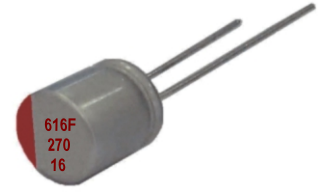


# PF series

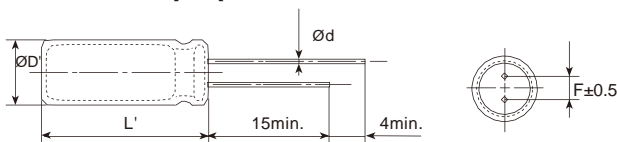
- Endurance: +105°C 3,000~5,000 hours
- Long life time
- Recommended Applications: System Board, Display Card, Small Charger and intelligent TV
- RoHS Compliant and lead-free



## SPECIFICATIONS

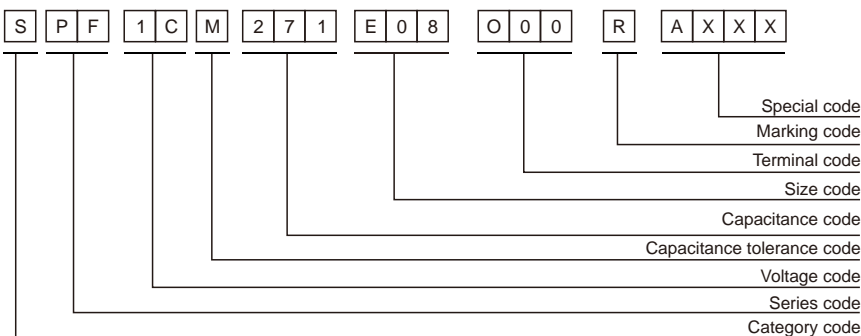
Items	Characteristics									
Category Temperature Range	-55~+105°C									
Rated Working Voltage Range	6.3~100 V <sub>dc</sub>									
Nominal Capacitance Range	4.7~5600μF									
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)									
DC Leakage Current	I 0.2CV or 500μA, whichever is greater. Where, I:Max.leakage current (μA), C:Nominal capacitance (μF), V: Rated voltage (V) (at 20°C after 2 minutes)									
DissipationFactor (tan )	Rated Voltage(V <sub>dc</sub> )	6.3	6.8	7.5	10	16	63	80	100	
	tan (max.)	0.08			0.12			0.15		(at 20°C, 120Hz)
ESR(100kHz,20°C)	Value in characteristics table									
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C) 1.25 Z(-55°C)/Z(+20°C) 1.25									
Endurance	After applying rated voltage for 3,000 to 5,000 hours at 105°C, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	±20% of the initial value								
	D.F. (tan )	150% of the initial specified value								
	ESR	150% of the initial specified value								
	Leakage Current	The initial specified value								
Humidity Test	After subjecting to 90~95%RH for 2,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.									
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	±20% of the initial value								
	D.F. (tan )	150% of the initial specified value								
	ESR	150% of the initial specified value								
	Leakage Current	The initial specified value								

## DIMENSIONS[mm]



ØD	5	5.5	6.3	8	10
ød	0.5	0.5	0.5	0.6	0.6
F	2.0	2.5	2.5	3.5	5.0
ØD'	ØD-0.1~+0.5				
L'	L+1.0max.			L-0.5~-+1	

