

30 to 60 V PTC Thermistors For Overload Protection



FEATURES

- Wide range of trip and non-trip currents: from 94 mA up to 2 A for the trip current
- Wide range of resistance: from 0.3 Ω up to 50 Ω
- Small ratio between trip and non-trip currents ($I_t/I_{nt} = 1.5$ at 25 °C)
- High maximum inrush current
- Excellent long term behaviour, also in humidity
- 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 disc with two tinned brass or copper clad steel leads and coated. Leadless disks and leaded disks without coating are available on request.

MOUNTING

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

Soldering

< 240 °C; duration < 5 s

Resistance to heat

< 260 °C; duration < 5 s

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_{nt} , V_{max} on the other side.

QUICK REFERENCE DATA

| PARAMETER | VALUE | UNIT |
|----------------------|--------------|------|
| Switch temperature | 140 | °C |
| Maximum voltage (DC) | 30 to 60 | V |
| Temperature range | - 40 to + 85 | °C |
| Climatic category | 40/125/56 | |



| ELECTRICAL DATA AND ORDERING INFORMATION for 2381 66. 5...1; max. voltage = 30 V to 60 V (ac or dc) ¹⁾ | | | | | | | | | |
|--|-----------------------------------|----------------------------|------------|------------------------------------|--|-----------------------|---------------|-----------------|----------------|
| I _{nt} MAX. at 25 °C (mA) | I _t MIN. at 25 °C (mA) | R ₂₅ ± 20 % (Ω) | V MAX. (V) | I ²⁾ MAX. at 25 °C (mA) | I _{res} MAX. at V _{max} and 25 °C (mA) | DISSIP. FACTOR (mW/K) | Ø D MAX. (mm) | CATALOG NUMBERS | |
| | | | | | | | | BULK | TAPE ON REEL |
| 94 | 145 | 50 | 60 | 800 | 22 | 6.9 | 5 | 2381 660 59491 | 2381 660 69491 |
| 130 | 195 | 25 | 60 | 1200 | 25 | 6.9 | 5 | 2381 660 51311 | 2381 660 61311 |
| 180 | 270 | 13 | 30 | 1700 | 45 | 6.9 | 5 | 2381 660 51811 | 2381 660 61811 |
| 270 | 405 | 6 | 30 | 2500 | 60 | 6.9 | 5 | 2381 660 52711 | 2381 660 62711 |
| 320 | 480 | 5 | 30 | 3500 | 62 | 7.8 | 7 | 2381 661 53211 | 2381 661 63211 |
| 410 | 615 | 3 | 30 | 4500 | 65 | 7.8 | 7 | 2381 661 54111 | 2381 661 64111 |
| 470 | 705 | 2.5 | 30 | 5000 | 70 | 8.8 | 8.5 | 2381 661 54711 | 2322 661 64711 |
| 540 | 810 | 1.9 | 30 | 6000 | 75 | 8.8 | 8.5 | 2381 661 55411 | 2381 661 65411 |
| 610 | 915 | 1.7 | 30 | 7000 | 80 | 9.9 | 10.5 | 2381 662 56111 | 2381 662 66111 |
| 700 | 1050 | 1.3 | 30 | 8000 | 90 | 9.9 | 10.5 | 2381 662 57011 | 2381 662 67011 |
| 830 | 1245 | 1.1 | 30 | 10000 | 100 | 11.5 | 12.5 | 2381 662 58311 | 2381 662 68311 |
| 920 | 1380 | 0.9 | 30 | 11000 | 105 | 11.5 | 12.5 | 2381 662 59211 | 2381 662 69211 |
| 1170 | 1755 | 0.7 | 30 | 13500 | 140 | 14.5 | 16.5 | 2381 663 51121 | - |
| 1390 | 2085 | 0.5 | 30 | 16000 | 170 | 14.5 | 16.5 | 2381 663 51321 | - |
| 1770 | 2655 | 0.4 | 30 | 20000 | 200 | 18.7 | 20.5 | 2381 664 51721 | - |
| 2050 | 3075 | 0.3 | 30 | 23000 | 220 | 18.7 | 20.5 | 2381 664 52021 | - |

