

EPCOS Product Brief 2015

ThermoFuse Varistors, T Series

For Household Appliances and Industrial Applications

The new T series of ThermoFuse™ varistors is a housed component, consisting of a disk varistor in series with a thermally coupled fuse. If the varistor overheats, the thermal fuse activates and disconnects it from the power circuit, thus preventing the occurrence of fires, in the worst case. This increases reliability and protects the equipment. Both the housing and the coating of the varistor are made of flame-retardant material.

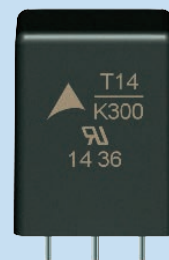
The ThermoFuse varistor has three terminal wires. Two are connected to the active lines while the third terminal can be used for status signalling.

The T series lineup currently comprises types that feature disk

varistors with diameters of 14 mm and 20 mm and are designed for maximum operating voltages of between 130 and 1000 V_{RMS}. The new ThermoFuse varistors can withstand surge currents of up to 10.000 A (8/20 μs) and absorb up to 410 J (2 ms).

Major applications for ThermoFuse varistors are:

- Household appliances
- Power supply units
- Inverters in solar power systems
- Drives
- Lighting applications
- Communication and data systems
- Transient voltage surge suppression (TVSS)



ThermoFuse Varistors, T Series

Electrical specification and ordering codes

Characteristics ($T_A = 85\text{ °C}$)

Ordering code	Type	V_{RMS} V	V_{DC} V	i_{max} 8/20 μ s (1 time) A	W_{max} 2 ms (1 time) J	P_{max} W
T14 $V_{RMS} = 130 \dots 420\text{ V}$						
B72214T2131K105	T14K130E2	130	170	6000	50	0.6
B72214T2151K105	T14K150E2	150	200	6000	60	0.6
B72214T2171K105	T14K175E2	175	225	6000	70	0.6
B72214T2231K105	T14K230E2	230	300	6000	90	0.6
B72214T2251K105	T14K250E2	250	320	6000	100	0.6
B72214T2271K105	T14K275E2	275	350	6000	110	0.6
B72214T2301K105	T14K300E2	300	385	6000	125	0.6
B72214T2321K105	T14K320E2	320	420	6000	136	0.6
B72214T2351K105	T14K350E2	350	460	6000	113	0.6
B72214T2381K105	T14K385E2	385	505	6000	124	0.6
B72214T2421K105	T14K420E2	420	560	6000	136	0.6
T20 $V_{RMS} = 130 \dots 420\text{ V}$						
B72220T2131K105	T20K130E2	130	170	10000	100	1.0
B72220T2151K105	T20K150E2	150	200	10000	120	1.0
B72220T2171K105	T20K175E2	175	225	10000	135	1.0
B72220T2231K105	T20K230E2	230	300	10000	180	1.0
B72220T2251K105	T20K250E2	250	320	10000	195	1.0
B72220T2271K105	T20K275E2	275	350	10000	215	1.0
B72220T2301K105	T20K300E2	300	385	10000	250	1.0
B72220T2321K105	T20K320E2	320	420	10000	273	1.0
B72220T2351K105	T20K350E2	350	460	10000	223	1.0
B72220T2381K105	T20K385E2	385	505	10000	248	1.0
B72220T2421K105	T20K420E2	420	560	10000	273	1.0
T20 $V_{RMS} = 460 \dots 1000\text{ V}$						
B72220T2461K105	T20K460E2	460	615	10000	300	1.0
B72220T2511K105	T20K510E2	510	670	10000	325	1.0
B72220T2551K105	T20K550E2	550	745	10000	360	1.0
B72220T2621K105	T20K625E2	625	825	10000	400	1.0
B72220T2681K105	T20K680E2	680	895	10000	440	1.0
B72220T0102K105	T20K1000	1000	1465	6500	410	1.0

Symbols and terms

V_{RMS}	Operating AC voltage, root-mean-square value	P_{max}	Maximum average power dissipation
V_{DC}	Operating DC voltage	V_V	Varistor voltage
i_{max}	Maximum surge current	C_{typ}	Typical capacitance
W_{max}	Maximum energy absorption		

