B11	8.5	16.0	18.0	4.2	100	PHE841EB5680MR17
0.082	B14	9.5	17.5	18.0	3.8	100	PHE841EB5820MR17
0.10	B14	9.5	17.5	18.0	3.7	100	PHE841EB6100MR17
LEAD SPACING 22.5 MM							
0.068	D13	6.5	14.5	26.0	2.9	100	PHE841ED5680MR06L2
0.082	D17	7.0	16.5	26.0	2.8	100	PHE841ED5820MR06L2
0.10	D17	7.0	16.5	26.0	2.7	100	PHE841ED6100MR06L2
0.12	D14	8.0	16.0	26.0	2.6	100	PHE841ED6120MR06L2
0.15	D15	9.0	18.5	26.0	2.5	100	PHE841ED6150MR06L2
0.18	D18	10.5	19.0	26.0	2.3	100	PHE841ED6180MR06L2
0.22	D18	10.5	19.0	26.0	2.2	100	PHE841ED6220MR06L2
0.27	D16	11.0	21.5	26.0	2.0	100	PHE841ED6270MR06L2
0.33	D16	11.0	21.5	26.0	1.9	100	PHE841EY6330MR06L2 *
0.39	D19	15.5	24.5	26.0	1.6	100	PHE841ED6390MR06L2
0.47	D19	15.5	24.5	26.0	1.5	100	PHE841ED6470MR06L2
LEAD SPACING 27.5 MM							
0.22	F11	10.5	20.5	31.5	2.0	100	PHE841EF6220MR06L2
0.27	F11	10.5	20.5	31.5	1.8	100	PHE841EF6270MR06L2
0.33	F12	11.5	22.5	31.5	1.6	100	PHE841EF6330MR06L2
0.39	F03	13.5	23.0	31.5	1.4	100	PHE841EF6390MR06L2
0.47	F03	13.5	23.0	31.5	1.3	100	PHE841EF6470MR06L2
0.56	F13	14.5	24.5	31.5	1.2	100	PHE841EF6560MR06L2
0.68	F14	17.5	28.0	31.5	1.1	100	PHE841EF6680MR06L2
0.82	F15	19.0	29.0	31.5	1.0	100	PHE841EF6820MR06L2
1.0	F16	21.0	30.0	31.5	1.0	100	PHE841EF7100MR06L2
LEAD SPACING 37.5 MM							
0.68	R05	13.0	24.0	41.0	1.1	100	PHE841ER6680MR06L2
0.82	R04	15.0	26.0	41.0	1.0	100	PHE841ER6720MR06L2
1.0	R04	15.0	26.0	41.0	0.92	100	PHE841ER7100MR06L2
1.2	R02	16.5	32.0	41.0	0.84	100	PHE841ER7120MR06L2
1.5	R03	19.0	36.0	41.0	0.74	100	PHE841ER7150MR06L2
1.8	R06	21.0	38.0	41.0	0.67	100	PHE841ER7180MR06L2
2.2	R06	21.0	38.0	41.0	0.60	100	PHE841ER7220MR06L2

* Only ±20 %

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 330 VAC)
	UL 1414	(U_R = 250 VAC)
cUL recognition	C 22.2 No. 8	(U_R = 330 VAC)
	C 22.2 No. 1	(U_R = 250 VAC)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X1
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PHE844

RoHS Compliant

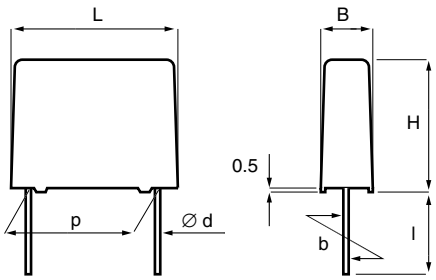
- **EMI suppressor, class X1, metallized polypropylene**
- **0.1 – 2.2 µF, 440 VAC/480 VAC, +105°C**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and across-the-line applications.

CONSTRUCTION

Series winding of metallized polypropylene. Encapsulated in self-extinguishing material meeting the requirements of UL 94 V–0.



p	d	std l	max l	b
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
440 VAC 50/60 Hz (ENEC)
480 VAC 50/60 Hz (UL, CSA)

Capacitance range
0.1 – 2.2 µF

Capacitance tolerance
± 20% standard, ± 10% option

Temperature range
–40 to +105°C

Climatic category
40/105/56/B

Approvals
ENEC, UL, cUL

Dissipation factor
Maximum values at +23°C

	C ≤ 0.1 µF	0.1µF < C ≤ 1 µF	C > 1 µF
1 kHz	0.1%	0.1%	0.1%
10 kHz	0.2%	0.4%	0.8%
100 kHz	0.6%	–	–

Test voltage between terminals
The 100% screening factory test is carried out at 3000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

Resonance frequency
Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 s

In DC application
Recommended voltage: ≤1000VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 22.5 MM							
0.10	D14	8.0	16.0	26.0	3.2	100	PHE844RD6100MR06L2
0.15	D15	9.0	18.5	26.0	2.6	100	PHE844RD6150MR06L2
0.22	D16	11.0	21.5	26.0	2.1	100	PHE844RD6220MR06L2
0.33	D20	13.5	23.0	26.0	1.8	100	PHE844RD6330MR06L2
0.47	D19	15.5	24.5	26.0	1.5	100	PHE844RD6470MR06L2
LEAD SPACING 27.5 MM							
0.22	F11	10.5	20.5	31.5	2.2	100	PHE844RF6220MR06L2
0.33	F03	13.5	23.0	31.5	1.7	100	PHE844RF6330MR06L2
0.47	F13	14.5	24.5	31.5	1.4	100	PHE844RF6470MR06L2
0.68	F14	17.5	28.0	31.5	1.1	100	PHE844RF6680MR06L2
1.0	F16	21.0	30.0	31.5	1.0	100	PHE844RF7100MR06L2
LEAD SPACING 37.5 MM							
0.47	R05	13.0	24.0	41.0	1.3	100	PHE844RR6470MR06L2
0.68	R05	13.0	24.0	41.0	1.1	100	PHE844RR6680MR06L2
1.0	R04	15.0	26.0	41.0	0.92	100	PHE844RR7100MR06L2
1.5	R03	19.0	36.0	41.0	0.74	100	PHE844RR7150MR06L2
2.2	R06	21.0	38.0	41.0	0.60	100	PHE844RR7220MR06L2

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R=480 VAC)
	UL 1414	(U_R=250 VAC)
cUL recognition	C 22.2 No. 8	(U_R=480 VAC)
	C 22.2 No. 1	(U_R=250 VAC)

ORDERING INFORMATION

The article code for the standard part is given in the article table. For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X1
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

PHE845

RoHS Compliant

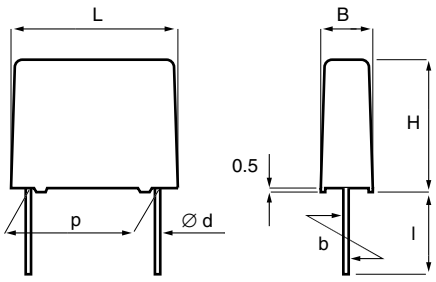
- **EMI suppressor, class X1, metallized polypropylene**
- **0.01 – 1.0 µF, 760 VAC/600 VAC, +105°C**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and across-the-line applications.

CONSTRUCTION

Triple winding of metallized polypropylene. Encapsulated in self-extinguishing material meeting the requirements of UL 94 V–0.



p	d	std l	max l	b
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
760 VAC 50/60 Hz (ENEC)
600 VAC 50/60 Hz (UL, CSA)

Capacitance range
0.01 – 1.0 µF

Capacitance tolerance
± 20% standard, ± 10% option

Temperature range
–40 to +105°C

Climatic category
40/105/56/B

Approvals
ENEC, UL, cUL

Dissipation factor
Maximum values at +23°C

	C ≤ 0.1 µF	0.1µF < C ≤ 1 µF
1 kHz	0.1%	0.1%
10 kHz	0.2%	0.4%
100 kHz	0.6%	–

Test voltage between terminals
The 100% screening factory test is carried out at 4250 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

Resonance frequency
Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 s

In DC application
Recommended voltage: ≤ 1500VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s²	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 22.5 MM							
0.010	D13	6.5	14.5	26.0	11	100	PHE845VD5100MR06L2
0.015	D13	6.5	14.5	26.0	9.2	100	PHE845VD5150MR06L2
0.022	D13	6.5	14.5	26.0	7.6	100	PHE845VD5220MR06L2
0.033	D17	7.0	16.5	26.0	6.4	100	PHE845VD5330MR06L2
0.047	D15	9.0	18.5	26.0	5.3	100	PHE845VD5470MR06L2
0.068	D18	10.5	19.0	26.0	4.4	100	PHE845VD5680MR06L2
0.10	D16	11.0	21.5	26.0	3.5	100	PHE845VD6100MR06L2
0.15	D20	13.5	23.0	26.0	3.1	100	PHE845VD6150MR06L2
0.22	D19	15.5	24.5	26.0	2.7	100	PHE845VY6220MR06L2*
LEAD SPACING 27.5 MM							
0.10	F11	10.5	20.5	31.5	3.4	100	PHE845VF6100MR06L2
0.15	F12	11.5	22.5	31.5	3.0	100	PHE845VF6150MR06L2
0.22	F03	13.5	23.0	31.5	2.4	100	PHE845VF6220MR06L2
0.33	F15	19.0	29.0	31.5	2.0	100	PHE845VF6330MR06L2
0.47	F16	21.0	30.0	31.5	1.6	100	PHE845VZ6470MR06L2*
LEAD SPACING 37.5 MM							
0.47	R04	15.0	26.0	41.0	1.6	100	PHE845VW6470MR06L2*
0.47	R02	16.5	32.0	41.0	1.6	100	PHE845VR6470MR06L2
0.68	R03	19.0	36.0	41.0	1.2	100	PHE845VR6680MR06L2
1.0	R06	21.0	38.0	41.0	1.0	100	PHE845VW7100MR06L2*

* Only ±20%

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R=600 VAC)
cUL recognition	C 22.2 No. 8	(U_R=600 VAC)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X1
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

PHE850

RoHS Compliant

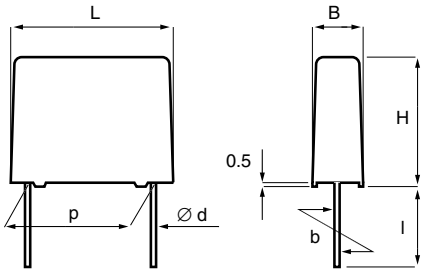
- **EMI suppressor, class Y2, metallized polypropylene**
- **0.001 – 1.0 µF, 300 VAC/480 VAC, +110 °C**
- **New, small dimensions including low profile capacitors**

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in Y2 (line-to-earth) applications.

CONSTRUCTION

Winding of metallized polypropylene. Encapsulated in self-extinguishing material meeting the requirements of UL 94V-0.



p	d	std l	max l	b
10.0 ± 0.4	0.6	17	30	±0.4
15.0 ± 0.4	0.6/0.8*	17	30	±0.4
22.5 ± 0.4	0.8	6	30	±0.4
27.5 ± 0.4	0.8	6	30	±0.4
37.5 ± 0.5	1.0	6	30	±0.7

* Size 7.5 x 14.5 x 18.0 and bigger, d = 0.8 mm.

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

TECHNICAL DATA

Rated voltage
300 VAC, 50/60 Hz (ENEC)
480 VAC 50/60 Hz (UL, CSA)

Capacitance range µF
0.001–1.0

Temperature range °C
–55/+110

Climatic category IEC
55/110/56/B

Capacitance tolerance
± 20% standard, other tolerances on request

Approvals
ENEC, UL, cUL

Dissipation factor tanδ
Maximum values at +23 °C

	C ≤ 0.1 µF	0.1 µF < C ≤ 1 µF
1 kHz	0.2%	0.15%
10 kHz	0.3%	0.4%
100 kHz	0.6%	–

Insulation resistance
C ≤ 0.33 µF: ≥ 30 000 MΩ
C > 0.33 µF: ≥ 10 000 s

Resonance frequency
Tabulated self-resonance frequencies f_0 refer to 5 mm lead lengths.

Test voltage between terminals
The 100% screening factory test is carried out at 5000 VDC and 2500 VAC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

In DC applications
Recommended voltage: ≤ 1250 VDC

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.7 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each, 10 – 55 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit
Bump	IEC 60068-2-29, Test Eb	1000 bumps at 390 m/s²	No visible damage, No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 10 MM							
0.0010	A06	4.0	8.0	13.0	50	100	PHE850EA4100MA06R17
0.0012	A06	4.0	8.0	13.0	45	100	PHE850EA4120MA06R17
0.0015	A01	4.0	9.0	13.0	43	100	PHE850EA4150MA01R17
0.0018	A01	4.0	9.0	13.0	40	100	PHE850EA4180MA01R17
0.0022	A01	4.0	9.0	13.0	36	100	PHE850EA4220MA01R17
0.0027	A02	4.5	10.5	13.0	34	100	PHE850EA4270MA02R17
0.0033	A02	4.5	10.5	13.0	31	100	PHE850EA4330MA02R17
0.0039	A03	5.0	11.0	13.0	29	100	PHE850EA4390MA03R17
0.0047	A03	5.0	11.0	13.0	26	100	PHE850EA4470MA03R17
0.0056	A04	6.0	12.0	13.0	23	100	PHE850EA4560MA04R17
0.0068	A04	6.0	12.0	13.0	20	100	PHE850EA4680MA04R17
0.0068	A05	9.5	7.5	13.0	21	100	PHE850EP4680MA05R17
LEAD SPACING 15 MM							
0.0068	B04	5.5	10.5	18.0	14	100	PHE850EB4680MB04R17
0.0082	B04	5.5	10.5	18.0	14	100	PHE850EB4820MB04R17
0.010	B04	5.5	10.5	18.0	13	100	PHE850EB5100MB04R17
0.012	B05	5.5	12.5	18.0	12	100	PHE850EB5120MB05R17
0.015	B15	6.0	12.0	18.0	11	100	PHE850EB5150MB15R17
0.018	B10	6.5	12.5	18.0	10	100	PHE850EB5180MB10R17
0.022	B06	7.5	14.5	18.0	9.5	100	PHE850EB5220MB06R17
0.027	B06	7.5	14.5	18.0	8.6	100	PHE850EB5270MB06R17
0.033	B12	8.0	15.0	18.0	7.8	100	PHE850EB5330MB12R17
0.039	B11	8.5	16.0	18.0	7.0	100	PHE850EB5390MB11R17
0.047	B14	9.5	17.5	18.0	6.3	100	PHE850EB5470MB14R17
0.047	B17	13.0	12.5	18.0	6.3	100	PHE850EH5470MB17R17
0.056	B16	11.0	19.0	18.0	5.5	100	PHE850EB5560MB16R17
0.068	B16	11.0	19.0	18.0	4.7	100	PHE850EB5680MB16R17

Capacitance µF	Box code	Max dimensions in mm B	H	L	f_o MHz	Max dU/dt V/µs	Article code
LEAD SPACING 22.5 MM							
0.033	D13	6.5	14.5	26.0	5.7	100	PHE850ED5330MD13R06L2
0.039	D13	6.5	14.5	26.0	5.4	100	PHE850ED5390MD13R06L2
0.047	D13	6.5	14.5	26.0	5.0	100	PHE850ED5470MD13R06L2
0.056	D17	7.0	16.5	26.0	4.7	100	PHE850ED5560MD17R06L2
0.068	D17	7.0	16.5	26.0	4.3	100	PHE850ED5680MD17R06L2
0.082	D15	9.0	18.5	26.0	4.0	100	PHE850ED5820MD15R06L2
0.10	D18	10.5	19.0	26.0	3.6	100	PHE850ED6100MD18R06L2
0.12	D18	10.5	19.0	26.0	3.3	100	PHE850ED6120MD18R06L2
0.15	D16	11.0	21.5	26.0	2.8	100	PHE850ED6150MD16R06L2
0.18	D20	13.5	23.0	26.0	2.5	100	PHE850ED6180MD20R06L2
0.22	D20	13.5	23.0	26.0	2.3	100	PHE850ED6220MD20R06L2
LEAD SPACING 27.5 MM							
0.15	F11	10.5	20.5	31.5	2.4	100	PHE850EF6150MF11R06L2
0.15	F17	21.0	12.5	31.5	2.4	100	PHE850ET6150MF17R06L2
0.18	F11	10.5	20.5	31.5	2.2	100	PHE850EF6180MF11R06L2
0.22	F12	11.5	22.5	31.5	2.1	100	PHE850EF6220MF12R06L2
0.27	F03	13.5	23.0	31.5	1.9	100	PHE850EF6270MF03R06L2
0.33	F13	14.5	24.5	31.5	1.7	100	PHE850EF6330MF13R06L2
0.39	F14	17.5	28.0	31.5	1.6	100	PHE850EF6390MF14R06L2
0.47	F14	17.5	28.0	31.5	1.4	100	PHE850EF6470MF14R06L2
0.47	F19	27.5	16.0	31.5	1.5	100	PHE850ET6470MF19R06L2
0.56	F16	21.0	30.0	31.5	1.3	100	PHE850EF6560MF16R06L2
0.68	F16	21.0	30.0	31.5	1.2	100	PHE850EZ6680MF16R06L2 *
LEAD SPACING 37.5 MM							
0.33	R05	13.0	24.0	41.0	1.2	100	PHE850ER6330MR05R06L2
0.39	R05	13.0	24.0	41.0	1.1	100	PHE850ER6390MR05R06L2
0.47	R05	13.0	24.0	41.0	1.1	100	PHE850ER6470MR05R06L2
0.56	R04	15.0	26.0	41.0	1.0	100	PHE850ER6560MR04R06L2
0.68	R02	16.5	32.0	41.0	0.94	100	PHE850ER6680MR02R06L2
0.82	R02	16.5	32.0	41.0	0.88	100	PHE850ER6820MR02R06L2
1.0	R03	19.0	36.0	41.0	0.81	100	PHE850ER7100MR03R06L2

* Only ± 20% tolerance

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 480 VAC)
	UL 1414	(U_R = 250 VAC)
cUL recognition	C 22.2 No. 1	(U_R = 250 VAC)
	C 22.2 No. 8	(U_R = 480 VAC)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- Y2
- Approval marks
- IEC Climatic category
- Passive flammability class
- Manufacturing date code

PME264

RoHS Compliant

• EMI suppressor, class X2, metallized paper
• 0.001 – 0.1 µF, 660 VAC, +85 °C

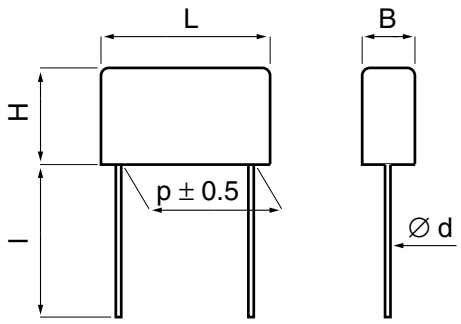
- Self-extinguishing encapsulation.
- High dU/dt capability.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

High AC and DC voltage applications, such as
– commutator capacitor in converters
– high voltage DC-capacitor in TV sets
– ignition circuits.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



d = 0.8 for p = 15.2 and 20.3
1.0 for p = 25.4

l = standard: 30 +5/-0 mm

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage	660 VAC 50/60 Hz 1500 VDC (1600 VDC, + 50°C)
Capacitance range	0.001 – 0.1 µF
Capacitance tolerance	± 20%
Temperature range	–40 to +85°C
Climatic category IEC	40/085/56/B
Approvals	ENEC, UL
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C
Test voltage between terminals	The 100% screening factory test is carried out at 3000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each, 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capaci-tance	Max dimensions in mm				Quantity per package R30	R06	reel taped	Weight	Max dU/dt	Article code
µF	B	H	L	p	pcs	pcs	pcs	g	V/µs	
0.0010	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME264NB4100MR30
0.0015	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME264NB4150MR30
0.0022	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME264NB4220MR30
0.0033	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME264NB4330MR30
0.0047	5.2	10.5	18.5	15.2	500	1000	600	1.7	2000	PME264NB4470MR30
0.0068	7.3	13.0	18.5	15.2	400	800	400	3.0	1400	PME264NB4680MR30
0.010	7.3	13.0	18.5	15.2	400	800	400	3.0	1400	PME264NB5100MR30
0.015	7.6	14.0	24.0	20.3	250	1500	250	4.0	1400	PME264NC5150MR30
0.022	9.0	15.0	24.0	20.3	200	1200	250	5.0	1400	PME264NC5220MR30
0.033	11.3	16.5	24.0	20.3	150	1000	180	7.0	1000	PME264NC5330MR30
0.047	10.5	17.0	30.5	25.4	100	1000		8.5	1000	PME264NE5470MR30
0.068	12.1	19.0	30.5	25.4	100	800		10.0	1000	PME264NE5680MR30
0.10	15.3	22.0	30.5	25.4	75	600		15.0	600	PME264NE6100MR30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005
UL	UL 1283 (U_R = 600 VAC)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- X2
- SH, for self healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

PME271E

• EMI suppressor, class X1, metallized paper
• 0.01 – 0.22 µF, 300 VAC, +110 °C

RoHS Compliant

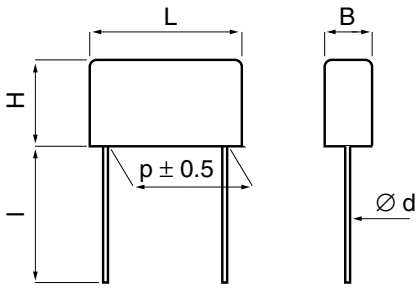
- The highest possible safety regarding active and passive flammability.
- Self-extinguishing UL 94V-0 encapsulation material.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- High dU/dt capability.
- Small dimensions.
- Safety approvals for worldwide use.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in X1 (across-the-line) applications.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



d = 0.6 for p = 10.2
0.8 for p = 15.2, 20.3, 22.5
1.0 for p = 25.4

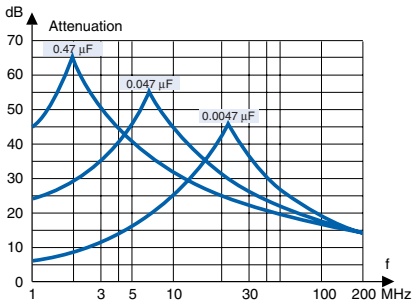
l = standard: 30 +5/-0 mm (code R30)

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage VAC, 50/60Hz	300
Capacitance range µF	0.01–0.22
Temperature range °C	–40/+110
Climatic category IEC	40/110/56/B
Capacitance tolerance	± 10% for C > 0.1 µF, code K. ± 20% for C ≤ 0.1 µF, code M
Approvals	ENEC, UL
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	C ≤ 0.33 µF ≥ 12000 MΩ C > 0.33 µF ≥ 4000 s Measured at 500 VDC after 60 s, +23°C
In DC applications	Recommended voltage: ≤ 630 VDC
Resonance frequency	Tabulated self-resonance frequencies f_0 refer to 5 mm lead lengths.
Test voltage between	The 100% screening factory test is carried out at 2150 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.



Suppression versus frequency. Typical values.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each, 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit	
Bump	IEC 60068-2-29, Test Eb	4000 bumps at 390 m/s²	No visible damage, No open or short circuit	
Solderability	IEC 60068-2-20, Test Ta	Solder globule method	Wetting time	for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005			
Passive flammability	EN/IEC 60384-14:2005			
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days	

ARTICLE TABLE

Capacitance µF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	f_o MHz	Max dU/dt V/µs	Article code
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	16	1200	PME271E510MR30
0.015	5.2	10.5	18.5	15.2	500	1000	600	1.7	13	1200	PME271E515MR30
0.022	7.3	13.0	19.0	15.2	400	800	400	3.0	9.8	1200	PME271E522MR30
0.033	7.3	13.0	19.0	15.2	400	800	400	3.0	7.0	1200	PME271E533MR30
0.047	8.5	14.3	18.5	15.2	300	500	350	3.8	6.4	1200	PME271E547MR30
0.068	7.6	14.0	24.0	20.3	250	1500	250	4.5	5.2	600	PME271E568MR30
0.10	11.3	16.5	24.0	20.3	150	1000	180	7.0	4.1	600	PME271E610MR30
0.068	8.0	17.0	27.0	22.5	200	1200	250	5.5	4.7	600	PME271ED5680MR30
0.10	8.0	17.0	27.0	22.5	200	1200	250	5.5	4.1	600	PME271ED6100MR30
0.15	10.0	19.0	27.0	22.5	150	1000	200	5.5	3.2	600	PME271ED6150KR30
0.22	12.0	22.0	27.0	22.5	100	800		5.5	2.5	600	PME271ED6220KR30
0.15	10.6	16.1	30.5	25.4	150	1000		8.6	3.3	400	PME271E615KR30
0.22	12.1	19.0	30.5	25.4	100	800		10.0	2.6	400	PME271E622KR30

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 250 VAC)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- X1
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PME271M

• EMI suppressor, class X2, metallized paper
• 0.001 – 0.6 µF, 275 VAC, +110 °C

RoHS Compliant

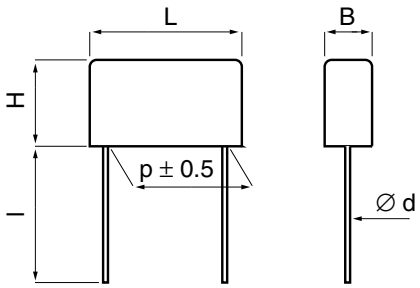
- The highest possible safety regarding active and passive flammability.
- Self-extinguishing UL 94V-0 encapsulation material.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- High dU/dt capability.
- Small dimensions.
- Safety approvals for worldwide use.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in X2 (across-the-line) applications.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



d = 0.6 for p = 10.2
0.8 for p = 15.2, 20.3, 22.5
1.0 for p = 25.4

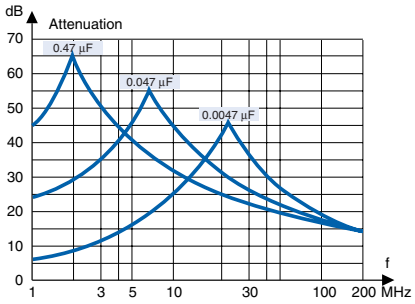
l = standard: 30 +5/-0 mm (code R30)

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage VAC, 50/60Hz	275
Capacitance range µF	0.001–0.6
Temperature range °C	–40/+110
Climatic category IEC	40/110/56/B
Capacitance tolerance	± 10% for C > 0.1 µF, code K ± 20% for C ≤ 0.1 µF, code M
Approvals	ENEC, UL, CSA
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	C ≤ 0.33 µF ≥ 12000 MΩ C > 0.33 µF ≥ 4000 s Measured at 500 VDC after 60 s, +23°C
In DC applications	Recommended voltage: ≤ 630 VDC
Resonance frequency	Tabulated self-resonance frequencies f_0 refer to 5 mm lead lengths.
Test voltage between	The 100% screening factory test is carried out at 2150 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.



Suppression versus frequency. Typical values.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each, 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit
Bump	IEC 60068-2-29, Test Eb	4000 bumps at 390 m/s²	No visible damage, No open or short circuit
Solderability	IEC 60068-2-20, Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capaci-tance µF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	f_o MHz	Max dU/dt V/µs	Article code
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	53	1200	PME271M410MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	44	1200	PME271M415MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	37	1200	PME271M422MR30
0.0033	4.1	8.2	13.5	10.2	1000	2000	600	0.9	30	1200	PME271M433MR30
0.0047	5.1	10.5	13.5	10.2	800	1600	600	1.2	24	1200	PME271M447MR30
0.0068	5.1	10.5	13.5	10.2	800	1600	600	1.2	21	1200	PME271MA4680MR30
0.0068	5.2	10.5	18.5	15.2	500	1000	600	1.7	19	1200	PME271M468MR30
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	16	1200	PME271M510MR30
0.015	5.2	10.5	18.5	15.2	500	1000	600	1.7	13	1200	PME271M515MR30
0.022	6.0	12.5	18.5	15.2	400	800	400	3.0	10	1200	PME271M522MR30
0.033	6.0	12.5	18.5	15.2	400	800	400	3.0	8.4	1200	PME271M533MR30
0.047	6.0	12.5	18.5	15.2	400	800	400	3.0	7.0	1200	PME271M547MR30
0.068	7.8	13.5	18.5	15.2	400	800	400	3.3	5.6	1200	PME271M568MR30
0.10	8.5	14.3	18.5	15.2	300	500	350	3.8	4.3	1200	PME271MB6100MR30
0.10	7.6	14.0	24.0	20.3	250	1500	250	4.0	4.1	600	PME271M610MR30
0.15	9.0	15.0	24.0	20.3	200	1200	250	5.0	3.4	600	PME271M615KR30
0.22	11.3	16.5	24.0	20.3	150	1000	180	7.0	2.7	600	PME271M622KR30
0.10	8.0	17.0	27.0	22.5	200	1200	250	5.5	3.9	600	PME271MD6100MR30
0.15	8.0	17.0	27.0	22.5	200	1200	250	5.5	3.3	600	PME271MD6150KR30
0.22	10.0	19.0	27.0	22.5	150	1000	200	7.5	2.6	600	PME271MD6220KR30
0.27	12.0	22.0	27.0	22.5	100	800		10.0	2.3	400	PME271MD6270KR30
0.33	12.0	22.0	27.0	22.5	100	800		10.0	2.1	400	PME271MD6330KR30
0.27	10.5	17.3	30.5	25.4	100	1000		8.5	2.4	400	PME271M627KR30
0.33	12.1	19.0	30.5	25.4	100	800		10.0	2.1	400	PME271M633KR30
0.47	15.3	22.0	30.5	25.4	75	600		15.0	1.8	400	PME271M647KR30
0.60	15.3	22.0	30.5	25.4	75	600		15.0	1.6	400	PME271M660KR30

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 250 VAC)
	UL 1414	(U_R = 250 VAC)
CSA	C 22.2 No. 1	(U_R = 250 VAC)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- X2
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PME271Y

• EMI suppressor, class Y2, metallized paper
• 0.001 – 0.15 µF, 250 VAC up to +100 °C, 300 VAC up to +115 °C

RoHS Compliant

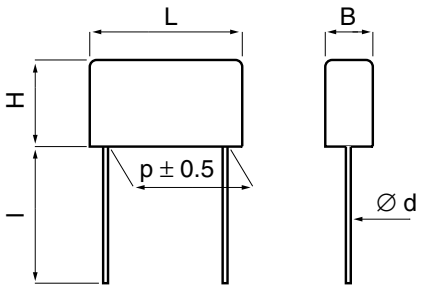
- The highest possible safety regarding active and passive flammability.
- Self-extinguishing UL 94V-0 encapsulation material.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- High dU/dt capability.
- Small dimensions.
- Safety approvals for worldwide use.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in Y2 (line-to-earth) applications.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



d = 0.6 for p = 10.2
0.8 for p = 15.2, 20.3, 22.5
1.0 for p = 25.4

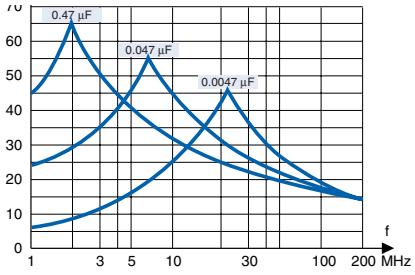
l = standard: 30 +5/-0 mm (code R30)

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

	PME271Y	PME271YA-E
Rated voltage VAC, 50/60Hz	250	300
Capacitance range µF	0.001–0.1	0.001–0.15
Temperature range °C	–40/+100	–40/+115
Climatic category IEC	40/100/56/B	40/115/56/B
Capacitance tolerance	± 10% for C > 0.1 µF, code K ± 20% for C ≤ 0.1 µF, code M	
Approvals	ENEC, UL, CSA	
Dissipation factor tanδ	≤ 1.3 % at 1 kHz	
Insulation resistance	C ≤ 0.33 µF ≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C	
In DC applications	Recommended voltage: ≤ 1000 VDC	
Resonance frequency	Tabulated self-resonance frequencies f_0 refer to 5 mm lead lengths.	
Test voltage between terminals	The 100% screening factory test is carried out at 3000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.	