## PART NUMBERING SYSTEM



**PF series**

■ STANDARD RATINGS

VDC (SV)	Cap (µF)	Size DxL(mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mA rms/105°C, 100kHz)	Leakage Current (µA)(max.)	Part Number
6.3 (7.2)	220	5x7	22	3100	500	SPF0JM221D07O00RAXXX
	270	5x7	22	3400	500	SPF0JM271D07O00RAXXX
	330	5x8	22	3600	500	SPF0JM331D08O00RAXXX
		6.3x5	27	2800	500	SPF0JM331E05O00RAXXX
	390	6.3x8	16	3600	500	SPF0JM331E08O00RAXXX
		5x9	22	3600	500	SPF0JM391D09O00RAXXX
	470	5x10	22	3800	592	SPF0JM471D10O00RAXXX
		5.5x9	22	3600	592	SPF0JM471B09O00RAXXX
		6.3x7	22	3500	592	SPF0JM471E07O00RAXXX
		6.3x8	16	3900	592	SPF0JM471E08O00RAXXX
	560	6.3x7	22	3700	706	SPF0JM561E07O00RAXXX
		6.3x8	22	4300	706	SPF0JM561E08O00RAXXX
		5.5x9	22	3800	706	SPF0JM561B09O00RAXXX
	680	6.3x9	22	4500	857	SPF0JM681E09O00RAXXX
		5.5x9	22	4300	857	SPF0JM681B09O00RAXXX
		8x9	22	4100	857	SPF0JM681F09O00RAXXX
	820	6.3x9	22	4500	1033	SPF0JM821E09O00RAXXX
		8x9	16	4200	1033	SPF0JM821F09O00RAXXX
		6.3x10	11	4600	1260	SPF0JM102E10O00RAXXX
	1000	8x9	13	4300	1260	SPF0JM102F09O00RAXXX
8x11		11	4600	1260	SPF0JM102F11O00RAXXX	
1200	8x11	11	4700	1512	SPF0JM122F11O00RAXXX	
1500	8x11	11	4800	1890	SPF0JM152F11O00RAXXX	
	10x12	11	4900	1890	SPF0JM152G12O00RAXXX	
1800	10x10	11	5000	2268	SPF0JM182G10O00RAXXX	
2200	8x14	11	5100	2772	SPF0JM222F14O00RAXXX	
	10x12	11	5200	2772	SPF0JM222G12O00RAXXX	
3300	10x14	11	5300	4158	SPF0JM332G14O00RAXXX	
4700	10x17	11	5400	5000	SPF0JM472G17O00RAXXX	
5600	10x18	11	5600	5000	SPF0JM562G18O00RAXXX	
6.8 (7.8)	220	5x7	22	2970	500	SPF0CM221D07O00RAXXX
	270	5x7	22	3240	500	SPF0CM271D07O00RAXXX
	330	5x8	22	3420	500	SPF0CM331D08O00RAXXX
	390	5x9	22	3510	530	SPF0CM391D09O00RAXXX
	470	5x9	22	3690	639	SPF0CM471D09O00RAXXX
