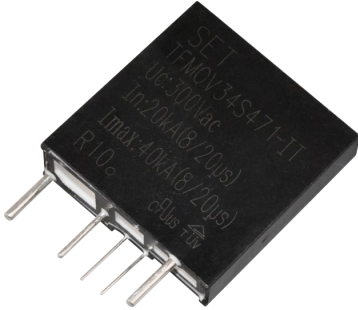


# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

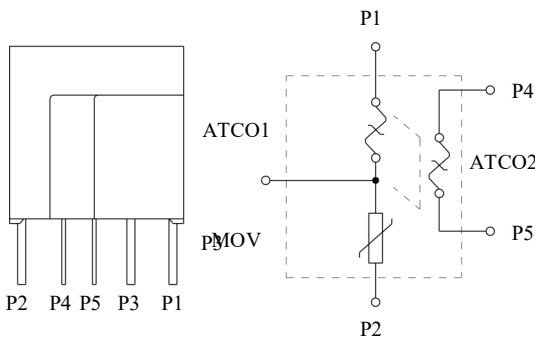
## Description



Thermal Fuse & MOV (TFMOV) is a thermally protected varistor that has all the characteristics of a thermally protected varistor (MOV). TFMOV has all the characteristics of a varistor (MOV) with thermal protection, and there are two types of deterioration: natural deterioration due to long-term operation and deterioration due to an abnormal surge. When a surge occurs, the leakage current of the degraded MOV continues to increase, causing the surface temperature of the MOV to continue to rise and the possibility of fire. At this time, the thermal cutoff (fusible alloy) in the TFMOV senses the abnormal temperature and operates (blows) to disconnect the MOV from the main circuit to protect the entire circuit, and the MOV itself will not continue to heat up and catch fire.

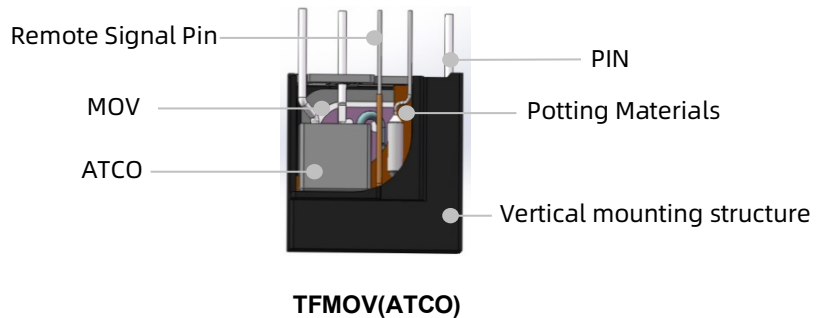
SETsafe | SETfuse Thermal Protection Varistors - Fusible Alloy TFMOV34S Series are mainly composed of Varistors (MOV), Thermal Cutoffs (Fusible Alloy) (ATCO), Flame Retardant Cases and Metal Components (Pins), Potting Materials. Vertical mounting structure; Nominal discharge current: (10 ~ 20) kA; Maximum continuous operating voltage: (30 ~ 750) VAC; Safety certificates: UL, cUL, TUV; RoHS, REACH compliant.

## Schematics



TFMOV(ATCO)

## Structure



TFMOV(ATCO)

## Features

- Thermal Protection, High Reliability
- Small Size
- Remote Signal Contact for Failure Indication (Optional)
- High Energy Capacity
- Epoxy Sealing Material, Flame-retardant to V0 (UL 94)
- Comply with UL 1449 / IEC 61643-11

## Applications




- Telecom Equipment
- String Inverter in Photovoltaic System
- AC / DC Power Supply
- Uninterruptable Power Supply (UPS)
- Surge Protective Device (SPD)
- Electric Meter
- Power Distribution Unit (PDU)

# TFMOV

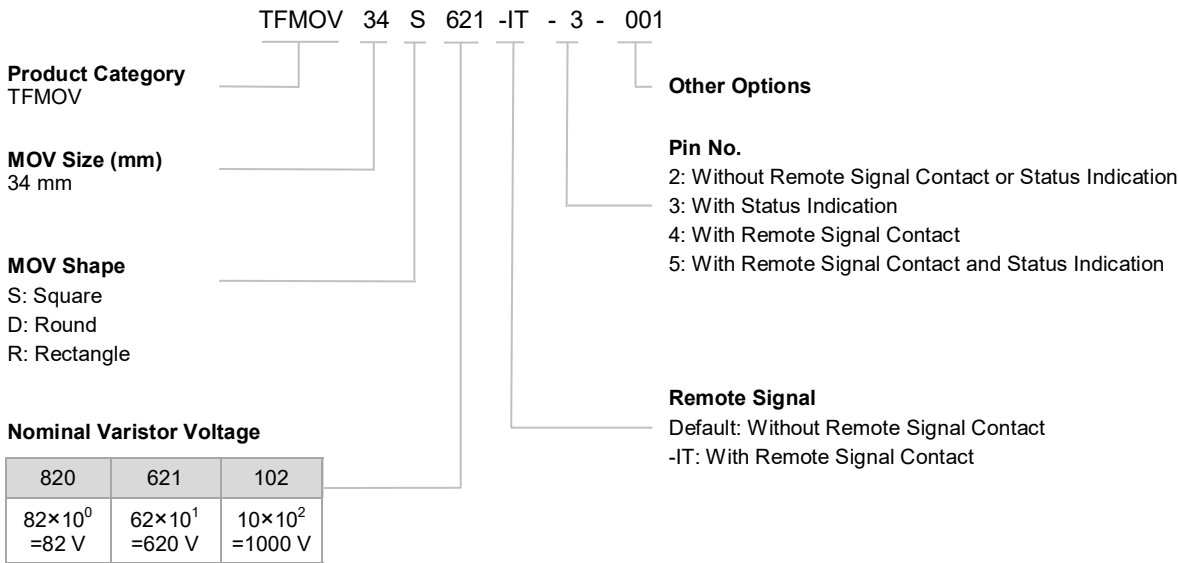
Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## Agency Approvals

Agency Symbol	Standards	The File No. and certification No. obtained by SETsafe   SETfuse	Category
	UL 1449	E322662	Type 4CA
	CSA C22.2 NO. 269, CSA ECN 516	E322662	Type 4CA
	IEC/EN 61643-11	J 50226017	Class II
Environment	RoHS & REACH	Compliant	

