

MOV

Metal Oxide Varistor

SFV34S Series



Description

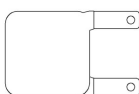
Metal Oxide Varistor (MOV) as one nonlinear resistance element is mainly made of zinc oxide (ZnO), which has very high surge capacity and big nonlinear coefficient. Below the threshold voltage, its resistance is very high, nearly no current flows through, but above the threshold voltage, the resistance reduces sharply, huge current can be discharged. Due to this characteristic, varistor as a protection component in electronic and electrical equipment can absorb abnormal over-voltage and lightning surge.

SETsafe | SETfuse varistor is with High Surge Current Density, Low Clamping Voltage, and Good Surge Capacity. It can also be customized as required.

Features

- Epoxy Resin Coating
- Silicone Resin Coating
- Low Leakage Current
- Bidirectional and Symmetrical V/I Characteristics
- RoHS & REACH Compliant
- Operating Temperature Range
Low Temperature: -40 °C
High Temperature: +85 °C

Lead Type

Lead Type		Code
	Straight Strap Lead	E

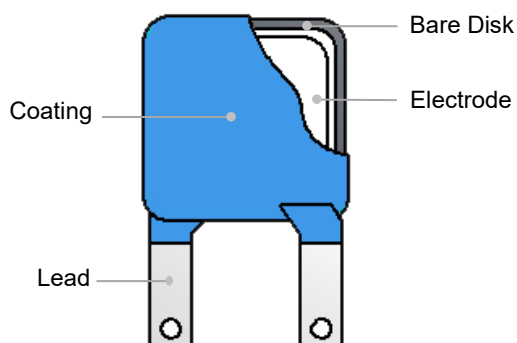
Agency Approvals

Agency	Standards	No.
	UL 1449 4 th Edition	E322662
	CSA C22.2 NO.269.5-17	E322662
	IEC 61051-1:2007 IEC 61051-2:1991 IEC 61051-2-2:1991	J 50234701

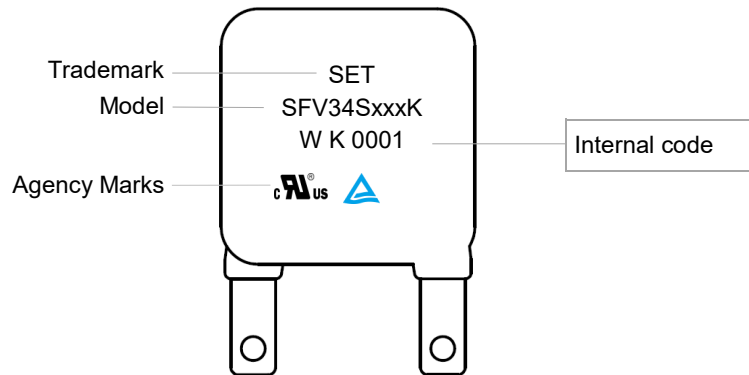
Applications

- Power Supplies
- Home Electrical Appliances
- Industrial Devices
- Surge Protectors
- Telecom Devices

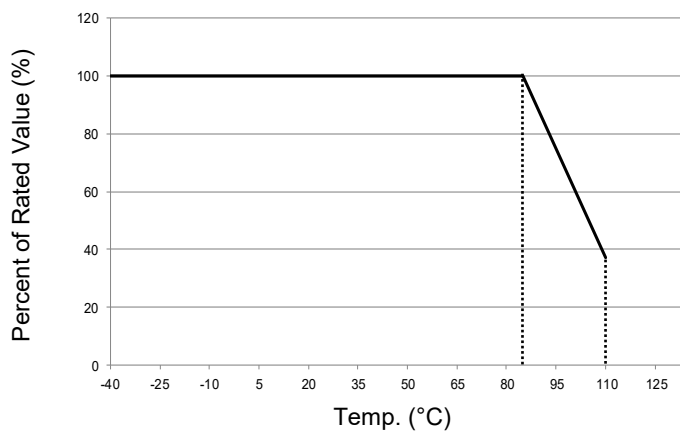
Product Structure



Marking



Temp. Derating Curve



For Normal Temp. Series

Note:

When ambient Temp. exceeds 85 °C, the peak surge current and energy rating should be reduced as shown in the left curve.

