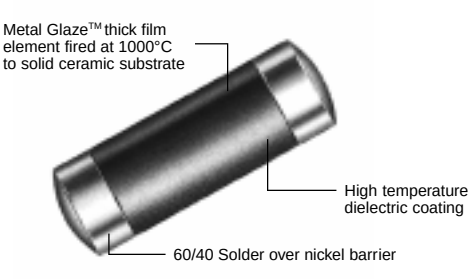
CYLINDRICAL GENERAL PURPOSE SURFACE MOUNT POWER RESISTOR METAL GLAZE™

ISO-9001 Registered

MM SERIES



- Up to 2 watts
- 0.1 ohm to 2.2 megohm range
- Up to 1000 volts
- 150°C maximum operating temperature

MM SPECIFICATIONS:

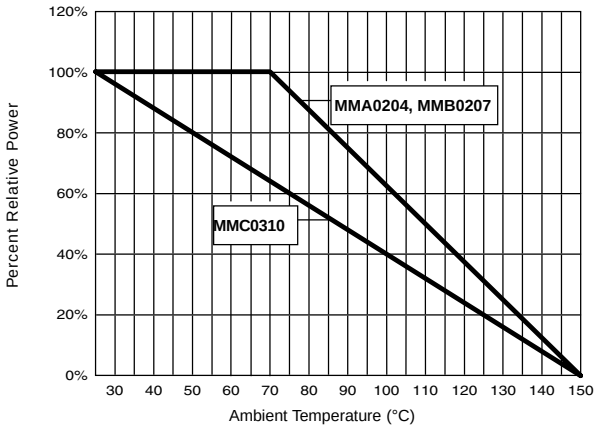
Size Code	IRC Type	Maximum Power Rating	Working Voltage[1]	Maximum Voltage	Resistance Range (ohms)[2]	Tolerance (±%)[2]	TCR (ppm/°C)[2]	Product Category
B	MMA0204	1/4W @ 70°C	200	400	0.1 to 0.99 1.0 to 1.0 M	1 1	100 50	Low Range Standard
F	MMB0207	1W @ 70°C	350	700	0.1 to 0.99 1.0 to 2.21M	1 1	100 50	Low Range Standard
H	MMC0310	2W @ 25°C 1.33W @ 70°C	500	1000	0.2 to 0.99 1.0 to 2.21M	1 1	100 50	Low Range Standard

[1]Not to exceed $\sqrt{P \times R}$ [2]Consult factory for tighter TCR, tolerance, or resistance values. E96 standard EIA Decade Values preferred. E196 and E24 Decade Values available.

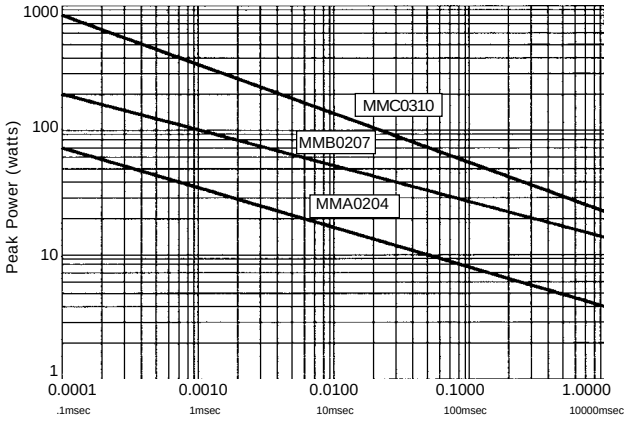
MM PERFORMANCE CHARACTERISTICS:

Characteristics	Maximum Change	Test Method
Temperature Coefficient	As specified	MIL-R-55342E Par 4.7.9 (-55°C +125°C)
Thermal Shock	±0.5% +0.01 ohm	MIL-R-55342E Par 4.7.3 (-65°C +150°C, 5 cycles)
Low Temperature Operation	±0.25% +0.01 ohm	MIL-R-55342E Par 4.7.4 (-65°C @ working voltage)
Short Time Overload	±1% +0.01 ohm	MIL-R-55342E Par 4.7.5 (2.5 x $\sqrt{P \times R}$ for 5 seconds)
High Temperature Exposure	±0.5% +0.01 ohm	MIL-R-55342E Par 4.7.6 (+150°C for 100 hours)
Resistance to Bonding Exposure	±0.25% 0.01 ohm	MIL-R-55342E Par 4.7.7 (Reflow soldered to board at 260°C for 10 seconds)
Solderability	95% minimum coverage	MIL-STD-202, Method 208 (245°C for 5 seconds)
Moisture Resistance	±0.5% +0.01 ohm	MIL-R-55342E Par 4.7.8 (10 cycles, total 240 hours)
Life Test	1% +0.01 ohm	MIL-R-55342E Par 4.7.10 (2000 hour at 70°C intermittent)
Terminal Adhesion Strength	±1% +0.01 ohm no mechanical damage	1200 gram push from underside of mounted chip for 60 seconds
Resistance to Board Bending	±1% + 0.01 ohm no mechanical damage	Chip mounted in center of 90mm long board, deflected 5mm so as to exert pull on chip contacts for 10 seconds

