2011 2nd
Product Catalog



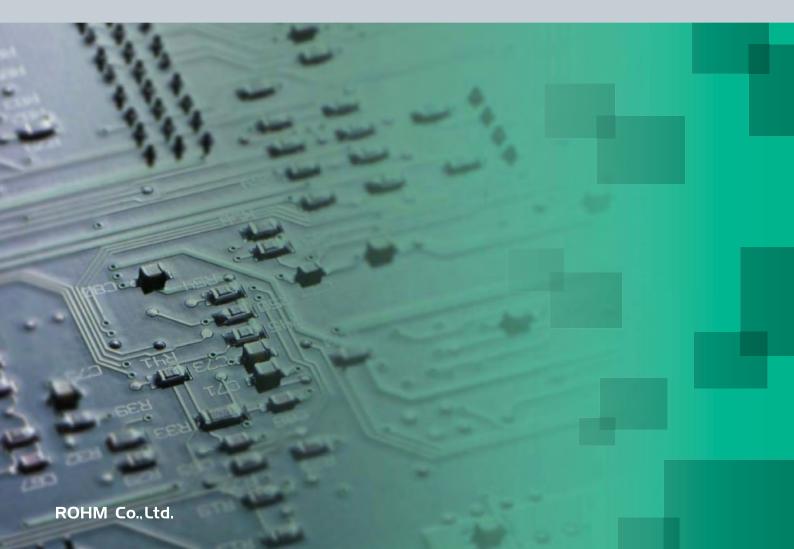
Passive Components

Resistors









Resistors

ROHM, the pioneer of chip resistors, offers a wide array of chip resistors that brings added value - in terms of greater reliability, increased miniaturization, and improved performance - to sets of all types.

Select the ideal solution from our complete lineup, including the ultra-compact MCR004 series for portable applications, the high voltage KTR series, the wide terminal LTR series that offers superior reliability, the anti-sulfuration TRR series, and low-ohmic types optimized for current detection (i.e. PMR/PML/UCR/LTR series).

We are also focused on effective use of natural resources, and provide narrow pitch taping and bulk products that reduce waste and resources considerably.

