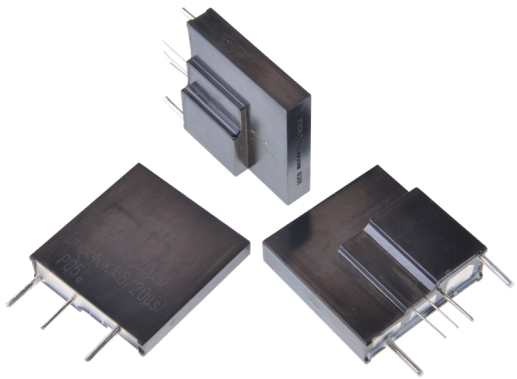


Description

TFMOV34S series are comprised of MOV and thermal protection element with unique structure design. It is designed to open the circuit in the event of overheating due to sustained voltage or degradation of varistor and to ensure the safety of the equipment. TFMOV34S series, with small size enclosure, can be mounted easily on PCB.

Agency Approvals

Agency	Standards	No.
c UL us	UL1449	on request
TÜVRheinland	EN 61643-11	on request
Environment	RoHS & REACH	Compliant

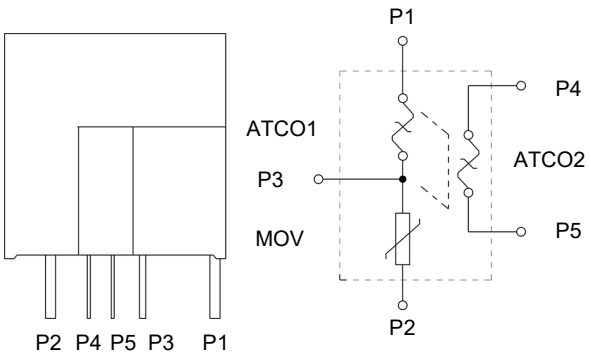
Features

- High Reliability
- Small Size
- Remote Signal Contact for Failure Indication (Optional)
- High Energy Capacity
- Epoxy Sealing Material, Flame-retardant to V0 (UL 94)
- UL 1449 Type 4CA

Applications

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

Schematics



Part Numbering System

TFMOV 34 S 621 -IT - 3 - 001

Product Category
TFMOV

MOV Size (mm)
34 mm

MOV Shape
S: Square

Nominal Varistor Voltage

820	621	102
82×10^0 =82 V	62×10^1 =620 V	10×10^2 =1000 V

Other Options

Pin No.
2: Without Remote Signal Contact or Status Indication
3: With Status Indication
4: With Remote Signal Contact
5: With Remote Signal Contact and Status Indication

Remote Signal
Default: Without Remote Signal Contact
-IT: With Remote Signal Contact

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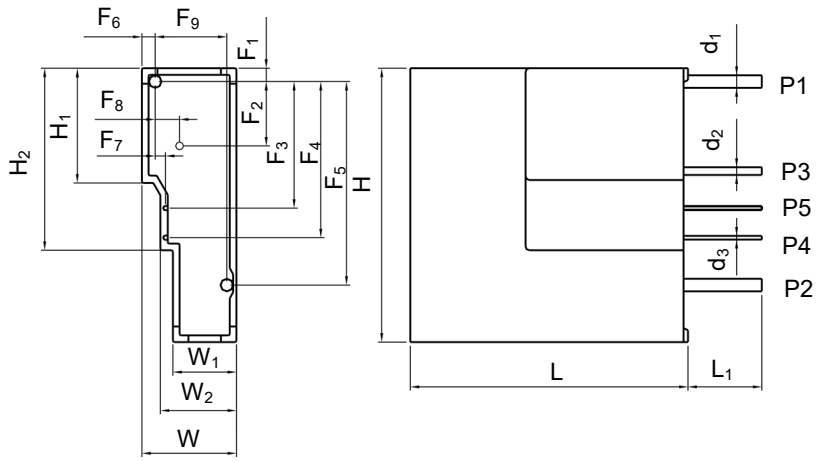
Dimensions (mm)



Note:
Pin P3 / P4 / P5 is Optional

Nominal Varistor Voltage	L (±1.0)	L_1 (±1.0)	W (±1.0)	W_1 (±1.0)	W_2 (±1.0)	H (±1.0)	H_1 (±0.5)	H_2 (±0.5)	d_1 (-0.05,+0.20)	d_2 (-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_3 (±0.05)**	**F_1 (±0.5)**	**F_2 (±0.5)**	**F_3 (±0.5)**	**F_4 (±0.5)**	**F_5 (±0.5)**	**F_6 (±0.5)**	**F_7 (±0.5)**	**F_8 (±0.5)**	**F_9 (±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