Suppression versus frequency. Typical values.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each, 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit	
Bump	IEC 60068-2-29, Test Eb	4000 bumps at 390 m/s²	No visible damage, No open or short circuit	
Solderability	IEC 60068-2-20, Test Ta	Solder globule method	Wetting time	for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005			
Passive flammability	EN/IEC 60384-14:2005			
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days	

ARTICLE TABLE

Capacitance µF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	f_o MHz	Max dU/dt V/µs	Article code
CLASS Y2 250 VAC +100 °C PME271 Y											
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	53	2000	PME271Y410MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	44	2000	PME271Y415MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	37	2000	PME271Y422MR30
0.0033	4.1	8.2	13.5	10.2	1000	2000	600	0.9	30	2000	PME271Y433MR30
0.0047	5.1	10.5	13.5	10.2	800	1600	600	1.2	24	2000	PME271Y447MR30
0.0068	5.2	10.5	18.5	15.2	500	1000	600	1.7	19	1400	PME271Y468MR30
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	16	1400	PME271Y510MR30
0.015	5.5	11.0	18.5	15.2	500	1000	500	2.0	13	1400	PME271Y515MR30
0.022	7.3	13.0	18.5	15.2	400	800	400	3.0	9.8	1400	PME271Y522MR30
0.033	7.6	14.0	24.0	20.3	250	1500	250	4.0	7.0	1000	PME271Y533MR30
0.047	9.0	15.0	24.0	20.3	200	1200	250	5.0	6.0	1000	PME271Y547MR30
0.068	11.3	16.5	24.0	20.3	150	1000	180	7.0	4.6	600	PME271Y568MR30
0.10	12.1	19.0	30.5	25.4	100	800		10.0	3.9	400	PME271Y610MR30
CLASS Y2 300 VAC + 115 °C PME271 Y											
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	53	2000	PME271YA4100MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	44	2000	PME271YA4150MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	37	2000	PME271YA4220MR30
0.0025	4.1	8.2	13.5	10.2	1000	2000	600	0.9	35	2000	PME271YA4250MR30
0.0033	4.1	8.2	13.5	10.2	1000	2000	600	0.9	30	2000	PME271YA4330MR30
0.0047	5.1	10.5	13.5	10.2	800	1600	600	1.2	24	2000	PME271YA4470MR30
0.0068	5.2	10.5	18.5	15.2	500	1000	600	1.7	19	1400	PME271YB4680MR30
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	16	1400	PME271YB5100MR30
0.015	5.5	11.0	18.5	15.2	500	1000	500	2.0	13	1400	PME271YB5150MR30
0.022	7.3	13.0	18.5	15.2	400	800	400	3.0	9.8	1400	PME271YB5220MR30
0.033	7.6	14.0	24.0	20.3	250	1500	250	4.0	7.0	1000	PME271YC5330MR30
0.047	9.0	15.0	24.0	20.3	200	1200	250	5.0	6.0	1000	PME271YC5470MR30
0.068	11.3	16.5	24.0	20.3	150	1000	180	7.0	4.6	1000	PME271YC5680MR30
0.033	8.0	17.0	27.0	22.5	200	1200	250	5.5	6.8	600	PME271YD5330MR30
0.047	8.0	17.0	27.0	22.5	200	1200	250	5.5	5.8	600	PME271YD5470MR30
0.068	10.0	19.0	27.0	22.5	150	1000	200	7.5	4.8	600	PME271YD5680MR30
0.10	12.0	22.0	27.0	22.5	100	800		10.0	3.8	600	PME271YD6100MR30
0.10	12.1	19.0	30.5	25.4	100	800		10.0	3.9	400	PME271YE6100MR30
0.15	15.3	22.0	30.5	25.4	75	600		15.0	3.1	400	PME271YE6150KR30

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 250 VAC)
CSA	C 22.2 No. 8	

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- Y2
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PME278

• EMI suppressor, class X1, metallized paper
• 0.001 – 0.15 µF, 440 VAC, +110 °C

RoHS Compliant

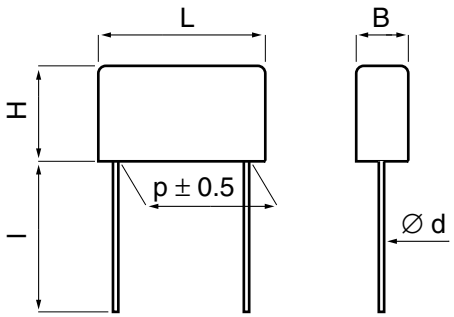
- High dU/dt capability.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in X1, across-the-line, 440 VAC applications.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



d = 0.6 for p = 10.2
0.8 for p = 15.2 and 20.3
1.0 for p = 25.4

l = standard : 30 +5/-0 mm

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage	440 VAC 50/60 Hz
Capacitance range	0.001 – 0.15 µF
Capacitance tolerance	± 20%
Temperature range	–40 to +110°C
Climatic category IEC	40/110/56/B
Approvals	ENEC
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C
Resonance frequency	Tabulated self-resonance frequencies f0 refer to 5 mm lead length.
In DC applications	Recommended voltage: ≤ 1000 VDC
Test voltage between terminals	The 100% screening factory test is carried out at 2700 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capaci-tance	Max dimensions in mm				Quantity per package R30	R06	reel taped	Weight	f_o	Max dU/dt	Article code
µF	B	H	L	p	pcs	pcs	pcs	g	MHz	V/µs	
0.0010	3.9	7.5	13.5	10.2	1000	2000	700	0.7	53.0	2000	PME278RA4100MR30
0.0015	3.9	7.5	13.5	10.2	1000	2000	700	0.7	44.0	2000	PME278RA4150MR30
0.0022	3.9	7.5	13.5	10.2	1000	2000	700	0.7	37.0	2000	PME278RA4220MR30
0.0033	4.1	8.2	13.5	10.2	1000	2000	600	0.9	30.0	2000	PME278RA4330MR30
0.0047	5.1	10.5	13.5	10.2	800	1600	600	1.2	24.0	2000	PME278RA4470MR30
0.0068	5.2	10.5	18.5	15.2	500	1000	600	1.7	18.5	1400	PME278RB4680MR30
0.010	5.2	10.5	18.5	15.2	500	1000	600	1.7	15.5	1400	PME278RB5100MR30
0.015	5.5	11.1	18.5	15.2	500	1000	500	2.0	13.0	1400	PME278RB5150MR30
0.022	8.5	14.3	18.5	15.2	300	500	350	3.8	9.6	1400	PME278RB5220MR30
0.033	7.6	14.0	24.0	20.3	250	1500	250	4.0	9.6	1000	PME278RC5330MR30
0.047	9.0	15.0	24.0	20.3	200	1200	250	5.0	7.5	1000	PME278RC5470MR30
0.068	11.3	16.5	24.0	20.3	150	1000	180	7.0	6.2	1000	PME278RC5680MR30
0.033	8.0	17.0	27.0	22.5	200	1200	250	5.5	7.2	1000	PME278RD5330MR30
0.047	8.0	17.0	27.0	22.5	200	1200	250	5.5	6.0	1000	PME278RD5470MR30
0.068	10.0	19.0	27.0	22.5	150	1000	200	7.5	4.8	1000	PME278RD5680MR30
0.10	12.0	22.0	27.0	22.5	100	800	180	10.0	3.6	600	PME278RD6100MR30
0.10	12.1	19.0	30.5	25.4	100	800		10.0	3.9	600	PME278RE6100MR30
0.15	15.3	22.0	30.5	25.4	75	600		15.0	3.2	600	PME278RE6150MR30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- X1
- SH, for self healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

PME295

- **EMI suppressor, class Y1, metallized paper capacitor**
- **Safety capacitor, ceramic replacement**
- **470 – 4700 pF, 440 VAC/480 VAC, +115 °C, test voltage 4000 VAC 60 s**
- **Replaces PME294**

RoHS Compliant

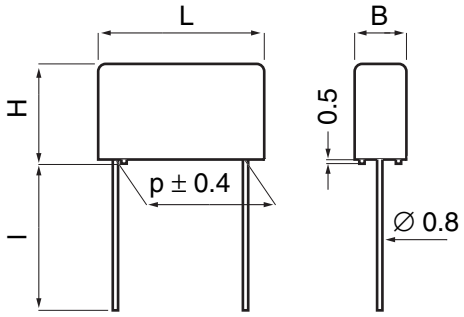
- Self-extinguishing encapsulation. The material is recognized according to UL 94 V-0.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- High dU/dt capability.
- Good resistance to ionisation due to impregnated dielectric.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

Safety capacitor for bridging of double or reinforced insulation applications requiring voltage test up to 4000 VAC 60 seconds. PME295 can be left in place during this test.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.

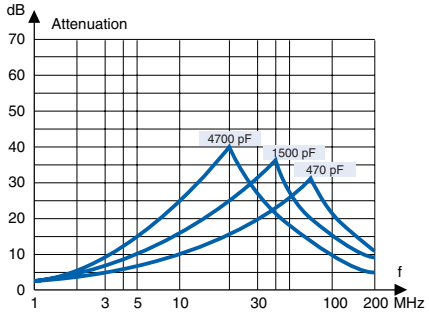


l = standard: 30 +5/-0 mm

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

TECHNICAL DATA

Rated voltage	440 VAC 50/60 Hz (ENEC) 480 VAC 50/60 Hz (UL, CSA)
Capacitance range	470 – 4700 pF
Capacitance tolerance	± 20%
Temperature range	–40 to +115 °C
Climatic category IEC	40/115/56/B
Approvals	ENEC, UL, cUL
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C
Resonance frequency	Tabulated self-resonance frequencies f_0 refer to 5 mm lead length.
In DC applications	Recommended voltage: ≤ 1500 VDC
Test voltage between terminals	The 100% screening factory test is carried out at 4000 VAC, 50 Hz, 2 s. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.



Suppression versus frequency. Typical values.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time < 1 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance pF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	f_o MHz	Max dU/dt V/µs	Article code
470	5.5	12.5	18.0	15.0	500	1000	600	1.8	64	2000	PME295RB3470MR30
560	5.5	12.5	18.0	15.0	500	1000	600	1.8	59	2000	PME295RB3560MR30
680	5.5	12.5	18.0	15.0	500	1000	600	1.8	54	2000	PME295RB3680MR30
820	5.5	12.5	18.0	15.0	500	1000	600	1.8	49	2000	PME295RB3820MR30
1000	5.5	12.5	18.0	15.0	500	1000	600	1.8	46	2000	PME295RB4100MR30
1200	6.5	12.5	18.0	15.0	400	800	400	2.3	43	2000	PME295RB4120MR30
1500	6.5	12.5	18.0	15.0	400	800	400	2.3	40	2000	PME295RB4150MR30
1800	6.5	12.5	18.0	15.0	400	800	400	2.3	37	2000	PME295RB4180MR30
2200	6.5	12.5	18.0	15.0	400	800	400	2.3	33	2000	PME295RB4220MR30
2500	7.5	14.5	18.0	15.0	400	600	400	3.0	31	2000	PME295RB4250MR30
2700	7.5	14.5	18.0	15.0	400	600	400	3.0	30	2000	PME295RB4270MR30
3300	7.5	14.5	18.0	15.0	400	600	400	3.0	27	2000	PME295RB4330MR30
3900	8.5	16.0	18.0	15.0	250	400	400	3.5	24	2000	PME295RB4390MR30
4700	8.5	16.0	18.0	15.0	250	400	400	3.5	22	2000	PME295RB4470MR30

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1283	(U_R = 480 VAC)
	UL 1414	(U_R = 250 VAC)
	Double protection	
cUL recognition	C22.2. No. 1	(U_R = 250 VAC)
	C22.2. No. 8	(U_R = 480 VAC)

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

Customized Capacitors

This section shows a selection of components designed to meet customers' special requirements.

EMI capacitor type		Rated voltage VAC	Page
PZB300	Delta capacitor, classes X2, Y2	275	74
PMZ2074	Double capacitor, class X2	275	76
PHZ9004	Triple capacitor, class X2	300	78

Other types of customized capacitors:

- **Motor capacitors for PCB and special mounting**
- **DC link capacitors for inverters**
- **Capacitors with flexible leads**

For more information please contact KEMET.

PZB300

RoHS Compliant

• Delta EMI suppressor, classes X2 and Y2, metallized paper
• 0.1 and 0.15 µF X2, 2200, 3300 and 4700 pF Y2, 275 VAC, +100 °C

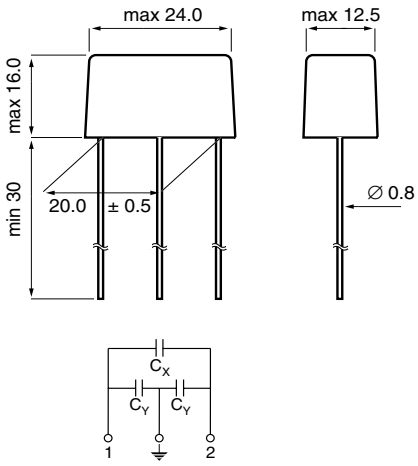
- Class X2 and Y2
- Compact size
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- The impregnated paper ensures excellent stability giving oustanding reliability properties, especially in applications having continuous operation.
- Self-extinguishing encapsulation.
- High dU/dt capability.
- Good resistance to ionisation due to impregnated dielectric material.

TYPICAL APPLICATIONS

Interference suppressors with X2 + 2 x Y2 capacitors in a delta configuration.

CONSTRUCTION

Multi-layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



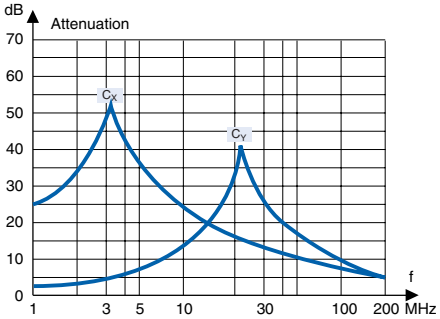
TECHNICAL DATA

Rated voltage	275 VAC 50/60 Hz
Capacitance X value, µF	0.1 and 0.15
Capacitance Y value, pF	2200, 3300 and 4700
Capacitance tolerance	± 20%
Temperature range	–40 to +100°C
Climatic category IEC	40/100/56/B
Approvals	ENEC, UL, CSA
Dissipation factor tanδ	≤ 1.3 % at 1 kHz
Insulation resistance	≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C
Test voltage between terminals	The 100% screening factory test is carried out at 2150 VDC for X2 capacitors and at 3000 VDC for Y2 capacitors. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s² (PZB300MC.. mounted on PC-board)	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s²	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time < 1 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

Suppression vs. frequency



Attenuation, typical values, 0.1 µF + 2 x 2200 pF

ARTICLE TABLE

Capacitance C_X µF	Capacitance C_Y pF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	Weight g	Max dU/dt V/µs C_X	C_Y	Article code
0.10	2200	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC11R30
0.10	3300	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC12R30
0.10	4700	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC13R30
0.15	2200	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC21R30
0.15	3300	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC22R30
0.15	4700	12.5	16.0	24.0	20.0	150	1000	7.5	600	1000	PZB300MC23R30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005
UL	UL 1283
CSA	C 22.2 No. 8

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- Rated capacitance (X and Y)
- Rated voltage
- X2 and Y2
- SH, for self healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Circuit diagram
- Manufacturing code (year, month)

PMZ2074

RoHS Compliant

- **Double capacitor; two capacitors in series**
- **EMI suppressor, class X2, metallized paper**
- **275 VAC, +110 °C**

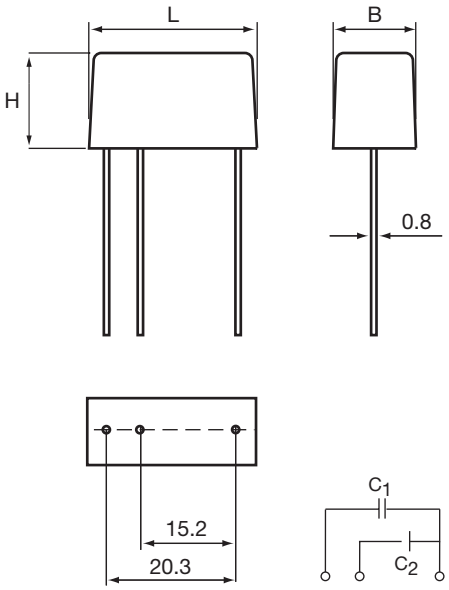
- The highest possible safety regarding active and passive flammability.
- Self-extinguishing UL 94V-0 encapsulation material.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Good resistance to ionisation due to impregnated dielectric.
- High dU/dt capability.
- Small dimensions.
- Safety approvals for worldwide use.
- The capacitors meet the most stringent IEC humidity class, 56 days.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in X2 (across-the-line) applications or in other demanding applications where two capacitors are utilized in series.

CONSTRUCTION

Multilayer metallized paper, encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0.



TECHNICAL DATA

Rated voltage	275 VAC, 50/60 Hz
Capacitance range **Capacitance tolerance**	150 + 33, 150 + 47, 150 + 68, 220 + 82, 220 + 100 nF ± 20%, ± 10%, -5/+15%
Temperature range **Climatic category**	–40 to +110°C 40/110/56/B
Approvals	ENEC
Dissipation factor tan δ	< 1.3 % at 1 kHz
Insulation resistance	≥ 12000 MΩ Measured at 500 VDC after 60 s, +23°C
Test voltage between terminals	The 100% screening factory test is carried out at 2150 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.
In DC applications	Recommended voltage ≤ 630 VDC.

ARTICLE TABLE

Capacitance C_1 µF	Capacitance C_2 µF	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	Max dU/dt V/µs C_1	C_2	Article code
0.15	0.033	12.5	16.0	24.0	20.3	150	900		7.0	600	1200	PMZ2074MC615K533MR30
0.15	0.047	12.5	16.0	24.0	20.3	150	900		7.0	600	1200	PMZ2074MC615K547MR30
0.15	0.068	12.5	16.0	24.0	20.3	150	900		7.0	600	1200	PMZ2074MC615K568MR30
0.22	0.082	14.0	18.0	24.0	20.3	100	900		8.4	600	1200	PMZ2074MC622K582MR30
0.22	0.10	14.0	18.0	24.0	20.3	100	900		8.4	600	1200	PMZ2074MC622K610MR30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated voltage
- Capacitor class and sub-class
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s^2	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s^2	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL 1414	Enclosure material of UL 94V-0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PHZ9004

RoHS Compliant

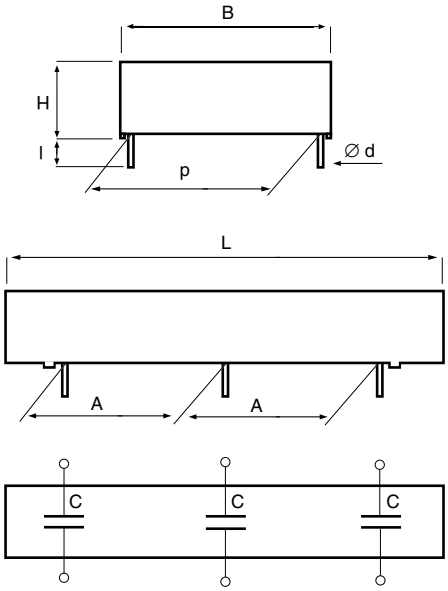
- **Low profile triple capacitor; three capacitors in the same box**
- **EMI suppressor, class X2, metallized polypropylene**
- **300 VAC, +105 °C**

TYPICAL APPLICATIONS

The capacitors are intended for use as interference suppressors in X2 (across-the-line) applications for three phases.

CONSTRUCTION

Metallized polypropylene film capacitor. Radial leads of tinned wire are welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self extinguishing material meeting the requirements of UL 94V-0.



C	p	d	A	l
3 x 1.0	27.5 ± 0.5	1.0	21.0 ± 0.5	6^{-1}

TECHNICAL DATA

Rated voltage U_R VAC	300
Capacitance range µF	3 x 1.0; other capacitance values on request.
Capacitance tolerance	± 20% standard. Other tolerances on request.
Temperature range	–55 to +105°C
Climatic category	55/105/56
Test voltage between terminals	The 100% screening factory test is carried out at 2200 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.
Insulation resistance	Measured at +23 °C, 500 VDC, 60s Between terminals: ≥ 10 000 S Between terminals and case: ≥ 100 000 MΩ
Dissipation factor	Max values at +23°C 1 kHz 0.10% 10 kHz 0.50%

ENVIRONMENTAL TEST DATA

Endurance	EN/IEC 60384-14:2005	1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature	
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each, 10–55 Hz at 0.75 mm or 98 m/s^2	No visible damage No open or short circuit
Bump	IEC 60068–2–29 Test Eb	1000 bumps at 390 m/s^2	No visible damage No open or short circuit
Change of temperature	IEC 60068–2–14 Test Na	Upper and lower rated temperature 5 cycles	No visible damage
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL1414	Enclosure material of UL94V–0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Rated voltage U_R VAC	Capacitance µF	Max dimensions in mm B	H	L	p	Quantity per package Tray pcs	Max dU/dt V/µs	Article code
300	3 x 1.0	30.0	11.5	64.0	27.5	72	100	PHZ9004EF7100MR06L2

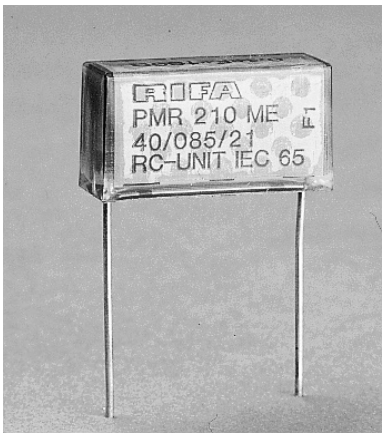
Other capacitance values on request.

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

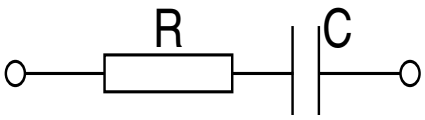
MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Rated AC voltage
- Capacitance tolerance code
- Manufacturing date code



RC units

This section covers capacitors with an integrated series resistor.



Type	Class	Approvals ENEC	Approvals UL	Rated voltage VAC	Rated voltage VDC	Capacitance µF	Resistance Ω	Page
PMR205				125	250	0.1 – 1.0	22 – 680	84
PMR209	X2	•	•	250	630	0.047 – 0.47	22 – 470	86
PMR210	X1	•	•	250		0.022 – 0.1	100	88
PMZ2035	X1	•		440	1000	0.1	150	90

CONSTRUCTION

The RC unit consists of a metallized paper capacitor with the resistance of the metal layer utilized as the series resistance (integrated resistor) to the capacitor.

The capacitor in the RC unit consists of a winding which, for a single layer capacitor, comprises two strips of metallized paper. On the metallized paper a margin is left on one side, and the strips are so arranged, that the metal coating on one strip extends to one edge of the finished winding, and the metal coating on the next strip extends to the other edge. In capacitors intended for higher voltages one or more layers of paper are inserted between the metallized papers to reinforce the dielectric (multilayer).

Connections to the electrodes are made by spraying a layer of metal on the ends of the winding, to which the terminating wires can subsequently be attached by welding or soldering.

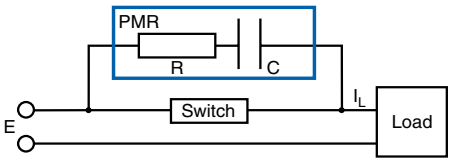
The winding is impregnated with self-extinguishing material meeting the requirements of UL94V-0.

HOW TO SELECT AN RC UNIT

To achieve optimum contact life and EMI transient suppression, you can in most cases use the following rules of thumb:

$R = E/I_L$
$C\ (\mu F) = k \times I_L\ (Ampere)$

Typically $k \approx 1$. Depending on the application k normally is in the range of 0.1 to 2.



In some AC circuits it can be necessary to connect the RC unit across the load. Connection across the switch is preferred.

TERMS AND DEFINITIONS

Rated resistance
The series resistance is defined at:
1 kHz for RC > 50 µs
100 kHz for RC ≤ 50 µs

Peak pulse voltage
The peak pulse voltage indicates the maximum permissible pulse voltage.

Current rating
The current rating indicates the maximum permitted pulse current through the component.

APPLICATION GUIDE

Evox Rifa's RC units are designed for use in DC and AC applications for

- Contact protection
- Interference suppression of contacts
- Transient suppression for protection of low-power thyristors and triacs
- dU/dt suppression in thyristor and triac low-power snubber circuits.

Application of RC units
The use of a capacitor and resistor in series has long been known as a most effective means of increasing the life of contacts. At the same time electromagnetic interference suppression is achieved.
RC units are also very suitable as dU/dt and transient suppressors on thyristors and triacs in low power applications, for example in dimmers and speed regulators.

RC units for contact protection and interference suppression
Relay contacts that make and break a circuit are subjected to electrical erosion resulting from sparking and arcing. Spark suppressors used are RC units, nonlinear resistors, shunt resistors, diodes and gas discharge valves. Among these devices the RC network is in most cases the best spark suppressor for the reduction of contact erosion. The advantages are:

- RC networks are bipolar and therefore suitable for AC applications.
- The relay operating time will not be very much affected.
- No current consumption.
- Electromagnetic interference suppression is achieved.

When the contact K (see figure 1) breaks, the voltage across the contact rapidly grows with the rate of I/C_1 (C_1 is the small capacitance of the wiring) resulting in a breakdown of K and a spark disharge of C_1. The discharge stops when the voltage across K has decreased to about 15 V. C_1 recharges and another breakdown occurs. This series of sparks stops when the contact clearance is wide enough to withstand the voltage without breakdowns (see figure 2).

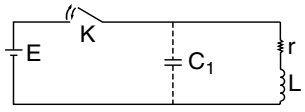


Figure 1

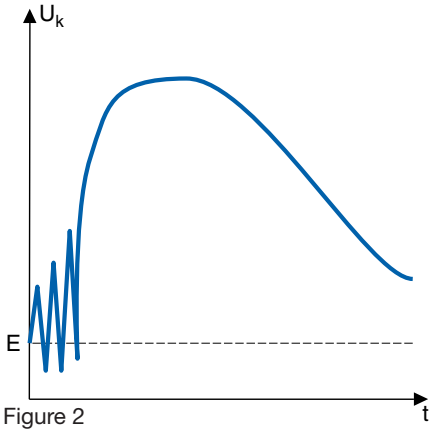


Figure 2

By coupling a capacitor C over the contact (see figure 3a) the voltage across the contact will be reduced and the voltage increase dU/dt will be limited to I/C_1.

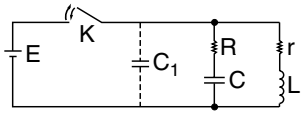


Figure 3a

As I/C is much less than I/C_1 the voltage increase over the contact will be kept low enough to prevent breakdowns (see figure 3b).

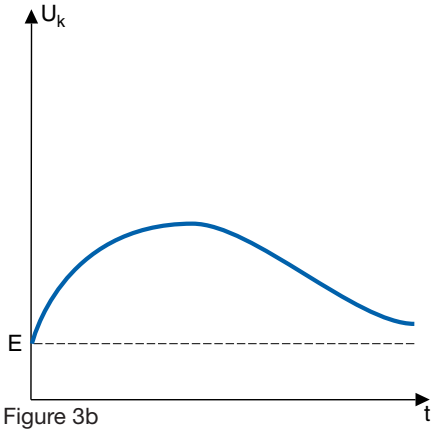


Figure 3b

In order to limit the current through the contact when it closes, the resistor R must be connected in series with the capacitor.

The values of the capacitor and the resistor depend on the inductance and resistance in the load, the applied voltage and type of contact (i.e. exactly how the contact makes and breaks and its current rating). The protective capacitance must be large enough to prevent the contact voltage from rising to a value greater than the air breakdown value at any instant.

APPLICATION GUIDE

This value depends on the contact separation but is never less than 300 volts. With few exceptions, a 0.1 µF capacitor will be large enough to hold the peak voltage to less than 300 volts.

Limiting the voltage rise across the contacts to less than 300 volts peak will not necessarily prevent all breakdowns of the gap. At the very first instant of contact breaking the contact operation is so minute that low-voltage breakdowns of the gap may occur. To minimize this risk the common procedure is to impose the additional requirement that the contact protection capacitor must limit the rate of voltage rise immediately after the contact breaks to 1 volt per microsecond. This requirement will be met if the ratio I/C is less than unity where I is given in amperes and C is in microfarads. For slow moving contacts even larger capacitors are used.

With sufficient capacitance in the circuit for protection when the contact breaks, a resistor is needed for protection when the contact closes. The network capacitor is charged to the full voltage when the circuit is open. Closing the contacts effectively short-circuits this voltage, so a resistance is connected in series with the network capacitor to limit the current through the contact. The resistor thus reduces erosion as the contact closes, but also tends to increase it as it opens. The sudden diversion of the steady-state current into the protection network on contact breaking immediately produces a voltage across the contacts due to the current flowing through the protection resistance. A compromise is therefore necessary, and it is general practice to have a resistance that gives the same current through the contact on closure as the steady-state current.

The RC network can be connected across the contact or across the load. If there is long wiring between the contact and the load, connecting the RC network across the contact is to be preferred.

At the same time as the contact is protected by the RC network, electro-magnetic interference suppression is achieved as the sparks, which contain a high frequency spectrum are avoided.

RC units as dU/dt suppressors on thyristors and triacs

The junctions of any semiconductor exhibit some unavoidable capacitance.
A changing voltage impressed on this junction capacitance results in a current, I = C dU/dt. If this current is sufficiently large a regenerative action may occur causing the SCR to switch to the on-state. This regenerative action is similar to what will occur when a gate current is injected. High dU/dt may occur from other thyristors switching on or off or be due to reapplied dU/dt. Figure 4a shows a full-wave phase control circuit, with an inductive load.

