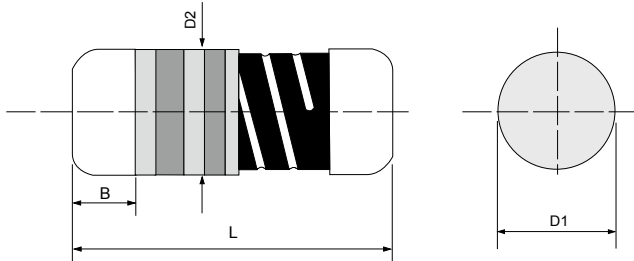


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MM(P)



Specifications Per

- IEC 60115-1
- EN 140401-803

Features

- SMD enabled structure
- Excellent solderability termination
- Excellent in heat dissipation than chip resistor
- Stronger mechanical structure to endure vibration and thermal shock
- 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
MM16P	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
MM204P	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
MM207P	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
MM52P	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams

GENERAL SPECIFICATIONS

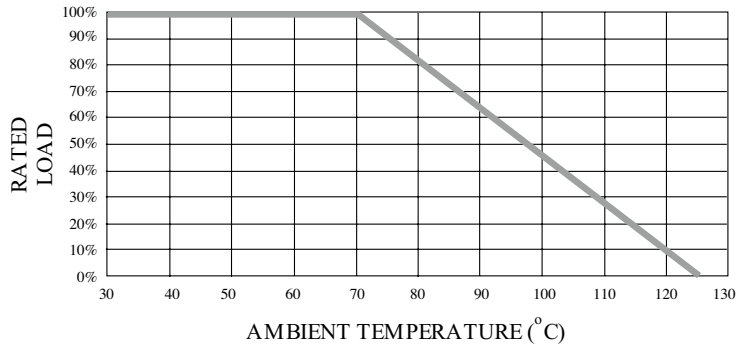
Type	Power Rating At 70°C	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
MM16P	1/6W	200V	400V	0.1Ω	100KΩ	±1%	E-96
						±2%, ±5%	E-48/E-24
MM204P	1/4W	200V	400V	0.1Ω	100KΩ	±1%	E-96
						±2%, ±5%	E-48/E-24
MM207P	1/3W	300V	500V	0.1Ω	330KΩ	±1%	E-96
						±2%, ±5%	E-48/E-24
MM52P	1/2W	300V	500V	0.1Ω	330KΩ	±1%	E-96
						±2%, ±5%	E-48/E-24

For zero-ohm jumper, please see ZMM series. For 10~510mΩ please see CSM series.
Special sizes, values, and specifications not listed available on special order.

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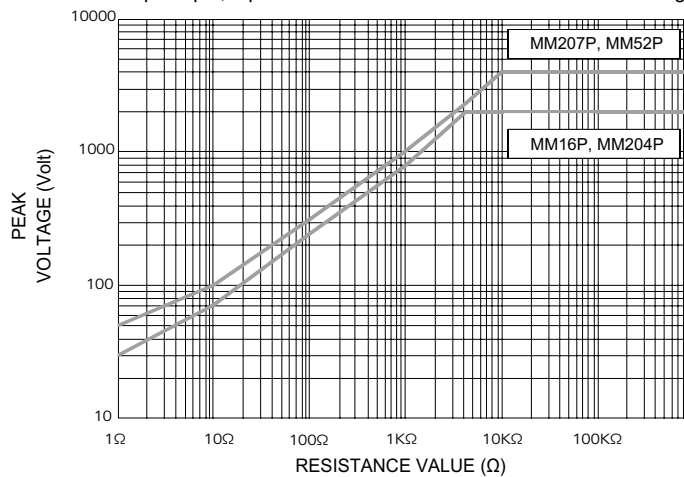
MM(P)

POWER DERATING CURVE



SURGE PERFORMANCE

Pulse load rating in accordance with IEC 60115-1, 4.27
1.2µs/50µs ; 5 pulses at 12s interval for ±0.5% resistance change



PART NUMBER

Example: MM52PJ10K0TKSTR2K0

MM52P	J	10K0	TKS	TR2K0
Type	Tolerance*	Resistance	TCR*	Packaging
	F (1%) G (2%) J (5%)	10KΩ 4-character code containing - 3 significant digits 1 letter multiplier <u>OHM MULTIPLIER</u> R = 1 K = 10 ³ M = 10 ⁶ G = 10 ⁹	100ppm 3-character code TKR = ± 50ppm TKS = ± 100ppm	5-character code TR = Tape Reel (pieces per reel) <u>MM16P/MM204P</u> 3K0 = 3,000 6K0 = 6,000** 10K = 10,000** <u>MM207P/MM52P</u> 2K0 = 2,000 6K0 = 6,000** 10K = 10,000**

* Listed values may not be applicable across product types or to all resistance values. Please check with us before placing order.
** upon request

TECHNICAL SUMMARY

Characteristics	Limits			
Dielectric Withstanding Voltage, VAC or DC	MM16P, MM204P: 200 MM207P, MM52P: 500			
Temperature Coefficient, PPM / °C*	±1%, ±2%		±50	
	±5%		±100	
Operating Temperature Range, °C	-55 ~ +125			
Film Temperature, °C	MM16P	MM204P	MM207P	MM52P
	125	125	125	140
Insulation Resistance, MΩ	>10 ⁴			
Tin Whisker (JESD201 Temperature Cycling & High Temp. / Humidity Storage), μm	< 5			
Failure Rate in Time, pcs / 10 ⁹ device hours	<1			

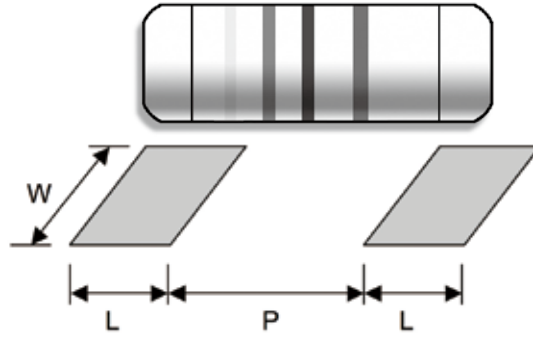
* Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).

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)	±0.5%
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	±1.5%
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 hours OFF, at (70±2)°C	±1.5%
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%
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.	±0.25%
Thermal Endurance	IEC 60115-1 4.25.3 1000 hours at 125°C without load	±1%
Thermal Shock	IEC 60115-1 4.19 -55°C 30minutes, +125°C 30minutes, 5 cycles	±0.5%

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■ SUGGESTED PAD LAYOUT



MM(P)

Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
MM16P MM204P	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
MM207P MM52P	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.