

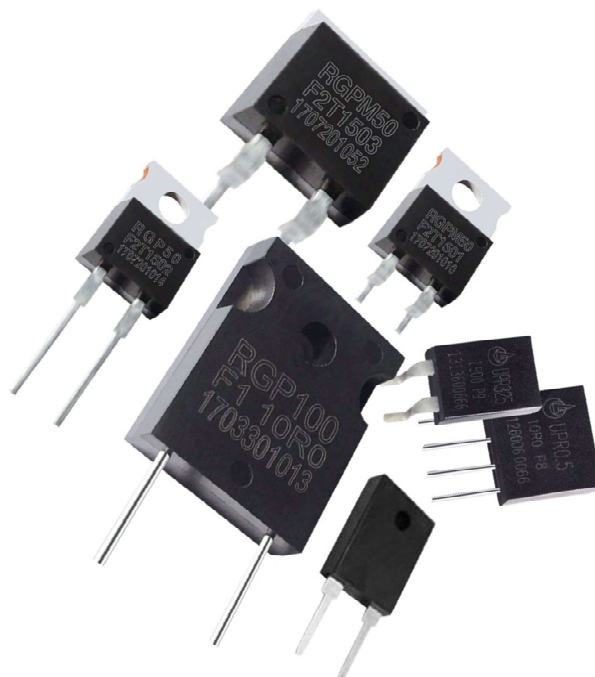


RGP SERIES

MOLD TYPE POWER RESISTORS

FEATURES

- Advanced thin film and thick film technology
- Very low TCR: Lower than $\pm 50 \text{ ppm}/^\circ\text{C}$ for resistance over 10 Ohm.
- Tolerance up to $\pm 0.50\%$ on request
- Excellent overall stability: Class 1
- Very low noise and voltage coefficient
- Non-inductive available for high frequency and pulsing applications
- Perfect high-speed pulse loading capability





1. Part number:

The part number of the resistors is identified by the series name, power rating, tolerance, temperature coefficient, packing type and resistance value.

Example:

| | | | | | |
|---------------|--------------|------------------|------------|----------------|-------------------|
| RGP | 20 | J | 2 | B | 151 |
| Series | Power | Tolerance | TCR | Packing | Resistance |

(1) Style: RGP SERIES THICK FILM POWER RESISTORS

(2) Power Rating: 20=20W; 25=25W; 50=50W; 100=100W

(3) Tolerance: F=±1.0%; J=±5.0%; K=±10%;

(4) T.C.R.: 2=±50ppm/°C ; 1=±100ppm/°C ; 0= ≥100ppm/°C

(5) Packaging Type: B=Bulk; T= Tube (50 pcs per tube & 500pcs per box)

(6) Resistance Value(for 5%): 330=33Ω、151=150Ω、122=1200Ω

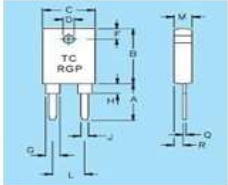

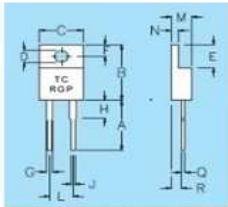

(for tight tolerance): 33R0=33Ω、1500=150Ω、1211=1210Ω

2. Digital marking:

including type, power rating, resistance value, batch number



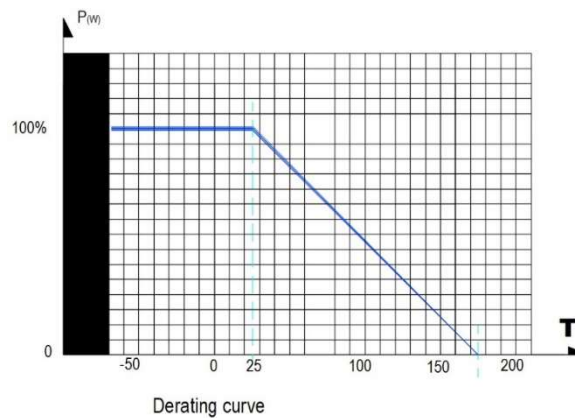
3. ELECTRICAL CHARACTERISTICS AND DIMENSION

