APPROVAL SHEET

RGP SERIES

THICK FILM POWER RESISTORS

Non-inductive design for

high frequency and pulse application

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APPROVED BY: *Charles Chen*

Tel. +86-755-26611344 Fax: +86-755-2661948 Email: sales@thunder-resistor.com

1. PRODUCT: Thick film power resistors

FEATURES

- Advanced thick film technology
- Very low TCR: lower than ±50ppm/℃ for resistance over 10 Ohm.
- Tolerance up to ±0.50%
- Excellent overall stability: Class 1
- Very low noise and voltage coefficient
- Non-inductive design for high frequency and pulsing applications
- Perfect high speed pulse loading capability

2. Part number of the thick film resistor is identified by the series name, power rating, tolerance, temperature coefficient, packing type and resistance value.

Example：

RGP	100	J	2	B	100R
Series	Power	Tolerance	TCR	Packing	Resistance

(1) Style: RGP SERIES THICK FILM POWER RESISTORS

(2) Power Rating: 35=35W、50=50W、100=100W

(3) Tolerance: J=±5.0%; K=±10%；

(4) T.C.R.: 2=±50ppm/℃ for R>10Ω; 1= ±50ppm/℃ for R>0.1Ω; 0= no TCR test

(5) Packaging Type:B＝BULK/BOX

(6) Resistance Value: 33R0、1200、1201、1002、3303……

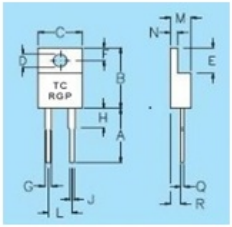
3. Digital marking: including type, power rating, resistance value, batch number

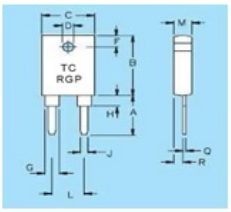
4. ELECTRICAL CHARACTERISTICS

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/℃)	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

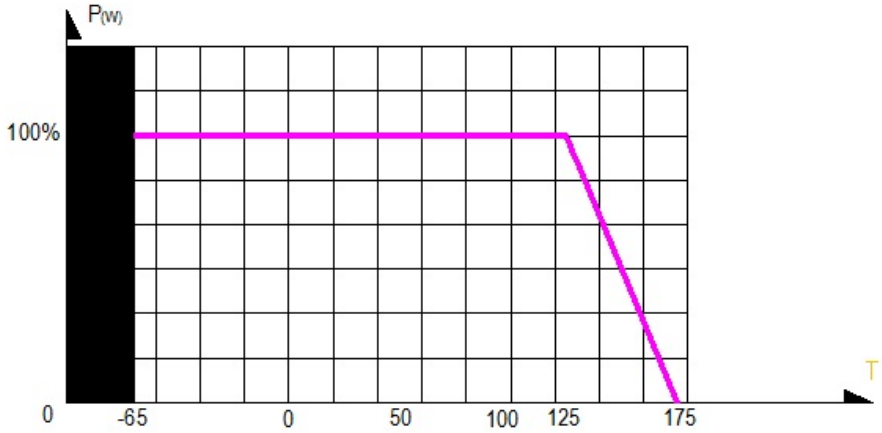
Dimension





Unless otherwise specified, all values are tested at the following condition:
Temperature: 21℃ to 25℃ and Relative humidity: 45% to 75%
Testing point is at 2.54mm from bottom of molding of terminals

5. Derating curve



This value is only valid by using a thermal conduction to the heat sink Rth-cs<0.025°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 6.4μm.

6. ENVIRONMENTAL CHARACTERISTICS

(1) Short Time Over Load Test

Load resistors at 1.5 times rated voltage or 1.5 times the maximum working voltage whichever is lower, applied for 5 seconds, the resistor should be free from defects in outlooks, unload the resistor for 30 minutes before test, the change of the resistance should be within $\Delta R < \pm (0.30\% + 0.005\Omega)$

(2) Dielectric Withstanding Voltage

Apply dielectric withstanding voltage $1800V_{ac}$ between the terminals connected together with the resistor body for about 60 seconds. The resistor shall be able to withstand without breakdown or flashover. The change of the resistance should be within $\Delta R < \pm (0.15\% + 0.005\,\Omega)$

(3) Temperature Coefficient Test

Test of resistors at room temperature and 105°C 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.

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

R= Resistance value under the testing temperature
R_0 = Resistance value at the room temperature
t = the 2nd testing temperature
t_0 = Room temperature

(4) Insulation Resistance

Apply test poles on resistor body and terminals of the resistor. The insulation resistance should be high than 10,000 M Ohm. The test voltage is $500V_{dc}$.

(5) Solderability

Immerse the resistor into the solder pot at 230±5°C for 5±0.5 seconds. At least 95% solder coverage on the termination.

(6) Resistance to Solvent

Immerse the resistors into the appropriate solvent of Ethylene Chloride, washing with ultrasonic machine for 1 minute. No deterioration of coatings and color code occurred.

(7) Resistance to soldering heat:

Immerse the terminals of resistor one by one into the solder pot at 260±5°C for 10±1 seconds. ΔR < ±(0.25%+0.005Ω)

(8) Pulse Overload

Apply 4 times rated voltage or 2 times the maximum working voltage whichever is lower to the resistor at the 0.1 second on and 2.5 seconds off cycle for 1000 cycles. ΔR < ± (1.0%+0.005Ω).

(9) High voltage high pulse overload

Apply 10 pulses with 10 times rated voltage or 2 times the maximum working voltage whichever is lower to the resistor, the pulses parameter is 10μs/700μs.
ΔR < ± (2.0%+0.005Ω).

(10) Humidity (steady state)

Place the resistors in a test chamber at 40±2°C and 90~95% relative humidity. Apply the voltage of DC0.1W for 1000+48 hours. The change of the resistance shall be within ΔR < ±(0.50%+0.005Ω).

(11) Load Life Test

Placed the resistor in the constant temperature chamber of 25±2°C, the resistor shall be well welded with soldering pad no less than the recommended size. The resistors shall be arranged not much effected mutually by the temperature of the resistors and the excessive ventilation shall not be performed. Apply the rated D.C. voltage or the maximum working voltage whichever is lower to the resistors at 90 minutes on and 30 minutes off periodically for 2000+48/-0 hours. Leave the resistors at room temperature without load for 1hour before final testing. The change of the resistance shall be within ΔR <±(1.0%+0.001Ω)

(12) Climatic sequence

The climatic sequence test cycle is shown in the following table shall be repeated 5 times consecutively. The measurement of the resistance value is done before the first cycle at room temperature and 1 hours leaving in the room temperature after the fifth cycle, the change of the resistance shall be within ± (0.50%+0.05Ω). After the test the resistors shall be free from the electrical or mechanical damage.

Cycling Conditions:

dry heat	UCT; 16 h
damp heat,	55℃;24h; ≥90% RH
cyclic	1 cycle;
cold	LCT; 2 h
low air	8.5 kPa
pressure	25±10℃ 2h;
damp heat	55℃;24h; ≥90% RH ;
cyclic	5 cycles
	LCT= -55℃;
	UCT=125℃

(13) Vibration, High Frequency:

IEC60068-2-6: ΔR < ±(0.25% + 0.005Ω)