General Technical Data

Item	Value	Unit
Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Voltage Proof	≥2500	V _{ac}
Insulation Resistance	≥100	MΩ

Part Numbering System

SFV 34 S 471 - K N K A BUL - 001

Other Options

*Packaging & Lead Length

BUL: Bulk + Standard Lead Length

Lead Type

E: Straight Strap Lead

Surge Level

K: Standard Type

Operating Temp.

N: Epoxy Coating 85 °C

Voltage Tolerance

K: ±10%

J: ±5%

S: Special Tolerance

Nominal Varistor Voltage

220: $22 \times 10^0 = 22 \text{ V}$

471: $47 \times 10^1 = 470 \text{ V}$

122: $12 \times 10^2 = 1200 \text{ V}$

Disk Shape

S: Square

Bare Disk Dimension

34: 34×34 mm

Product Category

SETfuse Varistor

*For more details refer to packaging information.

Glossary

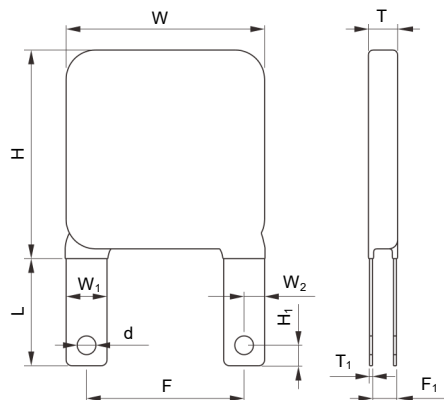
Item	Description
V_N	Nominal Varistor Voltage Voltage, at specified D.C. current used as a reference point in the component characteristics.
I_L	Leakage Current Measuring at 75% of varistor voltage.
UCT	Upper Category Temp. Max. ambient temp. for which a varistor has been designed to operate continuously.
LCT	Lower Category Temp. Minimum ambient temp. at which a varistor has been designed to operate continuously.
Max. Peak Current	Max. Peak Current Max. current per pulse, which may be passed by a varistor at an ambient temp. of 25 °C, for a given number of pulses.
V_C	Clamping Voltage Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 μ s class current pulse.
Voltage Proof	Voltage Proof Max. peak voltage, which may be applied under continuous operating conditions between the varistor terminations and any conducting mounting surface (Applicable only to insulated varistors).
C_V	Capacitance Capacitance across the MOV measured at a specified frequency and voltage.
V_{ac}	Max. Continuous a.c. Voltage Max. a.c. r.m.s. voltage of a substantially sinusoidal waveform (less than 5% total harmonic distortion) which can be applied to the component under continuous operating conditions at 25 °C.
V_{dc}	Max. Continuous d.c. Voltage Max. d.c. voltage (with less than 5% ripple) which can be applied to the component under continuous operating conditions at an ambient temp. of 25 °C.

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Dimensions (mm)



