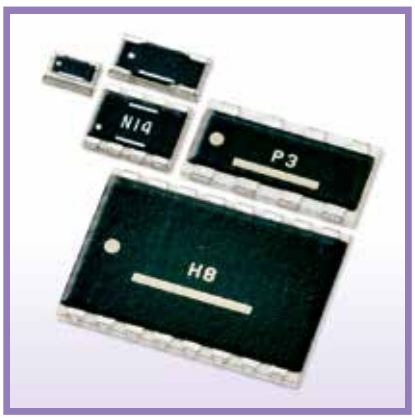

Lead free | Halogen free | RoHS Compliance

Metal thin film chip resistor networks

■RM series

AEC-Q200 Compliant

Features

- Relative resistance tolerance and relative TCR definable among multiple resistors within package.
- Relative resistance tolerance: ±0.01%, relative TCR: ±1ppm/°C
- Number of resistors in package: 2 or higher, standard and custom circuits designs available
- RG series equivalent reliability and long term stability: less than ±0.1% drift after 10000 hour stress test.
- RoHS compliant, 100% lead free

Applications

- Precision measurement instrumentation, medical electronics, automotive electronics
- Voltage divider and amplification circuits that require very precise relative resistance tolerance and TCR
- Multi step precision amplification circuits for minute signals

◆Part numbering system

RM 2012 A - */*** - P W X L 10**

- RM: Series code
- 2012: Size: RM2012, RM3216, RM3225
- A: circuits
- ***/***: Nominal Resistance Value(R1/R2)
- P: Absolute TCR
- W: Absolute resistance tolerance
- X: Relative TCR
- L: Relative resistance tolerance
- 10: Packaging quantity: 10(1,000pcs), 50(5,000pcs)

RM 3216 C - * - 10**

- RM: Series code
- 3216: Size: RM3216, RM3225, RM6432
- C: circuits
- ***: Custom part number (e.g.)N10
- 10: Packaging quantity: 10(1,000pcs), 50(5,000pcs)

※ **Please contact our sales office regarding custom products including resistance, resistance combination, number of elements, circuit, and others.**

※ **Standard quantity / reel is 1000 and 5000. Please contact our sales office for custom product's quantity / reel.**

※ **Standard resistance value pairings are shown as below (Standard products are 2element circuit typeA & typeB only.)**

◆Standard resistance value pairings

Ratio	R1 (Ω)	R2 (Ω)	Ratio	R1 (Ω)	R2 (Ω)	Ratio	R1 (Ω)	R2 (Ω)	Ratio	R1 (Ω)	R2 (Ω)	Ratio	R1 (Ω)	R2 (Ω)	Ratio	R1 (Ω)	R2 (Ω)
1 : 1	1k	1k	1 : 3	1k	3k	1 : 5	1k	5k	1 : 9	1k	9k	1 : 20	1k	20k	1 : 50	1K	50k
	10k	10k		10k	30k		2k	10k		10k	90k		2k	40k		2K	100k
	100k	100k		100k	300k		10k	50k	1 : 10	1k	10k		5k	100k	1 :100	1K	100k
1 : 2	1k	2k	1 : 4	1k	4k	1 : 6	1k	6k		2k	20k	1 : 25	1k	25k		2K	200k
	10k	20k		10k	40k		10k	60k		10k	100k		2k	50k			
	100k	200k															

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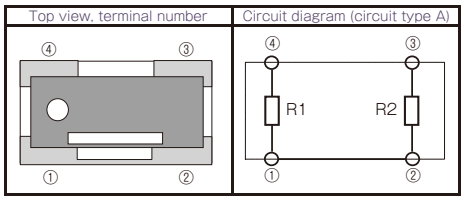
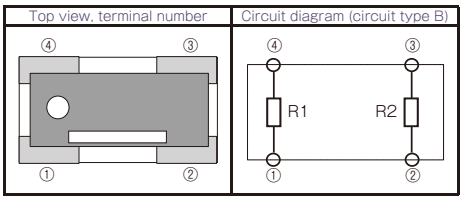
◆Electrical Specification

