SMD PTC Thermistors For Overload Protection



FEATURES

- Compact resettable overload protection
- Low mounting height
- Suitable for reflow soldering
- Small ceramic diameter for faster response
- Low heat transfer to substrate
- Flat terminations for stable positioning and good solderability
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

APPLICATIONS

Over-temperature/over-load protection:

- Telecom
  - -Central Office Switching (C.O.)
  - -Subscriber Terminal Equipment (T.E.)
  - -Set-top Box
  - -Modems
- General industry and automotive
  - -Low power overload protection
  - -Inrush current limitation

DESCRIPTION

The component consists of a high performance PTC ceramic mounted in a lead frame with lead (Pb)-free tin plated contacts. The terminations are joined to the Ag plated ceramic by a high melting solder. The ceramic is covered with a protective high temperature silicone layer.

MARKING

- All SMD PTCs are marked with a 3-digit type number (XXX) and a date code (YYWW)

QUICK REFERENCE DATA

PARAMETER	VALUE		UNIT
	STANDARD TYPES (1)	TELECOM TYPES (1)	
Resistance value at 25 °C	2 to 500	10 to 70	Ω
Tolerance on R_{25} value	± 10; ± 15; ± 20		%
Maximum overload current I_{ol} ($V_{max.}$ dependent)	2 to 10		A
Maximum holding current (I_{hd})	50 to 500 (at 25 °C)	50 to 100 (at 70 °C)	
Maximum voltage (RMS or DC)	16 to 400	220 to 600	V_{RMS}
Maximum trip time at 1 A	0.8 to 6		s
Switching temperature (T_{sw})	105 to 140		°C
Operating temperature range at max. voltage	-40 to 85		
Storage temperature	-40 to 155		
Maximum continuous power at 25 °C	2		W

Note

(1) Customized products are available on request in the indicated nominal R_{25} range. Larger 8 mm ceramics for lower resistance values or higher voltages are in use in the PTCCZ08 series.

ELECTRICAL DATA AND ORDERING INFORMATION

RESISTANCE		MATCHING (Ω)	$V_{max.}$ (V)	I_{hd} at		I_t at	MAX. TRIP-TIME at 1 A (s)	MAX. I_{ol} at $V_{max.}$ (A)	T_{sw}	OPERATING TEMP. RANGE AT MAX. VOLTAGE	STORAGE TEMP. RANGE	CATALOG NUMBER	
R_{25} (Ω)	TOL. (%)			25 °C (mA)	70 °C (mA)	25 °C (mA)						SAP ORDERING CODE	TYPE NR MARKING
TELECOM AND INDUSTRIAL TYPES													
10	20	-	245	165	100	270	3.0	2.0	105	0 to 70	-25 to 125	PTCTZ3NR100GTT (2)	012
10	20	0.5	245	165	100	270	3.0	2.0	105	0 to 70	-25 to 125	PTCTZ3MR100GTT (2)	016
40	25	no	265	80	50	130	0.8	2.0	105	0 to 70	-25 to 125	PTCTZ3NR400HTT	002
25	20	1	265	120	70	220	1.3	2.0	110	0 to 70	-25 to 125	PTCTZ3MR250HTT (2)	005
15 to 20	-	-	300	150	100	250	1.5	1.5	115	0 to 70	-25 to 125	PTCTZ3NR150KTT (2)	004
15 to 20	-	0.5	300	150	100	250	1.5	2.0	115	0 to 70	-25 to 125	PTCTZ3MR150KTT (2)	003
20	20	0.5	300	120	70	250	1.4	1.5	105	0 to 70	-25 to 125	PTCTZ3MR200KTT (2)	018
35	+15 / -20	1	425	110	70	175	1.0	0.7	125	-25 to 85	-40 to 155	PTCTZ3MR350MTT (2)	009
50	20	1	425	90	60	150	0.8	0.7	125	-40 to 70	-40 to 125	PTCTZ3MR500MTT	019
GENERAL INDUSTRIAL TYPES													
3.3	25	-	24	400	-	650	6.0	8.0	140	-40 to 85	-40 to 155	PTCTZ3NR339CTT	013
9.4	25	-	60	150	100	300	1.8	3.0	115	-40 to 85	-40 to 155	PTCTZ3NR949ETT	011

