

# Metal thin film chip resistors (Ultra-precision)

■ RG series (This series now includes the former RGH series.) AEC-Q200 Compliant

## Features

- Ultimate chip resistors: the result of all of our thin film technology expertise including inorganic passivation
- Resistance drift: less than +/-0.1% after 10000 hour accelerated reliability test
- +/-0.02% of resistance tolerance and +/-5ppm/°C of temperature coefficient of resistance
- Excellent tolerance to power surges

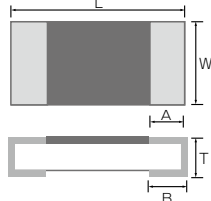
## Applications

- Any applications that require precision resistors such as automotive electronics, industrial test and measurement equipment, and consumer electronics

## Specifications

\* Standard stock item: E-24 series with TOR P, Q, and R grades, as well as tolerance D and B grades. Other E-24 grades and E-96 series are made to order

### Dimensions



| Dimension (inch) | RG1005 (0402) | RG1608 (0603) | RG2012 (0805) | RG3216 (1206) |
|------------------|---------------|---------------|---------------|---------------|
| L                | 1.00±0.05     | 1.60±0.20     | 2.00±0.20     | 3.20±0.20     |
| W                | 0.50±0.05     | 0.80±0.20     | 1.25±0.20     | 1.60±0.20     |
| A                | 0.20±0.10     | 0.30±0.20     | 0.40±0.20     | 0.50±0.25     |
| B                | 0.25±0.05     | 0.30±0.20     | 0.40±0.20     | 0.50±0.20     |
| T                | 0.35±0.05     | 0.40±0.10     | 0.40±0.10     | 0.40±0.10     |

NOTE Obsolete : RGH1005-2B (0402) RGH1608-2C (0603) RGH2012-2E (0805)  
Alternative P/N : RG1005 (0402) RG1608 (0603) RG2012 (0805)

### Electrical characteristics

| Series name                                    | RG1005                                                                                                      | RG1608                                                           |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Rated power*1                                  | High power application: 1/8W (OLD: RGH1005-2B)<br>Regular power application: 1/16W<br>High precision: 1/32W | 1/6W (OLD: RGH1608-2C)<br>1/10W<br>1/16W                         |
| E series offered                               | 10~46.4, 47~97.6, 100~294k, 3k~100k                                                                         | 10~46.4, 47~97.6, 100~499k, 5.1k~270k, 274~332k, 340~360k        |
| Resistance range (Ω)                           | 10~46.4, 47~97.6, 100~294k, 3k~100k                                                                         | 10~46.4, 47~97.6, 100~499k, 5.1k~270k, 274~332k, 340~360k        |
| Resistance tolerance (%)                       | ±0.02% (P)<br>±0.05% (W)<br>±0.1% (B)<br>±0.25% (C)<br>±0.5% (D)                                            | ±0.02% (P)<br>±0.05% (W)<br>±0.1% (B)<br>±0.25% (C)<br>±0.5% (D) |
| Temperature coefficient of resistance (ppm/°C) | ±5 (V)<br>±10 (N)<br>±25 (P)<br>±50 (Q)<br>±100 (R)                                                         | ±5 (V)<br>±10 (N)<br>±25 (P)<br>±50 (Q)<br>±100 (R)              |
| Maximum voltage                                | 50V                                                                                                         | 100V                                                             |
| Operating temperature                          | -55°C~155°C                                                                                                 | -55°C~155°C                                                      |
| Packaging                                      | 5,000pcs CodeT5<br>10,000pcs CodeT10                                                                        | CodeT5                                                           |

| Series name                                    | RG2012                                                                                                     | RG3216                                                           |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Rated power*1                                  | High power application: 1/4W (OLD: RGH2012-2E)<br>Regular power application: 1/8W<br>High precision: 1/10W | 1/4W<br>1/8W                                                     |
| E series offered                               | 10~46.4, 47~97.6, 100~10k, 10.2k~475k, 487k~1M                                                             | 10~46.4, 47~97.6, 100~33.2k, 34k~1M                              |
| Resistance range (Ω)                           | 10~46.4, 47~97.6, 100~10k, 10.2k~475k, 487k~1M                                                             | 10~46.4, 47~97.6, 100~33.2k, 34k~1M                              |
| Resistance tolerance (%)                       | ±0.02% (P)<br>±0.05% (W)<br>±0.1% (B)<br>±0.25% (C)<br>±0.5% (D)                                           | ±0.02% (P)<br>±0.05% (W)<br>±0.1% (B)<br>±0.25% (C)<br>±0.5% (D) |
| Temperature coefficient of resistance (ppm/°C) | ±5 (V)<br>±10 (N)<br>±25 (P)<br>±50 (Q)                                                                    | ±5 (V)<br>±10 (N)<br>±25 (P)<br>±50 (Q)                          |
| Maximum voltage                                | 150V                                                                                                       | 200V                                                             |
| Operating temperature                          | -55°C~155°C                                                                                                | -55°C~155°C                                                      |
| Packaging                                      | 5,000pcs CodeT5                                                                                            | CodeT5                                                           |

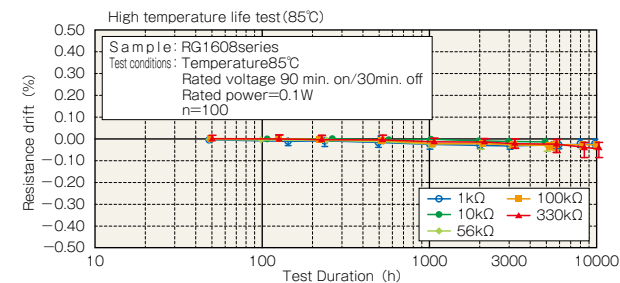
\*1 Depending on customer's reliability requirements, power rating between high power and regular power can be selected.  
· Contact us for RG3225 with 1/2W rated power.