		6.3x7	22	3330	639	SPF0CM471E07O00RAXXX
	560	6.3x8	22	4050	762	SPF0CM561E08O00RAXXX
	680	6.3x9	22	4320	925	SPF0CM681E09O00RAXXX
	820	6.3x9	22	4410	1115	SPF0CM821E09O00RAXXX
	1000	6.3x11	13	4590	1360	SPF0CM102E11O00RAXXX
	8x11	11	4635	1360	SPF0CM102F11O00RAXXX	
7 (8.1)	220	5x7	22	2880	500	SPF0QM221D07O00RAXXX
	270	5x8	22	3060	500	SPF0QM271D08O00RAXXX
	330	5x9	22	3240	500	SPF0QM331D09O00RAXXX
	470	6.3x8	22	3420	658	SPF0QM471E08O00RAXXX
		5.5x9	22	3240	658	SPF0QM471B09O00RAXXX
	560	6.3x8	22	3600	784	SPF0QM561E08O00RAXXX
	680	6.3x9	13	3780	952	SPF0QM681E09O00RAXXX
	820	6.3x10	13	4050	1148	SPF0QM821E10O00RAXXX
	8x9	13	4140	1148	SPF0QM821F09O00RAXXX	
7.5 (8.6)	220	5x7	22	2790	500	SPF0AM221D07O00RAXXX
	270	5x8	22	2970	500	SPF0AM271D08O00RAXXX
	330	5x9	22	3150	500	SPF0AM331D09O00RAXXX
	470	6.3x7	28	2880	705	SPF0AM471E07O00RAXXX
		5.5x9	22	3195	705	SPF0AM471B09O00RAXXX
	500	5.5x9	22	3240	750	SPF0AM501B09O00RAXXX
	560	6.3x8	22	3510	840	SPF0AM561E08O00RAXXX
	680	6.3x9	13	3690	1020	SPF0AM681E09O00RAXXX
	820	6.3x10	13	3960	1230	SPF0AM821E10O00RAXXX
		8x9	13	4095	1230	SPF0AM821F09O00RAXXX
1200	8x11	13	4320	1800	SPF0AM122F11O00RAXXX	
10 (11.5)	47	5x7	38	1900	500	SPF1AM470D07O00RAXXX
	56	5x7	38	2000	500	SPF1AM560D07O00RAXXX
	68	5x7	38	2000	500	SPF1AM680D07O00RAXXX
	82	5x7	38	2100	500	SPF1AM820D07O00RAXXX
	100	5x7	38	2100	500	SPF1AM101D07O00RAXXX
	120	5x7	22	2200	500	SPF1AM121D07O00RAXXX
	150	5x7	22	2200	500	SPF1AM151D07O00RAXXX
	220	5x9	22	2500	500	SPF1AM221D09O00RAXXX
		6.3x8	16	2800	500	SPF1AM221E08O00RAXXX
	270	6.3x8	22	2700	540	SPF1AM271E08O00RAXXX
	330	6.3x8	22	2900	660	SPF1AM331E08O00RAXXX
	390	8x9	16	3000	660	SPF1AM331F09O00RAXXX
		6.3x8	22	3000	780	SPF1AM391E08O00RAXXX