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} *0.85

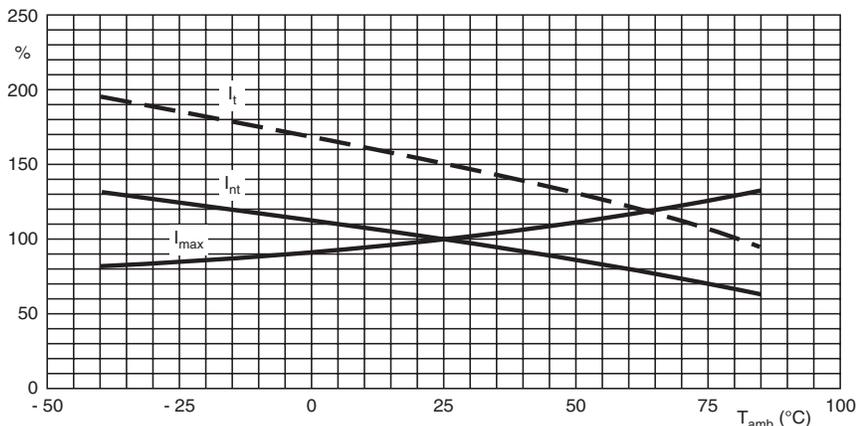
| SAP AND 12NC PART NUMBERS | | | |
|----------------------------------|----------------|----------------|----------------|
| 12NC | SAP CODING | 12NC | SAP CODING |
| 2381 660 x9491 | PTCCL05H940EyE | 2381 662 x6111 | PTCCL11H611DyE |
| 2381 660 x1311 | PTCCL05H131EyE | 2381 662 x7011 | PTCCL11H701DyE |
| 2381 660 x1811 | PTCCL05H181DyE | 2381 662 x8311 | PTCCL13H831DyE |
| 2381 660 x2711 | PTCCL05H271DyE | 2381 662 x9211 | PTCCL13H921DyE |
| 2381 661 x3211 | PTCCL07H321DyE | 2381 663 51121 | PTCCL17H112DBE |
| 2381 661 x4111 | PTCCL07H411DyE | 2381 663 51321 | PTCCL17H132DBE |
| 2381 661 x4711 | PTCCL09H471DyE | 2381 664 51721 | PTCCL21H172DBE |
| 2381 661 x5411 | PTCCL09H541DyE | 2381 664 52021 | PTCCL21H202DBE |

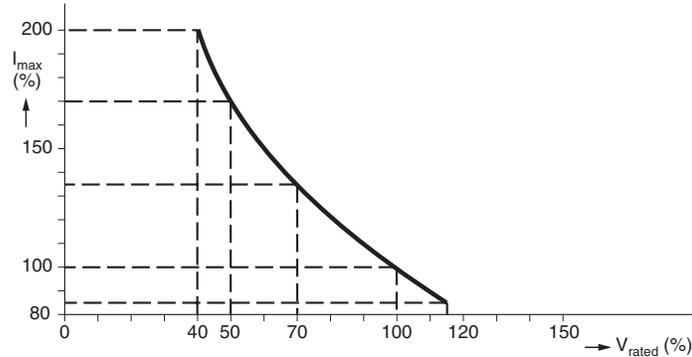
Notes

For bulk parts replace x by "5" and y by "B".

For taped on reel parts replace it x by "6" and y by "T".

CURRENT DEVIATION AS A FUNCTION OF THE AMBIENT TEMPERATURE.



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.

| COMPONENTS OUTLINE | | | |
|----------------------------|---------------|--------------|----------------|
| CODE NUMBER 2381 | | S.P.Q | OUTLINE |
| 660 | 5...1 | 500 | Fig. 1a |
| | 6...1 | 1500 | Fig. 1b |
| 661 | 5...1 | 250 | Fig. 1a |
| | 6...1 | 1500 | Fig. 1b |
| 662 | 5...1 | 250 | Fig. 1a |
| | 66111 - 67011 | 1500 | Fig. 1b |
| | 68311 - 69211 | 750 | Fig. 1c |
| 663 | 5...1 | 200 | Fig. 1a |
| 664 | 5...1 | 100 | Fig. 1a |