Straight Strap Lead

Model	L	W (Max.)	W ₁	W ₂	H (Max.)	H ₁	T (Max.)	T ₁	d	F	F ₁
SFV34S470K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.3	0.50±0.05	3.20±0.05	25.4±0.6	0.9 - 2.4
SFV34S560K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.5	0.50±0.05	3.20±0.05	25.4±0.6	1.0 - 2.6
SFV34S680K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.8	0.50±0.05	3.20±0.05	25.4±0.6	1.2 - 2.9
SFV34S820K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.1	0.50±0.05	3.20±0.05	25.4±0.6	0.9 - 2.3
SFV34S101K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.3	0.50±0.05	3.20±0.05	25.4±0.6	1.0 - 2.5
SFV34S121K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.5	0.50±0.05	3.20±0.05	25.4±0.6	1.1 - 2.7
SFV34S151K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.8	0.50±0.05	3.20±0.05	25.4±0.6	1.4 - 3.0
SFV34S181K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.3	0.50±0.05	3.20±0.05	25.4±0.6	1.1 - 2.6
SFV34S201K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.4	0.50±0.05	3.20±0.05	25.4±0.6	1.2 - 2.7
SFV34S221K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.5	0.50±0.05	3.20±0.05	25.4±0.6	1.3 - 2.8
SFV34S241K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.7	0.50±0.05	3.20±0.05	25.4±0.6	1.4 - 3.0
SFV34S271K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	4.9	0.50±0.05	3.20±0.05	25.4±0.6	1.5 - 3.1
SFV34S301K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	5.1	0.50±0.05	3.20±0.05	25.4±0.6	1.6 - 3.3
SFV34S331K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	5.3	0.50±0.05	3.20±0.05	25.4±0.6	1.7 - 3.5
SFV34S361K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	5.5	0.50±0.05	3.20±0.05	25.4±0.6	1.8 - 3.7
SFV34S391K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	5.7	0.50±0.05	3.20±0.05	25.4±0.6	1.9 - 3.9
SFV34S431K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	6.0	0.50±0.05	3.20±0.05	25.4±0.6	2.1 - 4.1
SFV34S471K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	6.3	0.50±0.05	3.20±0.05	25.4±0.6	2.3 - 4.3
SFV34S511K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	6.5	0.50±0.05	3.20±0.05	25.4±0.6	2.6 - 4.6
SFV34S561K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	6.9	0.50±0.05	3.20±0.05	25.4±0.6	2.9 - 4.9
SFV34S621K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	7.3	0.50±0.05	3.20±0.05	25.4±0.6	3.3 - 5.3
SFV34S681K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	7.7	0.50±0.05	3.20±0.05	25.4±0.6	3.6 - 5.6
SFV34S751K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	8.1	0.50±0.05	3.20±0.05	25.4±0.6	4.0 - 6.0
SFV34S821K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	8.6	0.50±0.05	3.20±0.05	25.4±0.6	4.5 - 6.5
SFV34S911K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	9.2	0.50±0.05	3.20±0.05	25.4±0.6	5.0 - 7.0
SFV34S102K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	9.8	0.50±0.05	3.20±0.05	25.4±0.6	5.6 - 7.6
SFV34S112K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	10.5	0.50±0.05	3.20±0.05	25.4±0.6	6.2 - 8.2
SFV34S122K	10.0±3.0	36	6.00±0.05	3.00±0.05	40	3.50±0.05	11.1	0.50±0.05	3.20±0.05	25.4±0.6	6.8 - 8.8

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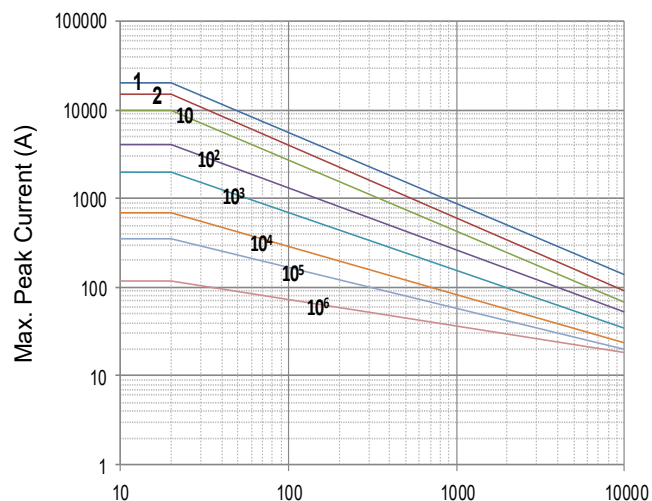
Specification

