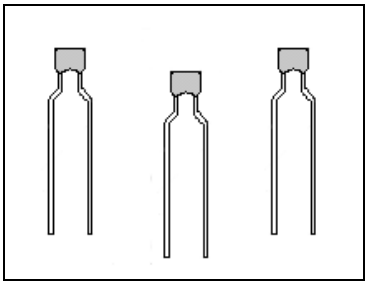
MV Series – Low Voltage Leaded Dual Function Varistors/ RFI Suppressors

Multilayer Technology

Varistor Plus

Description



MV Series varistors/suppressors are dual function devices that protect electronic equipment operating in the low voltage region against voltage surges and high-frequency noise, replacing two components: a low voltage varistor and a capacitor.

The MV Series incorporates a varistor function in the DC voltage range from 3V to 125V and the function of a high-frequency by-pass capacitor operating in the capacitance range from 10 nF to 1000 nF. They are intended for protection of all sensitive electronic devices experiencing both voltage transients and high-frequency noise produced by electromechanical devices such as buzzers, relays, etc.

MV varistors/suppressors are square shaped components with in-line leads, which require at least 30% less mounting space than the two components they replace.

Features

- Operating voltage range (V_{DC}).....3V to 125V
- Part number voltage range (V_{RMS}).....2V to 95V
- Capacitance range C (@1 kHz) .....10 nF to 1000 nF
- Capacitor temperature characteristics Z5U/Y5V
- Protects against voltage transients and suppresses high-frequency interference
- Dimensional and weight savings on PC board
- One model size available ..... 6 x 9 mm
- In-line leads
- Available with crimped leads
- Available in tape and reel for automatic pick and place

Absolute Maximum Ratings

Continuous:	Value
Steady State Applied Voltage:	
DC Voltage Range (V_{DC})	3V to 125V
AC Voltage Range (V_{RMS})	2V to 95V
Transient:	
Single Pulse Peak Current (I_P), 8/20 µs Waveform	150A
Single Pulse Transient Energy (W_{MAX}), 10/1000 µs Waveform	0.1J to 2.5J
Capacitance Range	10nF to 1000nF
Capacitor Temperature Characteristics	Z5U or Y5V
Operating Ambient Temperature	-40°C to +85°C
Storage Temperature Range	-40°C to +125°C
Threshold Voltage Temperature Coefficient	< - 0.05%/°C
Insulation Resistance	> 1GΩ
Isolation Voltage Capability	> 1kV
Response Time	< 25ns

HOW TO ORDER: MV SERIES (LOW VOLTAGE, DUAL FUNCTION LEADED DEVICES)

MV 1 20 K 104 M Z R

PACKAGING OPTIONS:
(See page 52 for dimensional specifications)
B = Bulk
R = Reel (per IEC 286-2)
A = Ammo Pack

DIELECTRIC MATERIAL:
Z stands for Z5U/Y5V

CAPACITANCE TOLERANCE:
M = ± 20%

CAPACITANCE VALUE:
103 = 10 nF
104 = 100 nF
105 = 1000 nF

V_N TOLERANCE:
K = ± 10%; L = ± 15%; M = ± 20%

MAXIMUM CONTINUOUS WORKING VOLTAGE (V_{RMS}):

2 = 2	14 = 14	35 = 35
4 = 4	17 = 17	40 = 40
6 = 6	20 = 20	50 = 50
8 = 8	25 = 25	60 = 60
11 = 11	30 = 30	95 = 95

LEAD STYLE (VERSION) / LEAD SPACING:
(See page 54 for detailed drawings / dimensions)
Version:
1 = Outward Crimped Leads (5mm Lead Spacing)

SERIES NAME

Standard Packaging Options / Quantities

Series	Voltage Range (V_{RMS})	Model Size	Packaging Options		
			B = Bulk R = Reel A = Ammo Pack		
			B	R	A
MV	2 to 95	6 x 9mm	2000	2000	2500