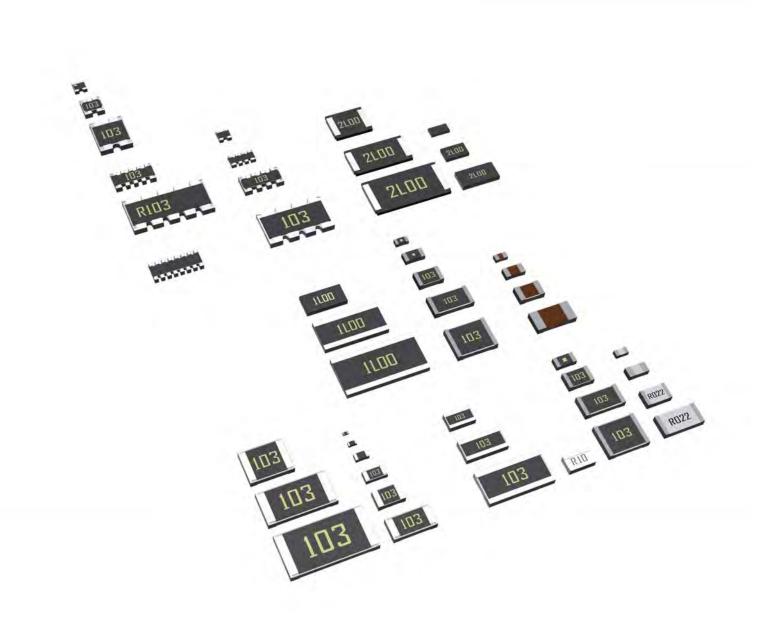


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Resistor Lineup

Part No.	Size (mm [inch])	Circuit	Rated pov	ver (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
	n Chip Resistors <m0< th=""><th>CR Series></th><th>1/3</th><th>2\W</th><th>J(±5%)</th><th>*</th><th></th><th></th></m0<>	CR Series>	1/3	2\W	J(±5%)	*		
MCR004	0402 [01005]		(0.03		F(±1%)	±300/±250*	10 to 3M	
			1/2	0\\/	J(±5%)	+600/-200/±250 *	1 to 10M	-55 to +125
MCR006	0603 [0201]			5W)	F(±1%)	±250	10 to 10M	
					D(±0.5%) J(±5%)	±200/±100 * +500/-250/±200 *	10 to 1M 1 to 10M	
MCR01	1005 [0402]	Š	1/1		F(±1%)	±100	10 to 2.2M	
MONOT	1003 [0402]	[] R	(0.06	3W)	D(±0.5%)	±100/±50 *	10 to 1M	
		l l			J(±5%)	±400/±200 *	1 to 10M	
MCR03	1608 [0603]		1/1 (0.1		FX(±1%)	±100	10 to 10M	-55 to +155
			(0.1	•••,	D(±0.5%)	±100/±50 *	10 to 1M	
			1/8		J(±5%)	±400/±200 *	1 to 10M	
MCR10	2012 [0805]		(0.12		F(±1%)	±100	10 to 2.2M	
Thick Film Chin Bo	sistors <mcr series:<="" th=""><th></th><th>1/10W</th><th>(0.1VV)</th><th>D(±0.5%)</th><th>±100/±50 *</th><th>10 to 1M</th><th></th></mcr>		1/10W	(0.1VV)	D(±0.5%)	±100/±50 *	10 to 1M	
Trick Film Onlp Re	SISTORS CIVICAL Series.	>	1/2	1W	J(±5%)	±400/±200*	1 to 10M	
MCR18	3216 [1206]			5W)	F(±1%)	±100	10 to 2.2M	
			1/8W(0).125W)	D(±0.5%)	±100/±50*	10 to 1M	
MCR25	3225 [1210]	Ì		1W	J(±5%)	500±350/±500/±200*	1 to 3.3M	-55 to +155
		Î R		5W)	F(±1%)	±100	10 to 1M	
MCR50	5025 [2010]	Å		2W 5W)	J(±5%) F(±1%)	500±350/±500/±200/±350*	1 to 560k	
			(0.0)vv)	J(±5%)	±100 500±350/±500/±350/±200*	10 to 180k	
MCR100	6432 [2512]		1'	W	F(±1%)	±100	1 to 100k 10 to 82k	-55 to +125
Low Ohmic Thick F	ilm Chip Resistors <	MCR Series>	l		. (= : /0)	1100	10 to 62k	
MCR01	1005 [0402]		1/16W(0).063W)	F(±1%)	±400	1 to 9.1	
MCR03	1608 [0603]		1/10W	(0.1W)	F(±1%)	±400	1 to 9.1	
MCR10	2012 [0805]		1/4		J(±5%)	500±300/400±200/±250*	0.047 to 0.91	
MONTO	2012 [0000]		(0.2		F(±1%)	3001000/4001200/1200	0.047 to 9.1	
MCR18	3216 [1206]		1/4		J(±5%)	500±300/400±200/±250*	0.047 to 0.91	-55 to +155
		Å_	(0.2	•	F(±1%)		0.047 to 9.1 0.047 to 0.91	
MCR25	3225 [1210]	Î R	1/2		J(±5%) F(±1%)	300±300/±200*	0.047 to 0.91	
		8	1/2	-	J(±5%)		0.047 to 0.91	
MCR50	5025 [2010]		(0.5		F(±1%)	500±300/400±200/±250*	0.047 to 9.1	
MCR100	6432 [2512]		1\	٨/	J(±5%)	500±300/400±200/±250*	0.047 to 0.91	55 to .405
			1.1	/ V	F(±1%)	500±300/400±200/±250	0.047 to 9.1	-55 to +125
· ·	r Tape Chip Resistors : No.		- l=1\		Dite	h (Tanina)	Minimo	Ouden Occapita
	3MZPJ	Size (mm [ir	icnj)		Pitch (Taping)		Minimum Order Quantity	
	3MZPFX	1608 (060	03)		2mm		10.00	0 pcs.
	3MZPD	1000 (000	30)				10,00	о рос.
Compact Chip Res	istor Networks <mnf< th=""><th>R Series></th><th></th><th></th><th></th><th></th><th></th><th></th></mnf<>	R Series>						
MNR02	1005 [0402] × 2		0.063W	Element	J(±5%)	±300		
MNR12	1608 [0603] × 2	γ		' Element	J(±5%)	±200		
		J J			F(±1%)	±100		
MNR32	3216 [1206] × 2			Element	J(±5%)	±200	10 to 1M	-55 to +125
MNR04	1005 [0402] × 4	P P P	0.063W	Element	J(±5%)	±200		
MNR14	1608 [0603] × 4	R1 R2 R3 R4	0.063W	Element	J(±5%)	±200 ±100		
MNR34	3216 [1206] × 4	1 1 1 1	0.125\\\/	'Element	F(±1%) J(±5%)	±200		
	t Chip Resistor Netw	orks <mnr series=""></mnr>	U. 120VV /	LIGHTOHIL	U(±070)	1200		
MNR15	1608 [0603] × 5	ÎÎÎÎ	0.031W /	Element	J(±5%)	±200	56 to 100k	
MNR35	3216 [1206] × 5			Element	J(±5%)	±200	56 to 100k	FF 1- 10-
MNR18	1605 [0602] × 8		0.063W / Element		J(±5%)	±200	10 to 1M	-55 to +125
Chip Attenuators <	RCN Series>							
Part No.	Size (mm [inch])	Circuit	No. of pins	No. of elements	Rated power (70°C	lmpedance (Ω)	Voltage standing wave ratio	Operating temperature range (°C)
RCN02	1010 [0404]	4 R1 3 R2	4	3	0.04W / Packag	e 50	Less than 1.3	-55 to +125

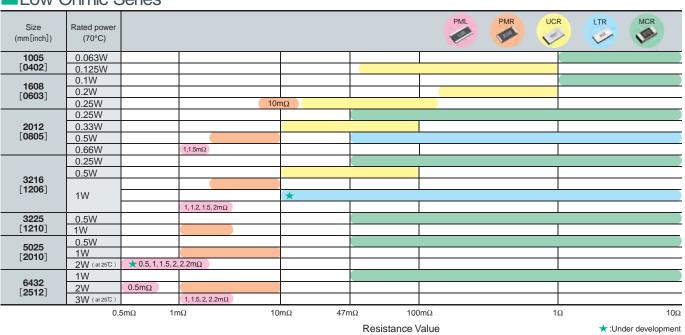
^{*:} The temperature characteristics will vary depending on the resistance value



