



APPROVAL SHEET

Product Name : Metal Film MELF Resistor

Part No. : MMR Series

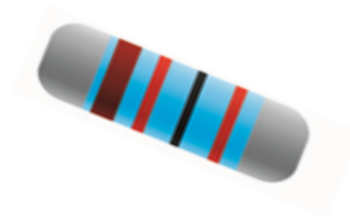
Description : Size 0204 / 0207

For more contact information, please refer to our website: www.rideetech.com

Metal Film MELF Resistor - MMR Series

■ Applications

- Medical Equipment
- Telecommunication Equipment
- Industrial Process Control Systems.
- Electronic Energy Meter



■ Features

- Excellent heat dissipation
- Low noise characteristics
- Free direction for mounting due to cylindrical design
- Tight tolerance down to $\pm 0.1\%$
- AEC-Q200 Compliant

■ Part Number Explanation

MMR	0207	B	1003	T	C	S
Product	Size (Inch)	Tolerance	Resistance	Packaging	TCR (PPM/°C)	Functional
Metal Film MELF Resistors	0204 0207	B= $\pm 0.1\%$ C= $\pm 0.25\%$ D= $\pm 0.5\%$ F= $\pm 1\%$	100R=100 Ω 1001=1K Ω 1004=1M Ω	T=Taped & Reeled	B= ± 10 N= ± 15 C= ± 25 D= ± 50	S=Standard P=Power Type

Standard Electrical Specifications

Type	Power Rating at 70°C	Max. Operating Voltage	Max. Overload Voltage	Resistance Range				TCR (PPM/°C)
				±0.1%	±0.25%	±0.5%	±1%	
MMR0204	0.25W	200V	400V	10Ω≤R≤20KΩ				±10
				10Ω≤R≤300KΩ				±15
				10Ω≤R≤1MΩ		10Ω≤R≤2.49MΩ	1Ω≤R≤2.49MΩ	±25
				10Ω≤R≤1MΩ		1Ω≤R≤2.49MΩ	0.2Ω≤R≤2.49MΩ	±50
MMR0207	0.5W	300V	600V	10Ω≤R≤20KΩ				±10
				10Ω≤R≤300KΩ				±15
				10Ω≤R≤1MΩ		10Ω≤R≤2.49MΩ	1Ω≤R≤2.49MΩ	±25
				10Ω≤R≤1MΩ		1Ω≤R≤2.49MΩ	0.2Ω≤R≤2.49MΩ	±50

● Functional code: S

Power Type Electrical Specifications

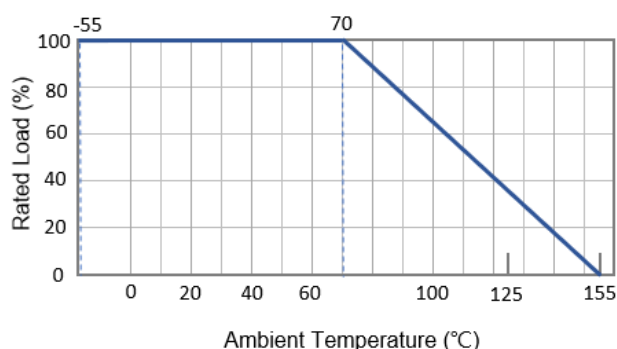
Type	Power Rating at 70°C	Max. Operating Voltage	Max. Overload Voltage	Resistance Range				TCR (PPM/°C)
				±0.1%	±0.25%	±0.5%	±1%	
MMR0204	0.4W	200V	400V	10Ω≤R≤20KΩ				±10
				10Ω≤R≤300KΩ				±15
				10Ω≤R≤1MΩ		10Ω≤R≤2.49MΩ	1Ω≤R≤2.49MΩ	±25
				10Ω≤R≤1MΩ		1Ω≤R≤2.49MΩ	0.2Ω≤R≤2.49MΩ	±50
MMR0207	1W	350V	700V	10Ω≤R≤20KΩ				±10
				10Ω≤R≤300KΩ				±15
				10Ω≤R≤1MΩ		10Ω≤R≤2.49MΩ	1Ω≤R≤2.49MΩ	±25
				10Ω≤R≤1MΩ		1Ω≤R≤2.49MΩ	0.2Ω≤R≤2.49MΩ	±50

● Functional code: P

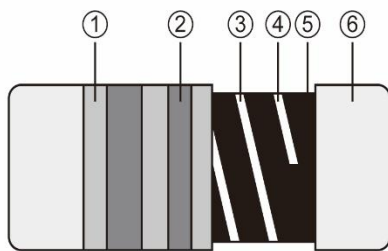
● Beyond the above specification also can meet the special requirements. For detail questions, please contact us freely.