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Glossary

Item	Description
V_N	**Nominal Varistor Voltage** Voltage, at specified d.c. current used as a reference point in the component characteristic.
8/20 µs	**8/20 Current Impulse** Current impulse with a nominal virtual front time of 8 µs and a nominal time to half-value of 20 µs. — (IEC 61643-11)
1.2/50 µs	**1.2/50 Voltage Impulse** Voltage impulse with a nominal virtual front time of 1.2 µs and a nominal time to half-value of 50 µs. — (IEC 61643-11)
U_c	**Maximum Continuous Operating Voltage** Maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection. — (IEC 61643-11)
I_n	**Nominal Discharge Current** Crest value of the current through the SPD having a current waveshape of 8/20 µs. — (IEC 61643-11)
I_{max}	**Maximum Discharge Current** Crest value of a current through the SPD having an 8/20 µs waveshape and magnitude according to the manufacturers specification. I_{max} is equal to or greater than I_n. — (IEC 61643-11)
V_C	**Clamping Voltage** Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 µs class current pulse.
C_V	**Capacitance** Capacitance across the MOV measured at a specified frequency and voltage.
TCO	**Thermal-Link** 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.
ATCO	**Alloy Thermal-Link** Alloy Type Thermal-Link, Alloy is the thermal element.

TFMOV

Specifications

Model	Max. Continuous Operating Voltage		Varistor Voltage @1 mA DC		Clamping Voltage (Max.)		Nominal Discharge Current (8/20 µs)	Max. Discharge Current (8/20 µs)	Voltage Clamping Ratio[a]		Max. Energy (Joule)	Typical Capacitance (Reference)	Thermal Fuse
	U_c		Min.	Max.	V_C	I_P	I_n	I_{max}	R_{cl}	I_n	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_r:690 VAC I_r: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

Note:

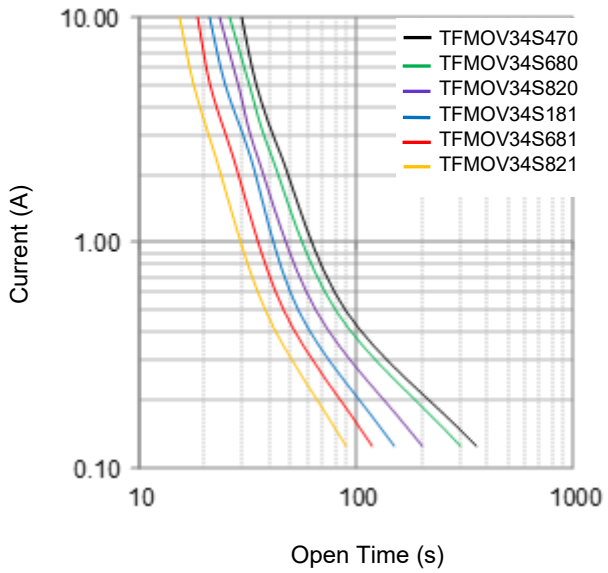
a: $R_{cl} = \frac{V_C}{V_N}$, $U_p \geq V_C$, V_C: Clamping Voltage (@ I_n), V_N: Varistor Voltage, U_p: Voltage Protection Level.

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

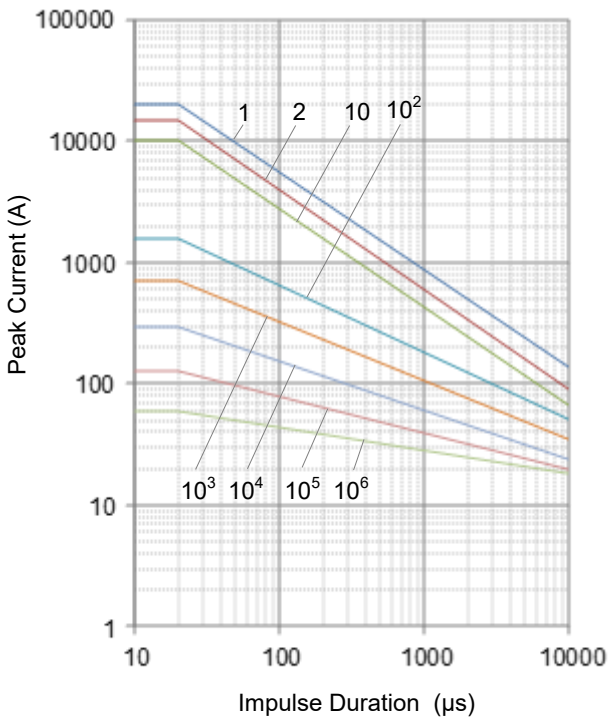
Limited Current Test Curve (UL 1449 4th clause 44.4)



