



**THE DATASHEET OF  
RG1608N-272-W-T5**



# Metal thin film chip resistors (the highest precision)

■ RG series

AEC-Q200 Compliant

## Features

- Long term stability with inorganic passivation
- Less than  $\pm 0.1\%$  drift after 10000 hours of reliability test
- High precision resistance tolerance:  $\pm 0.05\%$ , very small TCR:  $\pm 5\text{ppm}/^\circ\text{C}$
- Thin film structure enabling low noise and anti-sulfur

## Applications

- Automotive electronics
- Industrial measurement instrumentation, industrial machines
- Various sensors, medical electronics

Thin film surface mount resistors



RG series

## ◆ Part numbering system

**RG 1608 N - 102 - B - T5**

Series code

Size: RG1005, RG1608, RG2012, RG3216

Temperature coefficient of resistance

Packaging quantity:  
T5(5,000pcs), T10(10,000pcs)

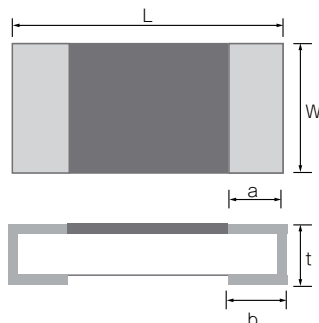
Resistance tolerance

Nominal resistance value  
(E-24: 3 digit, E-96: 4 digit, RG3216: all 4 digit)

## ◆ Electrical Specification

| Type   | Power ratings |         |      | Temperature coefficient of resistance (ppm/ $^\circ\text{C}$ ) | Resistance range ( $\Omega$ ) Resistance tolerance (%) |                         |                         |                       | Maximum voltage | Resistance value series | Operating temperature                          | Packaging quantity |
|--------|---------------|---------|------|--|--|-------------------------|-------------------------|-----------------------|-----------------|-------------------------|--|--------------------|
|        | Low           | Regular | High |  | $\pm 0.02\%$ (P)                                       | $\pm 0.05\%$ (W)        | $\pm 0.1\%$ (B)         | $\pm 0.5\%$ (D)       |                 |                         |  |                    |
| RG1005 | 1/32W         | 1/16W   | 1/8W | $\pm 5$ (V)  | 100 $\leq$ R<3k  |                         |                         |                       | 75V             |                         |  | T5<br>T10          |
|        |               |         |      | $\pm 10$ (N)   | 100 $\leq$ R<3k  | 47 $\leq$ R<100k        |                         |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 25$ (P)   | 100 $\leq$ R<3k  | 47 $\leq$ R<100k        |                         | 47 $\leq$ R<150k      |                 |                         |  |                    |
|        |               |         |      | $\pm 100$ (R)  | —  | —                       | —                       | 10 $\leq$ R<47        |                 |                         |  |                    |
| RG1608 | 1/16W         | 1/10W   | 1/6W | $\pm 5$ (V)  | 100 $\leq$ R<5.1k                                      |                         |                         |                       | 100V            | E-24,<br>E-96           | -55 $^\circ\text{C}$<br>~ 155 $^\circ\text{C}$ | T5                 |
|        |               |         |      | $\pm 10$ (N)   | 100 $\leq$ R<5.1k                                      | 47 $\leq$ R $\leq$ 270k |                         |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 25$ (P)   | 100 $\leq$ R<5.1k                                      | 47 $\leq$ R $\leq$ 270k | 47 $\leq$ R $\leq$ 332k | 47 $\leq$ R $\leq$ 1M |                 |                         |  |                    |
|        |               |         |      | $\pm 50$ (Q)   | —  | —                       | —                       | 10 $\leq$ R<47        |                 |                         |  |                    |
| RG2012 | 1/10W         | 1/8W    | 1/4W | $\pm 5$ (V)  | 100 $\leq$ R<10.2k                                     |                         |                         |                       | 150V            |                         |  | T5                 |
|        |               |         |      | $\pm 10$ (N)   | 100 $\leq$ R<10.2k                                     | 47 $\leq$ R $\leq$ 475k |                         |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 25$ (P)   | 100 $\leq$ R<10.2k                                     | 47 $\leq$ R $\leq$ 475k | 47 $\leq$ R $\leq$ 2.7M |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 50$ (Q)   | —  | —                       | —                       | 10 $\leq$ R<47        |                 |                         |  |                    |
| RG3216 | 1/8W          | 1/4W    | —    | $\pm 5$ (V)  | 100 $\leq$ R<33.2k                                     |                         |                         |                       | 200V            |                         |  |                    |
|        |               |         |      | $\pm 10$ (N)   | 100 $\leq$ R<33.2k                                     | 47 $\leq$ R $\leq$ 1M   |                         |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 25$ (P)   | 100 $\leq$ R<33.2k                                     | 47 $\leq$ R $\leq$ 1M   | 47 $\leq$ R $\leq$ 5.1M |                       |                 |                         |  |                    |
|        |               |         |      | $\pm 50$ (Q)   | —  | —                       | —                       | 10 $\leq$ R<47        |                 |                         |  |                    |