Multilayer Technology

Varistor Plus

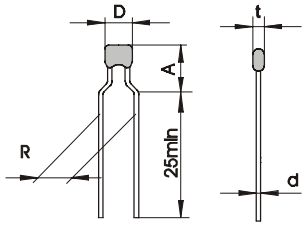
Device Ratings and Characteristics

MV 2 M 103 MZ - to MV 20 K 105 MZ -

Catalog Number	V_{RMS}	V_{DC}	V_N @ 1 mA	V_C @ 1 A	W_{MAX} 10/1000 µs	P_{MAX}	I_P 8/20 µs	$C_{(TYP)}$ @1 kHz
Unit of Measure	Volts	**Volts**	Volts	Volts	**Joules**	Watts	Amps	**nF**
MV 2 M 103 MZ -	2	**3**	4	10	**0.1**	0.01	150	**10**
MV 2 M 104 MZ -	2	**3**	4	10	**0.1**	0.01	150	**100**
MV 2 M 105 MZ -	2	**3**	4	10	**0.1**	0.01	150	**1000**
MV 4 L 103 MZ -	4	**5.5**	8	14	**0.2**	0.01	150	**10**
MV 4 L 104 MZ -	4	**5.5**	8	14	**0.2**	0.01	150	**100**
MV 4 L 105 MZ -	4	**5.5**	8	14	**0.2**	0.01	150	**1000**
MV 6 L 103 MZ -	6	**8**	11	21	**0.2**	0.01	150	**10**
MV 6 L 104 MZ -	6	**8**	11	21	**0.2**	0.01	150	**100**
MV 6 L 105 MZ -	6	**8**	11	21	**0.2**	0.01	150	**1000**
MV 8 L 103 MZ -	8	**11**	15	25	**0.3**	0.01	150	**10**
MV 8 L 104 MZ -	8	**11**	15	25	**0.3**	0.01	150	**100**
MV 8 L 105 MZ -	8	**11**	15	25	**0.3**	0.01	150	**1000**
MV 11 K 103 MZ -	11	**14**	18	35	**0.8**	0.01	150	**10**
MV 11 K 104 MZ -	11	**14**	18	35	**0.8**	0.01	150	**100**
MV 11 K 105 MZ -	11	**14**	18	35	**0.8**	0.01	150	**1000**
MV 14 K 103 MZ -	14	**18**	22	38	**0.9**	0.01	150	**10**
MV 14 K 104 MZ -	14	**18**	22	38	**0.9**	0.01	150	**100**
MV 14 K 105 MZ -	14	**18**	22	38	**0.9**	0.01	150	**1000**
MV 17 K 103 MZ -	17	**22**	27	49	**1.1**	0.01	150	**10**
MV 17 K 104 MZ -	17	**22**	27	49	**1.1**	0.01	150	**100**
MV 17 K 105 MZ -	17	**22**	27	49	**1.1**	0.01	150	**1000**
MV 20 K 103 MZ -	20	**26**	33	54	**1.3**	0.01	150	**10**
MV 20 K 104 MZ -	20	**26**	33	54	**1.3**	0.01	150	**100**
MV 20 K 105 MZ -	20	**26**	33	54	**1.3**	0.01	150	**1000**

Other capacitance values >1000nF are also available. Contact factory.

MV Series - Low Voltage Leaded Dual Function Varistors / RFI Suppressors						
Model Size	**Voltage Range (V_{RMS})**	**Dimensions (mm)**				
		D_{MAX}	**h/A_{MAX}**	**R**	**d**	**t_{MAX}**
6 x 9 mm	2 - 95	6	9	5	0.6	5.5



