

## Resistors Quick Reference of Package Size

## ■Lineup (Shunt Resistors)

Size mm (inch)	Resistance Range (mΩ)	Rated Power (W)	Rated Current (A)	Part No.	Product Type	Printing Page
0603 (0201)	100 to 910	0.1	0.33 to 1	UCR006	Face Down/Thick Film type	P.233
1005 (0402)	10	0.2	4.4	PMR01	General Purpose/Metal Plate type	P.235
	68 to 910	0.125	0.37 to 1.35	UCR01	Face Down/Thick Film type	P.233
1608 (0603)	10	0.25	5	PMR03	General Purpose/Metal Plate type	P.235
	20 to 910	0.25	0.52 to 3.53	UCR03	Face Down/Thick Film type	P.233
2012 (0805)	2 to 10	0.5	7 to 15	PMR10	General Purpose/Metal Plate type	P.235
	11 to 100	0.33	1.81 to 5.47	UCR10	Face Down/Thick Film type	P.233
	47 to 910	0.5	0.74 to 3.26	☆MCR10L	General Purpose/Thick Film type	P.231
1220 (0508)	1 to 2.5	0.66	16 to 25	PML10	Wide Terminal/Metal Plate type	P.236
	47 to 9100	0.5	0.23 to 3.26	LTR10	Wide Terminal/Thick Film type	P.234
3216 (1206)	1 to 10	1	10 to 31	PMR18	General Purpose/Metal Plate type	P.235
	11 to 100	0.5/1.0	2.23 to 6.74	UCR18	Face Down/Thick Film type	P.233
	47 to 910	0.75	0.91 to 3.99	☆MCR18L	General Purpose/Thick Film type	P.231
1632 (0612)	0.5 to 2.5	1	20 to 44	PML18	Wide Terminal/Metal Plate type	P.236
	10 to 1000	1	1 to 10	LTR18	Wide Terminal/Thick Film type	P.234
	33 to 1000	1.25	1.19 to 6.16	LHR18	Wide Terminal/Thick Film type	P.234
3225 (1210)	1 to 5	1	14 to 31	PMR25	General Purpose/Metal Plate type	P.235
5025 (2012)	1 to 10	1	10 to 31	PMR50	General Purpose/Metal Plate type	P.235
	5 to 220	4	4 to 28	GMR50	High Power/Metal Plate type	P.238
2550 (1020)	0.5, 2.2	1.5	54, 26	PML50	Wide Terminal/Metal Plate type	P.236
	10 to 910	2	1.48 to 14.14	LTR50	Wide Terminal/Thick Film type	P.234
6432 (2512)	0.3 to 3	4.0 to 8.0	36 to 163	PSR100	High Power/Metal Plate type	P.237
	1 to 10	2 to 3	14 to 44	PMR100	General Purpose/Metal Plate type	P.235
	5 to 220	7	5 to 37	GMR100	High Power/Metal Plate type	P.238
3264 (1225)	0.5 to 2.2	2	30 to 63	PML100	Wide Terminal/Metal Plate type	P.236
	91 to 910	2 to 4	1.81 to 20.0	LTR100	Wide Terminal/Thick Film type	P.234
7142 (2817)	5 to 100	10	10 to 44	GMR320	High Power/Metal Plate type	P.238
10x5.2 (3921)	0.2 to 3	5.0 to 12.0	40 to 244	PSR400	High Power/Metal Plate type	P.237
15x7.75 (5931)	0.1 to 2	7.0 to 15.0	59 to 387	PSR500	High Power/Metal Plate type	P.237

☆: Under Development

## ■Lineup (General Purpose/High Reliability)

Size mm (inch)	Resistance Range (mΩ)	Rated Power (W)	Part No.	Product Type	Printing Page
03015 (009005)	10 to 1M	0.02	SMR003	RASMID™	P.222
0402 (01005)	1 to 10M	0.031	MCR004	General Purpose	P.224
0603 (0201)	1 to 10M	0.05	MCR006	General Purpose	P.224, P.232
1005 (0402)	1 to 10M	0.063	MCR01	General Purpose	P.224, P.232
	1 to 10M	0.063	SFR01	Anti-Sulfurated	P.230
	1 to 10M	0.1	MCR01S	General Purpose/High Power	P.223
	1 to 10M	0.2	ESR01	Anti-surge	P.227
1608 (0603)	1 to 10M	0.1	MCR03	General Purpose	P.224, P.232
	1 to 10M	0.1	SFR03	Anti-Sulfurated	P.230
	1 to 10M	0.1	KTR03	High Voltage Resistance	P.229
	1 to 10M	0.125	MCR03S	General Purpose/High Power	P.223
	1 to 10M	0.25	ESR03	Anti-surge	P.227
	1 to 10M	0.3	SDR03	High Anti-surge	P.227
	1 to 10M	0.125	MCR10	General Purpose	P.224, P.232
2012 (0805)	1 to 10M	0.125	SFR10	Anti-Sulfurated	P.230
	1 to 10M	0.125	KTR10	High Voltage Resistance	P.229
	1 to 10M	0.25	MCR10S	General Purpose/High Power	P.223
	1 to 10M	0.4	ESR10	Anti-surge	P.227
	1 to 10M	0.5	SDR10	High Anti-surge	P.227
	1 to 10M	0.25	LTR10	High Power/Wide Terminal	P.228
1220 (0508)	1 to 976	☆1.0	LTR10	High Power/Wide Terminal	P.228
	1 to 10M	0.25	MCR18	General Purpose	P.224, P.232
3216 (1206)	1 to 10M	0.25	SFR18	Anti-Sulfurated	P.230
	1 to 10M	0.25	KTR18	High Voltage Resistance	P.229
	1 to 10M	0.4	MCR18S	General Purpose/High Power	P.223
	1 to 10M	0.5	ESR18	Anti-surge	P.227
1632 (0612)	1 to 1M	0.75	LTR18	High Power/Wide Terminal	P.228
	1 to 976	1.5	LTR18	High Power/Wide Terminal	P.228
3225 (1210)	1 to 10M	0.66	ESR25	Anti-surge	P.227
	1 to 1M	0.33	SFR25	Anti-Sulfurated	P.230
2550 (1020)	1 to 10M	0.33	KTR25	High Voltage Resistance	P.229
	1 to 1M	1	LTR50	High Power/Wide Terminal	P.228
3264 (1225)	1 to 976	☆2.0	LTR50	High Power/Wide Terminal	P.228
	1 to 1M	2	LTR100	High Power/Wide Terminal	P.228
	1 to 976	☆3.0	LTR100	High Power/Wide Terminal	P.228

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☆: Under Development

## Class-leading Compact Size Chip Resistors (RASMID™ series) Ultra-Compact Chip Resistors (SMR003 <009005>)

- Original process technology ensures greater accuracy
- Chip dimensional precision improved from ±20μm to ±10μm
- Gold electrodes utilized for superior solderability and reliability



\*Minimum order quantity is further discussion is needed

SMR003 <009005>								
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SMR003	03015 (009005)	0.02W	10	J (±5%)	±200	10 to 1MΩ (E24 series)	-55 to +125	-
				F (±1%)		10 to 1MΩ (E24, E96 series)		

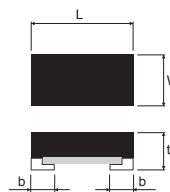
\*E24: Standard products E96: Custom products

Jumper type					
Part No.	Size Code mm (inch)	Rated Current (A)	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
SMR003	03015 (009005)	0.5	50mΩ Max	-55 to +125	-

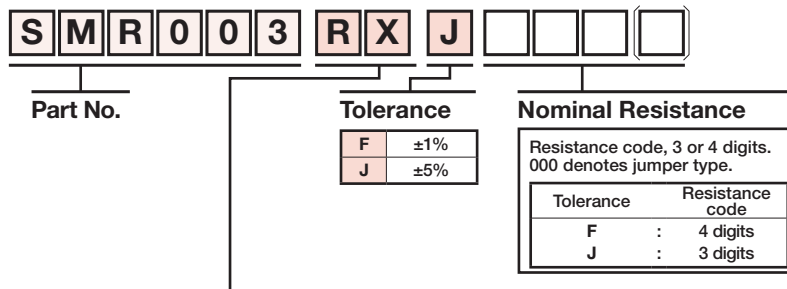
### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
SMR003	03015 (009005)	0.30±0.01	0.15±0.01	0.11±0.01	-	0.07±0.01

### SMR003



### Part No. Explanation



### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
SMR003	RX	○	○	Embossed tape (1mm Pitch)	φ180mm (7inch)	40,000*

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

\*RASMID™ is a trademark or a registered trademark of ROHM Co., Ltd.  
RASMID™: ROHM's proprietary new method that enables superior dimensional precision, making it possible to develop the ultra-compact products.  
\*Minimum order quantity is further discussion is needed

## Thick Film Chip Resistors

### General Purpose Chip Resistors : New MCR series<0402 to 1206>

- Guaranteed the same rated power as one size larger product by changing the design of the resistive element.
- Circuit space can be saved (reducing the area by about 60% by replacing 0603 size with 0402 size)



New MCR series <0402 to 1206>								
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR01S	1005 (0402)	0.1W (1/10W)	75	J (±5%)	±400	1.0Ω to 9.1Ω (E24 series)	-55 to +155	YES
				F (±1%)	±200	10Ω to 10MΩ (E24 series)		
MCR03S	1608 (0603)	0.125W (1/8W)	150	J (±5%)	±400	1.0Ω to 9.1Ω (E24 series)		
				F (±1%)	±200	10Ω to 10MΩ (E24 series)		
MCR10S	2012 (0805)	0.25W (1/4W)	200	J (±5%)	±400	1.0Ω to 9.1Ω (E24 series)		
				F (±1%)	±200	10Ω to 10MΩ (E24 series)		
MCR18S	3216 (1206)	0.4W (2/5W)	200	J (±5%)	±400	1.0Ω to 9.1Ω (E24 series)		
				F (±1%)	±200	10Ω to 10MΩ (E24 series)		

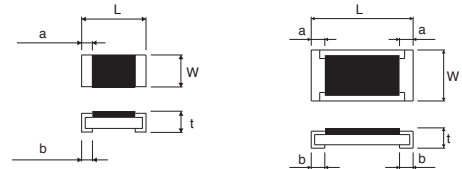
\*E24: Standard products E96: Custom products

Jumper type					
Part No.	Size Code mm (inch)	Rated Current (A)	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR01S	1005 (0402)	1.5	50mΩ Max	-55 to +155	YES
MCR03S	1608 (0603)	2			YES
MCR10S	2012 (0805)	2.5			YES
MCR18S	3216 (1206)	2.5			YES

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
MCR01S	1005 (0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.10</sub>
MCR03S	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
MCR10S	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4±0.2
MCR18S	3216 (1206)	3.2 <sup>+0.15</sup> <sub>-0.20</sub>	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25

●MCR01S/03S (Partially marked) ●MCR10S/18S (Partially marked)



### Part No. Explanation



Part No.