MM POWER DERATING CURVE:



MM REPETITIVE SURGE CURVE:



Note: Use for repetitive pulses where the average power dissipation is not to exceed the component rating at 70°C. Surge handling capacity for low-repetitive surges may be significantly greater than shown above. Contact factory for recommendations.

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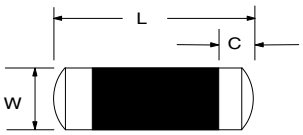
MM FAMILY STANDARD SIZES, SOLDER PADS AND PACKAGING:

DIMENSIONS (mm and (inches)):



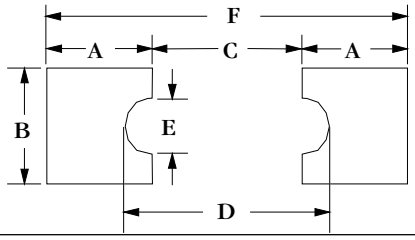
Size Code	Actual Size	L	W	C*
B		3.25±0.18 (0.128±0.007)	1.45±0.15 (0.057±0.006)	0.51+0.50/-0.38 (0.020+0.020/-0.015)
F		6.38±0.25 (0.251±0.010)	2.01±0.15 (0.079±0.006)	1.02±0.50 (0.040±0.020)
H		9.32±0.25 (0.367±0.010)	2.67±0.15 (0.105±0.006)	1.27±0.50 (0.050±0.020)

***C dimension is average termination width.**

RECOMMENDED SOLDER PAD DIMENSIONS (REFLOW):

To ensure excellent solderability performance, IRC recommends the following pad design. This design will provide a large repeatable solder fillet to the MM resistor on reflow processes and will provide maximum heat transfer to the PC board in high power applications. By placing the MM on the solder paste while the paste is in the "tacky" state, the MM will be held in position until solder reflow begins. The pad design then uses the surface tension of the molten solder to pull the component to the center of the solder pad. The placement of a via rising above the board level directly beneath the MM is not recommended.

Size Code	Dimensions (mm and (inches))					
	A	B	C	D	E	F
B	1.93 (0.076)	2.36 (0.093)	1.47 (0.058)	2.49 (0.098)	0.81 (0.032)	5.36 (0.211)
F	3.07 (0.121)	3.20 (0.126)	3.23 (0.127)	4.65 (0.183)	1.02 (0.040)	9.37 (0.369)
H	4.32 (0.170)	4.06 (0.160)	5.41 (0.213)	6.93 (0.273)	1.12 (0.044)	14.05 (0.553)



STANDARD REEL PACKAGING PER EIA-481:

Size Code	Reel Diameter*	Quantity Per Reel	Carrier Tape Width	Component Pitch
B	7"	2,500 max.	8mm	**4mm**
	13"	10,000 max.		
F	7"	1,500 max.	12mm	4mm
	13"	5,000 max.		
H	13"	1,500 max.	24mm	4mm

* The 13" reel is considered standard and will be supplied unless otherwise specified.

HOW TO ORDER:

Sample Part No. **MMA0204 - 50 - 2203 - F - 13**

IRC Type
(MMA0204, MMB0207, MMC0310)

Temperature Coefficient
(50 or 100)

Resistance Value
(100 ohms and greater - First 3 significant figures plus 4th digit multiplier)
Example: 100 ohms = 1000, 1000 ohms = 1001, 150,000 ohms = 1503
(Less than 100 ohms - "R" is used to designate decimal)
Example: 51 ohms = 51R0, 1 ohm = 1R00, 0.25 ohm = R250

Tolerance
(F = 1.0%)

Packaging Code*
(BLK = Bulk, 7=7" Reel, 13=13" Reel)

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