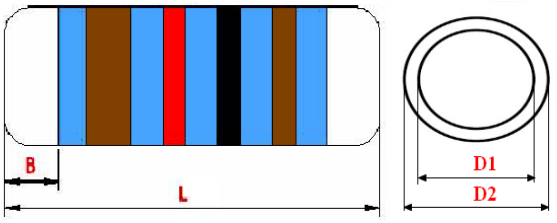
METAL FILM MELF PRECISION RESISTORS

(MM SERIES)

Features

- Cylindrical SMD Style Metal Film Resistors
- Conformal Multi-layer Coating Against Humidity.
- Excellent Solderability Termination, Specially plated Electrodes



Dimensional Specifications

Type	Body Length (L)	D1 Min.	D2 Max	(B) min
MM-0102/P	2.2±0.1	1.10	1.25	0.45
MM-0204/P	3.5±0.2	1.12	1.5	0.5
MM-0207	5.9±0.2	1.72	2.4	0.5
MM-0052	5.9±0.2	1.72	2.4	0.5
MM-01SS	5.9±0.2	1.72	2.4	0.5
MM-0309	8.5±0.2	2.55	3.4	0.5
MM-0100	8.5±0.2	2.55	3.4	0.5
MM-02SS	8.5±0.2	2.55	3.4	0.5
MM-02S	10.5±0.3	3.7	4.3	1.0
MM-03S	14.5±0.3	4.2	4.8	1.0

Performance Specifications

Requirements	Characteristics	Test Method (JIS-C5202)
Temp. Coefficient (PPM /˚C)	±100, ±50, ±25, ±15 PPM / ˚C	JIS-C(5202-5.2)
Short Time Overload	±(0.5%+0.05Ω)	JIS-C(5202-5.5)
Intermittent	±(1.0%+0.05Ω)	JIS-C(5202-5.8)
Resistance to Soldering heat	±(0.5%+0.05Ω)	JIS-C(5202-6.4)
Solderability	95% Coverage min	JIS-C(5202-6.5)
Moisture Resistance	±(1%+0.1Ω)	JIS-C(5202-7.9)
Load Life	*±(1%+0.05Ω)	JIS-C(5202-7.10)