## Part Numbering System

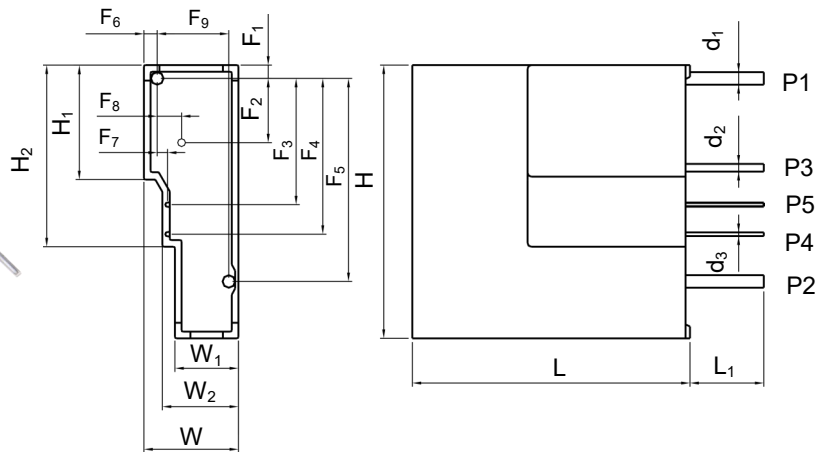
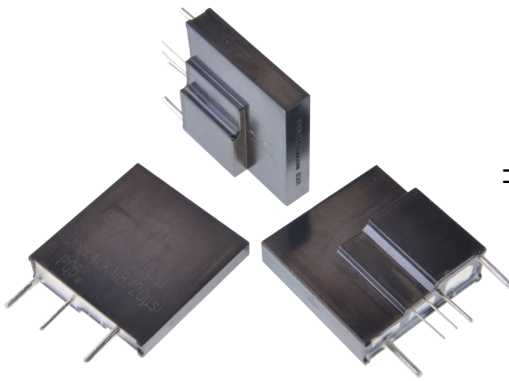


Reminder:  
Part numbering system in the datasheet is only for selecting correct parameter and product features. Before placing order, please contact us for specifications and use the part number and product code in the specifications to place order to ensure the part is correct. Product code is the unique identification.

# TFMOV

Thermal Fuse & MOV (TFMOV)

## TFMOV34S Series



Note:

Pin P3 / P4 / P5 is Optional

Unit: mm

Nominal Varistor Voltage	L (±1.0)	L <sub>1</sub> (±1.0)	W (±1.0)	W <sub>1</sub> (±1.0)	W <sub>2</sub> (±1.0)	H (±1.0)	H <sub>1</sub> (±0.5)	H <sub>2</sub> (±0.5)	d <sub>1</sub> (-0.05,+0.20)	d <sub>2</sub> (-0.05,+0.15)
34S470 ~ 121	37.6	10.0	10.0	5.8	7.5	37.0	15.5	24.6	1.70	1.05
34S151 ~ 271	37.6	10.0	10.5	6.3	8.0	37.0	15.5	24.6	1.70	1.05
34S301 ~ 471	37.6	10.0	12.0	7.8	9.5	37.0	15.5	24.6	1.70	1.05
34S511 ~ 681	37.6	10.0	12.8	8.6	10.3	37.0	15.5	24.6	1.70	1.05
34S751 ~ 821	37.6	10.0	14.0	9.8	11.5	37.0	15.5	24.6	1.70	1.05
34S911 ~ 122	37.6	10.0	16.5	12.3	14.0	37.0	15.5	24.6	1.70	1.05
Nominal Varistor Voltage	d <sub>3</sub> (±0.05)	F <sub>1</sub> (±0.5)	F <sub>2</sub> (±0.5)	F <sub>3</sub> (±0.5)	F <sub>4</sub> (±0.5)	F <sub>5</sub> (±0.5)	F <sub>6</sub> (±0.5)	F <sub>7</sub> (±0.5)	F <sub>8</sub> (±0.5)	F <sub>9</sub> (±0.5)
34S470 ~ 121	0.50	1.8	12.1	17.1	21.1	27.5	1.8	1.5	3.3	6.9
34S151 ~ 271	0.50	1.8	12.1	17.1	21.1	27.5	1.8	1.5	3.3	7.4
34S301 ~ 471	0.50	1.8	12.1	17.1	21.1	27.5	1.8	1.5	3.3	8.9
34S511 ~ 681	0.50	1.8	12.1	17.1	21.1	27.5	1.8	1.5	3.3	9.7
34S751 ~ 821	0.50	1.8	12.1	17.1	21.1	27.5	1.8	1.5	3.3	10.9
34S911 ~ 122	0.50	1.8	8.7	17.1	21.1	27.5	1.8	1.5	3.3	13.4

# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## Specifications

Model	Max. Continuous Operating Voltage		Varistor Voltage @1 mA DC		Clamping Voltage (Max.)		Nominal Dis-charge Current (8/20 μs)		Max. Dis-charge Current (8/20 μs)		Voltage Clamping Ratio <sup>a</sup>		Max. Energy (Joule)	Typical Capacitance (Reference)	Thermal Fuse
	U <sub>c</sub>		Min.	Max.	V <sub>C</sub>	I <sub>P</sub>	I <sub>n</sub>	I <sub>max</sub>	R <sub>cl</sub>	I <sub>n</sub>	10/1000 μs	@1 kHz	UL 60691 E214712		
	(VAC)	(VDC)	(V)		(V)	(A)	(kA)			(kA)	(J)	(pF)			
TFMOV34S470x	30	38	42	52	93	60	10	20	4.3	10	96	35000	VQ Series U <sub>r</sub> :690 VAC I <sub>r</sub> :25 A		
TFMOV34S560x	35	45	50	62	110	60	10	20	3.8	10	115	29500			
TFMOV34S680x	40	56	61	75	135	60	10	20	3.8	10	136	24200			
TFMOV34S820x	50	65	74	90	135	300	15	30	3.2	15	156	17950			
TFMOV34S101x	60	85	90	110	165	300	15	30	3.2	15	195	15000			
TFMOV34S121x	75	100	108	132	200	300	15	30	3.2	15	235	12200			
TFMOV34S151x	95	125	135	165	250	300	20	40	3.2	20	296	10000			
TFMOV34S181x	115	150	162	198	300	300	20	40	2.3	20	350	8250			
TFMOV34S201x	130	170	185	225	340	300	20	40	2.3	20	400	6750			
TFMOV34S221x	140	180	198	242	360	300	20	40	2.3	20	450	6400			
TFMOV34S241x	150	200	216	264	395	300	20	40	2.3	20	480	5650			
TFMOV34S271x	175	225	243	297	455	300	20	40	2.3	20	540	5100			
TFMOV34S301x	190	250	270	330	500	300	20	40	2.3	20	600	4510			
TFMOV34S331x	210	275	297	363	550	300	20	40	2.3	20	656	4150			
TFMOV34S361x	230	300	324	396	595	300	20	40	2.3	20	745	3750			
TFMOV34S391x	250	320	351	429	650	300	20	40	2.3	20	830	3500			
TFMOV34S431x	275	350	387	473	710	300	20	40	2.3	20	920	2950			
TFMOV34S471x	300	385	423	517	775	300	20	40	2.3	20	1000	2880			
TFMOV34S511x	320	415	459	561	845	300	20	40	2.3	20	1060	2650			
TFMOV34S561x	350	460	504	616	925	300	20	40	2.3	20	1150	2450			
TFMOV34S621x	385	505	558	682	1025	300	20	40	2.3	20	1250	2200			
TFMOV34S681x	420	560	612	748	1120	300	20	40	2.3	20	1250	2000			
TFMOV34S751x	460	615	675	825	1240	300	20	40	2.3	20	1280	1820			
TFMOV34S821x	510	670	738	902	1355	300	20	40	2.3	20	1300	1800			
TFMOV34S911x	550	745	819	1001	1500	300	20	40	2.3	20	1475	1500			
TFMOV34S102x	625	825	900	1100	1650	300	20	40	2.3	20	1550	1350			
TFMOV34S112x	680	895	990	1210	1815	300	20	40	2.3	20	1750	1230			
TFMOV34S122x	750	1000	1080	1320	1980	300	20	40	2.3	20	2000	1135			

# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

Note:

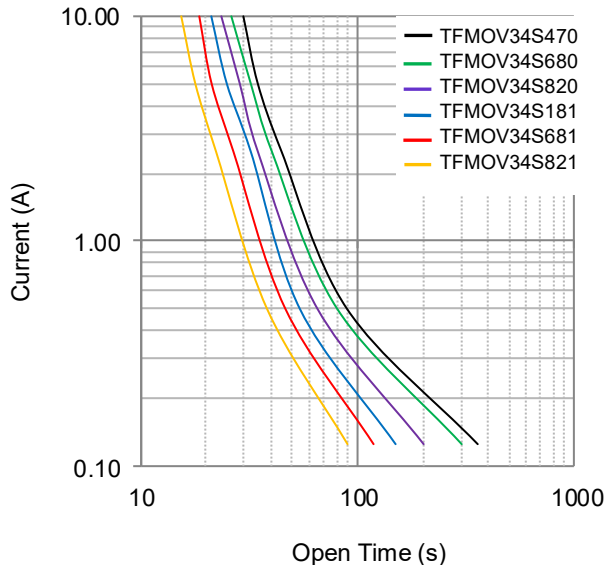
a:  $R_{cl} = \frac{V_C}{V_N}$ ,  $U_p \geq V_C$ ,  $V_C$ : Clamping Voltage (@  $I_n$ ),  $V_N$ : Varistor Voltage,  $U_p$ : Voltage Protection Level.

The Value of Voltage Protection Level ( $U_p$ ) is determined according to IEC 61643-11:2011 clause 6.4.

Preferred values of voltage protection level (kV): 0.08, 0.09, 0.10, 0.12, 0.15, 0.22, 0.33, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.5, 1.8, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.

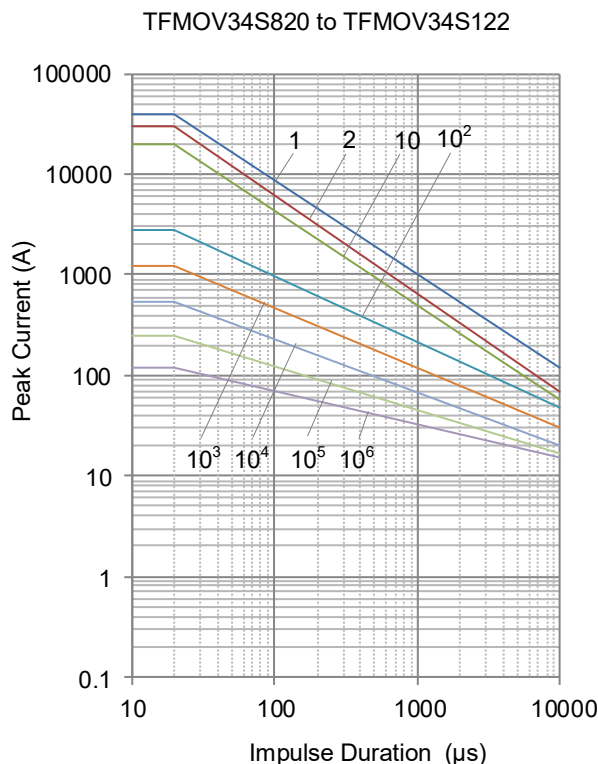
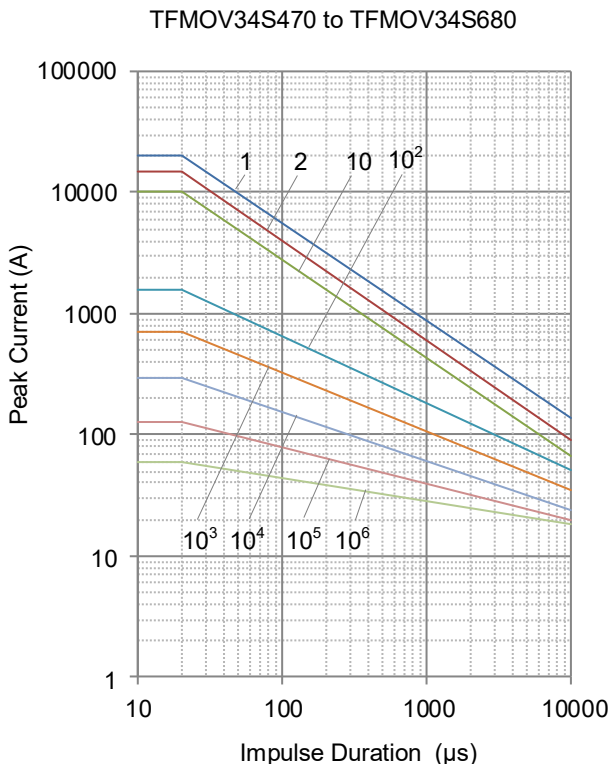
## Performance Curve for Reference

Limited Current Test Curve (UL 1449 clause 44.4)



Note: The limited current test curve is for reference only.

