



5% High Power Thick Film Resistors

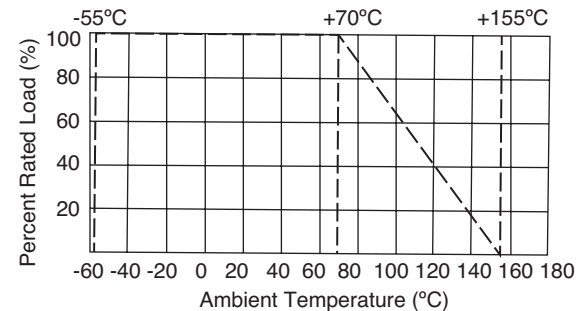
HP5-RC Series

(RoHS Compliant)

■ FEATURES

- Temperature Range:-55°C ~ +155°C (derated over 70°C)
- Value Range: 1~10M
- Wave or Flow Solderable

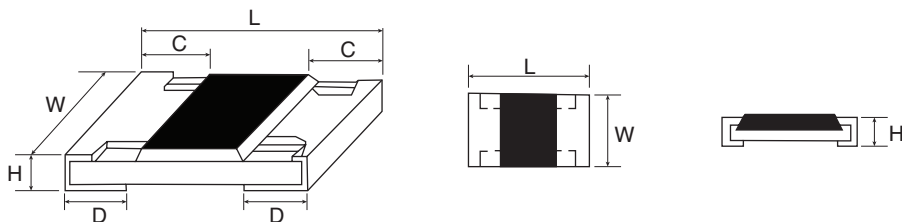
■ DERATING CURVE



■ PART NUMBERING SYSTEM



■ SERIES, SIZE, WATTAGE, VOLTAGE, AND DIMENSIONS



Series	Case Size	Watts (W)	Voltage (V) (max.)		Dimension (mm)				
			W.V.	O.V.	L	W	H	C	D
314	0603	1/5	50	100	1.60±.10	.80±.10	.45±.10	.30±.20	.30±.20
316	0805	1/3	75	150	2.00±.15	1.25±.15	.55±.10	.40±.20	.40±.20
318	1206	1/2	200	400	3.10±.15	1.55±.15	.55±.10	.45±.20	.45±.20
320	2512	2	250	500	6.35±.10	3.20±.20	.55±.10	.60±.25	.50±.20

■ STANDARD VALUES (Ω)

1.0	15	56	180	470	1.5K	4.7K	22K	56.2K	330K
1.5	18	68	200	510	1.8K	5.6K	27K	82K	390K
2.7	22	75	220	560	2.0K	6.8K	33K	100K	470K
4.7	27	82	270	620	2.2K	8.2K	36K	120K	560K
7.5	33	100	300	680	2.7K	10K	39K	150K	680K
8.2	39	120	330	820	3.0K	12K	47K	180K	820K
10	47	150	360	1.0K	3.3K	15K	51K	220K	1.0M
12	51	160	390	1.2K	3.9K	18K	56K	270K	10M

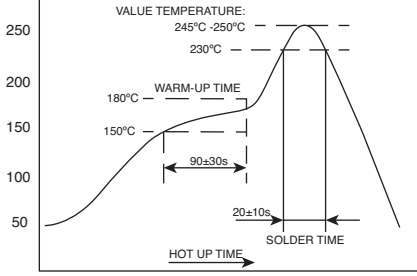




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■ CHARACTERISTICS

Characteristics	Limits	Test Methods (JIS C 5201-1)															
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	4.7 Clamped in the trough of a 90°C metallic v-block and shall be tested at ac potential respectively specified in the type for 60-70 seconds															
Temperature Coefficient	1Ω~10Ω $\leq \pm 200$ PPM/°C 10.1Ω~10MΩ $\leq \pm 100$ PPM/°C	4.8 Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (T1) R2: Resistance value at room temp. plus 100°C (T2) Test pattern: room temp. (T1), room temp. +100°C (T2)															
Short time overload	Resistance change rate is $\pm 5\%$ (2.0% + 0.1Ω) Max. $\pm 1\%$ (1.0% + 0.1Ω) Max.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds															
Solderability	95% coverage Min.	Wave Solder: Test temperature of solder: 245°C ± 3 °C dipping time in solder: 2-3 seconds. Reflow: 															
Soldering heat	Resistance change rate is + (1.0% + 0.05Ω) Max.	4.18 Dip the resistor into a solder bath having a temperature of 260°C ± 3 °C and hold it for 10 ± 1 seconds															
Temperature Cycling	Resistance change rate is $\pm 5\%$ (2.0% + 0.05Ω) Max. $\pm 1\%$ (0.5% + 0.05Ω) Max.	4.19 Resistance change after continuous 5 cycles for duty cycle specified below: <table border="1"> <thead> <tr> <th>Step</th><th>Temperature</th><th>Time</th></tr> </thead> <tbody> <tr> <td>1</td><td>-55°C ± 3°C</td><td>30 mins</td></tr> <tr> <td>2</td><td>Room temp.</td><td>10~15 mins</td></tr> <tr> <td>3</td><td>+155°C ± 2C</td><td>30 mins</td></tr> <tr> <td>4</td><td>Room temp.</td><td>10~15 mins</td></tr> </tbody> </table>	Step	Temperature	Time	1	-55°C ± 3 °C	30 mins	2	Room temp.	10~15 mins	3	+155°C ± 2 C	30 mins	4	Room temp.	10~15 mins
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1	-55°C ± 3 °C	30 mins															
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■ CHARACTERISTICS (CON'T)

Characteristics	Limits	Test Methods (JIS C 5201-1)
Humidity	Resistance change rate is $\pm 5\%$ ($3.0\% + 0.1\Omega$) Max. $\pm 1\%$ ($0.5\% + 0.1\Omega$) Max.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40 \pm 2^\circ\text{C}$ and 90-95% humidity
Load life in humidity	Resistance change rate is $\pm 5\%$ ($3.0\% + 0.1\Omega$) Max. $\pm 1\%$ ($0.5\% + 0.1\Omega$) Max.	7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at $40^\circ\text{C} \pm 2^\circ\text{C}$ and 90 to 95% relative humidity
Load Life	Resistance change rate is $\pm 5\%$ ($3.0\% + 0.1\Omega$) Max. $\pm 1\%$ ($0.5\% + 0.1\Omega$) Max.	4.25.1 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of (1.5 hours "on", 0.5 hour "off") at $70^\circ\text{C} \pm 2^\circ\text{C}$ ambient
Terminal bending	Resistance change rate is $\pm (1.0\% + 0.05\Omega)$ Max.	4.33 Twist of Test Board: Y/X - 3/90 mm for 60 seconds

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