Version 1

Multilayer Technology

Varistor Plus

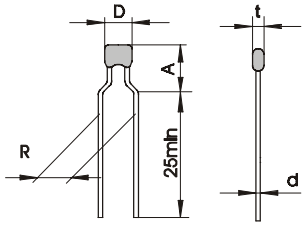
Device Ratings and Characteristics

MV 25 K 103 MZ - to MV 95 K 105 MZ -

Catalog Number	V_{RMS}	V_{DC}	V_N @ 1 mA	V_C @ 1 A	W_{MAX} 10/1000 µs	P_{MAX}	I_P 8/20 µs	C (TYP) @1 kHz
Unit of Measure	Volts	**Volts**	Volts	Volts	**Joules**	Watts	Amps	**nF**
MV 25 K 103 MZ -	25	**31**	39	65	**1.7**	0.01	150	**10**
MV 25 K 104 MZ -	25	**31**	39	65	**1.7**	0.01	150	**100**
MV 25 K 105 MZ -	25	**31**	39	65	**1.7**	0.01	150	**1000**
MV 30 K 103 MZ -	30	**38**	47	77	**2.0**	0.01	150	**10**
MV 30 K 104 MZ -	30	**38**	47	77	**2.0**	0.01	150	**100**
MV 30 K 105 MZ -	30	**38**	47	77	**2.0**	0.01	150	**1000**
MV 35 K 103 MZ -	35	**45**	56	90	**2.2**	0.01	150	**10**
MV 35 K 104 MZ -	35	**45**	56	90	**2.2**	0.01	150	**100**
MV 35 K 105 MZ -	35	**45**	56	90	**2.2**	0.01	150	**1000**
MV 40 K 103 MZ -	40	**56**	68	110	**2.3**	0.01	150	**10**
MV 40 K 104 MZ -	40	**56**	68	110	**2.3**	0.01	150	**100**
MV 40 K 105 MZ -	40	**56**	68	110	**2.3**	0.01	150	**1000**
MV 50 K 103 MZ -	50	**65**	82	135	**2.3**	0.01	150	**10**
MV 50 K 104 MZ -	50	**65**	82	135	**2.3**	0.01	150	**100**
MV 50 K 105 MZ -	50	**65**	82	135	**2.3**	0.01	150	**1000**
MV 60 K 103 MZ -	60	**85**	100	165	**2.3**	0.01	150	**10**
MV 60 K 104 MZ -	60	**85**	100	165	**2.3**	0.01	150	**100**
MV 60 K 105 MZ -	60	**85**	100	165	**2.3**	0.01	150	**1000**
MV 95 K 103 MZ -	95	**125**	150	250	**2.5**	0.01	150	**10**
MV 95 K 104 MZ -	95	**125**	150	250	**2.5**	0.01	150	**100**
MV 95 K 105 MZ -	95	**125**	150	250	**2.5**	0.01	150	**1000**

Other capacitance values >1000nF are also available. Contact factory.

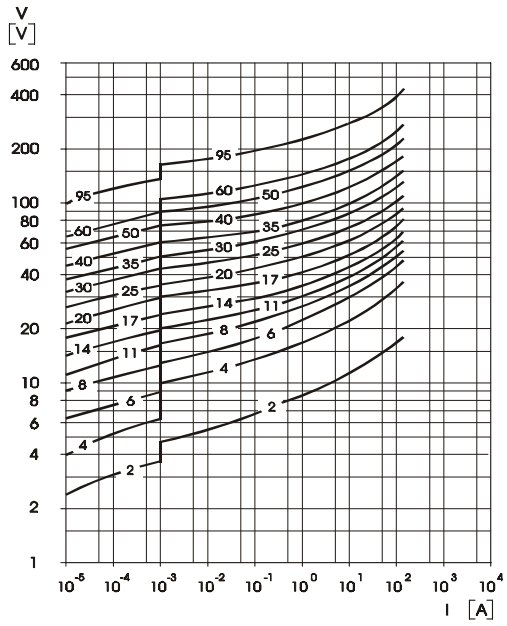
MV Series - Low Voltage Leaded Dual Function Varistors / RFI Suppressors						
Model Size	**Voltage Range (V_{RMS})**	**Dimensions (mm)**				
		D_{MAX}	**h/A_{MAX}**	**R**	**d**	**t_{MAX}**
6 x 9 mm	2 - 95	6	9	5	0.6	5.5