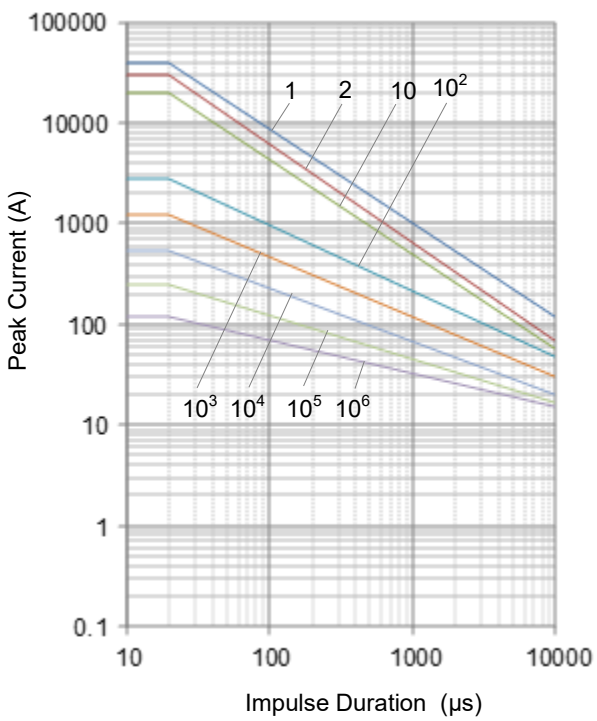
Note: The limited current test curve is for reference only.

