



ThermoFuse Varistor

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Series/Type: T25K75DF
Ordering code: TBD
Date: 2015-07-16
Version: p2

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Applications

- ◆ Overvoltage protection with integrated thermal fuse and warning signal
- ◆ Suitable for use in industrial and household appliance applications

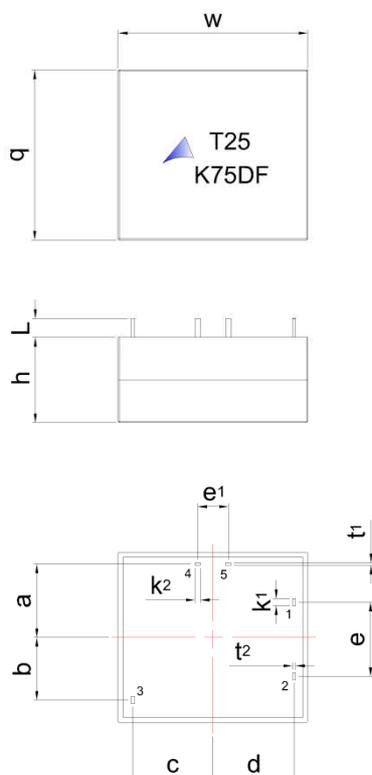
Features

- ◆ Micro switch for warning signal purposes

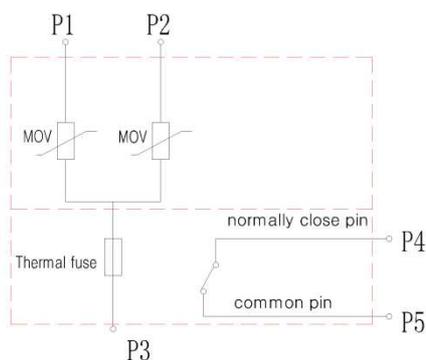
Nomenclature

T	=	EPCOS ThermoFuse varistor
25	=	Rated disk length (mm)
K	=	Tolerance of V_V at 1 mA: $\pm 10\%$
75	=	Operating max. AC voltage
DF	=	Double thermal fuses

Dimensional drawing in mm



Leads configuration



w_{max}	=	31.0	
q_{max}	=	28.0	
h_{max}	=	14.5	
a	=	12.1	± 0.5
b	=	10.3	± 0.5
c	=	13.1	± 0.5
d	=	13.2	± 0.5
e	=	12.2	± 0.5
e_1	=	5.0	± 0.5
t_1	=	0.4	± 0.05 (pin4 pin5)
t_2	=	0.6	± 0.05 (pin1 pin2 pin3)
k_1	=	1.2	± 0.1 (pin1 pin2 pin3)
k_2	=	0.9	± 0.1 (pin4 pin5)
L	=	3.0	± 0.5

Note: When thermal fuse disconnected, subminiature basic switch relaxes, P4-P5 disconnected.

Note: the following technical specification is applicable between pin3 to pin1+pin2.

Electrical data

Maximum Ratings (85 °C)

Max. operating AC voltage	V_{RMS}	=	75 V
Max. operating DC voltage	V_{DC}	=	100 V
Nominal discharge current (8/20 μ s) 20 times	I_n	=	20000 A
Energy absorption (2 ms) 1 time	W_{max}	=	190 J
Average power dissipation	P_{max}	=	1,2 W

Characteristics (25 °C):

Varistor voltage at 1 mA	V_V	=	120 V \pm 10%
Clamping voltage at 20kA	$V_{C,max}$	=	400V
Typ.Capacitance at 1 kHz	C	=	9600 pF

) 20 times 20 kA: impulse shape 8/20 μ s; time between impulses \geq 60 s.

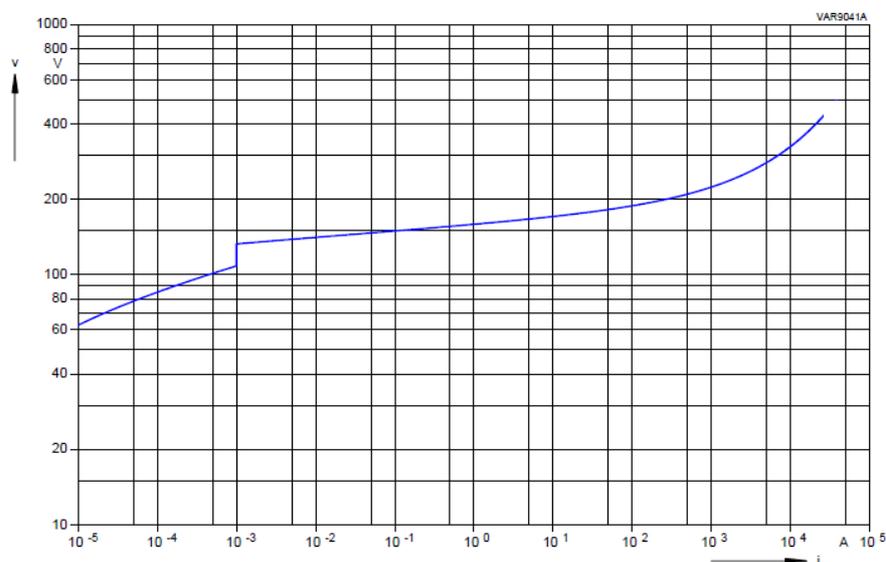
Inspection severity: 0/10 per ceramic lot.