○ 4 terminal, 2 element

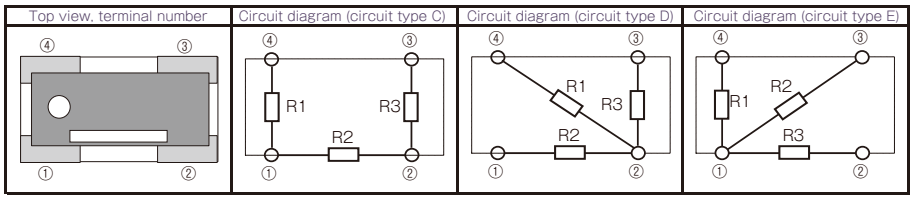




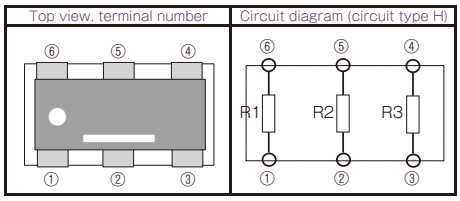
Type	Power ratings (85°C)	Resistance range (Ω)	Resistance tolerance (Code)				Temperature coefficient of resistance (Code)				Pakaging quantity (designation)
			Absolute tolerance	Tolerance ratio *1			Absolute TCR	TCR tracking *1			
				Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500		Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500	
RM2012	0.05W / Element 0.1W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 50=5,000pcs
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3216	0.063W / Element 0.125W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 500k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3225	0.1W / Element 0.2W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 500k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	

*1 Contact us for detailed information on relative tolerance and TCR.

○ 4 terminal, 3 element



○ 6 terminal, 3 element



Type	Power rating (85°C)	Resistance range (Ω)	Resistance tolerance (Code)				Temperature coefficient of resistance (Code)				Pakaging quantity (designation)
			Absolute tolerance	Tolerance ratio *1			Absolute TCR	TCR tracking *1			
				Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500		Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500	
RM3216	0.042W / Element 0.125W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 50=5,000pcs
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3225	0.066W / Element 0.2W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	

*1 Contact us for detailed information on relative tolerance and TCR.

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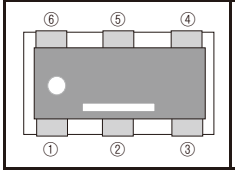
Metal thin film chip resistor networks

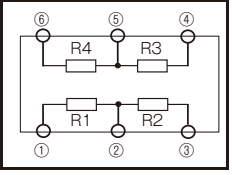
■RM series

○ 6 terminal, 4 element

Top view, terminal number



Circuit diagram (circuit type I)

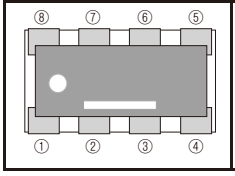


Type	Power ratings (85°C)	Resistance range (Ω)	Resistance tolerance (Code)				Temperature coefficient of resistance (Code)				Pakaging quantity (designation)
			Absolute tolerance	Tolerance ratio *1			Absolute TCR	TCR tracking *1			
				Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500		Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500	
RM3216	0.032W / Element 0.125W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 50=5,000pcs
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3225	0.05W / Element 0.2W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	

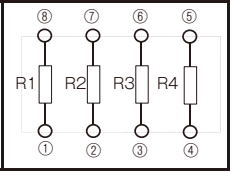
*1 Contact us for detailed information on relative tolerance and TCR.

○ 8 terminal, 4 element

Top view, terminal number



Circuit diagram (circuit type F)



Type	Power ratings (85°C)	Resistance range (Ω)	Resistance tolerance (Code)				Temperature coefficient of resistance (Code)				Pakaging quantity (designation)
			Absolute tolerance	Tolerance ratio *1			Absolute TCR	TCR tracking *1			
				Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500		Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500	
RM3216	0.032W / Element 0.125W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 50=5,000pcs
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3225	0.05W / Element 0.2W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM6432	0.1W / Element 0.4W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 40=4,000pcs
		300 ~ 1M	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	

*1 Contact us for detailed information on relative tolerance and TCR.

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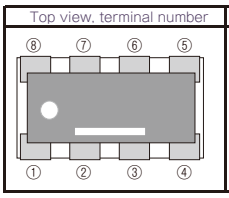
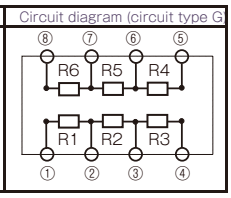
○ 8 terminal, 6 element

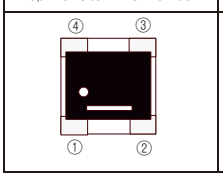
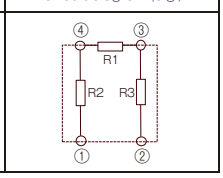
Top view, terminal number	Circuit diagram (circuit type G)
	

