Ver2.0

High Power Thick Film Chip Resistors

PR Series

PRODUCTS DATASHEET

NINGBO GIANTOHM MICRO ELECTRONICS TECHNOLOGY CO., LTD.

BLDG. 15, 136 YUHAI EAST RD., HANGZHOU BAY NEW ZONE, NINGBO, ZHEJIANG, CHINA 315336

SALES@GIANTOHM.COM
MARKETING@GIANTOHM.COM
HTTP://WWW.GIANTOHM.COM

FEATURE

- Superior high-power performance
- High reliability.
- RoHS complaint.
- Compatible with Reflow and Wave soldering

Applications:

- Adapters
- Back-light circuit
- Camera
- Industrial Equipment
- etc.

MANUFACTURER PART NO.

For example: PR1206J100KT5G00-PR1206 5% 100KΩ T/R-5000

Series	Size	Tol.	Value	PKG	SPQ	Feature	TCR
2 codes	4 codes	1 code	2~5 codes	1 code	1 code	1 code	2 codes
PR	1206	J	100K	T	5	G	00
PR: High Power Thick Film Chip Resistors	0402 0603 0805 1206 1210 2010 2512	F=1% J=5%	0R01①: 0.01Ω 0R1: 0.1Ω 1R: 1Ω 4R7: 4.7Ω 4K7②: 4.7KΩ 100K: 100KΩ 4M7③: 4.7MΩ	T: T/R④	4=4K 5=5K A=10K B=15K	G=Std. S=P.C.⑤	00=Refer to table as below.

Note:

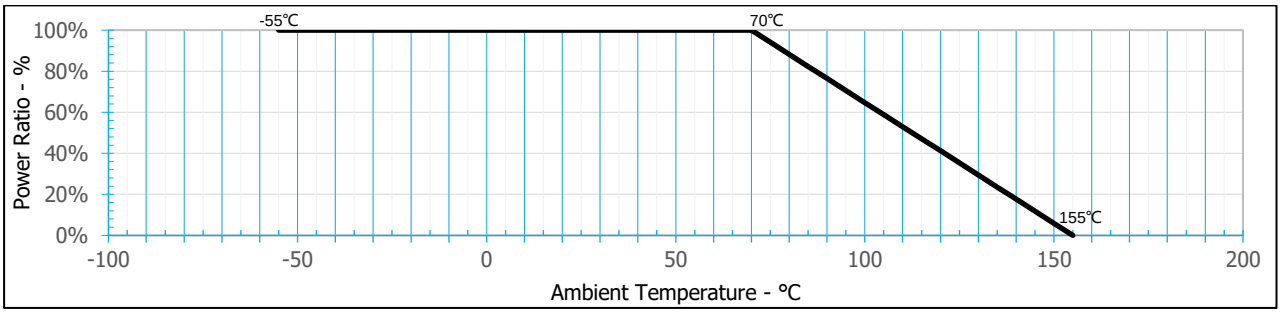
① R=Radix ② K=Kilo, 10^3 ③ M=Mega, 10^6 ④ T/R=Taping in reel package type ⑤ P.C.=Personal and Customized.

CHARACTERISTIC

Series	Power rating	MWV①	MOV②	±1%&±5% Resistance Range	Jumper Max Value	Jumper Max. Current
PR0402	1/10W	50V	100V	1Ω-10MΩ	10mΩ	3.0A
PR0603	1/5W	75V	150V	100mΩ-10MΩ	8mΩ	5.0A
PR0805	1/3W	150V	300V	10mΩ-10MΩ	5mΩ	6.0A
PR1206	1/2W	200V	400V	10mΩ-10MΩ	5mΩ	10A
PR1210	3/4W	200V	500V	100mΩ-10MΩ	4mΩ	12A
PR2010	1W	200V	500V	10mΩ-10MΩ	5mΩ	12A
PR2512	2W	300V	500V	10mΩ-10MΩ	5mΩ	16A

Note: ① MWV: Max. Working Voltage ② MOV: Max. Overload Voltage ③ MOC: Max. Overload Current

POWER DERATING CURVE



Note: Operating Temperature Range: -55℃~+155℃

RATED VOLTAGE

Resistors should have a Rated Voltage DC or AC corresponding to Rated Power which can be calculated by formula as below.