## ◆ Dimensions



| Type   | Size (inch) | L                    | W               | a               | b               | t               |
|--------|-------------|----------------------|-----------------|-----------------|-----------------|-----------------|
| RG1005 | 0402        | 1.00 $\pm$ 0.1/-0.05 | 0.50 $\pm$ 0.05 | 0.20 $\pm$ 0.10 | 0.25 $\pm$ 0.05 | 0.35 $\pm$ 0.05 |
| RG1608 | 0603        | 1.60 $\pm$ 0.20      | 0.80 $\pm$ 0.20 | 0.30 $\pm$ 0.20 | 0.30 $\pm$ 0.20 | 0.40 $\pm$ 0.10 |
| RG2012 | 0805        | 2.00 $\pm$ 0.20      | 1.25 $\pm$ 0.20 | 0.40 $\pm$ 0.20 | 0.40 $\pm$ 0.20 | 0.40 $\pm$ 0.10 |
| RG3216 | 1206        | 3.20 $\pm$ 0.20      | 1.60 $\pm$ 0.20 | 0.50 $\pm$ 0.25 | 0.50 $\pm$ 0.20 | 0.40 $\pm$ 0.10 |

(unit : mm)

### ◆ Reliability specification

| Test Items                     | Condition (test methods)  | Low    |        | Regular |        | High |        | Typical  |
|--------------------------------|---|--------|--------|---------|--------|------|--------|----------|
|                                |   | ≤47Ω   | ≥47Ω   | ≤47Ω    | ≥47Ω   | ≤47Ω | ≥47Ω   | Low      |
| Short time overload            | 2.5 x rated voltage,*1 5 seconds                                | ±0.10% | ±0.05% | ±0.10%  | ±0.05% | —    | ±0.10% | ±(0.01%) |
| Life (biased)                  | 70°C, rated voltage,*1 90min on 30min off, 1000hours            | ±0.25% | ±0.10% | ±0.50%  | ±0.25% | —    | ±0.50% | ±(0.01%) |
| High temperature high humidity | 85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours | ±0.25% | ±0.10% | ±0.50%  | ±0.25% | —    | ±0.50% | ±(0.05%) |
| Temperature shock              | -55°C (30min) ~ 125°C (30min) 1000cycles                        | ±0.25% | ±0.10% | ±0.25%  | ±0.10% | —    | ±0.10% | ±(0.01%) |
| High temperature exposure      | 155°C, no bias, 1000hours                                       | ±0.25% | ±0.10% | ±0.25%  | ±0.10% | —    | ±0.10% | ±(0.01%) |
| Resistance to soldering heat   | 260±5°C, 10 seconds (reflow)                                    | ±0.1%  | ±0.1%  | ±0.1%   | ±0.1%  | —    | ±0.1%  | ±(0.01%) |

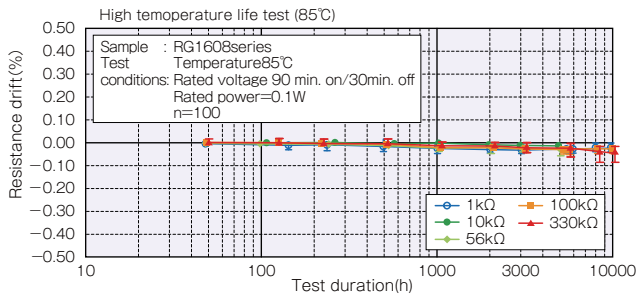
\*1 Rated voltage is given by  $E = \sqrt{R \times P}$  E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)  
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