* ±(0.5%+0.05Ω) for resistor tolerance tighten than 0.5%

RoHS compliant

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General Specifications

Type	Power Rating (at 70˚C)	Max. Working Voltage	Max. Overload Voltage	Operating Temp. Range	Resistance Range					Standard Resistance (PPM/℃)
					±0.1% (E24, E96)	±0.25% (E24, E96)	±0.5% (E24, E96)	±1% (E24, E96)	±5% (E24)	
MM-0102	1/8W	150V	300V	-55~+155℃	--			1Ω ~ 1MΩ		±100
					--		1Ω ~ 1MΩ			±50
					100Ω ~ 82KΩ		49.9~200KΩ	49.9~390KΩ	--	±25
					100Ω ~ 56KΩ				--	±15
MM-0102P	1/5W	200V	400V	-55~+155℃	100Ω ~ 82KΩ		49.9~200KΩ	49.9~390KΩ	--	±25
					100Ω ~ 56KΩ				--	±15
	0.3W				--			1 Ω ~ 1MΩ		±100
					--		1 Ω ~ 1MΩ			±50
MM-0204	1/4W	200V	400V	-55~+155℃	--			0.1Ω ~ 1MΩ		±100
					10Ω ~ 1MΩ	1Ω ~ 1MΩ	1Ω ~ 3.4MΩ	0.2Ω ~ 3.4MΩ		±50
					10Ω ~ 1MΩ		10Ω ~ 3.4MΩ	1Ω ~ 3.4MΩ		±25
					10Ω ~ 300KΩ				--	±15
					49.9~ 20KΩ	49.9~ 300K	49.9Ω ~ 20KΩ		--	±10
MM-0204P	0.4W	200V	400V	-55~+155℃	--			0.1Ω ~ 1MΩ		±100
					10Ω ~ 1MΩ	1Ω ~ 1MΩ	1Ω ~ 3.4MΩ	0.2Ω ~ 3.4MΩ		±50
					10Ω ~ 1MΩ		10Ω ~ 3.4MΩ	1Ω ~ 3.4MΩ		±25
					10Ω ~ 300KΩ				--	±15
					49.9Ω ~ 20KΩ				--	±10
MM-0207	1/2WS	300V	600V	-55~+155℃	--			0.1Ω ~ 1MΩ		±100
					10Ω ~ 1MΩ	1Ω ~ 1MΩ	1Ω ~ 3.4MΩ	0.2Ω ~ 3.4MΩ		±50
					10Ω ~ 1MΩ		10Ω ~ 3.4MΩ	1Ω ~ 3.4MΩ		±25
					10Ω ~ 300KΩ				--	±15
					49.9Ω ~ 20KΩ				--	±10
MM-0052	1/2W	250V	500V	-55~+155℃	--			0.1Ω ~ 10MΩ		±100
					--			0.1Ω ~ 10MΩ		±50,±25
MM-0309	1/2W	350V	700V	-55~+155℃	--			0.1Ω ~ 10MΩ		±100
					--			0.1Ω ~ 10MΩ		±50
					0.1Ω ~ 1MΩ			0.1Ω ~ 10MΩ		±25
					0.1Ω ~ 1MΩ					±15
					0.1Ω ~ 1MΩ					±10, ±5
MM-01SS	1WSS	350V	700V	-55~+155℃	--			0.1Ω ~ 1MΩ		±100
					10Ω ~ 1MΩ	1Ω ~ 1MΩ	1Ω ~ 3.4MΩ	0.2Ω ~ 3.4MΩ		±50
					10Ω ~ 1MΩ		10Ω ~ 3.4MΩ	1Ω ~ 3.4MΩ		±25
					10Ω~300KΩ				--	±15
					49.9~100KΩ	49.9Ω ~ 20KΩ			--	±10
MM-0100	1WS	350V	700V	-55~+155℃	--			10Ω ~ 10MΩ		±100
					--			10Ω ~ 10MΩ		±50,±25
MM-02SS	2WSS	350V	700V	-55~+155℃	--			10Ω ~ 10MΩ		±100
					--			10Ω ~ 10MΩ		±50,±25
MM-02S	2WS	500V	1000V	-55~+155℃	--			10Ω ~ 1MΩ		±50, ±100
MM-03S	3WS	500V	1000V	-55~+155℃	--			10Ω ~ 1MΩ		±50, ±100

Lower or higher resistances beyond above list are available on request.

RoHS compliant

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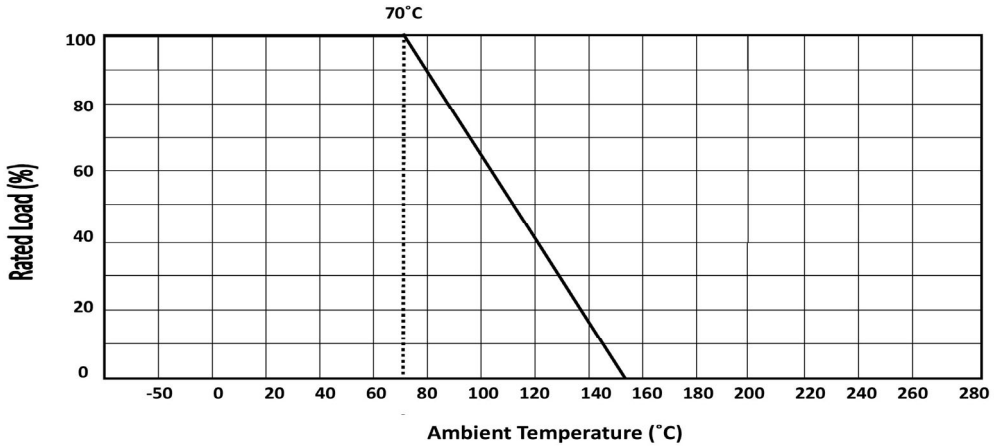
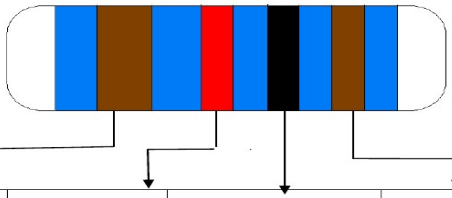
Power Derating Curve



