

MELF Metal Film

FrelTec

Resistors

FrelTec GmbH

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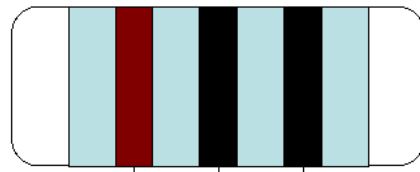
MELF High Voltage Metal Film Resistors

SPECIFICATION

Part Number

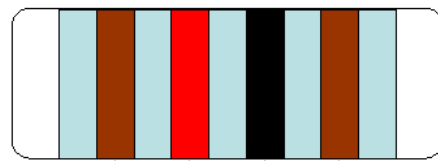
058	27*	----	E*	J*	E02*	D*
Type	Size	Value	Power Rating	Tolerance	Packing Type	TCR
058 : Hight Voltage MELF Metal Film Resistors	39 : 0309 5,9x3,4	The last digit is the multiplier which denotes the number of zero following	H: 1/2W	J : $\pm 5\%$	E02 : 3000pcs 0207 size (7")	F : $\pm 100\text{ppm}/^\circ\text{C}$
	27 : 0207 5,9x2,4	0000 = 0Ohm	J: 1W	F : $\pm 1\%$	L0Y : 2500pcs 0207 size (13")	G : $\pm 200\text{ppm}/^\circ\text{C}$
		Example:				* not all combination is possible
		9760 = 9760hm				
		1001 = 1kOhm				

All products according to RoHS (2015/863/EU)



1st digit 2nd digit Multiplier

±5%	E-24	1,0	1,1	1,2	1,3	1,5	1,6	1,8	2,0	2,2	2,4	2,7	3,0	3,3	3,6	3,9	4,3	4,7	5,1	5,6	6,2	6,8	7,5	8,2	9,1
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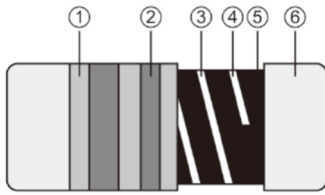
1st digit 2nd digit 3rd digit Multiplier

±1%	E-96	1,00	1,02	1,05	1,07	1,10	1,13	1,15	1,18	1,21	1,24	1,27	1,30	1,33	1,37	1,40	1,43	1,47	1,50	1,54	1,58	1,62	1,65	1,69	1,74
		1,78	1,82	1,87	1,91	1,96	2,00	2,05	2,10	2,15	2,21	2,26	2,32	2,37	2,43	2,49	2,55	2,61	2,67	2,74	2,80	2,87	2,94	3,01	3,09
		3,16	3,24	3,32	3,40	3,48	3,57	3,65	3,74	3,83	3,92	4,02	4,12	4,22	4,32	4,42	4,53	4,64	4,75	4,87	4,99	5,11	5,23	5,36	5,49
		5,62	5,76	5,90	6,04	6,19	6,34	6,49	6,65	6,81	6,98	7,15	7,32	7,50	7,68	7,87	8,06	8,25	8,45	8,66	8,87	9,09	9,31	9,53	9,76

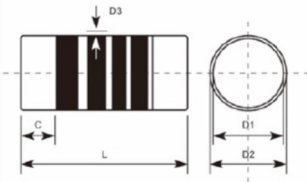
Color	Digit	Multiplier
Silver	-	10 ⁻²
Gold	-	10 ⁻¹
Black	0	10 ⁰
Brown	1	10 ¹
Red	2	10 ²
Orange	3	10 ³
Yellow	4	10 ⁴
Green	5	10 ⁵
Blue	6	10 ⁶
Violet	7	10 ⁷
Grey	8	10 ⁸
White	9	10 ⁹

Resistance more than two significant figures (<10hm) or more than three significant figures (>10hm) will not provide color code

