MLF/MLFM Series

Metal Film Melf Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

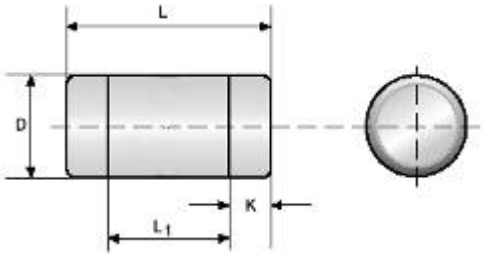
Features:

- Thin Film Technology for precision and stability
- Excellent power to size ratio
- Exhibits good pulse power characteristics
- RoHS compliant / lead-free

Electrical Specifications

Type / Code	Package Size	Power Rating (Watts) @ 70ºC	Maximum Working Voltage(1)	Maximum Overload Voltage	Resistance Temperature Coefficient	Ohmic Range (Ω) and Tolerance			
						0.1%	0.5%	1%	5%
MLF14	0204	0.25W	200V	400V	±10 ppm/ºC ±15 ppm/ºC ±25 ppm/ºC ±50/100 ppm/ºC	49.9 - 20K 49.9 - 300K 10 - 1M 10 - 1M	49.9 - 20K 49.9 - 300K 10 - 1M 1 - 1M	49.9 - 20K 49.9 - 300K 10 - 1M 1 - 10M	49.9 - 20K 49.9 - 300K 10 - 4.7M 1 - 10M
MLF12	0207	0.5W	300V	500V	±10 ppm/ºC ±15 ppm/ºC ±25 ppm/ºC ±50/100 ppm/ºC	49.9 - 20K 49.9 - 300K 10 - 1M 10 - 1M	49.9 - 20K 49.9 - 300K 10 - 1M 1 - 1M	49.9 - 20K 49.9 - 300K 10 - 4.7M 1 - 5.1M	49.9 - 20K 49.9 - 300K 10 - 4.7M 1 - 10M
MLFM1	0207	1W	350V	700V	±15 ppm/ºC ±25 ppm/ºC ±50/100 ppm/ºC	49.9 - 100K 10 - 1M 10 - 1M	49.9 - 100K 10 - 1M 1 - 1M	49.9 - 100K 10 - 1M 1 - 10M	49.9 - 100K 10 - 1M 1 - 10M

(1) Lesser of √PR or maximum working voltage



Mechanical Specifications

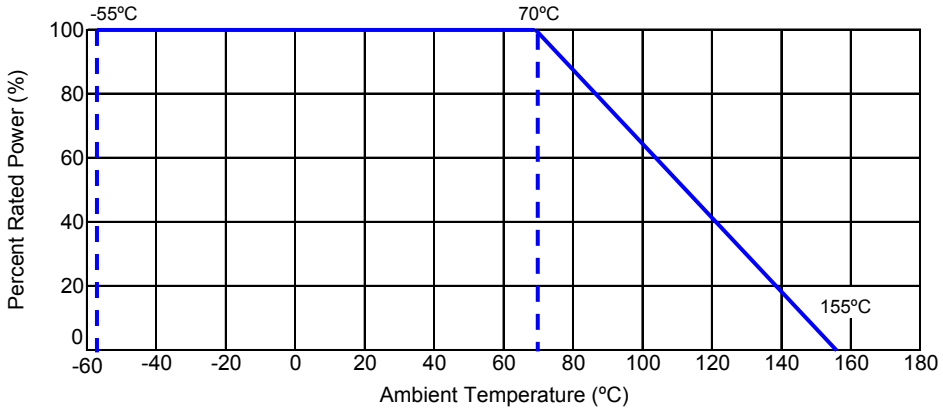
Type / Code	L Body Length	D Body Diameter	L1 Inner Body	K Termination	Unit
MLF14	0.138 ± 0.008 3.50 ± 0.2	0.055 ± 0.006 1.40 ± 0.15	0.09 2.3	0.020 ± 0.004 0.50 ± 0.1	inches mm
MLF12 MLFM1	0.232 ± 0.008 5.90 ± 0.2	0.087 ± 0.008 2.20 ± 0.2	0.185 4.7	0.020 ± 0.004 0.50 ± 0.1	inches mm

Performance Characteristics

Test	Specification
Load Life	±2%
Load Life in Moisture	±2%
Resistance to Soldering Heat	±0.5%
Solderability	Min 95% coverage
Short Time Overload	±0.5%
Insulation Resistance	1GΩ minimum

Operating Temperature Range: -55ºC to +155ºC

Power Derating Curve:



