THE DATASHEET OF

RG2012P-4023-B-T5

Metal thin film chip resistors
(the highest precision)

■RG series **AEC-Q200 Compliant**

Lead free | Halogen free | RoHS Compliance

Features

- Long term stability with inorganic passivation
- Less than ±0.1% drift after 10000 hours 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

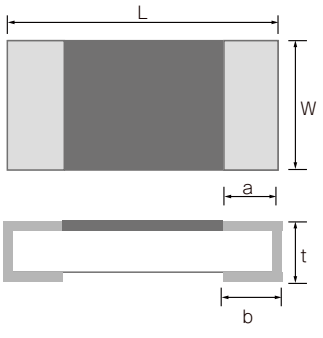
RG 1608 N - 102 - B - T5

- RG: Series code
- 1608: Size: RG0603, 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)	±0.05% (W)	±0.1% (B)	±0.5%(D)				
RG0603	1/20W	1/16W	—	±10(N)	—	100≦R≦22k		30V	E-24, E-96	-55℃ ~ 155℃	T10
				±25(P)							
				±50(Q)		—	47≦R≦56k				
				±100(R)			10≦R<47				
RG1005	1/32W	1/16W	1/8W	±5(V)	100≦R<3k			75V			T5
				±10(N)	47≦R≦100k						T10
				±25(P)	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)	47≦R≦274k						
				±25(P)	47≦R≦274k	47≦R≦1M					
				±50(Q)	—	—	10≦R<47				
RG2012	1/10W	1/8W	1/4W	±5(V)	100≦R<10.2k			150V			
				±10(N)	47≦R≦475k						
				±25(P)	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)	47≦R≦1M						
				±25(P)	47≦R≦5.1M						
				±50(Q)	—	—	10≦R<47				

◆Dimensions



Type	Size (inch)	L	W	a	b	t
RG0603	0201	0.60±0.05	0.30±0.05	0.13±0.05	0.15±0.05	0.23±0.03
RG1005	0402	1.0±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)

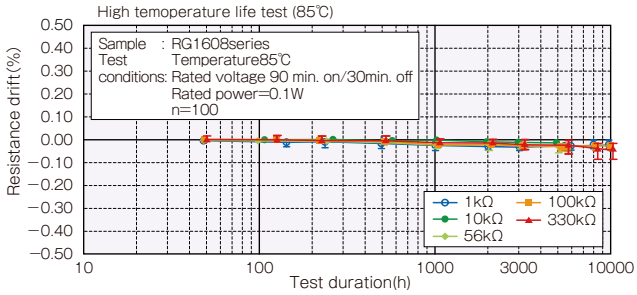
◆Reliability specification

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	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	—	±(0.05%+0.01Ω)	±(0.01%)
Life (biased)	70℃, rated voltage,*1 90min on 30min off, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.5%+0.05Ω)	±(0.25%+0.05Ω)	—	±(0.5%+0.01Ω)	±(0.01%)
High temperature high humidity	85℃, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.5%+0.05Ω)	±(0.25%+0.05Ω)	—	±(0.5%+0.01Ω)	±(0.05%)
Temperature shock	-55℃ (30min) ~ 125℃ (30min) 1000cycles	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	—	±(0.1%+0.01Ω)	±(0.01%)
High temperature exposure	155℃, no bias, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	—	±(0.1%+0.01Ω)	±(0.01%)
Resistance to soldering heat	260±5℃, 10 seconds (reflow)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	—	±(0.05%+0.01Ω)	±(0.01%)

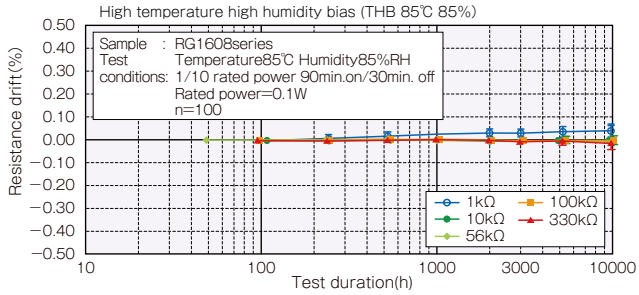
*1 Rated voltage is given by E= $\sqrt{R \times P}$ E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

◆10000 hour reliability test data

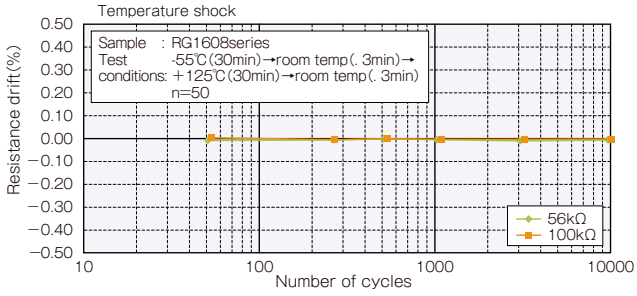
○Biased life test



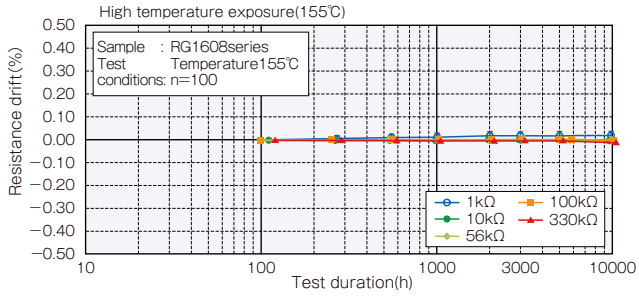
○High temperature high humidity (biased)



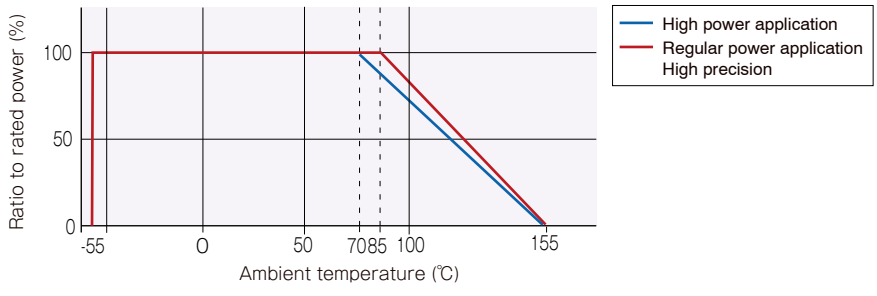
○Temperature shock



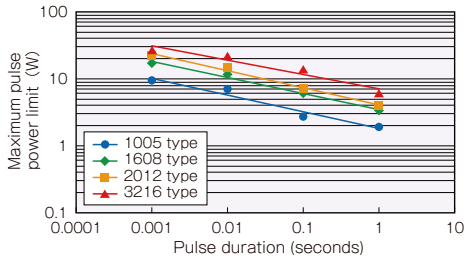
○High temperature exposure



◆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.

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