The Rated Voltage of certain resistance value should be the calculated result or Max. Working Voltage of product series whichever less.

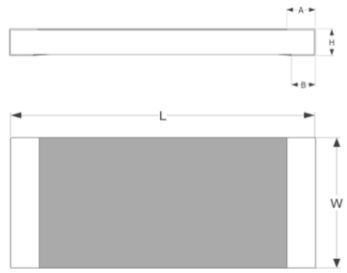
Formula:

$$E = \sqrt{P \times R}$$

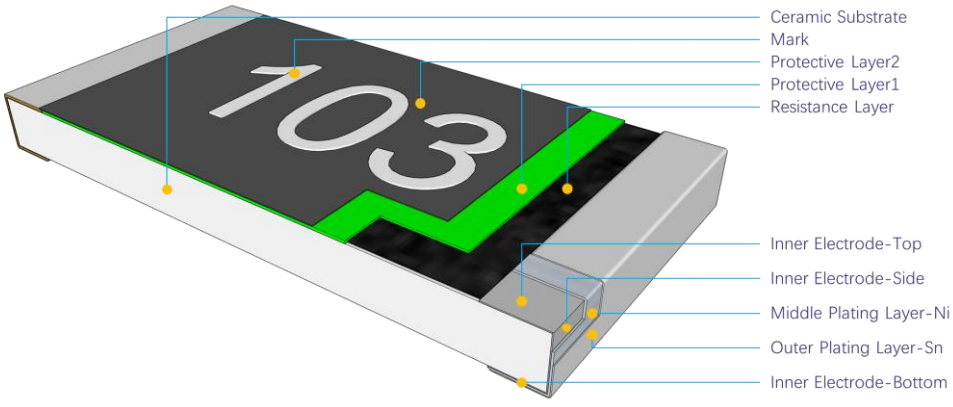
E=Rated voltage(V)
P=Rated power(W)
R=Nominal resistance(Ω)

DIMENSION

Unit: mm

Figure	Type	L	W	H	A	B
	PR0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
	PR0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.15	0.30±0.15
	PR0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.15
	PR1206	3.05±0.10	1.55±0.10	0.50±0.10	0.45±0.20	0.35±0.15
	PR1210	3.05±0.10	2.55±0.10	0.55±0.10	0.50±0.20	0.50±0.20
	PR2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20
	PR2512	6.30±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20