Tolerance

F	±1%
J	±5%
J is also used for jumper	

Nominal Resistance

Resistance code, 3 or 4 digits. 000 denotes jumper type.

Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

### Packaging Specifications Code

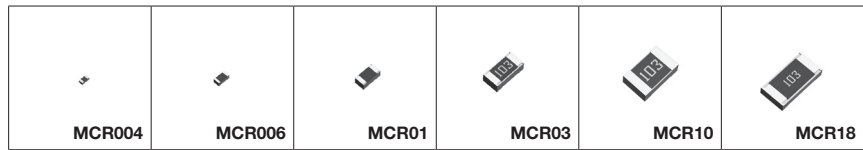
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J(±5%)	F(±1%)				
MCR01S	MQP	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000	—
MCR03S	EQP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
MCR10S	EQP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
MCR18S	EQP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
 ○: Standard product

## Thick Film Chip Resistors (Standard series)

## General Purpose Chip Resistors (MCR series <01005 to 1206>)

- High reliability chip resistors optimized for a variety of applications.
- Nine package sizes, ranging from 01005 to 1205.
- Market-proven reliability.



MCR series <01005 to 1206>									
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range		Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR004	0402 (01005)	0.031W (1/32W)	15	J (±5%)	+600/-200 ±300 ±250	1Ω to 9.1Ω (E24 series) 10Ω to 91Ω (E24 series) 100Ω to 3MΩ (E24 series)	-55 to +125	-	
				F (±1%)	±300 ±250	10Ω to 97.6Ω (E24, E96 series) 100Ω to 3MΩ (E24, E96 series)			
MCR006	0603 (0201)	0.05W	25	J (±5%)	+600/-200 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +125	YES	
				F (±1%)	±200	10Ω to 10MΩ (E24, E96 series)			
				D (±0.5%)	±200 ±100	10Ω to 97.6Ω (E24, E96 series) 1kΩ to 1MΩ (E24, E96 series)			
MCR01	1005 (0402)	0.063W (1/16W)	50	J (±5%)	+500/-250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES	
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)			
				D (±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)			
MCR03	1608 (0603)	0.1W	50	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES	
				FX (±1%)	±100	10Ω to 10MΩ (E24, E96 series)			
				D (±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)			
MCR10	2012 (0805)	0.125W	150	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES	
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)			
		0.1W		D (±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)			
MCR18	3216 (1206)	0.25W	200	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES	
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)			
		0.125W		D (±0.5%)	±100 ±50	10Ω to 97.6Ω (E24, E96 series) 100Ω to 1MΩ (E24, E96 series)			

\*E24: Standard products E96: Custom products

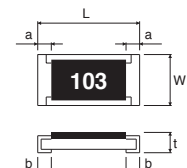
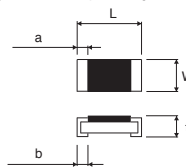
Jumper type					
Part No.	Size Code mm (inch)	Rated Current (A)	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR004	0402 (01005)	0.5	50mΩ Max	-55 to +125	-
MCR006	0603 (0201)	0.5			YES
MCR01	1005 (0402)	1			YES
MCR03	1608 (0603)	1		-55 to +155	YES
MCR10	2012 (0805)	2			YES
MCR18	3216 (1206)	2			YES

### Dimensions (Unit: mm)

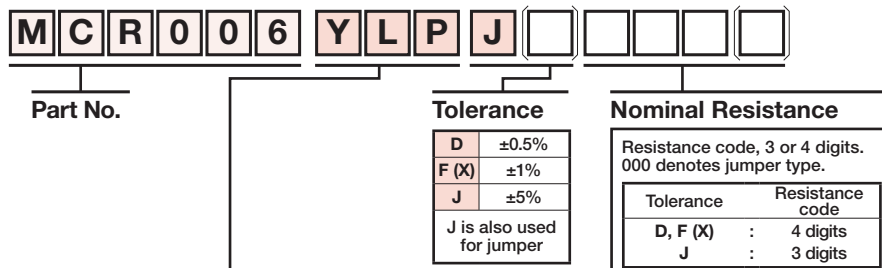
Part No.	Size Code mm (inch)	L	W	t	a	b
MCR004	0402 (01005)	0.4±0.02	0.2±0.02	0.13±0.02	0.1±0.03	0.1 ±0.03
MCR006	0603 (0201)	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
MCR01	1005 (0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.10</sub>
MCR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3 ±0.2
MCR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4 ±0.2
MCR18	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5 ±0.25

- MCR004/006/01
- MCR03 (Partially marked)

- MCR10/18



### Part No. Explanation



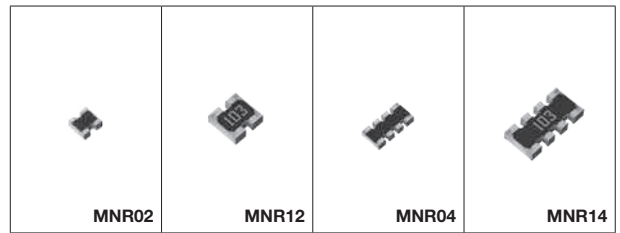
### Packaging Specifications Code

Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J (±5%)	F (±1%)	D (±0.5%)				
MCR004	QLP	○	○	—	Paper tape (2mm Pitch)	φ180mm (7inch)	20,000	—
MCR006	YLP	○	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	15,000	—
MCR01	MZP	○	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000	—
MCR03	EZP	○	○ (FX)	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
MCR10	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
MCR18	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Thick Film Chip Resistors (Standard series) Chip resistor networks (MNR series <0402x2 to 0603x4>)

- Reduces cost  
Use of chip networks reduces the number of components and saves mounting space.
- Easy fillet inspection  
Convex type electrodes facilitate visual inspection of fillets. Inspection can be performed with automatic inspection equipment.



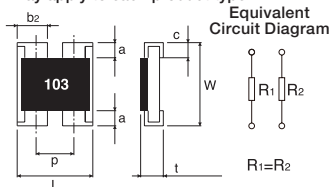
MNR series <0402x2 to 0603x4>										
Part No.	Size Code mm (inch)	No. of Terminals	No. of Elements	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR02	1005 (0402)x2	4	2	0.063W/Element	25	J (±5%)	±200	10Ω to 1MΩ (E24 series)	-55 to +155	YES
MNR04	1005 (0402)x4	8	4	0.063W/Element	25	J (±5%)	+500/-250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 1MΩ (E24 series)		YES
MNR12	1608 (0603)x2	4	2	0.063W/Element	50	J (±5%) F (±1%)	±200 ±100	10Ω to 1MΩ (E24 series)		YES
MNR14	1608 (0603)x4	8	4	0.063W/Element	50	J (±5%) F (±1%)	±500 ±200 ±100	2.2Ω to 6.8Ω (E6 series) 10Ω to 1MΩ (E24 series) 10Ω to 1MΩ (E24 series)		YES

Jumper type					
Part No.	Size Code mm (inch)	Rated Current	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR02	1005 (0402)x2	1A/Element	50mΩ Max	-55 to +155	YES
MNR04	1005 (0402)x4	1A/Element			YES
MNR12	1608 (0603)x2	1A/Element			YES
MNR14	1608 (0603)x4	1A/Element			YES

### Dimensions (Unit: mm)

#### ● MNR02/MNR12 (Marked except MNR02)

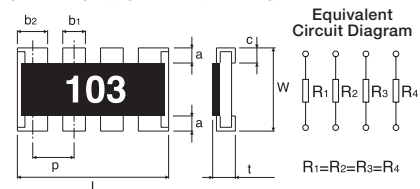
Different marking system may apply to each product type.



Part No.	L	W	t	a	b <sub>2</sub>	c	p
MNR02	1.0±0.1	1.0±0.1	0.35±0.1	0.2±0.1	0.33 <sup>+0.1</sup> <sub>-0.05</sub>	0.25±0.1	0.68
MNR12	1.6±0.1	1.6±0.1	0.5±0.1	0.3±0.2	0.6±0.15	0.25±0.15	0.8

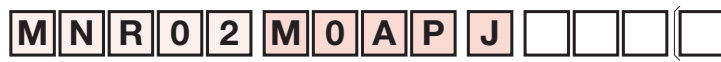
#### ● MNR04/MNR14 (Marked except MNR04)

Different marking system may apply to each product type.



Part No.	L	W	t	a	b <sub>1</sub>	b <sub>2</sub>	c	p
MNR04	2.0±0.1	1.0±0.1	0.35±0.1	0.2±0.1	0.3±0.1	0.4±0.1	0.25±0.1	0.5
MNR14	3.2±0.1	1.6±0.1	0.5±0.1	0.3±0.2	0.4±0.15	0.6±0.15	0.25±0.15	0.8

### Part No. Explanation



Part No.

