

SMOV®34S Varistor Series



Description

The Littelfuse SMOV®34S thermally protected varistor is a self-protected device. It consists of a 34mm square varistor with an integral thermal disconnect designed to open in the event of overheating due to abnormal overvoltage as outlined in UL1449. The SMOV® helps facilitate SPD module compliance to UL1449 and offers quick thermal response due to the close proximity of the integrated thermal element to the MOV body. This configuration also offers lower inductance than most discreet solutions resulting in improved clamping performance to fast over voltage transients.

The device has a separate micro-switch, which can be used to indicate that the MOV has been disconnected from the circuit. This separate switch makes the monitoring circuitry completely isolated from the main power which ensures indicator circuit safety and simplifies the customers circuit design.

Agency Approvals

Agency	Agency Approval	Agency File Number
	UL1449	E320116

Additional Information



Datasheet



Resources



Samples

Features

- Maximum single surge capability 40 kA, 8/20 waveshape.
- Nominal Discharge Current Value: 20kA.
- Intermediate current rating: 50A/150A.
- -45°C to +75°C operating temperature.
- Recognized to UL 1449.
- Lead-Free and RoHS compliant.
- Integrated micro-switch for indication circuitry/design.

Applications

- SPD applications
- AC/DC distribution
- T/Data center
- Power supplier
- Telecommunication

Absolute Maximum Ratings

• For ratings of individual members of a series, see Device Ratings and Specifications chart

	SMOV34S S Varistor Series	Units
Continous:		
Steady State Applied Voltage:		
DC Voltage Range (VM(DC))	150 to 970	V
AC Voltage Range (V _{MIACIRMS})	115 to 750	V
Transient:		
Non-Repetitive Surge Current, 8/20μs Waveform (I _{TM})	40,000	A
Non-Repetitive Energy Capability, 2ms Waveform (W _{TM})	280 to 1200	J
Operating Ambient Temperature Range (T _A)	-45 to +75	°C
Storage Temperature Range (T _{STG})	-45 to +85	°C
Hi-Pot Encapsulation (Isolation Voltage Capability)	2500	V
Isolation Voltage Capability (when the thermal disconnect opens)	1500	V
Housing Insulation Resistance	>1,000	MΩ