Note

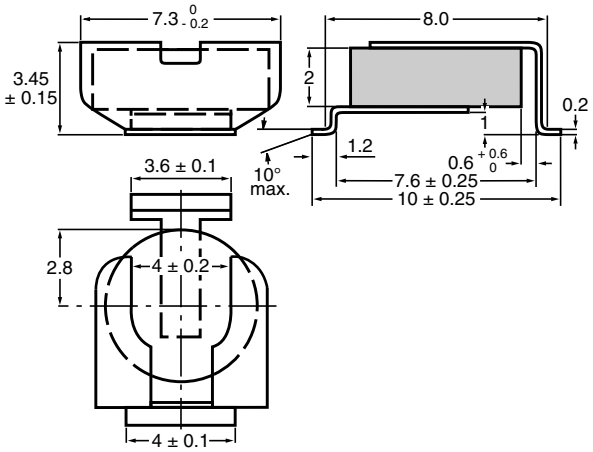
(2) These types pass ITU-K20-21-45 telecommunication protection recommendation

For technical questions, contact: nlr@vishay.com

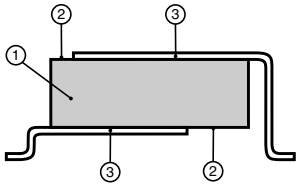
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PTC OUTLINES

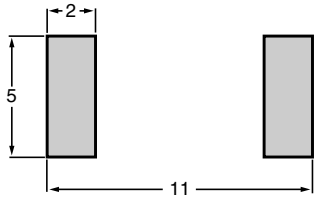
PTC SMD ceramic size: 6.5 mm



DIMENSIONS in millimeters



DIMENSIONS OF SOLDER LANDS in millimeters



PACKAGING					
TYPE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
PTCTZ	1500	PS conductive blister tape acc. IEC60286-3	16 mm	12 mm	330 mm

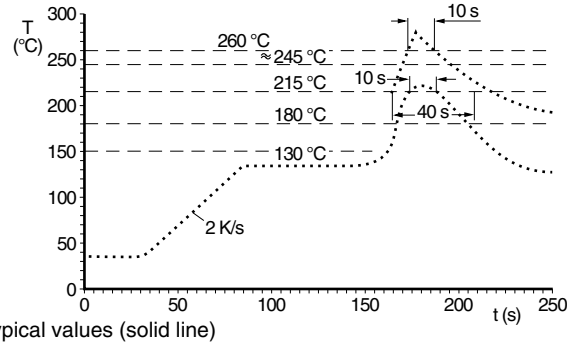
MATERIAL INFORMATION		
REF.	DESCRIPTION	MATERIAL AND REMARKS
1	Ceramic	$BaTiO_3$ doped
2	Metalization	NiCr Ag layer (vacuum deposition)
3	Lead frame	Ni plated phosphor bronze material covered by matte tin layer

SOLDERING CONDITIONS

This SMD thermistor is only suitable for reflow soldering, in accordance with JEDEC J-STD-020D. Soldering processes which can be used are reflow (infrared and convection heating) and vapor phase. The maximum temperature of 260 °C during 10 s should not be exceeded and no liquid flux should be allowed to reach the ceramic body.

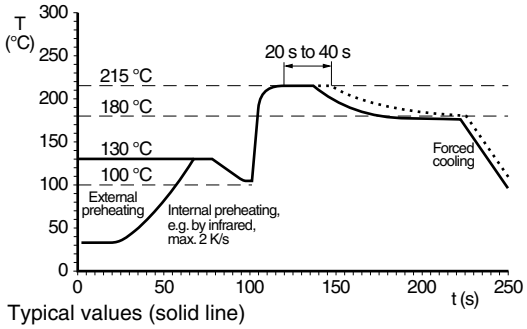
Typical examples of a soldering processes that will provide reliable joints without damage, are shown below.

Reflow soldering



Typical values (solid line)
Process limits (dotted lines)

Vapor phase soldering



Typical values (solid line)
Process limits (dotted lines)

MOUNTING CONDITIONS

A flat pick-up area of minimum 10 mm^2 and low weight allows for fast placement.

Because of the nature of PTC ceramic material the component should not be touched with bare hands, as the residue of perspiration can influence component behavior at high temperatures.

Handling forces applied to the component should be limited to 5 N in any condition.

For technical questions, contact: nlr@vishay.com

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