Max. Peak Current Derating Curve



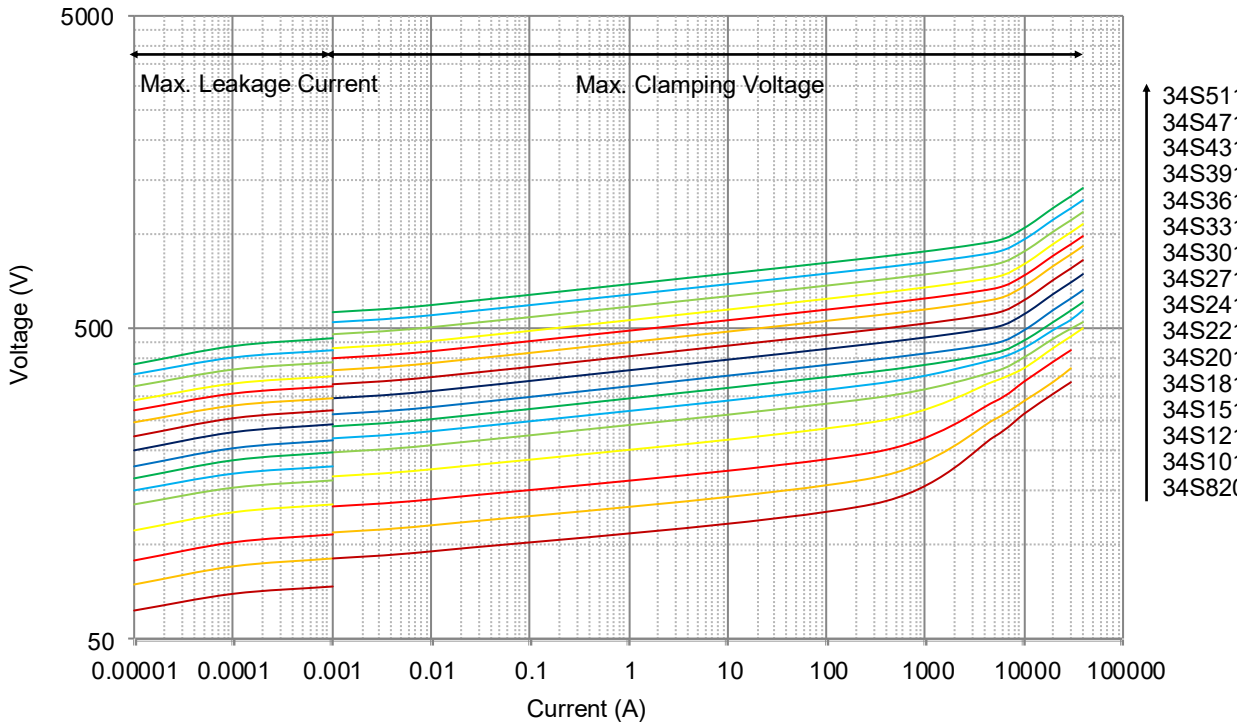
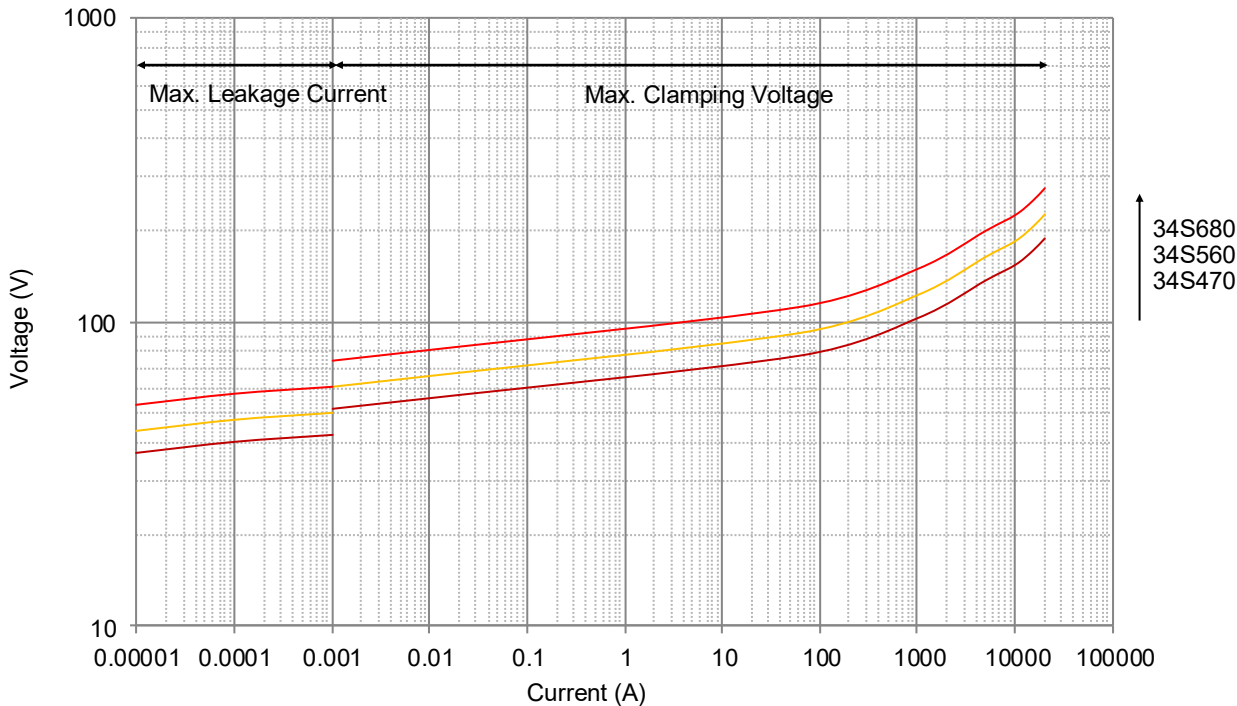
Note: 1, 2, 10, 10<sup>2</sup>, 10<sup>3</sup>, 10<sup>4</sup>, 10<sup>5</sup>, 10<sup>6</sup> Stand for number of repetitions.

TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

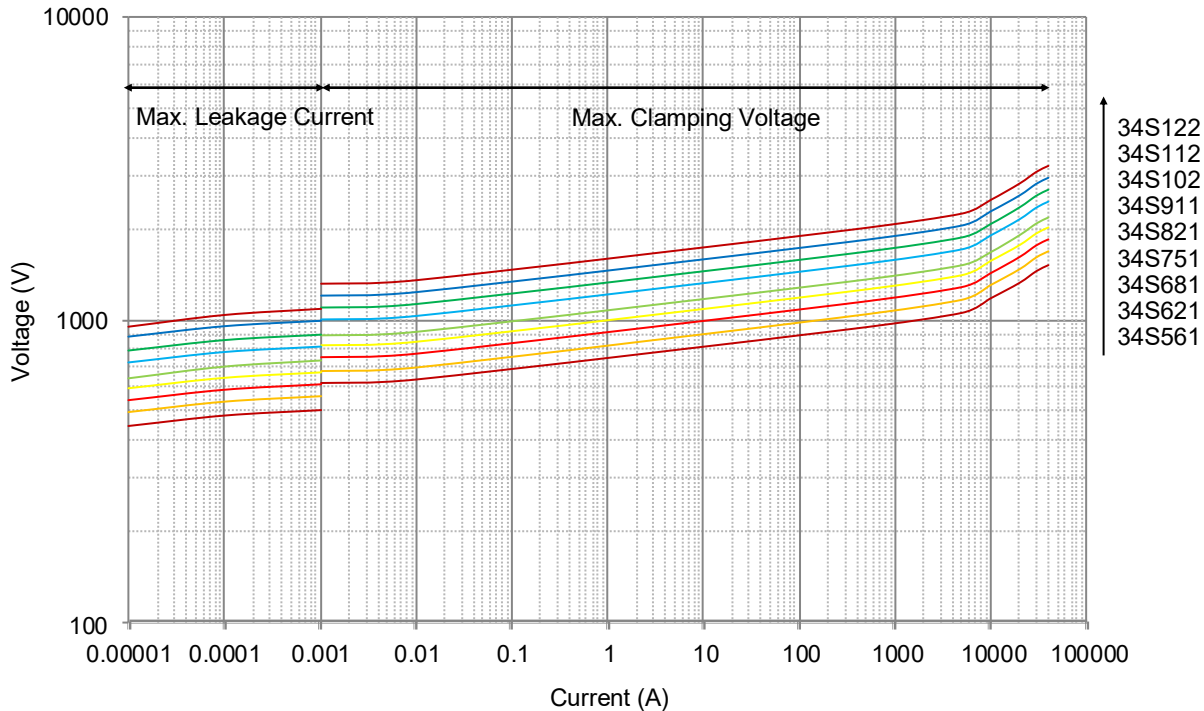
Voltage-Current Characteristic Curves



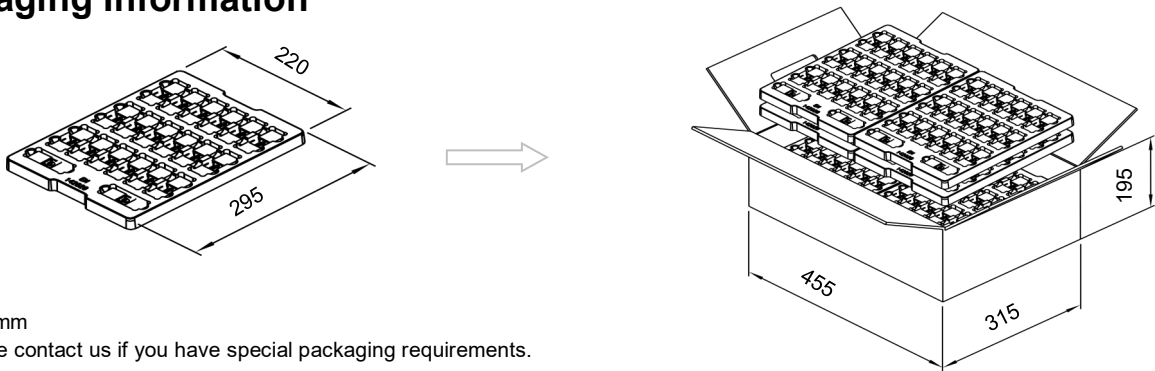
# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series



## Packaging Information



Unit: mm  
Please contact us if you have special packaging requirements.

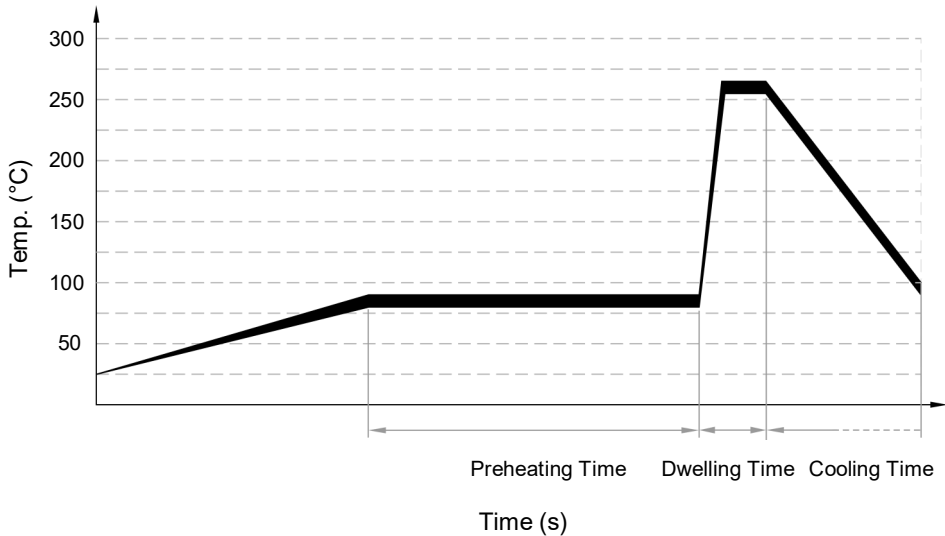
Item	Nominal Varistor Voltage	Tray	Carton
Dimensions (mm)	N/A	295 × 220	455 × 315 × 195
Quantity (PCS)	470 ~ 121	20	400
	151 ~ 681	20	320
	751 ~ 122	20	240

# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## Wave Soldering Parameters (Reference)



Item	Temp. (°C)	Time (s)
Preheating	80 to 90	60 to 150
Dwelling	250 to 260	2 to 4

## Recommended Hand-Soldering Parameters

Item	Condition
Iron Temperature	350 °C (Max.)
Soldering Time	4 seconds (Max.)
Distance between Soldering Point and the Bottom of Product	2 mm (Min.)

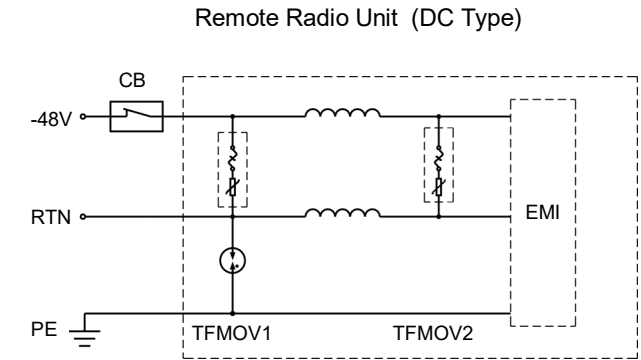
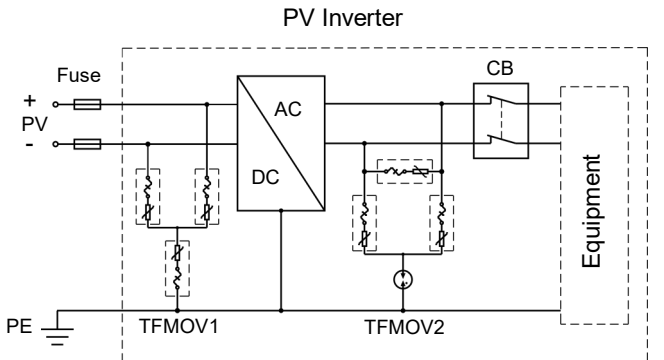
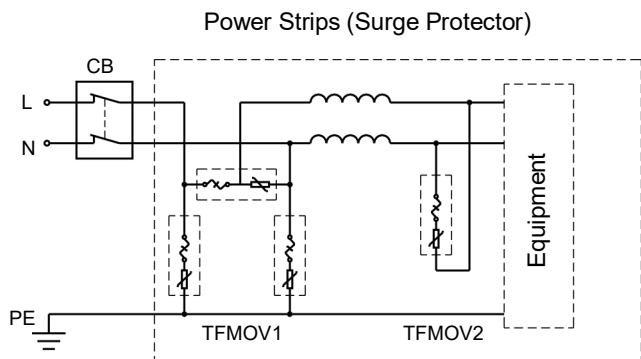
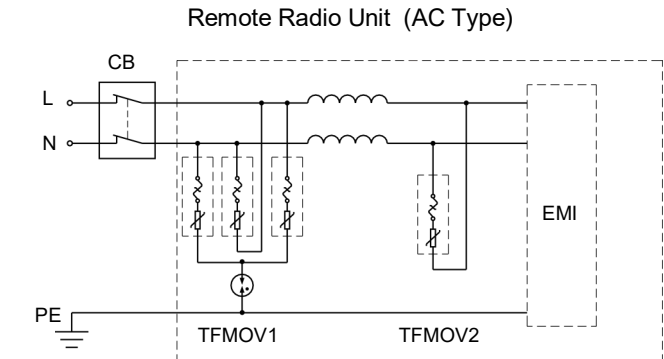


# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## Application Options



## Design

When a single TFMOV surge capacity can't meet the requirement of customers, paralleling more TFMOVs is recommended. Due to its nonlinear current-voltage characteristics, please pay attention to below tips:

1. Use the TFMOV from the same manufacturer with same model to parallel.
2. Control the varistor voltage; Typically, the varistor voltage deviation should be less than 1% in the same group (between the Max and Min), and meet the next tip at the same time.
3. Calculate the average surge capacity for each TFMOV and keep a margin at least 10%.
4. Design the layout like Figure.2. to make sure the surge capacity is divided averagely.