Max. Peak Current Derating Curve

TFMOV34S470 to TFMOV34S680

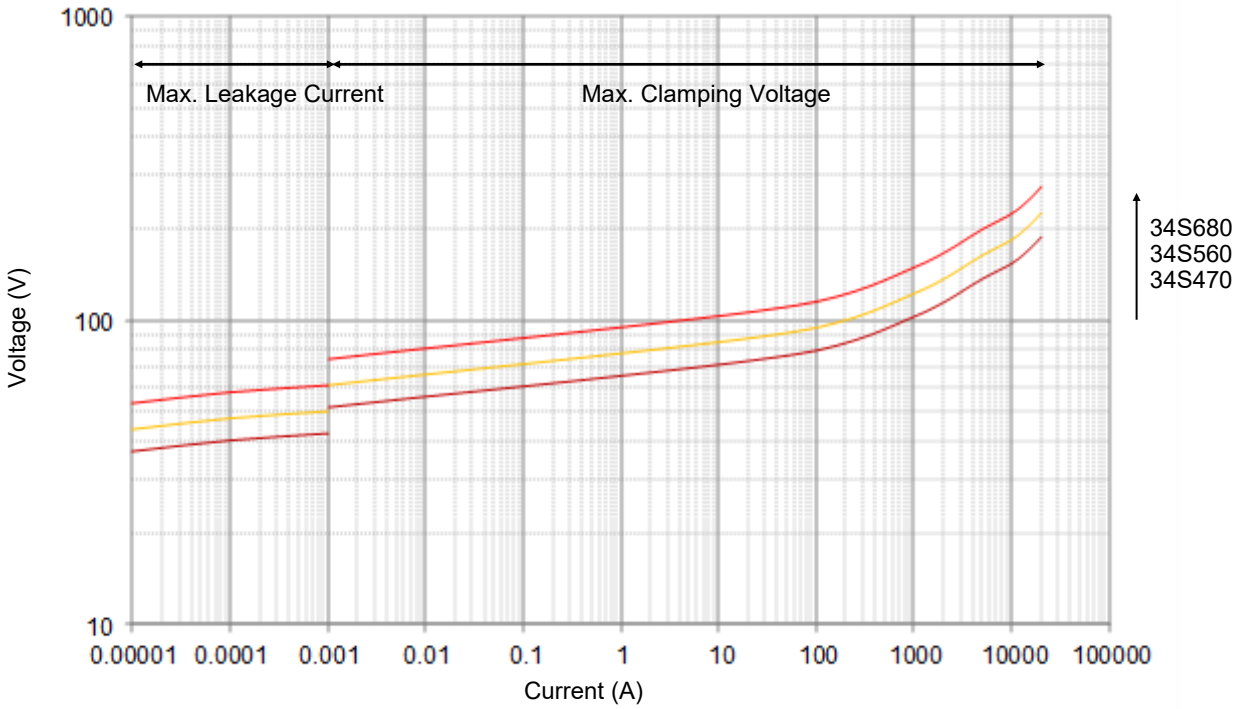


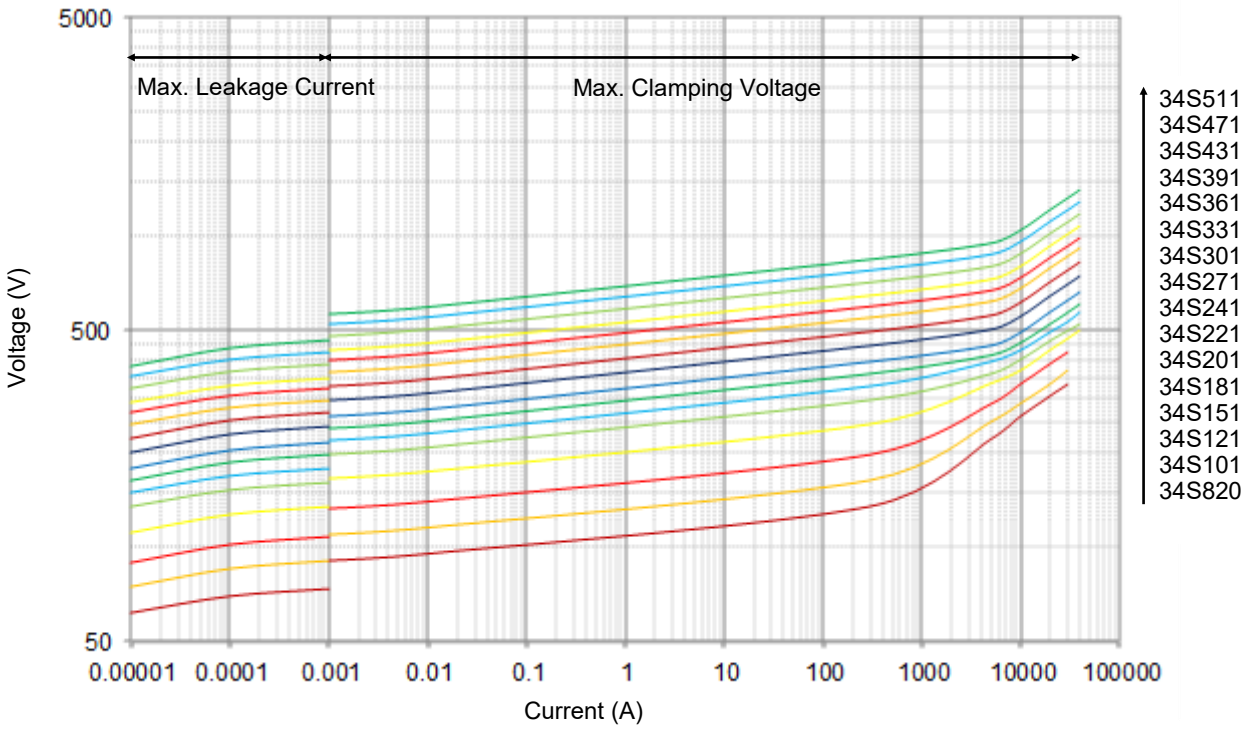
TFMOV34S820 to TFMOV34S122



Note: 1, 2, 10, 10^2, 10^3,10^4, 10^5, 10^6 Stand for number of repetitions.