When the current decreases to zero (the triac commutates, point A), figure 4b, the supply voltage (which is not zero) must then appear as a forward bias across the triac. The rate-of-change of this voltage is dependent on inductance and capacitance in the load circuit, as well as on reverse

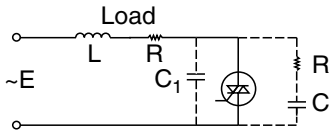


Figure 4a

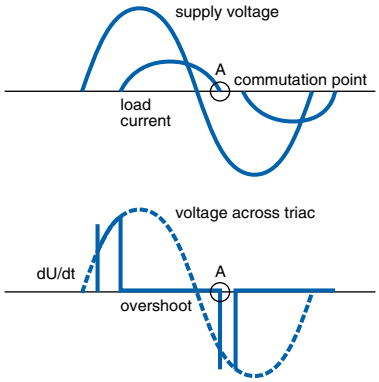


Figure 4b

recovery characteristics of the triac. The application of a series RC circuit in parallel with the triac will reduce the dU/dt to an acceptable value. The values of R and C are functions of the load, line voltage and triac used. Since circuit impedances for a particular application are not usually well known the values of C and R are often determined by trial and error, or simply by overrating. For triacs 0.1 µF + 100 Ω is often used. Evox Rifa's RC units are well suited as dU/dt protectors in low power circuits. As the tolerances of capacitance and resistance are not critical they will give satisfactory operation in most circuits.

PMR205

RoHS Compliant

- **RC unit, metallized paper with integrated resistor**
- **0.1 – 1.0 µF, 22 - 680 Ω, 125 VAC, +85 °C**

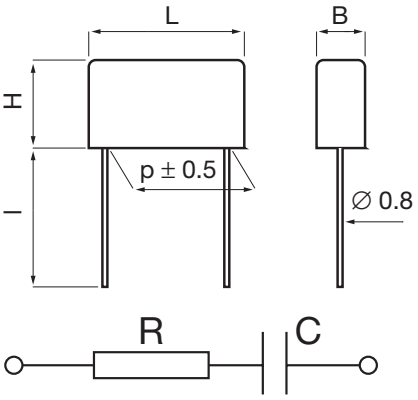
- Small dimensions
- High dU/dt capability.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- Self-extinguishing encapsulation.
- Good resistance to ionisation due to impregnated dielectric.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

RC unit for use in DC and AC applications for:
– contact protection
– interference suppression of contacts
– transient suppression

CONSTRUCTION

Single layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0. The resistance in the metal layer is utilized as series resistance, integrated resistor.



l: standard: 30 +5/-0 mm (code R30)

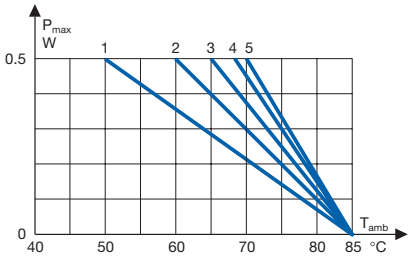
option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage	250 VDC, 125 VAC
Capacitance range	0.1–1.0 µF
Capacitance tolerance	± 20%
Resistance range	22 – 680 Ω
Resistance tolerance	± 30%
Peak pulse voltage	375 V
Temperature range	–40 to +85°C
Climatic category	40/085/56/B
Series resistance	The series resistance is defined at 1 kHz for RC ≥ 50 µs and at 100 kHz for RC < 50 µs.
Insulation resistance	≥ 3000 MΩ for C ≤ 0.33 µF ≥ 1000 s for C > 0.33 µF Measured at 100 VDC after 60 s, +23°C
Power ratings	The average losses may reach 0.5 W provided the surface temperature does not exceed + 85°C. For maximum permitted power dissipation v temperature, see derating curves.

Curve	Dimensions
1	B = 5.2
2	B = 7.3
2	B = 7.8
3	B = 7.6
4	B = 9.0
5	B = 11.3



Maximum allowable power dissipation vs ambient temperature and case sizes.

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit
Bump	IEC 60068-2-29, Test Eb	4000 bumps at 390 m/s²	No visible damage, No open or short circuit
Solderability	IEC 60068-2-20, Test Ta	Solder globule method	Wetting time < 1 s
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance	Resistance	Max dimensions in mm				Quantity per package R30	R06	reel taped	Weight	Article code
µF	Ω	B	H	L	p	pcs	pcs	pcs	g	
0.10	33	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6100M033R30
0.10	47	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6100M047R30
0.10	100	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6100M100R30
0.10	220	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6100M220R30
0.15	68	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6150M068R30
0.15	100	5.2	10.5	18.5	15.2	500	1000	600	1.7	PMR205AB6150M100R30
0.22	47	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6220M047R30
0.22	100	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6220M100R30
0.22	220	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6220M220R30
0.22	330	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6220M330R30
0.22	470	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6220M470R30
0.25	200	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6250M200R30
0.25	350	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6250M350R30
0.25	600	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR205AB6250M600R30
0.33	47	7.8	13.5	18.5	15.2	400	800	400	3.3	PMR205AB6330M047R30
0.47	22	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M022R30
0.47	33	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M033R30
0.47	47	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M047R30
0.47	68	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M068R30
0.47	100	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M100R30
0.47	150	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M150R30
0.47	220	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M220R30
0.47	330	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR205AC6470M330R30
0.47	470	9.0	15.0	24.0	20.3	200	1200	250	5.0	PMR205AC6470M470R30
0.47	680	11.3	16.5	24.0	20.3	150	1000	180	7.0	PMR205AC6470M680R30
1.0	33	10.6	16.1	30.5	25.4	150	1000		8.6	PMR205AE7100M033R30
1.0	47	11.3	16.5	24.0	20.3	150	1000		7.0	PMR205AC7100M047R30
1.0	68	11.3	16.5	24.0	20.3	150	1000		7.0	PMR205AC7100M068R30
1.0	100	11.3	16.5	24.0	20.3	150	1000		7.0	PMR205AC7100M100R30
1.0	150	11.3	16.5	24.0	20.3	150	1000		7.0	PMR205AC7100M150R30
1.0	220	11.3	16.5	24.0	20.3	150	1000		7.0	PMR205AC7100M220R30

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- RIFA article code
- RC unit
- Rated capacitance and resistance
- Rated voltage
- MP, for metallized paper
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Circuit diagram
- Manufacturing code (year, month)

PMR209

RoHS Compliant

- **RC unit, class X2, metallized paper with integrated resistor**
- **0.047 – 0.47 µF, 22 – 470 Ω, 250 VAC, +85 °C**

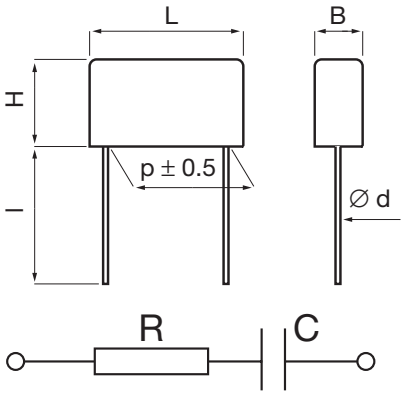
- Small dimensions
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- High dU/dt capability.
- Self-extinguishing encapsulation.
- Good resistance to ionisation due to impregnated dielectric.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

RC unit for use in DC and AC applications for:
– contact protection
– interference suppression of contacts
– transient suppression

CONSTRUCTION

Single layer metallized paper. Encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0. The resistance in the metal layer is utilized as series resistance, integrated resistor.

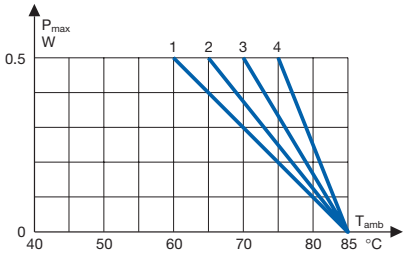


d = 0.8 for p = 15.2 and 20.3
1.0 for p = 25.4

l: standard: 30 +5/-0 mm (code R30)

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N



TECHNICAL DATA

Rated voltage	250 VAC 50/60 Hz, 630 VDC
Capacitance range **Capacitance tolerance**	0.047 – 0.47 µF ± 20%
Resistance range **Resistance tolerance**	22 – 470 Ω ± 30%
Peak pulse voltage	1000 V
Temperature range **Climatic category**	–40 to +85°C 40/085/56/B
Approvals	ENEC, UL
Series resistance	The series resistance is defined at 1 kHz for RC ≥ 50 µs and at 100 kHz for RC < 50 µs.
Insulation resistance	≥ 3000 MΩ for C ≤ 0.33 µF ≥ 1000 s for C > 0.33 µF Measured at 500 VDC after 60 s, +23°C
Pulse current	Max 12 A repetitive. Max 20 A peak for occasional transients.
Test voltage between terminals	The 100% screening factory test is carried out at 1800 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.
In DC applications	Recommended voltage ≤ 630 VDC.
Power ratings	The average losses may reach 0.5 W provided the surface temperature does not exceed + 85°C. For max. permitted power dissipation vs temperature, see derating curves.

Curve	Dimensions
1	B = 7.3
2	B = 7.6
3	B = 11.3
4	B = 15.3

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6, Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s²	No visible damage, No open or short circuit
Bump	IEC 60068-2-29, Test Eb	4000 bumps at 390 m/s²	No visible damage, No open or short circuit
Solderability	IEC 60068-2-20, Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005		
Humidity	IEC 60068-2-3, Test Ca	+40°C and 90 – 95% R.H.	56 days

ARTICLE TABLE

Capacitance µF	Resistance Ω	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	Article code
0.047	47	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR209MB5470M047R30
0.047	100	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR209MB5470M100R30
0.10	22	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR209MC6100M022R30
0.10	33	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR209MC6100M033R30
0.10	47	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR209MC6100M047R30
0.10	68	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR209MC6100M068R30
0.10	100	7.6	14.0	24.0	20.3	250	1500	250	4.0	PMR209MC6100M100R30
0.10	150	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6100M150R30
0.10	220	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6100M220R30
0.10	330	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6100M330R30
0.10	470	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6100M470R30
0.22	22	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M022R30
0.22	33	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M033R30
0.22	47	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M047R30
0.22	68	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M068R30
0.22	100	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M100R30
0.22	150	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M150R30
0.22	220	11.3	16.5	24.0	20.3	150	1500	180	7.0	PMR209MC6220M220R30
0.22	330	12.1	19.0	30.5	25.4	100	800		10.0	PMR209ME6220M330R30
0.22	470	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6220M470R30
0.47	33	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M033R30
0.47	47	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M047R30
0.47	68	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M068R30
0.47	100	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M100R30
0.47	150	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M150R30
0.47	220	15.3	22.0	30.5	25.4	75	600		15.0	PMR209ME6470M220R30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005
UL	UL 1283

MARKING

- RIFA
- RIFA article code
- RC unit
- Rated capacitance and resistance
- Rated voltage
- X2
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Circuit diagram
- Manufacturing code (year, month)

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PMR210

RoHS Compliant

• RC unit, class X1, metallized paper with integrated resistor
• 0.022 – 0.1 µF, 100 Ω, 250 VAC, +85 °C

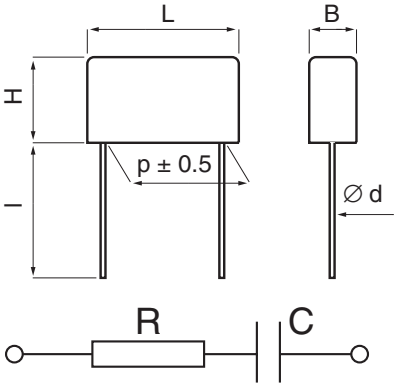
- RC unit for safety applications.
- Small dimensions
- High dU/dt capability.
- Self-extinguishing encapsulation. The material is recognized acc. to UL 94 V-0
- Good resistance to ionisation due to impregnated dielectric.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

RC unit for use in DC and AC applications for:
– contact protection
– interference suppression of contacts
– transient suppression

CONSTRUCTION

Single layer metallized paper, encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0. The resistance in the metal layer is utilized as series resistance, integrated resistor.



d = 0.8 for p = 15.2 and 20.3
1.0 for p = 25.4

l: standard: 30 +5/-0 mm

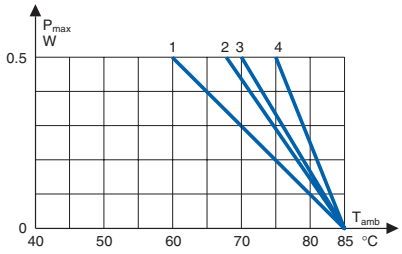
option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06)
Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage	250 VAC, 50/60 Hz
Capacitance range	0.022–0.1 µF
Capacitance tolerance	± 20%
Resistance range	100 Ω
Resistance tolerance	± 30%
Peak pulse voltage	1000 V
Temperature range	–40 to +85°C
Climatic category	40/085/56/B
Approvals	ENEC, UL
Series resistance	The series resistance is defined at 100 kHz
Insulation resistance	≥ 1000 MΩ Measured at 500 VDC after 60 s, +23°C
Pulse current	Max 12 A repetitive. Max 20 A peak for occasional transients.
Test voltage between terminals	The 100% screening factory test is carried out at 3000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.
In DC applications	Recommended voltage ≤ 1000 VDC.
Power ratings	The average losses may reach 0.5 W provided the surface temperature does not exceed + 85°C. For maximum permitted power dissipation vs temperature, see derating curves.

Curve	Dimensions
1	B = 7.3
1	B = 8.5
2	B = 9.0
3	B = 11.3
4	B = 10.6



Maximum allowable power dissipation vs ambient temperature and case sizes.

ARTICLE TABLE

Capacitance µF	Resistance Ω	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	Article code
0.022	100	7.3	13.0	18.5	15.2	400	800	400	3.0	PMR210MB5220M100R30
0.033	100	8.5	14.3	18.5	15.2	300	500	350	3.8	PMR210MB5330M100R30
0.047	100	9.0	15.0	24.0	20.3	200	1200	250	5.0	PMR210MC5470M100R30
0.068	100	11.3	16.5	24.0	20.3	150	1000	180	7.0	PMR210MC5680M100R30
0.10	100	10.6	16.1	30.5	25.4	150	1000		8.0	PMR210ME6100M100R30

APPROVALS

Certification Body	Specification	
ENEC	EN/IEC 60384-14:2005	
UL	UL 1414 Across-the-line	(U_R = 250 VAC)

MARKING

- RIFA
- RIFA article code
- RC unit
- Rated capacitance and resistance
- Rated voltage
- IEC 60065
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s^2	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s^2	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d ≤ 0.8 < 1 s for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL 1414	Enclosure material of UL 94V-0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

PMZ2035

RoHS Compliant

• RC unit, class X1, metallized paper with integrated resistor
• 0.1 µF 150 Ω, 440 VAC, +85 °C

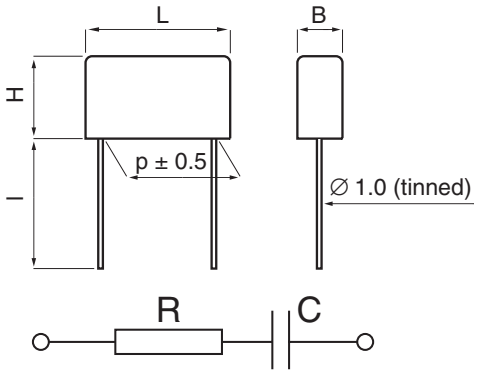
- RC unit for safety applications.
- Small dimensions
- High dU/dt capability.
- Self-extinguishing encapsulation. The material is recognized acc. to UL 94 V-0
- Good resistance to ionisation due to impregnated dielectric.
- Excellent self-healing properties. Ensures long life even when subjected to frequent overvoltages.
- The impregnated paper ensures excellent stability giving outstanding reliability properties, especially in applications having continuous operation.

TYPICAL APPLICATIONS

RC unit for use in DC and AC applications for:
– contact protection
– interference suppression of contacts
– transient suppression

CONSTRUCTION

Multilayer metallized paper, encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94V-0. The resistance in the metal layer is utilized as series resistance, integrated resistor.



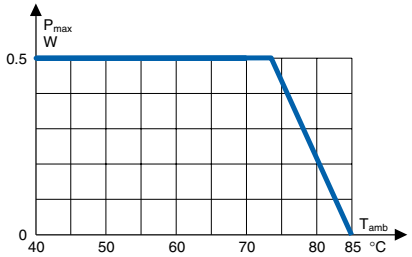
l: standard: 30 +5/-0 mm

option 1: short leads, tolerance +0/-1 mm (standard 6 mm, code R06) Other lead lengths on request

option 2: 30 mm insulated solid leads, ordering code: replace R30 with R300PS in std P/N

TECHNICAL DATA

Rated voltage	440 VAC, 50/60 Hz
Capacitance range	0.1 µF
Capacitance tolerance	± 20%
Resistance range	150 Ω
Resistance tolerance	± 30%
Peak pulse voltage	1000 V
Temperature range	–40 to +85°C
Climatic category	40/085/56/B
Approvals	ENEC
Series resistance	The series resistance is defined at 100 kHz
Insulation resistance	≥ 6000 MΩ Measured at 500 VDC after 60 s, +23°C
Pulse current	Max 12 A repetitive. Max 20 A peak for occasional transients.
Test voltage between terminals	The 100% screening factory test is carried out at 1800 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test.
In DC applications	Recommended voltage ≤ 1000 VDC.
Power ratings	The average losses may reach 0.5 W provided the surface temperature does not exceed + 85°C. For maximum permitted power dissipation vs temperature, see derating curve.



Maximum allowable power dissipation vs ambient temperature

ARTICLE TABLE

Capacitance µF	Resistance Ω	Max dimensions in mm B	H	L	p	Quantity per package R30 pcs	R06 pcs	reel taped pcs	Weight g	Article code
0.10	150	12.1	19.0	30.5	25.4	100	800		10	PMZ2035RE6100K150R30

APPROVALS

Certification Body	Specification
ENEC	EN/IEC 60384-14:2005

MARKING

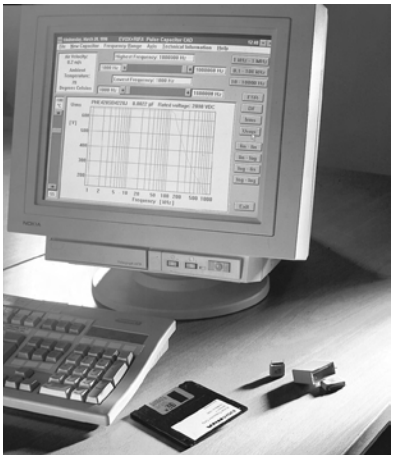
- RIFA
- RIFA article code
- RC unit
- Rated capacitance and resistance
- Rated voltage
- Capacitor class and sub-class
- SH, for self-healing
- Climatic category according to IEC 60068-1, appendix A
- Passive flammability class
- Approval marks
- Manufacturing code (year, month)

ENVIRONMENTAL TEST DATA

Vibration	IEC 60068-2-6 Test Fc	3 directions at 2 hour each 10 – 500 Hz at 0.75 mm or 98 m/s^2	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	4000 bumps at 390 m/s^2	No visible damage No open or short circuit
Solderability	IEC 60068-2-20 Test Ta	Solder globule method	Wetting time for d > 0.8 < 1.5 s
Active flammability	EN/IEC 60384-14:2005		
Passive flammability	EN/IEC 60384-14:2005 UL 1414	Enclosure material of UL 94V-0 flammability class	
Humidity	IEC 60068-2-3 Test Ca	+40°C and 90 – 95% R.H.	56 days

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.



Pulse Capacitors

This section covers a range of through-hole metallized (MKP) and film/foil (KP) polypropylene capacitors for pulse and high frequency applications.

For SMD capacitors we refer to our SMD Capacitors Catalogue or www.kemet.com

Type	Construction	Capacitance	Rated voltage	Page
PHE426	single metallized	0.001 - 27 µF	100 – 1000 VDC	96
PHE429	single metallized	0.047 - 0.47 µF	420 – 630 VDC	103
PHE448	film/metallized film/foil	100 pF - 15 nF	1600 – 2000 VDC	105
PHE450	double metallized	330 pF - 10 µF	250 – 3000 VDC	107
PFR	film/foil	100 pF - 22 nF	63 – 1000 VDC	115

TERMS AND DEFINITIONS

Pulse capacitor
A pulse capacitor is a capacitor designed primarily for applications with intermittent charges and/or discharges at high values of the charge/discharge current.

Pulse operation
Capacitors subjected to pulses with fast rise or fall times (high dU/dt) will be exposed to high current pulses (i = C x dU/dt). In order not to overload the internal connections the current must be limited. The current limits for a specific type of capacitor are dependent upon:
- Amplitude and form of the pulse
- Rated voltage of the capacitor
- Capacitance
- Geometrical configuration of the winding

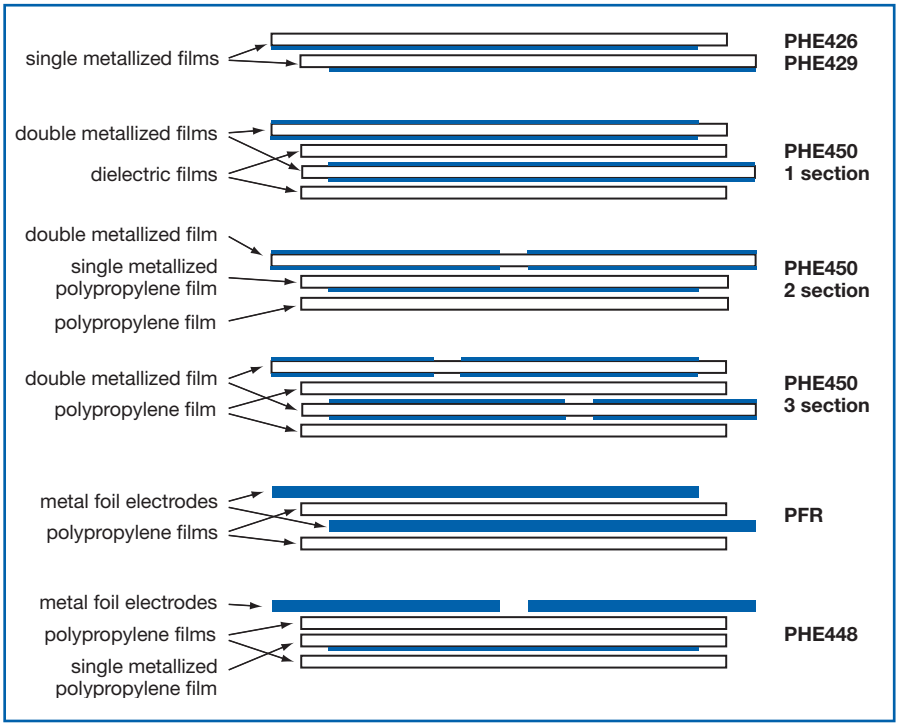
At repeated pulse operation, self-heating, ambient temperature and cooling set the load limit.
Pulse current limits are commonly expressed in the form of maximum permitted dU/dt in volts per microsecond. The figures stated in the data sheets refer to an unlimited number of pulses charging or discharging to or from the rated voltage U_R.

TYPICAL APPLICATIONS

Pulse capacitors are intended for coupling, bypass, filtering, snubbering or pulse operation in SMPS at low as well as at high AC voltage of high frequency where there is a need for high pulse rise time and high ionization level, e.g. fly-back circuits in TV-sets.

CONSTRUCTION

In a metallized film capacitor the electrodes are deposited under vacuum on the plastic film. Contact to the metallized layers is achieved by spraying the ends of the windings with a special metal alloy. This method results in low inductance and a low series resistance capacitor. There are three main types of metallized film compositions. In film/foil types of capacitors metal foils are used as electrodes.



THERMAL DISSIPATION

The power dissipation in a capacitor is approximately:
$P = 2\pi f \times C \times \tan\delta \times U_{rms}^2$ (1)
or
$P = \tan\delta/(2\pi f \times C) \times I_{rms}^2$ (2)
$\tan\delta$ = dissipation factor.
Typical values can be estimated from the diagram on page 15.
f = frequency (Hz)
This is valid for sine wave signals. For wide band signals, the power dissipation values for each frequency have to be added, i.e.

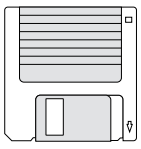
$P_{tot} = P1 + P2 + ... + Pn$
$\Delta T = (T_h - T_a) = P \times R_{thha}$ °C (3)
Temperature increase between hot spot (T_h) of the capacitor and ambient (T_a).
R_{thha} = Thermal resistance (°C/W) between hot spot and ambient.
Maximum permissible hot spot temperature for polypropylene is +105 °C and maximum ΔT=10 °C at +85 °C T_a.
For lower T_a, a higher ΔT can be allowed.
This is implemented in PCCAD software package below.

The diagrams for derated AC voltage vs. frequency for the pulse capacitors in this catalogue are calculated with T_a = +85 °C and ΔT = 10 °C.
Example:
PHE450SB4680JR06 6.8 nF 2000 VDC
f = 100 kHz, U_{rms} = 200 VAC, DF = 0.03%,
R_{thha} = 98 °C/W
With formula (1) and (3) above:
P = 0.05 W and ΔT = 5 °C
If T_a = 85 °C then T_h = 90 °C

PULSE CAPACITOR CAD (PCCAD) - UNIQUE SOFTWARE

In order to make it easy to select pulse capacitors Evox Rifa has developed a software for Windows™ with the following main options:
- To get general technical information about pulse capacitors
- To get complete data sheets of all Evox Rifa pulse capacitors
- To select a Part Number and then get diagrams of ESR, DF, max I_{rms} and U_{rms} vs frequency and ambient temperature. This means that it is easy
- To check if a certain capacitor is suitable for a certain application.
- To make Fourier analysis of an arbitrary waveform.
- To make print-outs of data files and diagrams from simulations.

This is normally all the information needed to select the right pulse capacitor.
Free download is available at www.kemet.com.



QUALITY TESTS AND REQUIREMENTS

The details are valid for all types of pulse capacitors unless specific remark is made in each detail specification.
All tests are made at +23°C unless otherwise specified.

Test	IEC Publication	Procedure	Requirements
Voltage proof	60384-1 clause 4.6	1.6 x U_R after 60 s	The capacitors must withstand the voltage without breakdowns or flashovers and without decreased insulation resistance below the value in each detail specification. No visible damage.
	clause 4.6 2.3	2 x U_R (min 400 VDC to case) after 60s	As above
Vibration	60068-2-6 Test Fc	6 h with 10 – 500 Hz and 0.75 mm amplitude or 98 m/s² depending on frequency	No visible damage. tanδ ≤ 1.2 x stated value at 100 kHz ΔC/C ≤ ± 0.5 %
Bump	60068-2-29 Test Eb	4000 bumps with 390m/s² mounted on PCB	ΔC/C ≤ ± 0.5% tanδ ≤ 1.2 x stated value at 100 kHz Insulation resistance: ≥ 100000 MΩ for C_R ≤ 0.33 µF ≥ 30000 s for C_R > 0.33 µF
Resistance to soldering heat *	60068-2-20 Method 1A	Solder bath at + 260°C ± 5°C with screening	Immersion of the terminations into the solder bath shall be completed in a time not exceeding 1 s and the terminations shall remain immersed to the specified depth for 10 + 1 s and then be withdrawn. ΔC/C ≤ ± 0.5 % tanδ ≤ 1.2 x stated value at 100 kHz No visible damage.
Climatic sequence	60384-1 para 4:21	IEC 60068-2.2 dry heat 16 h IEC 60068-2-34 damp heat, one cycle, IEC 60068-2-1 Test Aa 2 h	Insulation resistance: ≥ 100000 MΩ for C_R ≤ 0.33 µF ≥ 30000 s for C_R > 0.33 µF ΔC/C ≤ ± 0.5 % tanδ ≤ 1.2 x stated value at 100 kHz
Damp heat steady state	IEC 60068-2-3 Test Ca	+ 40°C and 90 – 95% RH	56 days No visible damage. Insulation resistance: ≥ 50000 MΩ for C_R ≤ 0.33 µF ≥ 15000 s for C_R > 0.33 µF ΔC/C ≤ ± 1% tanδ ≤ 1.2 x stated value at 100 kHz
Endurance, AC		1000 h at +85°C and 1.25 x U_R AC	No visible damage. ΔC/C ≤ ± 3% tanδ ≤ 1.5 x stated value at 100 kHz Insulation resistance: ≥ 100000 MΩ for C_R ≤ 0.33 µF ≥ 30000 MΩ for C_R > 0.33 µF
Charge and discharge	60384-17 para 4.13	10000 pulses and with (2 x) dU/dt according to detail specification	tanδ (100 kHz) ≤ 2 x stated value (100 kHz) ΔC/C ≤ ± 0.5% Insulation resistance: ≥ 50000 MΩ for C_R ≤ 0.33 µF ≥ 15000 s for C_R > 0.33 µF

* Note: Generally, all small polypropylene capacitors are sensitive to the soldering heat due to the relatively low melting point of polypropylene material (160°C - 170°C). This is why the suitability of the soldering process should be checked before the use of especially PHE426 in 5 and 7.5 mm pitches. Consult KEMET for recommended temperature profiles.

PHE426

RoHS Compliant

- **Single metallized film pulse capacitor, polypropylene dielectric**
- **According to IEC 60384-16, grade 1.1**

TYPICAL APPLICATIONS

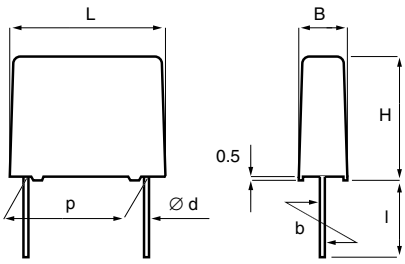
Pulse operation in SMPS, TV, monitor, electrical ballast and other high frequency applications demanding stable operation.

CONSTRUCTION

Polypropylene film capacitor with vacuum evaporated aluminum electrodes. Radial leads of tinned wire are electrically welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.
Two different winding constructions are used, depending on voltage and lead spacing. They are specified in the article table.

1 section construction

2 section construction



p	d	std l	max l	b
5.0 ± 0.4	0.5	5^{-1}	20	± 0.4
7.5 ± 0.4	0.6	5^{-1}	20	± 0.4
10.0 ± 0.4	0.6	5^{-1}	30	± 0.4
15.0 ± 0.4	0.8	6^{-1}	30	± 0.4
22.5 ± 0.4	0.8	6^{-1}	30	± 0.4
27.5 ± 0.4	0.8	6^{-1}	30	± 0.4
37.5 ± 0.5	1.0	6^{-1}	30	± 0.7

TECHNICAL DATA

Rated voltage U_R, VDC	100	250	300	400	450	630	1000	1600	2000
Rated voltage U_R, VAC	63	160	160	220	220	250	250	650	700
Capacitance range, µF	0.001 –0.22	0.001 –27	0.033 –18	0.001 –10	0.1 –3.9	0.001 –5.6	0.0027 –3.3	0.0047 –0.047	0.001 –0.027

Capacitance values
In accordance with IEC E12 series

Capacitance tolerance
±5%, other tolerances on request

Category temperature range
–55 ... +105°C

Rated temperature
+85°C

Voltage derating
The rated voltage is decreased with 1.3%/°C between +85°C and +105°C.