Tolerance

Nominal Resistance

F	±1%
J	±5%
J is also used for jumper	

Resistance code, 3 or 4 digits. 000 denotes jumper type.	
Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

### Packaging Specifications Code

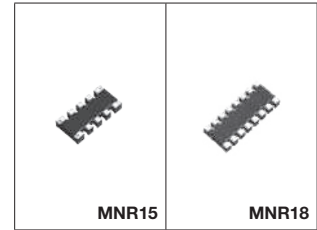
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
MNR02	M0AP	○	—	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000
MNR04	M0AP	○	—	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000
MNR12	E0AP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
MNR14	E0AP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Thick Film Chip Resistors (Standard series)

### 8-element Chip Resistor Networks (MNR series <0603x5 to 0602x8>)

- One package built in 8-element chip contributes to space-saving
- 8 resistor elements reduce mounting cost
- Convex type electrodes facilitate visual inspection of fillets. Inspection can be performed with automatic inspection equipment.
- Suitable for pull-up resistor, damping resistor
- No direction to be mounted



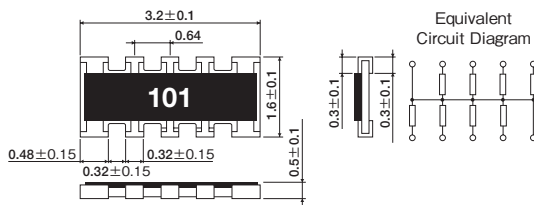
MNR series <0603x5 to 0602x8>										
Part No.	Size Code mm (inch)	No. of Terminals	No. of Elements	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR15	1608 (0603)×5	10	8	0.031W/Element	12.5	J (±5%)	±200	56Ω to 100kΩ (E24 series)	-55 to +125	YES
MNR18	1605 (0602)×8	16	8	0.063W/Element*	25	J (±5%)	±200	10Ω to 1MΩ (E24 series)		YES

\*Power for a packing Max 0.25W in all elements

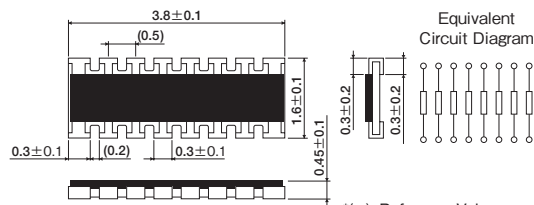
Jumper type					
Part No.	Size Code mm (inch)	Rated Current	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
MNR18	1605 (0602)×8	1A/Element	50mΩ Max	-55 to +125	YES

### Dimensions (Unit: mm)

#### ● MNR15

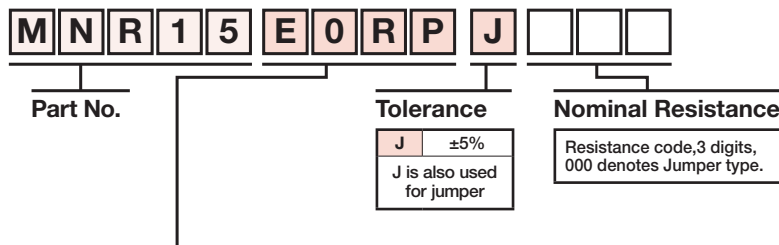


#### ● MNR18



( ): Reference Value

### Part No. Explanation



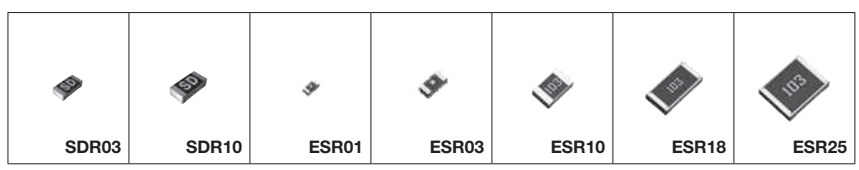
### Packaging Specifications Code

Part No.	Code	Tolerance	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)			
MNR15	E0RP	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
MNR18	E0AP	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
 ○: Standard product

# Thick Film Chip Resistors (High Reliability series) High Anti-surge Chip Resistors (SDR series) Anti-surge Chip Resistors (ESR series)

- Exclusive resistive element pattern and laser trimming technology results in significantly improved surge resistance characteristics.
- Superior power ratings.



SDR series								
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SDR03	1608 (0603)	0.3W	150	J (±5%)	±200	1Ω to 10MΩ (E24 series)	-55 to +155	YES
				F (±1%)	±200 ±100	1Ω to 9.76Ω (E24, E96 series) 10Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
SDR10	2012 (0805)	0.5W	400	J (±5%)	±200	1Ω to 10MΩ (E24 series)		
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		

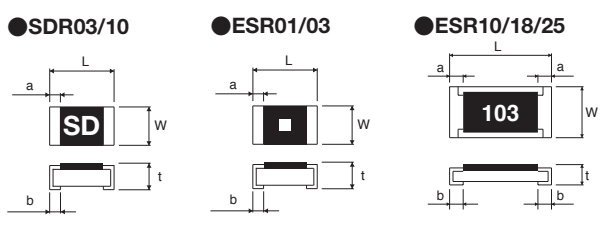
  

ESR series								
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
ESR01	1005 (0402)	0.2W	50	J (±5%)	+500/-250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES
				F (±1%)	±100	10Ω to 976kΩ (E24, E96 series) 1MΩ to 2.2MΩ (E24 series)		
ESR03	1608 (0603)	0.25W	150	J (±5%)	±200	1Ω to 10MΩ (E24 series)		
				F (±1%)	±200 ±100	1Ω to 9.76Ω (E24, E96 series) 10Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
ESR10	2012 (0805)	0.4W	150	J (±5%)	±200	1Ω to 10MΩ (E24 series)		
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
ESR18	3216 (1206)	0.5W	200	J (±5%)	±200	1Ω to 10MΩ (E24 series)		
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		
ESR25	3225 (1210)	0.66W (2/3W)	200	J (±5%)	±200	1Ω to 10MΩ (E24 series)		
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)		
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)		

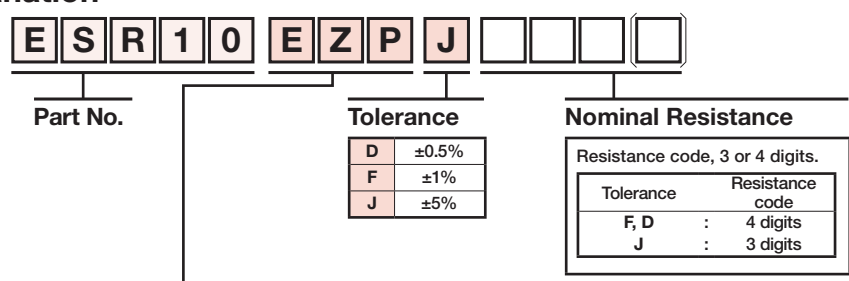
\*E24: Standard products E96: Custom products

## Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
SDR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.25±0.1	0.25±0.1
SDR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.25±0.1	0.4 ± 0.2
ESR01	1005 (0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>
ESR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3 ± 0.2
ESR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4 ± 0.2
ESR18	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5 ± 0.25
ESR25	3225 (1210)	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5 ± 0.25



## Part No. Explanation



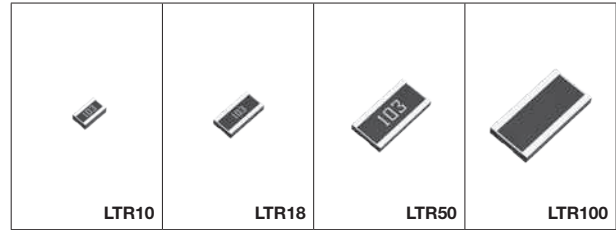
## Packaging Specifications Code

Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)	D (±0.5%)			
SDR03	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
SDR10	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
ESR01	MZP	○	○	—	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000
ESR03	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
ESR10	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
ESR18	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
ESR25	JZP	○	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	4,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Thick Film Chip Resistors (High Reliability series) High Power Chip Resistors <Wide Terminal type><Anti-surge> (LTR series)

- High joint reliability with long side terminations.
- Highest power ratings in their class.
- Guaranteed anti-surge characteristic in all series.

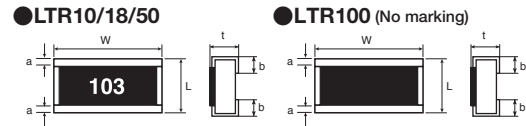


LTR series											
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200			
LTR10	1220 (0508)	0.25W	150	J (±5%)	±200	1Ω to 1MΩ (E24 series)	-55 to +155	YES			
		☆1.0W*		F (±1%)	±100	1Ω to 1MΩ (E24, E96 series)					
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)					
LTR18	1632 (0612)	0.75W	200	J (±5%)	±200	1Ω to 1MΩ (E24 series)		-55 to +155	YES		
		New 1.5W*		F (±1%)	±100	1Ω to 1MΩ (E24, E96 series)					
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)					
LTR50	2550 (1020)	1W	200	J (±5%)	±200	1Ω to 1MΩ (E24 series)			-55 to +155	YES	
		☆2.0W*		F (±1%)	±100	1Ω to 1MΩ (E24, E96 series)					
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)					
LTR100	3264 (1225)	2W	200	J (±5%)	±200	1Ω to 1MΩ (E24 series)				-55 to +155	YES
		☆3.0W*		F (±1%)	±100	1Ω to 1MΩ (E24, E96 series)					
				D (±0.5%)	±100	10Ω to 1MΩ (E24, E96 series)					

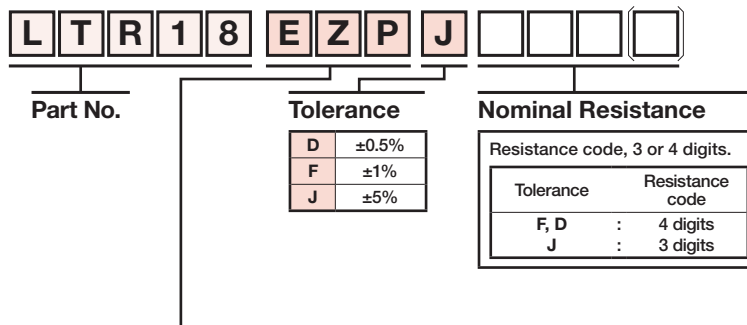
☆: Under Development  
\*E24: Standard products E96: Custom products  
\*Guaranteed by terminal temperature derating (10Ω≤Resistance<1kΩ)

