ALTERNATION HISTORY RECORDS变更记录

Date	Version	Mark	Page	Description	Drafter	Approver
2025-12-20	B	/	/	Revised edition release	Doris Chang	/

1. Features:

Excellent overall stability.

Advanced thin film technology.

The World`s Most Reliable and

Predictable, High-Performing Film Resistors

Tight tolerance down to ±0.1%.

Extremely low TCR down to ±15 PPM/°C

High power rating up to 2 Watts.

The resistors are suitable for processing on automatic SMD assembly systems.

2. Applicable Scope:

Telecommunication.

Medical equipment.

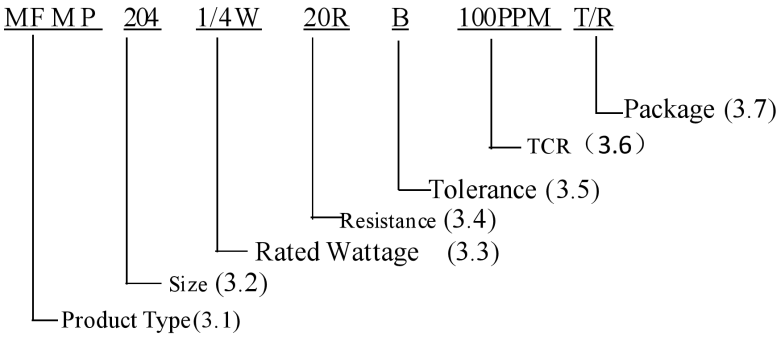
Measurement/Testing Equipment.

Automotive.

Industrial.

3. Part Number System:

It is composed by Type, Rated Wattage, Nominal Resistance, Tolerance, Safety Version and Package. e.g.



3.1 Product Type

Code	MFMP
Product Type	Metal Film Precision Resistor

3.2 Size code

Code	204	207	309
Size(L x φ D)mm	3.5x1.4	5.9x2.2	8.5x3.2

3.3 Rated Wattage

Code	1/4W	2/5W	1W
Wattage (W)	Rated Power:1/4W	Rated Power:2/5W	Rated Power:1W

3.4 Resistance

Code	22R	10K	100K
Resistance	22Ω	10KΩ	100KΩ

Remark:Ω is its unit which be in accordance with JIS-C6409 article 6 (EIARS-196A) series.

3.5 Resistance tolerance

Code	B	C	D	F	J	Z
Tolerance Range	±0.1%	±0.25%	±0.50%	±1%	±5%	Jumper

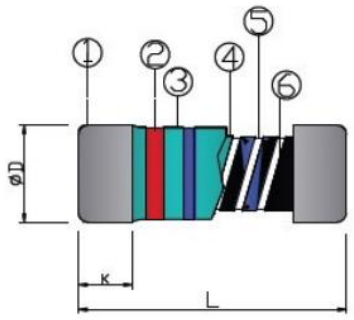
3.6 TCR

Code	15PPM	25PPM	50PPM	100PPM
TCR(PPM/°C)	±15PPM	±25PPM	±50PPM	±100PPM

3.7 Package

Code	T/R	RR
Inner Code	Taping Reel	Bulk

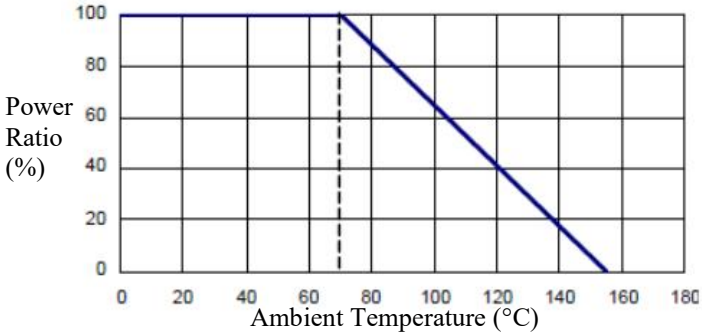
4. Construction & Dimension



①	Steel Termination Cap	④	Metal Film Resistive Layer
②	Color Code Rings	⑤	Trimming Line
③	Insulation Coating	⑥	Alumina Ceramic Rod