**PF series**

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size DxL(mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mA rms/105°C, 100kHz)	Leakage Current (μA)(max.)	Part Number
10 (11.5)	470	5.5x9	22	3000	940	SPF1AM471B09000RAXXX
		6.3x8	22	3100	940	SPF1AM471E08000RAXXX
		8x9	16	3100	940	SPF1AM471F09000RAXXX
	560	8x11	13	5000	940	SPF1AM471F11000RAXXX
		6.3x10	14	3200	1120	SPF1AM561E10000RAXXX
		8x9	16	3200	1120	SPF1AM561F09000RAXXX
	680	8x11	13	3500	1360	SPF1AM681F11000RAXXX
		820	8x11	13	3600	1640
	1000	8x11	13	3700	2000	SPF1AM102F11000RAXXX
		10x12	11	4700	2000	SPF1AM102G12000RAXXX
	1200	8x12	11	4000	2400	SPF1AM122F12000RAXXX
		10x12	11	4900	2400	SPF1AM122G12000RAXXX
	1500	10x12	11	4900	3000	SPF1AM152G12000RAXXX
	1800	10x13	11	5200	3600	SPF1AM182G13000RAXXX
	2200	10x15	11	5400	4400	SPF1AM222G15000RAXXX
3300	10x18	11	5500	5000	SPF1AM332G18000RAXXX	
12 (13.8)	330	5.5x9	22	2790	792	SPF1TM331B09000RAXXX
		5.5x9	22	2880	1128	SPF1TM471B09000RAXXX
	470	6.3x9	22	3105	1128	SPF1TM471E09000RAXXX
		6.3x10	17	3060	1128	SPF1TM471E10000RAXXX
	680	6.3x11	17	3240	1632	SPF1TM681E11000RAXXX
		8x10	17	3330	1632	SPF1TM681F10000RAXXX
	820	8x11	13	3420	1968	SPF1TM821F11000RAXXX
	1000	8x12	13	3600	2400	SPF1TM102F12000RAXXX
	1200	8x14	13	3960	2880	SPF1TM122F14000RAXXX
	1500	8x16	13	4320	3600	SPF1TM152F16000RAXXX
16 (18.4)	47	5x7	22	1800	500	SPF1CM470D07000RAXXX
	56	5x7	22	1800	500	SPF1CM560D07000RAXXX
	68	5x7	22	1900	500	SPF1CM680D07000RAXXX
	82	5x8	22	1900	500	SPF1CM820D08000RAXXX
	100	5x7	22	2000	500	SPF1CM101D07000RAXXX
		6.3x5	27	1800	500	SPF1CM101E05000RAXXX
	120	5x8	22	2100	500	SPF1CM121D08000RAXXX
	150	5x8	22	2100	500	SPF1CM151D08000RAXXX
	180	5x8	22	2200	576	SPF1CM181D08000RAXXX
		6.3x7	17	2200	576	SPF1CM181E07000RAXXX
	220	5x10	22	2300	704	SPF1CM221D10000RAXXX
		6.3x8	22	2400	704	SPF1CM221E08000RAXXX
	270	6.3x10	16	2600	704	SPF1CM221E10000RAXXX
		5.5x9	22	2400	864	SPF1CM271B09000RAXXX
		6.3x8	22	2500	864	SPF1CM271E08000RAXXX
	330	8x9	22	2600	864	SPF1CM271F09000RAXXX
		5.5x9	22	2600	1056	SPF1CM331B09000RAXXX
	470	6.3x9	22	2600	1056	SPF1CM331E09000RAXXX
		6.3x10	16	2700	1056	SPF1CM331E10000RAXXX
		6.3x11	16	2800	1504	SPF1CM471E11000RAXXX
	560	8x11	16	4100	1504	SPF1CM471F11000RAXXX
		8x11	16	2800	1792	SPF1CM561F11000RAXXX
	680	8x13	16	2800	1792	SPF1CM561F13000RAXXX
		8x11	16	3000	2176	SPF1CM681F11000RAXXX
	820	10x12	13	3200	2176	SPF1CM681G12000RAXXX
		8x13	12	3100	2624	SPF1CM821F13000RAXXX
	1000	10x12	13	3400	2624	SPF1CM821G12000RAXXX
		10x12	13	3600	3200	SPF1CM102G12000RAXXX
	1200	8x14	13	3200	3200	SPF1CM102F14000RAXXX
		10x15	13	3800	3840	SPF1CM122G15000RAXXX
	1500	10x12	13	3700	3840	SPF1CM122G12000RAXXX
		10x18	13	4900	4800	SPF1CM152G18000RAXXX
	1800	10x14	13	4800	5000	SPF1CM182G14000RAXXX
	2200	10x17	13	5200	5000	SPF1CM222G17000RAXXX
		10x15	13	4900	5000	SPF1CM222G15000RAXXX
20 (23.0)	33	5x8	44	1710	500	SPF1DM330D08000RAXXX
	39	5x8	44	1755	500	SPF1DM390D08000RAXXX
	47	5x8	44	1980	500	SPF1DM470D08000RAXXX
	56	5x9	44	1890	500	SPF1DM560D09000RAXXX
	68	6.3x8	33	1890	500	SPF1DM680E08000RAXXX
	82	6.3x8	33	1935	500	SPF1DM820E08000RAXXX
	100	6.3x8	33	1980	500	SPF1DM101E08000RAXXX
	120	6.3x8	33	2070	500	SPF1DM121E08000RAXXX
	150	6.3x10	22	2115	600	SPF1DM151E10000RAXXX
	220	8x9	33	2205	880	SPF1DM221F09000RAXXX
		8x11	22	2295	880	SPF1DM221F11000RAXXX
	270	8x11	22	2430	1080	SPF1DM271F11000RAXXX
	330	8x11	22	2520	1320	SPF1DM331F11000RAXXX