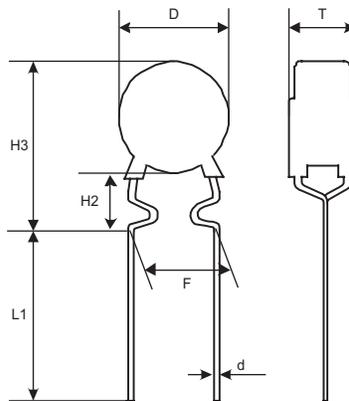
PTC THERMISTORS IN BULK


Fig. 1a

PTC THERMISTORS ON TAPE ON REEL

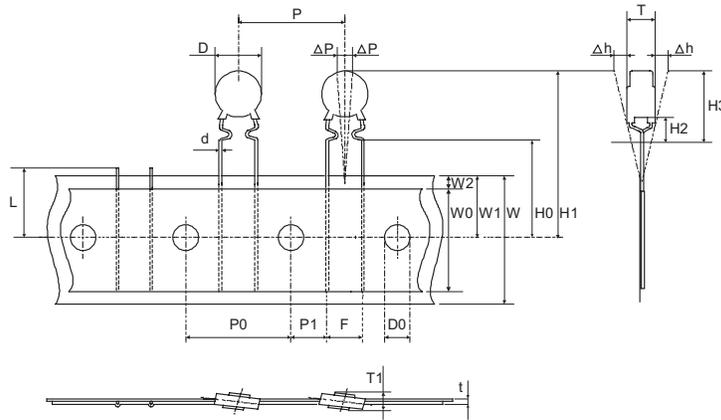


Fig. 1b

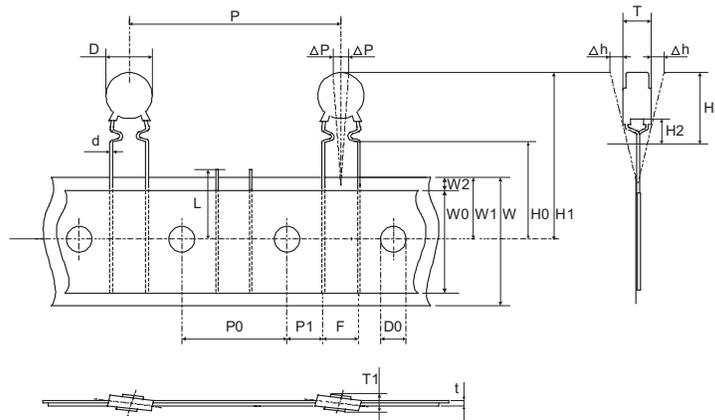
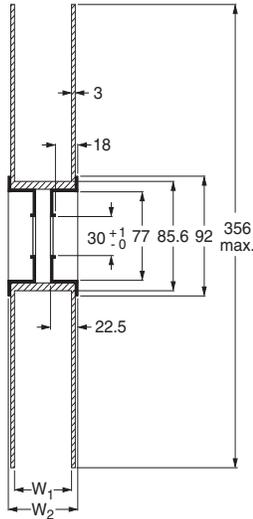


Fig. 1c

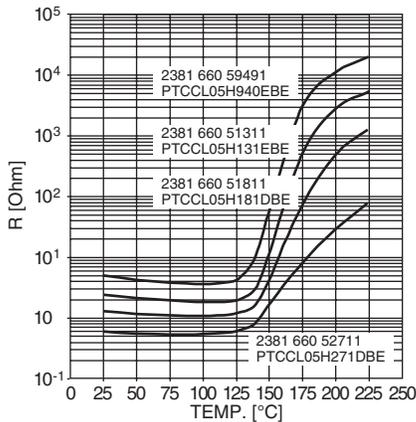
| TAPE AND REEL ACCORDING TO IEC60286-2 dimensions in millimeters | | | | |
|---|---------------------------------------|------------|----------------|---------------------------------------|
| SYMBOL | PARAMETER | DIMENSIONS | TOLERANCE | REMARKS |
| D | body diameter | see table | max | |
| d | lead diameter | 0.6 | ± 10 % | |
| D0 | feed hole diameter | 4.0 | ± 0.2 | |
| F | lead to lead distance | 5.0 | + 0.6 - 0.1 | guaranteed between 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 | 0 | ± 0.2 | |
| Δh | (left-right lead) component alignment | 0 | ± 2.0 | |
| L1 | lead length | 20 | min. | |
| T | total thickness | 4.0 | max. | |
| t | total tape thickness | 0.9 | max. | with cardboard tape 0.5 ± 0.1 |

REEL SPECIFICATIONS in millimeters

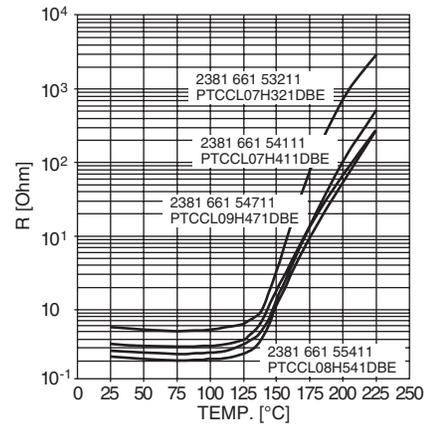


| REEL DIMENSIONS in millimeters | | |
|--------------------------------|----------------|---------------------|
| DIAMETER \varnothing | W ₁ | W ₂ MAX. |
| < 12 | 42 ± 1 | 56 |
| 12 | 46 ± 1 | 60 |

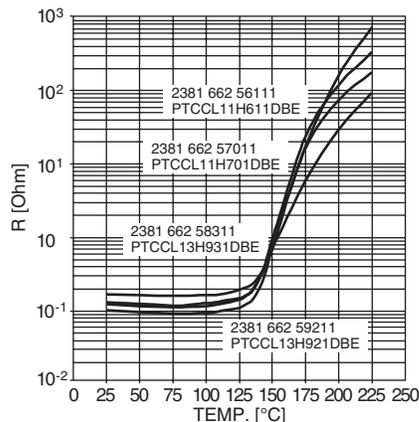
TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



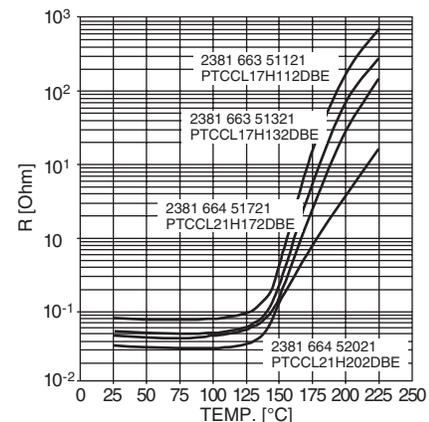
TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC



TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC





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