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

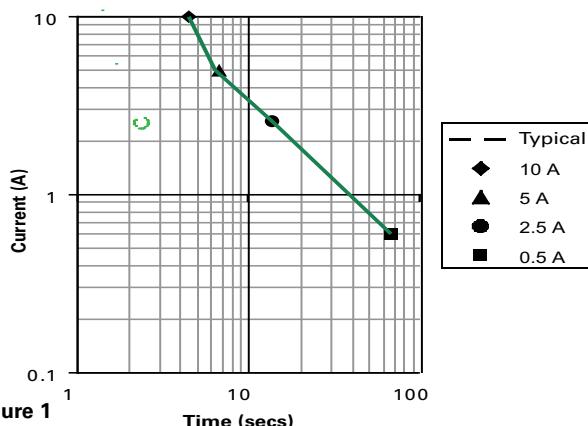
Device Ratings & Specifications

Part Number	Maximum Rating (75°C)					Specifications (25 °C)					
	Continuous		Transient			Varistor Voltage at 1mA Test Current		Maximum Clamping Voltage 8/20µs		Typical Capacitance f = 1MHz	
	AC Volts	DC Volts	Energy 2ms	Peak Surge Current 8/20µs	Nominal Discharge Current						
	V _{M (AC)} RMS (V)	V _{M(DC)} (V)	W _{TM} (J)	I _{TM} 1 x Pulse (A)	I _n (A)	V _{N(DC)} Min (V)	V _{N(DC)} Max (V)	V _c (V)	I _{PK} (A)	C (pF)	
	SMOV34S111MP	115	150	280	40000	20000	162	198	305	200	11500
SMOV34S111NP											
SMOV34S131MP											
SMOV34S131NP											
SMOV34S151MP											
SMOV34S151NP											
SMOV34S181MP											
SMOV34S181NP											
SMOV34S251MP											
SMOV34S251NP											
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SMOV34S751MP											
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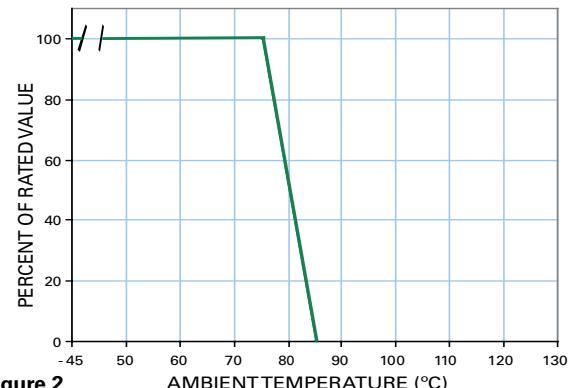
Average power dissipation of transients should not exceed 2.0 watts

Same ratings and specifications apply to Non Isolated Monitored Switch alternative design. Replace "M" with "N" in the part number. e.g.: SMOV34S111NP. Refer to Part Number System at the end of this document.

Thermal Characteristics

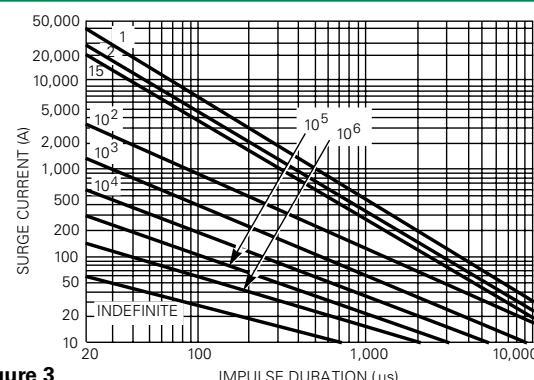


Peak Current & Energy Derating Curve

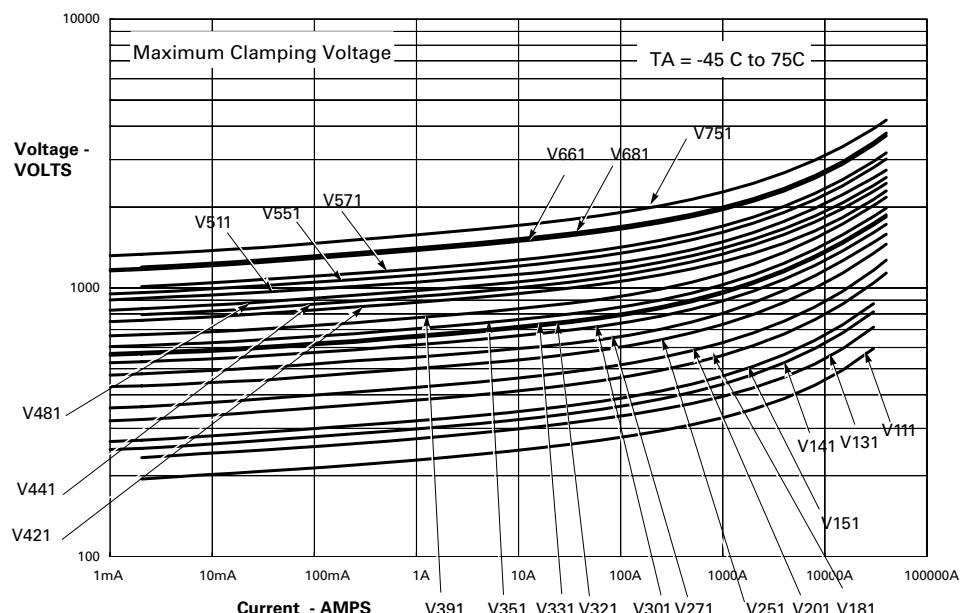


For applications exceeding 75°C ambient temperature, the peak surge current and energy ratings must be reduced as shown.