Derating Curve

Operating Temperature Range: -55 to +155°C

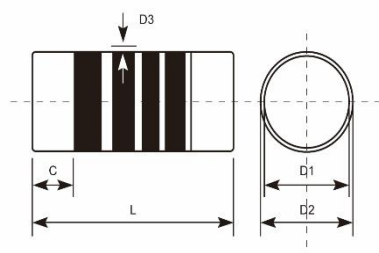


Construction



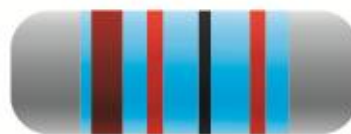
Item	Material
①	Insulation Coating
②	Marking
③	Cutting Line
④	Ceramic Core
⑤	Resistive Film
⑥	Terminal

Dimension



Size code	Dimension (mm)			
	L	D1	D2	C
0204	3.5±0.2	D2 +0/-0.2	1.40±0.15	0.8±0.1
0207	5.9±0.2	D2 +0/-0.2	2.20±0.20	1.3±0.1

Color Band



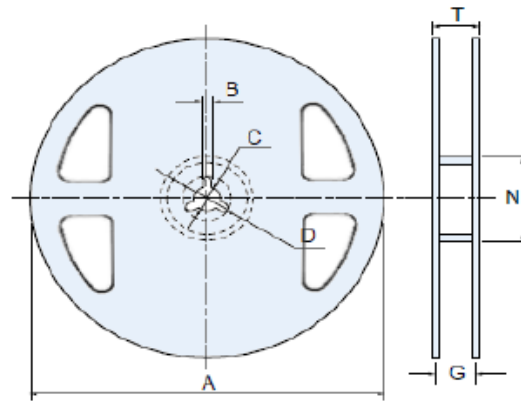
COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER
BLACK	0	0	0	1Ω
BROWN	1	1	1	10Ω
RED	2	2	2	100Ω
ORANGE	3	3	3	1KΩ
YELLOW	4	4	4	10KΩ
GREEN	5	5	5	100KΩ
BLUE	6	6	6	1MΩ
VIOLET	7	7	7	10MΩ
GREY	8	8	8	
WHITE	9	9	9	
GOLD				0.1Ω
SILVER				0.01Ω

The tolerance 0.1%, 0.25%, 0.5% with 4 bands for E-192 series.

Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	Temperature: (T1. +25°C) ~ (T2. +125°C) TCR(ppm/°C) = (R2-R1)/R1×1/(T2-T1)×10 ⁶ (+25~ -55°C please contact factory)	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 x √(PR) for 5 seconds	10Ω-270KΩ :ΔR≤ ±(0.1%+0.01Ω) <10Ω&>270KΩ : ΔR≤ ±(0.15%+0.01Ω)
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	After immersing flux, dip in the 245±5°C molten solder bath for 3±0.5 sec.	Over 95% of termination must be covered with Solder.
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5°C for 10 seconds. Measure the resistance after 1 hour	10Ω-270KΩ :ΔR≤ ±(0.1%+0.01Ω) <10Ω&>270KΩ : ΔR≤ ±(0.25%+0.01Ω)
Operational Life	AEC-Q200 7.8.	Test 1000hr @ T=125°C at specified rated power. Measurement at 24±2 hours after test conclusion.	10Ω-270KΩ :ΔR≤ ±(0.25%+0.01Ω) <10Ω&>270KΩ : ΔR≤ ±(0.5%+0.01Ω)
Temperature Cycling	AEC-Q200 7.4	1000 Cycles (-55°C to +125°C). Measurement at 24±2 hours after test conclusion.	10Ω-270KΩ :ΔR≤ ±(0.25%+0.01Ω) <10Ω&>270KΩ : ΔR≤ ±(0.5%+0.01Ω)
Biased Humidity	AEC-Q200 7.7	1000 hours 85°C/85%RH. 10% of operating power. Measurement at 24 ±2 hours after test conclusion.	<10Ω: ΔR≤ ±(1%+0.01Ω) 10Ω-270KΩ :ΔR≤ ±(0.5%+0.01Ω) >270KΩ-2.49MΩ: ΔR≤ ±(1%+0.01Ω)
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply the maximum overload voltage (DC) for 1minute	ΔR ≥10GΩ
Bending Strength	AEC-Q200 7.21	Bend 2mm for 60 seconds	10Ω-270KΩ :ΔR≤ ±(0.1%+0.01Ω) <10Ω&>270KΩ :ΔR≤ ±(0.5%+0.01Ω)
High Temperature Exposure (Storage)	AEC-Q200 7.3	1000 hrs. @ T=155°C. Unpowered. Measurement at 24 ±2 hours after test conclusion.	10Ω-270KΩ :ΔR≤ ±(0.25%+0.01Ω) <10Ω&>270KΩ : ΔR≤ ±(1%+0.01Ω)
Mechanical Shock	AEC-Q200 7.13	Test Peak value:100g's,Wave:Hail-sine, Duration:6ms,Velocity:12.3ft/sec.	ΔR≤ ±(0.25%+0.01Ω)
Vibration	AEC-Q200 7.14	5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10-2000 Hz.	ΔR≤ ±(0.5%+0.01Ω) No mechanical damage.
ESD	AEC-Q200-002	0204:2KV; 0207:4KV	ΔR≤ ±(0.5%+0.01Ω) No mechanical damage.
Terminal Strength	AEC Q200-006	Force 1.8 Kg for 60 seconds.	No mechanical damage
Flammability	AEC-Q200 7.20	UL-94 V-0 or V-1 are acceptable	Refer UL-94.

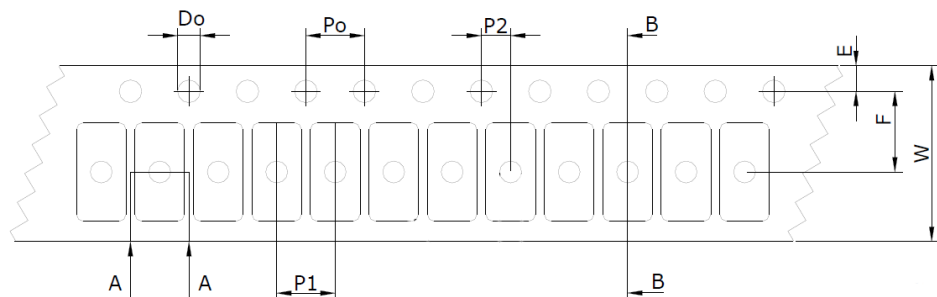
■ Packaging Information



Unit : mm

Size	Packaging Q'ty	A	N	C	D	B	G	T
0204	3kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.
0207	2kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	13.8±1.5	16.7max.

