Vishay BCcomponents



145 V PTC Thermistors For Overload Protection



- Wide range of trip and non-trip currents: from 47 mA up to 1 A for the trip current
- Wide range of resistance: from 1.3 Ω up to 240 Ω
- Small ratio between trip and non-trip currents (I_t/I_{nt} = 1.5 at 25 °C)
- High maximum inrush current (up to 13 A)
- Leaded parts withstand mechanical stresses and vibration
- UL file E148885 according to XGPU standard UL1434
- UL approved PTCs are guaranteed to withstand severe test programs
 - Long-life cycle tests (over 5000 trip cycles)
 - Long-life storage tests (3000 hours at 250 °C)
 - Electrical cycle tests at low ambient temperatures (- 40 °C or 0 °C)
 - · Damp-heat and water immersion tests
 - · Overvoltage tests at up to 200 % of rated voltage
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

APPLICATIONS

- Telecommunications
- · Automotive systems
- Industrial electronics
- Consumer electronics
- · Electronic data processing

DESCRIPTION

These directly heated thermistors have a positive temperature coefficient and are primarily intended for overload protection. They consist of a naked disk with two tinned brass or copper clad steel leads and coated. Leadless disks and leaded disks without coating are available on request.

QUICK REFERENCE DATA PARAMETER VALUE UNIT Switch temperature 140 °C Maximum voltage (RMS) 145 V Temperature range 0 to 70 °C Climatic category 25/125/56

MOUNTING

The PTC Thermistors are suitable for processing on automatic insertion equipment.

Typical soldering

235 °C; duration: 5 s (Pb-bearing) 245 °C, duration: 5 s (Lead (Pb)-free)

Resistance to soldering heat 260 °C, duration: 10 s max

MARKING

Only the grey lacquered thermistors with a diameter of 8.5 to 20.5 mm are marked with BC, R25 value (example 1R9) on one side and $I_{\rm nt}$, $V_{\rm max}$ on the other side.

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ELECTRICAL DATA AND ORDERING INFORMATION for 2381 66. 52; max. voltage = 145 V (ac or dc) ¹⁾									
I _{NT}	I _T		J 2)	I _{RES}	I _{RES}		CATALOG NUMBERS		
MAX. at 25 °C (mA)	MIN. at 25 °C (mA)	R ₂₅ ± 20 % (Ω)	MAX. at 25 °C (mA)	MAX. at V _{MAX} and 25 °C (mA)	DISSIP. FACTOR (mW/K)	∅ D MAX. (mm)	BULK	TAPE ON REEL	
47	70	240	200	9	7.3	5	2381 660 54792	2381 660 64792	
65	100	115	300	11	7.3	5	2381 660 56592	2381 660 66592	
93	140	55	450	13	7.3	5	2381 660 59392	2381 660 69392	
110	165	40	500	13	7.3	5	2381 660 51112	2381 660 61112	
130	195	28	600	13	7.3	5	2381 660 51312	2381 660 61312	
170	255	19	1000	15	8.3	7	2381 661 51712	2381 661 61712	
210	315	12	1400	15	8.3	7	2381 661 52112	2381 661 62112	
250	375	9.4	2000	16.5	9	8.5	2381 661 52512	2381 661 62512	
270	405	8	2200	16.5	9	8.5	2381 661 52712	2381 661 62712	
320	480	6.7	3000	19	10.5	10.5	2381 662 53212	2381 662 63212	
360	540	5.3	3500	19	10.5	10.5	2381 662 53612	2381 662 63612	
410	615	4.6	4500	22.5	11.7	12.5	2381 662 54112	2381 662 64112	
450	675	3.8	5000	22.5	11.7	12.5	2381 662 54512	2381 662 64512	
600	900	2.9	7200	28.5	15.5	16.5	2381 663 56012	-	
710	1065	2.1	8500	28.5	15.5	16.5	2381 663 57112	-	
880	1320	1.7	11 000	37.5	19.8	20.5	2381 664 58812	=	
1000	1500	1.3	13 000	37.5	19.8	20.5	2381 664 51022	-	