How to Order

1	2	3	4	5	6	7	8	9	10	11	12
M	L	F	1	2	D	T	E	4	K	7	5

Product Series	
MLF	Standard
MLFM	Mini

Size	Power
14	0.25W
12	0.5W
1	1W

Tolerance		
Code	Tol	Value
B	0.1%	E96, E24
D	0.5%	
F	1%	
J	5%	E24

Packaging			
Code	Description	Size	Quantity
T	7" Reel Paper Tape	14	3,000
		12, 1	2,000

TCR	
Code	ppm
T	10
S	15
E	25
C	50
D	100

Resistance Value
Four characters with the multiplier used as the decimal holder.
10 ohm = 10R0 100 ohm = 100R 1 Kohm = 1K00 560 Kohm = 560K

Legacy Part Number (before January 3, 2011):

SEI Type	Code	TCR	Nominal Resistance	Tolerance	Packaging
MLF	1/2	T9	4.75K	0.5%	R

Type	Description
MLF	Standard
MLFM	Mini

Code	Wattage
1/4	0.25W
1/2	0.5W
1	1W

TCR (ppm)	
T1	100
T2	50
T9	25
TD	15
TB	10

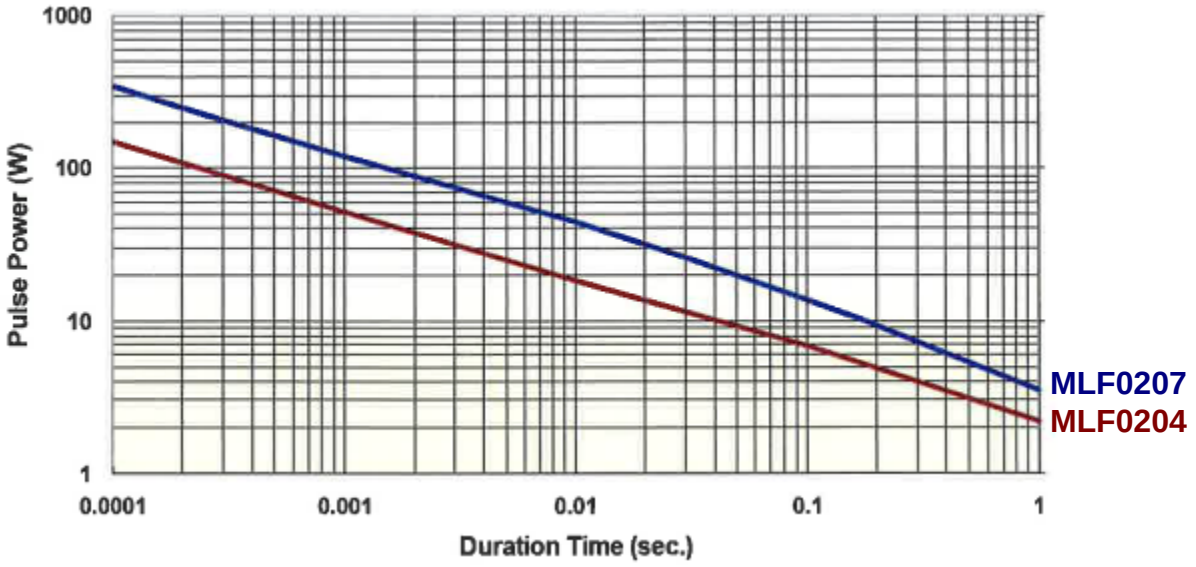
Tolerance	Values
0.1%	E96, E24
0.5%	E96, E24
1%	E96, E24
5%	E24

SEI Types	Pkg Qty	Code	Description
MLF0204	3,000	R	7" reel paper tape
MLF0207, MLFM0207	2,000		

Pulse withstanding capacity

The single impulse graph is the result of 50 impulses of rectangular shape applied at one-minute intervals. The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.