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
LTR10	1220 (0508)	1.2±0.1	2.0±0.1	0.55±0.1	0.25±0.1	0.35±0.2
LTR18	1632 (0612)	1.6±0.15	3.2±0.15	0.55±0.1	0.3±0.2	0.5±0.2
LTR50	2550 (1020)	2.5±0.15	5.0±0.15	0.55±0.1	0.38±0.2	0.9±0.2
LTR100	3264 (1225)	3.2±0.15	6.4±0.15	0.55±0.15	0.4±0.25	1.13±0.25



### Part No. Explanation



### Packaging Specifications Code

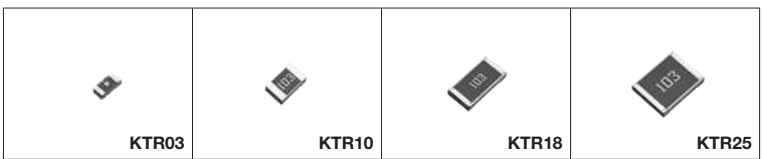
Part No.	Code	Tolerance			Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)	D (±0.5%)			
LTR10	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR18	EZP	○	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR50	UZP	○	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR100	JZP	○	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	4,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product



# Thick Film Chip Resistors (High Reliability series) High Voltage Resistance Chip Resistors (KTR series)

- Twice the rated voltage of conventional products.
- Perfect for use in Camera Flash circuit, etc.

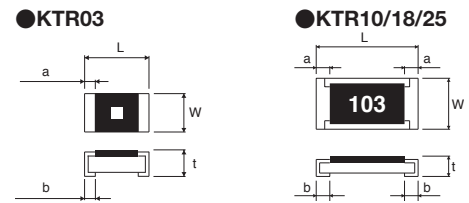


KTR series											
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200			
KTR03	1608 (0603)	0.1W	350	J (±5%)	±200	1Ω to 10MΩ (E24 series)	-55 to +155	YES			
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)					
KTR10	2012 (0805)	0.125W	400	J (±5%)	±200	1Ω to 10MΩ (E24 series)		-55 to +155	YES		
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)					
KTR18	3216 (1206)	0.25W	500	J (±5%)	±200	1Ω to 10MΩ (E24 series)			-55 to +155	YES	
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)					
KTR25	3225 (1210)	0.33W (1/3W)	600	J (±5%)	±200	1Ω to 10MΩ (E24 series)				-55 to +155	YES
				F (±1%)	±100	1Ω to 10MΩ (E24, E96 series)					

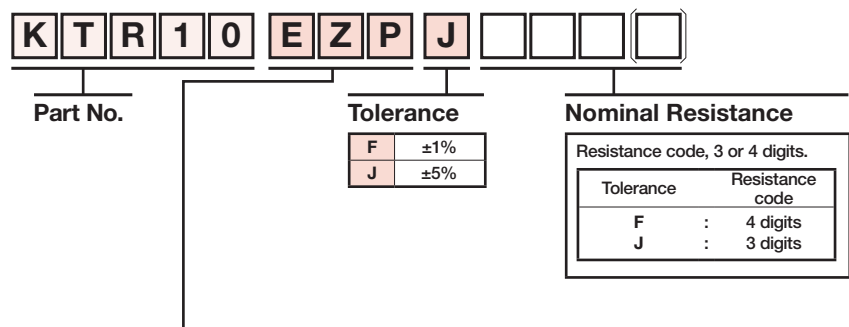
\*E24: Standard products E96: Custom products

## Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
KTR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
KTR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4±0.2
KTR18	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5±0.25
KTR25	3225 (1210)	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5±0.25



## Part No. Explanation



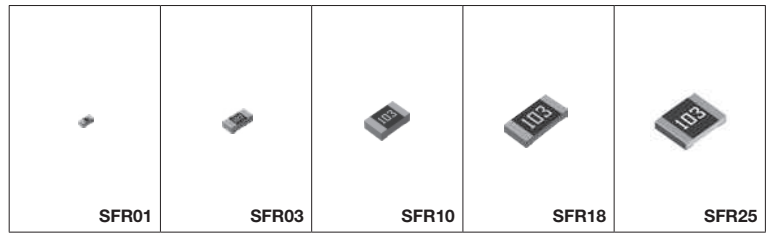
## Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
KTR03	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
KTR10	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
KTR18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
KTR25	JZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	4,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Thick Film Chip Resistors (High Reliability series) Tolerance for Sulfurization Chip Resistor (SFR series)

• Improved Anti-sulfur reliability by ROHM original structure.



SFR series								
Part No.	Size Code mm (inch)	Rated Power (70°C)	Limiting Element Voltage (V)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
SFR01	1005 (0402)	0.063W (1/16W)	50	J (±5%)	+500/-250 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)	-55 to +155	YES
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)		
SFR03	1608 (0603)	0.1W	50	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)		YES
				F (±1%)	±100	10Ω to 10MΩ (E24, E96 series)		
SFR10	2012 (0805)	0.125W	150	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)		YES
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)		
SFR18	3216 (1206)	0.25W	200	J (±5%)	±400 ±200	1Ω to 9.1Ω (E24 series) 10Ω to 10MΩ (E24 series)		YES
				F (±1%)	±100	10Ω to 2.2MΩ (E24, E96 series)		
SFR25	3225 (1210)	0.5W	200	J (±5%)	±200	1Ω to 1MΩ (E24 series)		YES
				F (±1%)	±100	10Ω to 1MΩ (E24, E96 series)		

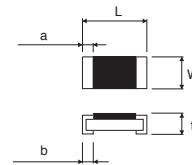
\*E24: Standard products E96: Custom products

Jumper type					
Part No.	Size Code mm (inch)	Rated Current (A)	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200
SFR01	1005 (0402)	1	50mΩ Max	-55 to +155°C	YES
SFR03	1608 (0603)	1			YES
SFR10	2012 (0805)	2			YES
SFR18	3216 (1206)	2			YES
SFR25	3225 (1210)	2			YES

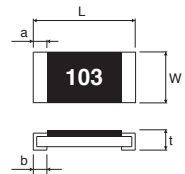
### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
SFR01	1005 (0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.33±0.08	0.25 <sup>+0.05</sup> <sub>-0.10</sub>
SFR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.4±0.2	0.3 ±0.2
SFR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4 ±0.2
SFR18	3216 (1206)	3.2 <sup>+0.15</sup> <sub>-0.20</sub>	1.6±0.15	0.55±0.1	0.55±0.25	0.5 ±0.25
SFR25	3225 (1210)	3.2 <sup>+0.15</sup> <sub>-0.20</sub>	2.5±0.15	0.55±0.1	0.55±0.25	0.5 ±0.25

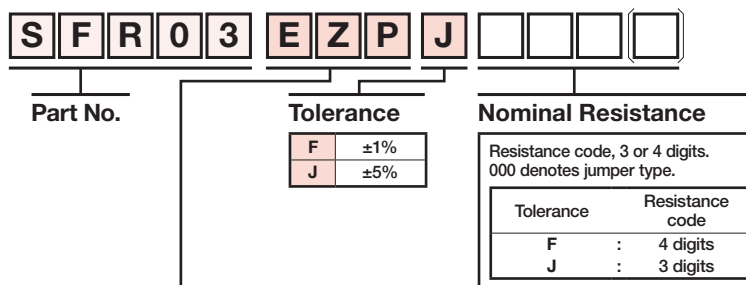
●SFR01



●SFR03/10/18/25



### Part No. Explanation



### Packaging Specifications Code

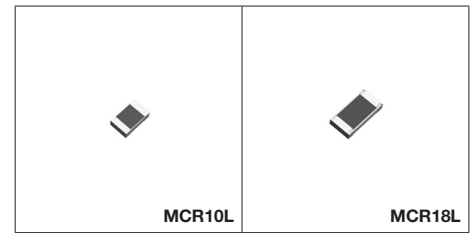
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
SFR01	MZP	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000
SFR03	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
SFR10	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
SFR18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
SFR25	JZP	○	○	Embossed tape (4mm Pitch)	φ180mm (8inch)	4,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

# Chip Resistors for Current Detection (Thick Film type)

## General Purpose Chip Resistors : New MCR series <Low ohmic><0805 to 1206>

- Guaranteed the same rated power as one size larger product by changing the design of the resistive element.
- Very-low ohmic resistance from 47m Ohm is in lineup by thick-film resistive element.
- High-reliability chip resistor employing metal glaze as resistive element.



