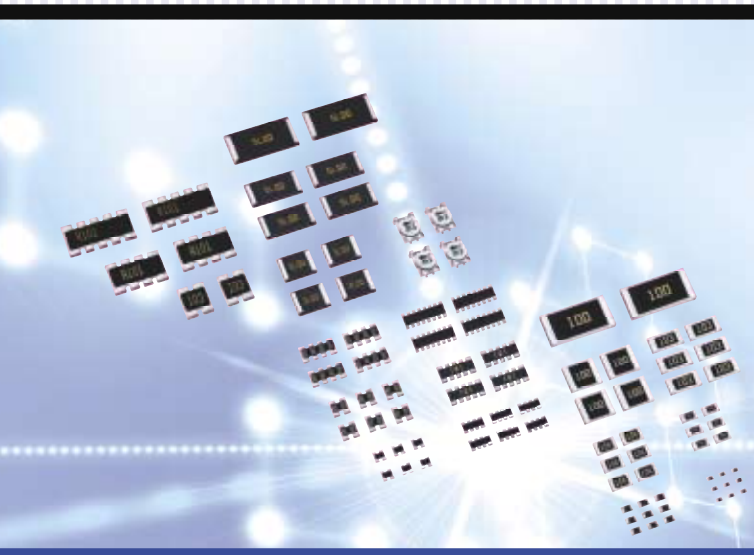
R EMI Product Catalog
2009-1st

Pb Free
ROHM Electronic Components

RoHS
Directive Compliance



Resistors
EMI Filters

Passive Components

Excellence in Electronics

ROHM

www.rohm.com

■Ultra-low Ohmic Chip Resistors for Current Detection (i.e. PMR03 series)

Trimming-less structure improves current detection accuracy.
Optimal for large current high-speed switching circuits.
Resistance range: 1mΩ to 10mΩ.

■Fixed Thick Film Low Ohmic Chip Resistors: (i.e.UCR10)

This chip resistor for current detection features a thick film resistive element and comes in a lineup of low resistances ranging from 11mΩ to 0.91Ω.

■High Power, Low Ohmic Wide Terminal Chip Resistors (i.e. LTR10 series)

Chip resistors for current detection.
Positioning the electrodes lengthwise improves junction reliability – especially with respect to temperature changes.
Resistance range: 47mΩ to 9.1Ω.

■Ultra-low Ohmic Wide Terminal Chip Resistors for Current Detection (i.e. PML50 series)

Available from as low as 0.5mΩ, the wide terminal configuration improves both junction reliability and heat dissipation.

■Anti-surge Chip Resistors (i.e. ESR03 series)

The novel design prevents current concentration, dramatically improving anti-surge characteristics.
Ideal for sets and circuits requiring surge protection.

■High Voltage Resistance Chip Resistors (i.e. KTR03 series)

At least twice the maximum element voltage of conventional products.The high maximum element voltage makes it suitable for high-voltage circuits.

■High Power Wide Terminal Chip Resistors (i.e. LTR10 series)

The wide terminal structure dramatically improves junction reliability with respect to temperature changes, making it optimized for applications exposed to harsh conditions, such as automotive systems. Resistance range: 10Ω to 1MΩ.

■Sulfur-resistant Chip Resistors (i.e. TRR01 series)

These resistors feature a proprietary internal structure with a built-in barrier highly resistant sulfur-rich environments.

■Compact Chip Resistors (MCR004 series)

Optimized for a wide variety of applications, from consumer electronics to vehicle and industrial devices.
Currently the thinnest, most compact chip resistors in the ndustry.

■Narrow Pitch Paper Tape Chip Resistors (i.e. MCR01 series)

Contains twice the number of resistors in the same reel size as conventional taping products, reducing the amount of packaging waste, storage space, and costs by half while increasing time between reel replacement.

■3-Terminal EMI Filters (MCF18 series)

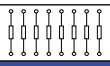
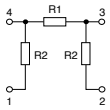
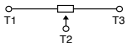
The entire series comes in the compact 1608 size and supports large currents (4A max.).
Ideal for eliminating noise in power supply lines.

CONTENTS

Resistor Lineup Table

Part No.	Size (inch)	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
Compact Thick Film Chip Resistors <MCR series>						
New MCR004	0402(01005)		0.031W	J(±5%)	10Ω to 3MΩ	-55 to +125°C
				F(±1%)	10Ω to 3MΩ	
MCR006	0603(0201)		0.05W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 10MΩ	
				D(±0.5%)	100Ω to 100kΩ	
MCR01	1005(0402)		0.063W	J(±5%)	1Ω to 10MΩ	-55 to +155°C
				F(±1%)	10Ω to 2.2MΩ	
				D(±0.5%)	10Ω to 1MΩ	
MCR03	1608(0603)		0.1W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 10MΩ	
				D(±0.5%)	10Ω to 1MΩ	
MCR10	2012(0805)		0.125W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 2.2MΩ	
			0.1W	D(±0.5%)	10Ω to 1MΩ	
Thick Film Chip Resistors <MCR series>						
MCR18	3216(1206)		0.25W	J(±5%)	1Ω to 10MΩ	-55 to +155°C
				F(±1%)	10Ω to 2.2MΩ	
			0.125W	D(±0.5%)	10Ω to 1MΩ	
MCR25	3225(1210)		0.25W	J(±5%)	1Ω to 3.3MΩ	-55 to +125°C
				F(±1%)	10Ω to 1MΩ	
MCR50	5025(2010)		0.5W	J(±5%)	1Ω to 560kΩ	
				F(±1%)	10Ω to 180kΩ	
MCR100	6432(2512)		1W	J(±5%)	1Ω to 100kΩ	
				F(±1%)	10Ω to 82kΩ	
Ultra-low Ohmic Chip Resistors for Current Detection <PMR series>						
PMR03	1608(0603)		0.25W	J(±5%)	10mΩ	-55 to +155°C
PMR10	2012(0805)		0.5W	J(±5%)	2, 3, 4, 5, 6, 7, 8, 9, 10mΩ	
				G(±2%)		
				F(±1%)		
PMR18	3216(1206)		0.75W	J(±5%)	2, 3, 4, 5, 6, 7, 8, 9, 10mΩ	
				F(±1%)		
PMR25	3225(1210)		1W	J(±5%)	1, 2, 3, 4, 5mΩ	
				F(±1%)		
PMR50	5025(2010)		1W	J(±5%)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10mΩ	
				F(±1%)		
PMR100	6432(2512)		2W	J(±5%)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10mΩ	
				F(±1%)		
Fixed Thick Film Low Ohmic Chip Resistors <UCR series>						
☆ UCR01	1005(0402)		0.125W	J(±5%)	47mΩ to 910mΩ	-55 to +155°C
				F(±1%)		
☆ UCR03	1608(0603)		0.2W	J(±5%)	47mΩ to 910mΩ	
				F(±1%)		
UCR10	2012(0805)		0.33W	J(±5%)	11mΩ to 100mΩ	
				F(±1%)	20mΩ to 100mΩ	
☆ UCR18	3216(1206)		0.5W	J(±5%)	11mΩ to 100mΩ	
				F(±1%)		
High Power, Low Ohmic Wide Terminal Chip Resistors for Current Detection <LTR series>						
LTR10	2012(0805)		0.5W	J(±5%)	47mΩ to 9.1Ω	-55 to +155°C
				F(±1%)		
☆ LTR18	3216(1206)		1W	J(±5%)	47mΩ to 9.1Ω	
				F(±1%)		
☆ LTR50	5025(2010)		1.5W	J(±5%)	47mΩ to 9.1Ω	
				F(±1%)		
Ultra-low Ohmic Wide Terminal Chip Resistors for current Detection <PML series>						
New PML50	5025(2010)		2W	J(±5%)	0.5, 1, 1.5, 2mΩ	-55 to +155°C
New PML100	6432(2512)		3W	J(±5%)	0.5, 1, 1.5, 2mΩ	
Anti-surge Chip Resistors <ESR series>						
ESR03	1608(0603)		0.2W	J(±5%)	10Ω to 10MΩ	-55 to +155°C
				F(±1%)	10Ω to 10MΩ	
				D(±0.5%)	10Ω to 1MΩ	
ESR10	2012(0805)		0.25W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	1Ω to 10MΩ	
				D(±0.5%)	10Ω to 1MΩ	
ESR18	3216(1206)		0.33W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	1Ω to 10MΩ	
				D(±0.5%)	10Ω to 1MΩ	
ESR25	3225(1210)		0.5W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	1Ω to 10MΩ	
				D(±0.5%)	10Ω to 1MΩ	