Part No.	Size (mm [inch])	Circuit	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (W)	Operating temperature range (°C)	
Ultra-Low Ohmic Ch	nip Resistors for Curre	ent Detection <pmr series=""></pmr>						
PMR03	1608[0603]		1/4W (0.25W)	J(±5%) F(±1%)	0 to +150	10m		
PMR10	2012[0805]		1/2W (0.5W)	J(±5%) G(±2%) F(±1%)	±150	2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m, 10m		
PMR18	3216[1206]	Î R	1W	J(±5%) F(±1%)	±100	7111, 0111, 9111, 10111	-55 to +155	
PMR25	3225[1210]		1W	J(±5%) F(±1%)	±100	1m, 2m, 3m, 4m, 5m		
PMR50	5025[2010]		1W	J(±5%) F(±1%)	±100	1m, 2m, 3m, 4m, 5m,		
PMR100	6432[2512]		2W	J(±5%) F(±1%)	±100/±150*	6m, 7m, 8m, 9m, 10m		
Ultra-Low Ohmic Wi	ide Terminal Chip Re	sistors <pml series=""></pml>						
New PML10	2012[0805]		0.66W	J(±5%) G(±2%)	±200	1m, 1.5m		
New PML18	3216[1206]	Ů R	1W	J(±5%) G(±2%)	±150	1m, 1.2m, 1.5m, 2m	-55 to +155	
★ PML50	5025[2010]	Ţ	1.5W(2W at 25°C)	J(±5%)	±200	0.5m, 1m, 1.5m, 2m, 2.2m		
			2W(3W at 25℃)	,	±100	1m, 1.5m, 2m, 2.2m		
PML100	6432[2512]		2W	J(±5%)	±150	0.5m		
Thick Film Low Ohn	nic Chip Resistors <l< th=""><th>JCR Series></th><th></th><th></th><th></th><th></th><th></th></l<>	JCR Series>						
UCR01	1005[0402]		1/8W (0.125W)	J(±5%) F(±1%)	0 to 300/0 to 250/0 to 200*	68m to 910m		
Hopes	4000[0000]	•	1/4W (0.25W)	J(±5%) F(±1%)	0 to 250/0 to 200/0 to 150*	20m to 200m		
UCR03	1608[0603]] R	1/5W (0.2W)	J(±5%) F(±1%)	0 to 150	220m to 910m	-55 to +155	
LICD40	2012[0805]	8	1/3W	J(±5%)	250±200/0 to 250/0 to 150*	11m to 100m		
UCR10	2012[0005]		(0.33W)	F(±1%)	0 to 250/0 to 150*	20m to 100m		
UCR18	3216[1206]		1/2W (0.5W)	J(±5%) F(±1%)	0 to 350/0 to 200/0 to 150*	11m to 100m		
High Power Wide Te	erminal Chip Resistor	s (Low Ohmic Type) <ltr seri<="" th=""><th>es></th><th></th><th></th><th></th><th></th></ltr>	es>					
LTR10	2012[0805]	Ů R	1/2W (0.5W)	J(±5%) F(±1%)	±150	47m to 9.1	55.455	
★ LTR18	3216[1206]	ų K	1W	J(±5%) F(±1%)	±300	10m to 9.1	-55 to +155	

^{★:} Under development

Low Ohmic Series



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^{*:} The temperature characteristics will vary depending on the resistance value

Part No.	Size (mm [inch])	Circuit	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
	sistors <esr series=""></esr>				41 - 3	0 ()	3 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
			1/5W	J(±5%)	±200	401 414	
New ESR01	1005 [0402]		(0.2W)	F(±1%)	±100	10 to 1M	
				J(±5%)	±200	4 to 4014	
ESR03	1608 [0603]		1/5W	F(±1%)	±100	1 to 10M	
			(0.2W)	D(±0.5%)	±100	10 to 1M	
		Ŷ	4/404/	J(±5%)	±200	4 1- 4014	
ESR10	2012 [0805]	 ∏ R	1/4W (0.25W)	F(±1%)	±100	1 to 10M	-55 to +155
			(0.25	D(±0.5%)	±100	10 to 1M	-55 10 +155
		8	4/014/	J(±5%)	±200	1 to 10M	
ESR18	3216 [1206]		1/3W (0.33W)	F(±1%)	±100		
			(0.0011)	D(±0.5%)	±100	10 to 1M	
			4/01/1	J(±5%)	±200	1 to 10M	
ESR25	3225 [1210]		1/2W (0.5W)	F(±1%)	±100	1 10 10101	
			(0.577)	D(±0.5%)	±100	10 to 1M	
High Voltage Resist	ance Chip Resistors <	KTR Series>					
KTR03	1608 [0603]		1/10W	J(±5%)	±200	1 to 10M	
	.000 [0000]		(0.1W)	F(±1%)	±100	1 10 10111	
KTR10	2012 [0805]	Ŷ	1/8W	J(±5%)	±200	1 to 10M	
KIIIIO	20:2 [0000]	R J	(0.125W)	F(±1%)	±100	1 10 10101	-55 to +155
KTR18	3216 [1206]		1/4W	J(±5%)	±200	1 to 10M	00 10 1 100
Kiiiio			(0.25W)	F(±1%)	±100	1 10 10101	
KTR25	3225 [1210]		1/3W (0.33W)	J(±5%)	±200	1 to 10M	
KIIIZJ				F(±1%)	±100		
High Power Wide Te	erminal Chip Resistor	s <ltr series=""></ltr>					
			1/4W	J(±5%)	±200	1 to 1M	
LTR10	2012 [0805]		(0.25W)	F(±1%)	±100	1 10 1111	
				D(±0.5%)	±100	10 to 1M	
		Î	1/2W	J(±5%)	±200	1 to 1M	
LTR18	3216 [1206]	[] R	(0.5W)	F(±1%)	±100	1 10 1101	-55 to +155
			` ′	D(±0.5%)	±100	10 to 1M	
				J(±5%)	±200	1 to 1M	
LTR50	5025 [2010]		1W	F(±1%)	±100	T to TW	
				D(±0.5%)	±100	10 to 130k	
Sulfuration-Resistar	nt Chip Resistors <tf< th=""><th>RR Series></th><th></th><th></th><th></th><th></th><th></th></tf<>	RR Series>					
TRR01	1005 [0402]		1/16W	J(±5%)	+500/-250/±200 *	1 to 10M	
IRRUI	1005 [0402]		(0.063W)	F(±1%)	±100	10 to 2.2M	
TDDO	4000 [0000]	P	1/10W	J(±5%)	±400/±200 *	1 to 10M	
TRR03	1608 [0603]	 ∏ R	(0.1W)	F(±1%)	±100	10 to 10M	-55 to +155
TDD40	2042 [2025]	U K	1/8W	J(±5%)	±400/±200 *	1 to 10M	-55 to +155
TRR10	2012 [0805]		(0.125W)	F(±1%)	±100	10 to 2.2M	
TDD40	2010 [1005]			J(±5%)	±400/±200 *	1 to 10M	
TRR18	3216 [1206]		(0.25W)	F(±1%)	±100	10 to 2.2M	

 $[\]ast$: The temperature characteristics will vary depending on the resistance value



Nominal Resistance Values

E3		10				22				47							
E6	1	0	1	5	2	2	3	3	4	7				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										
	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
F00	226	232	237	243	249	255	261	267	274	280	287	294	301	309	316	324	332
E96	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

The nominal resistance of each series is listed above. These values are based on approximations of the geometric ratios at right.