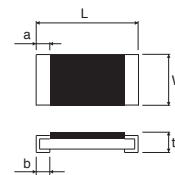
New MCR series <Low ohmic>							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
☆MCR10L	2012 (0805)	0.5W (1/2W)	J (±5%)	0 to 250	0.047Ω to 0.130Ω (E24 series)	-55 to 155	YES
				0 to 150	0.150Ω to 0.910Ω (E24 series)		
			F (±1%)	0 to 250	0.047Ω to 0.130Ω (E24 series)		
				0 to 150	0.150Ω to 0.910Ω (E24 series)		
☆MCR18L	3216 (1206)	0.75W (3/4W)	J (±5%)	0 to 250	0.047Ω to 0.130Ω (E24 series)	-55 to 155	YES
				0 to 150	0.150Ω to 0.910Ω (E24 series)		
			F (±1%)	0 to 250	0.047Ω to 0.130Ω (E24 series)		
				0 to 150	0.150Ω to 0.910Ω (E24 series)		

☆: Under Development

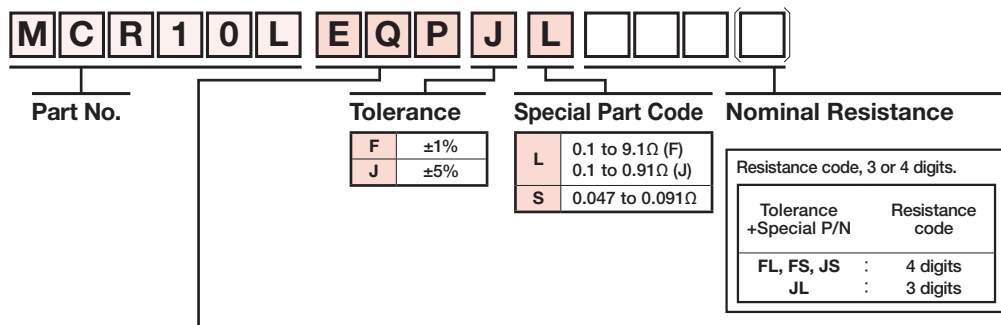
### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
MCR10L	2012 (0805)	2.0±0.1	1.25±0.1	0.58±0.1	0.57 to 0.20 ±0.2	0.4 ±0.2
MCR18L	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5 ±0.25

### ●MCR10L/18L



### Part No. Explanation



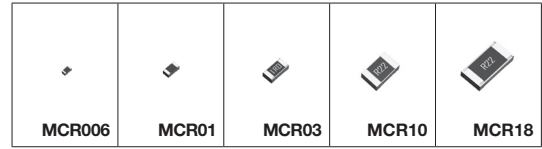
### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J(±5%)	F(±1%)				
MCR10L	EQP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
MCR18L	EQP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
 ○: Standard product

## Chip Resistors for Current Detection (Thick Film type) General Purpose Chip Resistors <Low ohmic> (Low Ohmic MCR series)

- Very-low ohmic resistance from 47m Ohm is in lineup by thick-film resistive element.
- High-reliability chip resistor employing metal glaze as resistive element.



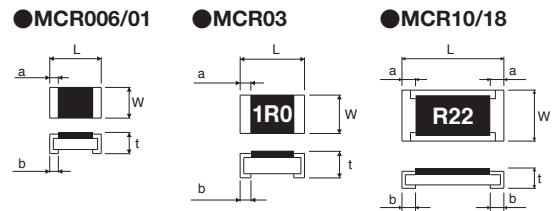
Low Ohmic MCR series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
MCR006	0603 (0201)	0.05W	F (±1%)	+600/-200	1Ω to 9.1Ω (E24 series)	-55 to +155	YES
MCR01	1005 (0402)	0.063W (1/16W)	F (±1%)	±400	1Ω to 9.1Ω (E24 series)		YES
MCR03	1608 (0603)	0.1W	F (±1%)	±400	1Ω to 9.1Ω (E24 series)		YES
MCR10	2012 (0805)	0.25W	J (±5%)	*Table 1	0.047Ω to 0.91Ω (E24 series)		YES
MCR18	3216 (1206)		F (±1%)	*Table 1	0.047Ω to 9.1Ω (E24 series)		YES

\*Table 1

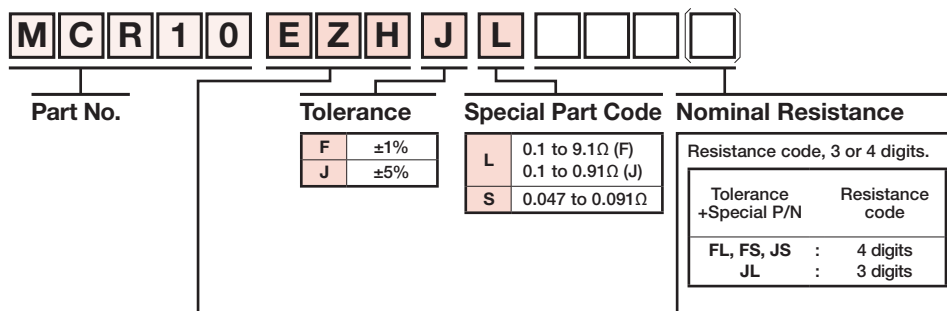
Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range
J (±5%) F (±1%)	500±300	0.047Ω to 0.091Ω (E24 series)
	400±200	0.1Ω to 0.13Ω (E24 series)
	±250	0.15Ω to 9.1Ω (E24 series)

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
MCR006	0603 (0201)	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
MCR01	1005 (0402)	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>
MCR03	1608 (0603)	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
MCR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4±0.2
MCR18	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25



### Part No. Explanation



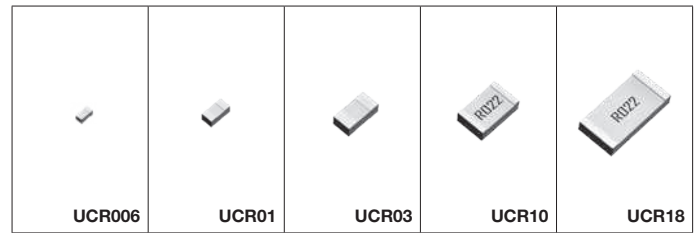
### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
MCR006	YLP	—	○	Paper tape (2mm Pitch)	φ180mm (7inch)	15,000
MCR01	MZP	—	○	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000
MCR03	EZP	—	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
MCR10	EZH	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
MCR18	EZH	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Chip Resistors for Current Detection (Thick Film type) Thick Film Shunt Resistors <Face Down type> (UCR series)

- Chip resistors for current detection. (11mΩ or more)
- Resistive element is located at bottom side, which reduces the resistance shift during mounting process.
- ROHM's unique structure achieved improvement of heat.

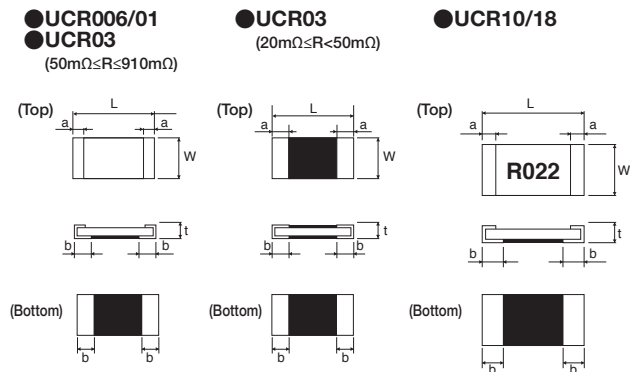


UCR series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
UCR006	0603 (0201)	0.1W	J (±5%)	0 to 300	100mΩ to 910mΩ (E24 series)	-55 to +155	YES
			F (±1%)				
UCR01	1005 (0402)	0.125W	J (±5%)	0 to 300	68mΩ to 91mΩ (E24 series)		YES
			F (±1%)	0 to 250	100mΩ to 200mΩ (E24 series)		
UCR03	1608 (0603)	0.25W	J (±5%)	0 to 250	20mΩ to 47mΩ (E24 series)		YES*
			F (±1%)	0 to 200	51mΩ to 91mΩ (E24 series)		
		0.2W	J (±5%)	0 to 150	100mΩ to 200mΩ (E24 series)		
			F (±1%)	0 to 150	220mΩ to 910mΩ (E24 series)		
UCR10	2012 (0805)	0.33W (1/3W)	J (±5%)	250±200 0 to 250 0 to 150	11mΩ to 18mΩ (E24 series) 20mΩ to 47mΩ (E24 series) 51mΩ to 100mΩ (E24 series)	YES	
			F (±1%)	0 to 250 0 to 150	11mΩ to 47mΩ (E24 series) 51mΩ to 100mΩ (E24 series)		
UCR18	3216 (1206)	☆1W	J (±5%)	0 to 350	11mΩ to 18mΩ (E24 series)	YES	
			F (±1%)	0 to 200	20mΩ to 39mΩ (E24 series)		
		0.5W	J (±5%)	0 to 150	43mΩ to 100mΩ (E24 series)		YES
			F (±1%)				

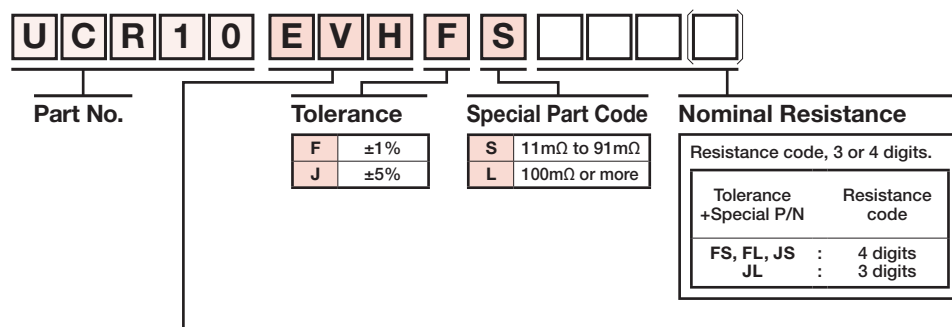
\*Limited to 100mΩ and higher  
☆: Under Development

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b
UCR006	0603 (0201)	0.62±0.05	0.32±0.05	0.24±0.05	0.18±0.1	0.22±0.1
UCR01	1005 (0402)	1.0±0.1	0.55±0.1	0.37±0.05	0.28±0.1	0.34±0.1
UCR03	1608 (0603)	1.6±0.1	0.87±0.1	0.5±0.1	0.45±0.2	0.45±0.2
UCR10	2012 (0805)	2.0±0.1	1.25±0.1	0.55±0.1	0.24±0.2	0.5±0.2
UCR18	3216 (1206)	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.2	0.9±0.25



### Part No. Explanation



### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)	Remarks
		J (±5%)	F (±1%)				
UCR006	YVP	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	15,000	—
UCR01	MVP	○	○	Paper tape (2mm Pitch)	φ180mm (7inch)	10,000	—
UCR03	EWP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	20mΩ to 47mΩ
	EVP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	51mΩ to 910mΩ
UCR10	EVH	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—
UCR18	EVH	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000	—

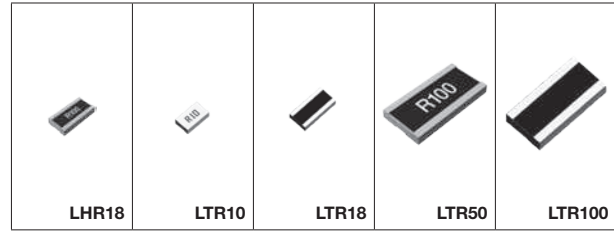
Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Chip Resistors for Current Detection (Thick Film type)

### High Power Thick Film Shunt Resistors <Wide Terminal type> <Low TCR> (LHR series)

### High Power Thick Film Shunt Resistors <Wide Terminal type> (Low Ohmic LTR series)

- Chip resistors for current detection. (10mΩ or more)
- High joint reliability with long side terminations.
- Improvement of rated power enables to displace smaller size of resistors, and it contributes space savings in your set.



