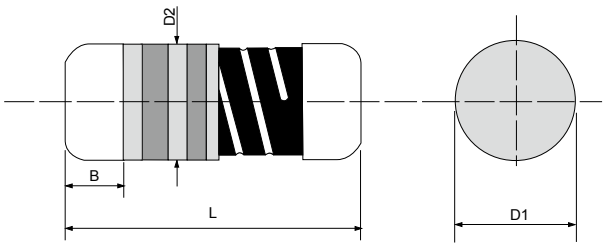
RMM Series

Metal Film MELF Resistor



Specifications Per

- IEC 60115-1
- EN140401-803

Features

- SMD enabled structure
- Excellent solderability termination
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body Length (L, mm)	Cap Diameter (D1, mm)	Body Diameter (D2, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
RMM16	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
RMM204	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
RMM207	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
RMM52	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams

GENERAL SPECIFICATIONS

Type	Power Rating At 70°C	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
RMM16	1/6W	200V	400V	0, 0.51Ω	10MΩ	±1%	E-24/E-96
						±2%, ±5%	E-24
RMM204	1/4W	200V	400V	0, 0.51Ω	10MΩ	±1%	E-24/E-96
						±2%, ±5%	E-24
RMM207	1/3W	300V	500V	0, 0.51Ω	10MΩ	±1%	E-24/E-96
						±2%, ±5%	E-24
RMM52	1/2W	300V	500V	0, 0.51Ω	10MΩ	±1%	E-24/E-96
						±2%, ±5%	E-24

For zero-ohm jumper, please see ZMM series. For 1m~510mΩ please see RCSM series.
Special sizes and specifications available on request.

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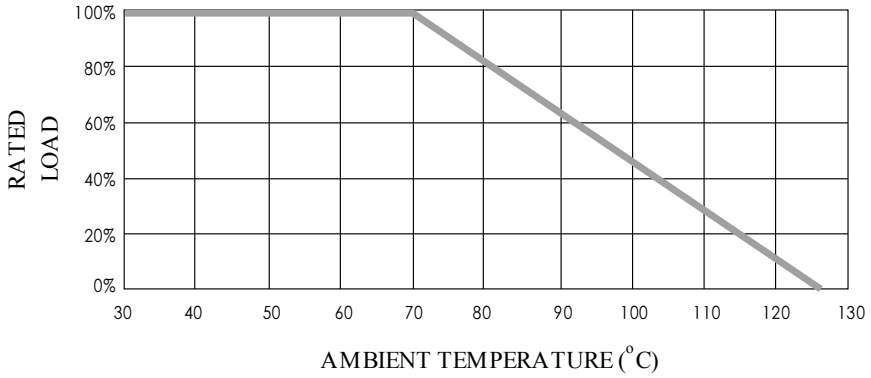
TECHNICAL SUMMARY

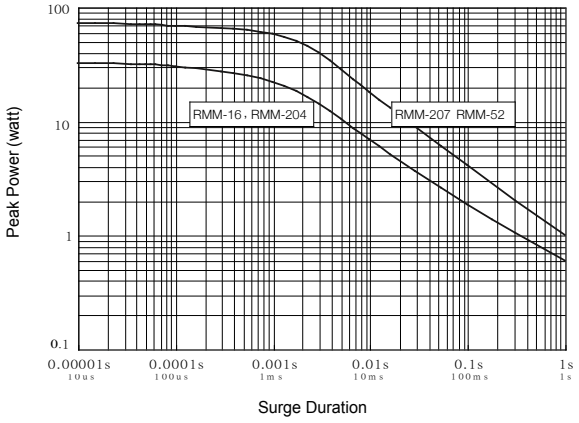
Characteristics	Ranges & Limits	
Operating Temperature Range, °C	-55 ~ +125	
Temperature Coefficient, PPM / °C*	±1%, ±2%	±25, ±50, ±100
	±5%	±100
Dielectric Withstanding Voltage, VAC or DC	RMM16, RMM204	200
	RMM207, RMM52	500
Insulation Resistance, MΩ	$>10^4$	
Film Temperature, °C	RMM16, RMM204, RMM207	125
	RMM52	140
Tin Whisker (JESD201 Temperature Cycling & High Temp. / Humidity Storage), μm	<5	

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

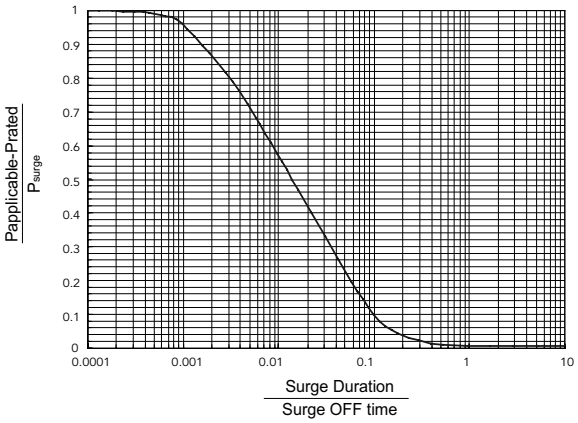
POWER DERATING CURVE



SINGLE SURGE PERFORMANCE



SURGE POWER DERATING CURVE



Notes:

• SINGLE SURGE PERFORMANCE graph is good for NON REPETITIVE applications operating in an ambient temperature of 70°C or less. For temperatures above 70°C, the graph power must be derated further linearly down to zero at 125°C.

