# THE DATASHEET OF

# RG1608N-222-B-T5


Lead free　Halogen free　RoHS Compliance

# Metal thin film chip resistors
## (the highest precision)

**■RG series**　　**AEC-Q200 Compliant**

### Features

- Long term stability with inorganic passivation
- Less than ±0.1% drift after 10000 hors of reliability test
- High precision resistance tolerance: ±0.05%, very small TCR: ±5ppm/℃
- Thin film structure enabling low noise and anti-sulfur

### Applications

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

## ◆Part numbering system

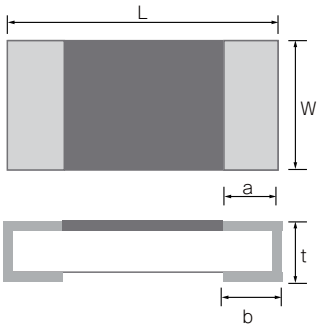
**RG　1608　N - 102 - B - T5**

- RG: Series code
- 1608: Size: RG1005, RG1608, RG2012, RG3216
- N: Temperature coefficient of resistance
- 102: Nominal resistance value (E-24: 3 digit, E-96: 4 digit, RG3216: all 4 digit)
- B: Resistance tolerance
- T5: Packaging quantity: T5(5,000pcs), T10(10,000pcs)

## ◆Electrical Specification

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

## ◆Dimensions




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

(unit : mm)

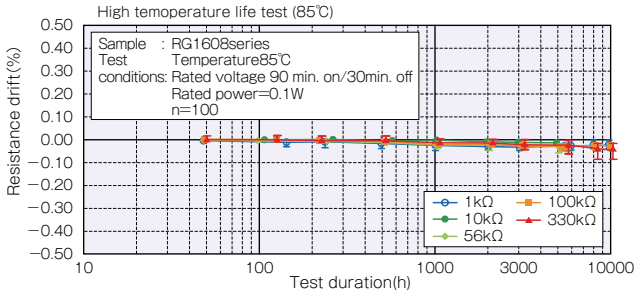
## ◆Reliability specification

| 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℃, 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℃, 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℃ (30min) ~ 125℃ (30min) 1000cycles | ±0.25% | ±0.10% | ±0.25% | ±0.10% | — | ±0.10% | ±(0.01%) |
| High temperature exposure | 155℃, no bias, 1000hours | ±0.25% | ±0.10% | ±0.25% | ±0.10% | — | ±0.10% | ±(0.01%) |
| Resistance to soldering heat | 260±5℃, 10 seconds (reflow) | ±0.1% | ±0.1% | ±0.1% | ±0.1% | — | ±0.1% | ±(0.01%) |

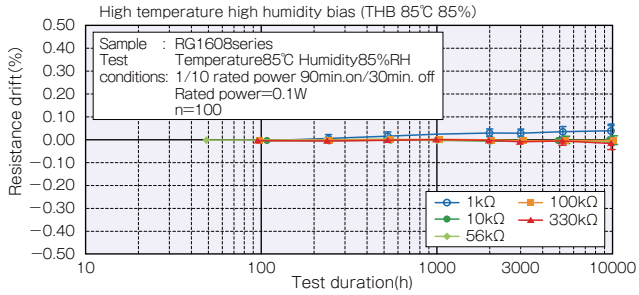
*1 Rated voltage is given by E= $\sqrt{R \times P}$ E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

## ◆10000 hour reliability test data

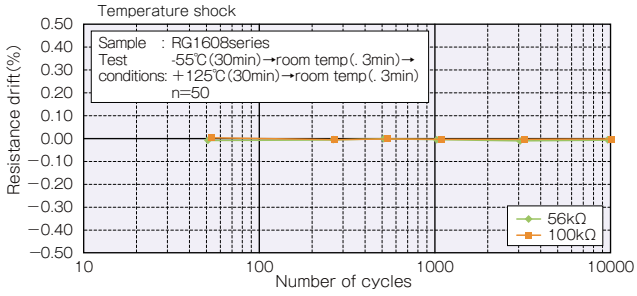
### ○Biased life test



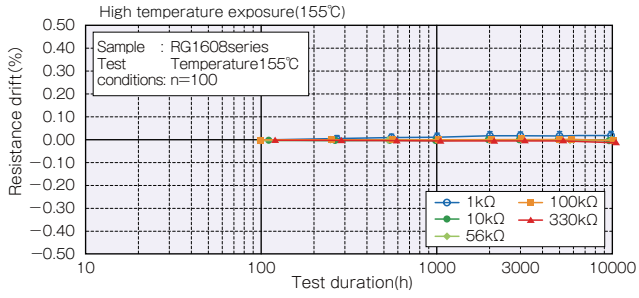

### ○High temperature high humidity (biased)



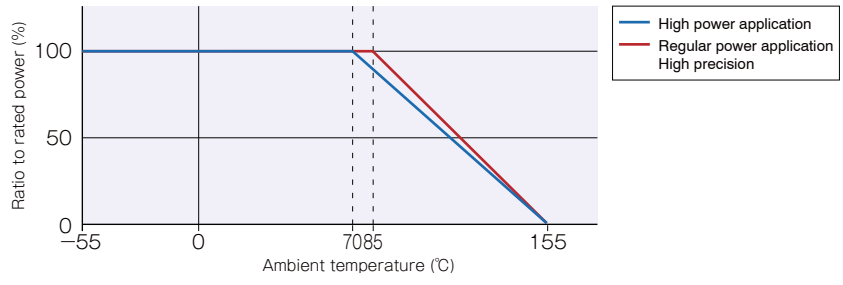

### ○Temperature shock



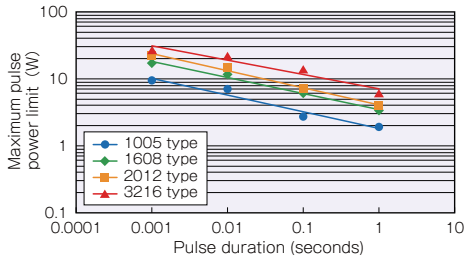

### ○High temperature exposure




## ◆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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