

RG series, ultra-precision & ultra-reliability metal film chip resistors

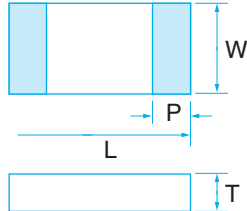


Tight resistance tolerance of $\pm 0.02\%$ and temperature coefficient of resistance of $5\text{ppm}/^\circ\text{C}$ are achieved. Under high temperature and humid condition of 85°C and $85\%\text{RH}$, and at 155°C (duration: 8000 hours for both tests), superior reliability of only less than $\pm 0.1\%$ of change in resistance value is realized.



SPECIFICATIONS

Mechanical



| Dimension (mm) | RG1005 (0402) | RG1608 (0603) | RG2012 (0805) | RG3216 (1206) |
|----------------|-----------------|---------------|----------------|----------------|
| L | 1.0 ± 0.05 | 1.6 ± 0.2 | 2.0 ± 0.2 | 3.2 ± 0.2 |
| W | 0.5 ± 0.05 | 0.8 ± 0.2 | 1.25 ± 0.2 | 1.6 ± 0.2 |
| P | 0.2 ± 0.10 | 0.3 ± 0.2 | 0.4 ± 0.2 | 0.5 ± 0.25 |
| T | 0.35 ± 0.05 | 0.4 ± 0.1 | 0.4 ± 0.1 | 0.4 ± 0.1 |

Electrical

| Type | RG1005 | | | | RG1608 | | | | | | |
|---|--|--|---|--|--|--|---|--|------------------------------|--------------|--------------|
| Power | general | 1/16W | | | | 1/10W | | | | | |
| | Ultra-reliability | 1/32W | | | | 1/16W | | | | | |
| Resistance Tolerance (%) | $\pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.02(P), \pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.02(P), \pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.1(B)$ | $\pm 0.5(D)$ | $\pm 0.5(D)$ |
| Resistance Range (Ω) | 10~46.4 | 47~97.6 | 100~2.94k | 3k~100k | 10~46.4 | 47~97.6 | 100~4.99k | 5.1k~270k | 274~332k | 340~360k | |
| Temperature Coefficient of Resistance ppm / $^\circ\text{C}$ (code) | $\pm 100 (R)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 5 (V)$ $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 50 (Q)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 25 (P)$ | $\pm 25 (P)$ |
| Maximum Operating Voltage | 25V | | | | 75V | | | | | | |
| Resistance Value | E-24, E-96 | | | | | | | | | | |
| Operating Tem. Range | $-55^\circ\text{C} \sim 155^\circ\text{C}$ | | | | | | | | | | |
| Package | 1,000pcs/reel (T1:P,W), 10,000pcs/reel (T10:B,C,D) | | | | 1,000pcs/reel (T1:P,W,B), 5,000pcs/reel (T5:B,C,D) | | | | | | |

| Type | RG2012 | | | | | RG3216 | | | |
|---|--|--|---|--|--------------|------------------------------|--|---|--|
| Power | general | 1/8W | | | | | 1/4W | | |
| | Ultra-reliability | 1/10W | | | | | 1/8W | | |
| Resistance Tolerance (%) | $\pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.02(P), \pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.1(B)$ | $\pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.02(P), \pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ | $\pm 0.05(W), \pm 0.1(B), \pm 0.25(C), \pm 0.5(D)$ |
| Resistance Range (Ω) | 10~46.4 | 47~97.6 | 100~10k | 10.2k~475k | 487k~1M | 47~97.6 | 100~33.2k | 34k~1M | |
| Temperature Coefficient of Resistance ppm / $^\circ\text{C}$ (code) | $\pm 50 (Q)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 5 (V)$ $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | $\pm 10 (N)$ $\pm 25 (P)$ | |
| Maximum Operating Voltage | 100V | | | | | 150V | | | |
| Resistance Value | E-24, E-96 | | | | | | | | |
| Operating Tem. Range | $-55^\circ\text{C} \sim 155^\circ\text{C}$ | | | | | | | | |
| Package | 1,000pcs/reel (T1:P,W,B), 5,000pcs/reel (T5:B,C,D) | | | | | | | | |

· Please contact us for Resistance tolerance $\pm 0.01\%$. · Please contact us for RG3226 series with power of 1/2W