Indicated Resistances

Regarding the nominal resistances, products with a resistance tolerance of $\pm 5\%$ are indicated by 3 digits, while $\pm 1\%$ products are denoted by 4 digits. The first 2 or 3 digits (depending on tolerance type) are significant figures, while the last digit signifies the number of zeroes. In addition, an 'R' is used to indicate a decimal point.

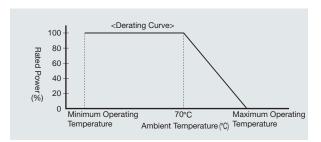
Ex. 1	$22\Omega \rightarrow 22 \times 10^{0}\Omega \rightarrow \underline{220}$ (Indicates a multiplier of '0' \rightarrow 100)
Ex. 2	$47k\Omega \rightarrow 47 \times 10^{3}\Omega \rightarrow \underline{473}$ (Indicates a multiplier of '3' \rightarrow 103)
Ex. 3	1.2M Ω →12×10 ⁵ Ω → $\underline{125}$ (Indicates a multiplier of '5' → 105)
Ex. 4	2.7 Ω →2R7 ('R' indicates a decimal, for resistances less than 10 Ω)
Ex. 5	1130 Ω \rightarrow 113×10 ¹ Ω \rightarrow 1131 (Indicates a multiplier of '1' \rightarrow
	101 - the 4 digits denote F Class products with a tolerance of $\pm 1\%$)
Ex. 6	0.10Ω→R10

■Notes on Rated Power

•Please reduce the load power based on the derating curve at right for temperatures exceeding the ambient temperature.

Series	Ratio	Remarks			
E6	⁶ √10 ≒1.46				
E12	12√10 ≒1.21	Rounded to 2 significant figures			
E24	²⁴ √10 ≒1.10				
E96	⁹⁶ √10 ≒1.02	Rounded to 3 significant figures			

■ For the basic guidelines of the resistor, please refer to the technology report issued by JETTA (Japan Electronics and Information Technology Industries Association): JETA RCT-2121A 'Guidelines of Notabilia for Fixed Resistors for Use In Electronic Equipment (Safety Application Guide for Fixed Resistors for Use In Electronic Equipment)'.

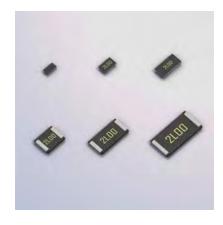


Usage Precautions

^{* 1 :} Please verify and confirm operation in the event of transient load pulses (large loads in a short time) while mounted in the customer's set. In addition, the performance and reliability of the product may suffer if the load voltage exceeds the rated value during steady state operation. Therefore, please ensure that the rated voltage is not exceeded.

^{* 2 :} The Rated Voltage (V) is calculated by $\sqrt{\text{Rated Power (W)} \times \text{Nominal Resistance (Ω)}}$ or the Limiting Element Voltage, whichever is smaller.

Ultra-Low Ohmic Chip Resistors for Current Detection



PMR Series $(1m\Omega \sim)$

Summary

These products feature a resistive element comprised of a metallic substrate with superior electrical characteristics. An original structure is utilized for low resistance values $(1 \text{m}\Omega$ to $10 \text{m}\Omega)$ with improved current detection accuracy.

Features

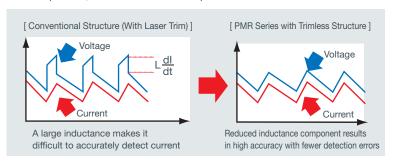
- · Compact
- High power
- · High performance

Applications

- · Current detection sets
- · Notebook PCs, HDDs, mobile
- phones, DC/DC converters, automotive systems, and more

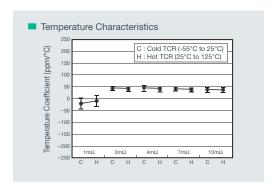
Trimless design ensures greater current detection accuracy

- · Ideal for high-speed switching circuits
- · Excellent heat dissipation characteristics
- · Stable operation, even under extreme temperature fluctuations

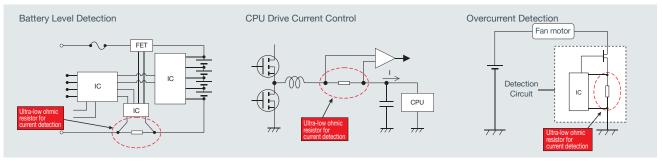


Superior resistance-temperature characteristics

· Stable resistance temperature characteristics



Circuit Examples



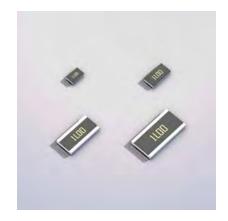
Lineup

Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (m Ω)	Operating temperature range (°C)
DMDOO	4000 [0000]	1/4W	J(±5%)	0 to +150	10	
PMR03	1608 [0603]	(0.25W)	F(±1%)	0 to +130	10	
		4 (0) 14	J(±5%)			
PMR10	2012 [0805]	1/2W (0.5W)	G(±2%)	±150	2, 3, 4, 5, 6,	
		(0.077)	F(±1%)		2, 3, 4, 5, 6, 7, 8, 9, 10	
DMD40	3216 [1206]	1W	J(±5%)	±100	,, 0, 0, 10	
PMR18	3210 [1200]	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	F(±1%)	1100		-55 to +155
PMR25	3225 [1210]	414/	J(±5%)	±100	1, 2, 3, 4, 5	
PIVIR25	3225 [1210]	1W	F(±1%)	±100	1, 2, 3, 4, 3	
PMR50	5025 [2010]	110/	J(±5%)	±100		
FIVIROU	5025 [2010]	1W	F(±1%)	±100	1, 2, 3, 4, 5,	
DMD400	6422 [2542]	014/	J(±5%)	±100 *	6, 7, 8, 9, 10	
PMR100	6432 [2512]	2W	F(±1%)	±100		

ROHM



Ultra-Low Ohmic Wide Terminal Chip Resistors for Current Detection



PML Series $(0.5 \text{m}\Omega \sim)$

Summary

These low-ohmic $(0.5m\Omega$ to $2.2m\Omega)$, wide terminal types optimized for current detection utilize a metallic substrate for the resistive element that provides excellent electrical characteristics, along with a novel design that improves current detection precision.

