

Metal Film Precision MELF Resistor High Voltage Type

MFMH Series

MERITEK

FEATURE

- Operating Temperature: -55 ~ +155°C
- Storage Temperature: 15 ~ 28°C, Humidity < 80% RH
- Tight Tolerance Down to ±0.1%
- High Power Rating Up to 1 Watt



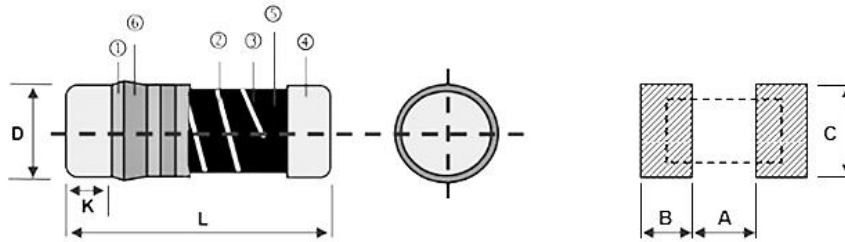
PART NUMBERING SYSTEM

MFMH 0204 G 1004 B C
(1) (2) (3) (4) (5) (6)



No	Item	Code	Description	Series Reference
(1)	Meritek Series	MFMH	Metal Film Precision MELF Resistor	SMD High Voltage Type
(2)	Size Code	0204	0204	0207
(3)	Power Rating	G	G: 2/5W	T: 1W
(4)	Resistance	1004	1004: 1MΩ	First 3 are significant, Fourth is multiplier (10x)
(5)	Tolerance	B	B: ±0.1%	C: ±0.25%, D:±0.5%, F: ±1%
(6)	TCR (PPM/°C)	C	C: ±25 PPM/°C	D: ±50 PPM/°C

DIMENSIONS AND CONSTRUCTION



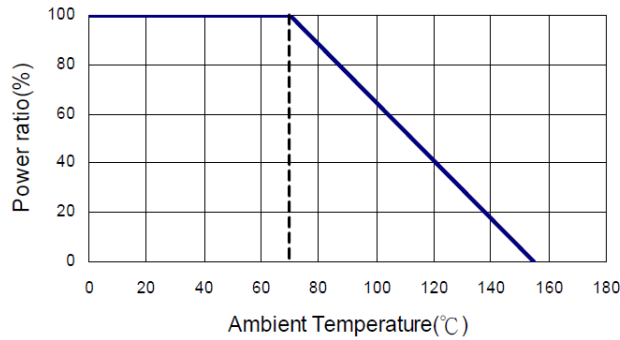
Size	L (mm)	ΦD (mm)	K (mm)	A (mm)	B (mm)	C (mm)	Weight (g/1000pcs)
0204	3.50±0.20	1.40±0.15	0.80±0.10	1.6	1.2	1.6	18.7
0207	5.90±0.20	2.20±0.20	1.30±0.10	3.0	1.7	2.4	80.9

Item	Construction	Item	Construction	Item	Construction
1	Insulation Coating	3	Ceramic Rod	5	Resistor Layer
2	Trimming Line	4	Electrode Cap	6	Marking

ELECTRICAL CHARACTERISTIC

Size	Power Rating at 70°C	Operating Temp. Range	Max Operating Voltage	Max Overload Voltage	Resistance (Ω)				TCR (PPM/°C)
					±0.1%	±0.25%	±0.5%	±1%	
0204	2/5W	-55 ~ +155°C	500V	1000V	340K ~ 1M		340K ~ 3.4M		±25
					340K ~ 1M		340K ~ 3.4M		±50
0207	1W	-55 ~ +155°C	1000V	2000V	340K ~ 1M		340K ~ 3.4M		±25
					340K ~ 1M		340K ~ 3.4M		±50