Conductive Polymer Radial Type

**PF series**

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size DxL(mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mArms/105°C, 100kHz)	Leakage Current (μA)(max.)	Part Number
20 (23.0)	470	10x12	22	2610	1880	SPF1DM471G12O00RAXXX
		10x13	22	2790	1880	SPF1DM471G13O00RAXXX
	680	10x15	22	2970	2720	SPF1DM681G15O00RAXXX
		10x12	22	2700	2720	SPF1DM681G12O00RAXXX
	820	10x18	22	3060	3280	SPF1DM821G18O00RAXXX
25 (28.8)	1000	10x18	22	3510	4000	SPF1DM102G18O00RAXXX
	33	5x9	66	1600	500	SPF1EM330D09O00RAXXX
		39	5x8	66	1700	500
	47	5x9	66	1700	500	SPF1EM470D09O00RAXXX
	56	5x9	66	1800	500	SPF1EM560D09O00RAXXX
	82	6.3x7	33	1900	500	SPF1EM820E07O00RAXXX
		6.3x8	33	2200	500	SPF1EM101E08O00RAXXX
	100	6.3x10	22	2500	500	SPF1EM101E10O00RAXXX
		8x11	22	2700	500	SPF1EM101F11O00RAXXX
	120	6.3x8	33	2200	600	SPF1EM121E08O00RAXXX
		6.3x10	22	2500	750	SPF1EM151E10O00RAXXX
	150	6.3x10	22	2500	900	SPF1EM181F09O00RAXXX
	180	8x9	33	2200	1100	SPF1EM221F11O00RAXXX
	220	8x11	22	2700	1350	SPF1EM271F11O00RAXXX
	270	8x11	22	2700	1650	SPF1EM331F11O00RAXXX
	330	10x12	22	2500	1650	SPF1EM331G12O00RAXXX
		10x12	22	3600	2350	SPF1EM471G12O00RAXXX
	470	8x11	22	2700	2350	SPF1EM471F11O00RAXXX
		10x15	22	3800	3400	SPF1EM681G15O00RAXXX
	680	10x18	22	4000	4100	SPF1EM821G18O00RAXXX
8x16		22	3200	4100	SPF1EM821F16O00RAXXX	
1000	10x18	22	4000	5000	SPF1EM102G18O00RAXXX	
35 (40.3)	4.7	5x8	66	1500	500	SPF1VM47D08O00RAXXX
		5x8	66	1600	500	SPF1VM100D08O00RAXXX
	15	5x8	66	1600	500	SPF1VM150D08O00RAXXX
	22	5x9	110	1700	500	SPF1VM220D09O00RAXXX
	33	5x9	55	1800	500	SPF1VM330D09O00RAXXX
	39	5x9	55	1800	500	SPF1VM390D09O00RAXXX
	47	6.3x7	55	1800	500	SPF1VM470E07O00RAXXX
	56	6.3x7	55	1900	500	SPF1VM560E07O00RAXXX
	68	6.3x7	55	1900	500	SPF1VM680E07O00RAXXX
	82	6.3x7	55	2000	574	SPF1VM820E07O00RAXXX
		6.3x8	55	2100	700	SPF1VM101E08O00RAXXX
	100	6.3x10	44	2100	700	SPF1VM101E10O00RAXXX
		8x11	44	2300	700	SPF1VM101F11O00RAXXX
	120	6.3x10	44	2200	840	SPF1VM121E10O00RAXXX
	150	6.3x10	44	2200	1050	SPF1VM151E10O00RAXXX
	220	8x11	44	2500	1540	SPF1VM221F11O00RAXXX
	270	10x12	33	2600	1540	SPF1VM221G12O00RAXXX
	270	10x12	33	2700	1890	SPF1VM271G12O00RAXXX
	330	10x12	33	2700	2310	SPF1VM331G12O00RAXXX
	470	10x13	22	2800	3290	SPF1VM471G13O00RAXXX
680	10x16	22	3000	4760	SPF1VM681G16O00RAXXX	
820	10x18	22	3100	5000	SPF1VM821G18O00RAXXX	
1000	10x18	22	3300	5000	SPF1VM102G18O00RAXXX	
50 (57.5)	4.7	5x8	66	1300	500	SPF1HM47D08O00RAXXX
		6.3x7	38	1600	500	SPF1HM100E07O00RAXXX
	10	5x8	77	1400	500	SPF1HM100D08O00RAXXX
	15	5x8	77	1400	500	SPF1HM150D08O00RAXXX
	22	6.3x7	44	1700	500	SPF1HM220E07O00RAXXX
	33	6.3x7	44	1800	500	SPF1HM330E07O00RAXXX
	47	6.3x8	38	1800	500	SPF1HM470E08O00RAXXX
	56	6.3x8	38	1900	560	SPF1HM560E08O00RAXXX
	68	6.3x10	33	1900	680	SPF1HM680E10O00RAXXX
	100	8x11	33	2000	1000	SPF1HM101F11O00RAXXX
	120	8x11	33	2100	1200	SPF1HM121F11O00RAXXX
	150	10x12	33	2200	1500	SPF1HM151G12O00RAXXX
	220	10x12	33	2400	2200	SPF1HM221G12O00RAXXX
	270	10x13	22	2600	2700	SPF1HM271G13O00RAXXX
	330	10x15	22	2700	3300	SPF1HM331G15O00RAXXX
440	10x18	22	2700	4400	SPF1HM441G18O00RAXXX	
470	10x18	22	2800	4700	SPF1HM471G18O00RAXXX	
63 (72.5)	4.7	6.3x8	66	1400	500	SPF1JM47E08O00RAXXX
	6.8	6.3x8	66	1400	500	SPF1JM68E08O00RAXXX
	10	6.3x5	66	1400	500	SPF1JM100E05O00RAXXX
	33	6.3x8	33	1500	500	SPF1JM330E08O00RAXXX
	39	6.3x8	33	1500	500	SPF1JM390E08O00RAXXX

