

# High temperature thin film chip resistors

■ RGA series

AEC-Q200 Compliant

## Features

- Conductive epoxy compatible
- Operating temperature up to 230°C
- Resistance tolerance:  $\pm 0.1\%$ , TCR:  $\pm 10\text{ppm}/^\circ\text{C}$
- Thin film structure enabling low noise and anti-sulfur

## Applications

- Automotive electronics
- Equipment used in high temperature
- Downhole drilling



Thin film surface mount resistors



RGA series

## ◆ Part numbering system

**RGA 2012 N - 104 - B - T1**

Series code

Size: RGA1005, RGA1608, RGA2012

Temperature coefficient of resistance

Nominal resistance value (E-24: 3digit, E-96: 4digit)

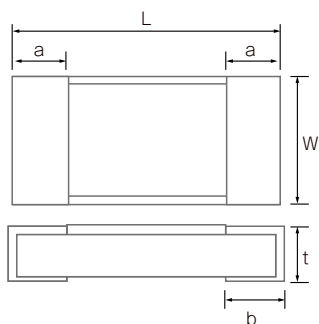
Packaging quantity:  
T1 (1,000pcs), T5 (5,000pcs)

Resistance tolerance

## ◆ Electrical Specification

| Type    | Power ratings | Temperature coefficient of resistance<br>(ppm/°C) | Resistance range(Ω)<br>Resistance tolerance |                         | Maximum voltage | Resistance value series | Operating temperature | Packaging quantity |
|---------|---------------|---|---|-------------------------|-----------------|-------------------------|-----------------------|--------------------|
|         |               |   | $\pm 0.1\%$ (B)                             | $\pm 0.5\%$ (D)         |                 |                         |                       |                    |
| RGA1005 | 1/32W         | $\pm 10$ (N)                                      | 47 $\leq$ R $\leq$ 100k                     |                         | 50V             | E-24, E-96              | -55°C ~ 230°C         | T1<br>T5           |
|         |               | $\pm 25$ (P)                                      | 10 $\leq$ R $\leq$ 100k                     |                         |                 |                         |                       |                    |
| RGA1608 | 1/16W         | $\pm 10$ (N)                                      | 47 $\leq$ R $\leq$ 274k                     |                         | 100V            | E-24, E-96              | -55°C ~ 230°C         | T1<br>T5           |
|         |               | $\pm 25$ (P)                                      | 10 $\leq$ R $\leq$ 332k                     | 10 $\leq$ R $\leq$ 360k |                 |                         |                       |                    |
| RGA2012 | 1/10W         | $\pm 10$ (N)                                      | 47 $\leq$ R $\leq$ 475k                     |                         | 150V            | E-24, E-96              | -55°C ~ 230°C         | T1<br>T5           |
|         |               | $\pm 25$ (P)                                      | 10 $\leq$ R $\leq$ 1M                       |                         |                 |                         |                       |                    |

## ◆ Dimensions



| Type    | Size (inch) | L                    | W                     | a               | b               | t                     |
|---------|-------------|----------------------|-----------------------|-----------------|-----------------|-----------------------|
| RGA1005 | 0402        | 1.00 $\pm$ 0.1/-0.05 | 0.50 $\pm$ 0.10       | 0.20 $\pm$ 0.10 | 0.25 $\pm$ 0.05 | 0.35 $\pm$ 0.05       |
| RGA1608 | 0603        | 1.60 $\pm$ 0.20      | 0.80 $\pm$ 0.25/-0.20 | 0.30 $\pm$ 0.20 | 0.30 $\pm$ 0.20 | 0.40 $\pm$ 0.15/-0.10 |
| RGA2012 | 0805        | 2.00 $\pm$ 0.20      | 1.25 $\pm$ 0.25/-0.20 | 0.40 $\pm$ 0.20 | 0.40 $\pm$ 0.20 | 0.40 $\pm$ 0.15/-0.10 |

(unit : mm)