Parts Number System

MM	0207	1002	F	R	C
Metal film		Resistance	Tolerance	Packaging Codes	TCR
Melf resistors	Size and Wattage	Tol. 5%: 3-digit codes 103=10K ohm Tol. : 1%, 0.5%, 0.25%. 0.1% 4-digit codes 1002=10K ohm	J=5% F=1% D=0.5% C=0.25% B=0.1%	2000pcs/Reel for MM-0207 MM-0052 MM-01SS 2500pcs/Reel for MM-0309 MM-0100 MM-02SS 3000pcs/Reel for MM-0102/P, MM-0204/P 1500pcs/reel for MM-02S, MM-03S R-tape reel, B-Bulk pack	K=100PPM C=50PPM E=25PPM H=15PPM

Color band



COLOR	1ST VALUE (Thickness)	2ND VALUE	3th VALUE	MULTIPLIER	TOLERANCE %	
BLACK	0	0	0	10^0		
BROWN	1	1	1	10^1	±1%	F
RED	2	2	2	10^2	±2	G
ORANGE	3	3	3	10^3		
YELLOW	4	4	4	10^4		
GREEN	5	5	5	10^5	±0.5%	D
BLUE	6	6	6	10^6	±0.25%	C
VIOLET	7	7	7	10^7	±0.1%	B
GREY	8	8	8	10^8	±0.05%	A
WHITE	9	9	9	10^9		
GOLD				10^{-1}	±5%	J
SILVER				10^{-2}	±10%	K
PLAIN					±20%	M

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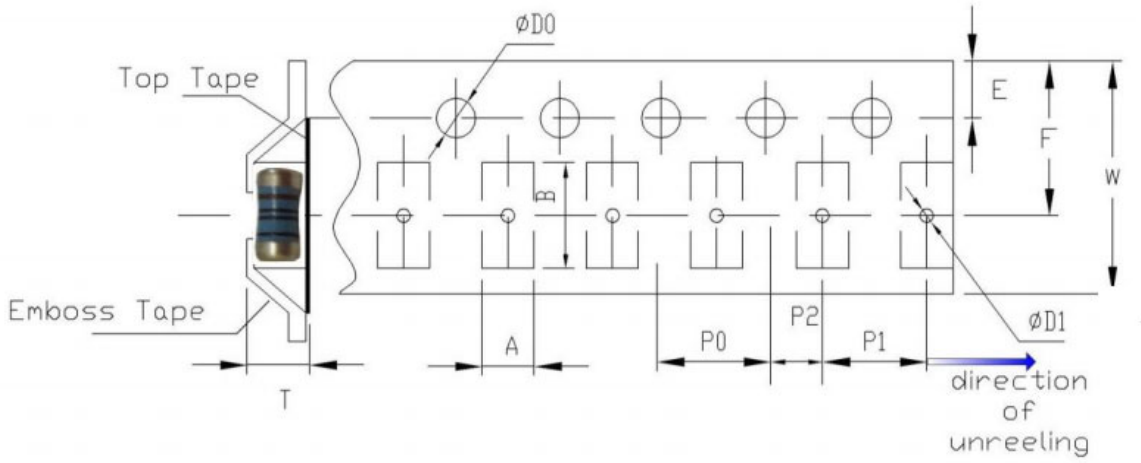
Emboss Plastic Tape Specifications



Type	A	B	W	E	F	P0	P1	P4	ΦD0	T
MM0204 MM0102 MM0016	1.60±0.10	3.70±0.10	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.10	1.45±0.10
MM0207 MM0052 MM01SS	2.40±0.10	6.30±0.10	12.0±0.10	1.75±0.10	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.10	2.50±0.10
MM0309 MM0100 MM02SS	3.30±0.10	9.00±0.10	16.0±0.30	1.75±0.10	7.50±0.10	4.00±0.10	8.00±0.10	2.00±0.05	1.50+0.10	3.30±0.10