# PF series

■ STANDARD RATINGS

VDC (SV)	Cap (μF)	Size DxL(mm)	ESR (mΩ, 20°C, 100kHz) (max.)	Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz)	Leakage Current (μA)(max.)	Part Number
63 (72.5)	47	6.3x9	33	1700	592	SPF1JM470E09O00RAXXX
	56	8x9	33	1600	706	SPF1JM560F09O00RAXXX
	68	8x11	33	1800	857	SPF1JM680F11O00RAXXX
	82	8x11	33	1800	1033	SPF1JM820F11O00RAXXX
	100	10x12	33	1900	1260	SPF1JM101G12O00RAXXX
	150	10x12	33	2200	1890	SPF1JM151G12O00RAXXX
	220	10x15	22	2300	2772	SPF1JM221G15O00RAXXX
	270	10x17	22	2500	3402	SPF1JM271G17O00RAXXX
80 (92.0)	330	10x18	22	2600	4158	SPF1JM331G18O00RAXXX
	4.7	6.3x8	66	1300	500	SPF1BM4R7E08O00RAXXX
	6.8	6.3x8	66	1300	500	SPF1BM6R8E08O00RAXXX
	22	6.3x10	66	1400	500	SPF1BM220E10O00RAXXX
	33	8x11	38	1500	528	SPF1BM330F11O00RAXXX
	47	10x12	38	1600	752	SPF1BM470G12O00RAXXX
	68	10x12	38	1700	1088	SPF1BM680G12O00RAXXX
	100	10x14	38	1800	1600	SPF1BM101G14O00RAXXX
100 (115.0)	4.7	6.3x8	132	1200	500	SPF1KM4R7E08O00RAXXX
	6.8	6.3x8	132	1300	500	SPF1KM6R8E08O00RAXXX
	10	6.3x10	55	1300	500	SPF1KM100E10O00RAXXX
		8x11	55	1300	500	SPF1KM100F11O00RAXXX
	15	8x11	55	1300	500	SPF1KM150F11O00RAXXX
	22	10x12	38	1400	500	SPF1KM220G12O00RAXXX
	33	10x14	38	1400	660	SPF1KM330G14O00RAXXX
	47	10x16	38	1600	940	SPF1KM470G16O00RAXXX

Conductive Polymer Radial Type

Specifications subject to change without notice.