The Design not Recommended

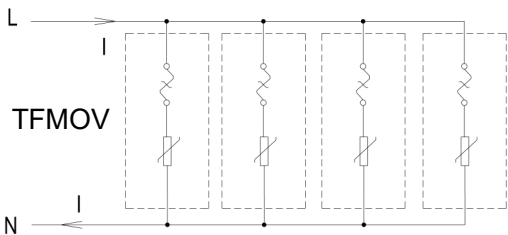


Figure .1

The Design Recommended

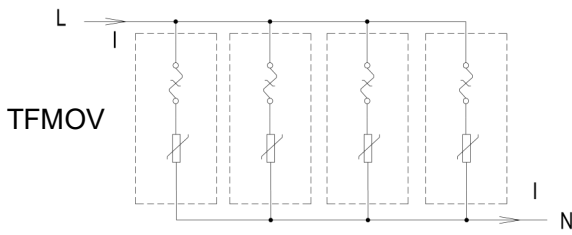


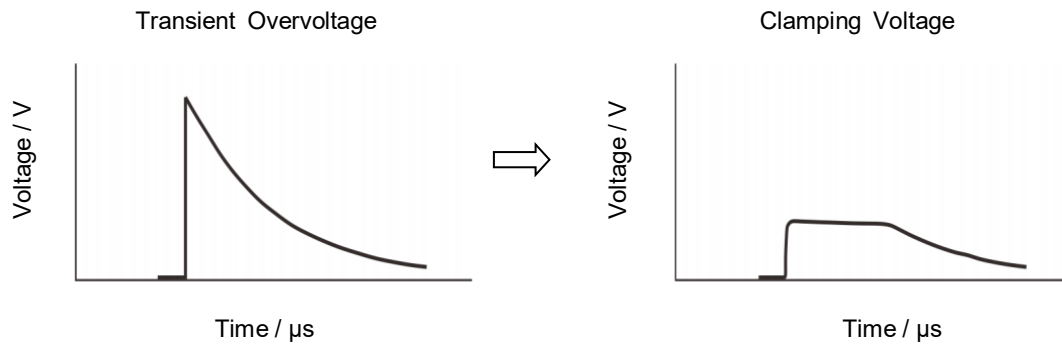
Figure .2

# TFMOV

Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## MOV Operation Principle



## MOV Thermal Protection

Figure a is a surge protection circuit commonly used in power supplies. MOV is used to suppress the surge voltage and protect the subsequent circuit. There is a risk of burning when the varistor degrades or fails. In the high-reliability surge protection circuit of Figure b, in order to improve the safety of the circuit, a thermal protection varistor TFMOV is used as the surge voltage protection element. TFMOV is a combination of varistors (MOV) and thermal protection component. When the temperature of the MOV is abnormally exceeded, the thermal fuse will be opened first, so that the failure mode of the MOV appears to be open-circuit failure.

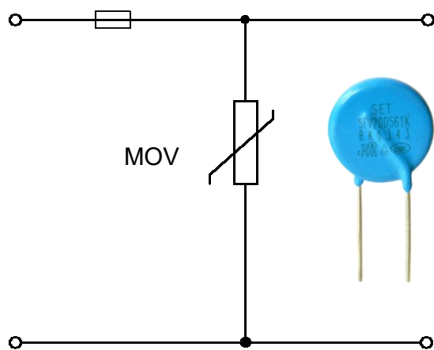


Figure a Typical surge protection circuit

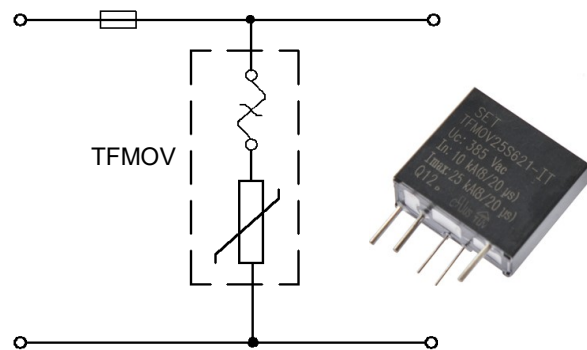


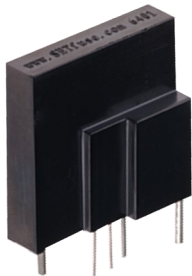
Figure b: High reliability surge protection circuit

# TFMOV

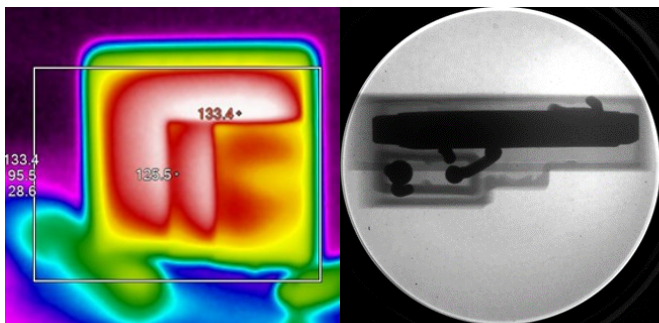
Thermal Fuse & MOV (TFMOV)

TFMOV34S Series

## Benefits



**Safety**

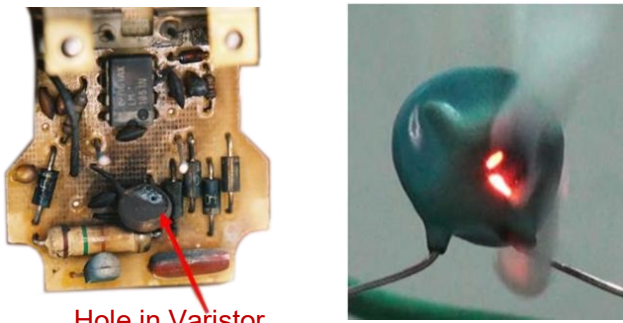


### TFMOV Failure Simulation

During the electrical performance degrading of varistor, the inbuilt ATCO will open the circuit when the leakage current of varistor increases to tens of micro Amperes. As shown in the figure above, this is a safe open circuit failure.



**Hidden Danger**



### MOV Failure Simulation

The electrical performance of varistor degrades with operating, mostly the varistor voltage drops, and leakage current increases. The heat accumulation can cause the temperature increase sharply and varistor results in thermal breakdown to short circuit status. It's very dangerous.