Construction



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

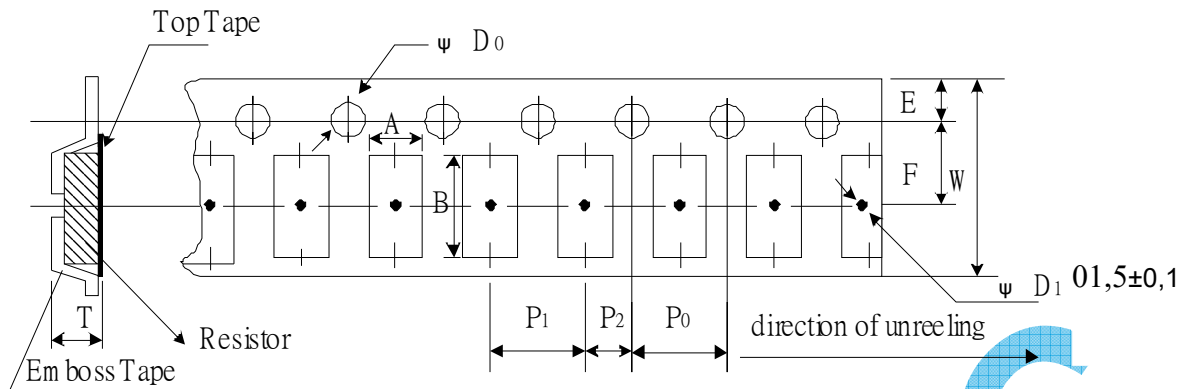


Dimensions

Type	L	D1	D2 max	D3 max	C min.
0207	5,90±0,20	2,20±0,10	2,40	0,15	0,5
0309	8,50±0,20	3,20±0,20	3,40	0,30	0,5

Unit: mm

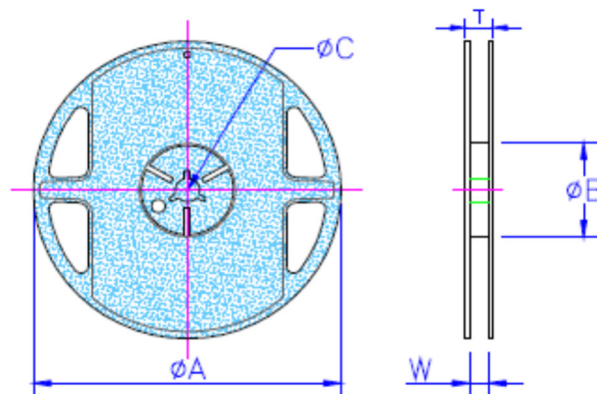
Packing



Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD_0	T
0207	$2,40 \pm 0,10$	$6,05 \pm 0,10$	$12,0 \pm 0,10$	$1,75 \pm 0,10$	$5,50 \pm 0,05$	$4,00 \pm 0,10$	$4,00 \pm 0,10$	$2,00 \pm 0,10$	$1,50 \pm 0,10$	$2,80 \pm 0,10$
0309	$3,50 \pm 0,10$	$8,85 \pm 0,10$	$16,0 \pm 0,10$	$1,75 \pm 0,10$	$7,50 \pm 0,10$	$4,00 \pm 0,10$	$8,00 \pm 0,10$	$2,00 \pm 0,05$	$1,50 \pm 0,10$	$3,85 \pm 0,10$

Unit: mm

Tape in Reel packing:



Type	ΦA	ΦB	ΦC	W	T
0207	$178,0 \pm 1,0$	$60,0 \pm 0,5$	$13,0 \pm 0,5$	$13,2 \pm 0,5$	$16,0 \pm 0,20$
0309	$330,0 \pm 1,0$	$100 \pm 1,0$	$13,0 \pm 0,5$	$17,0 \pm 0,5$	$21,5 \pm 0,20$

unit mm

Stock period

The performance of these products, including the solderability, is guaranteed for 12 month after production date code, provided that they remain packed as they were when delivered and stored at a temperature 15 to 28°C and a relative humidity 55 to 75% RH

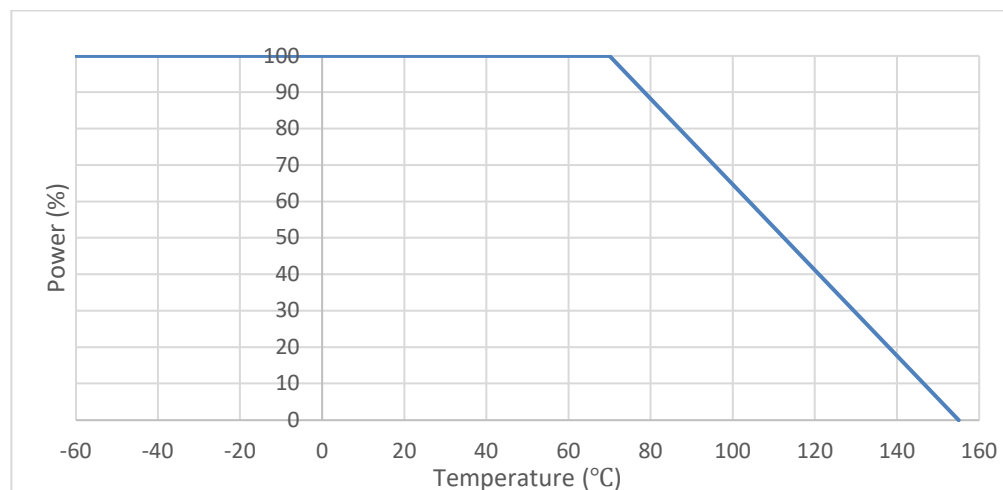
Specification

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operati ng Volutag e	Max. Overload Voltage	Resistance Range		TCR (PPM/° C)
					±1% E96	±5% E24	
0207	1/2W	-55 ~ +155°C	500V	700V	100kΩ-22MΩ		±100 ±200
0309	1W	-55 ~ +155°C	700V	1000V	100kΩ-22MΩ		±100 ±200