Model	Max. Continuous Operating Voltage		Varistor Voltage @1 mA DC		Clamping Voltage (Max.)		Max. Discharge Current (8/20 μs)		Max. Energy (10/1000 μs)	Typical Capacitance (For reference only) @1 kHz	Agency Approvals			
	Vac	Vdc	Min.	Max.	V _C	I _P	I _n	I _{max}	(J)	(pF)				
	(V)	(V)	(V)	(V)	(V)	(A)	(kA)	(kA)			UL	cUL	TUV	CQC
SFV34S470K	30	38	42	52	93	60	10	20	96	35000	●	●	●	○
SFV34S560K	35	45	50	62	110	60	10	20	115	29500	●	●	●	○
SFV34S680K	40	56	61	75	135	60	10	20	136	24200	●	●	●	○
SFV34S820K	50	65	74	90	135	300	20	40	156	17950	●	●	●	○
SFV34S101K	60	85	90	110	165	300	20	40	195	15000	●	●	●	○
SFV34S121K	75	100	108	132	200	300	20	40	235	12200	●	●	●	○
SFV34S151K	95	125	135	165	250	300	20	40	296	10000	●	●	●	○
SFV34S181K	115	150	162	198	300	300	20	40	350	8250	●	●	●	○
SFV34S201K	130	170	180	220	340	300	20	40	400	6750	●	●	●	○
SFV34S221K	140	180	198	242	360	300	20	40	450	6400	●	●	●	○
SFV34S241K	150	200	216	264	395	300	20	40	480	5650	●	●	●	○
SFV34S271K	175	225	243	297	455	300	20	40	540	5100	●	●	●	○
SFV34S301K	190	250	270	330	500	300	20	40	600	4510	●	●	●	○
SFV34S331K	210	275	297	363	550	300	20	40	656	4150	●	●	●	○
SFV34S361K	230	300	324	396	595	300	20	40	745	3750	●	●	●	○
SFV34S391K	250	320	351	429	650	300	20	40	830	3500	●	●	●	○
SFV34S431K	275	350	387	473	710	300	20	40	920	2950	●	●	●	○
SFV34S471K	300	385	423	517	775	300	20	40	1000	2880	●	●	●	○
SFV34S511K	320	415	459	561	845	300	20	40	1060	2650	●	●	●	○
SFV34S561K	350	460	504	616	925	300	20	40	1150	2450	●	●	●	○
SFV34S621K	385	505	558	682	1025	300	20	40	1250	2200	●	●	●	○
SFV34S681K	420	560	612	748	1120	300	20	40	1250	2000	●	●	●	○
SFV34S751K	460	615	675	825	1240	300	20	40	1280	1820	●	●	●	○
SFV34S821K	510	670	738	902	1355	300	20	40	1300	1800	●	●	●	○
SFV34S911K	550	745	819	1001	1500	300	20	40	1475	1500	●	●	●	○
SFV34S102K	625	825	900	1100	1650	300	20	40	1550	1350	●	●	●	○
SFV34S112K	680	895	990	1210	1815	300	20	40	1750	1230	●	●	●	○
SFV34S122K	750	1000	1080	1320	1980	300	20	40	2000	1135	●	●	●	○

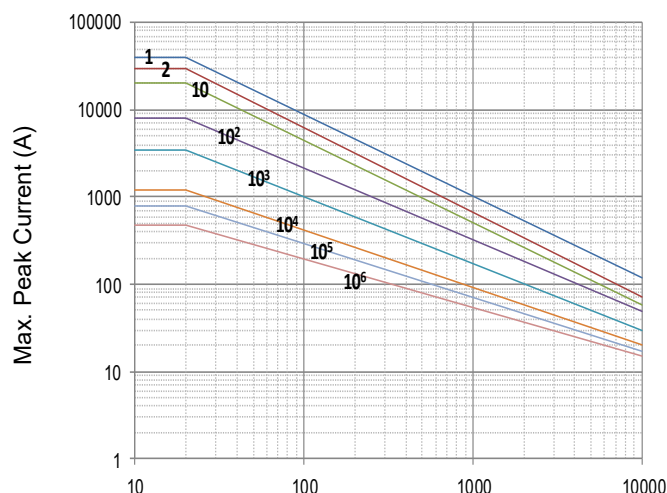
● : Approved ○ : Unauthorized

Performance Curve (For reference only)