Pass criteria: - Change of varistor voltage $|\Delta V / V (1 \text{ mA})| \leq 10\%$ in direction of load.
 - No visible damage.

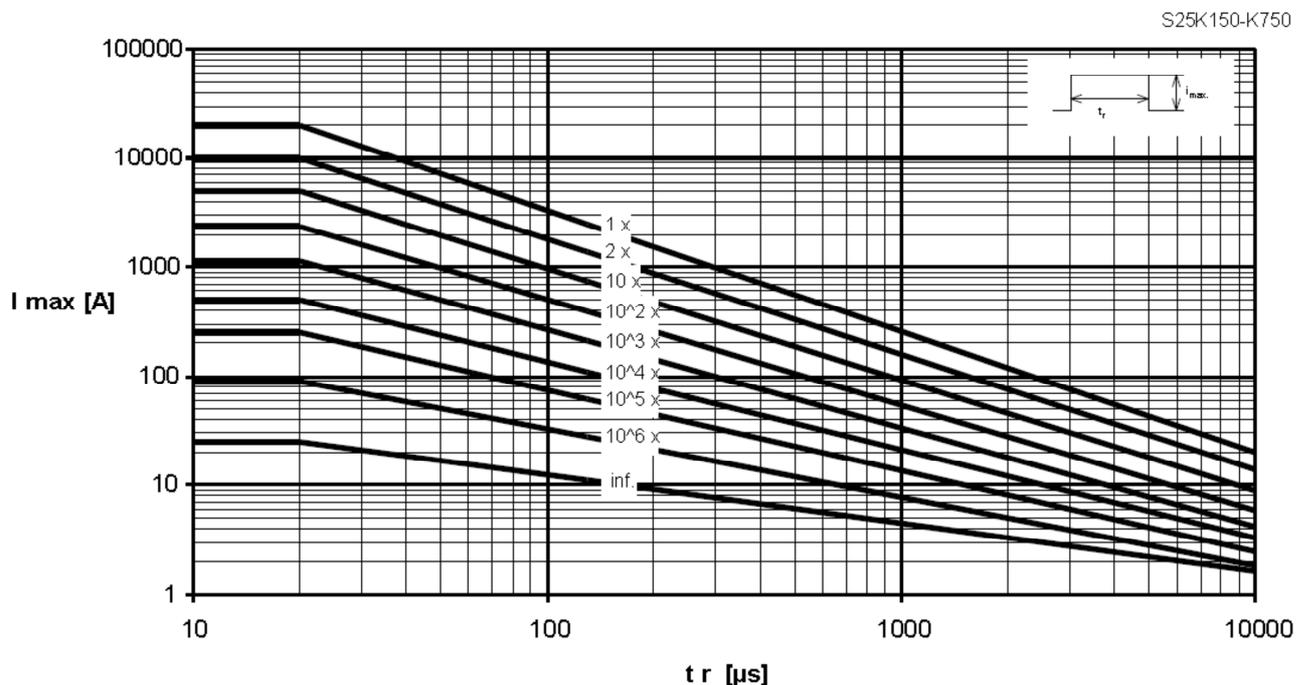
General technical data

Climatic category	to IEC 60068-1	40/85/56
Operating temperature	to CECC 42 000	-40...+85 °C
Storage temperature		-40...+85 °C
Electric strength	to CECC 42 000	$\geq 2.5 \text{ kV}_{RMS}$
Response time		<25 ns