## Reliability characteristics

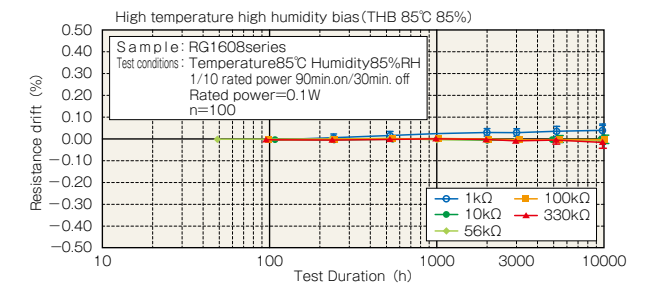
| Item                      | Test Method                                                                                                                               | Specification: drift limits for each power rating |        |                 |        |              |        | (Typical) |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------|-----------------|--------|--------------|--------|-----------|
|                           |                                                                                                                                           | Low<br>≤47Ω                                       | ≥47Ω   | Regular<br>≤47Ω | ≥47Ω   | High<br>≤47Ω | ≥47Ω   |           |
| Short time Overload       | Applied voltage : 2.5 times. Test duration: 5 seconds. (When maximum operating voltage: 2 times or less)                                  | ±0.10%                                            | ±0.05% | ±0.10%          | ±0.05% | -            | ±0.10% | ±(0.01%)  |
| Load Life                 | Test temperature : 85°C (When high voltage : 70°C). Applied voltage : rated voltage. Repeat 1000 hours as follow : 90 mins on/30mins off. | ±0.25%                                            | ±0.10% | ±0.50%          | ±0.25% | -            | ±0.50% | ±(0.01%)  |
| Moisture load life        | Test condition: 85°C, 85% RH. Applied power : 1/10 rated power. Repeat 1000 hours as follow : 90 mins on/30mins off.                      | ±0.25%                                            | ±0.10% | ±0.50%          | ±0.25% | -            | ±0.50% | ±(0.05%)  |
| Temperature Cycle         | Repeat 1000 cycle as follow :<br>-55°C (30 min.)/Room Temp.(2 min.) / +125°C (30min.)/Room Temp.(2min.)                                   | ±0.25%                                            | ±0.10% | ±0.25%          | ±0.10% | -            | ±0.10% | ±(0.01%)  |
| High temperature Exposure | +155°C for 1000 hours with no load                                                                                                        | ±0.25%                                            | ±0.10% | ±0.25%          | ±0.10% | -            | ±0.10% | ±(0.01%)  |

## 10000 hour reliability test data

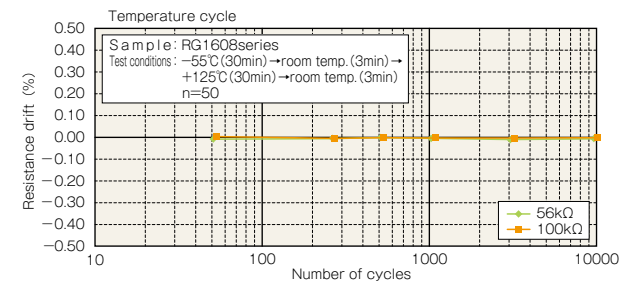
### Life test



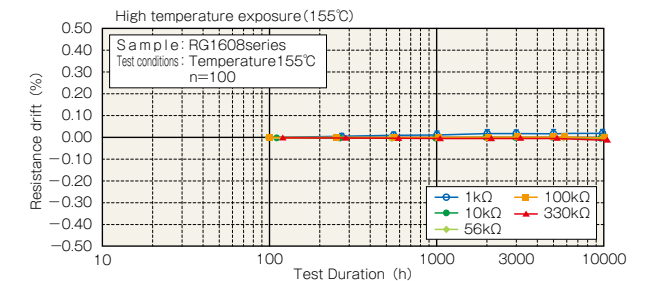
### High temperature high humidity bias test



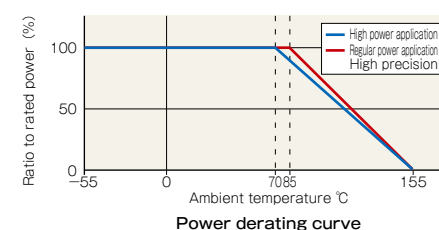
### Temperature cycle test



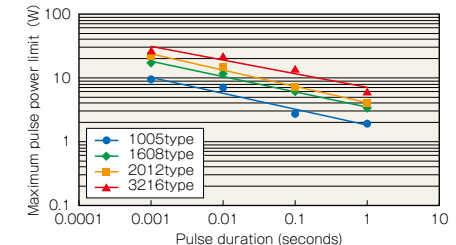
### High temperature exposure test



## Power derating characteristics



## 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.

## Part numbering system