Features

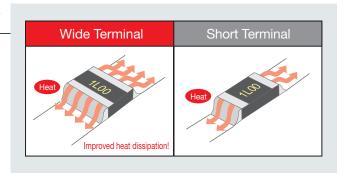
- · High power
- · High performance
- $\cdot \ \text{High reliability}$

Applications

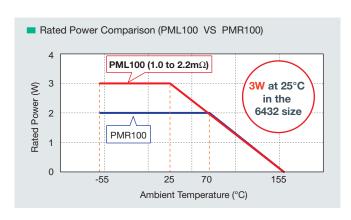
- · Automotive (i.e. power steering, ECU)
- Current detection in large current motors

Wide terminal configuration improves reliability

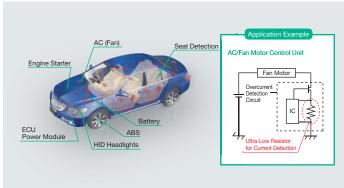
Wider contact area with the mounting plate provides a more reliable connection. Ideal for vehicle applications exposed to temperature cycling / fluctuations.



High rated power



Application Examples



Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (m Ω)	Operating temperature range (°C)
New PML10	2012[0805]	0.66W	J(±5%) G(±2%)	±200	1.0, 1.5	
New PML18	3216[1206]	1W	J(±5%) G(±2%)	±150	1.0, 1.2, 1.5, 2.0	-55~+155
★ PML50	5025[2010]	1.5W (2W at 25℃)	J(±5%)	±200	0.5, 1.0, 1.5, 2.0, 2.2	
PML100	6432[2512]	2W (3W at 25℃) 2W	J(±5%)	±100 ±150	1.0, 1.5, 2.0, 2.2 0.5	

^{*:} Under development

^{*}The designs and specifications are subject to change without notice

Thick Film Low Ohmic Chip Resistors



UCR Series $(11m\Omega \sim)$

Summary

The rear-mount design ensures high detection accuracy in a range of resistances ($11m\Omega$ to $910m\Omega$).

Features

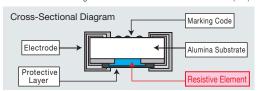
- Compact
- · High performance

Applications

 Notebook PCs, mobile phones, HDDs, portable audio players, power supplies, motors, and more

Rear-mount configuration

The UCR series is configured with the resistive element at the base (rear).



Higher rated power

The original structure increases the rated power.

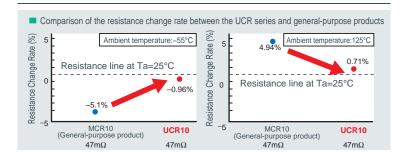
Size (mm[inch])	UCR Series	ROHM's Standard Resistors
1005[0402]	0.125W	0.063W
1608[0603]	0.25W/0.2W	0.1W
2012[0805]	0.33W	0.25W
3216[1206]	0.5W	0.25W
3225[1210]	-	0.5W

Resistance variations minimized during mounting

The rear-mount configuration shortens the current pathway by eliminating excess components.



Stable, low resistance characteristics guaranteed - regardless of ambient conditions



Ешопр		I	ı	1		
Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
		4 (0) 4 (J(±5%)	0 to 300	68m to 91m	
UCR01	1005 [0402]	1/8W (0.125W)	F(±1%)	0 to 250	100m to 200m	
		(***=****)	I (±170)	0 to 200	220m to 910m	
		4/4\0/	J(±5%)	0 to 250	20m to 047m	
		1/4W (0.25W)	F(±1%)	0 to 200	51m to 91m	
UCR03	1608 [0603]	(0.2011)	I (±170)	0 to 150	100m to 200m	
		1/5W	J(±5%)	0 to 150	220m to 910m	
		(0.2W)	F(±1%)	0 10 150	22011 to 91011	-55 to +155
			J(±5%)	250±200	11m to 18m	-55 10 +155
				0 to 250	20m to 47m	
UCR10	2012 [0805]	1/3W (0.33W)		0 to 150	51m to 100m	
		(0.00**)	F(±1%)	0 to 250	20m to 47m	
			I (±170)	0 to 150	51m to 100m	
		4 (0) 4 (J(±5%) F(±1%)	0 to 350	11m to 18m	
UCR18	3216 [1206]	3216 [1206] 1/2W (0.5W)		0 to 200	20m to 39m	
				0 to 150	43m to 100m	

^{*} The designs and specifications are subject to change without notice



High Power Wide Terminal Chip Resistors (Low Ohmic Type)



LTR Series ($10m\Omega\sim$)

Summary

These wide terminal chip resistors improve thermal dissipation for higher rated power.

Features

- · High power
- · High performance
- · High reliability

Applications

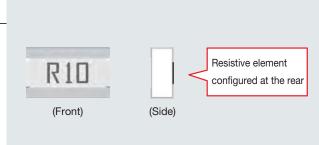
- · Automotive systems
- PCs, HDDs, mobile phones, power supplies, motors and other applications requiring current detection

Wide terminal design strong against temperature cycling



Rear-mount design improves current detection accuracy

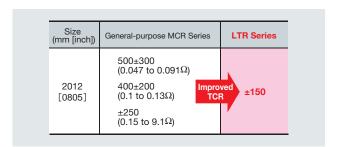
Rear-mount construction minimizes resistance changes during mounting.



Higher rated power



Superior resistance-temperature coefficient



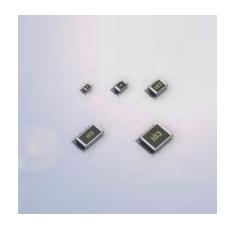
Emoup						
Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
LTD40	2012[0805]	1/2W	J(±5%)	±150	47m to 9.1	
LTR10		(0.5W)	F(±1%)	±150	47111 (0 9.1	-55 to +155
A LTD40	0040[4000]		J(±5%)	000	40 1 04	00 10 +100
★ LTR18	3216[1206]	1W	F(±1%)	±300	10m to 9.1	

^{★ :} Under development

^{*} The designs and specifications are subject to change without notice



Anti-Surge Chip Resistors



ESR Series

Summary

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

Features

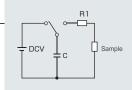
- · Small
- · Surge-resistant
- · High power

Applications

 Electronic devices requiring anti-surge and anti-pulse characteristics

2kV to 5kV* electrostatic discharge resistance (*EIAJ4701-1 Human Body Model)

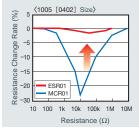
An electrostatic discharge resistance of 3kV has been achieved using novel construction and trimming processes, resulting in a greater degree of reliability.