Climatic category
IEC 60068-1, 55/105/56/B

Passive flammability
Category B according to IEC 60065

Maximum pulse steepness:
dU/dt according to article table
For peak to peak voltages lower than rated voltage ($U_{PP} < U_R$), the specified dU/dt can be multiplied by the factor U_R/U_{PP}.

Temperature coefficient
–200 (+50, –100) ppm/°C (at 1 kHz)

Self-inductance
Approximately 6 nH/cm for the total length of capacitor winding and the leads.

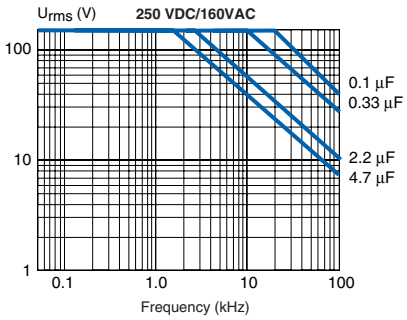
Dissipation factor tanδ
Maximum values at +23°C

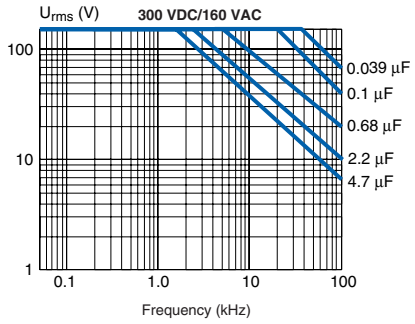
	C ≤ 0.1 µF	0.1µF < C ≤ 1.0 µF	C > 1.0 µF
1 kHz	0.05%	0.05%	0.10%
10 kHz	–	0.10%	
100 kHz	0.25%	–	–

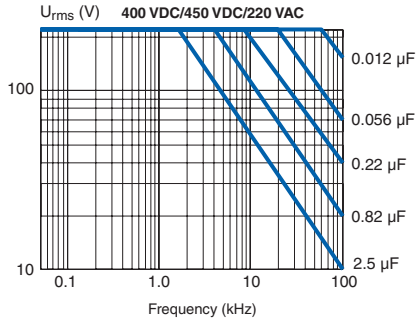
Insulation resistance
Measured at +23°C, 100 VDC 60 s for U_R < 500 VDC and at 500 VDC for U_R ≥ 500 VDC

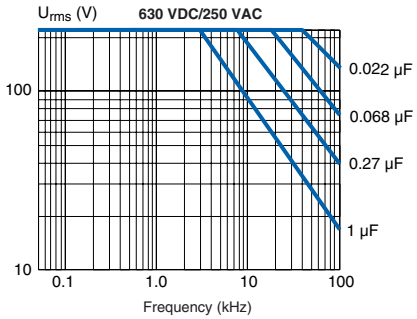
Between terminals:
C ≤ 0.33 µF: ≥ 100 000 MΩ
C > 0.33 µF: ≥ 30 000 s
Between terminals and case:
≥ 100 000 MΩ.

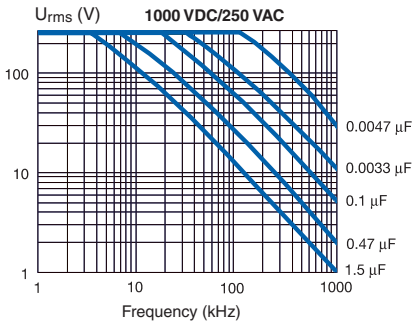
DERATING OF U_{RMS} VS FREQUENCY, +85°C AMBIENT TEMPERATURE AND 10°C INTERNAL HEATING, TYPICAL VALUES

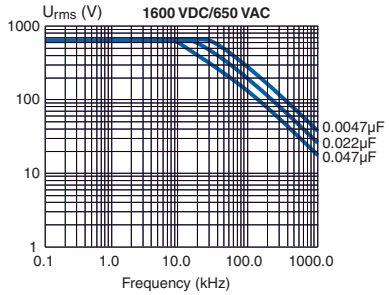


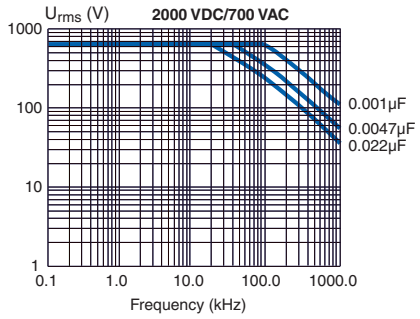












More simulation possibilities in PCCAD software package.
See page 94.

ENVIRONMENTAL TEST DATA

According to IEC 60384-16, Grade 1.1 and Quality tests and requirements for Pulse Capacitors on page 95.

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- Article code
- Rated capacitance according to IEC 60062
- Capacitance tolerance code
- Rated voltage
- Manufacturing code (year, month)

ARTICLE TABLE

100 VDC/63 VAC (1 Section)

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	J01	2.5	6.5	7.2	100	230	PHE426DJ4100JR05
0.0012	J01	2.5	6.5	7.2	100	230	PHE426DJ4120JR05
0.0015	J01	2.5	6.5	7.2	100	230	PHE426DJ4150JR05
0.0018	J01	2.5	6.5	7.2	100	230	PHE426DJ4180JR05
0.0022	J01	2.5	6.5	7.2	100	230	PHE426DJ4220JR05
0.0027	J01	2.5	6.5	7.2	100	230	PHE426DJ4270JR05
0.0033	J01	2.5	6.5	7.2	100	230	PHE426DJ4330JR05
0.0039	J01	2.5	6.5	7.2	100	230	PHE426DJ4390JR05
0.0047	J01	2.5	6.5	7.2	100	230	PHE426DJ4470JR05
0.0056	J01	2.5	6.5	7.2	100	230	PHE426DJ4560JR05
0.0068	J01	2.5	6.5	7.2	100	230	PHE426DJ4680JR05
0.0082	J01	2.5	6.5	7.2	100	230	PHE426DJ4820JR05
0.010	J01	2.5	6.5	7.2	100	230	PHE426DJ5100JR05
0.012	J01	2.5	6.5	7.2	100	230	PHE426DJ5120JR05
0.015	J01	2.5	6.5	7.2	100	230	PHE426DJ5150JR05
0.018	J02	3.5	8.0	7.2	100	230	PHE426DJ5180JR05
0.022	J02	3.5	8.0	7.2	100	230	PHE426DJ5220JR05
0.027	J02	3.5	8.0	7.2	100	230	PHE426DJ5270JR05
0.033	J02	3.5	8.0	7.2	100	230	PHE426DJ5330JR05
0.039	J02	3.5	8.0	7.2	100	230	PHE426DJ5390JR05
0.047	J02	3.5	8.0	7.2	100	230	PHE426DJ5470JR05
0.056	J03	4.5	9.0	7.2	100	230	PHE426DJ5560JR05
0.068	J03	4.5	9.0	7.2	100	230	PHE426DJ5680JR05
0.082	J04	5.0	10.0	7.2	100	230	PHE426DJ5820JR05
0.10	J05	6.0	11.0	7.2	100	230	PHE426DJ6100JR05
0.12	J05	6.0	11.0	7.2	100	230	PHE426DJ6120JR05
0.15	J06	7.2	13.0	7.2	100	230	PHE426DJ6150JR05
0.18	J06	7.2	13.0	7.2	100	230	PHE426DJ6180JR05
0.22	J06	7.2	13.0	7.2	100	230	PHE426DJ6220JR05

250 VDC/160 VAC (1 Section)

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	J01	2.5	6.5	7.2	40	230	PHE426HJ4100JR05
0.0012	J01	2.5	6.5	7.2	40	230	PHE426HJ4120JR05
0.0015	J01	2.5	6.5	7.2	40	230	PHE426HJ4150JR05
0.0018	J01	2.5	6.5	7.2	40	230	PHE426HJ4180JR05
0.0022	J01	2.5	6.5	7.2	40	230	PHE426HJ4220JR05
0.0027	J01	2.5	6.5	7.2	40	230	PHE426HJ4270JR05
0.0033	J01	2.5	6.5	7.2	40	230	PHE426HJ4330JR05
0.0039	J01	2.5	6.5	7.2	40	230	PHE426HJ4390JR05
0.0047	J01	2.5	6.5	7.2	40	230	PHE426HJ4470JR05
0.0056	J01	2.5	6.5	7.2	40	230	PHE426HJ4560JR05
0.0068	J01	2.5	6.5	7.2	40	230	PHE426HJ4680JR05
0.0082	J01	2.5	6.5	7.2	40	230	PHE426HJ4820JR05
0.010	J01	2.5	6.5	7.2	40	230	PHE426HJ5100JR05
0.012	J01	2.5	6.5	7.2	40	230	PHE426HJ5120JR05
0.015	J01	2.5	6.5	7.2	40	230	PHE426HJ5150JR05
0.018	J02	3.5	8.0	7.2	40	230	PHE426HJ5180JR05
0.022	J02	3.5	8.0	7.2	40	230	PHE426HJ5220JR05
0.027	J02	3.5	8.0	7.2	40	230	PHE426HJ5270JR05
0.033	J02	3.5	8.0	7.2	40	230	PHE426HJ5330JR05
0.039	J02	3.5	8.0	7.2	40	230	PHE426HJ5390JR05
0.047	J02	3.5	8.0	7.2	40	230	PHE426HJ5470JR05
0.056	J03	4.5	9.0	7.2	40	230	PHE426HJ5560JR05
0.068	J03	4.5	9.0	7.2	40	230	PHE426HJ5680JR05
0.082	J04	5.0	10.0	7.2	40	230	PHE426HJ5820JR05
0.10	J05	6.0	11.0	7.2	40	230	PHE426HJ6100JR05
0.12	J05	6.0	11.0	7.2	40	230	PHE426HJ6120JR05
0.15	J06	7.2	13.0	7.2	40	230	PHE426HJ6150JR05
0.18	J06	7.2	13.0	7.2	40	230	PHE426HJ6180JR05
0.22	J06	7.2	13.0	7.2	40	230	PHE426HJ6220JR05

250 VDC/160 VAC (1 Section)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	K01	4.0	8.0	10.0	180	160	PHE426HK4100JR05
0.0012	K01	4.0	8.0	10.0	180	160	PHE426HK4120JR05
0.0015	K01	4.0	8.0	10.0	180	160	PHE426HK4150JR05
0.0018	K01	4.0	8.0	10.0	180	160	PHE426HK4180JR05
0.0022	K01	4.0	8.0	10.0	180	160	PHE426HK4220JR05
0.0027	K01	4.0	8.0	10.0	180	160	PHE426HK4270JR05
0.0033	K01	4.0	8.0	10.0	180	160	PHE426HK4330JR05
0.0039	K01	4.0	8.0	10.0	180	160	PHE426HK4390JR05
0.0047	K01	4.0	8.0	10.0	180	160	PHE426HK4470JR05
0.0056	K01	4.0	8.0	10.0	180	160	PHE426HK4560JR05
0.0068	K01	4.0	8.0	10.0	180	160	PHE426HK4680JR05
0.0082	K01	4.0	8.0	10.0	180	160	PHE426HK4820JR05
0.010	K01	4.0	8.0	10.0	180	160	PHE426HK5100JR05
0.012	K01	4.0	8.0	10.0	180	160	PHE426HK5120JR05
0.015	K01	4.0	8.0	10.0	180	160	PHE426HK5150JR05
0.018	K01	4.0	8.0	10.0	180	160	PHE426HK5180JR05
0.022	K01	4.0	8.0	10.0	180	160	PHE426HK5220JR05
0.027	K01	4.0	8.0	10.0	180	160	PHE426HK5270JR05
0.033	K01	4.0	8.0	10.0	180	160	PHE426HK5330JR05
0.039	K01	4.0	8.0	10.0	180	160	PHE426HK5390JR05
0.047	K01	4.0	8.0	10.0	180	160	PHE426HK5470JR05
0.056	K01	4.0	8.0	10.0	180	160	PHE426HK5560JR05
0.068	K03	5.0	11.0	10.0	180	160	PHE426HK5680JR05
0.082	K03	5.0	11.0	10.0	180	160	PHE426HK5820JR05
0.10	K03	5.0	11.0	10.0	180	160	PHE426HK6100JR05
0.12	K04	6.0	12.0	10.5	180	160	PHE426HK6120JR05
0.15	K04	6.0	12.0	10.5	180	160	PHE426HK6150JR05

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.068	A01	4.0	9.0	13.0	160	135	PHE426HA5680JR05
0.082	A01	4.0	9.0	13.0	160	135	PHE426HA5820JR05
0.10	A02	4.5	10.5	13.0	160	120	PHE426HA6100JR05
0.12	A02	4.5	10.5	13.0	160	120	PHE426HA6120JR05
0.15	A03	5.0	11.0	13.0	160	113	PHE426HA6150JR05
0.18	A03	5.0	11.0	13.0	160	113	PHE426HA6180JR05
0.22	A04	6.0	12.0	13.0	160	105	PHE426HA6220JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.18	B04	5.5	10.5	18.0	120	99	PHE426HB6180JR06
0.22	B04	5.5	10.5	18.0	120	99	PHE426HB6220JR06
0.27	B05	5.5	12.5	18.0	120	85	PHE426HB6270JR06
0.33	B15	6.0	12.0	18.0	120	83	PHE426HB6330JR06
0.39	B10	6.5	12.5	18.0	120	82	PHE426HB6390JR06
0.47	B06	7.5	14.5	18.0	120	74	PHE426HB6470JR06
0.56	B06	7.5	14.5	18.0	120	74	PHE426HB6560JR06
0.68	B12	8.0	15.0	18.0	120	71	PHE426HB6680JR06
0.82	B11	8.5	16.0	18.0	120	64	PHE426HB6820JR06
1.0	B14	9.5	17.5	18.0	120	60	PHE426HB7100JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.68	D13	6.5	14.5	26.0	80	58	PHE426HD6680JR06L2
0.82	D17	7.0	16.5	26.0	80	53	PHE426HD6820JR06L2
1.0	D17	7.0	16.5	26.0	80	53	PHE426HD7100JR06L2
1.2	D14	8.0	16.0	26.0	80	53	PHE426HD7120JR06L2
1.5	D15	9.0	18.5	26.0	80	48	PHE426HD7150JR06L2
1.8	D18	10.5	19.0	26.0	80	45	PHE426HD7180JR06L2
2.2	D16	11.0	21.5	26.0	80	40	PHE426HD7220JR06L2
2.7	D20	13.5	23.0	26.0	80	40	PHE426HD7270JR06L2
3.3	D20	13.5	23.0	26.0	80	40	PHE426HD7330JR06L2
3.9	D19	15.5	24.5	26.0	80	40	PHE426HD7390JR06L2
4.7	D19	15.5	24.5	26.0	80	40	PHE426HD7470JR06L2

ARTICLE TABLE

250 VDC/160 VAC (1 Section)

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
2.2	F11	10.5	20.5	31.5	50	37	PHE426HF7220JR06L2
2.7	F11	10.5	20.5	31.5	50	37	PHE426HF7270JR06L2
2.7	F17	21.0	12.5	31.5	50	37	PHE426HT7270JR06L2
3.3	F12	11.5	22.5	31.5	50	34	PHE426HF7330JR06L2
3.9	F03	13.5	23.0	31.5	50	33	PHE426HF7390JR06L2
4.7	F03	13.5	23.0	31.5	50	32	PHE426HF7470JR06L2
5.6	F14	17.5	28.0	31.5	50	28	PHE426HF7560JR06L2
6.8	F14	17.5	28.0	31.5	50	28	PHE426HF7680JR06L2
6.8	F19	27.5	16.0	31.5	50	28	PHE426HT7680JR06L2
8.2	F15	19.0	29.0	31.5	50	26	PHE426HF7820JR06L2
10.0	F16	21.0	30.0	31.5	50	26	PHE426HF8100JR06L2
10.0	F18	31.0	19.0	31.5	50	26	PHE426HT8100JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
4.7	R05	13.0	24.0	41.0	30	27	PHE426HR7470JR06L2
5.6	R05	13.0	24.0	41.0	30	27	PHE426HR7560JR06L2
6.8	R04	15.0	26.0	41.0	30	25	PHE426HR7680JR06L2
8.2	R02	16.5	32.0	41.0	30	21	PHE426HR7820JR06L2
10.0	R02	16.5	32.0	41.0	30	21	PHE426HR8100JR06L2
12.0	R03	19.0	36.0	41.0	30	19	PHE426HR8120JR06L2
15.0	R03	19.0	36.0	41.0	30	19	PHE426HR8150JR06L2
18.0	R06	21.0	38.0	41.0	30	17	PHE426HR8180JR06L2
20.0	R06	21.0	38.0	41.0	30	17	PHE426HR8200JR06L2
22.0	R08	28.0	43.0	41.0	30	17	PHE426HR8220JR06L2
27.0	R08	28.0	43.0	41.0	30	17	PHE426HR8270JR06L2

300 VDC/160 VAC (1 Section)

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.033	A01	4.0	9.0	13.0	200	135	PHE426JA5330JR05
0.039	A01	4.0	9.0	13.0	200	135	PHE426JA5390JR05
0.047	A01	4.0	9.0	13.0	200	135	PHE426JA5470JR05
0.056	A01	4.0	9.0	13.0	200	135	PHE426JA5560JR05
0.068	A02	4.5	10.5	13.0	200	120	PHE426JA5680JR05
0.082	A02	4.5	10.5	13.0	200	120	PHE426JA5820JR05
0.10	A03	5.0	11.0	13.0	200	113	PHE426JA6100JR05
0.12	A03	5.0	11.0	13.0	200	113	PHE426JA6120JR05
0.15	A04	6.0	12.0	13.0	200	105	PHE426JA6150JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.10	B04	5.5	10.5	18.0	150	99	PHE426JB6100JR06
0.12	B04	5.5	10.5	18.0	150	99	PHE426JB6120JR06
0.15	B04	5.5	10.5	18.0	150	99	PHE426JB6150JR06
0.18	B05	5.5	12.5	18.0	150	85	PHE426JB6180JR06
0.22	B15	6.0	12.0	18.0	150	83	PHE426JB6220JR06
0.27	B10	6.5	12.5	18.0	150	82	PHE426JB6270JR06
0.33	B06	7.5	14.5	18.0	150	74	PHE426JB6330JR06
0.39	B06	7.5	14.5	18.0	150	74	PHE426JB6390JR06
0.47	B12	8.0	15.0	18.0	150	71	PHE426JB6470JR06
0.56	B11	8.5	16.0	18.0	150	64	PHE426JB6560JR06
0.68	B14	9.5	17.5	18.0	150	60	PHE426JB6680JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.33	D13	6.5	14.5	26.0	100	58	PHE426JD6330JR06L2
0.39	D13	6.5	14.5	26.0	100	58	PHE426JD6390JR06L2
0.47	D13	6.5	14.5	26.0	100	58	PHE426JD6470JR06L2
0.56	D13	6.5	14.5	26.0	100	58	PHE426JD6560JR06L2
0.68	D17	7.0	16.5	26.0	100	53	PHE426JD6680JR06L2
0.82	D14	8.0	16.0	26.0	100	53	PHE426JD6820JR06L2
1.0	D15	9.0	18.5	26.0	100	48	PHE426JD7100JR06L2

300 VDC/160 VAC (1 Section)

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.2	D18	10.5	19.0	26.0	100	45	PHE426JD7120JR06L2
1.5	D16	11.0	21.5	26.0	100	40	PHE426JD7150JR06L2
1.8	D20	13.5	23.0	26.0	100	40	PHE426JD7180JR06L2
2.2	D20	13.5	23.0	26.0	100	40	PHE426JD7220JR06L2
2.7	D19	15.5	24.5	26.0	100	40	PHE426JD7270JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.0	F11	10.5	20.5	31.5	70	37	PHE426JF7100JR06L2
1.2	F11	10.5	20.5	31.5	70	37	PHE426JF7120JR06L2
1.5	F11	10.5	20.5	31.5	70	37	PHE426JF7150JR06L2
1.8	F11	10.5	20.5	31.5	70	37	PHE426JF7180JR06L2
1.8	F17	21.0	12.5	31.5	70	37	PHE426JT7180JR06L2
2.2	F12	11.5	22.5	31.5	70	34	PHE426JF7220JR06L2
2.7	F03	13.5	23.0	31.5	70	33	PHE426JF7270JR06L2
3.3	F13	14.5	24.5	31.5	70	32	PHE426JF7330JR06L2
3.9	F14	17.5	28.0	31.5	70	28	PHE426JF7390JR06L2
3.9	F19	27.5	16.0	31.5	70	28	PHE426JT7390JR06L2
4.7	F14	17.5	28.0	31.5	70	28	PHE426JF7470JR06L2
5.6	F15	19.0	29.0	31.5	70	26	PHE426JF7560JR06L2
5.6	F18	31.0	19.0	31.5	70	26	PHE426JT7560JR06L2
6.8	F16	21.0	30.0	31.5	70	26	PHE426JF7680JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
3.3	R05	13.0	24.0	41.0	40	27	PHE426JR7330JR06L2
3.9	R05	13.0	24.0	41.0	40	27	PHE426JR7390JR06L2
4.7	R04	15.0	26.0	41.0	40	25	PHE426JR7470JR06L2
5.6	R02	16.5	32.0	41.0	40	21	PHE426JR7560JR06L2
6.8	R02	16.5	32.0	41.0	40	21	PHE426JR7680JR06L2
8.2	R03	19.0	36.0	41.0	40	19	PHE426JR7820JR06L2
10.0	R03	19.0	36.0	41.0	40	19	PHE426JR8100JR06L2
12.0	R06	21.0	38.0	41.0	40	17	PHE426JR8120JR06L2
15.0	R08	28.0	43.0	41.0	40	17	PHE426JR8150JR06L2
18.0	R08	28.0	43.0	41.0	40	17	PHE426JR8180JR06L2

400 VDC/220 VAC (1 Section)

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	J01	2.5	6.5	7.2	30	230	PHE426KJ4100JR05
0.0012	J01	2.5	6.5	7.2	30	230	PHE426KJ4120JR05
0.0015	J01	2.5	6.5	7.2	30	230	PHE426KJ4150JR05
0.0018	J01	2.5	6.5	7.2	30	230	PHE426KJ4180JR05
0.0022	J01	2.5	6.5	7.2	30	230	PHE426KJ4220JR05
0.0027	J01	2.5	6.5	7.2	30	230	PHE426KJ4270JR05
0.0033	J01	2.5	6.5	7.2	30	230	PHE426KJ4330JR05
0.0039	J01	2.5	6.5	7.2	30	230	PHE426KJ4390JR05
0.0047	J01	2.5	6.5	7.2	30	230	PHE426KJ4470JR05
0.0056	J01	2.5	6.5	7.2	30	230	PHE426KJ4560JR05
0.0068	J01	2.5	6.5	7.2	30	230	PHE426KJ4680JR05
0.0082	J02	3.5	8.0	7.2	30	230	PHE426KJ4820JR05
0.010	J02	3.5	8.0	7.2	30	230	PHE426KJ5100JR05
0.012	J02	3.5	8.0	7.2	30	230	PHE426KJ5120JR05
0.015	J02	3.5	8.0	7.2	30	230	PHE426KJ5150JR05
0.018	J02	3.5	8.0	7.2	30	230	PHE426KJ5180JR05
0.022	J02	3.5	8.0	7.2	30	230	PHE426KJ5220JR05
0.027	J03	4.5	9.0	7.2	30	230	PHE426KJ5270JR05
0.033	J03	4.5	9.0	7.2	30	230	PHE426KJ5330JR05
0.039	J04	5.0	10.0	7.2	30	230	PHE426KJ5390JR05
0.047	J05	6.0	11.0	7.2	30	230	PHE426KJ5470JR05
0.056	J05	6.0	11.0	7.2	30	230	PHE426KJ5560JR05
0.068	J06	7.2	13.0	7.2	30	230	PHE426KJ5680JR05

ARTICLE TABLE

400 VDC/220 VAC (1 Section)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	K01	4.0	8.0	10.0	200	160	PHE426KK4100JR05
0.0012	K01	4.0	8.0	10.0	200	160	PHE426KK4120JR05
0.0015	K01	4.0	8.0	10.0	200	160	PHE426KK4150JR05
0.0018	K01	4.0	8.0	10.0	200	160	PHE426KK4180JR05
0.0022	K01	4.0	8.0	10.0	200	160	PHE426KK4220JR05
0.0027	K01	4.0	8.0	10.0	200	160	PHE426KK4270JR05
0.0033	K01	4.0	8.0	10.0	200	160	PHE426KK4330JR05
0.0039	K01	4.0	8.0	10.0	200	160	PHE426KK4390JR05
0.0047	K01	4.0	8.0	10.0	200	160	PHE426KK4470JR05
0.0056	K01	4.0	8.0	10.0	200	160	PHE426KK4560JR05
0.0068	K01	4.0	8.0	10.0	200	160	PHE426KK4680JR05
0.0082	K01	4.0	8.0	10.0	200	160	PHE426KK4820JR05
0.010	K01	4.0	8.0	10.0	200	160	PHE426KK5100JR05
0.012	K01	4.0	8.0	10.0	200	160	PHE426KK5120JR05
0.015	K01	4.0	8.0	10.0	200	160	PHE426KK5150JR05
0.018	K01	4.0	8.0	10.0	200	160	PHE426KK5180JR05
0.022	K01	4.0	8.0	10.0	200	160	PHE426KK5220JR05
0.027	K01	4.0	8.0	10.0	200	160	PHE426KK5270JR05
0.033	K03	5.0	11.0	10.0	200	160	PHE426KK5330JR05
0.039	K03	5.0	11.0	10.0	200	160	PHE426KK5390JR05
0.047	K03	5.0	11.0	10.0	200	160	PHE426KK5470JR05
0.056	K04	6.0	12.0	10.5	200	160	PHE426KK5560JR05
0.068	K04	6.0	12.0	10.5	200	160	PHE426KK5680JR05

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.022	A01	4.0	9.0	13.0	300	135	PHE426KA5220JR05
0.027	A01	4.0	9.0	13.0	300	135	PHE426KA5270JR05
0.033	A02	4.5	10.5	13.0	300	120	PHE426KA5330JR05
0.039	A02	4.5	10.5	13.0	300	120	PHE426KA5390JR05
0.047	A02	4.5	10.5	13.0	300	120	PHE426KA5470JR05
0.056	A03	5.0	11.0	13.0	300	113	PHE426KA5560JR05
0.068	A04	6.0	12.0	13.0	300	105	PHE426KA5680JR05
0.082	A04	6.0	12.0	13.0	300	105	PHE426KA5820JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.068	B04	5.5	10.5	18.0	200	99	PHE426KB5680JR06
0.082	B04	5.5	10.5	18.0	200	99	PHE426KB5820JR06
0.10	B04	5.5	10.5	18.0	200	99	PHE426KB6100JR06
0.12	B05	5.5	12.5	18.0	200	85	PHE426KB6120JR06
0.15	B10	6.5	12.5	18.0	200	84	PHE426KB6150JR06
0.18	B06	7.5	14.5	18.0	200	74	PHE426KB6180JR06
0.22	B06	7.5	14.5	18.0	200	74	PHE426KB6220JR06
0.27	B12	8.0	15.0	18.0	200	71	PHE426KB6270JR06
0.33	B11	8.5	16.0	18.0	200	64	PHE426KB6330JR06
0.39	B14	9.5	17.5	18.0	200	60	PHE426KB6390JR06
0.47	B14	9.5	17.5	18.0	200	60	PHE426KB6470JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.18	D13	6.5	14.5	26.0	150	58	PHE426KD6180JR06L2
0.22	D13	6.5	14.5	26.0	150	58	PHE426KD6220JR06L2
0.27	D13	6.5	14.5	26.0	150	58	PHE426KD6270JR06L2
0.33	D13	6.5	14.5	26.0	150	58	PHE426KD6330JR06L2
0.39	D17	7.0	16.5	26.0	150	53	PHE426KD6390JR06L2
0.47	D14	8.0	16.0	26.0	150	53	PHE426KD6470JR06L2
0.56	D15	9.0	18.5	26.0	150	48	PHE426KD6560JR06L2
0.68	D15	9.0	18.5	26.0	150	48	PHE426KD6680JR06L2
0.82	D18	10.5	19.0	26.0	150	45	PHE426KD6820JR06L2
1.0	D16	11.0	21.5	26.0	150	40	PHE426KD7100JR06L2
1.2	D20	13.5	23.0	26.0	150	40	PHE426KD7120JR06L2
1.5	D20	13.5	23.0	26.0	150	40	PHE426KD7150JR06L2
1.8	D19	15.5	24.5	26.0	150	40	PHE426KD7180JR06L2

400 VDC/220 VAC (1 Section)

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.5	D20	13.5	23.0	26.0	150	40	PHE426KD7150JR06L2
1.8	D19	15.5	24.5	26.0	150	40	PHE426KD7180JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.56	F11	10.5	20.5	31.5	90	37	PHE426KF6560JR06L2
0.68	F11	10.5	20.5	31.5	90	37	PHE426KF6680JR06L2
0.82	F11	10.5	20.5	31.5	90	37	PHE426KF6820JR06L2
1.0	F11	10.5	20.5	31.5	90	34	PHE426KF7100JR06L2
1.2	F11	10.5	20.5	31.5	90	34	PHE426KF7120JR06L2
1.2	F17	21.0	12.5	31.5	90	34	PHE426KT7120JR06L2
1.5	F12	11.5	22.5	31.5	90	32	PHE426KF7150JR06L2
1.8	F03	13.5	23.0	31.5	90	28	PHE426KF7180JR06L2
2.2	F13	14.5	24.5	31.5	90	28	PHE426KF7220JR06L2
2.7	F14	17.5	28.0	31.5	90	26	PHE426KF7270JR06L2
2.7	F19	27.5	16.0	31.5	90	26	PHE426KT7270JR06L2
3.3	F15	19.0	29.0	31.5	90	26	PHE426KF7330JR06L2
3.9	F16	21.0	30.0	31.5	90	26	PHE426KF7390JR06L2
3.9	F18	31.0	19.0	31.5	90	26	PHE426KT7390JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.5	R05	13.0	24.0	41.0	60	27	PHE426KR7150JR06L2
1.8	R05	13.0	24.0	41.0	60	27	PHE426KR7180JR06L2
2.2	R05	13.0	24.0	41.0	60	27	PHE426KR7220JR06L2
2.7	R04	15.0	26.0	41.0	60	25	PHE426KR7270JR06L2
3.3	R02	16.5	32.0	41.0	60	21	PHE426KR7330JR06L2
3.9	R02	16.5	32.0	41.0	60	21	PHE426KR7390JR06L2
4.7	R03	19.0	36.0	41.0	60	19	PHE426KR7470JR06L2
5.6	R03	19.0	36.0	41.0	60	19	PHE426KR7560JR06L2
6.8	R06	21.0	38.0	41.0	60	17	PHE426KR7680JR06L2
8.2	R08	28.0	43.0	41.0	60	17	PHE426KR7820JR06L2
10	R08	28.0	43.0	41.0	60	17	PHE426KR8100JR06L2