STRUCTURE

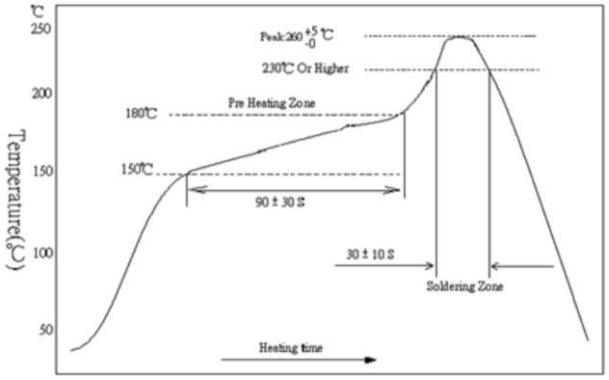


RELIABILITY

<table>
<tr><th>Item</th><th>Conditions</th><th>Specifications</th></tr>
<tr><td>Leaching</td><td>Hold resistor the tin furnace at 260 ° C for 30 seconds, take it out and observe the appearance of the resistance.
Experiment evidence: JIS-C5201-1 4.18</td><td>No visible damage.</td></tr>
<tr><td>High Temperature Exposure (Storage)</td><td>Store at the maximum temperature for 1000 hours without power, take it out and stand for 60 minutes, and then measure the change rate.
Experiment evidence: JIS-C5201-1 4.25</td><td>1% Series: ±1.0%
5% Series: ±3.0%</td></tr>
<tr><td>Thermal Shock</td><td>Place the product in the cold and hot shock box at - 55 ℃ for 15 minutes and + 125 ℃ for 15 minutes. Take it out after 300 cycles, stand for 60 minutes, and then measure the resistance change rate.
Experiment evidence: MIL-STD-202 Method 107G</td><td>1% Series: ±0.5%
5% Series: ±1.0%</td></tr>
<tr><td>Short Time Overload</td><td>Applied 2.5 times rated voltage for 5 seconds and release the load for about 30 minutes, then measure its resistance variance ate. (Rated voltage refer to characteristic)
Refer to JIS-C5201-1 4.13</td><td>1% Series: ±1.0%
5% Series: ±2.0%</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Hold resistors in 260 ℃ tin furnace for 10 seconds, take it out and stand for 60 minutes, and measure the change rate.
Experiment evidence: JIS-C5201-1 4.18</td><td>±1.0%</td></tr>
<tr><td>Solderability</td><td>Hold resistors in a furnace at 235 ± 5 ℃ for 2 seconds, take it out and observe the solder area under a microscope.
Experiment evidence: JIS-C5201-1 4.17</td><td>Coverage must be over 95%</td></tr>
<tr><td>Loading Life in Moisture</td><td>Place it in a constant temperature and humidity box with a temperature of 40 ℃ and a relative humidity of 90 ~ 95%, and apply the rated voltage, on for 90 minutes and off for 30 minutes, a total of 1000 hours. Take it out and stand for 60 minutes, and then measure the change rate
Experiment evidence: JIS-C5201-1 4.24</td><td>1% Series: ±0.5%
5% Series: ±3.0%</td></tr>
<tr><td>Load Life</td><td>Place in an oven at 70 ℃ and apply the rated voltage for 90 minutes on and 30 minutes off for 1000 hours. Take it out and stand for 60 minutes, and then measure the change rate of resistance value.
Experiment evidence: JIS-C5201-1 4.25</td><td>1% Series: ±0.5%
5% Series: ±3.0%</td></tr>
<tr><td>Temperature Coefficient of Resistance (T.C.R.)</td><td>$\mathrm{TCR(PPM/℃)} = \frac{(R_2 - R_1)}{R1 \times (T_2 - T_1)} \times 10^6$
R_1: Resistance at room temperature (Ω)
R_2: Resistance at test temperature(Ω)
T_1: Room temperature (℃)
T_2: Test temperature between -55℃ and +125℃
Experiment evidence: JIS-C5201-1 4.8</td><td>0402:
1Ω≤R≤10Ω: ±400 PPM/℃
10Ω < R≤100Ω: ±200 PPM/℃
100Ω < R≤10M: ±100 PPM/℃
0603：
100mΩ≤R < 200mΩ: ±200PPM/℃
200mΩ≤R≤10M: ±100 PPM/℃
0805：
10mΩ≤R≤15mΩ: ±800ppm/°C
15mΩ<R≤25mΩ: ±600ppm/°C
25mΩ<R≤50mΩ: ±400ppm/°C
50mΩ<R<100mΩ: ±200ppm/°C
100mΩ≤R≤10M: ±100ppm/°C
1206:
10mΩ≤R<15mΩ: ±700 ppm/°C
15mΩ≤R<30mΩ: ±400 ppm/°C
30mΩ≤R<50mΩ: ±300 ppm/°C
50mΩ≤R<100mΩ: ±150 ppm/°C
100mΩ≤R≤10M: ±100 ppm/°C
1210: ±100PPM/℃
2010:
10mΩ≤R<15mΩ: 0~+800 ppm/°C
15mΩ≤R<50mΩ: 0~+600 ppm/°C
50mΩ≤R<10M: ±100 ppm/°C
2512:
10mΩ≤R<20mΩ: 0~+800ppm/°C
20mΩ≤R≤50mΩ: 0~+400ppm/°C
50mΩ<R≤10M: ±100ppm/°C</td></tr>
<tr><td>Board Flex (Bending Test)</td><td>The resistance is welded in PCB, placed on the bending test machine, pressed in the center of PCB, and the change rate of resistance value is measured under load.:
<table>
<tr><th>Size</th><th>0603, 0805</th><th>1206, 1210</th><th>2010, 2512</th></tr>
<tr><td>Pressing depth (D, mm)</td><td>5</td><td>3</td><td>2</td></tr>
</table>
Experiment evidence: JIS-C5201-1 4.33</td><td>±1.0%</td></tr>
</table>