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Maximum ratings ($T_A = 25\text{ °C}$)				
Ordering code	Type	V_V 1 mA V	V_{clamp} 8/20 μ s V	C_{typ} 1 kHz pF
T14 $V_{RMS} = 130 \dots 420\text{ V}$				
B72214T2131K105	T14K130E2	205 \pm 10%	340 @ 50 A	880
B72214T2151K105	T14K150E2	240 \pm 10%	395 @ 50 A	750
B72214T2171K105	T14K175E2	270 \pm 10%	455 @ 50 A	670
B72214T2231K105	T14K230E2	360 \pm 10%	595 @ 50 A	530
B72214T2251K105	T14K250E2	390 \pm 10%	650 @ 50 A	490
B72214T2271K105	T14K275E2	430 \pm 10%	710 @ 50 A	440
B72214T2301K105	T14K300E2	470 \pm 10%	775 @ 50 A	400
B72214T2321K105	T14K320E2	510 \pm 10%	840 @ 50 A	370
B72214T2351K105	T14K350E2	560 \pm 10%	910 @ 50 A	340
B72214T2381K105	T14K385E2	620 \pm 10%	1025 @ 50 A	315
B72214T2421K105	T14K420E2	680 \pm 10%	1120 @ 50 A	290
T20 $V_{RMS} = 130 \dots 420\text{ V}$				
B72220T2131K105	T20K130E2	205 \pm 10%	340 @ 100 A	1850
B72220T2151K105	T20K150E2	240 \pm 10%	395 @ 100 A	1550
B72220T2171K105	T20K175E2	270 \pm 10%	455 @ 100 A	1350
B72220T2231K105	T20K230E2	360 \pm 10%	595 @ 100 A	1000
B72220T2251K105	T20K250E2	390 \pm 10%	650 @ 100 A	940
B72220T2271K105	T20K275E2	430 \pm 10%	710 @ 100 A	850
B72220T2301K105	T20K300E2	470 \pm 10%	775 @ 100 A	780
B72220T2321K105	T20K320E2	510 \pm 10%	840 @ 100 A	720
B72220T2351K105	T20K350E2	560 \pm 10%	910 @ 100 A	660
B72220T2381K105	T20K385E2	620 \pm 10%	1025 @ 100 A	600
B72220T2421K105	T20K420E2	680 \pm 10%	1120 @ 100 A	550
T20 $V_{RMS} = 460 \dots 1000\text{ V}$				
B72220T2461K105	T20K460E2	750 \pm 10%	1240 @ 100 A	500
B72220T2511K105	T20K510E2	820 \pm 10%	1355 @ 100 A	460
B72220T2551K105	T20K550E2	910 \pm 10%	1500 @ 100 A	410
B72220T2621K105	T20K625E2	1000 \pm 10%	1650 @ 100 A	380
B72220T2681K105	T20K680E2	1100 \pm 10%	1815 @ 100 A	340
B72220T0102K105	T20K1000	1800 \pm 10%	2970 @ 100 A	210

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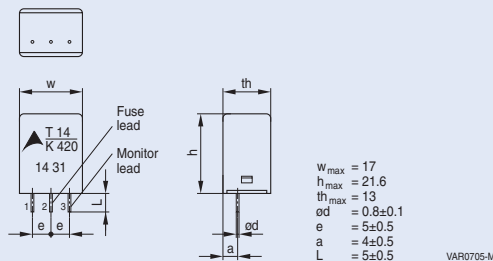
Features

- Terminal wires in line for easy assembly
- Rated voltages of 130 to 1000 V_{RMS}
- Robust and flame-retardant housing for physical protection of adjacent components
- 5 mm spring opening distance for reliable disconnection from power circuit
- Disconnection function according to limited current abnormal overvoltage test in UL 1449, 3rd edition, section 39.4, and as per thermal stability test in IEC 61643, edition 1 (2011), section 8.3.5.2
- T14/ T20 pin compatible for same PCB layout and different surge current levels (130 up to 420 V)
- Flammability according to UL 94 V-0

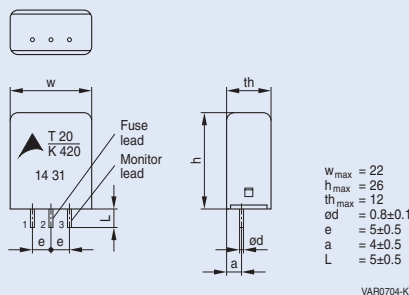


Dimensional drawings in mm

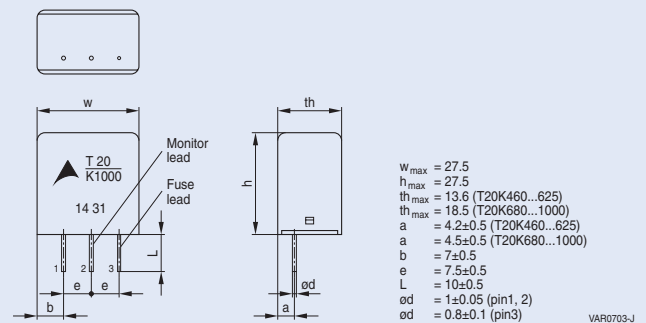
T14 V_{RMS} = 130 ... 420 V



T20 V_{RMS} = 130 ... 420 V

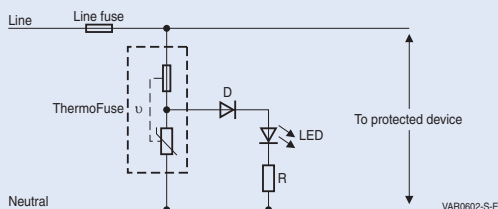


T20 V_{RMS} = 460 ... 1000 V

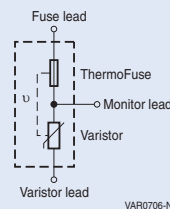


Circuit diagram

Typical application



Lead configuration



Structure of ordering codes: The ordering code for one and the same product can be represented differently in data sheets, data books, other publications and the website of EPCOS, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.** Detailed information can be found on the Internet under www.epcos.com/orderingcodes.

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