Thin film surface mount resistors

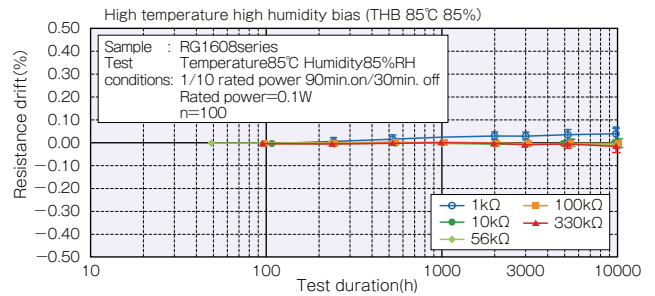
RG series

### ◆ 10000 hour reliability test data

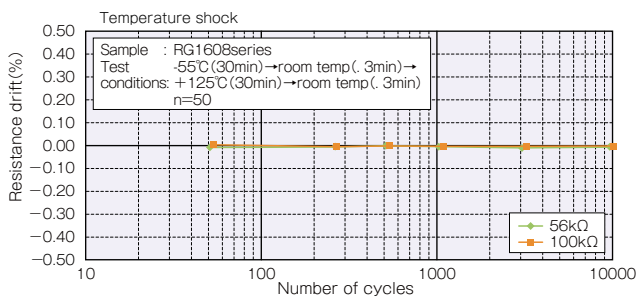
#### ○ Biased life test



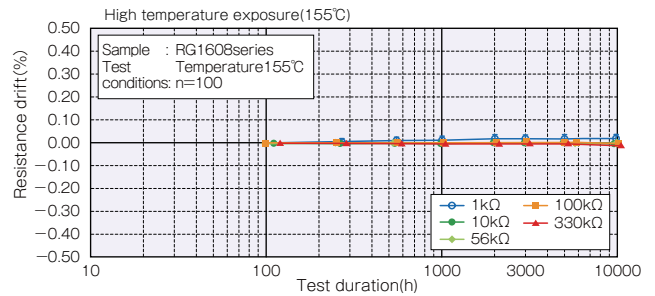
#### ○ High temperature high humidity (biased)



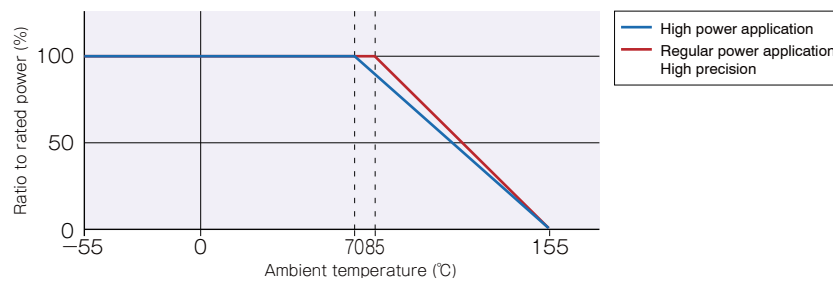
#### ○ Temperature shock



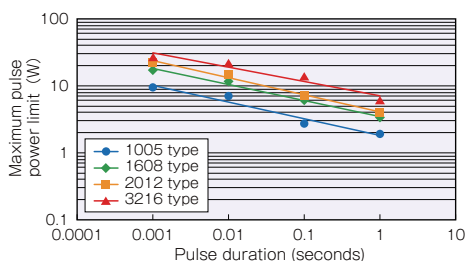
#### ○ High temperature exposure



### ◆ Derating Curve



### ◆ Maximum pulse power limit





#### Test procedure

Voltage pulse is applied to the test samples mounted on the test board.  
After each pulse, resistance drift is measured. Pulse voltage is increased until the drift exceeds +/-0.5%.  
The power at that voltage is defined as the maximum pulse power.

## Looking for pricing, stock, or lifecycle information?

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-  [Susumu Information](#)

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