Anti Surge Voltage

Item Type	Power Rating at 70°C	Voltage
0207	1/2W	100kΩ-10MΩ:3kV
0309	1W	100kΩ-10MΩ:4kV

Power rating:

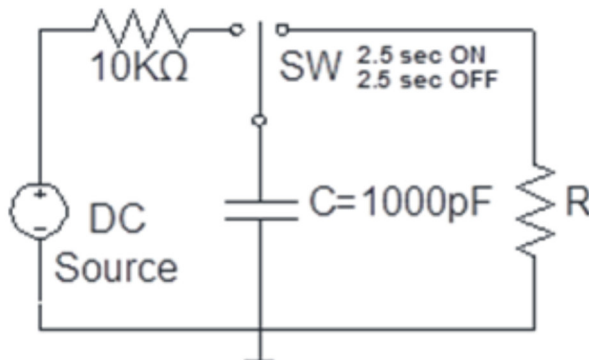


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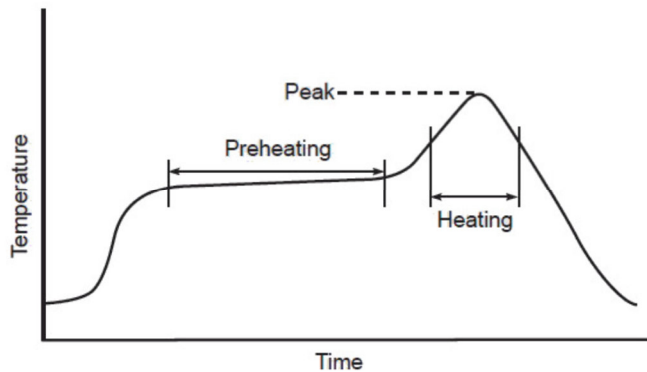
MELF High Voltage Metal Film

Resistors

Environmental Characteristics

Item	Requirement	Test Method									
Temperature Coefficient of Resistance (T.C.R.)	As Spec	At 25°C/-55°C and 25°C/+125°C									
Short Time Overload	$\pm(1\%+0,05\Omega)$	$V=\sqrt{(P \cdot R) \cdot 2,5}$ for 5 seconds <table> <tr> <td>Size</td><td>0207</td><td>0309</td></tr> <tr> <td>Power Rating</td><td>1/2W</td><td>1W</td></tr> <tr> <td>Voltage Max</td><td>200V</td><td>250V</td></tr> </table>	Size	0207	0309	Power Rating	1/2W	1W	Voltage Max	200V	250V
Size	0207	0309									
Power Rating	1/2W	1W									
Voltage Max	200V	250V									
Resistance to Soldering Heat	$\pm(1\%+0,05\Omega)$	260±5°C for 10±1 seconds									
Solderability	95% min. coverage	245±5°C for 3±0.5 seconds									
Thermal Shock Test	$\pm(2\%+0,05\Omega)$	5 cycle for -55°C 30minute 155°C 30minute									
Load Life Test	$\pm(5\%+0,05\Omega)$	70±2°C, DC 1,5 hrs "ON" and 0,5 hrs "OFF", applied continuously for 1000±48 hrs									
Humidity Test	$\pm(5\%+0,05\Omega)$	40±2°C, 90~95% R.H., 1,5 hrs "ON" and 0,5 hrs "OFF", 1000 hrs									
Resistance to Solvent	Epoxy insulation coating can not be peeled	3 circles, each circle takes 1 min									
Anti Surge Characteristics	$\pm(5\%+0,05\Omega)$	Discharge Test: 1/2W=3KV 1W=4KV  1000pF capacitor Discharge Pulse 50 time. (1 pulse / 5 sec. max)									

Soldering Conditions



Reflow soldering (lead-free)

Status	Temperature	Time
Preheating	180°C Max	120 sec. Max
Main heating	220°C Max	60 sec. Max
Peak	260°C Max	3 sec. Max

Flow soldering (lead-free)

Status	Temperature	Time
Soldering	260°C Max	10 sec. Max

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