Version 1

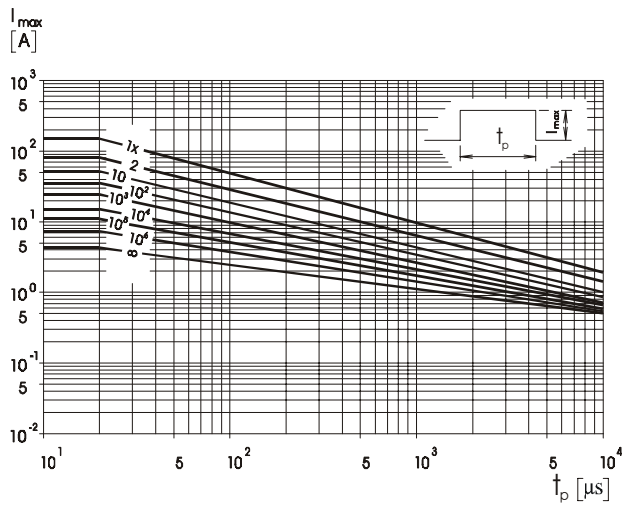
Performance Characteristics

Voltage/Current Curves

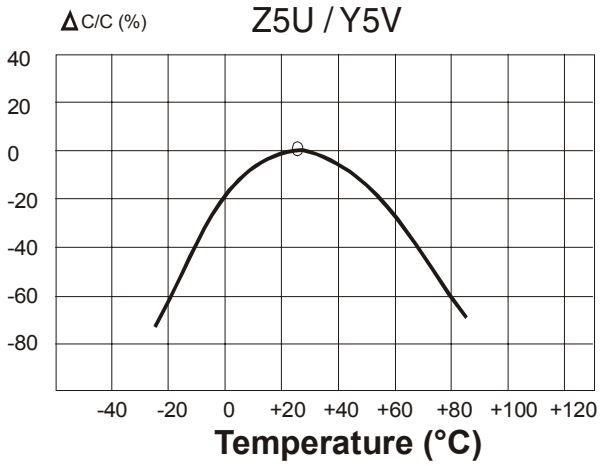


ML 2M...95K 103
104 MZ
105

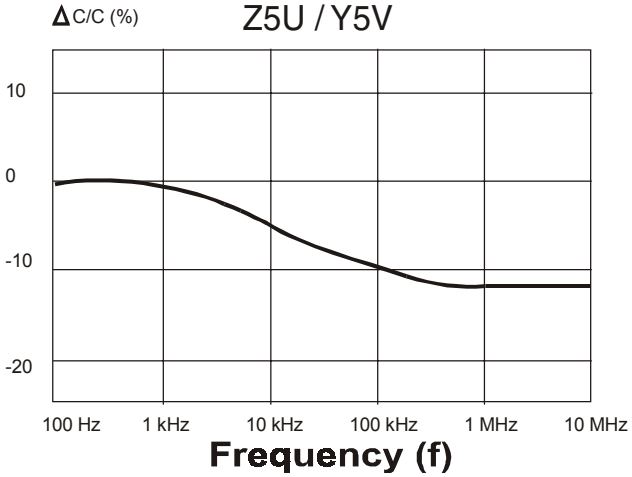
Pulse Rating Curves



Capacitance - Temperature Characteristics



Capacitance - Frequency Characteristics



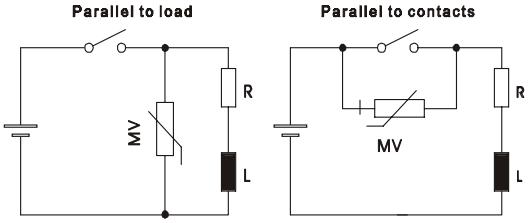
Application Information

Typical Applications:

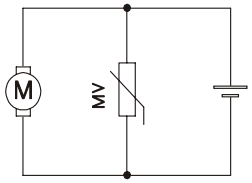
* Electrostatic Surge Absorption
* Relay Surge Suppression Effect and Relay Reset Time
* Piezoelectric Buzzer Shock Noise Absorption

Application Circuits:

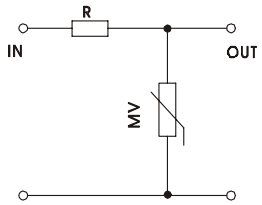
(a) Eliminating sparks from relay circuits
(there is no delay in operating time)



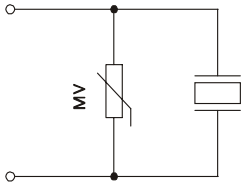
(b) Eliminating noise from micromotors



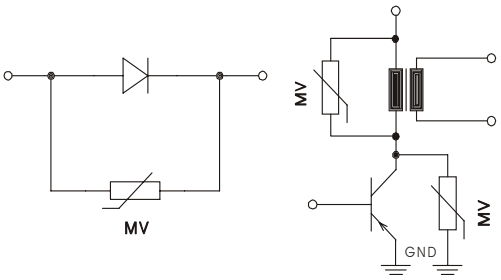
(c) Stabilizing voltages and absorbing line surges



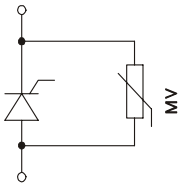
(d) Absorbing shock noise of piezoelectric alarms



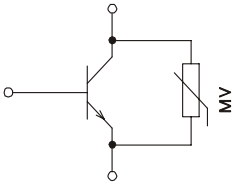
(e) Protecting semiconductive components including
transistors and diodes



(f) Improved thyristor configuration
Eliminating vibration better than conventional circuits



(g) Elimination of over-shooting from transistors



(h) Elimination of static electricity from circuits