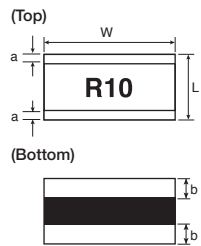
LHR series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
LHR18	1632 (0612)	1.25W	J (±5%)	0 to 125	33mΩ to 39mΩ (E24 series)	-55 to +155	YES
			F (±1%)	0 to 100 0 to 75	43mΩ to 270mΩ (E24 series) 300mΩ to 1Ω (E24 series)		
Low Ohmic LTR series							
LTR10	1220 (0508)	0.5W	J (±5%) F (±1%)	±150	47mΩ to 9.1Ω (E24 series)	-55 to +155	YES
LTR18	1632 (0612)	1W	J (±5%)	0 to 300	10mΩ to 18mΩ (E24 series)		YES
			F (±1%)	0 to 200 0 to 150 ±100	20mΩ to 47mΩ (E24 series) 51mΩ to 470mΩ (E24 series) 510mΩ to 1Ω (E24 series)		
LTR50	2550 (1020)	2W	J (±5%)	0 to 300	10mΩ to 18mΩ (E24 series)		YES
			F (±1%)	0 to 200 0 to 150 ±100	20mΩ to 47mΩ (E24 series) 51mΩ to 91mΩ (E24 series) 100mΩ to 910mΩ (E24 series)		
LTR100	3264 (1225)	2W	J (±5%)	±200	100mΩ to 910mΩ (E24 series)	YES	
			F (±1%)	0 to 150	100mΩ to 200mΩ (E24 series)		
		☆3W	J (±5%)	0 to 300	10mΩ to 18mΩ (E24series)		
			F (±1%)	0 to 200 0 to 150	20mΩ to 47mΩ (E24series) 51mΩ to 91mΩ (E24series)		

☆: Under Development

### Dimensions (Unit: mm)

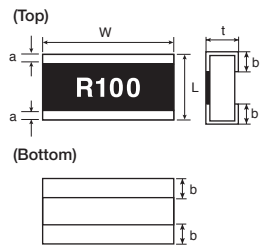
Part No.	Size Code mm (inch)	L	W	t	a	b
LHR18	1632 (0612)	1.6±0.1	3.2±0.1	0.58±0.1	0.3±0.2	0.5±0.2
LTR10	1220 (0508)	1.2±0.1	2.0±0.1	0.55±0.1	0.3±0.2	0.35±0.2
LTR18	1632 (0612)	1.6±0.1	3.2±0.1	0.58±0.1	0.5±0.2	0.5±0.2
LTR50	2550 (1020)	2.5±0.15	5.0±0.15	0.58±0.15	0.38±0.2	0.9±0.2
LTR100	3264 (1225)	3.2±0.15	6.4±0.15	0.55±0.15	0.4±0.25	1.13±0.25

#### ● LTR10

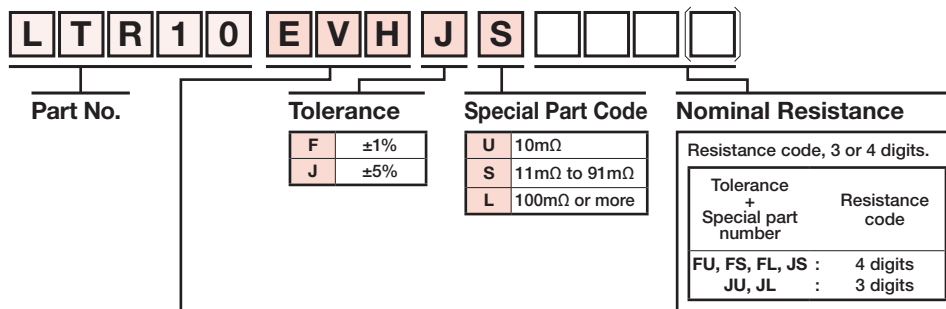


#### ● LHR18/LTR50 (marking)

#### ● LTR18/LTR100 (No marking)



### Part No. Explanation



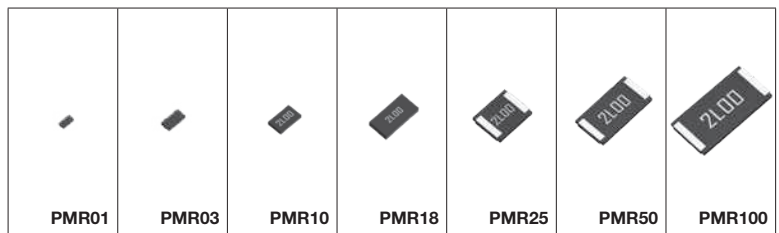
### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
LHR18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR10	EVH	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR50	UZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	5,000
LTR100	JZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	4,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

## Chip Resistors for Current Detection (Metal Plate type) Metal Plate Shunt Resistors <Ultra Low ohmic> (PMR series)

- Ultra low-ohmic resistance range (1mΩ or more)
- Improved current detection accuracy by trimming-less structure.  
Highly recommended for large current/  
High speed switching circuit.
- Special low resistance temperature coefficient (TCR) alloy utilized for the resistive element.



PMR series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Value (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PMR01	1005 (0402)	0.2W	J (±5%)	0 to 200	10	-55 to +155	YES
PMR03	1608 (0603)	0.25W	J (±5%) F (±1%)	0 to 150	10		YES
PMR10	2012 (0805)	0.5W	J (±5%) F (±1%)	±150	2, 3, 4, 5, 6, 7, 8, 9, 10		YES
		<i>New</i> 1W*	2				
PMR18	3216 (1206)	1W	J (±5%) F (±1%)	±100	1, 2, 3, 4, 5, 6, 7, 8, 9, 10		YES
		☆1.5W*	1, 2				
PMR25	3225 (1210)	1W	J (±5%) F (±1%)	±100	1, 2, 3, 4, 5		YES
		☆2W*	1, 2				
PMR50	5025 (2010)	1W	J (±5%) F (±1%)	±100	1, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10		YES
		☆2W*	1, 2				
PMR100	6432 (2512)	2W	J (±5%) F (±1%)	±150	1, 2	YES	
				±100	3, 4, 5, 6, 7, 8, 9, 10		
		<i>New</i> 3W*	J (±5%) F (±1%)	±150	1, 2		

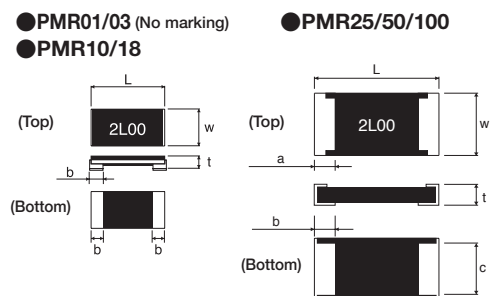
☆: Under Development  
\*Guaranteed by terminal temperature derating

Large Current Jumper type						
Part No.	Size Code mm (inch)	Rated Current (A)	Resistance	Operating Temperature (°C)	Automotive Grade AEC-Q200	
PMR01	1005 (0402)	20.0	0.5mΩ Max	-55 to +155	YES	
PMR03	1608 (0603)	22.4			YES	
PMR10	2012 (0805)	31.6			YES	
PMR18	3216 (1206)	38.7			YES	
PMR25	3225 (1210)	44.7			YES	
PMR50	5025 (2010)	50.0			YES	
PMR100	6432 (2512)	63.2			YES	

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	a	b	c
PMR01	1005 (0402)	1.0±0.05	0.5±0.05	0.25±0.1	—	0.25±0.10	—
PMR03	1608 (0603)	1.6±0.15	0.8±0.15	0.25±0.1	—	0.35±0.15	—
PMR10	2012 (0805)	2.0±0.15	1.2±0.15	0.42 to 0.28*±0.15	—	0.75 to 0.35*±0.25	—
PMR18	3216 (1206)	3.2±0.15	1.6±0.15	0.42 to 0.28*±0.15	—	1.20 to 0.5 *±0.25	—
PMR25	3225 (1210)	3.2±0.2	2.5±0.2	0.52 to 0.32*±0.15	0.5±0.2	1.00 to 0.8 *±0.2	1.95±0.2
PMR50	5025 (2010)	5.0±0.2	2.5±0.2	0.52 to 0.32*±0.15	0.5±0.2	1.85 to 0.9 *±0.2	1.95±0.2
PMR100	6432 (2512)	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	2.65±0.25

\*Each value range varies with the resistance. Please contact a ROHM sales representative for further details.



### Part No. Explanation



Part No.

Tolerance

Special Part Code

Nominal Resistance

F	±1%
J	±5%

U	5 to 10mΩ
V	1 to 4mΩ

\*Jumper type doesn't have a special part code

Resistance code, 3 or 4 digits.  
000 denotes jumper type.