Type	Power ratings (85°C)	Resistance range (Ω)	Resistance tolerance (Code)				Temperature coefficient of resistance (Code)				Pakaging quantity (designation)
			Absolute tolerance	Tolerance ratio *1			Absolute TCR	TCR tracking *1			
				Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500		Resistance ratio =1	1< Resistance ratio ≦100	100< Resistance ratio ≦500	
RM3216	0.021W / Element 0.125W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	tape & reel (T&R) 10=1,000pcs 50=5,000pcs
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM3225	0.033W / Element 0.2W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 100k	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	
RM6432	0.066W / Element 0.4W / Package	100 ~<300	±0.1%(B) ±0.5%(D)	±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.05%(W) ±0.1%(B) ±0.5%(D)	-	±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	-	
		300 ~ 1M	±0.05%(W) ±0.1%(B) ±0.5%(D)	±0.01%(L) ±0.02%(P) ±0.05%(W) ±0.1%(B) ±0.5%(D)		±0.05%(W) ±0.1%(B) ±0.5%(D)	±5ppm/℃(V) ±10ppm/℃(N) ±25ppm/℃(P)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±1ppm/℃(X) ±2ppm/℃(W) ±5ppm/℃(V)	±2ppm/℃(W) ±5ppm/℃(V)	

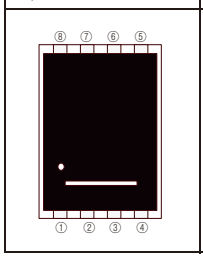
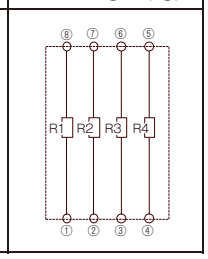
*1 Contact us for detailed information on relative tolerance and TCR.

○ Some examples of custom RM series

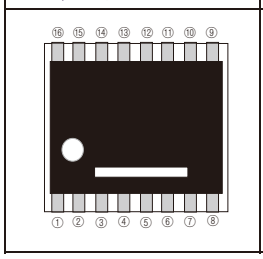
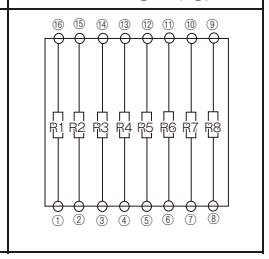
RM2525(2.5mm×2.5mm)

Top view, terminal number	Circuit diagram (e.g.)
	

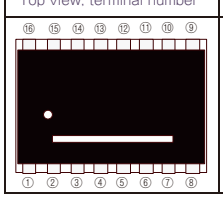
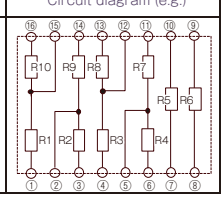
RM5882(5.8mm×8.2mm)

Top view, terminal number	Circuit diagram (e.g.)
	

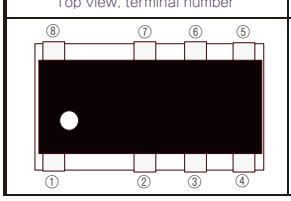
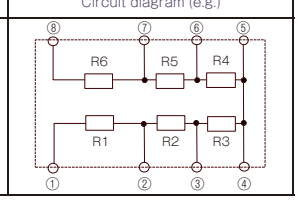
RM10280(10.2mm×7.2mm)

Top view, terminal number	Circuit diagram (e.g.)
	

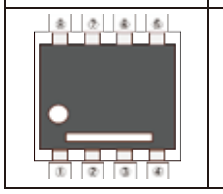
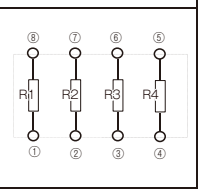
RM8258(8.2mm×5.8mm)

Top view, terminal number	Circuit diagram (e.g.)
	

RM11264(11.2mm×6.4mm)

Top view, terminal number	Circuit diagram (e.g.)
	

RM5050(5.0mm×5.0mm)

Top view, terminal number	Circuit diagram (e.g.)
	