☆: Under development *Size :( )inch

Part No.	Size (inch)	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
High Voltage Resistance Chip Resistors <KTR series>						
KTR03	1608(0603)		0.1W	J(±5%)	10Ω to 10MΩ	-55 to +155°C
				F(±1%)		
KTR10	2012(0805)		0.125W	J(±5%)	1Ω to 10MΩ	
				F(±1%)		
KTR18	3216(1206)		0.25W	J(±5%)	1Ω to 10MΩ	
				F(±1%)		
KTR25	3225(1210)		0.33W	J(±5%)	1Ω to 10MΩ	
				F(±1%)		
High Power Wide Terminal Chip Resistors <LTR series>						
LTR10	2012(0805)		0.25W	J(±5%)	10Ω to 1MΩ	-55 to +155°C
				F(±1%)		
				D(±0.5%)		
LTR18	3216(1206)		0.5W	J(±5%)	10Ω to 1MΩ	
				F(±1%)		
				D(±0.5%)		
LTR50	5025(2010)		1W	J(±5%)	10Ω to 130kΩ	
				F(±1%)		
				D(±0.5%)		
Sulfur Tolerance Chip Resistors <TRR series>						
TRR01	1005(0402)		0.063W	J(±5%)	1Ω to 10MΩ	-55 to +155°C
				F(±1%)	10Ω to 2.2MΩ	
TRR03	1608(0603)		0.1W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 10MΩ	
☆ TRR10	2012(0805)		0.125W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 2.2MΩ	
☆ TRR18	3216(1206)		0.25W	J(±5%)	1Ω to 10MΩ	
				F(±1%)	10Ω to 2.2MΩ	
Compact Chip Resistor Networks <MNR series>						
MNR02	100(0402)5 × 2		0.063W	J(±5%)	10Ω to 1MΩ	-55 to +125°C
MNR12	1608(0603) × 2		0.063W	J(±5%)	2.2Ω to 1MΩ	
				F(±1%)	10Ω to 1MΩ	
MNR32	3216(1206) × 2		0.125W	J(±5%)	10Ω to 1MΩ	
MNR04	1005(0402) × 4		0.063W	J(±5%)	10Ω to 1MΩ	
MNR14	1608(0603) × 4		0.063W	J(±5%)	2.2Ω to 1MΩ	
				F(±1%)	10Ω to 1MΩ	
MNR34	3216(1206) × 4		0.125W	J(±5%)	10Ω to 1MΩ	
Compact 8-element Chip Resistors Networks <MNR series>						
MNR15	1608(0603) × 5		0.031W	J(±5%)	56Ω to 100kΩ	-55 to +125°C
MNR35	3216(1206) × 5		0.063W	J(±5%)	56Ω to 100kΩ	
MNR18	1608(0603) × 8		0.063W	J(±5%)	10Ω to 1MΩ	
Chip Attenuators <RCN series>						
RCN02	1010(0404)		0.04W	±0.3dB	1 to 5dB	-55 to +125°C
				±0.5dB	6 to 10dB	
				±0.8dB	11 to 13dB	
				±1.5dB	14 to 16dB	
				±2.0dB	17 to 19dB	
				±2.5dB	20dB	
Chip Trimmer Potentiometers <MVR series>						
MVR22	2(+)		0.05W	N(±25%)	100Ω to 1MΩ	-55 to +125°C
MVR32	3(+)		0.1W	N(±25%)	100Ω to 1MΩ	
MVR34	3(−)		0.1W	N(±25%)	100Ω to 1MΩ	

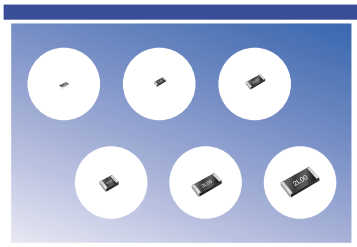
Narrow Pitch Paper Taping Products			
Part No.	Size(inch)	Pitch(Taping)	Basic ordering unit
MCR01ZZPJ	1005(0402)	1mm	20,000 pcs.
MCR01ZZPF			
MCR03MZPJ	1608(0603)	2mm	10,000 pcs.
MCR03MZPF			

1608-sized EMI Filters <MCF series>						
Part No.	Size(inch)	Circuit	Rated current	Capacitance tolerance	Capacitance(pF)	Operating temperature range
MCF18	1608(0603)		4A	M(±20%)	1,000 to 100,000	-55 to +125°C
☆ MCF18 (High capacitance type)	1608(0603)		4A	M(±20%)	220,000 to 1,000,000	-55 to + 85°C

☆: Under development ∗Size: ( ) inch

Ultra-low Ohmic Chip Resistors for Current Detection

PMR series



Features

Small
High performance

Summary

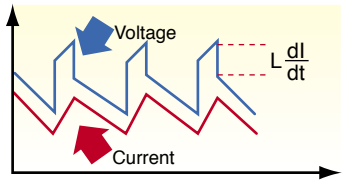
These ultra-low ohmic chip resistors utilize ROHM's original structural design for improved current detection precision. A full lineup is available in varying resistances ranging from 1mΩ to 10mΩ.

Applications

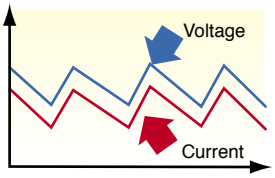
For current detection in current circuit, motors, compact battery control, IC current control and overcurrent detection

ROHM Original Trimming-less Structure

ROHM's low-inductance PMR series features fewer detection errors for greater precision results.



A large inductance makes it difficult to accurately detect current



(Ideal)

Optimum for high-speed switching circuits!!

Features excellent heat dissipation!!

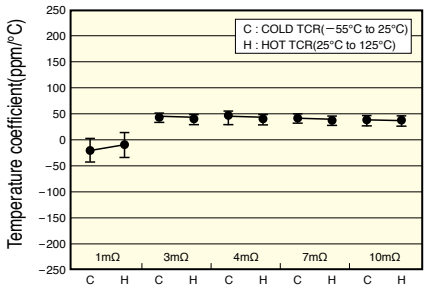
Stable operation, even in environments with extreme temperature fluctuations!

Stable resistance temperature characteristics!

Superior resistance-temperature Characteristics

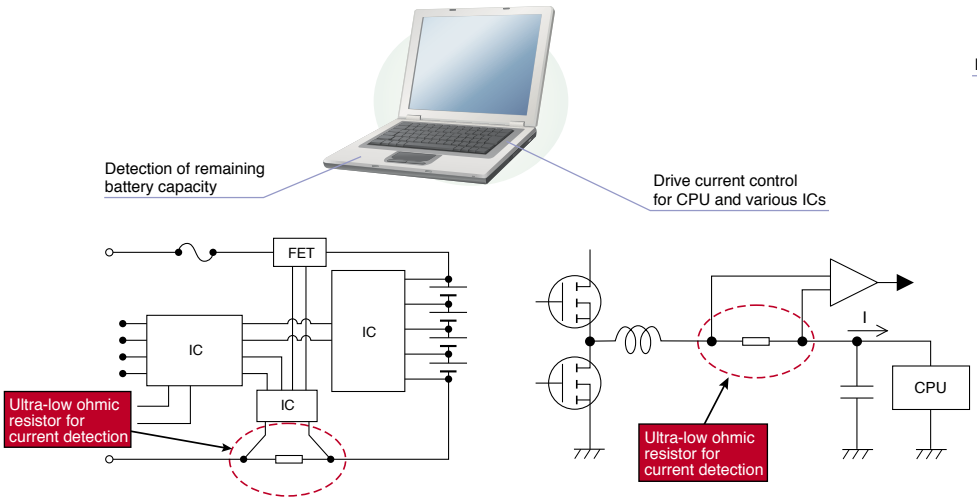
The use of special alloys in the resistors ensures stable resistance-temperature characteristics.