Type	L mm	ϕ D mm	K min.	Weight (g) (1000pcs)	Packaging
102	2.2±0.1	1.1±0.1	0.45	7.7	3000 pcs
204	3.5±0.2	1.4±0.15	0.70	18.7	3000 pcs
207	5.9±0.2	2.2±0.20	0.80	77.5	2000 pcs
309	8.5±0.3	3.2±0.30	1.40	233.0	2500 pcs

5.Derating Curve:



6. Standard Electrical Specifications

Item / Type	Power at 70°C	Temperature range	Maximum Working Voltage	Maximum Overload Voltage	Resistance range ±0.1%、±0.25%、±0.5%	T.C.R. PPM /°C
204	1/4W	-55~155	200V	400V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100
207	1/2W	-55~155	300V	700V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100
309	1 W	-55~155	400V	700V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100

7. High Power Rating Electrical Specifications

Item / Type	Power at 70°C	Temperature range	Maximum Working Voltage	Maximum Overload Voltage	Resistance range ±0.1%、±0.25%、±0.5%	T.C.R. PPM /°C
204	2/5W	-55~155	200V	400V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100
207	1W	-55~155	350V	700V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100
309	2 W	-55~155	500V	800V	33Ω-100KΩ	±15、±25
					101KΩ-2MΩ	±50、±100

8.Environmental Characteristics:

Item	Requirement	Test Method
Temperature Coefficient	As Spec.	-55℃~+125℃, 25℃ is the reference temperature.
Short Time Overload	±(0.25%+0.05Ω)	RCWV×2.5 or Max. Overload voltage for 5 seconds.
Damp Heat with Load	±(1.5%+0.05Ω)	40±2℃, 90~95% R.H. RCWV or Max. Operating voltage for 1,000 hrs. with 1.5 hrs. ON and 0.5 hrs. OFF.
Endurance	±(1.0%+0.05Ω)	70±2℃, RCWV or Max. Operating voltage for 1,000 hrs. (with 1.5 hrs. ON and 0.5 hrs. OFF).
Bending Strength	±(0.5%+0.05Ω)	Bending once for 5 seconds with 2mm.
Solder ability	95% min. Coverage	245±5℃ for 3 seconds.
Resistance to Soldering Heat	(±0.1%+0.05Ω)	260±5℃ for 10 seconds.
Voltage Proof	No breakdown or flashover	204:AC 300V, 207、309:AC 500V for 1 minute.
Insulation Resistance	>1000MΩ	DC 500V Megger.
Temperature Cycle	(±0.5%+0.05Ω)	-55℃(30 min.) > Room Temp.(3min.) > +155℃(30 min.) > Room Temp. (3min.) / (5 cycle).
Biased Humidity	±(0.5%+0.05Ω)	1,000 hrs. 85℃/ 85%RH, 10% of operating power (<100V).

Remark:

- RCWV (Rated Continuous Working Voltage)

RCWW=$\sqrt{\text{Power Rating x Resistance Values Max.}}$ RCWV listed above.

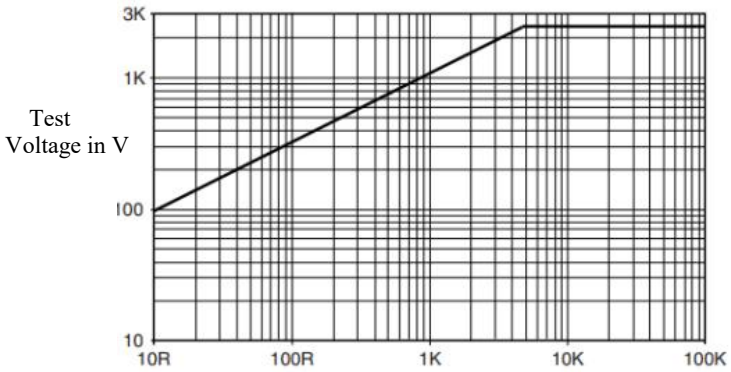
-Short time Overload(STOL) test should be determined form

STOL=2.5 x $\sqrt{\text{Power Rating x Resistance Values}}$ or maximum overload voltage listed above whichever is lower

-Reference Standards: IEC 60115-1；JIS-C 5201-1.

-Storage Temperature: 25±3°C; Humidity < 80% RH.