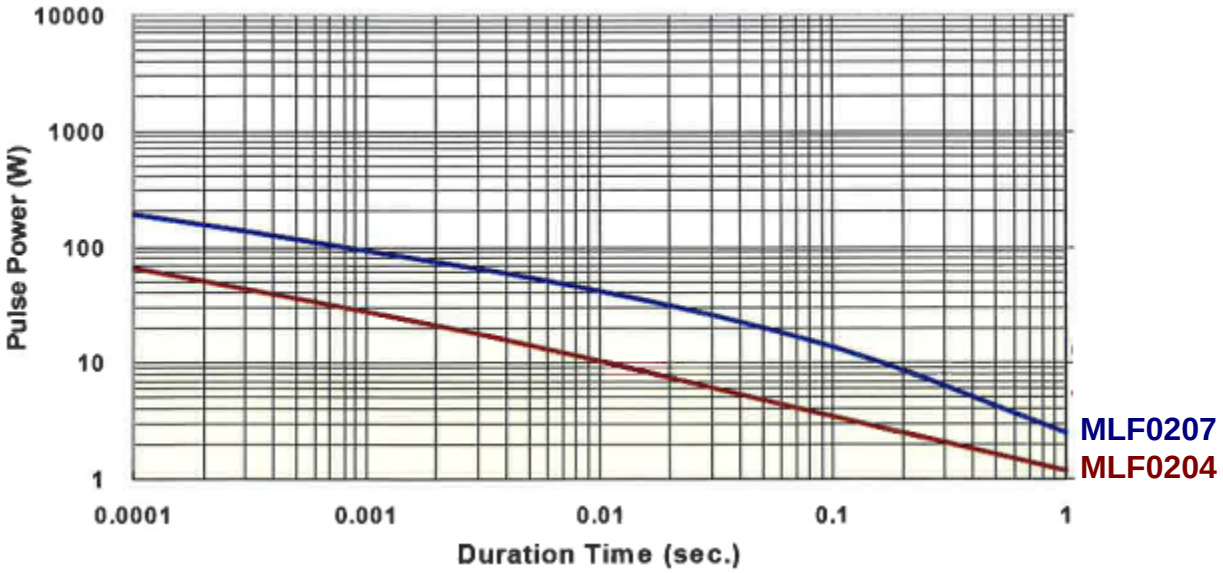
MLF Series Single Pulse (100 Ohm)



Continuous Pulse

The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70ºC. Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.

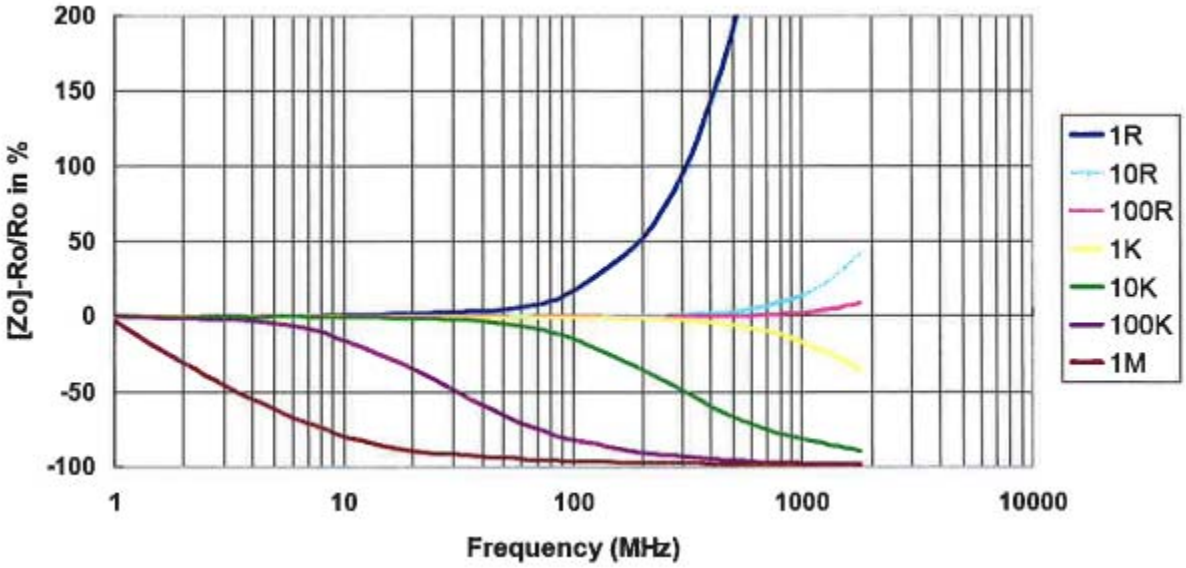
MLF Series Continuous Pulse (100 Ohm)