450 VDC/220 VAC (1 Section)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.10	B04	5.5	10.5	18.0	200	99	PHE426LB6100JR06
0.12	B05	5.5	12.5	18.0	200	85	PHE426LB6120JR06
0.15	B10	6.5	12.5	18.0	200	84	PHE426LB6150JR06
0.18	B06	7.5	14.5	18.0	200	74	PHE426LB6180JR06
0.22	B06	7.5	14.5	18.0	200	74	PHE426LB6220JR06
0.27	B12	8.0	15.0	18.0	200	71	PHE426LB6270JR06
0.33	B11	8.5	16.0	18.0	200	64	PHE426LB6330JR06
0.39	B14	9.5	17.5	18.0	200	60	PHE426LB6390JR06
0.47	B14	9.5	17.5	18.0	200	60	PHE426LB6470JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.18	D13	6.5	14.5	26.0	150	58	PHE426LD6180JR06L2
0.22	D13	6.5	14.5	26.0	150	58	PHE426LD6220JR06L2
0.27	D13	6.5	14.5	26.0	150	58	PHE426LD6270JR06L2
0.33	D13	6.5	14.5	26.0	150	58	PHE426LD6330JR06L2
0.39	D17	7.0	16.5	26.0	150	53	PHE426LD6390JR06L2
0.47	D14	8.0	16.0	26.0	150	53	PHE426LD6470JR06L2
0.56	D15	9.0	18.5	26.0	150	48	PHE426LD6560JR06L2
0.68	D15	9.0	18.5	26.0	150	48	PHE426LD6680JR06L2
0.82	D18	10.5	19.0	26.0	150	45	PHE426LD6820JR06L2
1.0	D16	11.0	21.5	26.0	150	40	PHE426LD7100JR06L2
1.2	D20	13.5	23.0	26.0	150	40	PHE426LD7120JR06L2
1.5	D20	13.5	23.0	26.0	150	40	PHE426LD7150JR06L2
1.8	D19	15.5	24.5	26.0	150	40	PHE426LD7180JR06L2

ARTICLE TABLE

450 VDC/220 VAC (1 Section)

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.56	F11	10.5	20.5	31.5	90	37	PHE426LF6560JR06L2
0.68	F11	10.5	20.5	31.5	90	37	PHE426LF6680JR06L2
0.82	F11	10.5	20.5	31.5	90	37	PHE426LF6820JR06L2
1.0	F11	10.5	20.5	31.5	90	34	PHE426LF7100JR06L2
1.2	F11	10.5	20.5	31.5	90	34	PHE426LF7120JR06L2
1.5	F12	11.5	22.5	31.5	90	32	PHE426LF7150JR06L2
1.8	F03	13.5	23.0	31.5	90	28	PHE426LF7180JR06L2
2.2	F13	14.5	24.5	31.5	90	28	PHE426LF7220JR06L2
2.7	F14	17.5	28.0	31.5	90	26	PHE426LF7270JR06L2
3.3	F15	19.0	29.0	31.5	90	26	PHE426LF7330JR06L2
3.9	F16	21.0	30.0	31.5	90	26	PHE426LF7390JR06L2

630 VDC/250 VAC (1 Section)

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	J01	2.5	6.5	7.2	30	230	PHE426MJ4100JR05
0.0012	J01	2.5	6.5	7.2	30	230	PHE426MJ4120JR05
0.0015	J01	2.5	6.5	7.2	30	230	PHE426MJ4150JR05
0.0018	J01	2.5	6.5	7.2	30	230	PHE426MJ4180JR05
0.0022	J01	2.5	6.5	7.2	30	230	PHE426MJ4220JR05
0.0027	J01	2.5	6.5	7.2	30	230	PHE426MJ4270JR05
0.0033	J01	2.5	6.5	7.2	30	230	PHE426MJ4330JR05
0.0039	J01	2.5	6.5	7.2	30	230	PHE426MJ4390JR05
0.0047	J02	3.5	8.0	7.2	30	230	PHE426MJ4470JR05
0.0056	J02	3.5	8.0	7.2	30	230	PHE426MJ4560JR05
0.0068	J03	4.5	9.0	7.2	30	230	PHE426MJ4680JR05
0.0082	J03	4.5	9.0	7.2	30	230	PHE426MJ4820JR05
0.010	J03	4.5	9.0	7.2	30	230	PHE426MJ5100JR05
0.012	J04	5.0	10.0	7.2	30	230	PHE426MJ5120JR05
0.015	J05	6.0	11.0	7.2	30	230	PHE426MJ5150JR05
0.018	J05	6.0	11.0	7.2	30	230	PHE426MJ5180JR05
0.022	J06	7.2	13.0	7.2	30	230	PHE426MJ5220JR05
0.027	J06	7.2	13.0	7.2	30	230	PHE426MJ5270JR05
0.033	J06	7.2	13.0	7.2	30	230	PHE426MJ5330JR05
0.039	J06	7.2	13.0	7.2	30	230	PHE426MJ5390JR05
0.047	J06	7.2	13.0	7.2	30	230	PHE426MJ5470JR05

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	K01	4.0	8.0	10.0	200	160	PHE426MK4100JR05
0.0012	K01	4.0	8.0	10.0	200	160	PHE426MK4120JR05
0.0015	K01	4.0	8.0	10.0	200	160	PHE426MK4150JR05
0.0018	K01	4.0	8.0	10.0	200	160	PHE426MK4180JR05
0.0022	K01	4.0	8.0	10.0	200	160	PHE426MK4220JR05
0.0027	K01	4.0	8.0	10.0	200	160	PHE426MK4270JR05
0.0033	K01	4.0	8.0	10.0	200	160	PHE426MK4330JR05
0.0039	K01	4.0	8.0	10.0	200	160	PHE426MK4390JR05
0.0047	K01	4.0	8.0	10.0	200	160	PHE426MK4470JR05
0.0056	K01	4.0	8.0	10.0	200	160	PHE426MK4560JR05
0.0068	K03	5.0	11.0	10.0	200	160	PHE426MK4680JR05
0.0082	K03	5.0	11.0	10.0	200	160	PHE426MK4820JR05
0.010	K03	5.0	11.0	10.0	200	160	PHE426MK5100JR05
0.012	K03	5.0	11.0	10.0	200	160	PHE426MK5120JR05
0.015	K04	6.0	12.0	10.5	200	160	PHE426MK5150JR05
0.018	K04	6.0	12.0	10.5	200	160	PHE426MK5180JR05
0.022	K04	6.0	12.0	10.5	200	160	PHE426MK5220JR05
0.027	K04	6.0	12.0	10.5	200	160	PHE426MK5270JR05
0.033	K04	6.0	12.0	10.5	200	160	PHE426MK5330JR05

630 VDC/250 VAC (1 Section)

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.010	A01	4.0	9.0	13.0	400	135	PHE426MA5100JR05
0.012	A01	4.0	9.0	13.0	400	135	PHE426MA5120JR05
0.015	A01	4.0	9.0	13.0	400	135	PHE426MA5150JR05
0.018	A01	4.0	9.0	13.0	400	135	PHE426MA5180JR05
0.022	A02	4.5	10.5	13.0	400	120	PHE426MA5220JR05
0.027	A02	4.5	10.5	13.0	400	120	PHE426MA5270JR05
0.033	A03	5.0	11.0	13.0	400	113	PHE426MA5330JR05
0.039	A04	6.0	12.0	13.0	400	105	PHE426MA5390JR05
0.047	A04	6.0	12.0	13.0	400	105	PHE426MA5470JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.033	B04	5.5	10.5	18.0	300	99	PHE426MB5330JR06
0.039	B04	5.5	10.5	18.0	300	99	PHE426MB5390JR06
0.047	B04	5.5	10.5	18.0	300	99	PHE426MB5470JR06
0.056	B05	5.5	12.5	18.0	300	85	PHE426MB5560JR06
0.068	B15	6.0	12.0	18.0	300	83	PHE426MB5680JR06
0.082	B10	6.5	12.5	18.0	300	84	PHE426MB5820JR06
0.10	B06	7.5	14.5	18.0	300	74	PHE426MB6100JR06
0.12	B06	7.5	14.5	18.0	300	74	PHE426MB6120JR06
0.15	B11	8.5	16.0	18.0	300	64	PHE426MB6150JR06
0.18	B14	9.5	17.5	18.0	300	60	PHE426MB6180JR06
0.22	B14	9.5	17.5	18.0	300	60	PHE426MB6220JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.10	D13	6.5	14.5	26.0	200	58	PHE426MD6100JR06L2
0.12	D13	6.5	14.5	26.0	200	58	PHE426MD6120JR06L2
0.15	D13	6.5	14.5	26.0	200	58	PHE426MD6150JR06L2
0.18	D17	7.0	16.5	26.0	200	53	PHE426MD6180JR06L2
0.22	D14	8.0	16.0	26.0	200	53	PHE426MD6220JR06L2
0.27	D15	9.0	18.5	26.0	200	48	PHE426MD6270JR06L2
0.33	D15	9.0	18.5	26.0	200	48	PHE426MD6330JR06L2
0.39	D18	10.5	19.0	26.0	200	45	PHE426MD6390JR06L2
0.47	D16	11.0	21.5	26.0	200	40	PHE426MD6470JR06L2
0.56	D20	13.5	23.0	26.0	200	40	PHE426MD6560JR06L2
0.68	D19	15.5	24.5	26.0	200	40	PHE426MD6680JR06L2
0.82	D19	15.5	24.5	26.0	200	40	PHE426MD6820JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.33	F11	10.5	20.5	31.5	140	37	PHE426MF6330JR06L2
0.39	F11	10.5	20.5	31.5	140	37	PHE426MF6390JR06L2
0.47	F11	10.5	20.5	31.5	140	37	PHE426MF6470JR06L2
0.56	F12	11.5	22.5	31.5	140	34	PHE426MF6560JR06L2
0.56	F17	21.0	12.5	31.5	140	34	PHE426MT6560JR06L2
0.68	F12	11.5	22.5	31.5	140	34	PHE426MF6680JR06L2
0.82	F03	13.5	23.0	31.5	140	33	PHE426MF6820JR06L2
1.0	F13	14.5	24.5	31.5	140	32	PHE426MF7100JR06L2
1.2	F14	17.5	28.0	31.5	140	28	PHE426MF7120JR06L2
1.2	F19	27.5	16.0	31.5	140	28	PHE426MT7120JR06L2
1.5	F15	19.0	29.0	31.5	140	26	PHE426MF7150JR06L2
1.8	F16	21.0	30.0	31.5	140	26	PHE426MF7180JR06L2
1.8	F18	31.0	19.0	31.5	140	26	PHE426MT7180JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.82	R05	13.0	24.0	41.0	80	27	PHE426MR6820JR06L2
1.0	R05	13.0	24.0	41.0	80	27	PHE426MR7100JR06L2
1.2	R04	15.0	26.0	41.0	80	25	PHE426MR7120JR06L2
1.5	R04	15.0	26.0	41.0	80	25	PHE426MR7150JR06L2
1.8	R02	16.5	32.0	41.0	80	21	PHE426MR7180JR06L2

ARTICLE TABLE

630 VDC/250 VAC (1 Section)

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
2.2	R02	16.5	32.0	41.0	80	21	PHE426MR7220JR06L2
2.7	R03	19.0	36.0	41.0	80	19	PHE426MR7270JR06L2
3.3	R03	19.0	36.0	41.0	80	19	PHE426MR7330JR06L2
3.9	R06	21.0	38.0	41.0	80	17	PHE426MR7390JR06L2
4.7	R08	28.0	43.0	41.0	80	17	PHE426MR7470JR06L2
5.6	R08	28.0	43.0	41.0	80	17	PHE426MR7560JR06L2

1000 VDC/250 VAC (1 Section)

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0027	A01	4.0	9.0	13.0	600	135	PHE426PA4270JR05
0.0033	A01	4.0	9.0	13.0	600	135	PHE426PA4330JR05
0.0047	A01	4.0	9.0	13.0	600	135	PHE426PA4470JR05
0.0056	A02	4.5	10.5	13.0	600	120	PHE426PA4560JR05
0.0068	A02	4.5	10.5	13.0	600	120	PHE426PA4680JR05
0.0082	A03	5.0	11.0	13.0	600	113	PHE426PA4820JR05
0.010	A03	5.0	11.0	13.0	600	113	PHE426PA5100JR05
0.012	A04	6.0	12.0	13.0	600	105	PHE426PA5120JR05
0.015	A04	6.0	12.0	13.0	600	105	PHE426PA5150JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.010	B04	5.5	10.5	18.0	450	99	PHE426PB5100JR06
0.012	B04	5.5	10.5	18.0	450	99	PHE426PB5120JR06
0.015	B04	5.5	10.5	18.0	450	99	PHE426PB5150JR06
0.018	B05	5.5	12.5	18.0	450	85	PHE426PB5180JR06
0.022	B05	5.5	12.5	18.0	450	85	PHE426PB5220JR06
0.027	B15	6.0	12.0	18.0	450	83	PHE426PB5270JR06
0.033	B10	6.5	12.5	18.0	450	84	PHE426PB5330JR06
0.039	B06	7.5	14.5	18.0	450	74	PHE426PB5390JR06
0.047	B06	7.5	14.5	18.0	450	74	PHE426PB5470JR06
0.056	B11	8.5	16.0	18.0	450	64	PHE426PB5560JR06
0.068	B14	9.5	17.5	18.0	450	60	PHE426PB5680JR06
0.082	B14	9.5	17.5	18.0	450	60	PHE426PB5820JR06
0.10	B14	9.5	17.5	18.0	450	60	PHE426PB6100JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.033	D13	6.5	14.5	26.0	300	58	PHE426PD5330JR06L2
0.039	D13	6.5	14.5	26.0	300	58	PHE426PD5390JR06L2
0.047	D13	6.5	14.5	26.0	300	58	PHE426PD5470JR06L2
0.056	D17	7.0	16.5	26.0	300	53	PHE426PD5560JR06L2
0.068	D17	7.0	16.5	26.0	300	53	PHE426PD5680JR06L2
0.082	D14	8.0	16.0	26.0	300	53	PHE426PD5820JR06L2
0.10	D15	9.0	18.5	26.0	300	48	PHE426PD6100JR06L2
0.12	D15	9.0	18.5	26.0	300	48	PHE426PD6120JR06L2
0.15	D18	10.5	19.0	26.0	300	45	PHE426PD6150JR06L2
0.18	D16	11.0	21.5	26.0	300	40	PHE426PD6180JR06L2
0.22	D16	11.0	21.5	26.0	300	40	PHE426PD6220JR06L2
0.27	D19	15.5	24.5	26.0	300	40	PHE426PD6270JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.10	F11	10.5	20.5	31.5	180	37	PHE426PF6100JR06L2
0.12	F11	10.5	20.5	31.5	180	37	PHE426PF6120JR06L2
0.15	F11	10.5	20.5	31.5	180	37	PHE426PF6150JR06L2
0.18	F11	10.5	20.5	31.5	180	37	PHE426PF6180JR06L2
0.18	F17	21.0	12.5	31.5	180	37	PHE426PT6180JR06L2
0.22	F12	11.5	22.5	31.5	180	34	PHE426PF6220JR06L2
0.27	F03	13.5	23.0	31.5	180	33	PHE426PF6270JR06L2
0.33	F13	14.5	24.5	31.5	180	32	PHE426PF6330JR06L2
0.39	F14	17.5	28.0	31.5	180	28	PHE426PF6390JR06L2
0.39	F19	27.5	16.0	31.5	180	28	PHE426PT6390JR06L2

1000 VDC/250 VAC (1 Section)

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.47	F14	17.5	28.0	31.5	180	28	PHE426PF6470JR06L2
0.56	F15	19.0	29.0	31.5	180	26	PHE426PF6560JR06L2
0.56	F18	31.0	19.0	31.5	180	26	PHE426PT6560JR06L2
0.68	F16	21.0	30.0	31.5	180	26	PHE426PF6680JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.33	R05	13.0	24.0	41.0	100	27	PHE426PR6330JR06L2
0.39	R05	13.0	24.0	41.0	100	27	PHE426PR6390JR06L2
0.47	R04	15.0	26.0	41.0	100	25	PHE426PR6470JR06L2
0.56	R04	15.0	26.0	41.0	100	25	PHE426PR6560JR06L2
0.68	R02	16.5	32.0	41.0	100	21	PHE426PR6680JR06L2
0.82	R02	16.5	32.0	41.0	100	21	PHE426PR6820JR06L2
1.0	R03	19.0	36.0	41.0	100	19	PHE426PR7100JR06L2
1.2	R03	19.0	36.0	41.0	100	19	PHE426PR7120JR06L2
1.5	R03	19.0	36.0	41.0	100	19	PHE426PR7150JR03R06L2*
1.8	R06	21.0	38.0	41.0	100	17	PHE426PR7180JR06L2
2.2	R06	21.0	38.0	41.0	100	17	PHE426PR7220JR06R06L2*
2.7	R08	28.0	43.0	41.0	100	15	PHE426PR7270JR06L2
3.3	R08	28.0	43.0	41.0	100	15	PHE426PR7330JR06L2

1600 VDC/650 VAC (2 Section)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0047	B04	5.5	10.5	18.0	1500	99	PHE426RB4470JR06
0.0056	B04	5.5	10.5	18.0	1500	99	PHE426RB4560JR06
0.0068	B04	5.5	10.5	18.0	1500	99	PHE426RB4680JR06
0.0082	B05	5.5	12.5	18.0	1500	85	PHE426RB4820JR06
0.0100	B05	5.5	12.5	18.0	1500	85	PHE426RB5100JR06
0.0120	B10	6.5	12.5	18.0	1500	84	PHE426RB5120JR06
0.0150	B06	7.5	14.5	18.0	1500	74	PHE426RB5150JR06
0.0180	B06	7.5	14.5	18.0	1500	74	PHE426RB5180JR06
0.0220	B12	8.0	15.0	18.0	1500	71	PHE426RB5220JR06
0.0270	B14	9.5	17.5	18.0	1500	60	PHE426RB5270JR06
0.0330	B14	9.5	17.5	18.0	1500	60	PHE426RB5330JR06
0.0390	B16	11.0	19.0	18.0	1500	59	PHE426RB5390JR06
0.0470	B16	11.0	19.0	18.0	1500	59	PHE426RB5470JR06

2000 VDC/700 VAC (2 Section)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	B04	5.5	10.5	18.0	1500	99	PHE426SB4100JR06
0.0012	B04	5.5	10.5	18.0	1500	99	PHE426SB4120JR06
0.0015	B04	5.5	10.5	18.0	1500	99	PHE426SB4150JR06
0.0018	B04	5.5	10.5	18.0	1500	99	PHE426SB4180JR06
0.0022	B04	5.5	10.5	18.0	1500	99	PHE426SB4220JR06
0.0027	B04	5.5	10.5	18.0	1500	99	PHE426SB4270JR06
0.0033	B04	5.5	10.5	18.0	1500	99	PHE426SB4330JR06
0.0039	B04	5.5	10.5	18.0	1500	99	PHE426SB4390JR06
0.0047	B05	5.5	12.5	18.0	1500	85	PHE426SB4470JR06
0.0056	B05	5.5	12.5	18.0	1500	85	PHE426SB4560JR06
0.0068	B10	6.5	12.5	18.0	1500	84	PHE426SB4680JR06
0.0082	B06	7.5	14.5	18.0	1500	74	PHE426SB4820JR06
0.0100	B06	7.5	14.5	18.0	1500	74	PHE426SB5100JR06
0.0120	B12	8.0	15.0	18.0	1500	71	PHE426SB5120JR06
0.0150	B11	8.5	16.0	18.0	1500	64	PHE426SB5150JR06
0.0180	B14	9.5	17.5	18.0	1500	60	PHE426SB5180JR06
0.0220	B16	11.0	19.0	18.0	1500	59	PHE426SB5220JR06
0.0270	B16	11.0	19.0	18.0	1500	59	PHE426SB5270JR06

* Please note: These articles have a box code included in the article code, see page 12.

PHE429

• Single metallized film capacitor, polypropylene dielectric

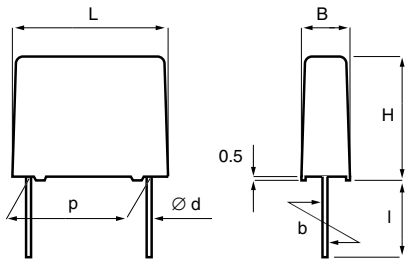
RoHS Compliant

TYPICAL APPLICATIONS

For use in Power Factor Correction, PFC, applications.

CONSTRUCTION

Polypropylene film capacitor with vacuum evaporated aluminum electrodes. Radial leads of tinned wire are electrically welded to the contact metal layer on the ends of the capacitor winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.

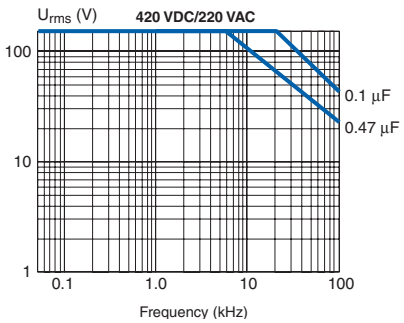


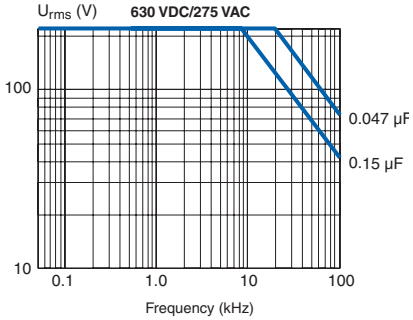
p	d	std l	max l	b
15.0 ± 0.4	0.8	6[-1]	30	± 0.4

TECHNICAL DATA

Rated voltage U_R, VDC	420	630
Rated voltage U_R, VAC	220	275
Capacitance range, µF	0.1 –0.47	0.047 –0.15
Capacitance tolerance	±10%, other tolerances on request	
Operating temperature range	–55 ... +110°C	
Voltage derating	The rated voltage is decreased with 1.3%/°C between +85°C and +110°C.	
Climatic category	IEC 60068-1, 55/110/56	
Maximum pulse steepness	dU/dt according to article table	
Self-inductance	Approximately 6 nH/cm for the total length of capacitor winding and the leads.	
Dissipation factor tanδ	Maximum values at +23°C 1 kHz 0.10%	
Insulation resistance	Measured at +23°C, 100 VDC 60 s for U_R < 500 VDC and at 500 VDC for $U_R \geq$ 500 VDC Between terminals: C ≤ 0.33 µF: ≥ 100 000 MΩ C > 0.33 µF: ≥ 30 000 s Between terminals and case: ≥ 100 000 MΩ.	

DERATING OF U_{RMS} VS FREQUENCY, +85°C AMBIENT TEMPERATURE AND 10°C INTERNAL HEATING, TYPICAL VALUES





ARTICLE TABLE

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
420 VDC/220 VAC							
LEAD SPACING 15 MM							
0.10	B04	5.5	10.5	18.0	150	99	PHE429KB6100KR06
0.15	B04	5.5	10.5	18.0	150	99	PHE429KB6150KR06
0.22	B15	6.0	12.0	18.0	150	83	PHE429KB6220KR06
0.33	B06	7.5	14.5	18.0	150	74	PHE429KB6330KR06
0.47	B12	8.0	15.0	18.0	150	71	PHE429KB6470KR06
630 VDC/275 VAC							
LEAD SPACING 15 MM							
0.047	B04	5.5	10.5	18.0	250	99	PHE429MB5470KR06
0.068	B04	5.5	10.5	18.0	250	99	PHE429MB5680KR06
0.10	B04	5.5	10.5	18.0	250	99	PHE429MB6100KR06
0.15	B10	6.5	12.5	18.0	250	84	PHE429MB6150KR06

ENVIRONMENTAL TEST DATA

See page 95.

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 12.

MARKING

- RIFA
- Article code
- Rated capacitance according to IEC 60062
- Capacitance tolerance code
- Rated voltage
- Manufacturing code (year, month)

PHE448

• Pulse capacitor, polypropylene film/foil

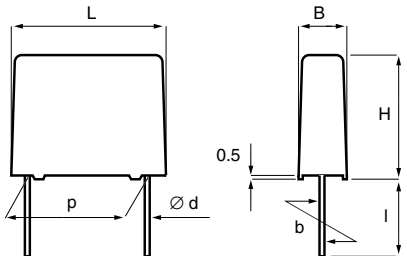
RoHS Compliant

TYPICAL APPLICATIONS

High frequency and high voltage applications, requiring capacitors with extremely high current handling capability, i.e. high dU/dt values.

CONSTRUCTION

Polypropylene film dielectric with aluminum foil and metallized film as electrodes, encapsulated in self-extinguishing material meeting the requirements of UL94V-0.



p	d	std l	max l	b
15.0 ± 0.4	0.8	6^{-1}	30	±0.4

Larger lead spacings, sizes and voltages on request. Ask for quotation.

TECHNICAL DATA

Rated voltage U_R, VDC	1600	2000
Rated voltage U_R, VAC	650	700
Capacitance range, nF	1.5–22	0.1–3.3
Capacitance values	In accordance with E12 series	
Capacitance tolerance	±5% standard. Other tolerances on request	
Category temperature range	-55 °C to +105 °C	
Rated temperature	+85° C	
Voltage derating	The rated voltage is decreased with 1.3%/°C from +85 °C.	
Climatic category	55/105/56	
Voltage proof	2 x U_R, 2s	
Insulation resistance	Measured at +23 °C, 100 VDC, 60s Between terminals: ≥ 100 000 MΩ Between terminals and case: ≥ 100 000 MΩ	
Dissipation factor tanδ	Max values at +23°C 1 kHz: 0.03% 10 kHz: 0.05% 100 kHz: 0.1%	
Pulse rise time	The capacitors can withstand an unlimited number of pulses with a dU/dt according to the article table.	

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- Article code
- Rated capacitance according to IEC 60062
- Capacitance tolerance code
- Rated voltage
- Manufacturing date code (year, month)

ENVIRONMENTAL TEST DATA

See page 95.

ARTICLE TABLE

1600 VDC/650 VAC

LEAD SPACING 15 MM

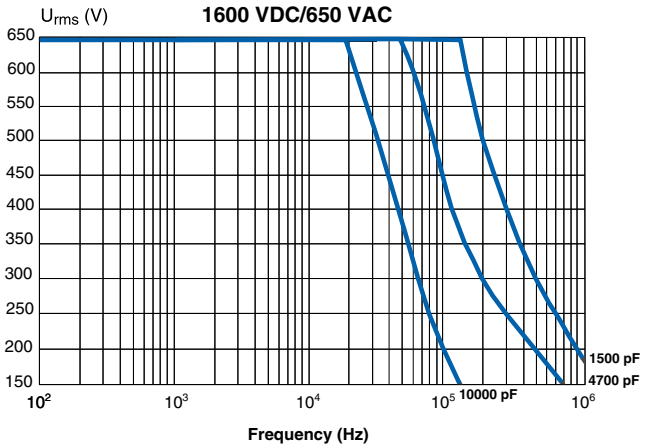
Capacitance nF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.5	B04	5.5	10.5	18.0	15000	87	PHE448RB4150JR06
1.8	B04	5.5	10.5	18.0	15000	86	PHE448RB4180JR06
2.2	B04	5.5	10.5	18.0	15000	84	PHE448RB4220JR06
2.7	B10	6.5	12.5	18.0	15000	82	PHE448RB4270JR06
3.3	B10	6.5	12.5	18.0	15000	82	PHE448RB4330JR06
3.9	B10	6.5	12.5	18.0	15000	82	PHE448RB4390JR06
4.7	B10	6.5	12.5	18.0	15000	82	PHE448RB4470JR06
5.6	B06	7.5	14.5	18.0	15000	78	PHE448RB4560JR06
6.8	B06	7.5	14.5	18.0	15000	78	PHE448RB4680JR06
8.2	B11	8.5	16.0	18.0	15000	70	PHE448RB4820JR06
10.0	B11	8.5	16.0	18.0	15000	70	PHE448RB5100JR06
12.0	B14	9.5	17.5	18.0	15000	60	PHE448RB5120JR06
15.0	B14	9.5	17.5	18.0	15000	60	PHE448RB5150JR06
18.0	B16	11.0	19.0	18.0	15000	55	PHE448RB5180JR06
22.0	B16	11.0	19.0	18.0	15000	55	PHE448RB5220JR06

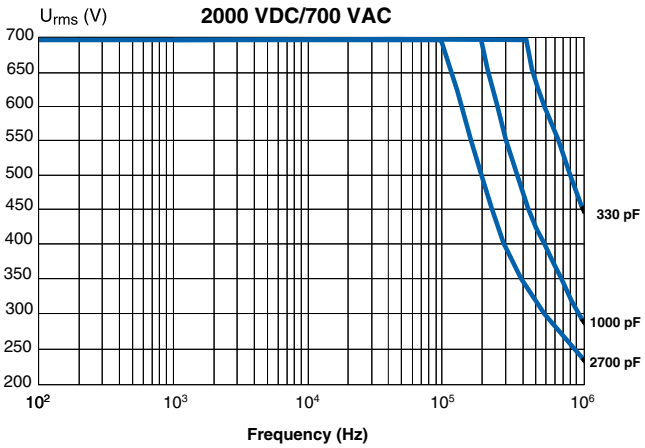
2000 VDC/700 VAC

LEAD SPACING 15 MM

Capacitance nF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.10	B04	5.5	10.5	18.0	25000	87	PHE448SB3100JR06
0.12	B04	5.5	10.5	18.0	25000	87	PHE448SB3120JR06
0.15	B04	5.5	10.5	18.0	25000	87	PHE448SB3150JR06
0.18	B04	5.5	10.5	18.0	25000	87	PHE448SB3180JR06
0.22	B04	5.5	10.5	18.0	25000	87	PHE448SB3220JR06
0.27	B04	5.5	10.5	18.0	25000	87	PHE448SB3270JR06
0.33	B04	5.5	10.5	18.0	25000	86	PHE448SB3330JR06
0.39	B04	5.5	10.5	18.0	25000	86	PHE448SB3390JR06
0.47	B04	5.5	10.5	18.0	25000	86	PHE448SB3470JR06
0.56	B04	5.5	10.5	18.0	25000	85	PHE448SB3560JR06
0.68	B04	5.5	10.5	18.0	25000	85	PHE448SB3680JR06
0.82	B04	5.5	10.5	18.0	25000	85	PHE448SB3820JR06
1.0	B04	5.5	10.5	18.0	25000	84	PHE448SB4100JR06
1.2	B10	6.5	12.5	18.0	25000	82	PHE448SB4120JR06
1.5	B10	6.5	12.5	18.0	25000	82	PHE448SB4150JR06
1.8	B06	7.5	14.5	18.0	25000	78	PHE448SB4180JR06
2.2	B11	8.5	16.0	18.0	25000	70	PHE448SB4220JR06
2.7	B11	8.5	16.0	18.0	25000	70	PHE448SB4270JR06
3.3	B14	9.5	17.5	18.0	25000	60	PHE448SB4330JR06

DERATING OF U_{RMS} VS FREQUENCY, +85°C AMBIENT TEMPERATURE AND 10°C INTERNAL HEATING, TYPICAL VALUES





More simulation possibilities in PCCAD. See page 94.