Pulse Rating Curve



Transient V-I Characteristic Curve



Wave Solder Profile

Because the SMOV®34S varistors contain a thermal protection device, care must be taken when soldering the devices into place. Two soldering methods are possible. Firstly, hand soldering: It is

Non Lead-free Profile

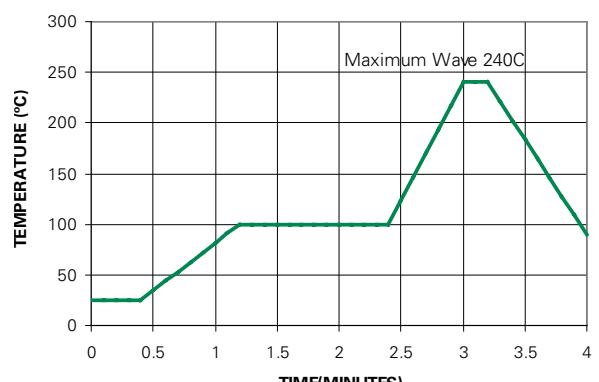


Figure 5

recommended to heat-sink the leads of the device. Secondly, wave-soldering: It is critically important that all preheat stage and the solder bath temperatures are rigidly controlled.

Lead-free Profile

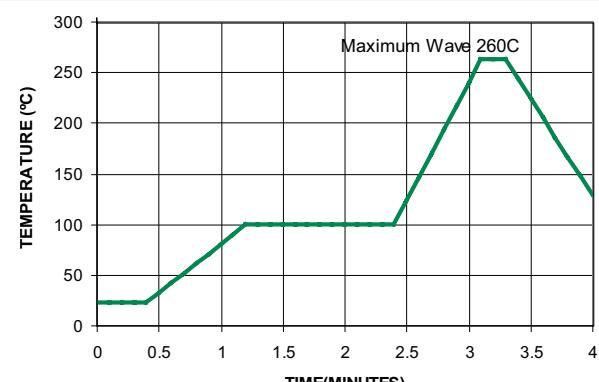


Figure 6

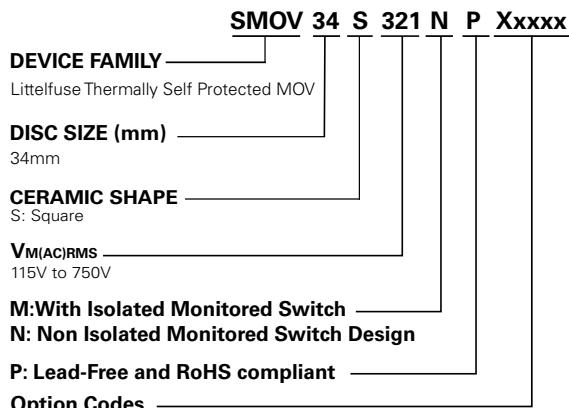
Physical Specifications

Lead Material	Tin-plated Copper
Soldering Characteristics	Solderability per MIL-STD-202, Method 208
Insulating Material	Cured, flame retardant epoxy polymer meets UL94V-0 requirements.
Device Labeling	Marked with LF, part identifier, and date code