v/i characteristics

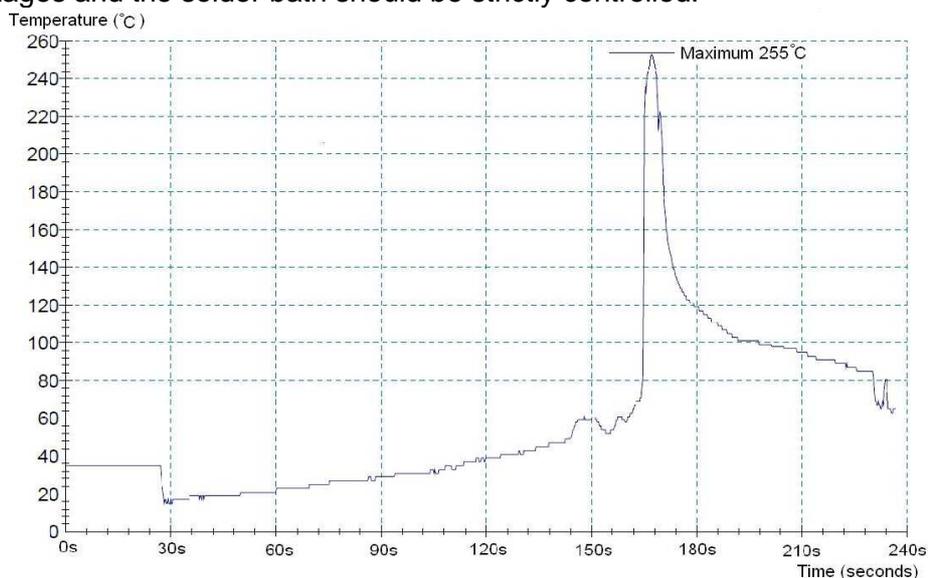


Derating curves

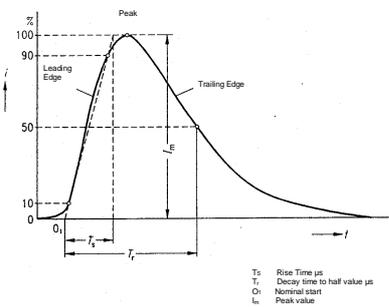


Typical wave soldering curve

Care must be taken when soldering the device into place because it contains a thermal fuse element. Two soldering methods are possible: (1) Manual soldering under max. 350°C / 3s: it is recommended to heat-sink the leads of the device. (2) Wave soldering: it is very important that the temperatures of all preheat stages and the solder bath should be strictly controlled.



Reliability data, electrical

Characteristics	Test methods / Description	Specifications
Varistor voltage	The voltage between two terminals with the specified measuring current applied is called V_V (1 mA _{DC} @ 0.2 ... 2 s).	To meet the specified value.
Clamping voltage	The maximum voltage between two terminals with the specified standard impulse current (8/20 μ s) illustrated below applied. 	To meet the specified value.
Surge current derating, 8/20 μ s	CECC 42 000, test C 2.1 100 surge currents (8/20 μ s), unipolar, interval 30 s, amplitude corresponding to derating curve for 20 μ s	$ \Delta V/V (1 \text{ mA}) \leq 10\%$ (measured in direction of surge current) No visible damage
Surge current derating, 2 ms	CECC 42 000, test C 2.1 100 surge currents (2 ms), unipolar, interval 120 s, amplitude corresponding to derating curve for 2 ms	$ \Delta V/V (1 \text{ mA}) \leq 10\%$ (measured in direction of surge current) No visible damage

Cautions and warnings

General

1. EPCOS metal oxide varistors (SIOVs) are designed for specific applications and should not be used for purposes not identified in our specifications, application notes and data books unless otherwise agreed with EPCOS during the design-in-phase.
2. Ensure suitability of SIOVs through reliability testing during the design-in phase. The SIOVs should be evaluated taking into consideration worst-case conditions.
3. For applications of SIOVs in line-to ground circuits based on various international and local standards there are restrictions existing or additional safety measures required.

Storage

1. Store SIOVs only in original packaging. Do not open the package before storage.
2. Storage conditions in original packaging:

Storage temperature:	-25 °C ... +45 °C
Relative humidity:	<75% annual average, <95% on maximum 30 days a year.
Dew precipitation:	Is to be avoided.
3. Avoid contamination of SIOVs surface during storage, handling and processing.
4. Avoid storage of SIOVs in harmful environments which can affect the function during long-term operation (examples given under operation precautions).
5. The SIOV type series should be soldered within the time specified.

SIOV-S, -Q, -LS	24 month
T, ETFV and SFS types	12 month.

Handling

1. SIOVs must not be dropped.
2. Components must not be touched with bare hands. Gloves are recommended.
3. Avoid contamination of the surface of SIOV electrodes during handling, be careful of the sharp edge of SIOV electrodes.

Soldering (where applicable)

1. Use rosin-type flux or non-activated flux.
2. Insufficient preheating may cause ceramic cracks.
3. Rapid cooling by dipping in solvent is not recommended.
4. Complete removal of flux is recommended.

Mounting

1. Potting, sealing or adhesive compounds can produce chemical reactions in the SIOV ceramic that will degrade the component's electrical characteristics.
2. Overloading SIOVs may result in ruptured packages and expulsion of hot materials. For this reason the SIOVs should be physically shielded from adjacent components.

Operation

1. Use SIOVs only within the specified temperature operating range
2. Use SIOVs only within the specified voltage and current ranges.
3. Environmental conditions must not harm the SIOVs. Use SIOVs only in normal atmospheric conditions. Avoid use in the presence of deoxidizing gases (chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, etc), corrosive agents, humid or salty conditions, Avoid contact with any liquids and solvents.

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