■Temperature characteristics

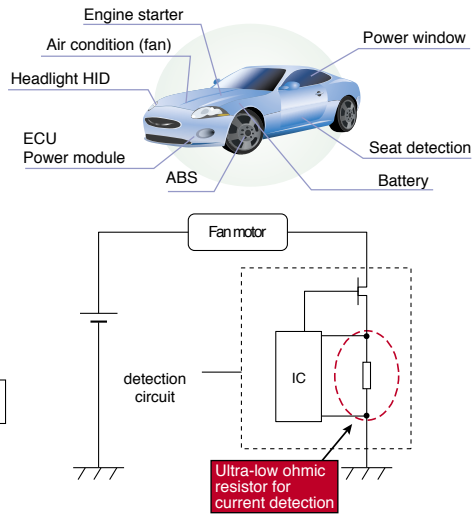


Circuit example

● Detection of remaining battery capacity / CPU drive current control



● Overcurrent detection



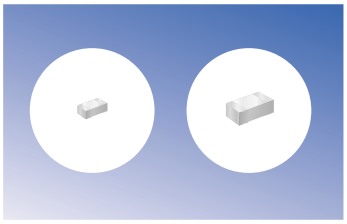
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
PMR03	1608(0603)	R	0.25W	J(±5%)	10mΩ	−55°C to +155°C
PMR10	2012(0805)		0.5W	J(±5%) , G(±2%) , F(±1%)	2mΩ to 10mΩ	
PMR18	3216(1206)		0.75W	J(±5%)		
PMR25	3225(1210)		1W		1mΩ to 5mΩ	
PMR50	5025(2010)		1W	F(±1%)	1mΩ to 10mΩ	
PMR100	6432(2512)		2W			

☆ : Under development　　*Size: ( ) inch

Fixed Thick Film Low Ohmic Chip Resistors

UCR series



Features

Small
High performance

Summary

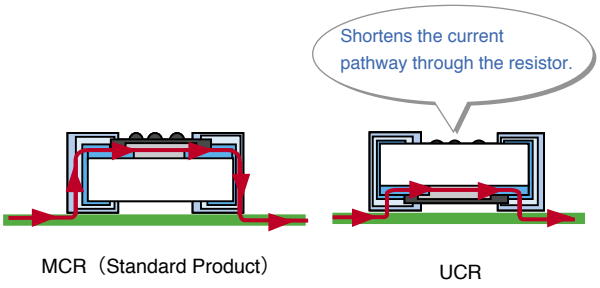
Thick film resistive elements were used to create this lineup of ultra-low resistance products ranging from 10mΩ to 100mΩ. These chip resistors are ideal for current detection.

Applications

Lap top PC, Mobile phone, HDD, Portable audio, Power supply, Motor, etc

Reduced resistance changes

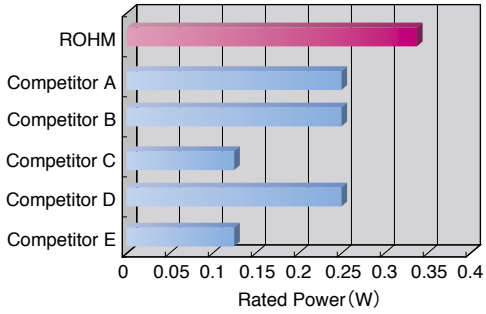
The rear-mount structure prevents changes in the resistance value during mounting.



Superior rated power

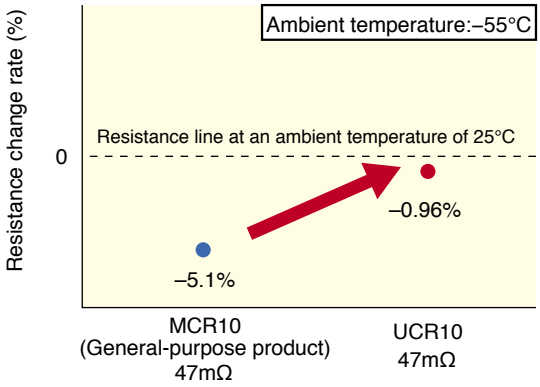
ROHM's unique structure provides improved heat radiation characteristics, resulting in the industry's only 1/3W rated short electrode resistor in the 2012 size.

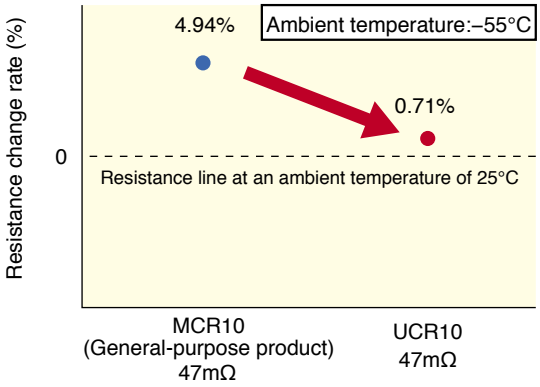
■Rated power comparison



Stable, low resistance guaranteed, regardless of the surrounding environment

■Comparison of the resistance rate change between the UCR series and general-purpose products





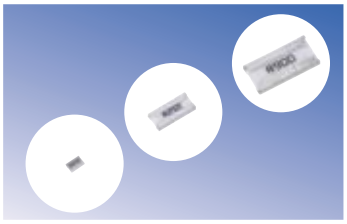
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
☆ UCR01	1005(0402)	R	0.125W	J (±5%) , F (±1%)	47mΩ to 910mΩ	–55°C to +155°C
☆ UCR03	1608(0603)		0.2W			
UCR10	2012(0805)		0.33W	J (±5%)	11mΩ to 100mΩ	
				F (±1%)	20mΩ to 100mΩ	
☆ UCR18	3216(1206)		0.5W	J (±5%) , F (±1%)	11mΩ to 100mΩ	

☆ : Under development　＊Size: (　) inch

High Power, Low Ohmic Wide Terminal Chip Resistors

LTR series



Features

High performance
High reliability

Summary

ROHM's novel heat dissipation design ensures higher rated power. The broad lineup ranges from 47mΩ to 9.1Ω.

Applications

Ideal for circuits requiring low ohmic resistors strong against temperature cycling.

Industry's highest rated power

Novel design improvements result in higher rated power and lower TCR.

■Rated Power

Size	Type	Rated power
5025	MCR50	0.5W
	LTR50	1.5W
3216	MCR18	0.25W
	LTR18	1.0W
2012	MCR10	0.125W
	LTR10	0.5W

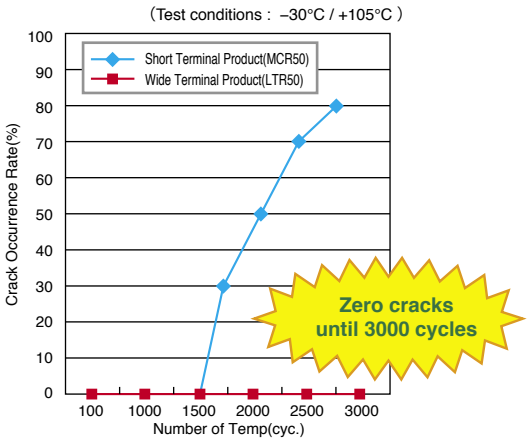
■Temperature coefficient

Size	Type	From 47mΩ	From 100mΩ	From 1Ω
5025	MCR50	±500ppm/°C	±500ppm/°C	
	LTR50	±150ppm/°C		
3216	MCR18	±500ppm/°C	±500ppm/°C	
	LTR18	±150ppm/°C		
2012	MCR10	±500ppm/°C	±500ppm/°C	
	LTR10	±150ppm/°C		

(Example)
MCR：47mΩ ±500ppm/°C
↓
LTR ：47mΩ ±150ppm/°C

Excellent temperature cycling resistance

The terminals are positioned lengthwise to shorten the distance between electrodes, dramatically improving junction reliability with respect to temperature changes.



Rear-mount structure

The rear-mount structure minimizes resistance changes during mounting.
Rated power is also significantly improved.