## Glossary

Item	Description
$V_N$	<b>Nominal Varistor Voltage</b> Voltage, at specified d.c. current used as a reference point in the component characteristic.
8/20 $\mu$ s	<b>8/20 Current Impulse</b> Current impulse with a nominal virtual front time of 8 $\mu$ s and a nominal time to half-value of 20 $\mu$ s. — (IEC 61643-11)
1.2/50 $\mu$ s	<b>1.2/50 Voltage Impulse</b> Voltage impulse with a nominal virtual front time of 1.2 $\mu$ s and a nominal time to half-value of 50 $\mu$ s. — (IEC 61643-11)
$U_c$	<b>Maximum Continuous Operating Voltage</b> Maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection. — (IEC 61643-11)
$I_n$	<b>Nominal Discharge Current</b> Crest value of the current through the SPD having a current waveshape of 8/20 $\mu$ s. — (IEC 61643-11)
$I_{imp}$	<b>Impulse Discharge Current for Class I Test</b> Crest value of a discharge current through the SPD with specified charge transfer Q and specified energy W/R in the specified time. — (IEC 61643-11)
$I_{max}$	<b>Maximum Discharge Current</b> Crest value of a current through the SPD having an 8/20 $\mu$ s waveshape and magnitude according to the manufacturers specification. $I_{max}$ is equal to or greater than $I_n$ . — (IEC 61643-11)
$V_c$	<b>Clamping Voltage</b> Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 $\mu$ s class current pulse.
$C_v$	<b>Capacitance</b> Capacitance across the MOV measured at a specified frequency and voltage.
<b>Modes of protection</b>	<b>Modes of protection</b> An intended current path, between terminals that contains protective components, e.g. line-to-line, line-to-earth, line-to-neutral, neutral-to-earth. — (IEC 61643-11)
$U_p$	<b>Voltage Protection Level</b> Maximum voltage to be expected at the SPD terminals due to an impulse stress with defined voltage steepness and an impulse stress with a discharge current with given amplitude and wave shape. — (IEC 61643-11)
<b>TCO</b>	<b>Thermal-Link</b> A non-resettable device incorporating a THERMAL ELEMENT which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed.
<b>ATCO</b>	<b>Alloy Thermal-Link</b> Alloy Type Thermal-Link, Alloy is the thermal element.
<b>MOV</b>	<b>Varistors</b> A resistive device with nonlinear voltammetry characteristics

## TFMOV

Thermal Fuse &amp; MOV (TFMOV)

TFMOV34S Series

## Patents

Name	Region	Category	Patent NO.
Varistor with In-built Alloy-Type Thermal Fuse	China	Patent for Invention	ZL 200510044661.5
A Protection Pluggable Module with Over Current、Over Voltage、and Over Temperature Protection Function	China	Utility Model	ZL 201020244488.X
A Varistor with Double Protection Function	China	Utility Model	ZL 201020255481.8
Surge Protection Module Applicable for Power Strip	China	Utility Model	ZL 201120107173.5
A Surge Protection Module Applicable for Power Strip	China	Patent for Invention	ZL 201110092261.7
A New Type of Varistor and Surge Protective Device with Thermal Protection	China	Utility Mode	ZL 201420306127.1
A Surge Protective Device	China	Utility Modeel	ZL 201420415059.2
A Varistor and Thermal Protection Component Combination	China	Utility Mode	ZL 201520376567.9
合金型温度ヒューズ付のバリスタ	Japan	Utility Mode	3142835
Varistor with an Alloy-Type Temperature Fuse	Australia	Utility Mode	2007100456
Varistor with an Alloy-Type Temperature Fuse	Taiwan	Utility Model	M 300855
Varistor with an Alloy-type Temperature Fuse	Canada	Patent for Invention	2588819
Metal Oxide Varistor with Built-in Alloy-Type Temperature Fuse	USA	Patent for Invention	US 8780521
Varistor with In-built Alloy Type Thermal Fuse (with Housing)	USA	Patent for Invention	US 9355763



## ATTENTION

### Usage

1. Frequency range is from 47 Hz to 63 Hz.
2. The voltage applied continuously to the TFMOV can not exceed its maximum continuous operating voltage  $U_c$ .
3. When atmosphere press is from 80 kPa to 106 kPa, the related altitude shall be from 2000 meters to - 500 meters.
4. Do not touch the product body or pins directly when power is on, to avoid electric shock.
5. Do not clean the TFMOV with strong polar solvent such as ketone, esters, benzene, halogenated hydrocarbon, to avoid damaging the enclosure.
6. It should have a reliable grounding when using these products.

### Replacement

TFMOV is a non-repairable product. For safety sake, please use equivalent TFMOV for replacement.

### Storage

Do not store TFMOV at high temperature, high humidity or corrosive gas environment. To avoid reducing the solderability of the pins, please use them up within 1 year after receiving the goods.

### Installation Position

Do not install the TFMOV on a place that may often suffer severe continuous vibration.

### Mechanical Stress

Do not take violent action such as knocking when assembling to avoid mechanical damage.

## Thermal Fuse & MOV (TFMOV) Feature & Model List Overview

Rated Voltage $U_n$ (V)	AC	DC	Nominal Discharge Current $I_n$ (kA)										Maximum Continuous Operating Voltage $U_n$ (V)		Model
			1	1.5	2.5	3	4	5	AC	DC					
690V	600V		○	○	○	○	○	○	○	○	○	○	750	1000	
		○	○	○	○	○	○	○	○	○	○	○	680	895	
480V	400V		○	○	○	○	○	○	○	○	○	○	625	825	
		○	○	○	○	○	○	○	○	○	○	○	550	745	
347V	254		○	○	○	○	○	○	○	○	○	○	510	670	
		○	○	○	○	○	○	○	○	○	○	○	460	615	
220	277V		○	○	○	○	○	○	○	○	○	○	420	560	
		○	○	○	○	○	○	○	○	○	○	○	385	505	
230V	300V		○	○	○	○	○	○	○	○	○	○	350	460	
		○	○	○	○	○	○	○	○	○	○	○	320	415	
120	220V		○	○	○	○	○	○	○	○	○	○	300	385	
		○	○	○	○	○	○	○	○	○	○	○	275	350	
130V	110V		○	○	○	○	○	○	○	○	○	○	250	320	
		○	○	○	○	○	○	○	○	○	○	○	230	300	
110V	110V		○	○	○	○	○	○	○	○	○	○	210	275	
		○	○	○	○	○	○	○	○	○	○	○	190	250	
60V	60V		○	○	○	○	○	○	○	○	○	○	175	225	
		○	○	○	○	○	○	○	○	○	○	○	150	200	
48V	48V		○	○	○	○	○	○	○	○	○	○	140	180	
		○	○	○	○	○	○	○	○	○	○	○	130	170	
36V	36V		○	○	○	○	○	○	○	○	○	○	115	150	
		○	○	○	○	○	○	○	○	○	○	○	95	125	
24V	24V		○	○	○	○	○	○	○	○	○	○	75	100	
		○	○	○	○	○	○	○	○	○	○	○	60	85	
12V	12V		○	○	○	○	○	○	○	○	○	○	50	65	
		○	○	○	○	○	○	○	○	○	○	○	40	56	
			○	○	○	○	○	○	○	○	○	○	35	45	
			○	○	○	○	○	○	○	○	○	○	30	38	
			○	○	○	○	○	○	○	○	○	○	25	31	
			○	○	○	○	○	○	○	○	○	○	20	26	
			○	○	○	○	○	○	○	○	○	○	17	22	