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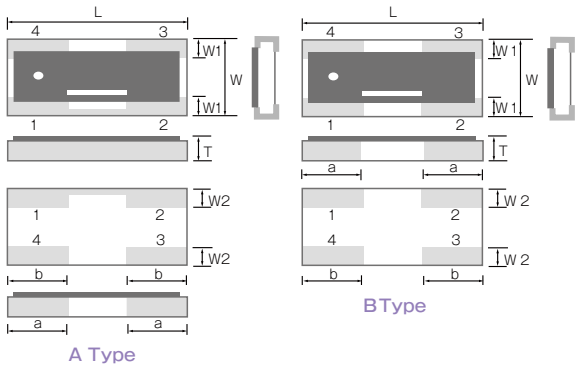
Metal thin film chip resistor networks

■RM series

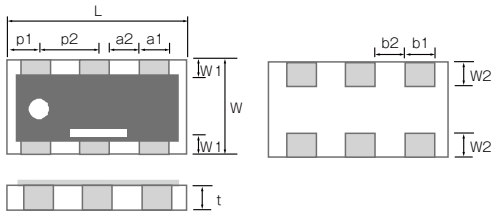
◆Dimensions



4 terminal

Type	Size (inch)	L	W	t	a	b	W1	W2
RM2012	0805	2.00±0.20	1.25±0.20	0.45±0.10	0.50±0.20	0.60±0.20	0.40±0.20	0.35±0.20
RM3216	1206	3.20±0.20	1.60±0.20	0.45±0.10	1.00±0.25	1.00±0.20	0.40±0.25	0.40±0.20
RM3225	1209	3.20±0.20	2.50±0.20	0.45±0.10	1.00±0.25	1.00±0.20	0.40±0.25	0.60±0.20

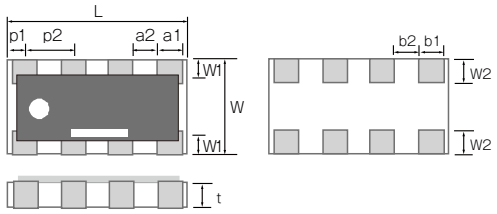
(unit : mm)



6 terminal

Type	Size (inch)	L	W	t	a1	a2	b1	b2	p1	p2	W1	W2
RM3216	1206	3.20±0.20	1.60±0.20	0.45±0.10	0.50±0.20	0.45±0.20	0.50±0.20	0.45±0.20	0.63±0.20	0.95±0.10	0.23±0.20	0.40±0.20
RM3225	1209	3.20±0.20	2.50±0.20	0.45±0.10	0.50±0.10	0.45±0.10	0.50±0.10	0.45±0.10	0.63±0.20	0.95±0.10	0.30±0.20	0.50±0.20

(unit : mm)



8 terminal

Type	Size (inch)	L	W	t	a1	a2	b1	b2	p1	p2	W1	W2
RM3216	1206	3.20±0.20	1.60±0.20	0.45±0.10	0.40±0.20	0.40±0.20	0.40±0.20	0.40±0.20	0.40±0.20	0.80±0.10	0.30±0.20	0.40±0.20
RM3225	1209	3.20±0.20	2.50±0.20	0.45±0.10	0.40 +0.20/-0.10	0.40 +0.10/-0.20	0.40 +0.10/-0.20	0.40 +0.10/-0.20	0.40±0.20	0.80±0.10	0.30±0.20	0.40±0.20
RM6432	2512	6.40±0.20	3.20±0.20	0.50±0.10	0.66 +0.20/-0.10	0.94 +0.10/-0.20	0.66 +0.20/-0.10	0.94 +0.10/-0.20	0.80±0.20	1.60±0.10	0.50±0.20	0.60±0.10

(unit : mm)

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◆Reliability specification

Test items	Condition (test methods (MIL-PRF-55342/JIS C5201-1)	Standard	
		Absolute tolerance	Relative tolerance
Short time overload	2.5 x rated voltage,*1 5seconds	±(0.05%+0.01Ω)	±0.02%
Life (biased)	85℃, rated voltage,*1 90min on 30min off, 1000hours	±(0.05%+0.01Ω)	±0.02%
High temperature high humidity	85℃, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours	±(0.05%+0.01Ω)	±0.02%
Temperature shock	-55℃ (38min) ~ 125℃ (30min) 1000cycles*2	±(0.05%+0.01Ω)	±0.02%
High temperature exposure	155℃, no bias, 100hours	±(0.05%+0.01Ω)	±0.02%
Resistance to soldering heat	260±5℃, 10 seconds (reflow)	±(0.05%+0.01Ω)	±0.02%

*1 Rated voltage is given by $E=\sqrt{R \times P}$
E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