- Max. Peak Current Derating Curves



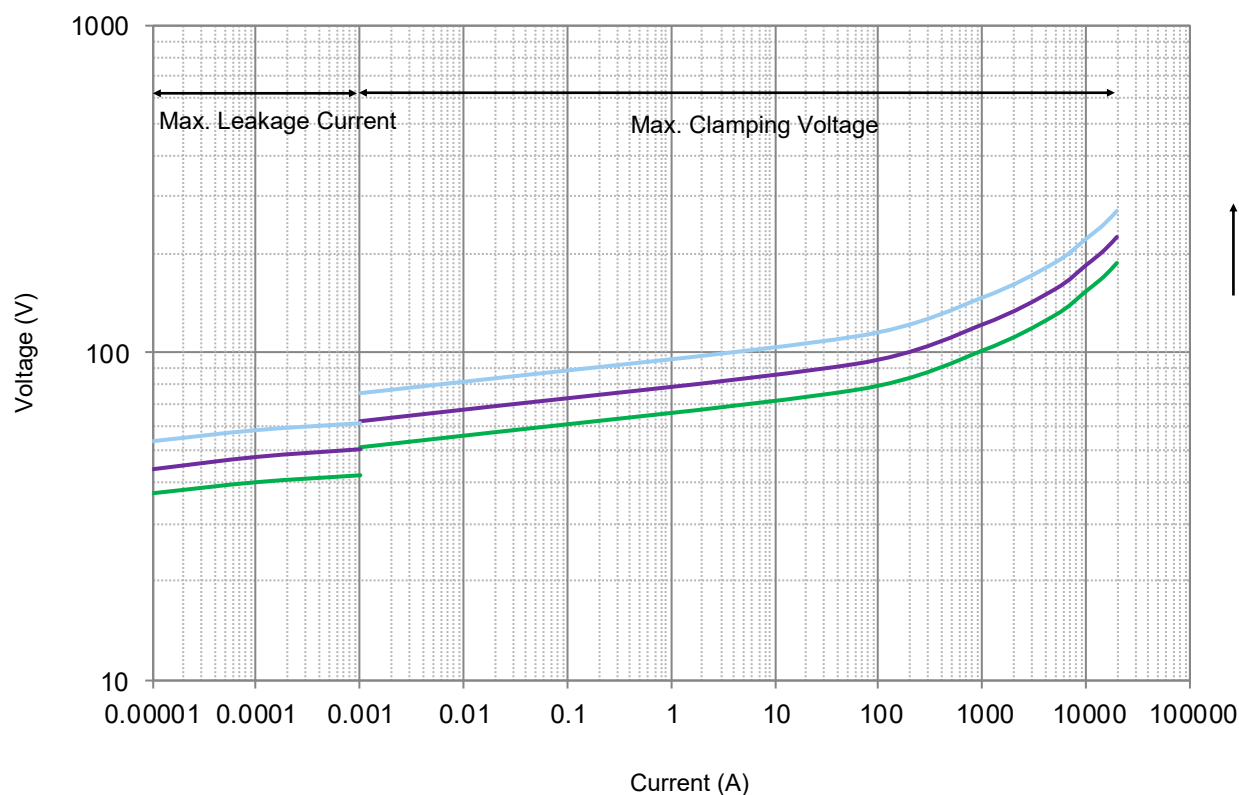
34S470K to 34S680K