Tolerance	Resistance code
F	: 4 digits
J	: 3 digits

### Packaging Specifications Code

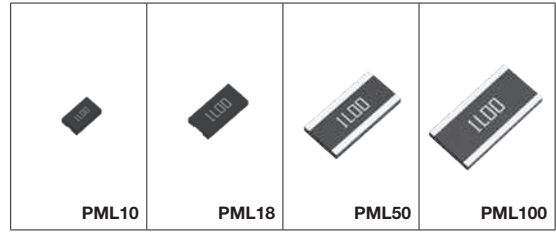
Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	F (±1%)			
PMR01	ZZP	○	—	Embossed tape (2mm Pitch)	φ180mm (7inch)	10,000
PMR03	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
PMR10	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
PMR18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
PMR25	HZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	2,000
PMR50	HZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	2,000
PMR100	HZP	○	○	Embossed tape (4mm Pitch)	φ180mm (7inch)	2,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product

Resistance Value (Ω)	Tolerance	
	J	F
Jumper	000	—
1mΩ	1L0	1L00
2mΩ	2L0	2L00
3mΩ	3L0	3L00
4mΩ	4L0	4L00
5mΩ	5L0	5L00
6mΩ	6L0	6L00
7mΩ	7L0	7L00
8mΩ	8L0	8L00
9mΩ	9L0	9L00
10mΩ	10L	10L0

## Chip Resistors for Current Detection (Metal Plate type) Metal Plate Shunt Resistors <Wide Terminal type> <Ultra Low ohmic> (PML series)

- Ultra-low resistance range (0.5mΩ or more).
- Wide terminal configuration for high joint reliability.
- Improved current detection accuracy by trimming-less structure.



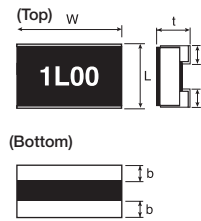
PML series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature Coefficient (ppm/°C)	Resistance Value (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PML10	1220 (0508)	0.66W	J (±5%) G (±2%)	±200	1.0, 1.5, 2.0, 2.5	-55 to +155	YES
PML18	1632 (0612)	1W	J (±5%) G (±2%)	±150	0.5, 1.0, 1.5, 2.0, 2.5		YES
PML50	2550 (1020)	2W	J (±5%)	±200	0.5, 2.2		YES
PML100	3264 (1225)	2W (3W at 25°C)	J (±5%)	±100	1.0, 1.5, 2.0, 2.2		YES
		2W		±150	0.5		

### Dimensions (Unit: mm)

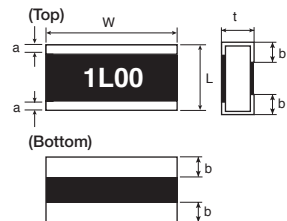
Part No.	Size Code mm (inch)	L	W	t	a	b
PML10	1220 (0508)	1.2±0.15	2.0±0.15	0.42±0.28 ±0.25	—	0.45 to 0.35 ±0.25
PML18	1632 (0612)	1.6±0.15	3.2±0.15	0.42 to 0.28* ±0.15	—	0.55 to 0.35 ±0.25
PML50	2550 (1020)	2.6±0.20	5.0±0.2	0.5 to 0.36* ±0.15	0.4±0.2	0.75 to 0.7* ±0.2
PML100	3264 (1225)	3.2±0.25	6.4±0.25	0.5 to 0.36* ±0.15	0.45±0.25	0.9 to 0.7* ±0.25

\*Each value range varies with the resistance. Please contact a ROHM sales representative for further details.

#### ● PML10/18



#### ● PML50/100



### Part No. Explanation

P	M	L	5	0	H	Z	P	J	V																																								
Part No.			Tolerance		Special Part Code			Nominal Resistance																																									
			<table border="1"> <tr><td>G</td><td>±2%</td></tr> <tr><td>J</td><td>±5%</td></tr> </table>		G	±2%	J	±5%				<table border="1"> <tr><td colspan="3">Resistance code, 3 or 4 digits.</td></tr> <tr><td colspan="2">Tolerance</td><td>Resistance code</td></tr> <tr><td>J</td><td>:</td><td>3 digits</td></tr> <tr><td>G</td><td>:</td><td>4 digits</td></tr> <tr><td colspan="3">Resistance Value (Ω)</td></tr> <tr><td>0.5mΩ</td><td>0L5</td><td>0L50</td></tr> <tr><td>1mΩ</td><td>1L0</td><td>1L00</td></tr> <tr><td>1.5mΩ</td><td>1L5</td><td>1L50</td></tr> <tr><td>2mΩ</td><td>2L0</td><td>2L00</td></tr> <tr><td>2.2mΩ</td><td>2L2</td><td>—</td></tr> <tr><td>2.5mΩ</td><td>2L5</td><td>2L50</td></tr> </table>					Resistance code, 3 or 4 digits.			Tolerance		Resistance code	J	:	3 digits	G	:	4 digits	Resistance Value (Ω)			0.5mΩ	0L5	0L50	1mΩ	1L0	1L00	1.5mΩ	1L5	1L50	2mΩ	2L0	2L00	2.2mΩ	2L2	—	2.5mΩ	2L5	2L50
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2.5mΩ	2L5	2L50																																															

### Packaging Specifications Code

Part No.	Code	Tolerance		Packaging Specifications	Reel	Basic Ordering Unit (pcs)
		J (±5%)	G (±2%)			
PML10	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
PML18	EZP	○	○	Paper tape (4mm Pitch)	φ180mm (7inch)	5,000
PML50	HZP	○	—	Embossed tape (4mm Pitch)	φ180mm (7inch)	2,000
PML100	HZP	○	—	Embossed tape (4mm Pitch)	φ180mm (7inch)	2,000

Reel (φ180mm): Compatible with JEITA standard "EIAJ ET-7200B"  
○: Standard product



## Chip Resistors for Current Detection (Metal Plate type) High Power Metal Plate Shunt Resistors <Ultra Low ohmic> (PSR series)

- High power 3W to 5W
- Ultra low resistance range (0.1mΩ or more).
- Excellent TCR characteristics
- Convex structure



PSR series							
Part No.	Size Code mm (inch)	Rated Power (70°C)	Tolerance	Temperature* coefficient (ppm/°C)	Resistance Range (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PSR100	6432 (2512)	3W	F (±1%)	±150	0.3	-55 to +170 (☆-65 to +175)	YES
				±115	0.5		
				±100	1.0		
				±50	2.0, 3.0		
PSR400	10×5.2 (3921)	4W	F (±1%)	125±50	<b>New</b> 0.2		
				±175	0.3, 0.5		
				±75	1.0, 2.0, 3.0		
				200±50	<b>New</b> 0.1		
PSR500	15×7.75 (5931)	5W	F (±1%)	±225	0.2		
				±150	0.3, 0.4, 0.5		
				±75	1.0, 2.0		

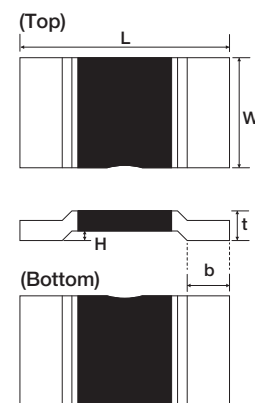
Rated Power Up PSR series							
Part No.	Size Code mm (inch)	Rated Power (Rated Terminal Temperature)	Tolerance	Temperature* coefficient (ppm/°C)	Resistance Range (mΩ)	Operating Temperature (°C)	Automotive Grade AEC-Q200
PSR100	6432 (2512)	8W (75°C), 4W (140°C)	F (±1%)	0 to +150	<b>New</b> 0.3	-65 to +175	YES
				0 to +115	<b>New</b> 0.5		
				0 to +100	<b>New</b> 1.0		
				0 to +50	<b>New</b> 2.0		
PSR400	10×5.2 (3921)	12W (75°C), 5W (130°C)	F (±1%)	0 to +50	☆3.0		
				125±50	<b>New</b> 0.2		
				0 to +100	☆0.3		
				0 to +100	<b>New</b> 0.5		
PSR500	15×7.75 (5931)	15W (75°C), 5W (130°C)	F (±1%)	0 to +75	<b>New</b> 1.0		
				0 to +75	☆2.0		
				0 to +75	<b>New</b> 3.0		
				200±50	<b>New</b> 0.1		
PSR500	15×7.75 (5931)	15W (75°C), 10W (120°C)	F (±1%)	0 to +100	☆0.2		
				0 to +100	☆0.3		
				0 to +100	☆0.4		
				0 to +100	<b>New</b> 0.5		
PSR500	15×7.75 (5931)	10W (75°C), 7W (120°C)	F (±1%)	0 to +75	<b>New</b> 1.0		
				0 to +75	<b>New</b> 2.0		

☆: Under Development \*(+20°C to +125°C)

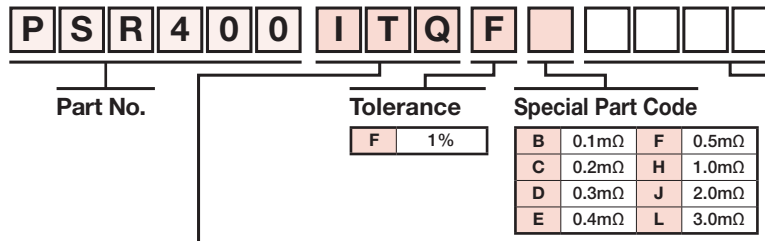
### Dimensions (Unit: mm)

Part No.	Resistance	L	W	t	H	b
PSR100	0.3mΩ	6.35±0.15	3.05±0.25	1.45±0.15	0.35±0.15	1.12±0.3
	0.5mΩ			1.15±0.15		
	1.0mΩ			0.75±0.15		
	2.0mΩ			1.00±0.15		
	3.0mΩ			0.75±0.15		
PSR400	0.2mΩ	10±0.3	5.2±0.3	1.9±0.15	0.5±0.15	2.0±0.6
	0.3mΩ			1.85±0.15		
	0.5mΩ			1.3±0.15		
	1.0mΩ			0.9±0.15		
	2.0mΩ			1.1±0.15		
PSR500	0.1mΩ	15±0.3	7.75±0.3	1.96±0.15	0.5±0.15	4.6±0.6
	0.2mΩ			1.85±0.15		
	0.3mΩ			1.4±0.15		
	0.4mΩ			1.15±0.15		
	0.5mΩ			1.05±0.15		