(Top view)

(Bottom view: Mounting side)

(Side view)

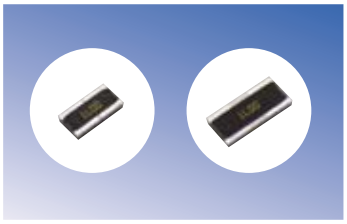
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
LTR10	2012(0805)	R	0.5W	J(±5%) F(±1%)	47mΩ to 9.1Ω	−55°C to +155°C
☆ LTR18	3216(1206)		1W			
☆ LTR50	5025(2010)		1.5W			

☆：Under development　　*Size: ( ) inch

Ultra-low Ohmic Wide Terminal Chip Resistance for Current Detection

PML series



Features

High performance
High reliability

Summary

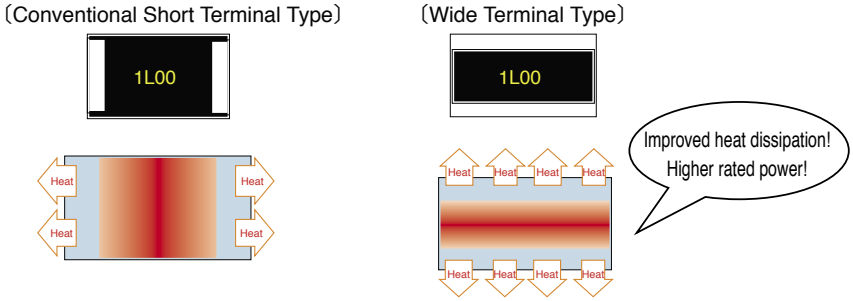
ROHM's ultra-low ohmic wide terminal chip resistors utilize a proprietary design for improved current detection accuracy. Available in a range of resistances, from 0.5Ωm to 2mΩ.

Applications

- Automotive (i.e. power steering, ECU)
- Current detection in large current motors

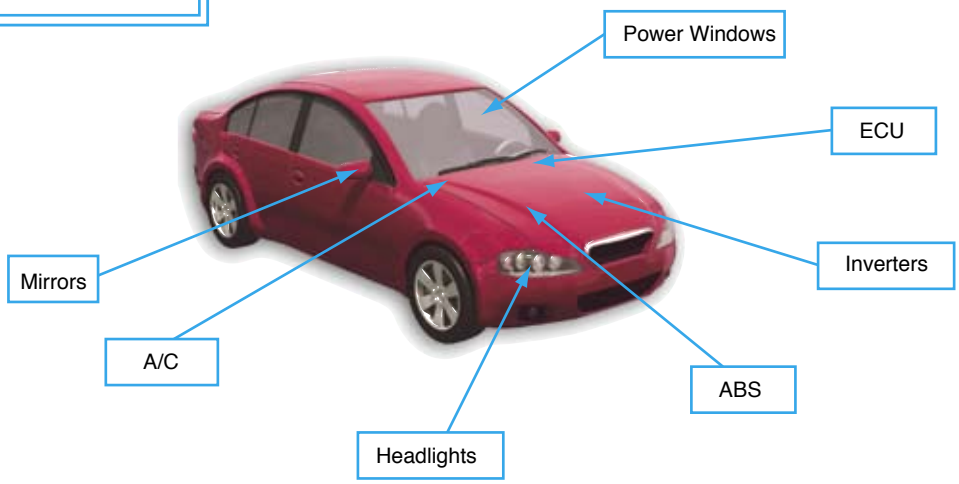
Wide terminal configuration improves reliability

- Improved heat dissipation.
- Higher rated power (3W guaranteed in the 6432 size)
- Wider contact area with the mounting plate provides a more reliable connection.
  Ideal for vehicle applications exposed to temperature cycling / fluctuations.



Application Examples

Suitable for a wide variety of automotive applications, including HEV and engine systems



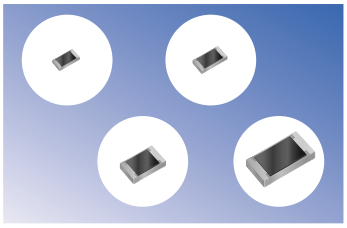
Lineup

Part No.	Size	Rated power	Resistance range〔mΩ〕	Tolerance	Temperature coefficient〔ppm/°C〕	Operating temperature range
New PML50	5025(2010)	2W (25°C) 1.5W (70°C)	0.5, 1, 1.5, 2	J(±5%)	±200	-55°C to +155°C
New PML100	6432(2512)	3W (25°C) 2W (70°C)				

*Size: ( ) inch

Anti-surge Chip Resistors

ESR series



Features

Small
Anti-surge

Summary

Significantly improved anti-surge characteristics have been achieved due utilization of original resistor construction and trimming processes.

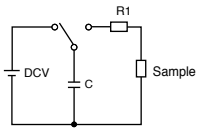
Applications

Electronic devices requiring anti-surge and anti-pulse characteristics.

3kV* electrostatic discharge resistance

(*EIAJ4701-1 Human Body Model)

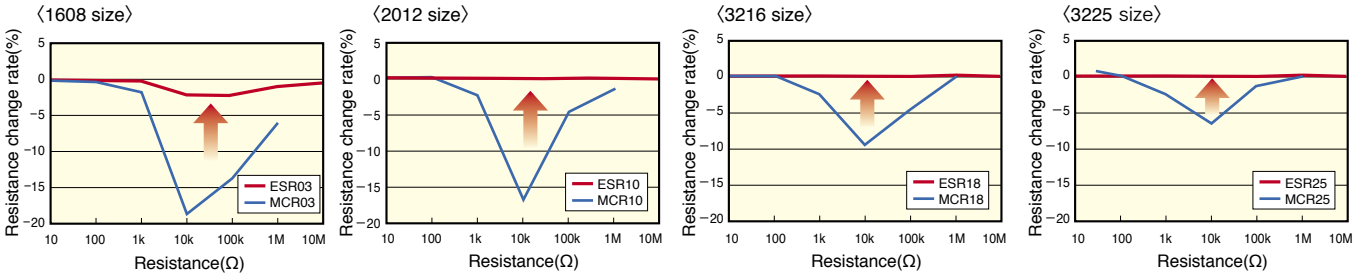
An electrostatic discharge resistance of 3kV has been achieved using novel construction and trimming processes, resulting in a greater degree of reliability.



	ESR03/10/18	ESR25
DCV(Applied voltage)	3kV	5kV
Applied cycle	±10 times	±10 times
C(Capacitor)	100pF	100pF
R1(Discharge resistance)	1.5kΩ	1.5kΩ

Significant improvement in endurance surge characteristics

■Conventional chip resistors vs.Anti-surge chip resisters



Double the conventional rated power

Significantly improved voltage resistance characteristics have been achieved through utilization of original resistive element structure and trimming design.
Only ROHM guarantees 0.2W in the 1608 size.
Improving the rated power enables smaller resistors to be used, saving space.

	ESR series	General-purpose MCR series
1608	0.20W	0.10W
2012	0.25W	0.125W
3216	0.33W	0.25W
3225	0.50W	0.25W
5025	–	0.5W

Downsizing

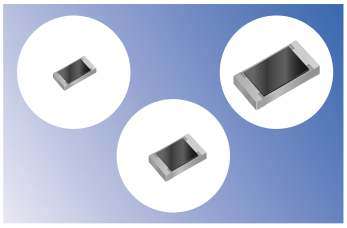
Lineup

Part No.	Size	Circuit	Rated power	Limiting Element voltage	Tolerance	Temperature coefficient	Resistance range	Operating temperature range
ESR03	1608(0603)	R	0.2W	50V	J(±5%)	±200ppm/°C	10Ω to 10MΩ	−55°C to +155°C
					F(±1%)	±100ppm/°C		
					D(±0.5%)	±100ppm/°C	10Ω to 1MΩ	
ESR10	2012(0805)		0.25W	150V	J(±5%)	±200ppm/°C	1Ω to 10MΩ	
					F(±1%)	±100ppm/°C		
					D(±0.5%)	±100ppm/°C	10Ω to 1MΩ	
ESR18	3216(1206)		0.33W	200V	J(±5%)	±200ppm/°C	1Ω to 10MΩ	
					F(±1%)	±100ppm/°C		
					D(±0.5%)	±100ppm/°C	10Ω to 1MΩ	
ESR25	3225(1210)		0.5W	200V	J(±5%)	±200ppm/°C	1Ω to 10MΩ	
					F(±1%)	±100ppm/°C		
					D(±0.5%)	±100ppm/°C	10Ω to 1MΩ	

*Size: ( ) inch

High Voltage Resistance Chip Resistors

KTR series



Features

Small
High performance

Summary

High voltage characteristics (more than double that of conventional products) have been achieved through the use of proprietary construction and trimming processes.