**Thermal Fuse & MOV (TFMOV) Feature & Model List Overview**

Rated Voltage $U_n$ (V)		Model						Maximum Continuous Operating Voltage $U_n$ (V)				
AC	DC	7.5	8	10	10 $I_{max} = 2.5/I_n$	10	15	AC	DC			
690V	600V	TFMOV20S122x				TFMOV25D122x	TFMOV25S122x			750	1000	
		TFMOV20S112x				TFMOV25D112x	TFMOV25S112x			680	895	
480V	400V	TFMOV20S102x				TFMOV25D102x	TFMOV25S102x			625	825	
		TFMOV20S911x				TFMOV25D911x	TFMOV25S911x			550	745	
347V	300V	TFMOV20S821x				TFMOV25D821x	TFMOV25S821x			510	670	
		TFMOV20S751x				TFMOV25D751x	TFMOV25S751x			460	615	
220 - 230V	254 - 277V	TFMOV20S681x	TFMOV20S681Lx			TFMOV25D681x	TFMOV25S681x	TFMOV25S681Lx			420	560
		TFMOV20S621x	TFMOV20S621Lx			TFMOV25D621x	TFMOV25S621x	TFMOV25S621Lx			385	505
220 - 230V	300V	TFMOV20S561x	TFMOV20S561Lx			TFMOV25D561x	TFMOV25S561x	TFMOV25S561Lx			350	460
		TFMOV20S511x	TFMOV20S511Lx			TFMOV25D511x	TFMOV25S511x	TFMOV25S511Lx			320	415
220V	120 - 130V	TFMOV20S471x	TFMOV20S471Lx			TFMOV25D471x	TFMOV25S471x	TFMOV25S471Lx			300	385
		TFMOV20S431x	TFMOV20S431Lx			TFMOV25D431x	TFMOV25S431x	TFMOV25S431Lx			275	350
110V	110V	TFMOV20S391x	TFMOV20S391Lx			TFMOV25D391x	TFMOV25S391x	TFMOV25S391Lx			250	320
		TFMOV20S361x	TFMOV20S361Lx			TFMOV25D361x	TFMOV25S361x	TFMOV25S361Lx			230	300
110V	110V	TFMOV20S331x	TFMOV20S331Lx			TFMOV25D331x	TFMOV25S331x	TFMOV25S331Lx			210	275
		TFMOV20S301x	TFMOV20S301Lx			TFMOV25D301x	TFMOV25S301x	TFMOV25S301Lx			190	250
110V	110V	TFMOV20S271x	TFMOV20S271Lx			TFMOV25D271x	TFMOV25S271x	TFMOV25S271Lx			175	225
		TFMOV20S241x	TFMOV20S241Lx			TFMOV25D241x	TFMOV25S241x	TFMOV25S241Lx			150	200
110V	110V	TFMOV20S221x	TFMOV20S221Lx			TFMOV25D221x	TFMOV25S221x	TFMOV25S221Lx			140	180
		TFMOV20S201x	TFMOV20S201Lx			TFMOV25D201x	TFMOV25S201x	TFMOV25S201Lx			130	170
48V	60V			TFMOV25S181x	TFMOV25S181Lx				TFMOV20K181x		115	150
				TFMOV25S151x	TFMOV25S151Lx				TFMOV20K151x		95	125
48V	48V			TFMOV25S121x	TFMOV25S121Lx				TFMOV34S121x		75	100
				TFMOV25S101x	TFMOV25S101Lx				TFMOV34S101x		60	85
24V	36V			TFMOV25S820x	TFMOV25S820Lx				TFMOV34S560Lx	TFMOV34S820x	50	65
						TFMOV34S680x			TFMOV34S470Lx		40	56
24V	24V					TFMOV34S560x					35	45
						TFMOV34S470x					30	38
12V	12V										25	31
											20	26
12V	12V										17	22



## Thermal Fuse & MOV (TFMOV) Feature & Model List Overview

Rated Voltage $U_n$ (V)	Model	Maximum Continuous Operating Voltage $U_n$ (V)	
		AC	DC
690V	600V	750	1000
		680	895
480V	400V	625	825
		550	745
347V	300V	510	670
		460	615
254	220V	420	560
		385	505
220	277V	350	460
		320	415
230V	300V	300	385
		275	350
120	220V	250	320
		230	300
130V	220V	210	275
		190	250
110V	110V	175	225
		150	200
110V	110V	140	180
		130	170
60V	60V	115	150
		95	125
48V	60V	75	100
		60	85
48V	48V	50	65
		40	56
24V	24V	35	45
		30	38
12V	12V	25	31
		20	26
AC	DC	17	22

Nominal Discharge Current  $I_n$  (kA)

$I_{max} = 2.5I_n$

## Thermal Fuse & MOV (TFMOV) Feature & Model List Overview

Rated Voltage $U_n$ (V)	AC	DC	Nominal Discharge Current $I_n$ (kA)						Maximum Continuous Operating Voltage $U_n$ (V)	
			2.5 x 2	5 x 2	7.5 x 2	2.5 x 3	5 x 3	7.5 x 3	AC	DC
690V									750	1000
600V									680	895
480V									625	825
400V									550	745
347V									510	670
254									460	615
220									420	560
230V									385	505
300V					TFMOV21R2P511				350	460
					TFMOV21R2P471			TFMOV21R3P511	320	415
					TFMOV21R2P431			TFMOV21R3P471	300	385
					TFMOV21R2P391			TFMOV21R3P431	275	350
120					TFMOV21R2P361			TFMOV21R3P391	250	320
130V					TFMOV21R2P331			TFMOV21R3P361	230	300
					TFMOV21R2P301			TFMOV21R3P331	210	275
					TFMOV21R2P271			TFMOV21R3P301	190	250
					TFMOV21R2P241			TFMOV21R3P271	175	225
110V					TFMOV21R2P221			TFMOV21R3P241	150	200
					TFMOV21R2P201			TFMOV21R3P221	140	180
								TFMOV21R3P201	130	170
					TFMOV21R2P181				115	150
60V					TFMOV21R2P151			TFMOV21R3P181	95	125
48V					TFMOV21R2P121			TFMOV21R3P151	75	100
					TFMOV21R2P101			TFMOV21R3P121	60	85
36V					TFMOV21R2P820			TFMOV21R3P101	50	65
								TFMOV21R3P820	40	56
24V					TFMOV21R2P680			TFMOV21R3P680	35	45
					TFMOV21R2P560			TFMOV21R3P560	30	38
					TFMOV21R2P470			TFMOV21R3P470	25	31
12V									20	26
									17	22