## ◆ Reliability specification

| Test items                     | Condition (test methods (MIL-PRF-55342/JIS C5201-1))  | Standard      |
|--------------------------------|---|---------------|
| Short time overload            | 2.5 x rated voltage,*1 5seconds   | ±(0.1%+0.01Ω) |
| Life (biased)                  | 125°C, rated voltage,*1 90min on 30min off, 1000hours   | ±(0.2%+0.05Ω) |
| High temperature high humidity | 85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours   | ±(0.2%+0.01Ω) |
| Temperature shock              | -55°C (30min) ~ 125°C (30min) 1000cycles  | ±(0.2%+0.01Ω) |
| High temperature exposure      | 155°C, no bias, 1000hours   | ±(0.2%+0.05Ω) |
| Vibration                      | Frequency 10Hz ~ 500Hz, vibration amplitude 1.5mm or acceleration 10gn<br>test duration for each of 3 axis: 6 hours | ±(0.2%+0.05Ω) |
| Resistance to soldering heat   | 260±5°C, 10 seconds (reflow)  | ±(0.5%+0.01Ω) |

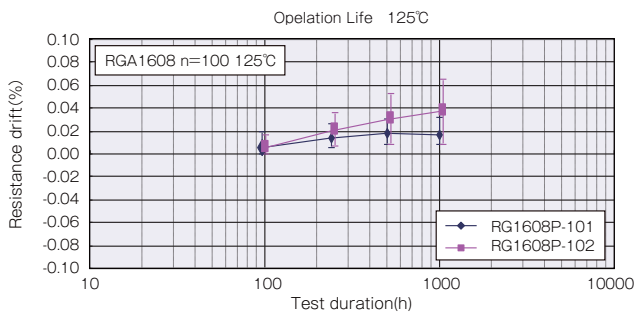
\*1 Rated voltage is given by  $E = \sqrt{R \times P}$   
 E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)  
 If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

Thin film surface mount resistors

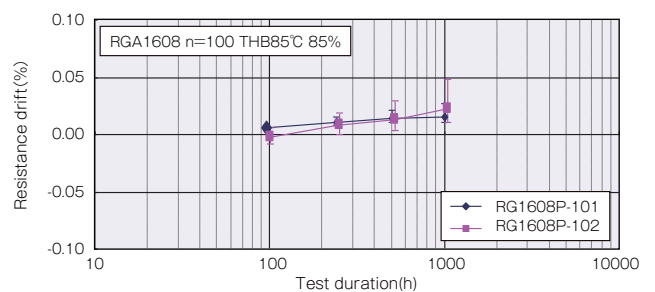
RGA series

## ◆ Reliability test data

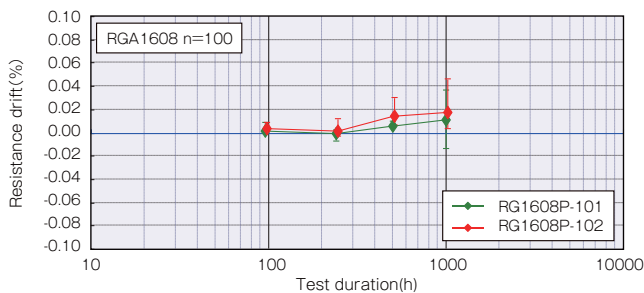
### ○ Biased life test



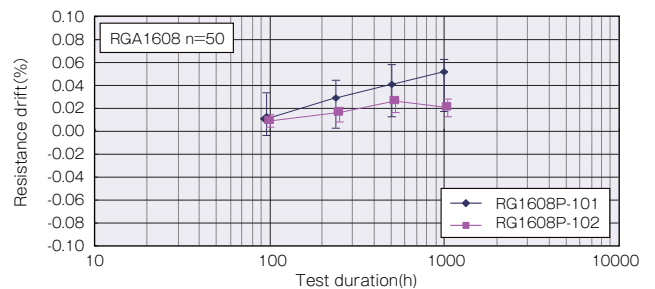
### ○ High temperature high humidity (biased)



### ○ Temperature shock



### ○ High temperature exposure



## ◆ Derating Curve