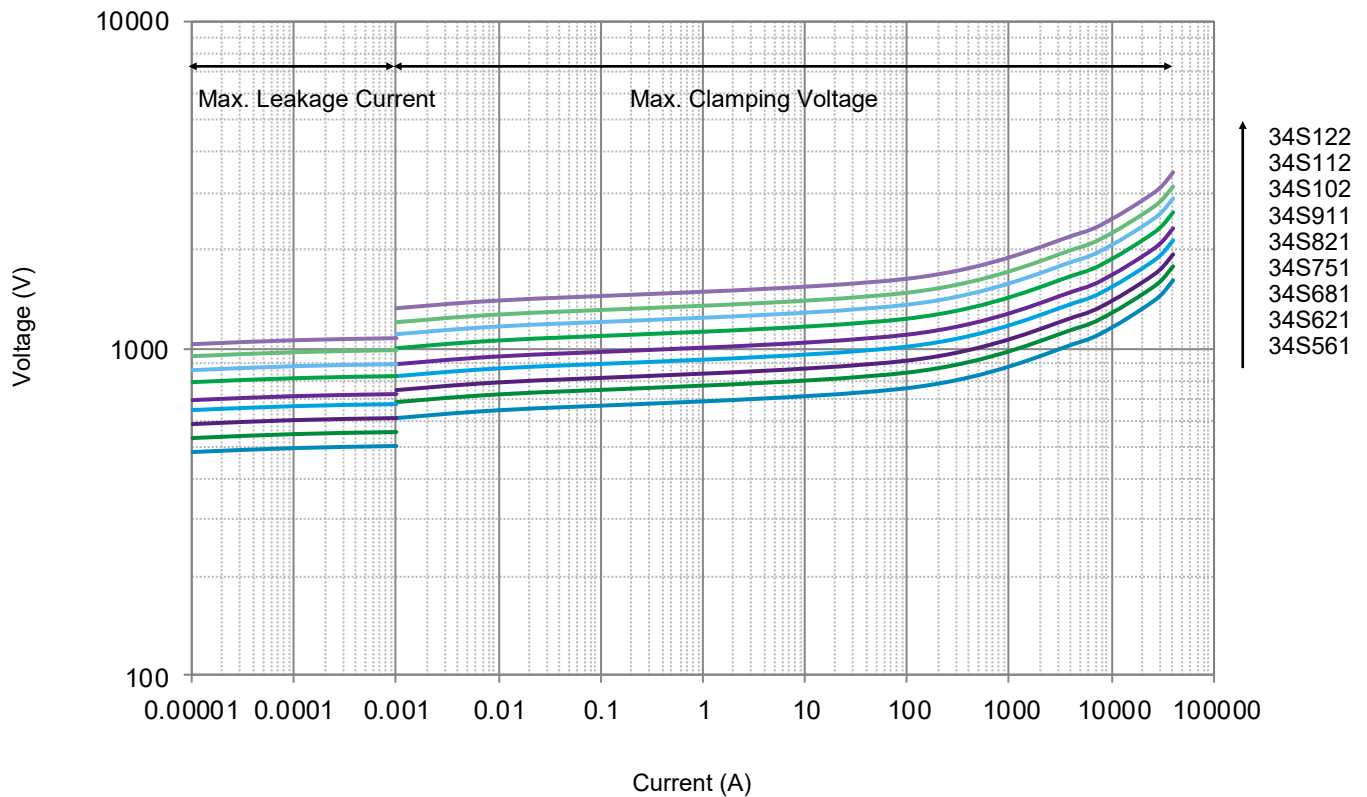
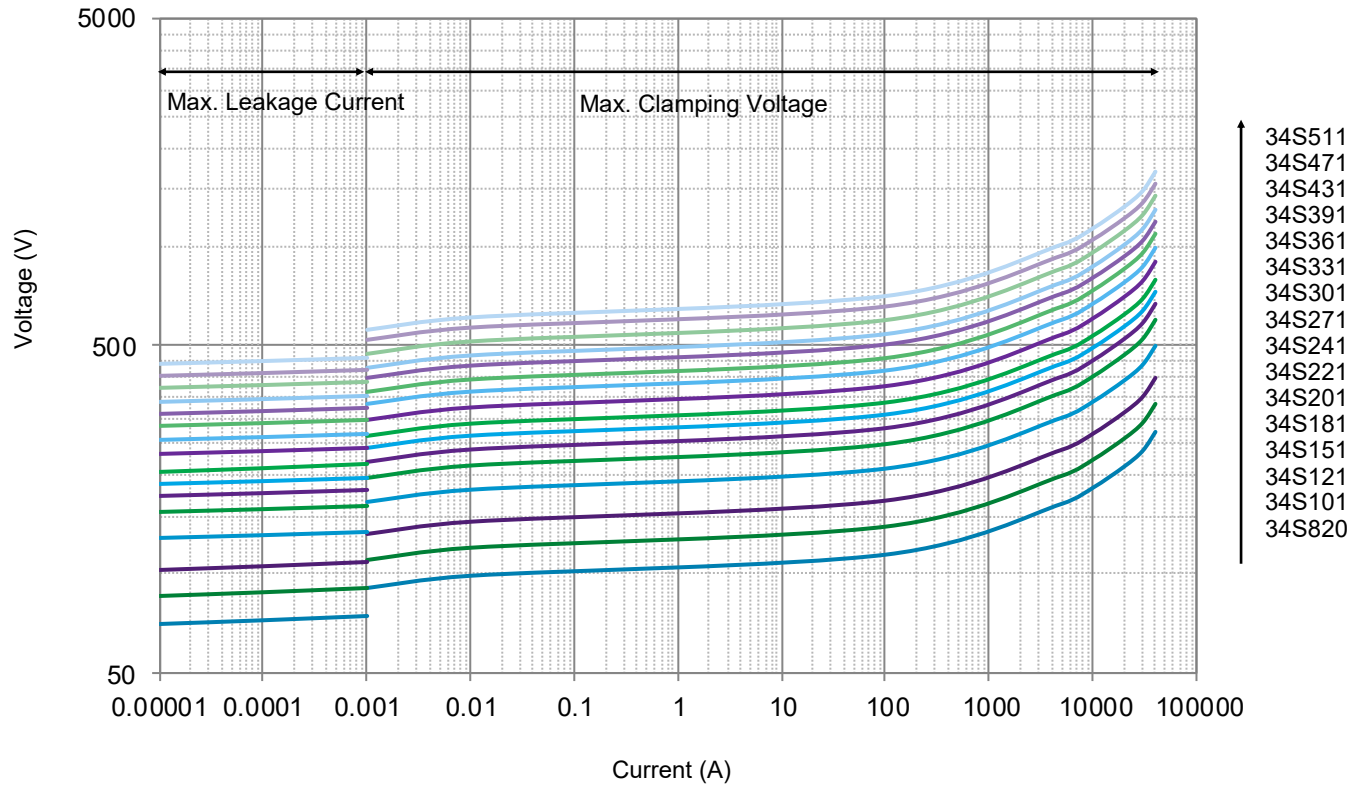
34S820K to 34S122K