PHE450

RoHS Compliant

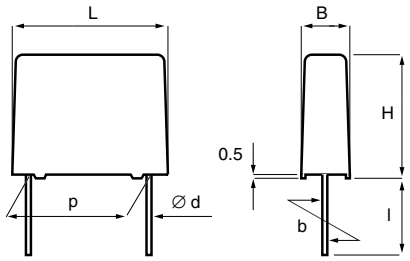
- **Double metallized film pulse capacitor, polypropylene dielectric**
- **According to IEC 60384-17 Grade 1.1**
- **Small sizes**

TYPICAL APPLICATIONS

High frequency applications with high current stress, such as deflection circuits in TV-sets, protection circuits in SMPS and in electronic ballasts.

CONSTRUCTION

Polypropylene dielectric with double metallized polyester film as electrodes. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



p	d	std l	max l	b
7.5 ± 0.4	0.6	5^{-1}	20	± 0.4
10.0 ± 0.4	0.6	5^{-1}	30	± 0.4
15.0 ± 0.4	0.8	6^{-1}	30	± 0.4
22.5 ± 0.4	0.8	6^{-1}	30	± 0.4
27.5 ± 0.4	0.8	6^{-1}	30	± 0.4
37.5 ± 0.5	1.0	6^{-1}	30	± 0.7

TECHNICAL DATA

Rated voltage U_R, VDC	250	400	630	1000	1600	2000	2500	3000
Rated voltage U_R, VAC	180	250	300/400	375/600	650	700	900	1000
Capacitance range	330pF–10µF	330pF–5.6µF	330pF–3.3µF	330pF–2.2µF	2.7nF–1.0µF	1.0nF–0.68µF	1.0nF–0.33µF	1.0nF–0.033µF

NEW RANGE

Capacitance values In accordance with IEC E12 series.

Capacitance tolerance ±5% standard. Other tolerances on request

Category temperature range –55° C to +105° C

Rated temperature +85° C

Voltage derating The rated voltage is decreased with 1.3% / ° C between +85° C and +105° C

Climatic category 55/105/56/B

Test voltage between terminals The 100 % factory test is carried out at 1.6 x U_R VDC

Insulation resistance Measured at 23° C, 100 VDC 60s for U_R < 500 VDC and at 500 VDC for $U_R \geq 500$ VDC
Between terminals:
C ≤ 0.33 µF: ≥ 100 000 MΩ
C > 0.33 µF: ≥ 30 000 s
Between terminals and case:
≥ 100 000 MΩ

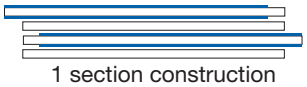
Dissipation factor tanδ Maximum values at 23°C

	C ≤ 0.1 µF	0.1 µF < C ≤ 1.0 µF	C > 1.0 µF
1 kHz	0.03 %	0.03 %	0.03 %
10 kHz	0.04 %	0.06 %	–
100 kHz	0.15 %	–	–

Inductance Approximately 6 nH/cm for the total length of capacitor winding and the leads.

Pulse rise time The capacitors can withstand an unlimited number of pulses with a dU/dt according to the article table. For peak to peak voltages lower than the rated voltage ($U_{PP} < U_R$), the specified dU/dt can be multiplied by U_R/U_{PP}.

Three different winding constructions are used, depending on voltage and lead spacing. They are specified in the article table.


1 section construction

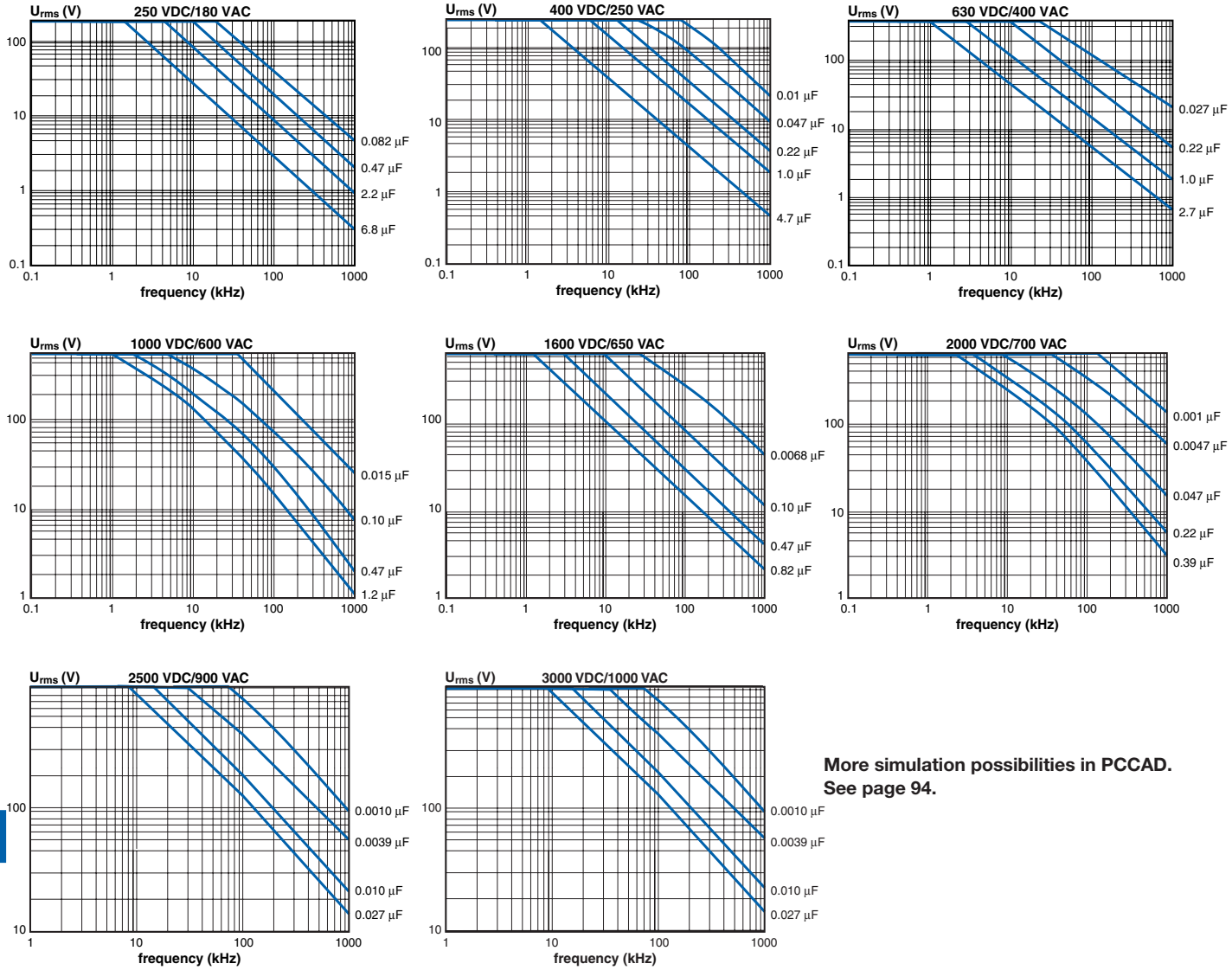

2 section construction


3 section construction

ENVIRONMENTAL TEST DATA

According to IEC 60384-17, Grade 1.1 and Quality tests and requirements for Pulse Capacitors on page 95.

DERATING OF U_{RMS} VS FREQUENCY, +85°C AMBIENT TEMPERATURE AND 10°C INTERNAL HEATING, TYPICAL VALUES



More simulation possibilities in PCCAD.
See page 94.

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MARKING

- RIFA
- Article code
- Rated capacitance according to IEC 60062
- Rated voltage
- Capacitance tolerance code
- Manufacturing code (year, month)

ARTICLE TABLE

250 VDC /180 VAC (1 section winding construction)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.00033	K01	4.0	8.0	10.0	2000	160	PHE450HK3330JR05
0.00039	K01	4.0	8.0	10.0	2000	160	PHE450HK3390JR05
0.00047	K01	4.0	8.0	10.0	2000	160	PHE450HK3470JR05
0.00056	K01	4.0	8.0	10.0	2000	160	PHE450HK3560JR05
0.00068	K01	4.0	8.0	10.0	2000	160	PHE450HK3680JR05
0.00082	K01	4.0	8.0	10.0	2000	160	PHE450HK3820JR05
0.0010	K01	4.0	8.0	10.0	2000	160	PHE450HK4100JR05
0.0012	K01	4.0	8.0	10.0	2000	160	PHE450HK4120JR05
0.0015	K01	4.0	8.0	10.0	2000	160	PHE450HK4150JR05
0.0018	K01	4.0	8.0	10.0	2000	160	PHE450HK4180JR05
0.0022	K01	4.0	8.0	10.0	2000	160	PHE450HK4220JR05
0.0027	K01	4.0	8.0	10.0	2000	160	PHE450HK4270JR05
0.0033	K01	4.0	8.0	10.0	2000	160	PHE450HK4330JR05
0.0039	K01	4.0	8.0	10.0	2000	160	PHE450HK4390JR05
0.0047	K01	4.0	8.0	10.0	1400	160	PHE450HK4470JR05
0.0056	K01	4.0	8.0	10.0	1400	160	PHE450HK4560JR05
0.0068	K01	4.0	8.0	10.0	1400	160	PHE450HK4680JR05
0.0082	K01	4.0	8.0	10.0	1400	160	PHE450HK4820JR05
0.010	K01	4.0	8.0	10.0	1200	160	PHE450HK5100JR05
0.012	K01	4.0	8.0	10.0	1200	160	PHE450HK5120JR05
0.015	K01	4.0	8.0	10.0	800	160	PHE450HK5150JR05
0.018	K01	4.0	8.0	10.0	800	160	PHE450HK5180JR05
0.022	K01	4.0	8.0	10.0	800	160	PHE450HK5220JR05
0.027	K03	5.0	11.0	10.0	800	160	PHE450HK5270JR05
0.033	K03	5.0	11.0	10.0	800	160	PHE450HK5330JR05
0.039	K03	5.0	11.0	10.0	800	160	PHE450HK5390JR05
0.047	K03	5.0	11.0	10.0	800	160	PHE450HK5470JR05
0.056	K03	5.0	11.0	10.0	800	160	PHE450HK5560JR05
0.068	K04	6.0	12.0	10.5	800	160	PHE450HK5680JR05

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	A01	4.0	9.0	13.0	1400	142	PHE450HA4100JR05
0.0012	A01	4.0	9.0	13.0	1400	142	PHE450HA4120JR05
0.0015	A01	4.0	9.0	13.0	1400	142	PHE450HA4150JR05
0.0018	A01	4.0	9.0	13.0	1400	142	PHE450HA4180JR05
0.0022	A01	4.0	9.0	13.0	1400	142	PHE450HA4220JR05
0.0027	A01	4.0	9.0	13.0	1400	142	PHE450HA4270JR05
0.0033	A01	4.0	9.0	13.0	1400	142	PHE450HA4330JR05
0.0039	A01	4.0	9.0	13.0	1400	142	PHE450HA4390JR05
0.0047	A01	4.0	9.0	13.0	1400	142	PHE450HA4470JR05
0.0056	A01	4.0	9.0	13.0	1400	142	PHE450HA4560JR05
0.0068	A01	4.0	9.0	13.0	1400	142	PHE450HA4680JR05
0.0082	A01	4.0	9.0	13.0	1200	142	PHE450HA4820JR05
0.010	A01	4.0	9.0	13.0	1200	142	PHE450HA5100JR05
0.012	A01	4.0	9.0	13.0	1200	142	PHE450HA5120JR05
0.015	A01	4.0	9.0	13.0	1200	142	PHE450HA5150JR05
0.018	A01	4.0	9.0	13.0	1100	142	PHE450HA5180JR05
0.022	A01	4.0	9.0	13.0	1100	142	PHE450HA5220JR05
0.027	A01	4.0	9.0	13.0	1100	142	PHE450HA5270JR05
0.033	A01	4.0	9.0	13.0	700	142	PHE450HA5330JR05
0.039	A01	4.0	9.0	13.0	700	142	PHE450HA5390JR05
0.047	A01	4.0	9.0	13.0	700	142	PHE450HA5470JR05
0.056	A02	4.5	10.5	13.0	700	122	PHE450HA5560JR05
0.068	A02	4.5	10.5	13.0	700	122	PHE450HA5680JR05
0.082	A03	5.0	11.0	13.0	700	116	PHE450HA5820JR05
0.100	A04	6.0	12.0	13.0	700	105	PHE450HA6100JR05
0.120	A04	6.0	12.0	13.0	700	105	PHE450HA6120JR05

250 VDC /180 VAC (1 section)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.047	B04	5.5	10.5	18.0	1000	100	PHE450HB5470JR06
0.056	B04	5.5	10.5	18.0	1000	100	PHE450HB5560JR06
0.068	B04	5.5	10.5	18.0	1000	100	PHE450HB5680JR06
0.082	B04	5.5	10.5	18.0	600	101	PHE450HB5820JR06
0.10	B04	5.5	10.5	18.0	600	100	PHE450HB6100JR06
0.12	B04	5.5	10.5	18.0	600	99	PHE450HB6120JR06
0.15	B05	5.5	12.5	18.0	600	85	PHE450HB6150JR06
0.18	B10	6.5	12.5	18.0	600	83	PHE450HB6180JR06
0.22	B06	7.5	14.5	18.0	600	74	PHE450HB6220JR06
0.27	B06	7.5	14.5	18.0	600	73	PHE450HB6270JR06
0.33	B12	8.0	15.0	18.0	600	67	PHE450HB6330JR06
0.39	B11	8.5	16.0	18.0	600	65	PHE450HB6390JR06
0.47	B14	9.5	17.5	18.0	600	60	PHE450HB6470JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.18	D13	6.5	14.5	26.0	600	58	PHE450HD6180JR06L2
0.22	D13	6.5	14.5	26.0	400	60	PHE450HD6220JR06L2
0.27	D13	6.5	14.5	26.0	400	59	PHE450HD6270JR06L2
0.33	D13	6.5	14.5	26.0	400	58	PHE450HD6330JR06L2
0.39	D17	7.0	16.5	26.0	400	54	PHE450HD6390JR06L2
0.47	D17	7.0	16.5	26.0	400	53	PHE450HD6470JR06L2
0.56	D15	9.0	18.5	26.0	400	49	PHE450HD6560JR06L2
0.68	D15	9.0	18.5	26.0	400	47	PHE450HD6680JR06L2
0.82	D18	10.5	19.0	26.0	400	43	PHE450HD6820JR06L2
1.0	D16	11.0	21.5	26.0	400	40	PHE450HD7100JR06L2
1.2	D20	13.5	23.0	26.0	400	38	PHE450HD7120JR06L2
1.5	D20	13.5	23.0	26.0	400	36	PHE450HD7150JR06L2
1.8	D19	15.5	24.5	26.0	400	36	PHE450HD7180JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.82	F11	10.5	20.5	31.5	300	38	PHE450HF6820JR06L2
1.0	F11	10.5	20.5	31.5	300	38	PHE450HF7100JR06L2
1.2	F11	10.5	20.5	31.5	300	37	PHE450HF7120JR06L2
1.2	F17	21.0	12.5	31.5	300	37	PHE450HT7120JR06L2
1.5	F12	11.5	22.5	31.5	300	34	PHE450HF7150JR06L2
1.8	F03	13.5	23.0	31.5	300	32	PHE450HF7180JR06L2
2.2	F13	14.5	24.5	31.5	300	31	PHE450HF7220JR06L2
2.2	F19	27.5	16.0	31.5	300	31	PHE450HT7220JR06L2
2.7	F14	17.5	28.0	31.5	300	27	PHE450HF7270JR06L2
3.3	F15	19.0	29.0	31.5	300	25	PHE450HF7330JR06L2
3.9	F16	21.0	30.0	31.5	300	23	PHE450HF7390JR06L2
3.9	F18	31.0	19.0	31.5	300	23	PHE450HT7390JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.8	R05	13.0	24.0	41.0	200	28	PHE450HR7180JR06L2
2.2	R05	13.0	24.0	41.0	200	28	PHE450HR7220JR06L2
2.7	R05	13.0	24.0	41.0	200	27	PHE450HR7270JR06L2
3.3	R04	15.0	26.0	41.0	200	25	PHE450HR7330JR06L2
3.9	R02	16.5	32.0	41.0	200	22	PHE450HR7390JR06L2
4.7	R02	16.5	32.0	41.0	200	22	PHE450HR7470JR06L2
5.6	R03	19.0	36.0	41.0	200	18	PHE450HR7560JR06L2
6.8	R06	21.0	38.0	41.0	200	17	PHE450HR7680JR06L2
8.2	R08	28.0	43.0	41.0	200	17	PHE450HR7820JR06L2
10	R08	28.0	43.0	41.0	200	17	PHE450HR8100JR06L2

ARTICLE TABLE

400 VDC / 250 VAC (1 section)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.00033	K01	4.0	8.0	10.0	2000	160	PHE450KK3330JR05
0.00039	K01	4.0	8.0	10.0	2000	160	PHE450KK3390JR05
0.00047	K01	4.0	8.0	10.0	2000	160	PHE450KK3470JR05
0.00056	K01	4.0	8.0	10.0	2000	160	PHE450KK3560JR05
0.00068	K01	4.0	8.0	10.0	2000	160	PHE450KK3680JR05
0.00082	K01	4.0	8.0	10.0	2000	160	PHE450KK3820JR05
0.0010	K01	4.0	8.0	10.0	2000	160	PHE450KK4100JR05
0.0012	K01	4.0	8.0	10.0	2000	160	PHE450KK4120JR05
0.0015	K01	4.0	8.0	10.0	2000	160	PHE450KK4150JR05
0.0018	K01	4.0	8.0	10.0	2000	160	PHE450KK4180JR05
0.0022	K01	4.0	8.0	10.0	2000	160	PHE450KK4220JR05
0.0027	K01	4.0	8.0	10.0	2000	160	PHE450KK4270JR05
0.0033	K01	4.0	8.0	10.0	2000	160	PHE450KK4330JR05
0.0039	K01	4.0	8.0	10.0	2000	160	PHE450KK4390JR05
0.0047	K01	4.0	8.0	10.0	1400	160	PHE450KK4470JR05
0.0056	K01	4.0	8.0	10.0	1400	160	PHE450KK4560JR05
0.0068	K01	4.0	8.0	10.0	1400	160	PHE450KK4680JR05
0.0082	K01	4.0	8.0	10.0	1400	160	PHE450KK4820JR05
0.010	K01	4.0	8.0	10.0	1200	160	PHE450KK5100JR05
0.012	K01	4.0	8.0	10.0	1200	160	PHE450KK5120JR05
0.015	K03	5.0	11.0	10.0	1200	160	PHE450KK5150JR05
0.018	K03	5.0	11.0	10.0	1200	160	PHE450KK5180JR05
0.022	K03	5.0	11.0	10.0	1200	160	PHE450KK5220JR05
0.027	K03	5.0	11.0	10.0	1200	160	PHE450KK5270JR05
0.033	K03	5.0	11.0	10.0	1200	160	PHE450KK5330JR05
0.039	K04	6.0	12.0	10.5	1200	160	PHE450KK5390JR05
0.047	K04	6.0	12.0	10.5	1200	160	PHE450KK5470JR05

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	A01	4.0	9.0	13.0	1400	142	PHE450KA4100JR05
0.0012	A01	4.0	9.0	13.0	1400	142	PHE450KA4120JR05
0.0015	A01	4.0	9.0	13.0	1400	142	PHE450KA4150JR05
0.0018	A01	4.0	9.0	13.0	1400	142	PHE450KA4180JR05
0.0022	A01	4.0	9.0	13.0	1400	142	PHE450KA4220JR05
0.0027	A01	4.0	9.0	13.0	1400	142	PHE450KA4270JR05
0.0033	A01	4.0	9.0	13.0	1400	142	PHE450KA4330JR05
0.0039	A01	4.0	9.0	13.0	1400	142	PHE450KA4390JR05
0.0047	A01	4.0	9.0	13.0	1400	142	PHE450KA4470JR05
0.0056	A01	4.0	9.0	13.0	1400	142	PHE450KA4560JR05
0.0068	A01	4.0	9.0	13.0	1400	142	PHE450KA4680JR05
0.0082	A01	4.0	9.0	13.0	1200	142	PHE450KA4820JR05
0.010	A01	4.0	9.0	13.0	1200	142	PHE450KA5100JR05
0.012	A01	4.0	9.0	13.0	1200	142	PHE450KA5120JR05
0.015	A01	4.0	9.0	13.0	1200	142	PHE450KA5150JR05
0.018	A01	4.0	9.0	13.0	1100	142	PHE450KA5180JR05
0.022	A01	4.0	9.0	13.0	1100	142	PHE450KA5220JR05
0.027	A01	4.0	9.0	13.0	1100	142	PHE450KA5270JR05
0.033	A02	4.5	10.5	13.0	1100	122	PHE450KA5330JR05
0.039	A03	5.0	11.0	13.0	1100	116	PHE450KA5390JR05
0.047	A04	6.0	12.0	13.0	1100	105	PHE450KA5470JR05
0.056	A04	6.0	12.0	13.0	1100	105	PHE450KA5560JR05

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.033	B04	5.5	10.5	18.0	2500	100	PHE450KB5330JR06
0.039	B04	5.5	10.5	18.0	1000	100	PHE450KB5390JR06
0.047	B04	5.5	10.5	18.0	1000	100	PHE450KB5470JR06
0.056	B04	5.5	10.5	18.0	1000	100	PHE450KB5560JR06
0.068	B04	5.5	10.5	18.0	1000	100	PHE450KB5680JR06
0.082	B05	5.5	12.5	18.0	1000	99	PHE450KB5820JR06
0.10	B10	6.5	12.5	18.0	1000	85	PHE450KB6100JR06

400 VDC / 250 VAC (1 section)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.12	B06	7.5	14.5	18.0	1000	75	PHE450KB6120JR06
0.15	B06	7.5	14.5	18.0	1000	75	PHE450KB6150JR06
0.18	B12	8.0	15.0	18.0	1000	71	PHE450KB6180JR06
0.22	B14	9.5	17.5	18.0	1000	60	PHE450KB6220JR06
0.27	B14	9.5	17.5	18.0	1000	59	PHE450KB6270JR06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.12	D13	6.5	14.5	26.0	600	58	PHE450KD6120JR06L2
0.15	D13	6.5	14.5	26.0	600	58	PHE450KD6150JR06L2
0.18	D13	6.5	14.5	26.0	600	58	PHE450KD6180JR06L2
0.22	D17	7.0	16.5	26.0	600	52	PHE450KD6220JR06L2
0.27	D17	7.0	16.5	26.0	600	52	PHE450KD6270JR06L2
0.33	D15	9.0	18.5	26.0	600	48	PHE450KD6330JR06L2
0.39	D15	9.0	18.5	26.0	600	48	PHE450KD6390JR06L2
0.47	D18	10.5	19.0	26.0	600	45	PHE450KD6470JR06L2
0.56	D16	11.0	21.5	26.0	600	40	PHE450KD6560JR06L2
0.68	D20	13.5	23.0	26.0	600	35	PHE450KD6680JR06L2
0.82	D20	13.5	23.0	26.0	600	35	PHE450KD6820JR06L2
1.0	D19	15.5	24.5	26.0	600	33	PHE450KD7100JR06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.47	F11	10.5	20.5	31.5	500	38	PHE450KF6470JR06L2
0.56	F11	10.5	20.5	31.5	500	38	PHE450KF6560JR06L2
0.68	F11	10.5	20.5	31.5	500	38	PHE450KF6680JR06L2
0.68	F17	21.0	12.5	31.5	500	38	PHE450KT6680JR06L2
0.82	F12	11.5	22.5	31.5	500	34	PHE450KF6820JR06L2
1.0	F03	13.5	23.0	31.5	500	32	PHE450KF7100JR06L2
1.2	F13	14.5	24.5	31.5	500	30	PHE450KF7120JR06L2
1.5	F14	17.5	28.0	31.5	500	27	PHE450KF7150JR06L2
1.5	F19	27.5	16.0	31.5	500	27	PHE450KT7150JR06L2
1.8	F15	19.0	29.0	31.5	500	25	PHE450KF7180JR06L2
2.2	F16	21.0	30.0	31.5	500	24	PHE450KF7220JR06L2
2.2	F18	31.0	19.0	31.5	500	24	PHE450KT7220JR06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
1.0	R05	13.0	24.0	41.0	300	27	PHE450KR7100JR06L2
1.2	R05	13.0	24.0	41.0	300	27	PHE450KR7120JR06L2
1.5	R05	13.0	24.0	41.0	300	27	PHE450KR7150JR06L2
1.8	R04	15.0	26.0	41.0	300	25	PHE450KR7180JR06L2
2.2	R02	16.5	32.0	41.0	300	22	PHE450KR7220JR06L2
2.7	R02	16.5	32.0	41.0	300	22	PHE450KR7270JR06L2
3.3	R03	19.0	36.0	41.0	300	19	PHE450KR7330JR06L2
3.9	R03	19.0	36.0	41.0	300	19	PHE450KR7390JR06L2
4.7	R06	21.0	38.0	41.0	300	17	PHE450KR7470JR06L2
5.6	R08	28.0	43.0	41.0	300	17	PHE450KR7560JR06L2

630 VDC / 300 VAC (1 SECTION)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.00033	K01	4.0	8.0	10.0	2000	160	PHE450MK3330JR05
0.00039	K01	4.0	8.0	10.0	2000	160	PHE450MK3390JR05
0.00047	K01	4.0	8.0	10.0	2000	160	PHE450MK3470JR05
0.00056	K01	4.0	8.0	10.0	2000	160	PHE450MK3560JR05
0.00068	K01	4.0	8.0	10.0	2000	160	PHE450MK3680JR05
0.00082	K01	4.0	8.0	10.0	2000	160	PHE450MK3820JR05
0.0010	K01	4.0	8.0	10.0	2000	160	PHE450MK4100JR05
0.0012	K01	4.0	8.0	10.0	2000	160	PHE450MK4120JR05

ARTICLE TABLE

630 VDC / 300 VAC (1 SECTION)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0015	K01	4.0	8.0	10.0	2000	160	PHE450MK4150JR05
0.0018	K01	4.0	8.0	10.0	2000	160	PHE450MK4180JR05
0.0022	K01	4.0	8.0	10.0	2000	160	PHE450MK4220JR05
0.0027	K01	4.0	8.0	10.0	2000	160	PHE450MK4270JR05
0.0033	K01	4.0	8.0	10.0	2000	160	PHE450MK4330JR05
0.0039	K01	4.0	8.0	10.0	2000	160	PHE450MK4390JR05
0.0047	K01	4.0	8.0	10.0	1400	160	PHE450MK4470JR05
0.0056	K01	4.0	8.0	10.0	1400	160	PHE450MK4560JR05
0.0068	K01	4.0	8.0	10.0	1400	160	PHE450MK4680JR05
0.0082	K01	4.0	8.0	10.0	1400	160	PHE450MK4820JR05
0.010	K03	5.0	11.0	10.0	1400	160	PHE450MK5100JR05
0.012	K03	5.0	11.0	10.0	1400	160	PHE450MK5120JR05
0.015	K03	5.0	11.0	10.0	1400	160	PHE450MK5150JR05
0.018	K03	5.0	11.0	10.0	1400	160	PHE450MK5180JR05
0.022	K04	6.0	12.0	10.5	1400	160	PHE450MK5220JR05

LEAD SPACING 10 MM

0.0010	A01	4.0	9.0	13.0	1400	142	PHE450MA4100JR05
0.0012	A01	4.0	9.0	13.0	1400	142	PHE450MA4120JR05
0.0015	A01	4.0	9.0	13.0	1400	142	PHE450MA4150JR05
0.0018	A01	4.0	9.0	13.0	1400	142	PHE450MA4180JR05
0.0022	A01	4.0	9.0	13.0	1400	142	PHE450MA4220JR05
0.0027	A01	4.0	9.0	13.0	1400	142	PHE450MA4270JR05
0.0033	A01	4.0	9.0	13.0	1400	142	PHE450MA4330JR05
0.0039	A01	4.0	9.0	13.0	1400	142	PHE450MA4390JR05
0.0047	A01	4.0	9.0	13.0	1400	142	PHE450MA4470JR05
0.0056	A01	4.0	9.0	13.0	1400	142	PHE450MA4560JR05
0.0068	A01	4.0	9.0	13.0	1400	142	PHE450MA4680JR05
0.0082	A01	4.0	9.0	13.0	1200	142	PHE450MA4820JR05
0.010	A01	4.0	9.0	13.0	1200	142	PHE450MA5100JR05
0.012	A01	4.0	9.0	13.0	1200	142	PHE450MA5120JR05
0.015	A01	4.0	9.0	13.0	1200	142	PHE450MA5150JR05
0.018	A02	4.5	10.5	13.0	1200	122	PHE450MA5180JR05
0.022	A02	4.5	10.5	13.0	1200	122	PHE450MA5220JR05
0.027	A03	5.0	11.0	13.0	1200	116	PHE450MA5270JR05
0.033	A04	6.0	12.0	13.0	1200	105	PHE450MA5330JR05
0.039	A04	6.0	12.0	13.0	1200	105	PHE450MA5390JR05

630 VDC / 400 VAC (2 SECTION)

LEAD SPACING 15 MM

0.010	B04	5.5	10.5	18.0	2500	99	PHE450MB5100JR06
0.012	B04	5.5	10.5	18.0	2500	99	PHE450MB5120JR06
0.015	B04	5.5	10.5	18.0	2500	100	PHE450MB5150JR06
0.018	B04	5.5	10.5	18.0	2500	100	PHE450MB5180JR06
0.022	B04	5.5	10.5	18.0	2500	100	PHE450MB5220JR06
0.027	B04	5.5	10.5	18.0	2500	100	PHE450MB5270JR06
0.033	B04	5.5	10.5	18.0	2500	100	PHE450MB5330JR06
0.039	B05	5.5	12.5	18.0	2500	90	PHE450MB5390JR06
0.047	B10	6.5	12.5	18.0	2500	85	PHE450MB5470JR06
0.056	B10	6.5	12.5	18.0	2500	85	PHE450MB5560JR06
0.068	B06	7.5	14.5	18.0	2500	75	PHE450MB5680JR06
0.082	B12	8.0	15.0	18.0	2500	72	PHE450MB5820JR06
0.10	B11	8.5	16.0	18.0	2500	70	PHE450MB6100JR06
0.12	B14	9.5	17.5	18.0	2500	61	PHE450MB6120JR06
0.15	B14	9.5	17.5	18.0	2500	61	PHE450MB6150JR06