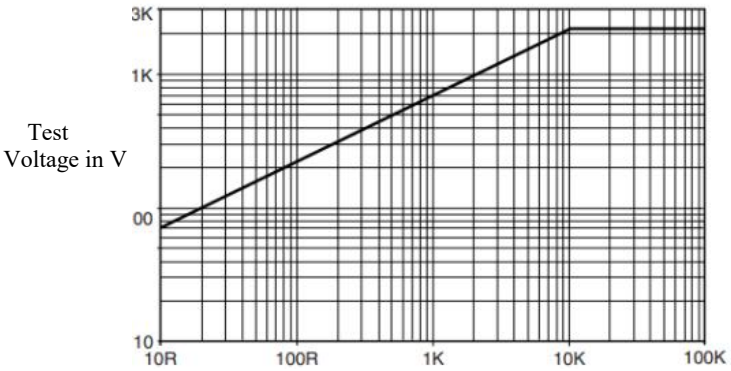
9.Anti-pulse curve:



Resistance Value in Ω

Remark:

Pulse load ratings match
IEC60115-1,4.27;1.2/50u;
Load a pulse
Apply only in 207 、309



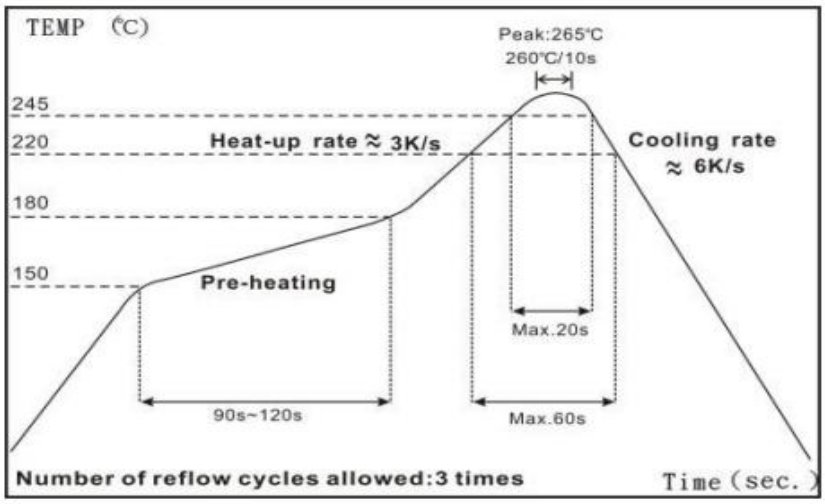
Resistance Value in Ω

Remark:

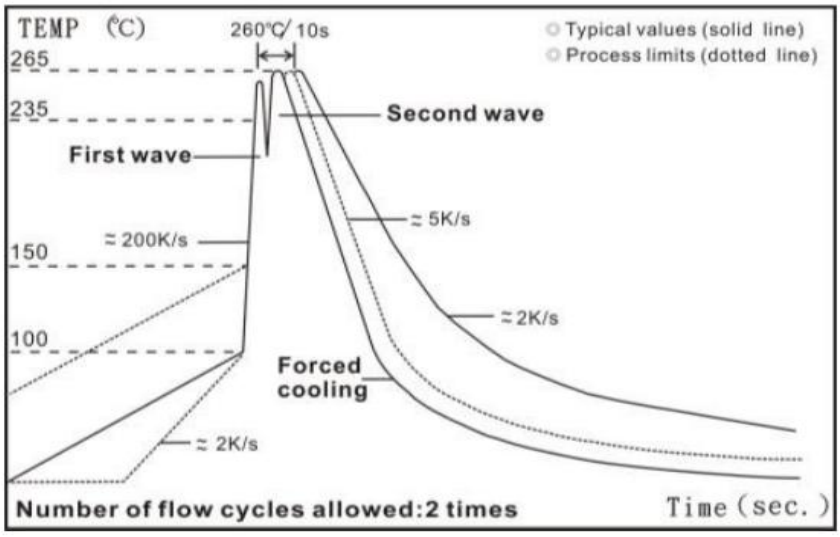
Pulse load ratings match
IEC60115-1,4.27;10/700u;
Load a pulse
Apply only in 207 、309

10.Soldering Condition:

IR Reflow Soldering



Wave Soldering (For R>10Ω)