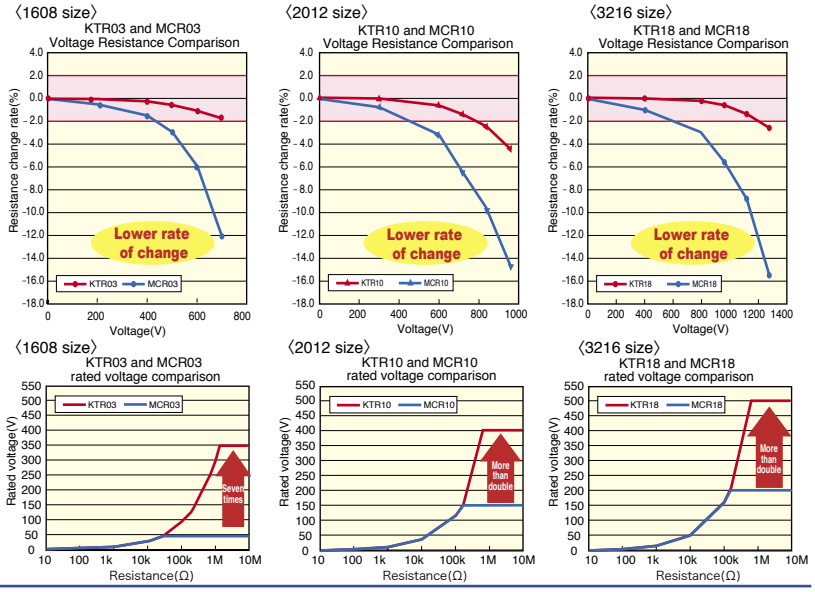
Applications

Camera flash circuits, inverter circuits, and more.

High voltage resistance

ROHM's unique resistance pattern and trimming design prevent concentration of the voltage load, resulting in more than twice the voltage resistance of our own general-purpose products (MCR series).
High voltage resistance circuits requiring multiple resistors can reduce the number of components using the KTR series. This makes them ideal for mobile products, which are becoming increasingly compact and thin.

■High voltage resistance chip resistors (KTR series) vs. Conventional Products (MCR series)



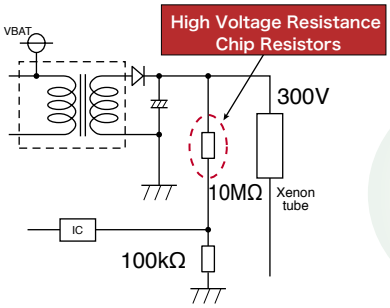
∗Limiting element voltage
The rated voltage is defined as the maximum voltage that can be applied continuously and is calculated using the following equation:

$$\text{Rated voltage (V)} = \sqrt{\text{Rated power (W)} \times \text{Nominal resistance (Ω)}}$$

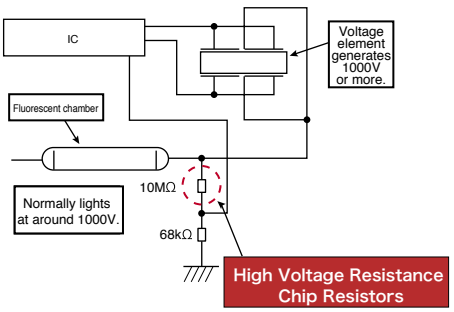
Note that the limiting element voltage of the element should not to be exceeded.

Circuit Examples

● Camera flash circuit



● Inverter circuit for display backlights



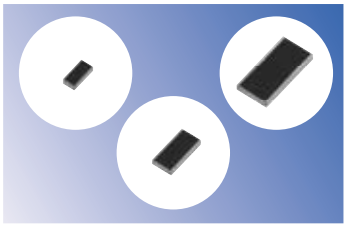
Lineup

Part No.	Size	Circuit	Rated power	Limiting Element voltage	Tolerance	Temperature coefficient	Resistance range	Operating temperature range
KTR03	1608(0603)	R	0.1W	350V	J(±5%)	±200ppm/°C	10Ω to 10MΩ	−55°C to +155°C
					F(±1%)	±100ppm/°C		
KTR10	2012(0805)		0.125W	400V	J(±5%)	±200ppm/°C	1Ω to 10MΩ	
					F(±1%)	±100ppm/°C		
KTR18	3216(1206)		0.25W	500V	J(±5%)	±200ppm/°C		
					F(±1%)	±100ppm/°C		
KTR25	3225(1210)		0.33W	600V	J(±5%)	±200ppm/°C		
					F(±1%)	±100ppm/°C		

∗Size: ( ) inch

High Power, Low Ohmic Wide Terminal Chip Resistors

LTR series



Features

Anti-surge
High reliability

Summary

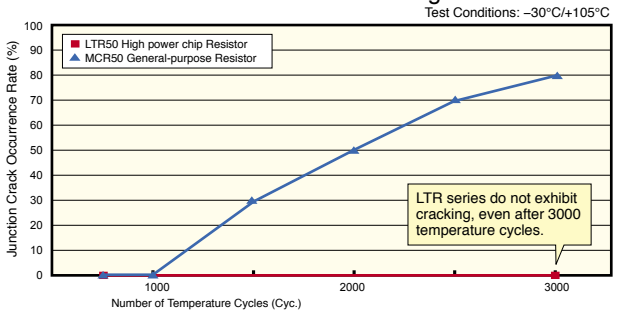
Making the long side of the resistor the electrode reduces the distance between the electrodes, improving temperature cycling strength.

Applications

Automotive systems requiring high temperature cycling strength and surge resistance characteristics.

Superior connection reliability against thermal cycling

Outstanding junction reliability characteristics against heat cycling.
The LTR series are resistant to soldering cracks caused by thermal stress.



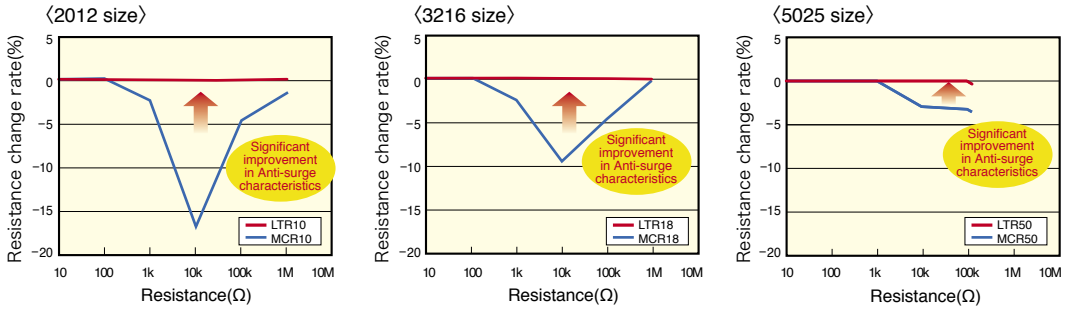
	LTR series	General-purpose MCR Series
Distance Between Electrodes	Short	Long
Effects of Expansion /Contraction of the Printed Circuit Board	Mechanical stress on junction area **small**	Mechanical stress on Junction area **large**
Junction Reliability	Very good	Good

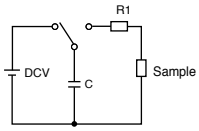
3kV* electrostatic discharge resistance

(*EIAJ4710-1 Human Body Model)

ROHM's unique resistive element structure and trimming design ensure greatly improved surge resistance characteristics
Only ROHM guarantees an electrostatic discharge resistance of 3kV (long side electrode structure).

■ High power chip resistors (Wide terminal type) vs. General-purpose Chip Resistors (MCR series)





	LTR10/LTR18	LTR50
DCV(Applied voltage)	3kV	5kV
Applied cycle	±10times	±10times
C(Capacitor)	100pF	100pF
R1(Discharge resistance)	1.5kΩ	1.5kΩ

Significantly higher rated power

Improved rated power makes it possible to use smaller resistors.