Note: 1, 2, 10, 10², 10³, 10⁴, 10⁵, 10⁶ Stand for Repetitions.

- Voltage-Current Characteristic Curves



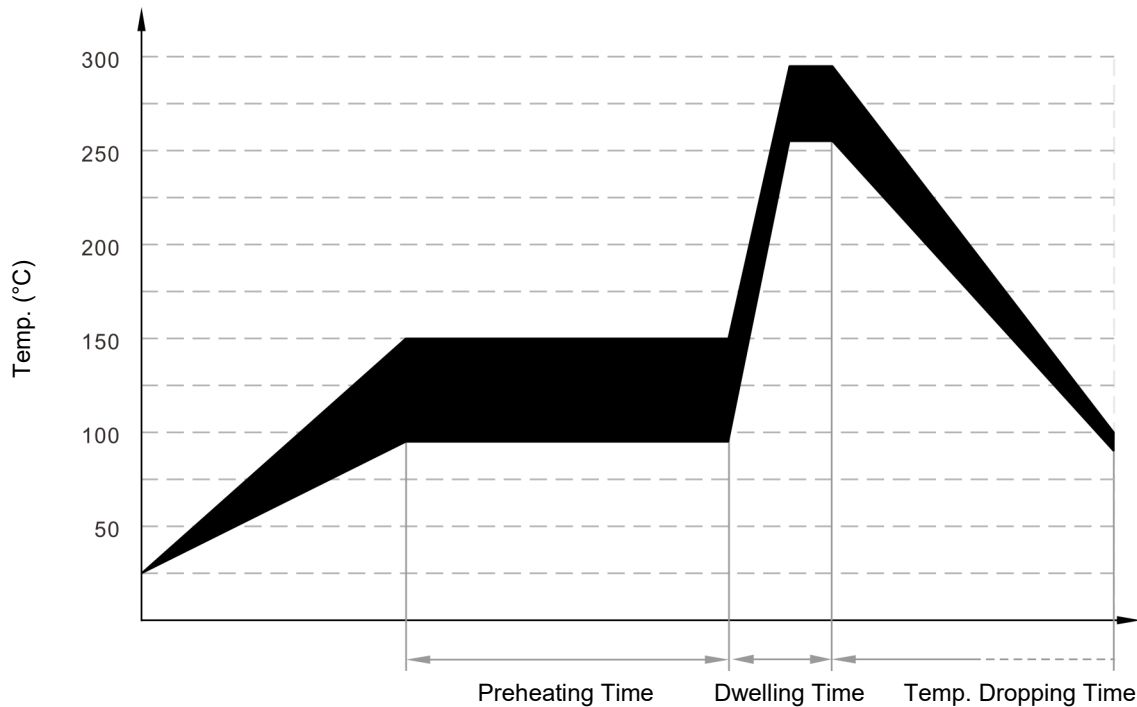
- Voltage-Current Characteristic Curves



Soldering Parameters

Wave Soldering Parameters

The wave soldering parameters are for reference only. When MOV is for practice use, some related validation is recommended.



Wave Soldering Curve

Item	Temp. (°C)	Time (s)
Preheating	90 to 150	<150
Dwelling	255 to 290	3 to 10

Recommended Hand-Soldering Parameters

Item	Condition
Temp. of Solder Head	350 °C (max.)
Soldering Time	4 seconds (max.)