• To determine applicable surge power in continuous-surge applications:

1. Identify allowable duration and peak power P_{surge} of single surge;
2. Determine ratio of surge duration/surge OFF time in application;
3. Calculate $P_{applicable}$ backwardly according to Y-axis of SURGE POWER DERATING CURVE.

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PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits	
Short Time Overload	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	0.51Ω to 332KΩ	±0.25%
		>332KΩ	±0.5%
Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hour OFF, at (70±2)°C	0.51Ω to 332KΩ	±0.75%
		>332KΩ	±1.0%
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	0.51Ω to 332KΩ	±1.5%
		>332KΩ	±2.5%
Load Life In Humidity (accelerated mode)	**IEC 60115-1 4.37** 1,000 hours at 85°C and 85% relative humidity with 0.1x rated voltage (not over 100V)	0.51Ω to <100KΩ	±1.5%
		100KΩ to 332KΩ	±3.0%
		>332KΩ	±5.0%
Periodic Electric Overload	**IEC 60115-1 4.39** 3.9x rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	±1.0%	
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds	±0.5%	
Thermal Endurance	**IEC 60115-1 4.25.3** 1,000 hours without load	85°C	±0.75%
		125°C	±1.0%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +125°C 30minutes	5 cycles	±0.5%
		1,000 cycles	±1.5%
Single pulse high voltage overload	**IEC 60115-1 4.27** • 5 pulses ofi 1.2/50μs at 10x rated voltage (not over 400V fior RMM16 & RMM204; not over 500V for RMM207 & RMM52) with interval of 12 sec. • 10 pulses ofi 10/700μs at 10x rated voltage (not over 400V fior RMM16 & RMM204; not over 500V for RMM207 & RMM52) with interval of 60 sec.	±0.5 ±0.5	
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 2KV for RMM16 & RMM204 or 4KV for RMM207 & RMM52 (For continuous surge application please see Surge Performance paragraph)	±2.0	
Climatic test	**IEC 60115-1 4.23** 4.23.2 - dry heat: 16 hours 125°C 4.23.3 - damp heat: 24 hours 55°C with 95% relative humidity 4.23.4 - cold: 2 hours -55°C 4.23.5 - negative air pressure: 2 hour 8.5KPa at (25±10)°C 4.23.6 - damp heat cyclic: 5 days 55°C with 95% relative humidity 4.23.7 - DC load: rated voltage at -55°C and 125°C each 1 Min.	±1.0	
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% min.coverage	
Vibration	**IEC 60115-1 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±1.0%	
Bending test	**IEC 60115-1 4.33** Pressing depth 2mm, 3 times	±0.25%	
Flammability	**IEC 60115-1 4.35** Needle flame test 10s	No burning after 30s	

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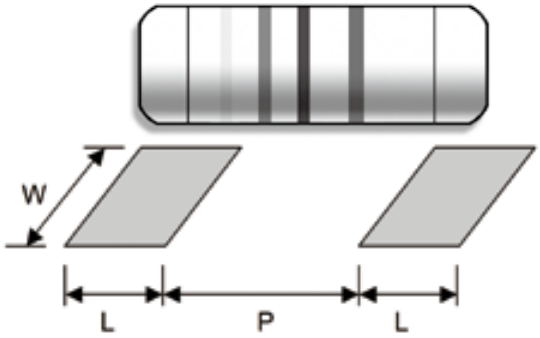
SUGGESTED PAD LAYOUT

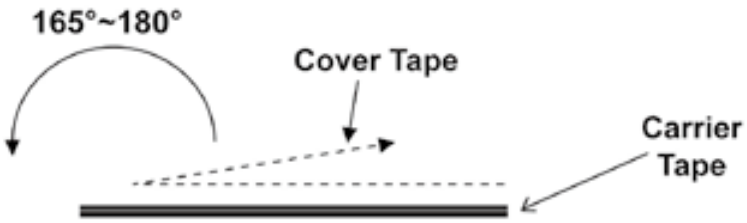


Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
RMM16 RMM204	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
RMM207 RMM52	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0

For better heat dissipation / lower heat resistance, increase W & L.

COVER TAPE PEELING SPECIFICATION

Recommended peeling force: 50±5gf



PART NUMBER

Example: **RMM161/6W22RJ25ppmNIL**

RMM16	1/6W	22R	J	25ppm	NIL
Type	**Power**	Resistance	Tolerance	TCR	Packaging
	/61W	22R=22Ω 22K=22KΩ 1M=1MΩ R = 1 K = 10^3 M = 10^6 G = 10^9	J (5%) K (10%) M (20%)	**3-7-character code** **TYL=Typical** ± 5 ppm=5ppm ± 1000ppm=1000ppm	Nil = Bulk **T/R = Tape and Reel** **T/B = Tape and Box**