### PSR100/400/500



### Part No. Explanation



### Packaging Specifications Code

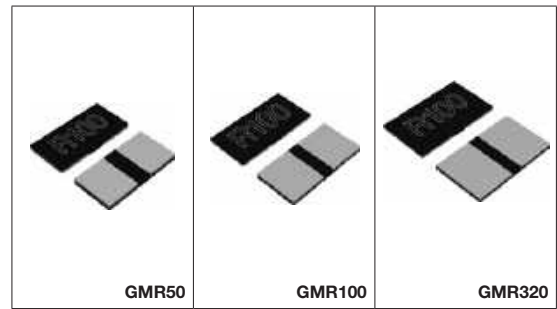
Part No.	Code	Tolerance F (±1%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
PSR100	KTQ	○	Embossed tape (8mm Pitch)	φ330mm (13inch)	5,000
PSR400	ITQ	○	Embossed tape (8mm Pitch)	φ330mm (13inch)	3,000
PSR500	HTQ	○	Embossed tape (12mm Pitch)	φ330mm (13inch)	2,000

○: Standard product Reel (φ330mm): Compatible with JEITA standard "EIAJ ET-7200B"

Resistance	F
0.1mΩ	0L10
0.2mΩ	0L20
0.3mΩ	0L30
0.4mΩ	0L40
0.5mΩ	0L50
1.0mΩ	1L00
2.0mΩ	2L00
3.0mΩ	3L00

## Chip Resistors for Current Detection (Metal Plate type) High Power Metal Plate Shunt Resistors (GMR series)

- High power (3W to 10W)
- High heat dissipation
- Excellent TCR characteristics
- Low ohmic (5mΩ to 220mΩ)

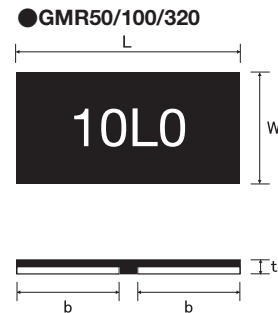


GMR series							
Part No.	Size Code mm (inch)	Rated Power (Rated Terminal Temperature)	Tolerance	Temperature <sup>*1</sup> Coefficient (ppm/°C)	Resistance Range	Operating Temperature (°C)	Automotive Grade AEC-Q200
<b>New</b> GMR50	5025 (2010)	4W (90°C), 3W (110°C)	F (±1%)	0 to +25	5mΩ	-65 to +170	YES
				±25	10mΩ to 220mΩ (E24 series) <sup>*2</sup>		
<b>New</b> GMR100	6432 (2512)	7W (70°C), 5W (110°C)	F (±1%)	0 to +25	5mΩ		YES
				±20	10mΩ to 220mΩ (E24 series) <sup>*2</sup>		
<b>New</b> GMR320	7142 (2817)	10W (70°C), 7W (110°C)	F (±1%)	0 to +25	5mΩ		YES
				±25	10mΩ to 100mΩ (E24 series) <sup>*2</sup>		

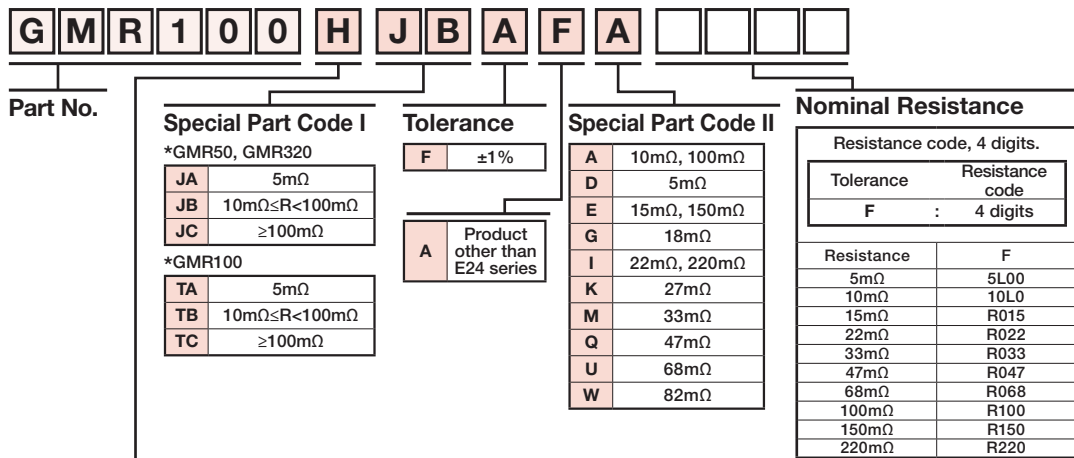
<sup>\*1</sup> (+20°C to +60°C)  
<sup>\*2</sup> Development schedule will vary depending on resistance value. Please contact us for resistance values.

### Dimensions (Unit: mm)

Part No.	Size Code mm (inch)	L	W	t	b
GMR50	5025 (2010)	5.00±0.25	2.50±0.25	0.40±0.15	2.05±0.25
GMR100	6432 (2512)	6.40±0.25	3.20±0.25	0.40±0.15	2.75±0.25
GMR320	7142 (2817)	7.10±0.25	4.20±0.25	0.40±0.15	3.10±0.25



### Part No. Explanation



### Packaging Specifications Code

Part No.	Code	Tolerance F (±1%)	Packaging Specifications	Reel	Basic Ordering Unit (pcs)
GMR50	H	○	Embossed tape (4mm Pitch)	φ180mm	2,000
GMR100	H	○	Embossed tape (8mm Pitch)	φ180mm	2,000
GMR320	H	○	Embossed tape (8mm Pitch)	φ180mm	2,000

○: Standard product

# Standard Nominal Resistance Values

E3	10				22						47						
E6	10		15		22		33		47		68						
E12	10	12	15	18	22	27	33	39	47	56	68	82					
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47
	51	56	62	68	75	82	91										
E96	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147
	150	154	158	162	165	169	174	178	182	187	191	196	200	205	210	215	221
	226	232	237	243	249	255	261	267	274	280	287	294	301	309	316	324	332
	340	348	357	365	374	383	392	402	412	422	432	442	453	464	475	487	499
	511	523	536	549	562	576	590	604	619	634	649	665	681	698	715	732	750
	768	787	806	825	845	866	887	909	931	953	976						

## Nominal Resistance

Resistors of a series fall into one of nominal resistance ranges shown in the table above. Nominal resistance is determined by the common ratio shown right.

Series	Common ratio	Remarks
E6	$\sqrt[6]{10} \approx 1.46$	Rounded off to a 2-digit figure.
E12	$\sqrt[12]{10} \approx 1.21$	
E24	$\sqrt[24]{10} \approx 1.10$	
E96	$\sqrt[96]{10} \approx 1.02$	Rounded off to a 3-digit figure.

## Resistance Coding

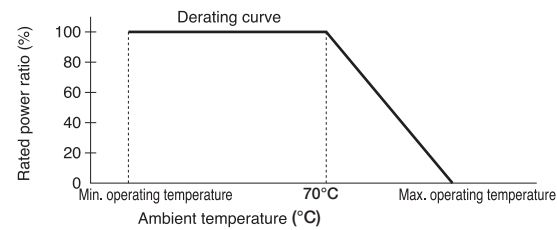
Nominal resistance is expressed in 3 digits when the resistance tolerance is  $\pm 5\%$  and in 4 digits when  $\pm 1\%$ .

The leading 2 or 3 digits indicate significant figure while the last digit indicates the number of zeros. The letter R or L denotes the decimal point if necessary.

- Ex.1  $22\Omega \rightarrow 22 \times 10^0\Omega \rightarrow 220$  (the last digit indicates the number "0" of a multiplier)
- Ex.2  $47k\Omega \rightarrow 47 \times 10^3\Omega \rightarrow 473$  (the last digit indicates the number "3" of a multiplier)
- Ex.3  $1.2M\Omega \rightarrow 12 \times 10^5\Omega \rightarrow 125$  (the last digit indicates the number "5" of a multiplier)
- Ex.4  $2.7\Omega \rightarrow 2R7$  (the decimal point indicate the letter R/the letter R apply to the low Resistance less than  $10\Omega$ )
- Ex.5  $1130\Omega \rightarrow 113 \times 10^1\Omega \rightarrow 1131$  (the last digit indicates the number "1" of a multiplier/Resistance Tolerance 1% (F) products)
- Ex.6  $0.10\Omega \rightarrow R10$
- Ex.7  $1m\Omega \rightarrow 1L0$

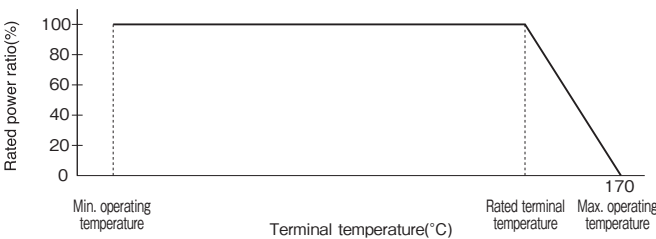
## Supplement of Rated Power

When the ambient temperature exceeds the rated ambient temperature, derate the load power based on the derating curve.



(PSR100, GMR100)

When the terminal temperature with load exceeds the rated terminal temperature (PSR100: 140°C, GMR100: 110°C), derate the load power based on the derating curve.



For basic guidelines on using resistors, see the technical reports issued by Japan Electronics and Information Technology Industries Association. JEITA RCR-2121A. "Guideline of notabilia for fixed resistors for use in electronic equipment (Safety Application Guide for fixed resistors for use in electronic equipment)"

## Supplementary to Notes

\*1 When resistor is to be exposed to a transient load (excessive large load, such as pulse), mount the resistor on your product and check the condition and evaluate the result. Constant application of a voltage above the rated voltage will degrade the performance and reliability of the resistor.  
Do not apply a voltage exceeding the rated voltage across any ROHM resistors.

\*2 Rated voltage (V) =  $\sqrt{\text{rated power (W)} \times \text{nominal resistance } (\Omega)}$  or the limiting element voltage, whichever smaller, is the rated voltage.