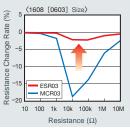


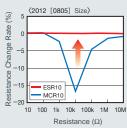
	ESR01	ESR03/10/18	ESR25
DCV (Applied Voltage)	2kV	3kV	5kV
No. of Cycles	±5 times	±10 times	±10 times
C (Capacitance)	100pF	100pF	100pF
R1 (Discharge Resistance)	1.5kΩ	1.5kΩ	1.5kΩ

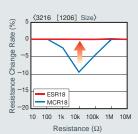
Significant improvement in endurance surge characteristics

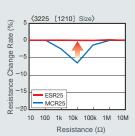
Anti-surge Chip Resistors (ESR Series) vs. Conventional Chip Resistors (MCR Series)











Double the conventional rated power

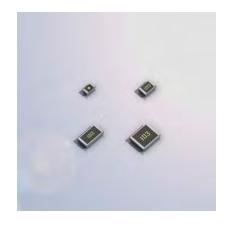
A higher rated power enables smaller resistors to be used, saving space.

Size(mm [inch])	ESR Series	General-purpose MCR Series			
<i>New</i> 1005[0402]	0.2W	0.063W			
1608[0603]	0.2W	0.1W			
2012[0805]	0.25W	0.125W			
3216[1206]	0.33W	0.25W			
3225[1210]	0.5W	0.25W			
5025[2010]	_	0.5W			
Downsizing					

Pa	art No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
New ESR01		1005 [0402]	1/5W	J(±5%)	±200	10 to 1M	
Wew Es	Shui	1003 [0402]	(0.2W)	F(±1%)	±100	TO TO TIVI	
			4 /5\\/	J(±5%)	±200	1 to 10M	
ES	SR03	1608 [0603]	1/5W (0.2W)	F(±1%)	±100	I to Tolvi	
			(0.211)	D(±0.5%)	±100	10 to 1M	
			1/4W (0.25W)	J(±5%)	±200	1 to 10M	
ES	SR10	2012 [0805]		F(±1%)	±100		FF 4 4FF
				D(±0.5%)	±100	10 to 1M	-55 to +155
		3216 [1206]	4 (014)	J(±5%)	±200	1 to 10M	
ES	SR18		16 [1206] 1/3W (0.33W)	F(±1%)	±100	1 10 10101	
				D(±0.5%)	±100	10 to 1M	
			1/2W (0.5W)	J(±5%)	±200	1 to 10M	
ESR25	SR25	3225 [1210]		F(±1%)	±100	1 to 10M	
		(0.0**)	D(±0.5%)	±100	10 to 1M		



High Voltage Resistance Chip Resistors



KTR Series

Summary

High voltage characteristics (more than double that of conventional products) are made possible through the use of proprietary construction and trimming processes.

Features

- · Compact
- · High voltage

Applications

- · Camera flash circuits
- Inverter circuits
- · Power supplies

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).

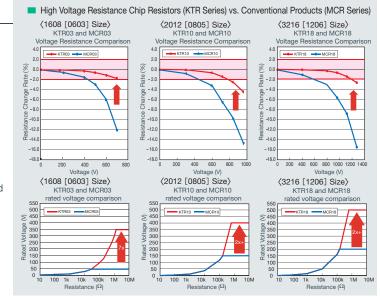
High voltage resistance circuits requiring multiple resistors can reduce the number of components by replacing conventional chip resistors with KTR series units. They are ideal for mobile products, which are becoming increasingly compact and thin.

[Limiting Element Voltage]

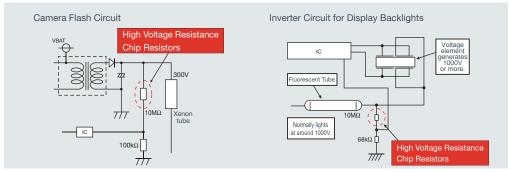
The rated voltage is defined as the maximum voltage that can be applied continuously and is calculated using the following equation:

Rated Voltage (V) = $\sqrt{\text{Rated Power (W)} \times \text{Nominal Resistance (}\Omega)}$

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

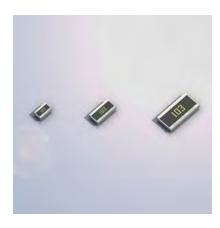


Circuit Examples



Part No.	Size (mm [inch])	Rated power (70°C)	Limiting Element Voltage(V)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
KTR03	1608 [0603]	1/10W	350	J(±5%)	±200	1 to 10M	
KINUS	1000 [0003]	(0.1W)	330	F(±1%)	±100	1 10 10101	
I/TD40	2012 [0805]	1/8W	400	J(±5%)	±200	1 to 10M	
KTR10	2012 [0005]	(0.125W)	400	F(±1%)	±100		-55 to +155
I/TD40	3216 [1206]	1/4W	F00	J(±5%)	±200	1 to 10M	-55 to +155
KTR18	3210 [1200]	(0.25W)	500	F(±1%)	±100		
KTR25	3225 [1210] 1/3W (0.33W)	600	J(±5%)	±200	4 +- 4014		
		(0.33W)	600	F(±1%)	±100	1 to 10M	

High Power Wide Terminal Chip Resistors



LTR Series

Placing the electrodes on the long sides of the resistor reduces the distance between the electrodes, improving temperature strength.