	LTR series	MCR series
2012 (0805)	0.25	0.125
3216 (1206)	0.5	0.25
5025 (2012)	1	0.5
6432 (2512)	–	1

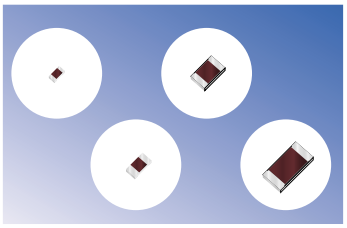
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
LTR10	2012(0805)	R	0.25W	J(±5%)	10Ω to 1MΩ	−55°C to +155°C
				F(±1%)		
				D(±0.5%)		
LTR18	3216(1206)		0.5W	J(±5%)		
				F(±1%)		
				D(±0.5%)		
LTR50	5025(2010)		1W	J(±5%)	10Ω to 130kΩ	
				F(±1%)		
				D(±0.5%)		

*Size: ( ) inch

Sulfur-resistant Chip Resistors

TRR series



Features

High reliability

Summary

The special internal structure prevents sulfurated gases from entering, resulting in greater reliability and more stable operation in sulfur-rich environments compared to general-purpose products.

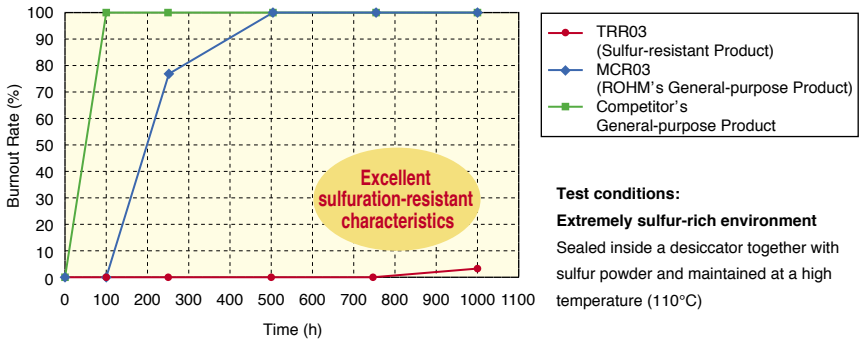
Applications

Circuits exposed to sulfur-rich environments, such as those in automotive systems.

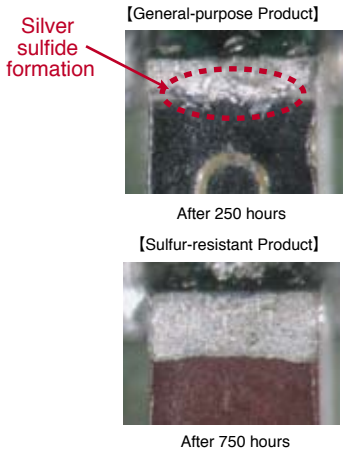
Reliable in sulfurated environments

Until now, resistors were particularly susceptible to failure in sulfur-rich environments. In response to this, ROHM's offers the TRR series featuring an internal structure resistant to silver migration and the formation of silver sulfide, resulting in a greater level of reliability.

■Sulfuration Test Results

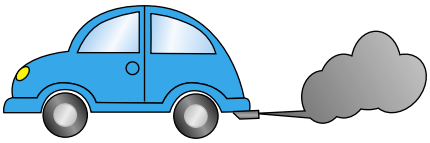


Test conditions:
Extremely sulfur-rich environment
Sealed inside a desiccator together with sulfur powder and maintained at a high temperature (110°C)

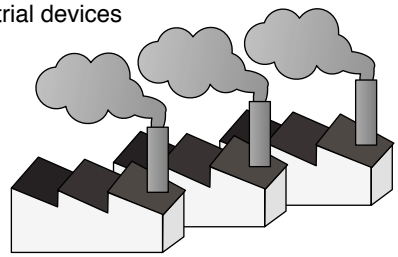


Applications

■General automotive equipment



■Industrial devices



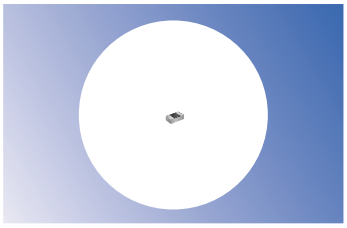
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
TRR01	1005(0402)	R	0.063W	J(±5%)	0Ω, 1Ω to 10MΩ	−55°C to +155°C
				F(±1%)	10Ω to 2.2MΩ	
TRR03	1608(0603)		0.1W	J(±5%)	0Ω, 1Ω to 10MΩ	
				F(±1%)	10Ω to 10MΩ	
☆ TRR10	2012(0805)		0.125W	J(±5%)	0Ω, 1Ω to 10MΩ	
				F(±1%)	10Ω to 2.2MΩ	
☆ TRR18	3216(1206)		0.25W	J(±5%)	0Ω, 1Ω to 10MΩ	
				F(±1%)	10Ω to 2.2MΩ	

☆ : Under development ∗Size: ( ) inch

0402-sized Ultra-compact Chip Resistors

MCR004 series



Features

Small

Summary

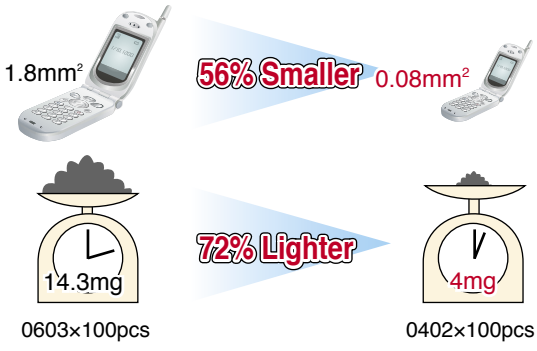
ROHM's 0402 sized ultra-compact chip resistors are the smallest in the world, contributing to increased space savings in mobile devices and module products.

Applications

Modules
Portable audio
Mobile phones
Digital cameras

Space-saving, lightweight

Surface area is reduced by 56% compared to the MCR006 (0603) and MCR004 (0402) package types, respectively, ensuring suitability with compact, cutting-edge applications.



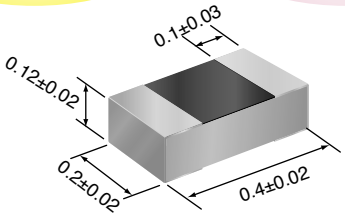
High dimensional precision

Ultra-compact Chip Resistors such as 0402 and 0603 package requires high accuracy process technology than conventional one in order to produce high dimensional accuracy.

Semiconductor processing technology
utilized for high dimensional accuracy

Dimensions dimensional accuracy ! 0.02mm

Terminal dimensional accuracy 0.03mm

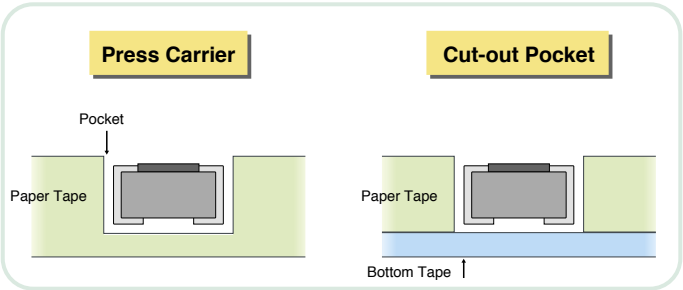


"Press Carrier" tape reduces error

A "Press Carrier" tape is used in order to reduce failures during the mounting process.

— Press Carrier Features —

- No adhesive substance on the bottom of the pocket (bottom tape not used).
- Highly precise pocket position.