630 VDC / 400 VAC (2 SECTION)

LEAD SPACING 22.5 MM

0.033	D13	6.5	14.5	26.0	1800	58	PHE450MD5330JR06L2
0.039	D13	6.5	14.5	26.0	1800	58	PHE450MD5390JR06L2
0.047	D13	6.5	14.5	26.0	1800	58	PHE450MD5470JR06L2
0.056	D13	6.5	14.5	26.0	1800	58	PHE450MD5560JR06L2
0.068	D13	6.5	14.5	26.0	1800	59	PHE450MD5680JR06L2
0.082	D13	6.5	14.5	26.0	1800	59	PHE450MD5820JR06L2
0.10	D13	6.5	14.5	26.0	1800	59	PHE450MD6100JR06L2
0.12	D17	7.0	16.5	26.0	1800	55	PHE450MD6120JR06L2
0.15	D17	7.0	16.5	26.0	1800	55	PHE450MD6150JR06L2
0.18	D15	9.0	18.5	26.0	1800	50	PHE450MD6180JR06L2
0.22	D15	9.0	18.5	26.0	1800	50	PHE450MD6220JR06L2
0.27	D16	11.0	21.5	26.0	1800	45	PHE450MD6270JR06L2
0.33	D16	11.0	21.5	26.0	1800	45	PHE450MD6330JR06L2
0.39	D20	13.5	23.0	26.0	1800	40	PHE450MD6390JR06L2
0.47	D20	13.5	23.0	26.0	1800	40	PHE450MD6470JR06L2
0.56	D19	15.5	24.5	26.0	1800	34	PHE450MD6560JR06L2

LEAD SPACING 27.5 MM

0.22	F11	10.5	20.5	31.5	1100	38	PHE450MF6220JR06L2
0.27	F11	10.5	20.5	31.5	1100	38	PHE450MF6270JR06L2
0.33	F11	10.5	20.5	31.5	1100	38	PHE450MF6330JR06L2
0.39	F11	10.5	20.5	31.5	1100	38	PHE450MF6390JR06L2
0.39	F17	21.0	12.5	31.5	1100	38	PHE450MT6390JR06L2
0.47	F12	11.5	22.5	31.5	1100	35	PHE450MF6470JR06L2
0.56	F03	13.5	23.0	31.5	1100	34	PHE450MF6560JR06L2
0.68	F13	14.5	24.5	31.5	1100	33	PHE450MF6680JR06L2
0.82	F14	17.5	28.0	31.5	1100	30	PHE450MF6820JR06L2
0.82	F19	27.5	16.0	31.5	1100	30	PHE450MT6820JR06L2
1.0	F14	17.5	28.0	31.5	1100	30	PHE450MF7100JR06L2
1.2	F16	21.0	30.0	31.5	1100	25	PHE450MF7120JR06L2
1.2	F18	31.0	19.0	31.5	1100	25	PHE450MT7120JR06L2

LEAD SPACING 37.5 MM

0.56	R05	13.0	24.0	41.0	700	29	PHE450MR6560JR06L2
0.68	R05	13.0	24.0	41.0	700	28	PHE450MR6680JR06L2
0.82	R05	13.0	24.0	41.0	700	28	PHE450MR6820JR06L2
1.0	R04	15.0	26.0	41.0	700	27	PHE450MR7100JR06L2
1.2	R04	15.0	26.0	41.0	700	27	PHE450MR7120JR06L2
1.5	R02	16.5	32.0	41.0	700	24	PHE450MR7150JR06L2
1.8	R03	19.0	36.0	41.0	700	20	PHE450MR7180JR06L2
2.2	R03	19.0	36.0	41.0	700	20	PHE450MR7220JR06L2
2.7	R06	21.0	38.0	41.0	700	18	PHE450MR7270JR06L2
3.3	R08	28.0	43.0	41.0	700	18	PHE450MR7330JR06L2

1000 VDC / 375 VAC (1 SECTION)

LEAD SPACING 7.5 MM

0.00033	K01	4.0	8.0	10.0	2000	160	PHE450PK3330JR05
0.00039	K01	4.0	8.0	10.0	2000	160	PHE450PK3390JR05
0.00047	K01	4.0	8.0	10.0	2000	160	PHE450PK3470JR05
0.00056	K01	4.0	8.0	10.0	2000	160	PHE450PK3560JR05
0.00068	K01	4.0	8.0	10.0	2000	160	PHE450PK3680JR05
0.00082	K01	4.0	8.0	10.0	2000	160	PHE450PK3820JR05
0.0010	K01	4.0	8.0	10.0	2000	160	PHE450PK4100JR05
0.0012	K01	4.0	8.0	10.0	2000	160	PHE450PK4120JR05
0.0015	K01	4.0	8.0	10.0	2000	160	PHE450PK4150JR05
0.0018	K01	4.0	8.0	10.0	2000	160	PHE450PK4180JR05
0.0022	K01	4.0	8.0	10.0	2000	160	PHE450PK4220JR05

ARTICLE TABLE

1000 VDC / 375 VAC (1 SECTION)

LEAD SPACING 7.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0027	K01	4.0	8.0	10.0	2000	160	PHE450PK4270JR05
0.0033	K01	4.0	8.0	10.0	2000	160	PHE450PK4330JR05
0.0039	K01	4.0	8.0	10.0	2000	160	PHE450PK4390JR05
0.0047	K03	5.0	11.0	10.0	2000	160	PHE450PK4470JR05
0.0056	K03	5.0	11.0	10.0	2000	160	PHE450PK4560JR05
0.0068	K03	5.0	11.0	10.0	2000	160	PHE450PK4680JR05
0.0082	K03	5.0	11.0	10.0	2000	160	PHE450PK4820JR05
0.010	K04	6.0	12.0	10.5	2000	160	PHE450PK5100JR05
0.012	K04	6.0	12.0	10.5	2000	160	PHE450PK5120JR05

LEAD SPACING 10 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0010	A01	4.0	9.0	13.0	1400	142	PHE450PA4100JR05
0.0012	A01	4.0	9.0	13.0	1400	142	PHE450PA4120JR05
0.0015	A01	4.0	9.0	13.0	1400	142	PHE450PA4150JR05
0.0018	A01	4.0	9.0	13.0	1400	142	PHE450PA4180JR05
0.0022	A01	4.0	9.0	13.0	1400	142	PHE450PA4220JR05
0.0027	A01	4.0	9.0	13.0	1400	142	PHE450PA4270JR05
0.0033	A01	4.0	9.0	13.0	1400	142	PHE450PA4330JR05
0.0039	A01	4.0	9.0	13.0	1400	142	PHE450PA4390JR05
0.0047	A01	4.0	9.0	13.0	1400	142	PHE450PA4470JR05
0.0056	A01	4.0	9.0	13.0	1400	142	PHE450PA4560JR05
0.0068	A01	4.0	9.0	13.0	1400	142	PHE450PA4680JR05
0.0082	A02	4.5	10.5	13.0	1400	122	PHE450PA4820JR05
0.010	A02	4.5	10.5	13.0	1400	122	PHE450PA5100JR05
0.012	A03	5.0	11.0	13.0	1400	116	PHE450PA5120JR05
0.015	A04	6.0	12.0	13.0	1400	105	PHE450PA5150JR05
0.018	A04	6.0	12.0	13.0	1400	105	PHE450PA5180JR05

1000 VDC / 600 VAC (2 SECTION)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0039	B04	5.5	10.5	18.0	2500	98	PHE450PB4390JR06
0.0047	B04	5.5	10.5	18.0	2500	98	PHE450PB4470JR06
0.0056	B04	5.5	10.5	18.0	2500	98	PHE450PB4560JR06
0.0068	B04	5.5	10.5	18.0	2500	99	PHE450PB4680JR06
0.0082	B04	5.5	10.5	18.0	2500	99	PHE450PB4820JR06
0.010	B04	5.5	10.5	18.0	2500	99	PHE450PB5100JR06
0.012	B04	5.5	10.5	18.0	2500	99	PHE450PB5120JR06
0.015	B04	5.5	10.5	18.0	2500	99	PHE450PB5150JR06
0.018	B04	5.5	10.5	18.0	2500	98	PHE450PB5180JB04R06
0.022	B04	5.5	10.5	18.0	2500	98	PHE450PB5220JB04R06
0.027	B05	5.5	12.5	18.0	2500	90	PHE450PB5270JB05R06
0.033	B10	6.5	12.5	18.0	2500	87	PHE450PB5330JB10R06
0.039	B06	7.5	14.5	18.0	2500	78	PHE450PB5390JR06
0.047	B06	7.5	14.5	18.0	2500	78	PHE450PB5470JB06R06
0.056	B12	8.0	15.0	18.0	2500	75	PHE450PB5560JB12R06
0.068	B11	8.5	16.0	18.0	2500	70	PHE450PB5680JB11R06
0.082	B14	9.5	17.5	18.0	2500	60	PHE450PB5820JB11R06
0.10	B16	11.0	19.0	18.0	2500	55	PHE450PB6100JB11R06
0.12	B16	11.0	19.0	18.0	2500	55	PHE450PB6120JB11R06

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.022	D13	6.5	14.5	26.0	1800	58	PHE450PD5220JR06L2
0.027	D13	6.5	14.5	26.0	1800	58	PHE450PD5270JR06L2
0.033	D13	6.5	14.5	26.0	1800	58	PHE450PD5330JR06L2
0.039	D13	6.5	14.5	26.0	1800	58	PHE450PD5390JR06L2
0.047	D13	6.5	14.5	26.0	1800	58	PHE450PD5470JR06L2
0.056	D13	6.5	14.5	26.0	1800	58	PHE450PD5560JR06L2
0.068	D13	6.5	14.5	26.0	1800	55	PHE450PD5680JD13R06L2

1000 VDC / 600 VAC (2 SECTION)

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.082	D13	6.5	14.5	26.0	1800	54	PHE450PD5820JD13R06L2
0.10	D17	7.0	16.5	26.0	1800	52	PHE450PD6100JD17R06L2
0.12	D14	8.0	16.0	26.0	1800	52	PHE450PD6120JD14R06L2
0.15	D15	9.0	18.5	26.0	1800	49	PHE450PD6150JD15R06L2
0.18	D18	10.5	19.0	26.0	1800	46	PHE450PD6180JD18R06L2
0.22	D16	11.0	21.5	26.0	1800	44	PHE450PD6220JD16R06L2
0.27	D20	13.5	23.0	26.0	1800	40	PHE450PD6270JD20R06L2
0.33	D20	13.5	23.0	26.0	1800	40	PHE450PD6330JD20R06L2
0.39	D19	15.5	24.5	26.0	1800	35	PHE450PD6390JD19R06L2

LEAD SPACING 27.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.15	F11	10.5	20.5	31.5	1300	38	PHE450PF6150JR06L2
0.18	F11	10.5	20.5	31.5	1300	38	PHE450PF6180JR06L2
0.22	F11	10.5	20.5	31.5	1300	36	PHE450PF6220JF11R06L2
0.22	F17	21.0	12.5	31.5	1300	36	PHE450PT6220JR06L2
0.27	F11	10.5	20.5	31.5	1300	36	PHE450PF6270JF11R06L2
0.33	F12	11.5	22.5	31.5	1300	35	PHE450PF6330JF12R06L2
0.39	F03	13.5	23.0	31.5	1300	34	PHE450PF6390JF03R06L2
0.47	F13	14.5	24.5	31.5	1300	34	PHE450PF6470JF13R06L2
0.47	F19	27.5	16.0	31.5	1300	30	PHE450PT6470JR06L2
0.56	F14	17.5	28.0	31.5	1300	28	PHE450PF6560JF14R06L2
0.68	F14	17.5	28.0	31.5	1300	28	PHE450PF6680JF14R06L2
0.68	F18	31.0	19.0	31.5	1300	25	PHE450PT6680JR06L2
0.82	F15	19.0	29.0	31.5	1300	25	PHE450PF6820JF15R06L2
1.0	F16	21.0	30.0	31.5	1300	25	PHE450PF7100JF16R06L2

LEAD SPACING 37.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.33	R05	13.0	24.0	41.0	800	28	PHE450PR6330JR06L2
0.39	R05	13.0	24.0	41.0	800	28	PHE450PR6390JR06L2
0.47	R05	13.0	24.0	41.0	800	28	PHE450PR6470JR06L2
0.56	R05	13.0	24.0	41.0	800	27	PHE450PR6560JR05R06L2
0.68	R04	15.0	26.0	41.0	800	25	PHE450PR6680JR04R06L2
0.82	R02	16.5	32.0	41.0	800	25	PHE450PR6820JR06L2
1.0	R02	16.5	32.0	41.0	800	20	PHE450PR7100JR02R06L2
1.2	R03	19.0	36.0	41.0	800	19	PHE450PR7120JR06L2
1.5	R03	19.0	36.0	41.0	800	19	PHE450PR7150JR03R06L2
1.8	R06	21.0	38.0	41.0	800	19	PHE450PR7180JR06R06L2
2.2	R08	28.0	43.0	41.0	800	19	PHE450PR7220JR08R06L2

1600 VDC / 650 VAC (2 SECTION)

LEAD SPACING 15 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.0027	B04	5.5	10.5	18.0	2500	98	PHE450RB4270JR06
0.0033	B04	5.5	10.5	18.0	2500	98	PHE450RB4330JR06
0.0039	B04	5.5	10.5	18.0	2500	98	PHE450RB4390JR06
0.0047	B04	5.5	10.5	18.0	2500	98	PHE450RB4470JR06
0.0056	B04	5.5	10.5	18.0	2500	98	PHE450RB4560JR06
0.0068	B04	5.5	10.5	18.0	2500	99	PHE450RB4680JR06
0.0082	B04	5.5	10.5	18.0	2500	99	PHE450RB4820JR06
0.010	B04	5.5	10.5	18.0	2500	99	PHE450RB5100JR06
0.012	B04	5.5	10.5	18.0	2500	99	PHE450RB5120JR06
0.015	B05	5.5	12.5	18.0	2500	90	PHE450RB5150JR06
0.018	B10	6.5	12.5	18.0	2500	88	PHE450RB5180JR06
0.022	B10	6.5	12.5	18.0	2500	89	PHE450RB5220JR06
0.027	B06	7.5	14.5	18.0	2500	80	PHE450RB5270JR06
0.033	B12	8.0	15.0	18.0	2500	75	PHE450RB5330JR06
0.039	B11	8.5	16.0	18.0	2500	73	PHE450RB5390JR06
0.047	B14	9.5	17.5	18.0	2500	60	PHE450RB5470JR06
0.056	B14	9.5	17.5	18.0	2500	60	PHE450RB5560JR06

ARTICLE TABLE

1600 VDC / 650 VAC (2 SECTION)

LEAD SPACING 22.5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
0.010	D13	6.5	14.5	26.0	1800	60	PHE450RD5100JR06L2
0.012	D13	6.5	14.5	26.0	1800	60	PHE450RD5120JR06L2
0.015	D13	6.5	14.5	26.0	1800	60	PHE450RD5150JR06L2
0.018	D13	6.5	14.5	26.0	1800	58	PHE450RD5180JR06L2
0.022	D13	6.5	14.5	26.0	1800	58	PHE450RD5220JR06L2
0.027	D13	6.5	14.5	26.0	1800	58	PHE450RD5270JR06L2
0.033	D13	6.5	14.5	26.0	1800	58	PHE450RD5330JR06L2
0.039	D13	6.5	14.5	26.0	1800	58	PHE450RD5390JR06L2
0.047	D17	7.0	16.5	26.0	1800	55	PHE450RD5470JR06L2
0.056	D17	7.0	16.5	26.0	1800	55	PHE450RD5560JR06L2
0.068	D15	9.0	18.5	26.0	1800	50	PHE450RD5680JR06L2
0.082	D15	9.0	18.5	26.0	1800	50	PHE450RD5820JR06L2
0.10	D18	10.5	19.0	26.0	1800	48	PHE450RD6100JR06L2
0.12	D16	11.0	21.5	26.0	1800	45	PHE450RD6120JR06L2
0.15	D20	13.5	23.0	26.0	1800	40	PHE450RD6150JR06L2
0.18	D20	13.5	23.0	26.0	1800	40	PHE450RD6180JR06L2
0.22	D19	15.5	24.5	26.0	1800	34	PHE450RD6220JR06L2

LEAD SPACING 27.5 MM

0.082	F11	10.5	20.5	31.5	1300	37	PHE450RF5820JR06L2
0.10	F11	10.5	20.5	31.5	1300	37	PHE450RF6100JR06L2
0.10	F17	21.0	12.5	31.5	1300	37	PHE450RT6100JR06L2
0.12	F11	10.5	20.5	31.5	1300	37	PHE450RF6120JR06L2
0.15	F12	11.5	22.5	31.5	1300	36	PHE450RF6150JR06L2
0.18	F03	13.5	23.0	31.5	1300	35	PHE450RF6180JR06L2
0.22	F13	14.5	24.5	31.5	1300	35	PHE450RF6220JR06L2
0.22	F19	27.5	16.0	31.5	1300	35	PHE450RT6220JR06L2
0.27	F14	17.5	28.0	31.5	1300	32	PHE450RF6270JR06L2
0.33	F15	19.0	29.0	31.5	1300	28	PHE450RF6330JR06L2
0.33	F18	31.0	19.0	31.5	1300	28	PHE450RT6330JR06L2
0.39	F16	21.0	30.0	31.5	1300	25	PHE450RF6390JR06L2

LEAD SPACING 37.5 MM

0.18	R05	13.0	24.0	41.0	800	27	PHE450RR6180JR06L2
0.22	R05	13.0	24.0	41.0	800	27	PHE450RR6220JR06L2
0.27	R05	13.0	24.0	41.0	800	27	PHE450RR6270JR06L2
0.33	R04	15.0	26.0	41.0	800	26	PHE450RR6330JR06L2
0.39	R04	15.0	26.0	41.0	800	26	PHE450RR6390JR04R06L2
0.47	R02	16.5	32.0	41.0	800	24	PHE450RR6470JR06L2
0.56	R02	16.5	32.0	41.0	800	20	PHE450RR6560JR02R06L2
0.68	R03	19.0	36.0	41.0	800	20	PHE450RR6680JR06L2
0.82	R06	21.0	38.0	41.0	800	18	PHE450RR6820JR06L2
NEW 1.0	R08	21.0	38.0	41.0	800	18	PHE450RR7100JR08R06L2

2000 VDC / 700 VAC (2 SECTION)

LEAD SPACING 15 MM

0.0010	B04	5.5	10.5	18.0	2500	98	PHE450SB4100JR06
0.0012	B04	5.5	10.5	18.0	2500	98	PHE450SB4120JR06
0.0015	B04	5.5	10.5	18.0	2500	98	PHE450SB4150JR06
0.0018	B04	5.5	10.5	18.0	2500	98	PHE450SB4180JR06
0.0022	B04	5.5	10.5	18.0	2500	98	PHE450SB4220JR06
0.0027	B04	5.5	10.5	18.0	2500	98	PHE450SB4270JR06
0.0033	B04	5.5	10.5	18.0	2500	98	PHE450SB4330JR06
0.0039	B04	5.5	10.5	18.0	2500	98	PHE450SB4390JR06
0.0047	B04	5.5	10.5	18.0	2500	98	PHE450SB4470JR06
0.0056	B04	5.5	10.5	18.0	2500	98	PHE450SB4560JR06
0.0068	B04	5.5	10.5	18.0	2500	98	PHE450SB4680JR06
0.0082	B05	5.5	12.5	18.0	2500	92	PHE450SB4820JR06

2000 VDC / 700 VAC (2 SECTION)

LEAD SPACING 15 MM

0.010	B10	6.5	12.5	18.0	2500	90	PHE450SB5100JR06
0.012	B06	7.5	14.5	18.0	2500	80	PHE450SB5120JR06
0.015	B06	7.5	14.5	18.0	2500	80	PHE450SB5150JR06
0.018	B12	8.0	15.0	18.0	2500	75	PHE450SB5180JR06
0.022	B11	8.5	16.0	18.0	2500	70	PHE450SB5220JR06
0.027	B14	9.5	17.5	18.0	2500	61	PHE450SB5270JR06

LEAD SPACING 22.5 MM

0.0033	D13	6.5	14.5	26.0	1800	60	PHE450SD4330JR06L2
0.0039	D13	6.5	14.5	26.0	1800	60	PHE450SD4390JR06L2
0.0047	D13	6.5	14.5	26.0	1800	60	PHE450SD4470JR06L2
0.0056	D13	6.5	14.5	26.0	1800	60	PHE450SD4560JR06L2
0.0068	D13	6.5	14.5	26.0	1800	60	PHE450SD4680JR06L2
0.0082	D13	6.5	14.5	26.0	1800	60	PHE450SD4820JR06L2
0.010	D13	6.5	14.5	26.0	1800	60	PHE450SD5100JR06L2
0.012	D13	6.5	14.5	26.0	1800	60	PHE450SD5120JR06L2
0.015	D13	6.5	14.5	26.0	1800	60	PHE450SD5150JR06L2
0.018	D13	6.5	14.5	26.0	1800	58	PHE450SD5180JR06L2
0.022	D13	6.5	14.5	26.0	1800	58	PHE450SD5220JR06L2
0.027	D17	7.0	16.5	26.0	1800	55	PHE450SD5270JR06L2
0.033	D17	7.0	16.5	26.0	1800	55	PHE450SD5330JR06L2
0.039	D14	8.0	16.0	26.0	1800	53	PHE450SD5390JR06L2
0.047	D15	9.0	18.5	26.0	1800	52	PHE450SD5470JR06L2
0.056	D18	10.5	19.0	26.0	1800	50	PHE450SD5560JR06L2
0.068	D16	11.0	21.5	26.0	1800	45	PHE450SD5680JR06L2
0.082	D16	11.0	21.5	26.0	1800	45	PHE450SD5820JR06L2
0.10	D20	13.5	23.0	26.0	1800	40	PHE450SD6100JR06L2
0.12	D19	15.5	24.5	26.0	1800	35	PHE450SD6120JR06L2

LEAD SPACING 27.5 MM

0.047	F11	10.5	20.5	31.5	1300	37	PHE450SF5470JR06L2
0.056	F11	10.5	20.5	31.5	1300	37	PHE450SF5560JR06L2
0.056	F17	21.0	12.5	31.5	1300	37	PHE450ST5560JR06L2
0.068	F11	10.5	20.5	31.5	1300	36	PHE450SF5680JF11R06L2
0.082	F11	10.5	20.5	31.5	1300	35	PHE450SF5820JF11R06L2
0.10	F12	11.5	22.5	31.5	1300	34	PHE450SF6100JF12R06L2
0.12	F03	13.5	23.0	31.5	1300	32	PHE450SF6120JF03R06L2
0.12	F19	27.5	16.0	31.5	1300	32	PHE450ST6120JR06L2
0.15	F13	14.5	24.5	31.5	1300	30	PHE450SF6150JF13R06L2
0.18	F14	17.5	28.0	31.5	1300	28	PHE450SF6180JF14R06L2
0.18	F18	31.0	19.0	31.5	1300	28	PHE450ST6180JR06L2
0.22	F15	19.0	29.0	31.5	1300	26	PHE450SF6220JF15R06L2 NEW
0.27	F16	21.0	30.0	31.5	1300	25	PHE450SF6270JF16R06L2

LEAD SPACING 37.5 MM

0.10	R05	13.0	24.0	41.0	800	27	PHE450SR6100JR06L2
0.12	R05	13.0	24.0	41.0	800	27	PHE450SR6120JR06L2
0.15	R05	13.0	24.0	41.0	800	26	PHE450SR6150JR05R06L2
0.18	R05	13.0	24.0	41.0	800	26	PHE450SR6180JR05R06L2
0.22	R04	15.0	26.0	41.0	800	24	PHE450SR6220JR04R06L2
0.27	R02	16.5	32.0	41.0	800	22	PHE450SR6270JR02R06L2
0.33	R02	16.5	32.0	41.0	800	22	PHE450SR6330JR02R06L2
0.39	R03	19.0	36.0	41.0	800	18	PHE450SR6390JR03R06L2
0.47	R03	19.0	36.0	41.0	800	18	PHE450SR6470JR03R06L2
0.56	R06	21.0	38.0	41.0	800	18	PHE450SR6560JR06R06L2
0.68	R08	28.0	43.0	41.0	800	18	PHE450SR6680JR08R06L2 NEW

ARTICLE TABLE

2500 VDC / 900 VAC (3 SECTION)

LEAD SPACING 15 MM

	Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
	0.0010	B04	5.5	10.5	18.0	2500	98	PHE450TB4100JR06
	0.0012	B04	5.5	10.5	18.0	2500	98	PHE450TB4120JR06
	0.0015	B04	5.5	10.5	18.0	2500	98	PHE450TB4150JR06
	0.0018	B04	5.5	10.5	18.0	2500	98	PHE450TB4180JR06
	0.0022	B05	5.5	12.5	18.0	2500	92	PHE450TB4220JR06
	0.0027	B10	6.5	12.5	18.0	2500	90	PHE450TB4270JR06
	0.0033	B06	7.5	14.5	18.0	2500	80	PHE450TB4330JR06
	0.0039	B06	7.5	14.5	18.0	2500	80	PHE450TB4390JR06
	0.0047	B12	8.0	15.0	18.0	2500	75	PHE450TB4470JR06
	0.0056	B11	8.5	16.0	18.0	2500	70	PHE450TB4560JR06
	0.0068	B14	9.5	17.5	18.0	2500	60	PHE450TB4680JB14R06
	0.0082	B14	9.5	17.5	18.0	2500	60	PHE450TB4820JR06
NEW	0.010	B16	11.0	19.0	18.0	2500	55	PHE450TB5100JB16R06

LEAD SPACING 22.5 MM

	0.0047	D13	6.5	14.5	26.0	1800	60	PHE450TD4470JR06L2
	0.0056	D13	6.5	14.5	26.0	1800	60	PHE450TD4560JR06L2
	0.0068	D13	6.5	14.5	26.0	1800	60	PHE450TD4680JR06L2
	0.0082	D13	6.5	14.5	26.0	1800	55	PHE450TD4820JD13R06L2
	0.010	D17	7.0	16.5	26.0	1800	53	PHE450TD5100JD17R06L2
	0.012	D14	8.0	16.0	26.0	1800	52	PHE450TD5120JD14R06L2
	0.015	D15	9.0	18.5	26.0	1800	52	PHE450TD5150JR06L2
	0.018	D15	9.0	18.5	26.0	1800	50	PHE450TD5180JD15R06L2
	0.022	D18	10.5	19.0	26.0	1800	48	PHE450TD5220JD18R06L2
	0.027	D16	11.0	21.5	26.0	1800	45	PHE450TD5270JD16R06L2
	0.033	D20	13.5	23.0	26.0	1800	38	PHE450TD5330JD20R06L2
	0.039	D20	13.5	23.0	26.0	1800	38	PHE450TD5390JD20R06L2
NEW	0.047	D19	15.5	24.5	26.0	1800	35	PHE450TD5470JD19R06L2

LEAD SPACING 27.5 MM

NEW	0.027	F11	10.5	20.5	31.5	1300	38	PHE450TF5270JF11R06L2
NEW	0.033	F11	10.5	20.5	31.5	1300	38	PHE450TF5330JF11R06L2
NEW	0.039	F12	11.5	22.5	31.5	1300	36	PHE450TF5390JF12R06L2
NEW	0.047	F03	13.5	23.0	31.5	1300	35	PHE450TF5470JF03R06L2
NEW	0.056	F03	13.5	23.0	31.5	1300	35	PHE450TF5560JF03R06L2
NEW	0.068	F13	14.5	24.5	31.5	1300	34	PHE450TF5680JF13R06L2
NEW	0.082	F14	17.5	28.0	31.5	1300	30	PHE450TF5270JF14R06L2
NEW	0.10	F15	19.0	29.0	31.5	1300	28	PHE450TF6100JF15R06L2
NEW	0.12	F16	21.0	30.0	31.5	1300	25	PHE450TF6120JF16R06L2

LEAD SPACING 37.5 MM

NEW	0.068	R05	13.0	24.0	41.0	800	28	PHE450TR5680JR05R06L2
NEW	0.082	R05	13.0	24.0	41.0	800	28	PHE450TR5820JR05R06L2
NEW	0.10	R04	15.0	26.0	41.0	800	27	PHE450TR6100JR04R06L2
NEW	0.12	R04	15.0	26.0	41.0	800	27	PHE450TR6120JR04R06L2
NEW	0.15	R02	16.5	32.0	41.0	800	25	PHE450TR6150JR02R06L2
NEW	0.18	R03	19.0	36.0	41.0	800	20	PHE450TR6180JR03R06L2
NEW	0.22	R03	19.0	36.0	41.0	800	20	PHE450TR6220JR03R06L2
NEW	0.22	R06	21.0	38.0	41.0	800	19	PHE450TR6220JR06L2
NEW	0.27	R06	21.0	38.0	41.0	800	19	PHE450TR6270JR06R06L2
NEW	0.33	R08	28.0	43.0	41.0	800	19	PHE450TR6330JR08R06L2

3000 VDC / 1000 VAC (3 SECTION)

LEAD SPACING 15 MM

	Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Rthha °C/W 85 °C 0.2 m/s	Article code
NEW RANGE	0.0010	B04	5.5	10.5	18.0	2500	98	PHE450XB4100JB04R06
NEW RANGE	0.0012	B04	5.5	10.5	18.0	2500	98	PHE450XB4120JB04R06
NEW RANGE	0.0015	B05	5.5	12.5	18.0	2500	92	PHE450XB4150JB05R06
NEW RANGE	0.0018	B05	5.5	12.5	18.0	2500	90	PHE450XB4180JB05R06
NEW RANGE	0.0022	B10	6.5	12.5	18.0	2500	87	PHE450XB4220JB10R06
NEW RANGE	0.0027	B06	7.5	14.5	18.0	2500	80	PHE450XB4270JB06R06
NEW RANGE	0.0033	B12	8.0	15.0	18.0	2500	75	PHE450XB4330JB12R06
NEW RANGE	0.0039	B11	8.5	16.0	18.0	2500	70	PHE450XB4390JB11R06
NEW RANGE	0.0047	B14	9.5	17.5	18.0	2500	61	PHE450XB4470JB14R06
NEW RANGE	0.0056	B14	9.5	17.5	18.0	2500	60	PHE450XB4560JB14R06
NEW RANGE	0.0068	B16	11.0	19.0	18.0	2500	55	PHE450XB4680JB16R06

LEAD SPACING 22.5 MM

NEW RANGE	0.0047	D13	6.5	14.5	26.0	1800	58	PHE450XD4470JD13R06L2
NEW RANGE	0.0056	D13	6.5	14.5	26.0	1800	58	PHE450XD4560JD13R06L2
NEW RANGE	0.0068	D17	7.0	16.5	26.0	1800	55	PHE450XD4680JD17R06L2
NEW RANGE	0.0082	D14	8.0	16.0	26.0	1800	54	PHE450XD4820JD14R06L2
NEW RANGE	0.010	D15	9.0	18.5	26.0	1800	50	PHE450XD5100JD15R06L2
NEW RANGE	0.012	D18	10.5	19.0	26.0	1800	49	PHE450XD5120JD18R06L2
NEW RANGE	0.015	D16	11.0	21.5	26.0	1800	44	PHE450XD5150JD16R06L2
NEW RANGE	0.018	D16	11.0	21.5	26.0	1800	44	PHE450XD5180JD16R06L2
NEW RANGE	0.022	D20	13.5	23.0	26.0	1800	38	PHE450XD5220JD20R06L2
NEW RANGE	0.027	D19	15.5	24.5	26.0	1800	35	PHE450XD5270JD19R06L2
NEW RANGE	0.033	D19	15.5	24.5	26.0	1800	35	PHE450XD5330JD19R06L2

PFR

RoHS Compliant

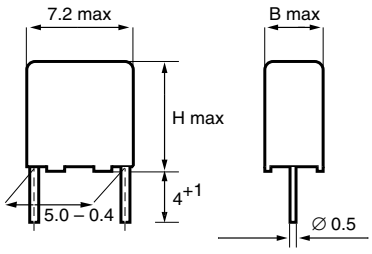
- **Polypropylene film/foil capacitor**
- **According to IEC 60384-13**

TYPICAL APPLICATIONS

High speed applications requiring low losses at high frequencies and high dU/dt. Typical applications electrical ballasts,TV/ video, telecommunications.