Features

- · High power
- · Strong against surges
- · Improved junction reliability

Applications

- · Automotive systems
- · Home appliances
- · Power supplies and the like

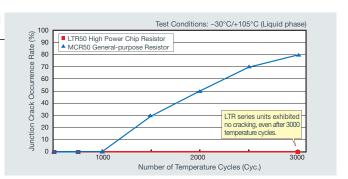
Superior connection reliability against thermal cycling

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

	Wide Terminal LTR Series	General-purpose MCR Series		
Distance Between Electrodes	Short	← Long →		
Effects of PCB Expansion/Contraction	Mechanical stress on junction area small	Mechanical stress on junction area large		
Junction Reliability	Very good	Good		

Significantly higher rated power

Higher rated power makes it possible to use smaller resistors.

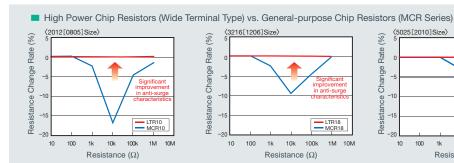


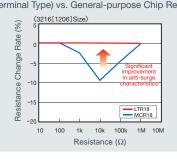
Size(mm [inch])	LTR Series	MCR Series	
2012[0805]	0.25	0.125	
3216[1206]	0.5	0.25	
5025[2010]	1	0.5	
6432[2512]	_	1	

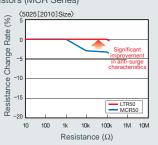
3kV* electrostatic discharge resistance

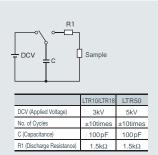
(*EIAJ4710-1 Human Body Model)

ROHM's unique resistive element structure and trimming design ensure greatly improved surge resistance characteristics.





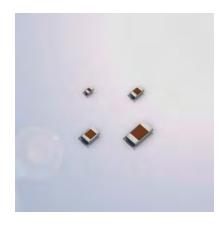




Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
				±200	1 to 1M	
LTR10	2012 [0805]	1/4W (0.25W)	F(±1%)	±100	1 10 1101	
			D(±0.5%)	±100	10 to 1M	
	3216 [1206]	206] 1/2W (0.5W)	J(±5%)	±200	1 to 1M	
LTR18			F(±1%)	±100	I to fivi	-55 to +155
			D(±0.5%)	±100	10 to 1M	
			J(±5%)	±200	1 to 1M	
LTR50	5025 [2010]	1W	F(±1%)	±100	I to Tivi	
			D(±0.5%)	±100	10 to 130k	



Sulfuration-Resistant Chip Resistors



TRR Series

Summary

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

Features

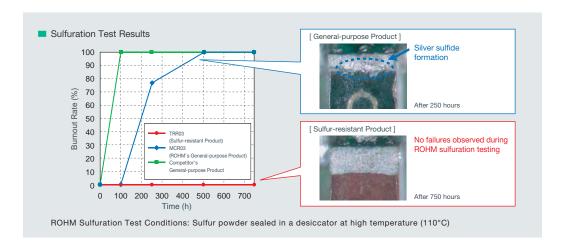
 $\cdot \ \text{High sulfuration resistance} \\$

Applications

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

Excellent anti-sulfuration characteristics

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.



Lineup

Lineup						
Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
			J(±5%)	+500/-250	1 to 9.1	
TRR01	1005 [0402]	1/16W (0.063W)	J(±376)	±200	10 to 10M	
		(0.0001.)	F(±1%)	±100	10 to 2.2M	
TRR03	1608 [0603]	1/10W (0.1W)	J(±5%)	±400	1 to 9.1	
				±200	10 to 10M	
			F(±1%)	±100	10 to 10M	-55 to +155
		1/8W (0.125W)	J(±5%)	±400	1 to 9.1	-55 (0 +155
TRR10	2012 [0805]			±200	10 to 10M	
			F(±1%)	±100	10 to 2.2M	
		3216 [1206] 1/4W (0.25W)	J(±5%)	±400	1 to 9.1	
TRR18	3216 [1206]			±200	10 to 10M	
		(5.2011)	F(±1%)	±100	10 to 2.2M	

Also compatible with jumpers.



0402-Sized Ultra-Compact Chip Resistors



MCR004 Series

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.

Features

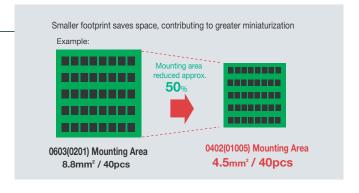
- · Compact
- · Space-saving

Applications

- · Modules
- · Portable audio
- · Mobile phones
- · Digital cameras

Lightweight · Space-saving

The MCR004 (0402) series reduces mounting area and weight by 56% and 72%,respectively, contributing to even greater miniaturization.



High dimensional precision

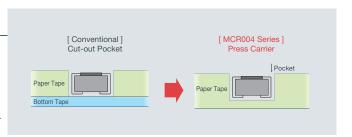
Ultra-compact chip resistors in the 0402 and 0603 size require more precise process technologies (compared to conventional processes) in order to ensure high dimensional accuracy.

Precision semiconductor processing technology utilized for high dimensional accuracy Substrate Dimensional Tolerance ±0.02mm Dimensional Tolerance ±0.03mm Dimensional Tolerance

Press carrier tape applications

Press carrier tape tape is used in order to reduce failures during the mounting process.

- Press Carrier Tape Features —
- $\boldsymbol{\cdot}$ No adhesive substance on the bottom of the pocket (bottom tape not used).
- · Highly precise pocket position.



Lineup

	Part No.	Size (mm [inch])	Rated power (70°C)	Tolerance	Temperature coefficient (ppm/°C)	Resistance range (Ω)	Operating temperature range (°C)
Managa	0.400 [0.4005]	1/32W	J(±5%)	±300	10 to 91	FF t 10F	
	MCR004	0402 [01005]	402 [01005] 1/32W (0.031W)	F(±1%)	±250	100 to 3M	-55 to +125

Also compatible with jumpers.

<Taping Specifications>

Truping operation			
Part No.	Taping No.	Taping specs	Min. order quantity (pcs)
MCR004	YZP	Paper tape (2mm pitch)	15,000
WICHUU4	RZP	Embossed tape (1mm pitch)	40,000



Narrow Pitch Paper Tape Products



MCR03MZP Series

Summary

Half the pitch of standard products results in double the quantity per reel in the same reel size (φ180mm).