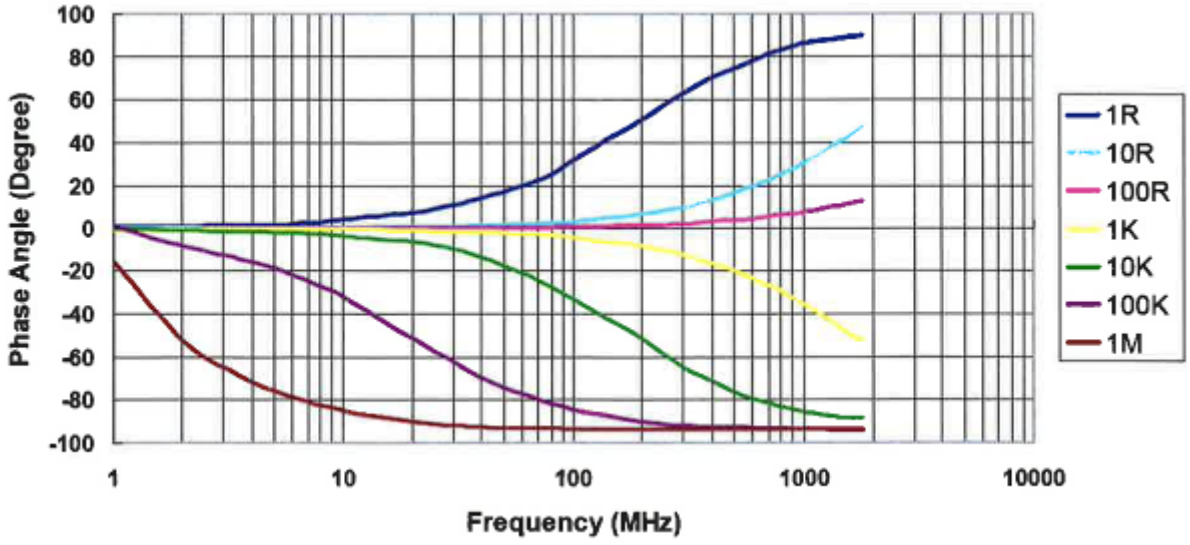
Frequency behavior

Resistors are designed to function according to ohmic laws. This is basically true of resistors for frequencies up to 100 kHz. At higher frequencies, there is an additional contribution to the impedance by an ideal resistor switched in series with a coil and both switched parallel to a capacitor. The values of the capacitance and inductance are mainly determined by the dimensions of the terminations and the conductive path length.
The environment surrounding components has a large influence on the behavior of the component on the printed-circuit board.