CONSTRUCTION

Capacitor with polypropylene film and metal foil electrodes. Radial leads of tinned wire are electrically welded to the winding. Encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



GENERAL DATA

Rated voltage U_R, VDC	63	100	250	400	630	1000
Rated voltage U_R, VAC	40	63	160	220	250	250
Capacitance range, pF	100–22000	100–10000	100–6800	100–6800	100–4700	100–680

Capacitance measured at f=1kHz, T=20°C
For C ≤ 1000 pF, f = 100 kHz.

Capacitance tolerance
±10%, ±5%, ±2.5%, ±2%, ±1%

DC Test voltage
2 x U_R for 2s

Temperature range
–55 ... +100°C
An operating temperature up to +105°C is allowed under certain conditions. For details consult KEMET.

Climatic category
IEC 60068-1, 55/100/56
DIN 40040, FMD

Capacitance drift
Max. 0.3% after a 2 year storage period at a temperature of +10° ... +40°C and a relative humidity of 40 ... 60%.

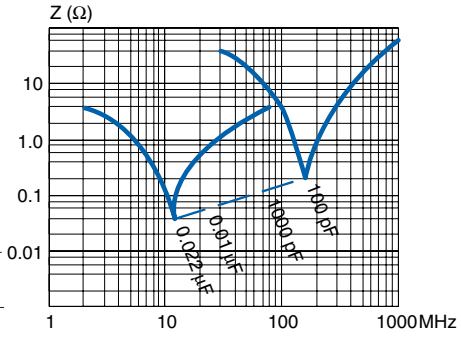
Temperature coefficient
–200 (+50, –100) ppm/°C (at 1 kHz)

Self inductance
Approximately 6 nH/cm for the total length of capacitor winding and leads.

Dissipation factor tanδ
Maximum values at +23°C

	C≤1000 pF	1000 pF<C≤4700 pF	C>4700 pF
1 kHz	≤ 0.04%	0.04%	0.04%
10 kHz	≤ 0.04%	0.05%	0.07%
100 kHz	≤ 0.05%	0.07%	

Insulation resistance
Measured at +20°C, according to IEC 60384-13.
Minimum value between terminals: 500 000 MΩ



Resonance frequencies

ENVIRONMENTAL TEST DATA

Damp heat test	Test conditions: Test criteria:	T = +40°C, RH = 93%, t = 56 days. Δ C/C ≤ ±1%, tanδ ≤ 1.4 x value before test, (1kHz and 100 kHz) IR after test ≥ 250 000 MΩ.
Endurance test	Test conditions:	T = +85°C, U = 1.5 x U_R, t = 1000 h and T = +100°C, U = 1.25 x U_C, t = 1000 h.
	Test criteria:	Δ C/C ≤ ±1%, tanδ ≤ 1.4 x value before test, (1kHz and 100 kHz) IR after test ≥ 250 000 MΩ.

MARKING

- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- Code PFR5

ARTICLE TABLE

63 VDC / 40 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J63J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J63J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J63J11L4 BULK
0.00033	J11	4.5	6.0	7.2	1000	PFR5 331J63J11L4 BULK
0.00047	J11	4.5	6.0	7.2	1000	PFR5 471J63J11L4 BULK
0.00068	J11	4.5	6.0	7.2	1000	PFR5 681J63J11L4 BULK
0.0010	J11	4.5	6.0	7.2	1000	PFR5 102J63J11L4 BULK
0.0015	J11	4.5	6.0	7.2	1000	PFR5 152J63J11L4 BULK
0.0022	J11	4.5	6.0	7.2	1000	PFR5 222J63J11L4 BULK
0.0033	J11	4.5	6.0	7.2	1000	PFR5 332J63J11L4 BULK
0.0047	J11	4.5	6.0	7.2	1000	PFR5 472J63J11L4 BULK
0.0068	J11	4.5	6.0	7.2	1000	PFR5 682J63J11L4 BULK
0.010	J12	5.5	7.0	7.2	1000	PFR5 103J63J12L4 BULK
0.015	J13	6.5	8.0	7.2	1000	PFR5 153J63J13L4 BULK
0.020	J13	6.5	8.0	7.2	1000	PFR5 203J63J13L4 BULK
0.022	J13	6.5	8.0	7.2	1000	PFR5 223J63J13L4 BULK

100 VDC/ 63 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J100J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J100J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J100J11L4 BULK
0.00033	J11	4.5	6.0	7.2	1000	PFR5 331J100J11L4 BULK
0.00047	J11	4.5	6.0	7.2	1000	PFR5 471J100J11L4 BULK
0.00068	J11	4.5	6.0	7.2	1000	PFR5 681J100J11L4 BULK
0.0010	J11	4.5	6.0	7.2	1000	PFR5 102J100J11L4 BULK
0.0015	J11	4.5	6.0	7.2	1000	PFR5 152J100J11L4 BULK
0.0022	J11	4.5	6.0	7.2	1000	PFR5 222J100J11L4 BULK
0.0033	J12	5.5	7.0	7.2	1000	PFR5 332J100J12L4 BULK
0.0047	J12	5.5	7.0	7.2	1000	PFR5 472J100J12L4 BULK
0.0068	J13	6.5	8.0	7.2	1000	PFR5 682J100J13L4 BULK
0.010	J13	6.5	8.0	7.2	1000	PFR5 103J100J13L4 BULK

250 VDC/ 160 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J250J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J250J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J250J11L4 BULK
0.00033	J11	4.5	6.0	7.2	1000	PFR5 331J250J11L4 BULK
0.00047	J11	4.5	6.0	7.2	1000	PFR5 471J250J11L4 BULK
0.00068	J11	4.5	6.0	7.2	1000	PFR5 681J250J11L4 BULK
0.0010	J11	4.5	6.0	7.2	1000	PFR5 102J250J11L4 BULK
0.0015	J11	4.5	6.0	7.2	1000	PFR5 152J250J11L4 BULK
0.0022	J11	4.5	6.0	7.2	1000	PFR5 222J250J11L4 BULK
0.0033	J12	5.5	7.0	7.2	1000	PFR5 332J250J12L4 BULK
0.0047	J13	6.5	8.0	7.2	1000	PFR5 472J250J13L4 BULK
0.0068	J13	6.5	8.0	7.2	1000	PFR5 682J250J13L4 BULK

400 VDC/ 220 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J400J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J400J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J400J11L4 BULK
0.00033	J11	4.5	6.0	7.2	1000	PFR5 331J400J11L4 BULK
0.00047	J11	4.5	6.0	7.2	1000	PFR5 471J400J11L4 BULK
0.00068	J11	4.5	6.0	7.2	1000	PFR5 681J400J11L4 BULK
0.0010	J11	4.5	6.0	7.2	1000	PFR5 102J400J11L4 BULK
0.0015	J11	4.5	6.0	7.2	1000	PFR5 152J400J11L4 BULK
0.0022	J11	4.5	6.0	7.2	1000	PFR5 222J400J11L4 BULK
0.0033	J12	5.5	7.0	7.2	1000	PFR5 332J400J12L4 BULK
0.0047	J13	6.5	8.0	7.2	1000	PFR5 472J400J13L4 BULK
0.0068	J13	6.5	8.0	7.2	1000	PFR5 682J400J13L4 BULK

630 VDC/ 250 VAC

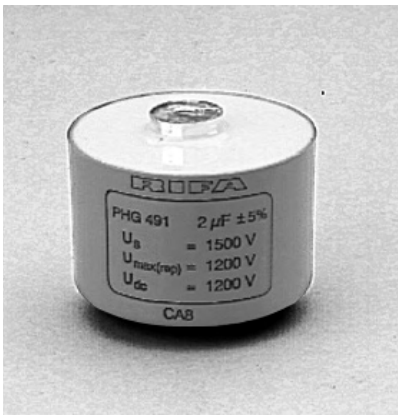
LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J630J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J630J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J630J11L4 BULK
0.00033	J11	4.5	6.0	7.2	1000	PFR5 331J630J11L4 BULK
0.00047	J11	4.5	6.0	7.2	1000	PFR5 471J630J11L4 BULK
0.00068	J11	4.5	6.0	7.2	1000	PFR5 681J630J11L4 BULK
0.0010	J11	4.5	6.0	7.2	1000	PFR5 102J630J11L4 BULK
0.0015	J11	4.5	6.0	7.2	1000	PFR5 152J630J11L4 BULK
0.0022	J12	5.5	7.0	7.2	1000	PFR5 222J630J12L4 BULK
0.0033	J13	6.5	8.0	7.2	1000	PFR5 332J630J13L4 BULK
0.0047	J13	6.5	8.0	7.2	1000	PFR5 472J630J13L4 BULK

1000 VDC/ 250 VAC

LEAD SPACING 5 MM

Capacitance µF	Box code	Max dimensions in mm B	H	L	Max dU/dt V/µs	Article code
0.00010	J11	4.5	6.0	7.2	1000	PFR5 101J1000J11L4 BULK
0.00015	J11	4.5	6.0	7.2	1000	PFR5 151J1000J11L4 BULK
0.00022	J11	4.5	6.0	7.2	1000	PFR5 221J1000J11L4 BULK
0.00033	J12	5.5	7.0	7.2	1000	PFR5 331J1000J12L4 BULK
0.00047	J12	5.5	7.0	7.2	1000	PFR5 471J1000J12L4 BULK
0.00068	J12	5.5	7.0	7.2	1000	PFR5 681J1000J12L4 BULK
0.0010	J13	6.5	8.0	7.2	1000	PFR5 102J1000J13L4 BULK



Power Electronic Capacitors

	Part No.	Capacitance	Voltage		Application	Page
RIFA	**PHG491**	0.22 – 10 µF	U_{GTO} U_{DC}	1500 – 2500 V 1200 – 2000 V	Snubber, Commutating	119
RIFA	**PHG 495**	5 – 25 µF	U_{GTO} U_{DC}	1500 – 2000 V 1000 – 1650 V	Clamping, Commutating	121
ICAR	**MSR25**	0.1 – 47 µF	U_{DC} U_{rms}	900 – 1850 V 440 – 935 V	Commutating, Filtering	*

* Data sheet available on request.

These capacitors are manufactured by ICAR, Italy.

For other Power Electronics Capacitors,
please contact your local KEMET sales person or see www.kemet.com

TERMS AND DEFINITIONS

Each capacitor type is characterized in the catalogue by "Basic Data" which provides an overview of the available standard range with regard to capacitance, voltage and temperature ranges as well as climatic category. Detailed data is provided as follows for selecting the correct capacitor for a particular application and load.

Rated voltage U_R
U_R is the voltage with which the capacitor is marked. It is defined as the peak value of the maximum sinusoidal voltage 50 Hz with which the capacitor may be continuously loaded at the maximum case temperature, T_C.

Rated DC voltage, U_{DC}
U_{DC} is the rated DC voltage capability at the upper rated temperature.

Maximum non-repetitive peak voltage U_S (surge)
U_S is the maximum voltage, (peak value), to which the capacitor may be subjected on isolated occasions.

Insulation. Self-discharge time constant, τ
The insulation (insulation resistance, R_{IS}) is specified as a time constant:
$\tau = R_{IS} \times C$ [MΩ x μF = s]
The insulation resistance, R_{IS}, is the ratio between an applied direct voltage and the current which flows through the capacitor. The current is measured 60 s after the voltage has been applied. Ambient temperature T_{amb} = + 23°C and RH less than 65%.

Insulation between terminals and case, R_{istc}
R_{istc} is the insulation resistance between short-circuited terminals and the case. See the details provided above.

Maximum case temperature, T_C
T_C is the maximum temperature which the capacitor case may reach in operation or during storage. T_C is measured at a point at half the height of the capacitor.

Ambient temperature Tamb
Tamb is the ambient temperature measured at a point of 20 mm from the capacitor's case at half its height.

Hot Spot temperature T_h
T_h is the hottest point in the capacitor winding during stationary operation. The temperature in the winding must not exceed T_h.

Thermal resistance Hot Spot to case R_{thhc}
R_{thhc} is the thermal resistance between the Hot Spot in the winding and the capacitor's case during stationary operation.

Thermal resistance, case ambient R_{thca}
R_{thca} is the thermal resistance between the capacitor's case and the environment during free convection cooling and stationary operation.

Rated capacitance C_N
C_N is the capacitance with which the capacitor is marked and corresponds to the capacitance measured at a frequency of 50 Hz sinusoidal at T_{amb} = 23°C.

Maximum root mean square current, I_{rms} max
I_{rms} max is the maximum root mean square current to which the capacitor may be subjected.

Maximum rate of rise of voltage, (dU/dt)max
$(dU/dt)_{max}$ is the maximum rate of rise of voltage to which the capacitor may be subjected. The following formula:
$I_{max} = C_N(dU/dt)_{max}$
gives the maximum peak current for the capacitor.

Dissipation factor, tanδ
Dissipation factor is a measure of the power loss in a capacitor in the case of sinusoidal voltage. It is defined as the ratio between the active power P and the reactive power Q:
$\tan\delta = P/Q = \tan\delta_{diel} + \tan\delta_{res}$
The losses in a capacitor can be both dielectric and resistive losses and are specified in the catalogue in the following form:
$\tan\delta = \tan\delta_{diel} + K \times f \times 10^{-6}$
Where $\tan\delta_{diel}$ = loss factor for the dielectric material
K = factor which is dependant on the size of the capacitor
f = frequency (kHz)
In the catalogue $\tan\delta_{diel}$ and the factor K are specified for each capacitor size.

Series resistance, R_S
RS is the ohmic resistance measured at 100 kHz, which is included in the factor K in the expression for tanδ.

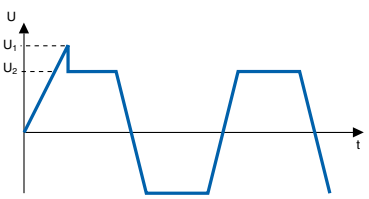
Self inductance L_{ESL}
L_{ESL} is the inductance measured at the capacitor's terminals.

Climatic category
The climatic category specifies the permissible temperature range and maximum relative humidity in the capacitor's environments. The climatic category is specified in accordance with IEC Publication No. 60068-1. Lowest temperature/highest temperature/number of test days, RH 95% for example, 40/085/56 means a lowest temperature of –40°C, a highest temperature of +85°C and that the capacitor has been type tested in a relative humidity of 95% during 56 days.

DESIGN RULES

The pulse shape, frequency and power loss in the capacitor must be taken into consideration when selecting the correct capacitor with regard to the load.

Selection of rated voltage UR
The peak value of the applied voltage must not at any time periodically exceed the capacitor's rated voltage U_R. The non-periodic voltage must not exceed U_S. Example: The voltage has the appearance illustrated in the figure below.



The capacitor is selected so that $U_2 \leq U_R$ and $U_1 \leq U_S$ (U_S = Surge voltage). If the load voltage is higher than the available capacitor's rated voltage U_R, capacitors must be connected in series.

Thermal design (power loss)
An approximate calculation of the capacitor's total power loss P_{tot} can be done according to:
$P_{tot} = P_{diel} + P_{RES}$
$P_{diel} = C_N \times p/4 \times U^2_{pp} \times f_0 \times \tan\delta_{diel}$
$P_{res} = I^2_{RMS} \times R_S$
with $\tan\delta_{diel} = 2 \times 10^{-4}$
C_N = Nominal capacitance value
U_{PP} = Repetitive peak to peak voltage
f_0 = Repetition frequency

The Hot Spot temperature T_h is calculated as follows:
$T_h = T_{amb} + (R_{thhc} + R_{thca}) \times P_{tot}$
Where T_{amb} = ambient temperature.
R_{thhc} = thermal resistance Hot Spot case (obtained from catalogue).
R_{thca} = thermal resistance case ambient (for free convection cooling).
P_{tot} = total power loss as calculated above.
If $T_h > T_{HS}$ (= 85°C) one of the following actions must be taken:
- reduce the ambient temperature
- forced cooling (R_{thca} decreases)
- parallel connection of capacitors

PHG491

• Power electronic capacitor, metallized polypropylene

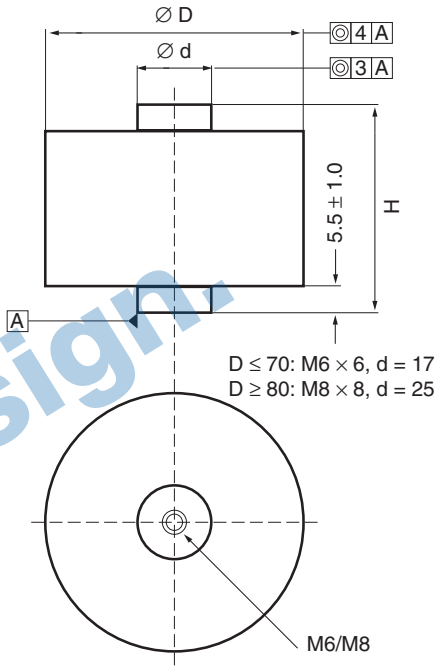
RoHS Compliant

TYPICAL APPLICATIONS

The PHG491 capacitor is intended for use in power electronic equipment, for example GTO snubber application. The capacitor is capable of operating continuously under non-sinusoidal current or voltage.

CONSTRUCTION

The PHG491 is a range of metallized polypropylene capacitors with low series resistance and low thermal resistance. Together with the special choice of metallized layer this gives a high ability to withstand voltage and current.



TECHNICAL DATA

Rated voltage, VDC	1200	1600	2000
Pulse rise time, dU/dt, V/µs, up to	1125	1125	1125
Capacitance range, µF	0.5 – 10	0.5 – 6	0.5 – 4
Capacitance tolerance	± 5%		
Climatic category **Temperature range**	40/085/56 – 40°C to + 85°C		
Insulation resistance	Between terminals ≥ 30 000 s.		
Hot Spot temperature, Th	≤ + 85°C.		
Quality and test data	All capacitors are subjected to 100% screening inspection in respect of voltage between terminals, capacitance, dissipation factor (1 kHz and 10 kHz) and insulation resistance between terminals. Each lot is sampled to establish the function of the screening inspection. The product quality is continuously followed by periodic tests, where the data of the product specification are established to be kept in the current production.		

MOUNTING

The capacitors can be mounted in any position. Max tightening torque:
M6 = 6 Nm
M8 = 10 Nm

ENVIRONMENTAL TEST DATA

Test	IEC Publication	Procedure	Requirements
Voltage proof	60384-1, clause 4.6		No flashover or permanent breakdown
Type test: between terminals		10 s 1700 VDC (U_{DC} = 1200 V) 2200 VDC (U_{DC} = 1600 V) 2700 VDC (U_{DC} = 2000 V)	
Routine test: between terminals		2 s 1700 VDC (U_{DC} = 1200 V) 2200 VDC (U_{DC} = 1600 V) 2700 VDC (U_{DC} = 2000 V)	
Insulation resistance between terminals	60384-1, clause 4.5	Measured at 500 VDC after 60 s, T_{amb} 23°C	 3 x 10^4 s
Dissipation factor	60384-1, clause 4.8	1 kHz, 10 kHz	≤ 3 x 10^{-4} ≤ 8 x 10^{-4}
Damp heat, steady state	60068-2-3 (1969)		56 days
Bump	60068-2-27 test Ea	4000 bumps, 245 m/s² in any direction	No visible damage No open or short circuit

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- U_{RMS} at 50 Hz
- MKP for metallized polypropylene
- Manufacturing code

ARTICLE TABLE

Rated cap	Dimensions in mm	dU/dt max	dU/dt rep	$I^2 x t$	Dissipation factor [1]	I_{rms} [2]	R_S	Inductance	Thermal resistance Hot spot-terminal R_{THHT}	Weight	Qty/ package	Article code
µF	Δ Dmax x H	V/µs	V/µs	A^2s	K	A	m Ω	nH	°C/W	g	pcs	
U_s 1500 V (non rep.) U_{max} 1200 V (rep) U_{DC} 1200 V U_{RMS} 550 VAC, 50 Hz												
0.5	40 x 49	1125	750	0.45	9	15	3.0	10	18.0	95	64	PHG491LB6500J
1	50 x 49	1125	750	1.8	10	20	1.6	10	10.7	130	49	PHG491LC7100J
2	58 x 49	1125	750	7.2	12	40	1.0	10	6.0	170	36	PHG491LD7200J
3	70 x 49	1125	750	16	14	55	0.7	10	4.2	230	25	PHG491LE7300J
4	80 x 52	1125	750	29	16	70	0.6	10	3.2	350	16	PHG491LG7400J
6	90 x 52	1125	750	65	20	80	0.5	10	2.2	450	16	PHG491LL7600J
8	90 x 62	750	500	77	32	65	0.6	10	3.5	500	16	PHG491LK7800J
10	90 x 62	750	500	120	36	75	0.6	10	2.9	500	16	PHG491LK8100J
U_s 2000 V (non rep.) U_{max} 1600 V (rep.) U_{DC} 1600 V U_{RMS} 650 VAC, 50 Hz												
0.5	40 x 49	1125	750	0.45	8	15	2.4	10	14.2	95	64	PHG491NB6500J
1	50 x 49	1125	750	1.8	9	25	1.4	10	8.3	130	49	PHG491NC7100J
2	70 x 49	1125	750	7.2	11	50	0.8	10	4.6	230	25	PHG491NE7200J
3	80 x 52	1125	750	16	12	65	0.7	10	3.2	350	16	PHG491NG7300J
4	90 x 52	1125	750	29	14	80	0.6	10	2.4	450	16	PHG491NL7400J
6	90 x 62	750	500	65	25	65	0.7	10	3.4	500	16	PHG491NK7600J
U_s 2500 V (non rep.) U_{max} 2000 V (rep) U_{DC} 2000 V U_{RMS} 750 VAC, 50 Hz												
0.5	50 x 49	1125	750	0.45	6	20	2.0	10	10.8	130	49	PHG491VC6500J
1	58 x 49	1125	750	1.8	7	40	1.1	10	6.1	170	36	PHG491VD7100J
2	70 x 59	750	500	4.8	15	35	1.2	10	6.5	270	25	PHG491VF7200J
2.5	80 x 62	750	500	8.0	16	40	1.0	10	5.5	420	16	PHG491VH7250J
3	80 x 62	750	500	11	17	50	0.9	10	4.7	420	16	PHG491VH7300J
4	90 x 62	750	500	19	18	65	0.7	10	3.7	500	16	PHG491VK7400J

[1] $\tan\delta \leq 200 \times 10^{-6} + K \times f_{kHz} \times 10^{-6}$

[2] Higher current can be used after testing and calculation of the temperature in the Hot-spot.

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MECHANICAL DATA

The capacitor winding is encapsulated in self-extinguishing material meeting the requirements of UL 94V-0. The capacitor has axial screw terminals with inner thread M6 respectively M8.

PHG495

• Power electronic capacitor, metallized polypropylene

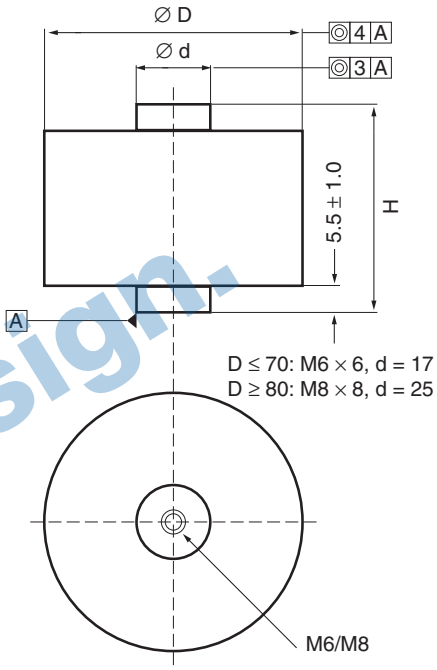
RoHS Compliant

TYPICAL APPLICATIONS

The PHG495 capacitor is intended for use in power electronic equipment, for example such as a clamping capacitor. The capacitor is capable of operating continuously under non-sinusoidal current or voltage.

CONSTRUCTION

The PHG495 is a range of metallized polypropylene capacitors with low series resistance and high capability to withstand inrush current. The capacitor winding is encapsulated in self-extinguishing material meeting the requirements oof UL 94V-0. The capacitor has axial screw terminals with inner M8 thread.



TECHNICAL DATA

Rated voltage, VDC	1000	1350	1650
Rated voltage, VAC	450	500	550
Capacitance range, µF	13 – 25	9 – 18	5 – 10
Capacitance tolerance	± 5%		
Climatic category	40/085/56		
Temperature range	– 40°C to + 85°C		
Insulation resistance	Measured at 500 VDC after 60 s, T_{amb} 23 °C Between terminals ≥ 30 000 s.		
Dissipation factor	1 kHz ≤ 30 000		
Hot Spot temperature, Th	≤ + 85°C.		
Quality and test data	All capacitors are subjected to 100% screening inspection in respect of voltage between terminals, capacitance, dissipation factor and insulation resistance between terminals. Each lot is sampled to establish the function of the screening inspection.		

MOUNTING

The capacitors can be mounted in any position. Max tightening torque:
M6 = 6 Nm
M8 = 10 Nm

ENVIRONMENTAL TEST DATA

Test	IEC Publication	Procedure	Requirements
Voltage proof	60384-1, clause 4.6		No flashover or permanent breakdown
Type test: between terminals		10 s 1700 VDC (U_{DC} = 1200 V) 2200 VDC (U_{DC} = 1600 V) 2700 VDC (U_{DC} = 2000 V)	
Routine test: between terminals		2 s 1700 VDC (U_{DC} = 1200 V) 2200 VDC (U_{DC} = 1600 V) 2700 VDC (U_{DC} = 2000 V)	
Insulation resistance between terminals	60384-1, clause 4.5	Measured at 500 VDC after 60 s, T_{amb} 23°C	 3 x 10^4 s
Dissipation factor	60384-1, clause 4.8	1 kHz, 10 kHz	≤ 3 x 10^{-4} ≤ 8 x 10^{-4}
Damp heat, steady state	60068-2-3 (1969)		56 days
Bump	60068-2-27 test Ea	4000 bumps, 245 m/s² in any direction	No visible damage No open or short circuit

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- U_{RMS} at 50 Hz
- MKP for metallized polypropylene
- Manufacturing code

ARTICLE TABLE

Rated cap	Dimensions in mm	dU/dt max	dU/dt rep	I^2 x t	Dissipation factor [1]	I_{rms} [2]	R_S	Inductance	Thermal resistance Hot spot-terminal R_{THHT}	Weight	Qty/ package	Article code
µF	Δ Dmax x H	V/µs	V/µs	A^2s	K	A	m Ω	nH	°C/W	g	pcs	
U_s 1500 V (non rep.) U_{max} 1200 V (rep.) U_{DC} 1000 V U_{rms} 450 V												
13	80	52	35	0.60	65	0.7	10	2.9	350	16	PHG495LG 8130J	
17	90	52	35	0.70	75	0.6	10	2.3	450	16	PHG495LL 8170J	
25	90	62	25	1.10	60	0.7	10	3.0	500	16	PHG495LK 8250J	
U_s 2000 V (non rep.) U_{max} 1600 V (rep.) U_{DC} 1350 V U_{rms} 500 V												
9	80	52	40	0.40	55	0.8	10	3.1	350	16	PHG495NG 7900J	
12	90	52	40	0.50	80	0.7	10	2.4	450	16	PHG495NL 8120J	
18	90	62	25	0.90	55	0.8	10	3.2	500	16	PHG495NK 8180J	
U_s 2500 V (non rep.) U_{max} 2000 V (rep.) U_{DC} 1650 V U_{rms} 550 V												
5	80	52	55	0.30	50	0.9	10	3.4	350	16	PHG495VG 7500J	
6.5	90	52	55	0.30	70	0.8	10	2.6	450	16	PHG495VL 7650J	
10	90	62	35	0.60	50	0.9	10	3.5	500	16	PHG495VK 8100J	

[1] $\tan\delta \leq 2\times10^{-4}+K\times f_{kHz}\times10^{-4}$

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.

MECHANICAL DATA

The capacitor winding is encapsulated in self-extinguishing material meeting the requirements of UL 94V-0. The capacitor has axial screw terminals with inner thread M6 respectively M8.

REPLACEMENT GUIDE

Capacitor Name	Capacitor Type	Replacement Type
MFR, CFR	Film/Foil	PFR
PMR	Pulse	PHE426
PHE241 - 243	General Purpose	MMK
PHE280	General Purpose	MMK
CMK, PHE307	General Purpose	SMR
PHE351, PHE353	General Purpose	MMK
PHE403, PHE404	Pulse	PHE426
PHE420	Pulse	PHE426
PHE430, 431, 427, 428	Pulse	PHE450
PHE800, PHE810	EMI	PHE820, PHE840
PHE830, PHE843	EMI	PHE820, PHE840
PME2614	General Purpose	PME261K
PME2616	General Purpose	PME261E
PME2631	General Purpose	PME261J
PME265, PME275	EMI	PME271Y
PME273	EMI	PME271M, insulated leads
PME274	EMI	PME271M
PME285	EMI	PME271M, PHE840M
PME289	EMI	PME271Y, PHE850
PME290	EMI	PME271Y, PHE850
PME291	EMI	PME271Y, PHE850
PME294	EMI	PME295
PMR202A..	RC unit	PMR205
PMR202M..	RC unit	PMR209
PMR2052, PMR2062	RC unit	PMR205
PMR207	RC unit	PMR205, insulated leads
PMZ2046	EMI	PME271M
PMZ2048	EMI	PME271M
PMZ2050	EMI	PME271M
PMZ2058	RC unit	PMZ2035
PZB4002, PZB4003	Delta EMI	PZB300

For other types, please contact your local KEMET sales person.

ALPHANUMERICAL INDEX

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