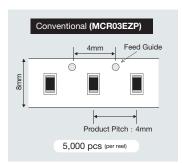
Features

- · Halves the number of reel changes
- Cuts the amount of packaging waste by 50%

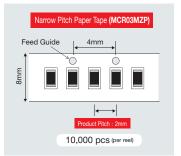
Applications

· All products

Doubles the time between reel replacement. Cuts package waste in half.

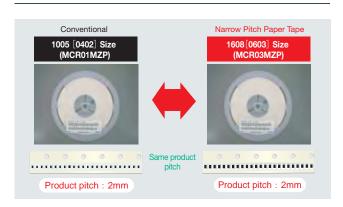


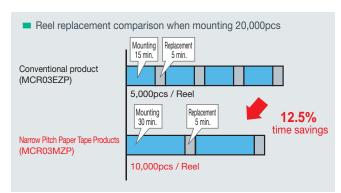




No new equipment required · Easy to install

Improves productivity by halving the number of reel replacements





Part No.	Size (mm [inch])	Product Pitch (Taping)	Reel	
MCR03MZPJ				
MCR03MZPFX	1608 [0603]	2mm	10,000 pcs.	
MCR03MZPD				



Dimensions

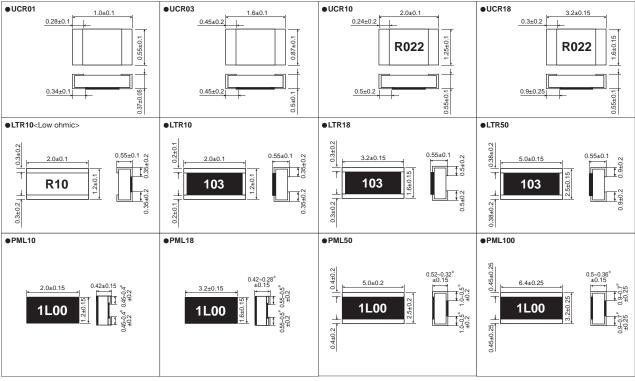
Unit : mm

	D : .	0 .		147			
0402	Dimensions	Series	L	W	t	а	b
(01005)	<u>a</u> — W	MCR004	0.4±0.02	0.2±0.02	0.13±0.02	0.1±0.03	0.1±0.03
	<u></u> T T T						
0603	<u>→</u> -						
(0201)	a w	MCR006	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
	<u></u>						
1005	<u>↓</u>	MCR01					
(0402)	₩	ESR01	40005	0.5.005	0.05.0.05	0.2±0.1	0.05 +0.05
	<u></u>	TRR01	1.0±0.05	0.5±0.05	0.35±0.05	0.33±0.08	- 0.25 ^{+0.05} _{-0.1}
	artial Marking Code)	MCR03					
(0603)	a \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	KTR03	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
		ESR03	1.0±0.1	0.6±0.1	0.45±0.1		0.3±0.2
_	<u> </u>	TRR03				0.4±0.1	
	R/KTR/ESR/TRR] [PMR03]	PMR03	1.6±0.15	0.8±0.15	0.25±0.15		0.35±0.15
2012 (0805) a.	<u></u>	MCR10				0.4±0.2	-
(3333)	103 W 2L00 W	KTR10	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4±0.2
		ESR10 TRR10				0.43 +0.15	-
IMCE	F/KTR/ESR/TRR] [PMR10]	PMR10	2.0±0.15	1.2±0.15	0.42 to 0.28* ±0.15	-0.1	0.75 to 0.35* ±0.15
3216		MCR18				0.5±0.25	
(1206) ^a	T T	KTR18			0.55±0.1	0.2.0.25	0.5±0.25
	103 W 2L00 W	ESR18	3.2±0.15	1.6±0.15		0.3±0.25	
b_	Ţt Þ	TRR18				0.69 ^{+0.2} _{-0.15}	
[MC	R/KTR/ESR/TRR] [PMR18]	PMR18			0.42 to 0.28* ±0.15		1.15 to 0.6* ±0.15
3225 (1210) ^a		MCR25			0.55±0.15	0.5±0.25	
	103 w 2L00 w	KTR25	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5±0.25
		ESR25			0.55±0.15	0.010.20	
	H- PMR25]	PMR25	3.2±0.2	2.5±0.2	0.52 to 0.32* ±0.15	0.5±0.2	1.0 to 0.8* ±0.2
5025 (2010) [≛] →	103 W 2L00 W	MCR50	5.0±0.15	2.5±0.15	0.55±0.15	0.6±0.25	0.6±0.25
b→	[MCR50] [PMR50]	PMR50	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
6432 (2512) =>	103 W 2L00 W	MCR100	6.3±0.15	3.2±0.15	0.55±0.15	0.6±0.25	0.6±0.25
<u>b</u> -	[MCR100] [PMR100]	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

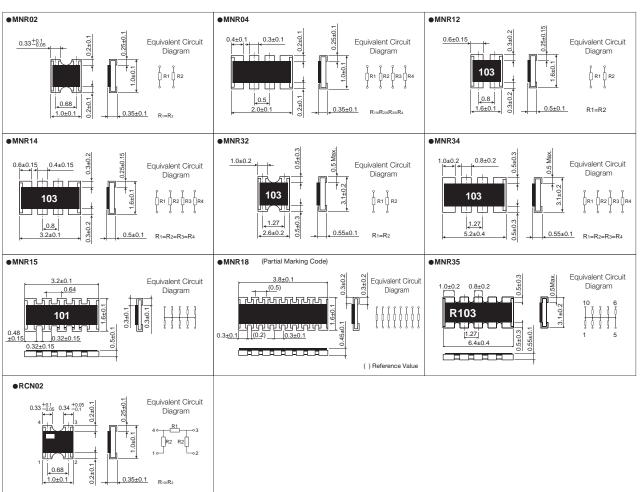
Note: Numbers in () indicate the size in inches

*May vary depending on the resistance value. For additional details, please consult with a local sales representative.





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