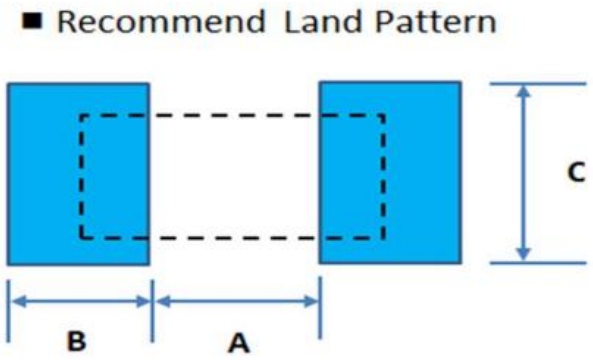
Remark:

1)Time of IR reflow soldering at maximum temperature point 260℃：10s

2)Time of wave soldering at maximum temperature point 260℃：10s

3)Time of soldering iron at maximum temperature point 410℃：5s

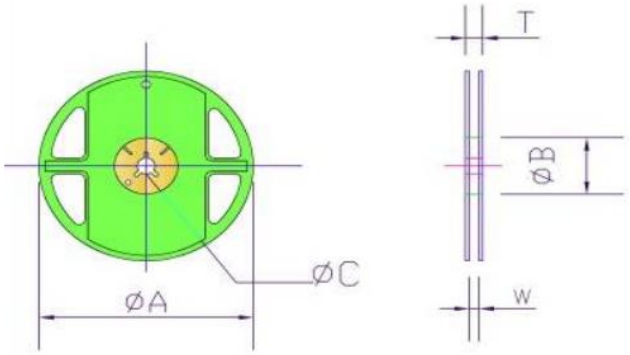
11. Recommend Land Pattern



Type	A(mm)	B(mm)	C(mm)
102	1.0	0.8	1.5
204	1.6	2.0	2.2
207	3.2	3.0	3.5
309	5.6	4.0	4.0

12. Packaging

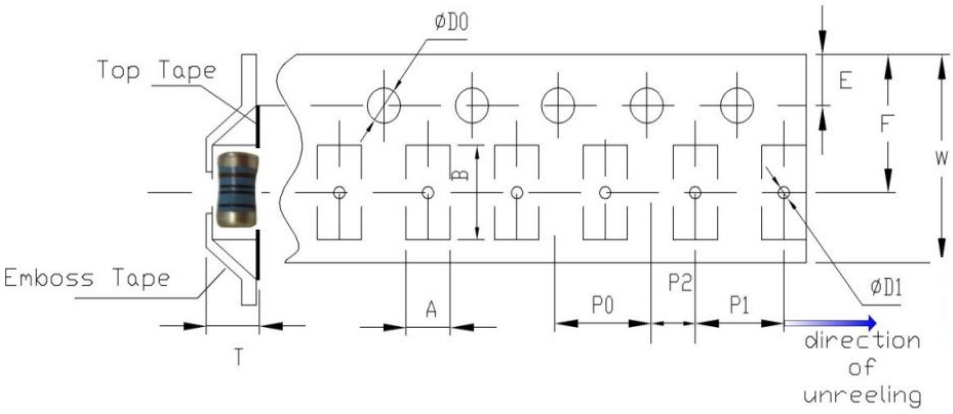
Packaging Quantity & Reel Specifications



Unit: mm

Type	∮ A(mm)	∮ B(mm)	∮ C(mm)	W	T	Emboss Plastic Tape (pcs)
102	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3000(7.0”)
204	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3000(7.0”)
207	178.5±1.5	60.0±1.0	13.0±0.5	13.0±0.5	15.5±0.5	2000(7.0”)
309	330±1.5	100.0±1.0	13.0±0.5	17.0±0.5	19.0±0.5	2500(7.0”)

Emboss Plastic Tape Specifications



0.9 Min. (MFMP102)
0.9Min. (MFMP204)
1.4Min.(MFMP207)
1.4Min.(MFMP309

Unit: mm

Type	A	B	W	E	F
102	1.30±0.10	2.40±0.10	8.00±0.10	1.75±0.10	3.50±0.05
204	1.60±0.10	3.70±0.10	8.00±0.10	1.75±0.10	3.50±0.05
207	2.40±0.10	6.30±0.10	12.0±0.10	1.75±0.10	5.50±0.05
309	3.30±0.10	9.00±0.10	16.0±0.30	1.75±0.10	7.50±0.05

Type	P0	P1	P2	ΦD0	T
102	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.45±0.10
204	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.45±0.10
207	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	2.50±0.10
309	4.00±0.10	8.00±0.10	2.00±0.05	1.50±0.10	3.30±0.10