*2 Based on the tests done on RM316.RM3225.
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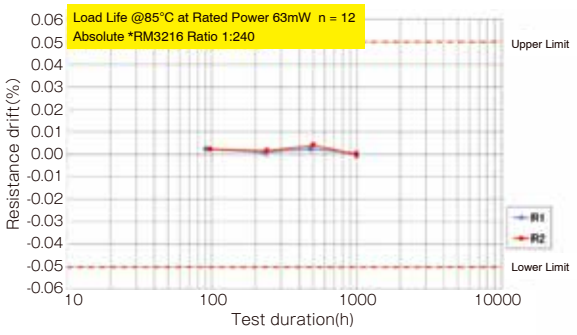
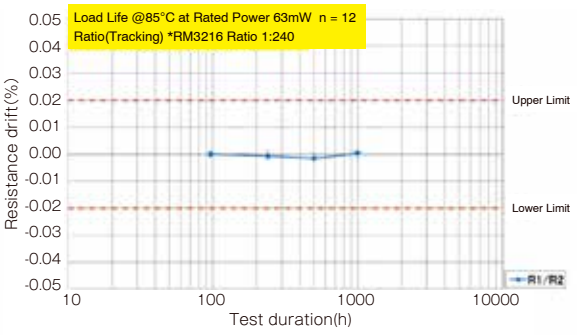
Metal thin film chip resistor networks

■RM series

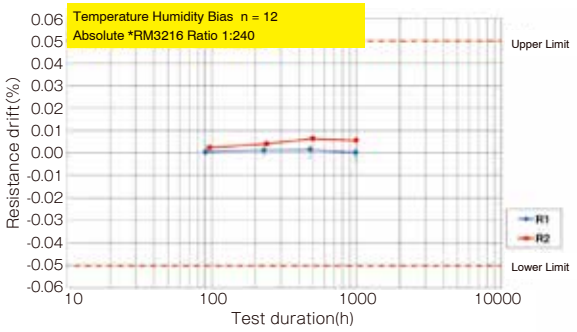
◆Reliability test data

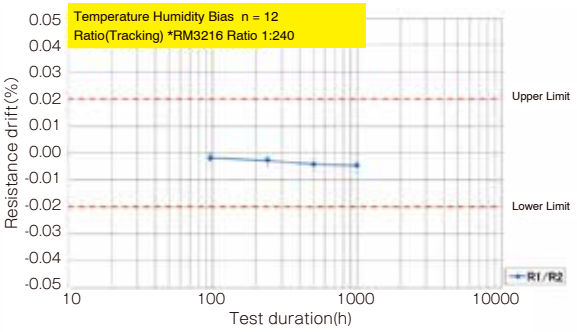
○Load life with rated power @85°C



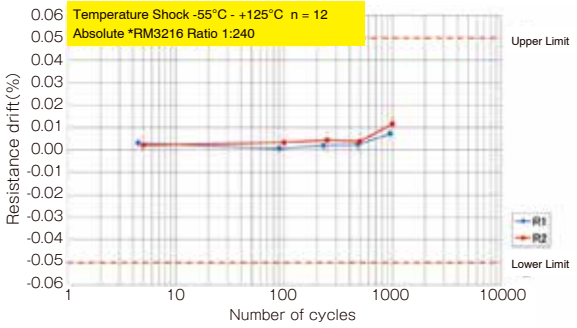


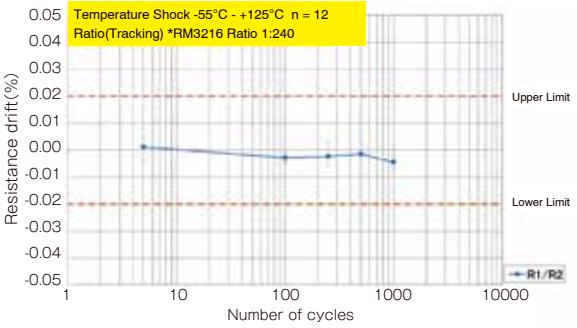
○High temperature high humidity (biased)



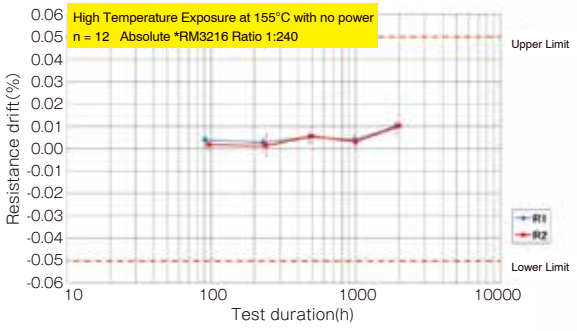


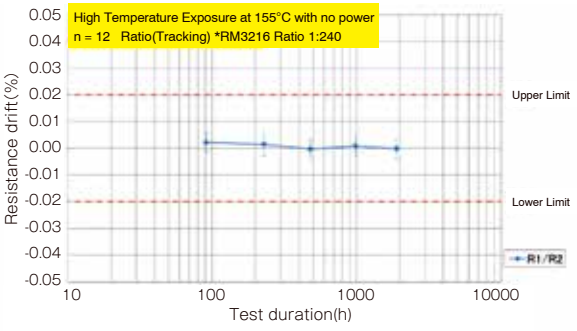
○Temperature shock





○High temperature exposure (155°C)





