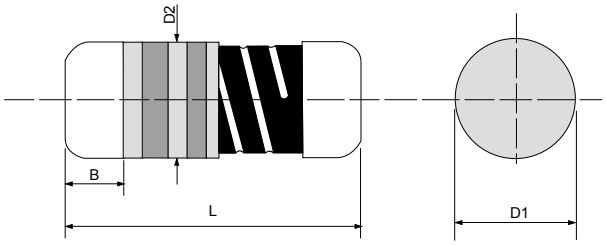
RMMP Series

Metal Film MELF

Precision 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
RMMP16	3.52 ± 0.08	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
RMMP204	3.52 ± 0.08	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
RMMP207	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
RMMP52	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
RMMP101	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 (AC/DC)	Maximum Overload Voltage (AC/DC)	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
RMMP16	1/6W	200V	400V	10Ω	1MΩ	± 0.5%	E-24/E192
				22Ω	510KΩ	± 0.25%	
				43Ω	510KΩ	± 0.1%	
RMMP204	1/4W	200V	400V	10Ω	1MΩ	± 0.5%	E-24/E192
				22Ω	510KΩ	± 0.25%	
				43Ω	510KΩ	± 0.1%	
RMMP207	1/3W	300V	500V	10Ω	1MΩ	± 0.5%	E-24/E192
				15Ω	1MΩ	± 0.25%	
				33Ω	1MΩ	± 0.1%	
RMMP52	1/2W	300V	500V	10Ω	1MΩ	± 0.5%	E-24/E192
				15Ω	1MΩ	± 0.25%	
				33Ω	1MΩ	± 0.1%	
RMMP101	1W	300V	500V	10Ω	1MΩ	± 0.5%	E-24/E192
				22Ω	1MΩ	± 0.25%	
				43Ω	1MΩ	± 0.1%	

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

RMMP Series

Metal Film MELF

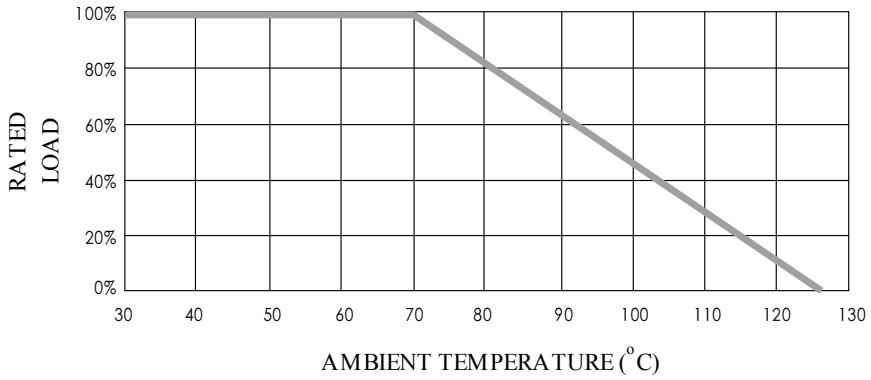
Precision Resistor

TECHNICAL SUMMARY

Characteristics	Ranges & Limits	
Operating Temperature Range, °C	-55 ~ +125	
Temperature Coefficient, PPM / °C*	±5, ±10, ±15, ±25, ±50 (See below for availability)	
Dielectric Withstanding Voltage, VAC or DC	RMMP16, RMMP204	300
	RMMP207, RMMP52, RMMP101	500
Insulation Resistance, MΩ	$>10^4$	
Film Temperature	RMMP16, RMMP204	RMMP207, RMMP52
	125°C	125°C
Failure Rate, pcs/10^9 device hours	RMMP16, RMMP207	RMMP204, RMMP52, RMMP101
	<1	<1.5
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



TEMPERATURE COEFFICIENT AVAILABILITY

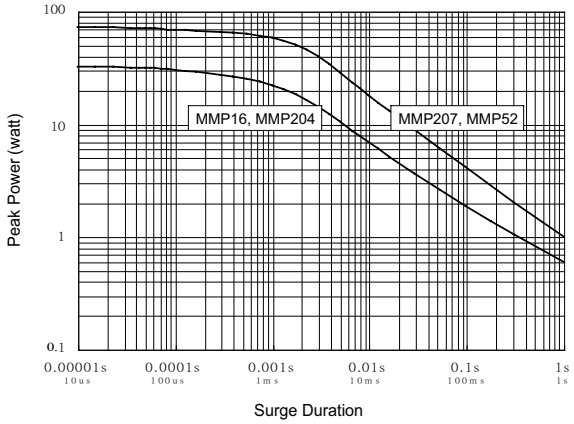
Specifications		Resistance Values Available				
TC	Tolerance	RMMP16	RMMP204	RMMP207	RMMP52	RMMP101
±5 PPM / °C	±0.5%	100Ω~10KΩ		75Ω~15KΩ		
	±0.25%					
	±0.1%					
±10, ±15 PPM / °C	±0.5%	10Ω~510KΩ	10Ω~330KΩ	10Ω~750KΩ	10Ω~680KΩ	10Ω~680KΩ
	±0.25%	22Ω~510KΩ	22Ω~330KΩ	15Ω~680KΩ	15Ω~510KΩ	15Ω~510KΩ
	±0.1%	43Ω~510KΩ	43Ω~330KΩ	33Ω~680KΩ	33Ω~510KΩ	33Ω~510KΩ
±25 PPM / °C	±0.5%	10Ω~750KΩ		10Ω~1MΩ		
	±0.25%	22Ω~510KΩ		15Ω~1MΩ		
	±0.1%	43Ω~510KΩ		33Ω~1MΩ		
±50 PPM / °C	±0.5%	10Ω~1MΩ		10Ω~1MΩ		
	±0.25%	22Ω~510KΩ		15Ω~1MΩ		
	±0.1%	43Ω~510KΩ		33Ω~1MΩ		