POWER DERATING CURVE

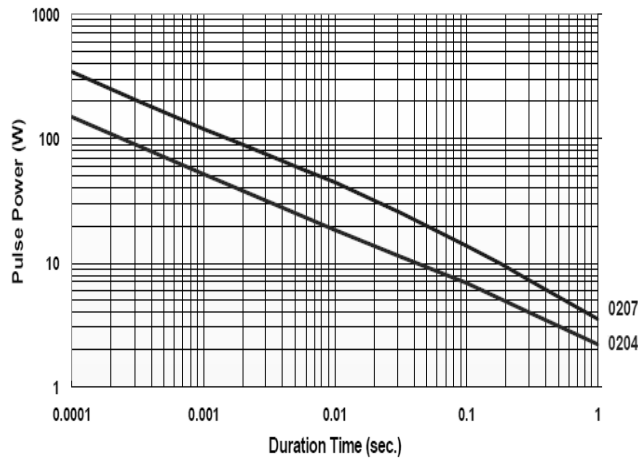


RELIABILITY TEST CONDITION AND REQUIREMENT

Test	Standard	Condition	Requirement
Temperature Coefficient of Resistance (T.C.R.)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	-55°C ~ +125°C, 25°C is the reference temperature	As Specified
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds	±(0.15%+0.05Ω)
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply Max Overload Voltage for 1 minute	≥10G
Endurance	JIS-C-5201-1 4.25 IEC60115-1 4.25.1 MIL-STD-202 Method 108	70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF". RCWV: $\sqrt{(P \cdot R)}$ or max operating voltage, whichever is lower	±(1%+0.05Ω)
Damp Heat With Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	40±2°C, 90~95% RH, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"	±(1%+0.05Ω)
High Temperature Exposure	MIL-STD-202 Method 108	at +155°C for 1000 hrs	±(1%+0.05Ω)
Board Flex	AEC-Q200-005	Bending once for 60 seconds with 2mm	±(0.5%+0.05Ω)
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17 J-STD-002	245±5°C for 3 seconds	95% minimum coverage
Resistance to Soldering Heat	MIL-STD-202 Method 210	260±5°C for 10 seconds	±(0.25%+0.05Ω)
Voltage Proof	JIS-C-5201-1 4.7 IEC-60115-1 4.7	1.42 times Max. Operating voltage for 1 minute	No breakdown or flashover
Leaching	JIS-C-5201-1 4.18 IEC60068-2-58 8.2.1	260±5°C for 30 seconds	Individual leaching area ≤5% Total leaching area ≤10%
Thermal Shock	JESD22 Method JA-104	-55°C ~ +125°C, 1000 cycles	±(0.5%+0.05Ω)
Resistance to Solvents	MIL-STD-202 Method 215	Add aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.	No visible damage on appearance and marking

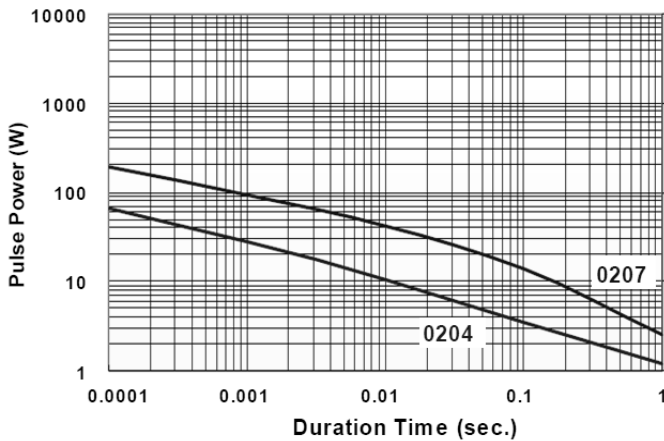
CHARACTERISTIC CURVE - Single PULSE WITHSTANDING CAPACITY

Single Pulse (100Ω)

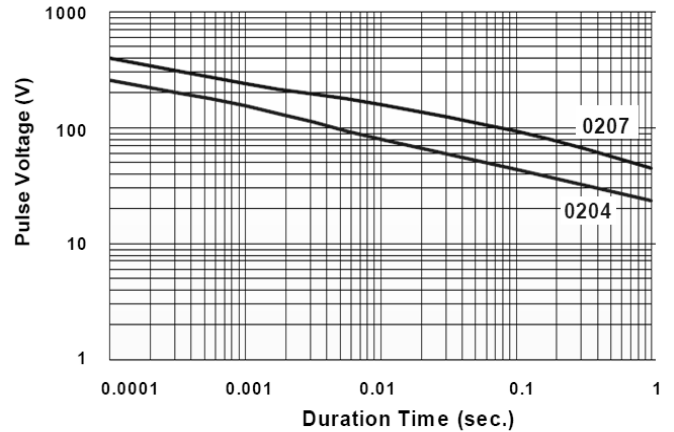


CHARACTERISTIC CURVE - CONTINUOUS PULSE WITHSTANDING CAPACITY

Continuous Pulse (100Ω)



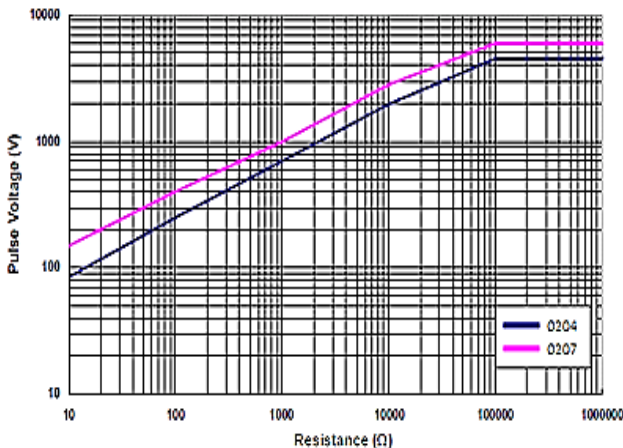
Pulse Voltage (100Ω)