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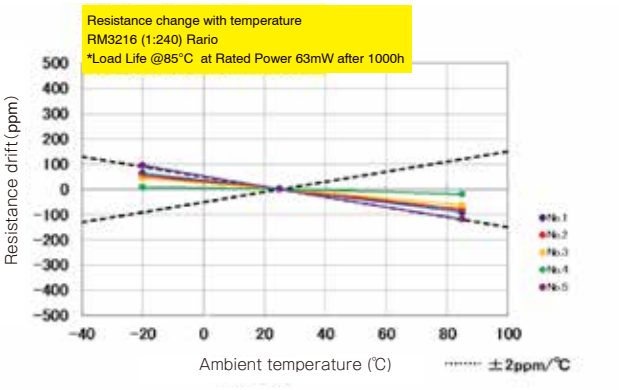
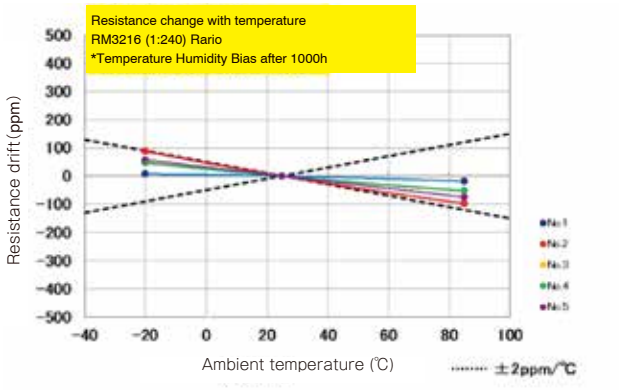
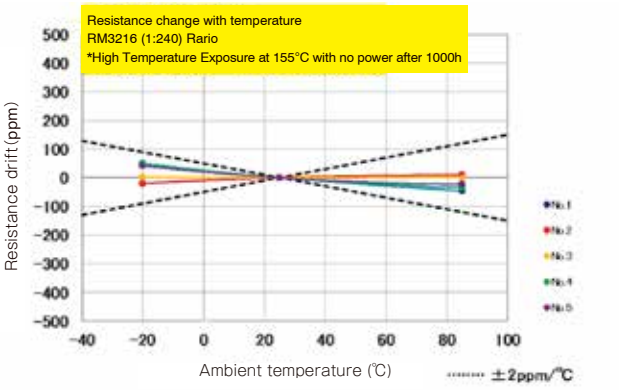
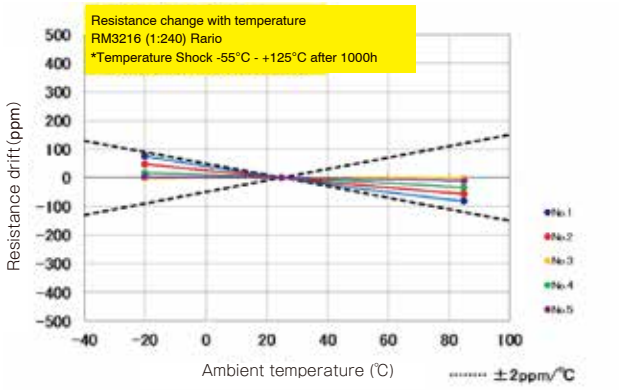
◆TCR linearity

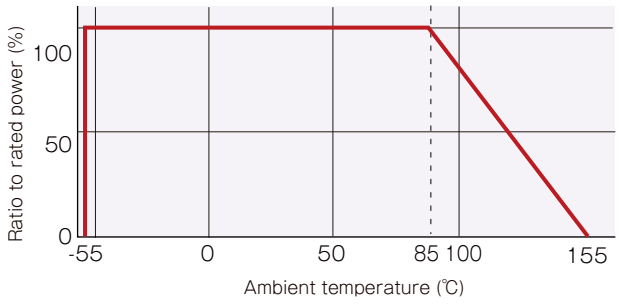








◆Derating Curve



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