Notes

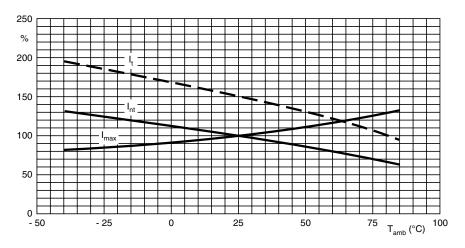
- 1. The thermistors are clamped at the seating plane.
- 2. I_{max} is the maximum overload current that may flow through the PTC when it passes from the low ohmic to the high ohmic state. UL approval: $I_{max} * 0.8$

SAP AND 12NC PART NUMBERS					
12NC	SAP CODING	12NC	SAP CODING		
2381 660 x4792	PTCCL05H470FyE	2381 662 x3212	PTCCL11H321FyE		
2381 660 x6592	PTCCL05H650FyE	2381 662 x3612	PTCCL11H361FyE		
2381 660 x9392	PTCCL05H930FyE	2381 662 x4112	PTCCL13H411FyE		
2381 660 x1112	PTCCL05H111FyE	2381 662 x4512	PTCCL13H451FyE		
2381 660 x1312	PTCCL05H131FyE	2381 663 56012	PTCCL17H601FBE		
2381 661 x1712	PTCCL07H171FyE	2381 663 57112	PTCCL17H711FBE		
2381 661 x2112	PTCCL07H211FyE	2381 664 58812	PTCCL21H881FBE		
2381 661 x2512	PTCCL09H251FyE	2381 664 51022	PTCCL21H102FBE		
2381 661 x2712	PTCCL09H271FyE				

Notes

- For bulk parts replace x by "5" and y by "B".
- For taped on reel parts replace x by "6" and y by "T".

CURRENT DEVIATION AS A FUNCTION OF THE AMBIENT TEMPERATURE

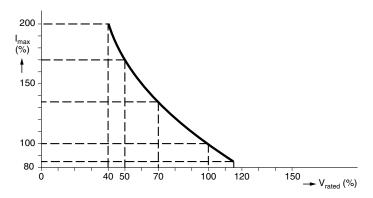


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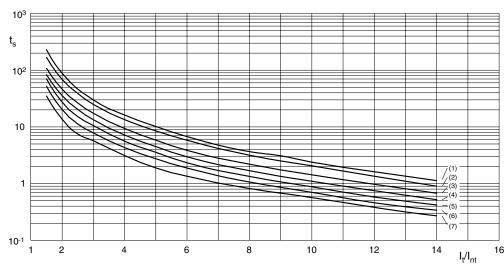
ELECTRICAL CHARACTERISTICS I_{MAX} AS A FUNCTION OF VOLTAGE



 I_{max} as stated in the Electrical data and ordering information tables, is the maximum overload current that may flow through the PTC when passing from the low ohmic to high ohmic state at rated voltage.

When other voltages are present after tripping, the I_{max} value can be derived from the above I_{max} as a function of voltage graph. Voltages below V_{rated} will allow higher overload currents to pass the PTC.

TYPICAL TRIP-TIME AS A FUNCTION OF TRIP CURRENT RATIO



Curve 1: \varnothing D_{max} = 20.5 mm

Curve 2: \varnothing D_{max} = 16.5 mm

Curve 3: \varnothing D_{max} = 12.5 mm

Curve 4: \varnothing D_{max} = 10.5 mm

Curve 5: \varnothing D_{max} = 8.5 mm

Curve 6: \varnothing D_{max} = 7.0 mm

Curve 7: \varnothing D_{max} = 5.0 mm

Measured in accordance with "IEC 60738".

Trip-time or switching time (t_s)

To check the trip-time for a specific PTC, refer to the Electrical Data and Ordering Information tables for the value I_{nt} . Divide the overload or trip current by this I_{nt} and you realize the factor I_t/I_{nt} . This rule is valid for any ambient temperature between 0 and 70 °C. Adapt the correct non-trip current with the appropriate curve in the Current Deviation as a Function of the Ambient Temperature graph. The relationship between the I_t/I_{nt} factor and the switching time is a function of the PTC diameter; see the above graphs.

Example

What will be the trip-time at I_{ol} = 0.8 A and T_{amb} = 0 °C of a thermistor type 2381 661 52112; 12 Ω ; Ø D_{max} = 7.0 mm:

Int from the table: 210 mA at 25 °C

 I_{nt} : 210 x 1.12 = 235 mA (at 0 °C).