RMMP Series

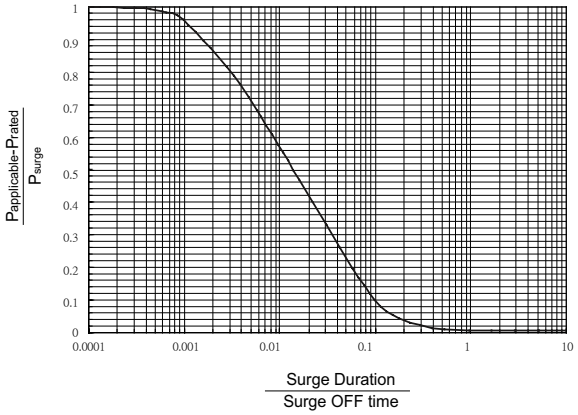
Metal Film MELF

Precision Resistor

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.

RMMP Series

Metal Film MELF

Precision Resistor

PERFORMANCE SPECIFICATIONS

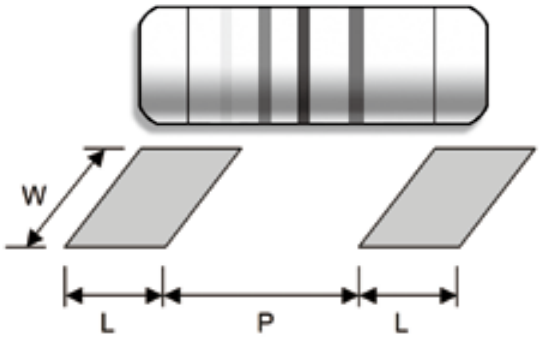
Characteristics	Test Conditions	Limits		
Short Time Overload	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	± 0.25%		
Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hrs with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	10Ω to 332KΩ		±0.5%
		>332KΩ		±0.75%
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	10Ω to 332KΩ		±0.75%
		>332KΩ		±1.0%
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)	10Ω to <10KΩ		±1.0%
		10KΩ to 332KΩ		±1.5%
		>332KΩ		±3.0%
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	± 0.5%		
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%		
Thermal Endurance	**IEC 60115-1 4.25.3** 1,000 hours without load	RMMP16 RMMP204 RMMP207 RMMP52	85°C	± 0.25%
			125°C	± 0.75%
		RMMP101	85°C	± 0.5%
			125°C	± 1.0%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +125°C 30minutes	5 Cycles		± 0.25%
		1,000 Cycles		± 1.0%
Single pulse high voltage overload	**IEC 60115-1 4.27 Severity no.4** 10 pulses of 10/700µs at 10x rated voltage (not over max. overload voltage) with interval of 60 sec.	± 0.5%		
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 2KV for MMP16 & MMP204 or 4KV for MMP207 & MMP52 & MMP101 (For continuous surge application please see Surge Performance paragraph)	± 1.0%		
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		

RMMP Series

Metal Film MELF

Precision Resistor

SUGGESTED PAD LAYOUT

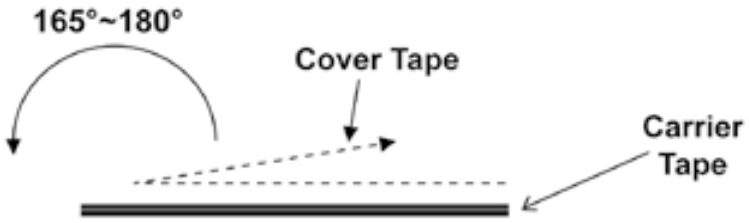


Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
RMMP16 RMMP204	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
RMMP207 RMMP52 RMMP101	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0

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

COVER TAPE PEELING SPECIFICATION

Recommended peeling force: 50±5gf



PART NUMBER

Example: **RMMP161/6W22RD5ppmNIL**

RMMP16	1/6W	22R	D	5ppm	NIL
Type	**Power**	Resistance	Tolerance	TCR	Packaging
	1/6W	22R=22Ω 22K=22KΩ 1M=1MΩ R = 1 K = 10^3 M = 10^6 G = 10^9	D (0.5%) J (5%) M (20%) K (10%)	**3-7-character code** **TYL=Typical** ± 5 ppm=5ppm ± 1000ppm=1000ppm	Nil = Bulk **T/R = Tape and Reel** **T/B = Tape and Box**