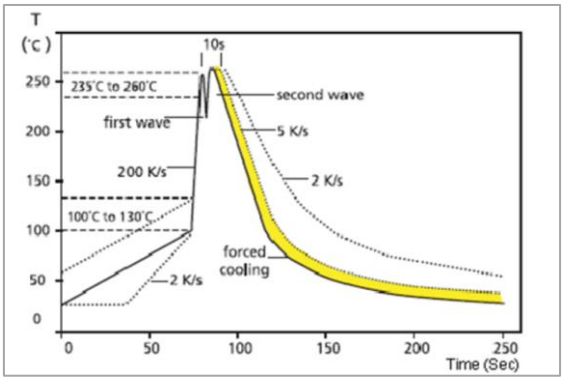
SOLDERING

Lead Free IR Reflow Soldering Profile



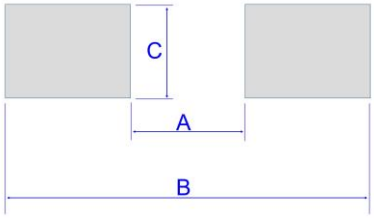
- Top temperature should be under 260 +5/-0 ℃ ,10Sec.
- Reference: J-STD-020D

Lead Free Double-Wave Soldering Profile



- Suitable for 0603 above size products
- 350±10℃ within 3 Sec. if soldering iron.

SOLDERING PAD



Type	A	B	C
PR0402	0.5	1.5	0.6
PR0603	0.8	2.1	0.9
PR0805	1.2	3.0	1.3
PR1206	2.2	4.2	1.6
PR1210	2.2	4.2	2.8
PR2010	3.5	6.1	2.8
PR2512	3.8	8.0	3.5

WORKING ENVIRONMENT

If user intends to use products in special environments or states (including but not limited to the following), it is necessary to approve special characteristics and reliability for the following or other application environments.

A. High temperature.
B. Near the sea, or corrosive gas, such as Cl_2、 H_2S、 NH_3、 SO_2 and NO_2, etc.
C. Unverified liquids, such as water, oil, chemical or organic solvent.
D. Unverified resin or paint to cover products.
E. Products should be washed with water soluble cleaner even if non cleaning flux.

STORAGE / CARRY CONDITIONS

A. Temperature: 25±5℃
B. Humidity: 60±15%RH
C. Storage life: 2 years
D. Please hold box correct orientation when storing and carrying. It is strictly prohibited to fall or squeeze the box, otherwise the product electrode or body may be damaged.

LEGAL DISCLAIMER

GiantOhm and its distributors or agents (hereinafter referred to as GiantOhm) shall not bear any responsibility for any error, inaccuracy or incompleteness contained in any product related information (including but not limited to product specifications, data, pictures, and charts). GiantOhm may change, revise, or improve product related information at any time without prior notice.

GiantOhm makes no commitment, guarantee for the suitability of its products for special purposes or the continuous production of any of its products. To the maximum extent permitted by law, GiantOhm does not assume any of the following responsibilities:

A. Any and all liabilities arising from the application or use of any GiantOhm's products.
B. Any and all liabilities, including but not limited to the loss of profits or direct damage, indirect damage, special damage, punitive damage, derivative damage or incidental damage caused by or related to GiantOhm's products.
C. Any and all implied warranties, including fitness for a particular purpose, non-infringement, and merchantability.

GiantOhm defines this product as a general consumer electronic purpose, which is not applicable to any medical life-saving or life-sustaining equipment, nor to any application that may cause casualties in case of failure of GiantOhm's products.

Any and all technical suggestions on product application provided by GiantOhm are provided free of charge. GiantOhm assumes no obligation and responsibility for adopting such technical suggestions and available results, and all risks of adopting such suggestions shall be borne by the buyer. All risks and responsibilities arising from the buyer's use of GiantOhm's products in combination with other materials or raw materials, or in any combination in its manufacturing process, shall be borne by the buyer, regardless of any oral or written technical instructions, suggestions or other requirements given by GiantOhm for the use of the products.

The information provided above is only to explain the product specifications. If the product is not changed, GiantOhm has all the rights to modify the above contents without prior notice, and the product change will be notified to the customer by ECN.