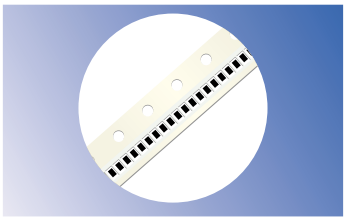
Lineup

Part No.	Size	Circuit	Rated power	Tolerance	Resistance range	Operating temperature range
New MCR004	0402(01005)	R	0.031W	J (±5%)	0Ω, 10Ω to 3MΩ	−55°C to +125°C
				F (±1%)	10Ω to 3MΩ	

∗Size: ( ) inch

Narrow Pitch Paper Tape Products

MCR01ZZP / MCR03MZP series



Features

High precision

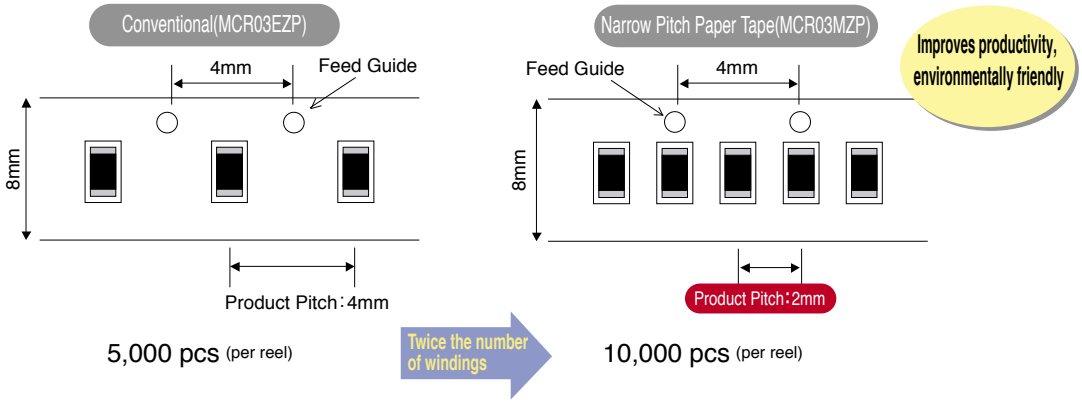
Summary

The pitch is half that of standard products, resulting in double the quantity per reel without changing the reel size (φ180mm).

Applications

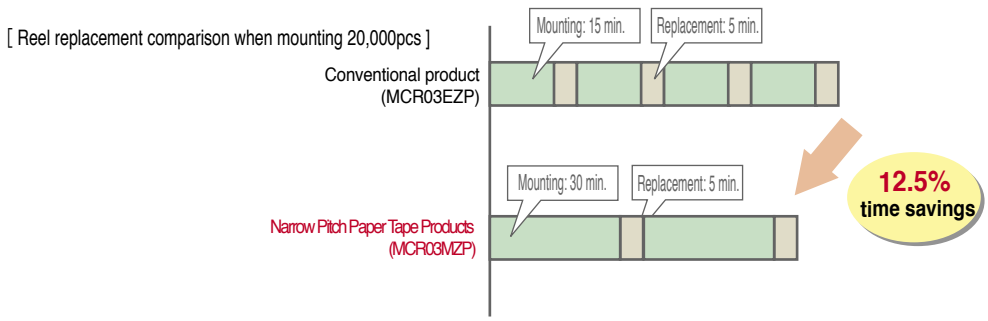
All products

Double the time between reel replacement.Cut package waste in half.



No new equipment required, Easy to install

Improves productivity by halving the number of reel replacements



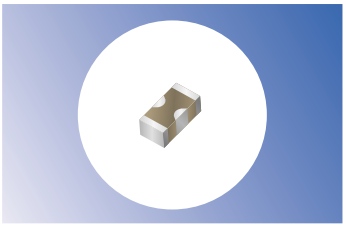
製品ラインアップ

Part No.	Size	Code	Pitch	Basic ordering unit	Tolerance
MCR01	1005(0402)	ZZP	1mm	20,000pcs	J(±5%)
MCR03	1608(0603)	MZP	2mm	10,000pcs	F(±1%)

*Size: ( ) inch

1608-sized EMI Filters

MCF18 series



Features

Small
High performance

Summary

Industry' s smallest size (1608 size)
Entire series compatible with large currents (4A)

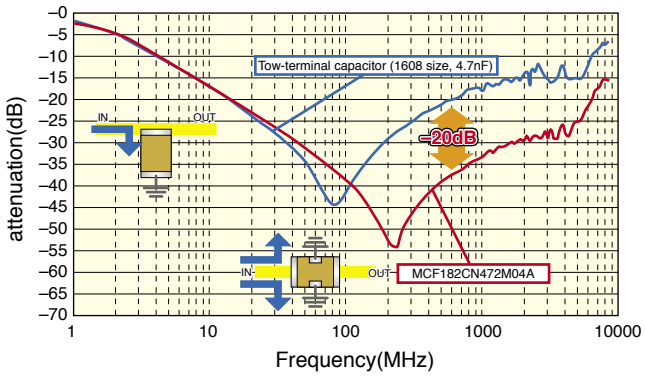
Applications

Digital TVs, DVDs, digital camcorders, mobile phones, copiers, and more.

High performance

The amount of attenuation in high frequency bands is vastly improved compared to two-terminal capacitors, resulting in greater noise removal efficiency. The number of parts required is reduced as well.

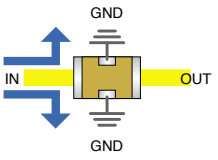
■ Attenuation Characteristics Comparison

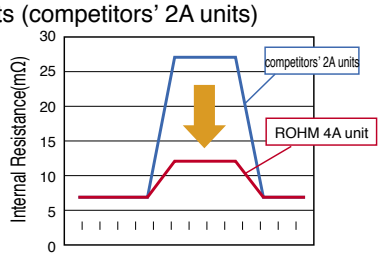


■ Only ROHM offers 4A products in the 1608 size

The entire series is rated at 4A, making them ideal for high current circuits in or around the power supply.

■ The internal resistance is lower than in standard products (competitors' 2A units)

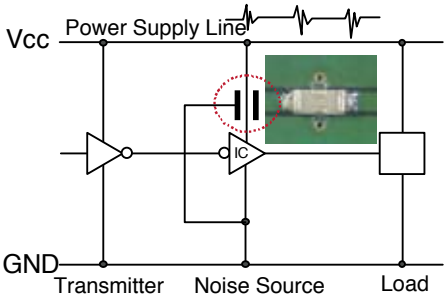




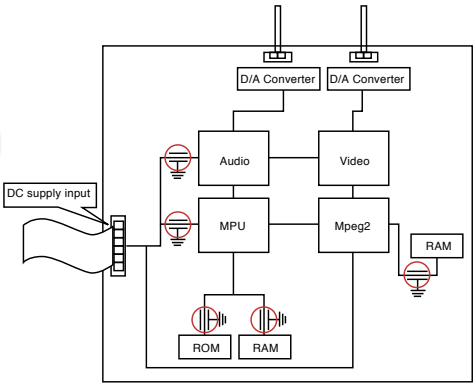
1. Decreased line side voltage
2. Reduced heat generation due to energization

Circuit example

■ Ideal for noise reduction on large current power lines



● DVD recorder



Lineup

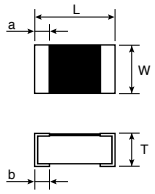
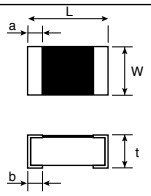
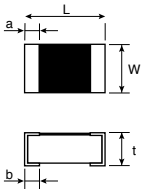
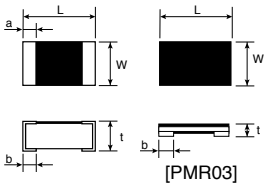
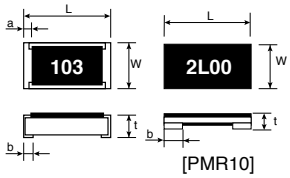
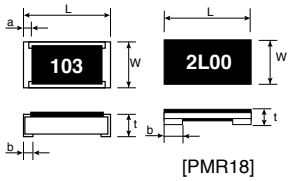
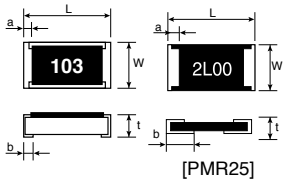
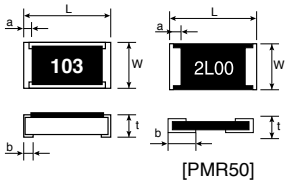
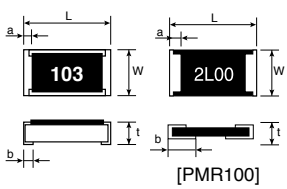
Part No.	Size	Code	Temperature characteristics	Capacitance tolerance	Capacitance(pF)	Rated current	Operating temperature range
New MCF18	1608(0603)	CN	±15%	M(±20%)	1,000pF to 0.1μF	4.0A	−55°C to +125°C
☆ MCF18 ((High capacitance type)	1608(0603)	CN	±15%	M(±20%)	0.22μF to 1μF	4.0A	−55°C to + 85°C