Voltage-Current Characteristic Curves





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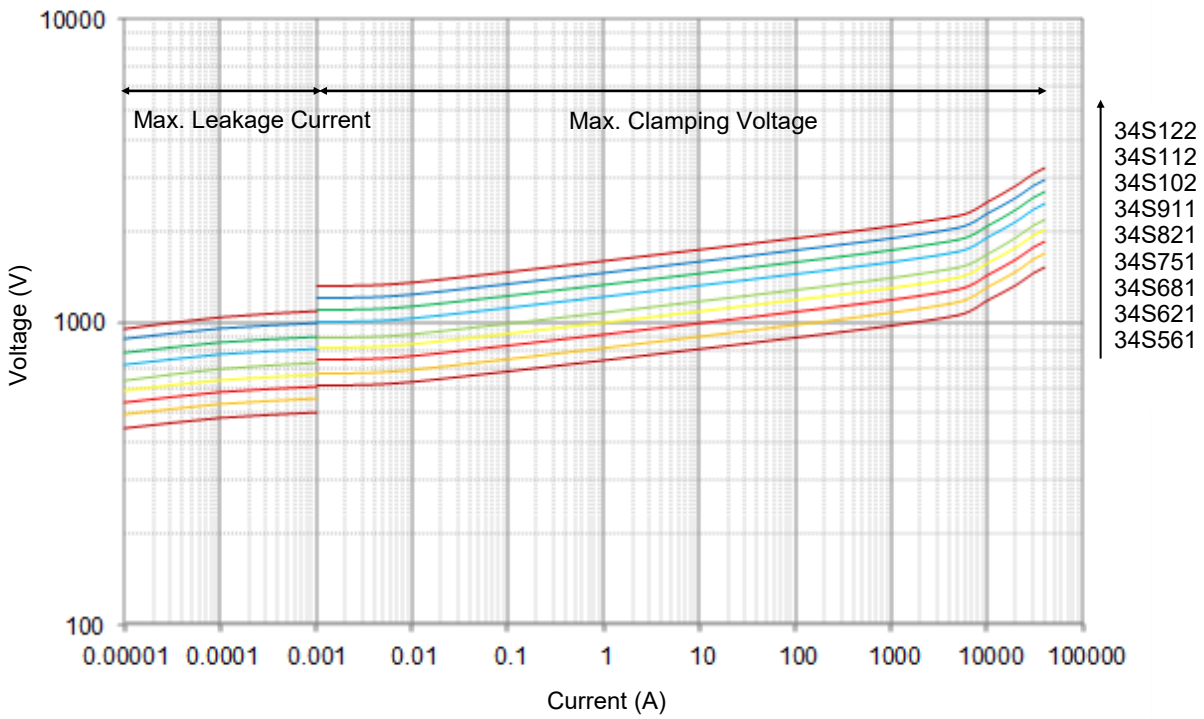
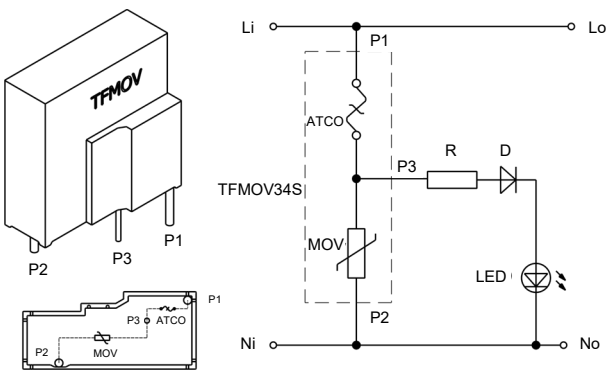
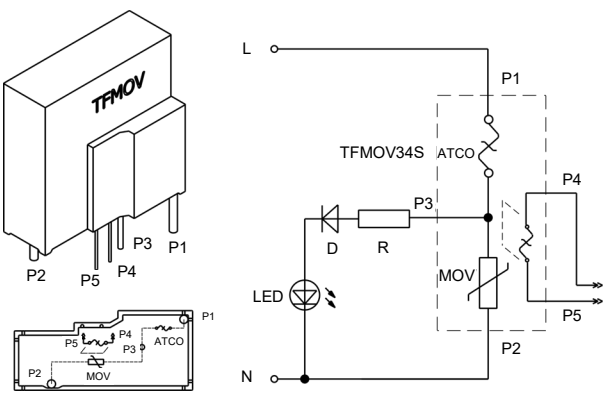