Overload current = 0.8 A; factor I_t/I_{nt} : ${}^{0.8}/_{0.235}$ = 3.40. In the typical trip-time as a function of trip current ratio graph, at the 7.0 mm line and I_t/I_{nt} = 3.40, the typical trip-time is 6.0 s.

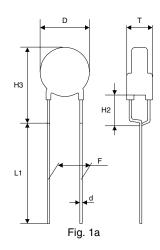


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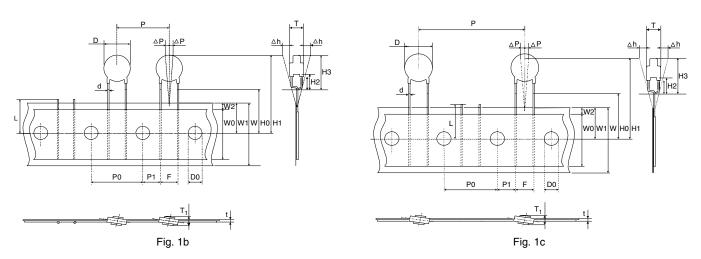
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COMPONENTS OUTLINE				
	NUMBER 2381	S.P.Q	OUTLINE	
660	52	500	Fig. 1a	
	62	1500	Fig. 1b	
661	52	250	Fig. 1a	
001	62	1500	Fig. 1b	
	52	200	Fig. 1a	
662	63212 - 63612	1500	Fig. 1b	
	64112 - 64512	750	Fig. 1c	
663	52	100	Fig. 1a	
664	52	100	Fig. 1a	

PTC THERMISTORS IN BULK



PTC THERMISTORS ON TAPE ON REEL



2381 66. 5...2/PTCCL..H...FBE

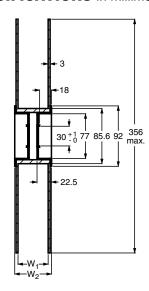
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SYMBOL	PARAMETER	DIMENSIONS	TOLERANCE	REMARKS
D	Body diameter	See table	max.	
d	Lead diameter	0.6	± 10 %	
D0	Feed hole diameter	4.0	± 0.2	
Р	Pitch of components			
	Diameter < 12 mm	12.7	± 1.0	
	Diameter ≥ 12 mm	25.4	± 2.0	
P0	Feed hole pitch	12.7	± 0.3	Cumulative pitch error ± 1 mm/20 pitches
P1	Feed hole center to lead center	3.81	± 0.7	guaranteed between component and tape
Δр	Component alignment	0	± 1.3	
F	Leadcenter to leadcenter distance	5.0	+ 0.6	Guaranteed between
			- 0.1	component and tape
H0	Lead wire clinch height	16.0	± 0.5	
H2	Component bottom to seating plane	4.0	± 1.0	
H3	Component top to seating plane	D + 5	max.	
H4	Seating plane difference (left-right lead)	0	± 0.2	
Δh	Component alignment	0	± 2.0	
L1	Lead length	20	min.	
W	Tape width	18	+ 1/- 0.5	
W0	Hold down tape width	9.0	min.	
W1	Hole Position	9.0	± 0.5	
W2	Hold down tape position	3.0	max.	
Т	Total thinkness	5.0	max.	
t	Total tape thickness	0.9	max.	With cardboard tape 0.5 ± 0.1 mm

REEL SPECIFICATIONS in millimeters



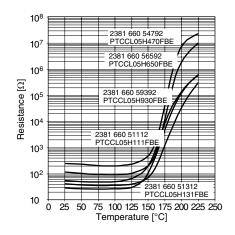
REEL DIMENSIONS in millimeters				
DIAMETER Ø	W ₁	W ₂ MAX.		
< 12	42 ± 1	56		
12	46 ± 1	60		



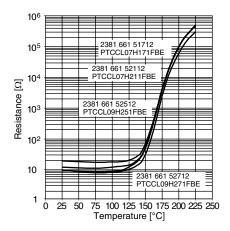
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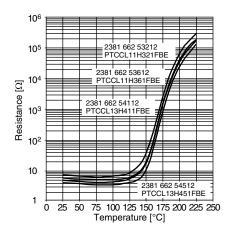
TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



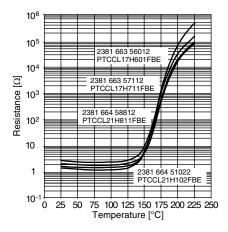
TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



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Document Number: 91000 www.vishay.com
Revision: 08-Apr-05 1