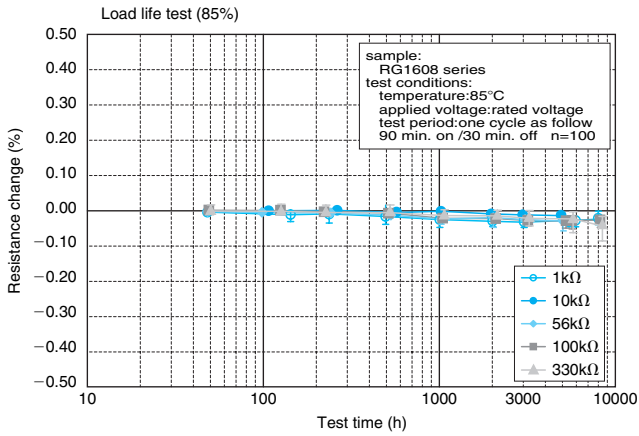
Reliability

| Item | Test Method | Specification | | Typical |
|---------------------------|--|-----------------------------|-----------------------------|-----------------------------|
| | | Ultra-reliability | general | Ultra-reliability |
| Short time overload | Applied voltage: $2.5 \times$ rated voltage or $2 \times$ maximum operating voltage which ever is less test duration: 5 seconds | $\pm (0.05\% + 0.01\Omega)$ | $\pm (0.05\% + 0.01\Omega)$ | $\pm (0.01\% + 0.01\Omega)$ |
| Load Life | Test Temperature: 85°C Applied voltage: rated voltage Test period: repeat 1000 cycle as follow: 90 min. on/30 min. off cycled | $\pm (0.1\% + 0.01\Omega)$ | $\pm (0.25\% + 0.05\Omega)$ | $\pm (0.01\% + 0.01\Omega)$ |
| Moisture load life | Test condition: $85^\circ\text{C}85\%\text{RH}$ Applied power: 1/10 rated Power Test period: repeat 1000 cycle as follow: 90 min. on/30 min. off cycled | $\pm (0.1\% + 0.01\Omega)$ | $\pm (0.25\% + 0.05\Omega)$ | $\pm (0.05\% + 0.01\Omega)$ |
| Temperature cycle | Repeat 1000 cycle as follow: -55°C (30 min.)/Room Tem.(2 min.)/ $+125^\circ\text{C}$ (30 min.)/ Room Tem.(2 min.) | $\pm (0.1\% + 0.01\Omega)$ | $\pm (0.25\% + 0.05\Omega)$ | $\pm (0.01\% + 0.01\Omega)$ |
| High temperature exposure | $+155^\circ\text{C}$ for 1000 hours with no load | $\pm (0.1\% + 0.01\Omega)$ | $\pm (0.25\% + 0.05\Omega)$ | $\pm (0.01\% + 0.01\Omega)$ |

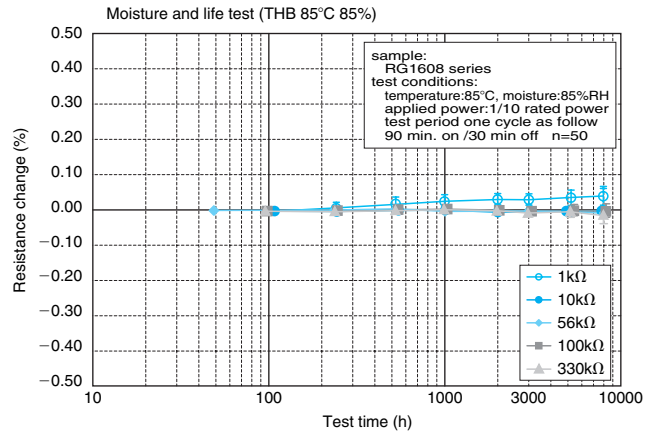


The result of each reliability test for 8000 hours

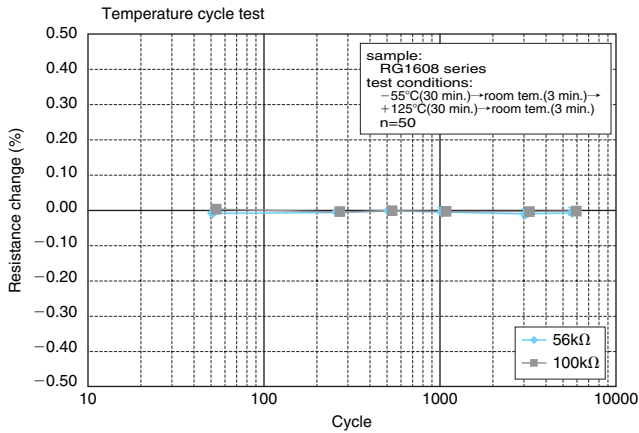
Load life test



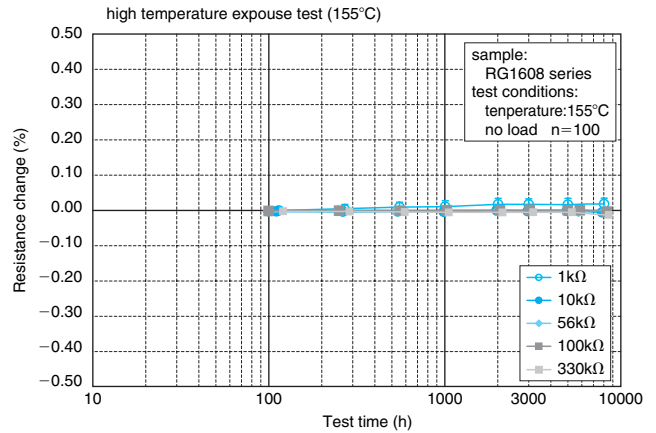
Moisture and life test



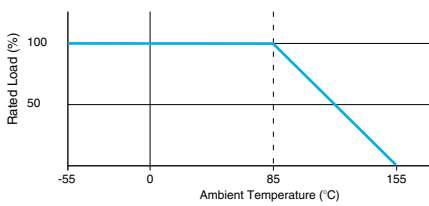
Temperature cycle test



High temperature exposure test



CHARACTERISTIC of Power Temperature Derating Curve



PART NUMBER

RG 1608 N - 102 - B - T5

- Package (T1,T5,T10)
- Resistance Tolerance
- Resistance
(E-24: in a three-digit number,
E-96: in a four-digit number 4 digits for all RG3216)
- Temperature Coefficient of Resistance
- Dimensions
- Part Code