Packaging Information

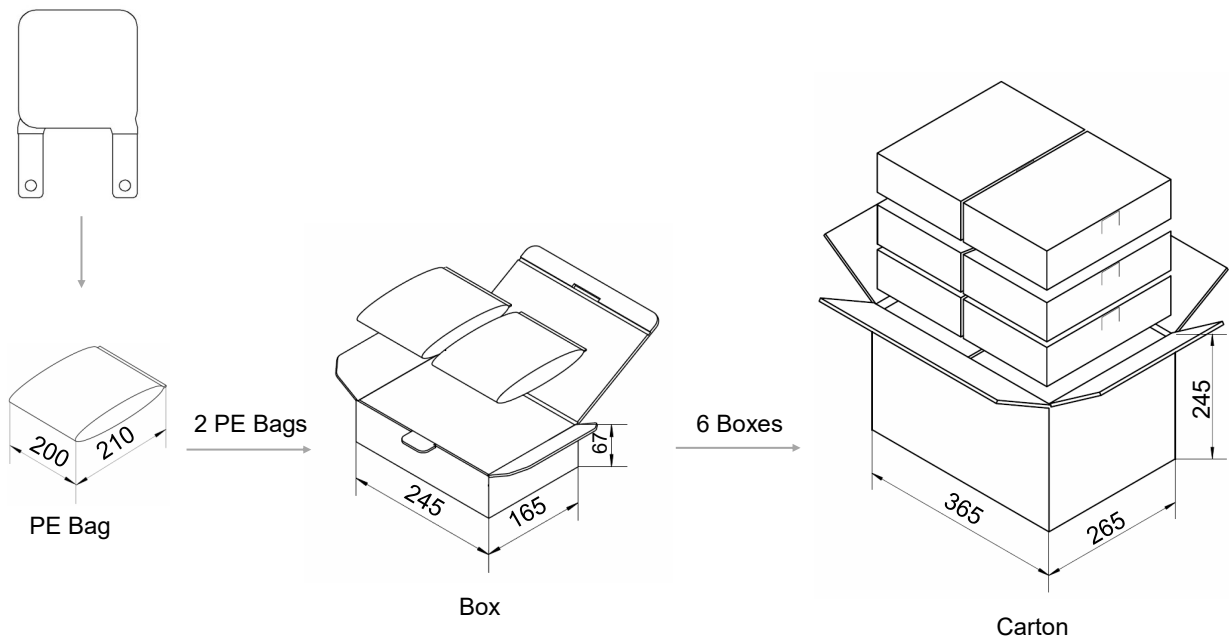
- Bulk Packaging (Code: BUL)
- Bulk Packaging Quantity & Weight.

Series	Nominal Varistor Voltage	PE Bag	Box	Carton	G. W / Carton (365 × 265× 245)
34S	(V)	(PCS)	(PCS)	(PCS)	(kg)±10%
	220 - 301	40	80	480	9 - 10
	331 - 821	30	60	360	7 - 14
	911 - 122	20	40	240	10 - 13

Note:

Other lead length packaging information, please contact SETsafe | SETfuse.

All Dimensions in mm





ATTENTION

MOV

MOV

Usage

1. Varistor must operated in the specified ambient temp.
2. Do not clean the varistor with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon.
3. Please do not apply severe vibration, shock or pressure to MOV.
4. Please fix lead wires when bending or cutting. The distance between the bending point and the sealing of MOV shall be greater than 2 mm.

Replacement

If varistor is visually damaged, please replace it.

Storage

1. Storage Temp. Range: (-40 to +125) °C
2. Relative Humidity : ≤75% RH
3. Altitude: <2000 m
4. Do not store the MOV at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder-ability of the lead wires, the product shall be used up within 1 year after receiving the goods.

Environmental Conditions

1. Varistor should neither be exposed to the open air, nor direct sunshine.
2. Varistor should avoid rain, water vapor or other condition of high temp. and high humidity.
3. Varistor should avoid sand dust, salt spray, or other harmful gases.

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Max. Typical Capacitance of Varistor

The typical capacitance of varistor is listed in the specifications. Designers may refer to it when designing MOV in high frequency circuit.

Installation

Mechanical Stress

Do not knock MOV when installing, to avoid mechanical damage.

MOV

MOV