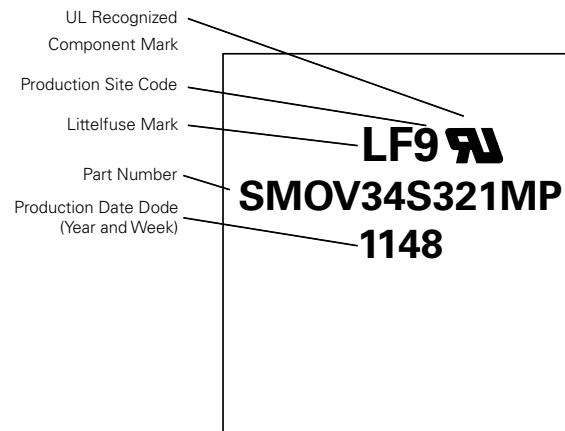
Environmental Specifications

Operating/Storage Temperature	-45°C to +75°C / -45°C to +85°C
Humidity Aging	+75°C, 85% RH, 1000 hours +/-10% voltage
Thermal Shock	+75°C to -40°C 5 times +/-10% voltage
Solvent Resistance	MIL-STD-202, Method 215
Moisture Sensitivity	Level 1, J-STD-020

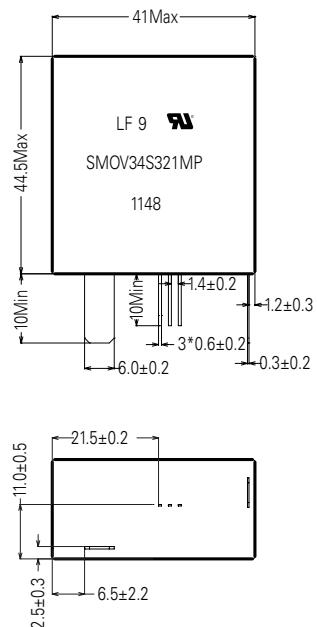
Part Numbering System



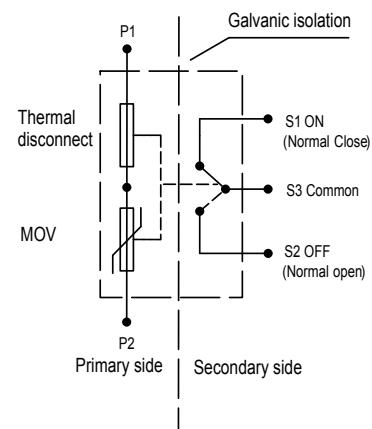
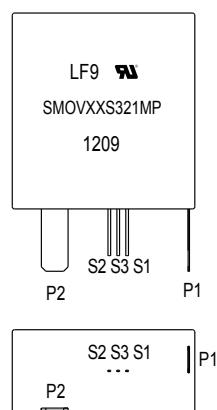
Part Marking System



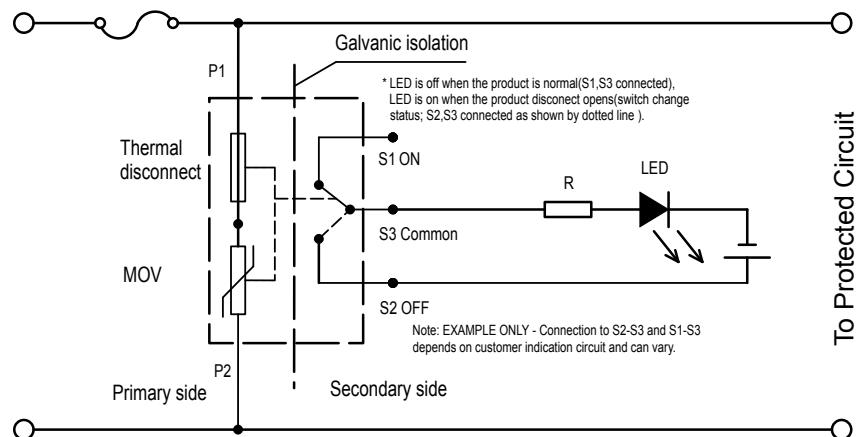
Device Dimension



Lead Configuration



Application Example



To Protected Circuit

Switch Specification

SMOV Switch	Voltage DC	Current (Amps)	Contact Resistance Max.	Insulation Resistance Min.	Dialectic Strength 0.5mA/Minute
Switch	12V	0.1A	70mΩ	100MΩ	500VAC

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