☆ : Under development　　∗Size: ( ) inch

MEMO

Dimensions

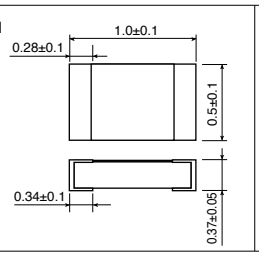
Unit: mm

Dimensions	Series	L	W	t	a	b
0402 (01005) 	MCR004	0.4±0.02	0.2±0.02	0.13±0.02	0.1±0.03	0.1±0.03
0603 (0201) 	MCR006	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
1005 (0402) 	MCR01	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 $^{+0.05}_{-0.1}$
	TRR01				0.3±0.08	
1608 (0603)  [PMR03]	MCR03	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
	KTR03					
	ESR03					
	TRR03				0.4±0.1	
	PMR03	1.6±0.15	0.8±0.15	0.25±0.15	——	0.35±0.15
2012 (0805)  [PMR10]	MCR10	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4±0.2
	KTR10				0.3±0.2	
	ESR10					
	TRR10				0.4$^{+0.2}_{-0.1}$	
	PMR10	2.0±0.15	1.2±0.15	0.42 to 0.28 ±0.15	——	0.6 to 0.2 ±0.15
3216 (1206)  [PMR18]	MCR18	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25
	KTR18				0.3±0.25	
	ESR18					
	TRR18				0.65$^{+0.25}_{-0.1}$	
	PMR18			0.42 to 0.28 ±0.15	——	0.9 to 0.4 ±0.15
3225 (1210)  [PMR25]	MCR25	3.2±0.15	2.5±0.15	0.55±0.15	0.5±0.25	0.5±0.25
	ESR25		2.6±0.1		0.3±0.25	
	PMR25	3.2±0.2	2.5±0.2	0.52 to 0.32 ±0.15	0.5±0.2	1.2 to 0.5 ±0.2
5025 (2010)  [PMR50]	MCR50	5.0±0.15	2.5±0.15	0.55±0.15	0.6±0.25	0.6±0.25
	PMR50	5.0±0.2	2.5±0.2	0.52 to 0.32 ±0.15	0.5±0.2	1.9 to 0.9 ±0.2
6432 (2512)  [PMR100]	MCR100	6.3±0.15	3.2±0.15	0.55±0.15	0.6±0.25	0.6±0.25
	PMR100	6.4±0.25	3.2±0.25	0.52 to 0.32 ±0.15	0.5±0.25	2.3 to 1.1 ±0.25

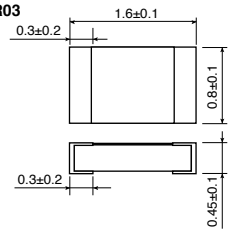
∗Size: ( ) inch

Unit: mm

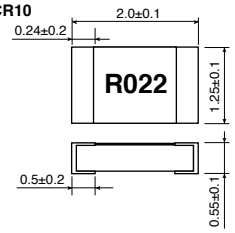
●UCR01



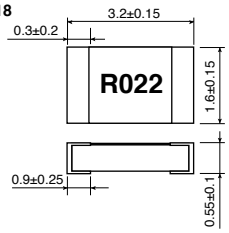
●UCR03



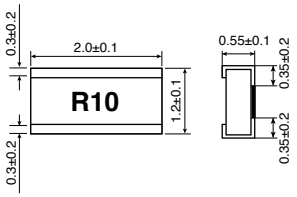
●UCR10



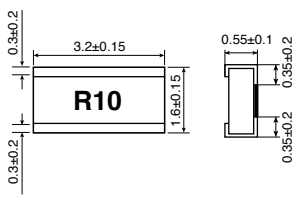
●UCR18



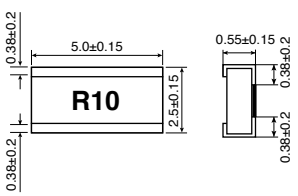
●LTR10 Low Resistor



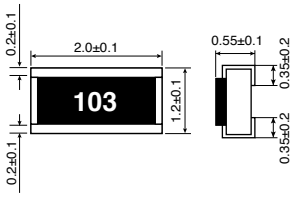
●LTR18 Low Resistor



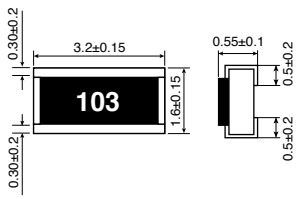
●LTR50 Low Resistor



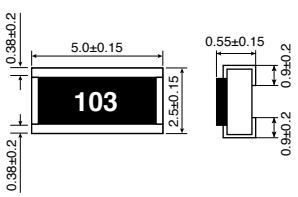
●LTR10



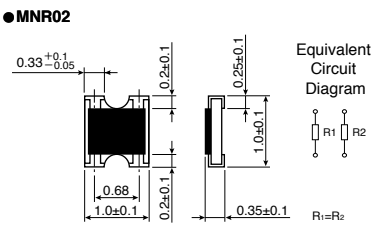
●LTR18



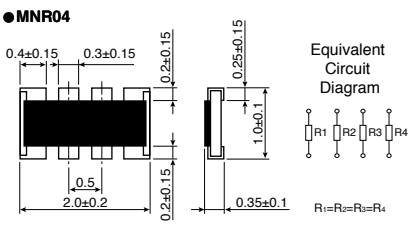
●LTR50



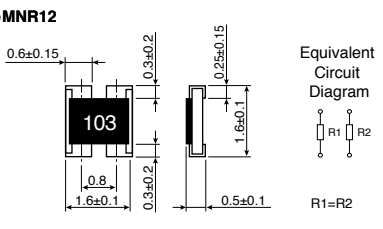
●MNR02



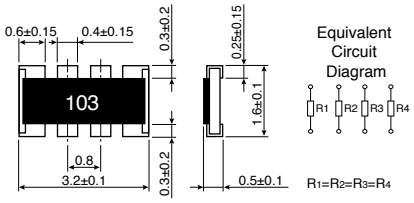
●MNR04



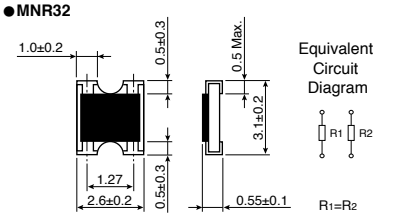
●MNR12



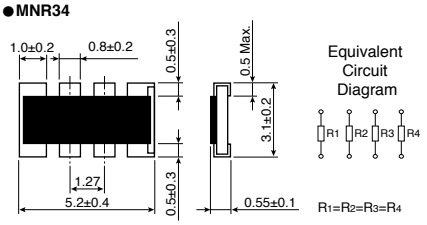
●MNR14



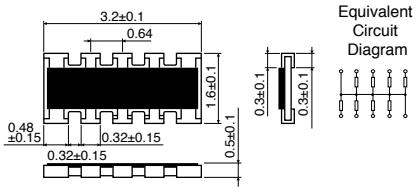
●MNR32



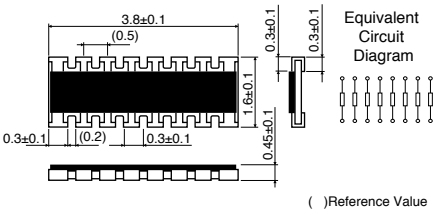
●MNR34



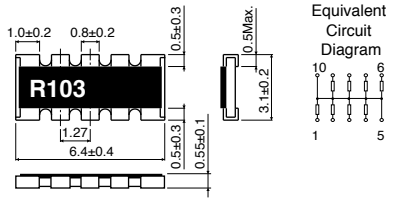
●MNR15



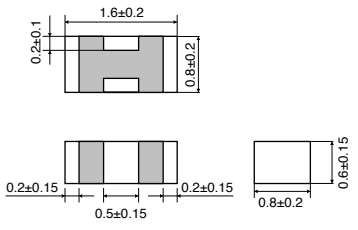
●MNR18



●MNR35



●MCF18



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