| Type | | RGP35 | | RGP50 | | RGP100 | |
|--|------------|--|-------|--------------------|-------|--------------------|-------|
| Encapsulation type | | TO-220 | | TO-220 | | TO-247 | |
| Standard applied | | IEC60115-1:2001(GB/T5729-2003); MIL-STD-202; MIL-R-39009D | | | | | |
| Watt power rating at 25°C case temperature | | 35W | | 50W | | 100W | |
| Operating voltage | U_{\max} | 350V _{dc} | | 420V _{dc} | | 700V _{dc} | |
| Resistance range | | 0.2Ω~1MΩ | | | | | |
| Tol. | | D(±0.50%); F(±1.0%); J(±5.0%); K(±10%); | | | | | |
| TCR | (ppm/°C) | C2(±50); (25°C~105°C) | | | | | |
| Operating Temperature range | | -55°C~+175°C | | | | | |
| Dimension | | RGP35 | | RGP50 | | RGP100 | |
| | | min | max | min | max | min | max |
| | A | 12.7 | 14.7 | 11.43 | 13.97 | 13.21 | 15.75 |
| | B | 14.5 | 15 | 16 | 16.52 | 20.44 | 20.96 |
| | C | 9.91 | 10.41 | 10.15 | 10.67 | 15.49 | 16.01 |
| | D | 3.55 | 3.75 | 3.08 | 3.28 | 3.53 | 3.73 |
| | E | 5.85 | 6.35 | - | - | - | - |
| | F | 2.85 | 3.05 | 2.92 | 3.44 | 5.07 | 5.59 |
| | G | 1.17 | 1.37 | 1.14 | 1.4 | 3.45 | 3.81 |
| | H | - | 4 | 2.54 | 4.06 | 2.03 | 3.55 |
| | J | 0.7 | 0.86 | 0.66 | 0.86 | 1.37 | 1.67 |
| | L | 4.83 | 5.33 | 4.82 | 5.34 | 9.9 | 10.42 |
| | M | 4.06 | 4.82 | 2.92 | 3.44 | 4.69 | 5.21 |
| | N | 1.2 | 1.4 | | | - | - |
| | Q | 0.55 | 0.7 | 0.4 | 0.6 | 0.55 | 1.07 |
| | R | 2.05 | 2.25 | 1.52 | 2.04 | 2.15 | 2.67 |
| Dimension | | <div></div> | | | | | |

- Unless otherwise specified, all values are tested at the following condition:
- Temperature: 21°C to 25°C and Relative humidity: 45% to 70%
- Testing point is at 5.27mm from bottom of molding of terminals
- Resistance and tolerance out of range is available upon request



4. Derating curve



This value is only valid by using a thermal conduction to the heat sink $R_{th-cs} < 0.025^\circ\text{K/W}$.

This value can be reached by using thermal transfer compound with a heat conductivity of 1W/mK . The flatness of the cooling plate must be better than 0.05mm overall. The roughness of the surface should not exceed $6.4\mu\text{m}$.

5. ENVIRONMENTAL CHARACTERISTICS

(1) Insulation Resistance

IEC 60115-1, 4.6: in V-block for 60 seconds, the test resistance should be high than 10,000 MΩ.

(2) Dielectric Withstanding Voltage

IEC 60115-1 4.7: Place resistors in V-block and apply 1800V for 60 Seconds, no breakdown or flashover.

(3) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C or 100°C on request above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = the 2nd testing temperature

t₀ = Room temperature

(4) Short Time Over Load Test

IEC60115-1 4.13: At 1.5 times rated voltage or 1.5 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ± (0.25%+0.005Ω) as compared with the value before the test.

(5) Solderability

IEC 60115-1, 4.17: 235±5°C for 3±0.5 Seconds, there are at least 95% solder coverage on the termination.

(6) Resistance to soldering heat:

IEC 60115-1, 4.18: $260 \pm 3^{\circ}\text{C}$ for 10 ± 1 Seconds, immersed to a point $3 \pm 0.5\text{mm}$ from the body. The change of the resistance value should be within $\pm(0.25\% + 0.005\ \Omega)$ as compared with the value before the test.

(7) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to $+155^{\circ}\text{C}$ to Room Temp. (5 cycles). The change of the resistance value shall be within $\pm(0.50\% + 0.005\ \Omega)$ as compared with the value before the load. After the test the resistors shall be free from the electrical or mechanical damage.

(8) Damp Heat Steady State

IEC 60115-1, 4.24: $40 \pm 2^{\circ}\text{C}$, 90-95% RH for 56 days, loaded with 0.1 times RCWV or the maximum working voltage whichever is lower. The change of the resistance value should be within $\pm(1\% + 0.005\ \Omega)$ as compared with the value before the load.

(9) Load Life Test

IEC 60115-1, 4.25: $25 \pm 2^{\circ}\text{C}$ at RCWV or the maximum working voltage whichever is lower for $1,000 \pm 48/-0$ Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed.

The change of the resistance value should be within $\pm(2\% + 0.005\ \Omega)$ as compared with the value before the load.

(10) Resistance to Solvent

IEC 60115-1, 4.30: IPA for 5 ± 0.5 Min. with ultrasonic. No deterioration occurred.

(11) Vibration, High Frequency:

IEC60068-2-6: $\Delta R < \pm(0.25\% + 0.005\ \Omega)$



THUNDER PRECISION RESISTORS



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