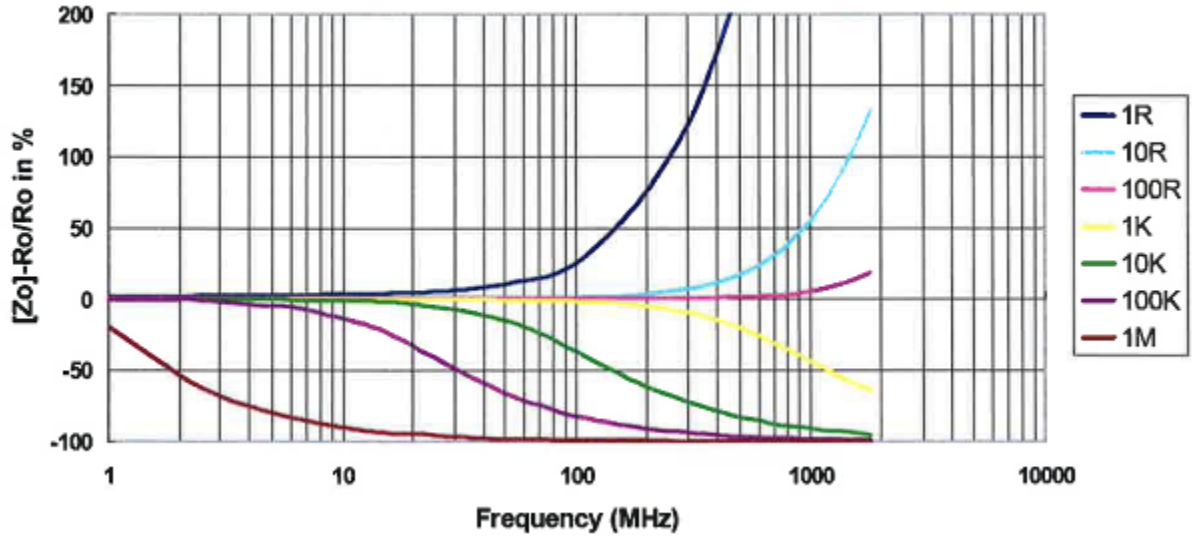
Frequency versus Impedance
MLF0204



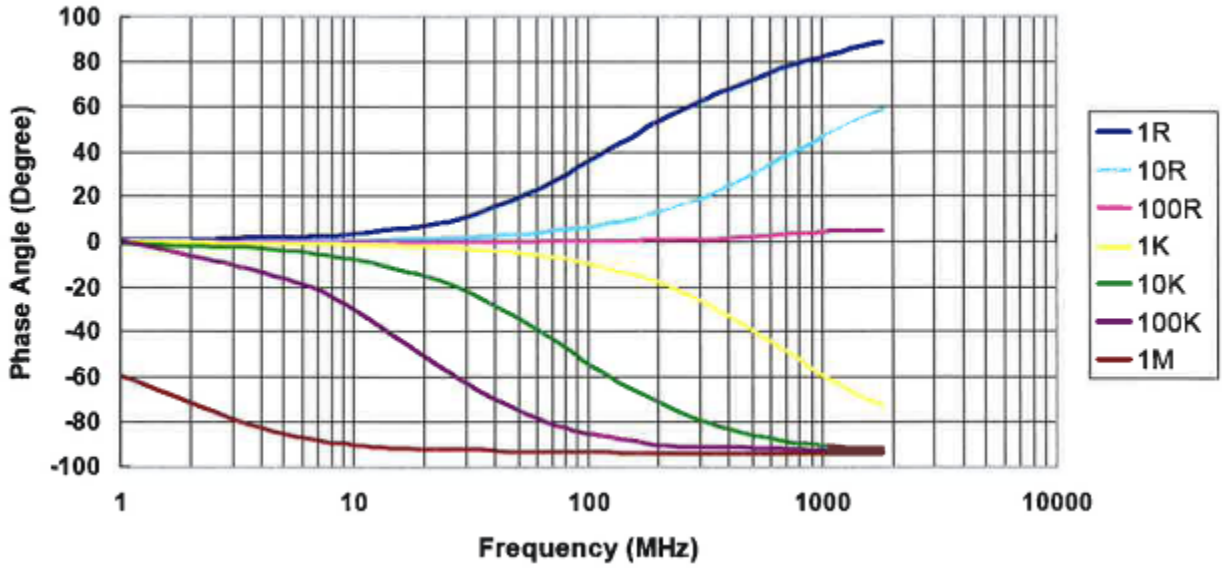
Frequency versus Phase Angle
MLF0204



Frequency versus Impedance
MLF0207



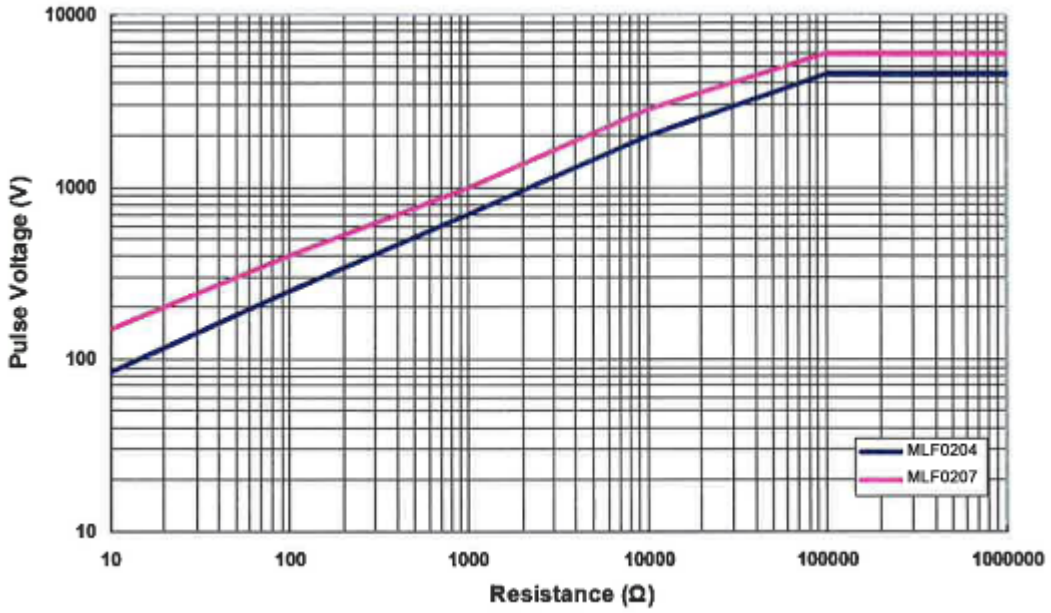
Frequency versus Phase Angle
MLF0207



Lightning Surge

Resistors are tested in accordance with IEC 60 115-1 using both 1.2/50us and 10/700us pulse shapes. The limit of acceptance is a shift in resistance of less than 0.5% from the initial value.

1.2/50µs Lightning Surge



10/700µs Lightning Surge