Application Options

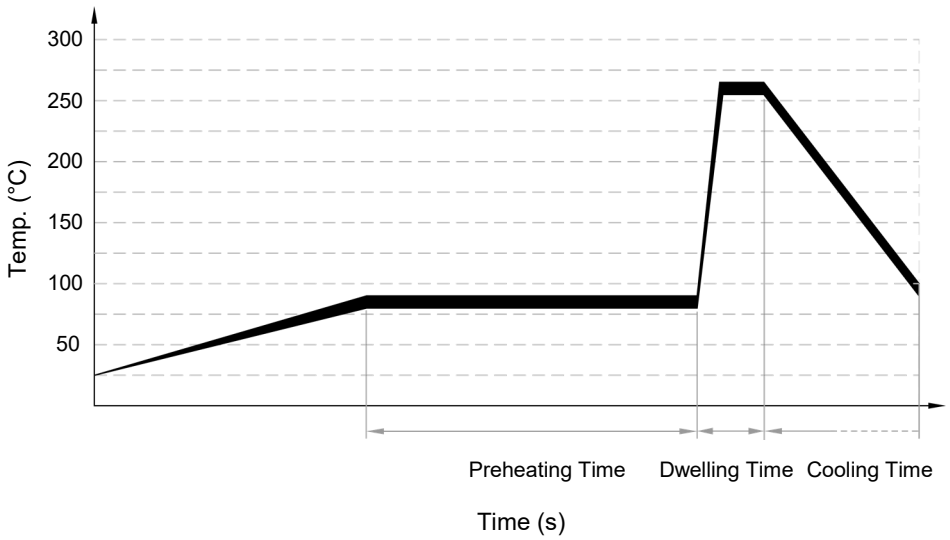


Thermal Protection Indication:
LED is off when the thermal element (ATCO) opens.



Thermal Protection Indication and Remote Signal Alarming:
The built-in discrete thermal element (ATCO) can offer a signal (from close to open) for remote indication when Metal Oxide Varistor (MOV) fails. At the same time, the thermal element (ATCO) in main line opens, the LED turns off.

Wave Soldering Parameters (Reference)



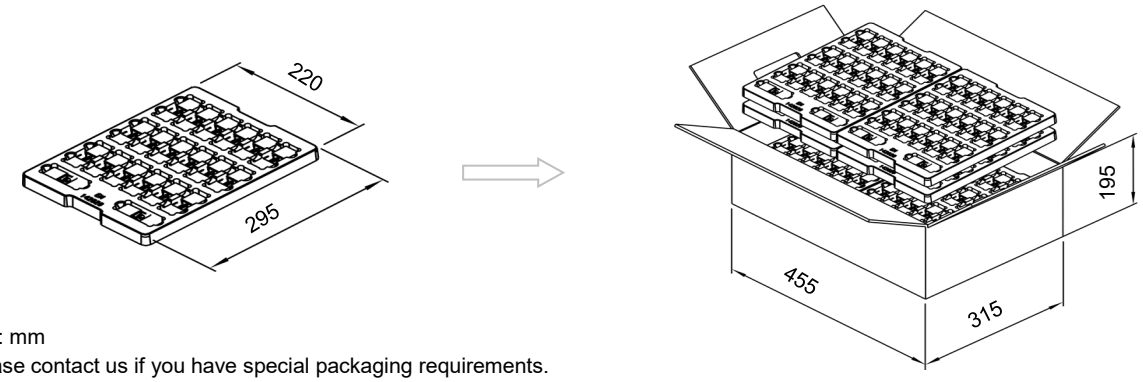
Item	Temp. (°C)	Time (s)
Preheating	80 to 90	60 to 150
Dwelling	250 to 260	2 to 4

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

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

Item	Nominal Varistor Voltage	Carton
Gross Weight (kg)	470 - 121	(11.6 to 12.6) ± 10%
	151 - 681	(10.0 to 15.5) ± 10%
	751 - 122	(12.8 to 16.6) ± 10%

Note:
The gross weight of each carton will be different because of the difference of product model. It depends on the nominal varistor voltage of the product. The gross weight is for reference only, please contact us for more details.

TFMOV

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 meter to - 500 meter.
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.
7. When TFMOV is used in DC system, if the system voltage is 300 V to 500 V, a fuse rated 500 VDC / 1 A should be paralleled with Thermal Fuse. If the system voltage is 500 V to 1000 V, a fuse rated 1000 VDC / 1 A should be paralleled with Thermal Fuse, for DC interrupting effectively.

Replace

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.