■ Tapping Specification

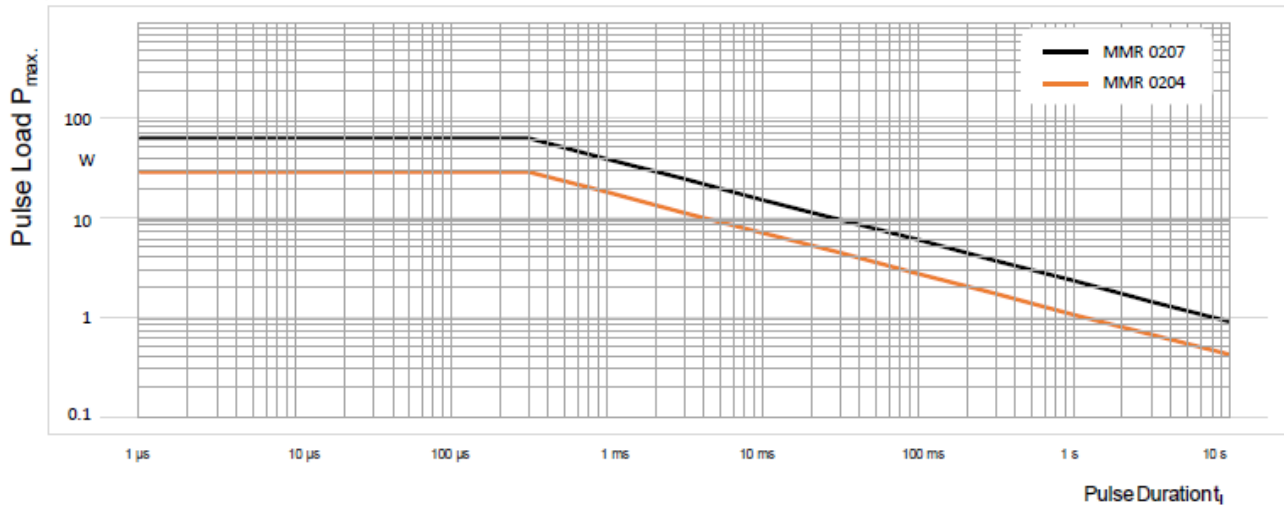


Size	A	B	W	F	E	P1	P2	P0	D
0204	1.55±0.20	3.65±0.20	8.0±0.10	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0207	2.40±0.10	6.15±0.10	12.0±0.10	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0

