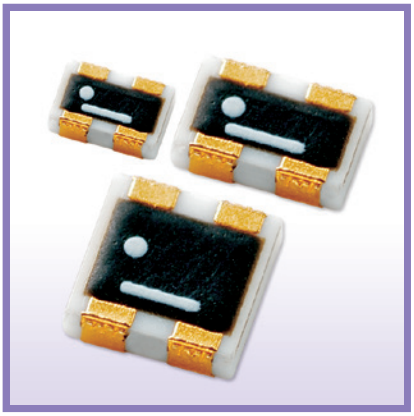


# High temperature metal thin film resistor networks

## ■RMA series

**AEC-Q200 Compliant**

Lead free　Halogen free　RoHS Compliance

## Features

- Conductive epoxy compatible chip resistor network
- Relative resistance tolerance: ±0.01%, relative TCR: ±1ppm/°C
- Operating temperature up to 230°C
- RoHS compliant, 100% lead free (gold terminal)
- Thin film structure enabling low noise and anti-sulfur

## Applications

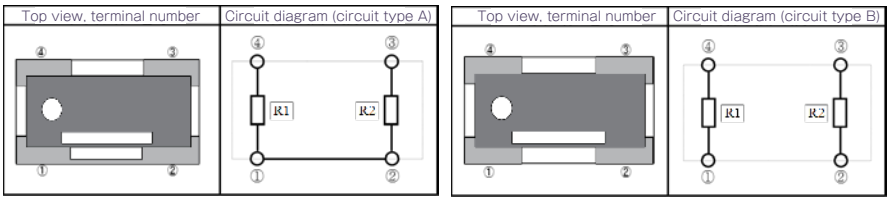
- Automotive electronics
- High temperature electronic devices
- Downhole drilling

## ◆Part numbering system

**RMA 2012 A - ***/*** P B V L 10**

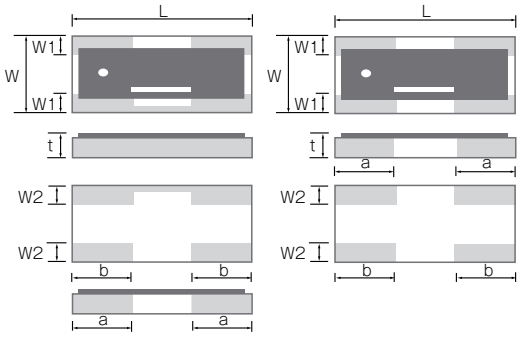
- RMA: Series code
- 2012: Size: RMA2012, RMA3216, RMA3225
- A: circuits
- ***/***: Nominal resistance value (E-24: 3 digit, E-96: all 4 digit)
- P: Absolute TCR
- B: Absolute resistance tolerance
- V: Relative TCR
- L: Relative resistance tolerance
- 10: Packaging quantity: 10(1,000pcs), 50(5,000pcs)

## ◆Electrical Specification




| Type | Power ratings (85°C) | Resistance range (Ω) | Resistance tolerance (Code) | | | Temperature coefficient of resistance (Code) | | | | Pakaging quantity (designation) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Absolute tolerance | Tolerance ratio | | Absolute TCR | TCR tracking | | | |
| | | | | Resistance ratio =1 | 1< Resistance ratio ≦100 | 100< Resistance ratio ≦500 | | Resistance ratio =1 | 1< Resistance ratio ≦100 | 100< Resistance ratio ≦500 | |
| RMA2012 | 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) | |
| RMA3216 | 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) | |
| RMA3225 | 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) | |

## ◆Dimensions




| Type | Size (inch) | L | W | t | a | b | W1 | W2 |
|---|---|---|---|---|---|---|---|---|
| RMA2012 | 0805 | 2.0±0.2 | 1.25±0.2 | 0.45±0.1 | 0.5±0.2 | 0.6±0.2 | 0.4±0.2 | 0.35±0.2 |
| RMA3216 | 1206 | 3.2±0.2 | 1.6±0.2 | 0.45±0.1 | 1.0±0.25 | 1.0±0.2 | 0.4±0.25 | 0.4±0.2 |
| RMA3225 | 1209 | 3.2±0.2 | 2.5±0.2 | 0.45±0.1 | 1.0±0.25 | 1.0±0.2 | 0.4±0.25 | 0.6±0.2 |

(unit : mm)

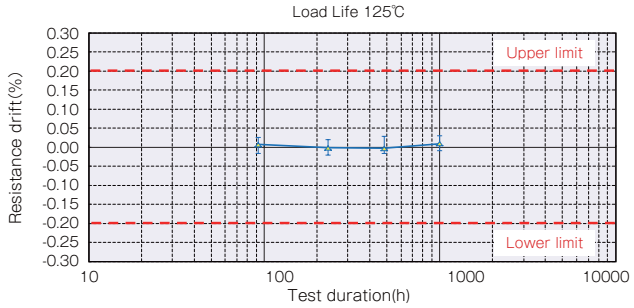
## ◆Reliability specification

| Test items | Condition (test methods (MIL-PRF-55342/JIS C5201-1) | Standard | |
|---|---|---|---|
| | | absolute | relative |
| Short time overload | 2.5 x rated voltage*1 5seconds | ±(0.1%+0.01Ω) | ±0.05% |
| Life (biased) | 70℃, rated voltage, 90min on 30min off, 1000hours | ±(0.1%+0.01Ω) | ±0.05% |
| Temperature shock | 85℃, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours | ±(0.1%+0.01Ω) | ±0.05% |
| High temperature exposure*2 | -55℃(30min) ~ 125℃(30min) 1000 cycles | ±(0.1%+0.01Ω) | ±0.05% |
| Resistance to soldering heat | 155℃, no bias, 1000hours | ±(0.1%+0.01Ω) | ±0.05% |

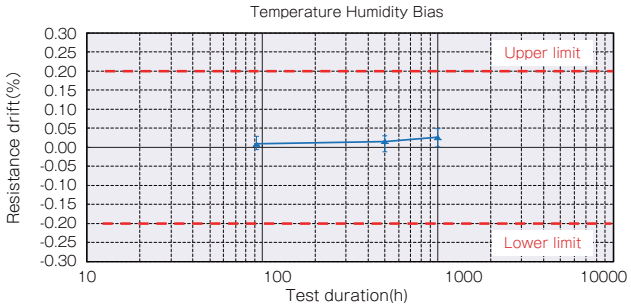
*1 Rated voltage is given by E=$\sqrt{R \times P}$ E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.
*2 Please contact our sales office for details.

## ◆Reliability test data

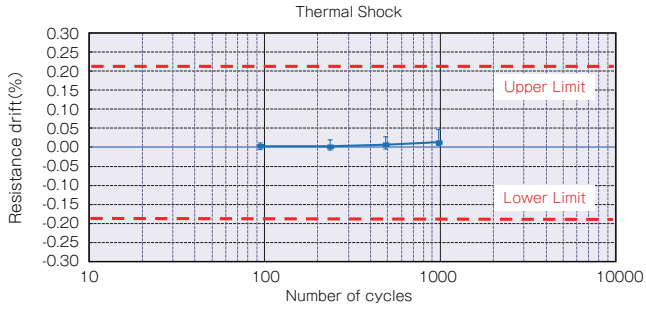
### ○Biased life test




### ○High temperature high humidity (biased)




### ○Temperature shock




## ◆Derating Curve