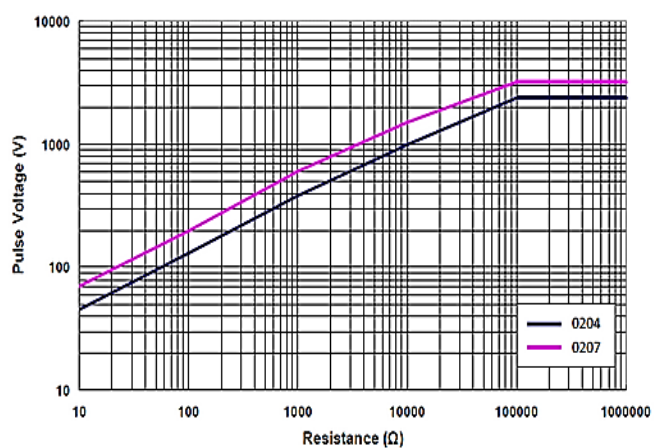
Notes:
 Single Pulse: Result of 50 rectangular pulses applied for at one minute intervals. Limit of acceptance was a R < 1% of the initial.
 Continuous Pulse: Result of rectangular pulses with period adjusted to the average power dissipated is equal to rated power. Limit of acceptance was a R < 1% of the initial.

CHARACTERISTIC CURVE - LIGHTNING SURGE

1.2/50μs Lighting Surge



10/700μs Lighting Surge



Notes:
 Lightning Surge: Tested in accordance with IEC 60115-1 using both 1.2/50μs and 10/700μs pulses. Limit of acceptance is R < 0.5% of the initial.

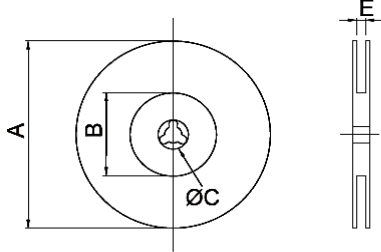
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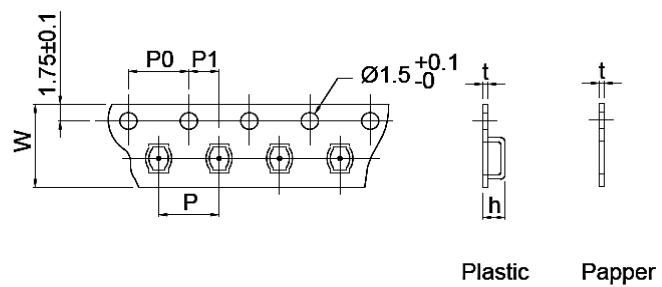
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PACKAGING SPECIFICATIONS

CARRIER TAPE REELS



TAPE DIMENSIONS (mm)

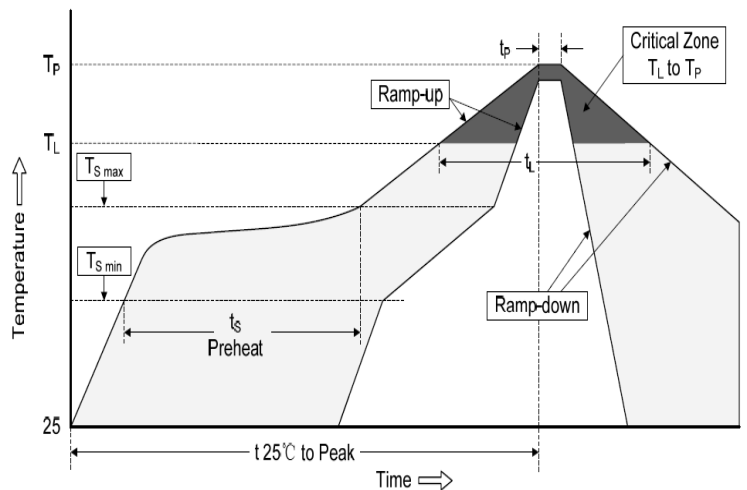


Plastic Paper

Item	Reel Dimension (mm)				Tape Dimensions (mm)					Parts Per Reel
	A ± 1.5	B ± 1.0	C ± 0.2	E ± 0.5	W ± 0.10	P ± 0.10	P0 ± 0.10	P1 ± 0.05	h ± 0.10	
MFMP0204	178.5	60.0	13.0	9.0	8.00	4.00	4.00	2.00	1.80	3,000
MFMP0207	178.5	60.0	13.0 ± 0.5	13.0	12.00	4.00	4.00	2.00	2.70	2,000

RECOMMENDED SOLDERING PROFILES

Reflow Condition		
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Temp. Max $T_{s(max)}$	180°C
	Time (min. to max.) (t_s)	90 ~120 seconds
Average ramp up rate (T_L) to peak		3°C/second max.
$T_{s(max)}$ to T_L (Ramp-up rate)		3°C/second max.
Reflow	Temp. (T_L)	220°C
	Time (min. to max.) (t_L)	60seconds max.
Peak Temperature (T_P)		260°C
Time within 15°C of actual peak Temperature (t_p)		10 seconds max.
Ramp-down Rate		6°C/second



Meritek Resistor Series: <http://www.meritekusa.com/EN/productlist/node/2>

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*Specifications subject to change without notice.