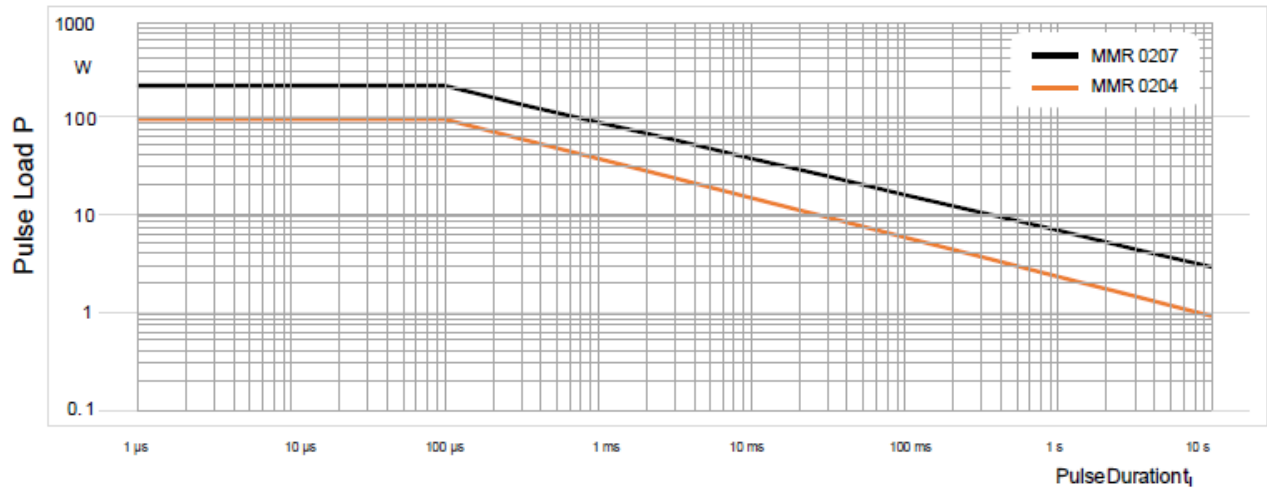
■ Pulse withstanding capacity

■ Single Pulse performance

Single Pulse for $R < 10 \Omega$

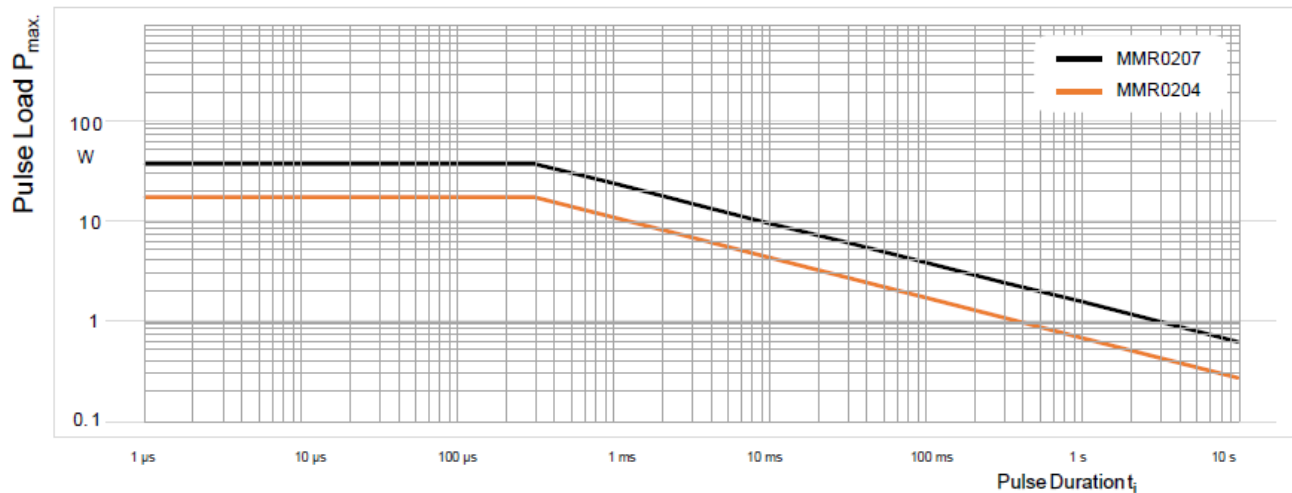


Single Pulse for $R \geq 10$

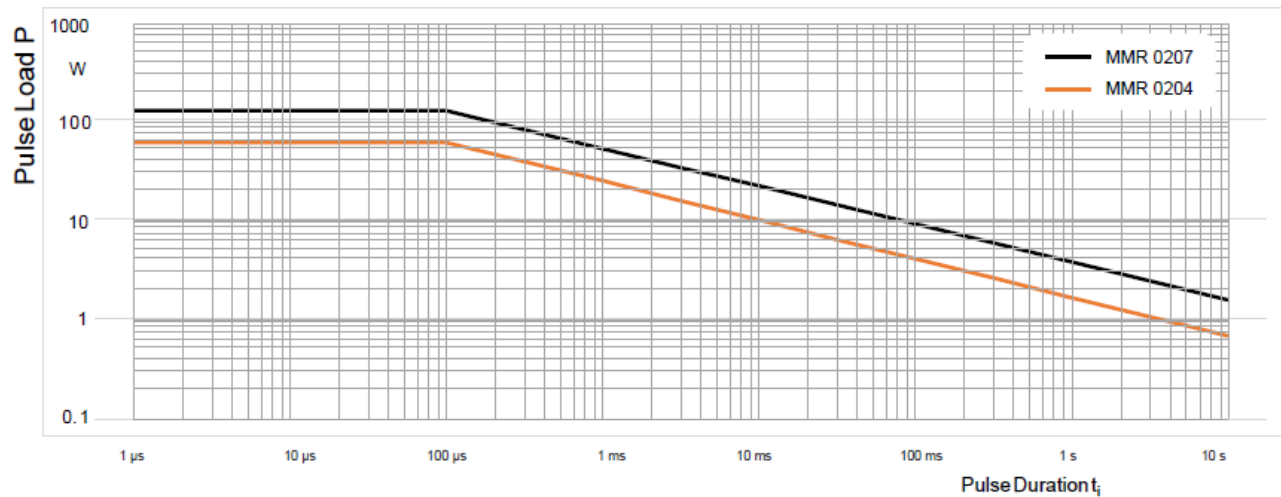


Continuous Pulse performance

Continuous Pulse for $R < 10 \Omega$

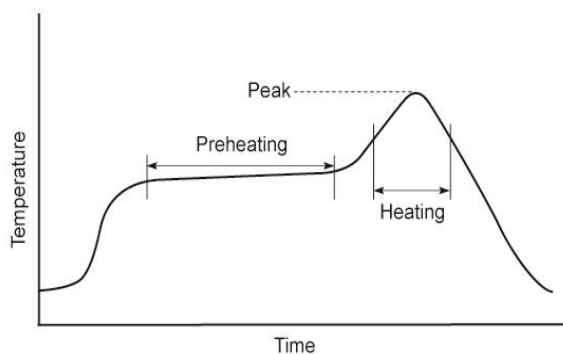


Continuous Pulse for $R \geq 10 \Omega$



Recommended Customer Soldering Parameters

IR Reflow Soldering Conditions



Reflow soldering (lead-free)

Status	Temperature	Time
Preheating	200°C Max	120 sec. Max
Heating	217°C Max	150 sec. Max
Peak	260°C Max	30 sec. Max