PTC Thermistor

Limit temperature sensors, probe assemblies

Series/Type:	**D1051-Axxx-A 40**
Ordering code:	**B59051D1*A040**
Date:	2025-12-12
Version:	f

Applications

Limit temperature sensor

Features

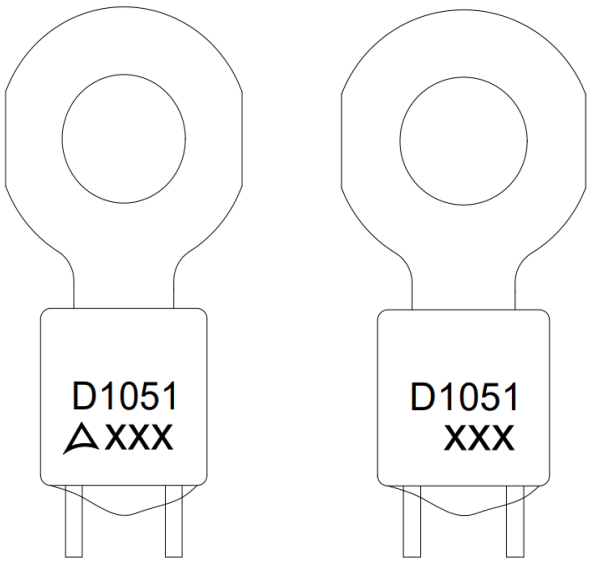
- Sensor with epoxy resin coating
- Tinned leads
- Metal tag for easy mounting
- Lead-free terminals
- Metal tag permits good thermal coupling and thus short response time
- Marking: Type, manufacturer's logo, T_{sense} temperature in °C
- UL approval to UL 1434 (file number E69802)
- IEC file number 101-QA-22 IECQ Issue 1
- RoHS compatible

Delivery mode

- Cardboard tape cut in 18 pcs, 540 pcs per carton box
- Carton box dimensions in mm: 240 x 110 x 63

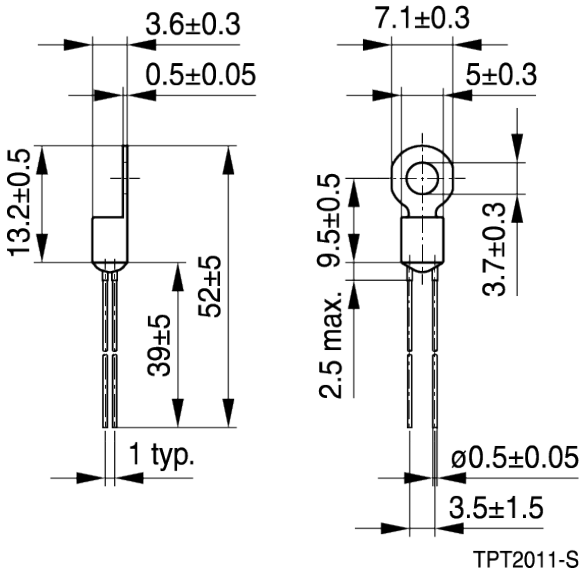
Marking

- Existing marking: D1051; Logo T_{sense} (100/110/120)
- New marking: D1051; T_{sense} (100/110/120) (from April 2026)



Existing marking New marking

Dimensions in mm



General technical data

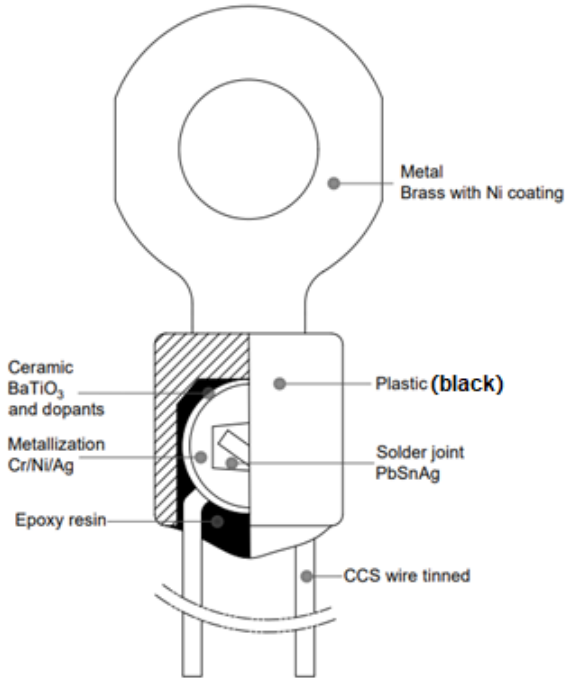
Max. operating voltage	(T_A = 0 … 40 °C)	V_{max}	16	V DC
Measuring voltage	(T_A = -25 °C … T_{sense})	V_{means}	2.5	V DC
Rated resistance	(V_{PTC} ≤ 2.5 V)	R_R	≤ 330	Ω
Insulating test voltage	(between tag and leads)	V_{ins}	500	V AC
Operating temperature range	(V ≤ V_{means})	T_{op}	-25/+130	°C
Operating temperature range	(V = V_{max})	T_{op}	0/+40	°C

Electrical specifications and ordering codes

T_{sense} °C	R (T_{sense} - 10 K) (V_{PTC} ≤ 2.5 V) Ω	R (T_{sense}) (V_{PTC} ≤ 2.5 V) Ω	Ordering code
100	≤ 1500	≥ 2200	B59051D1100A040
110	≤ 1500	≥ 2200	B59051D1110A040
120	≤ 1500	≥ 2200	B59051D1120A040

Specification for T_{amb} = 25 ±0.1 °C

Internal design

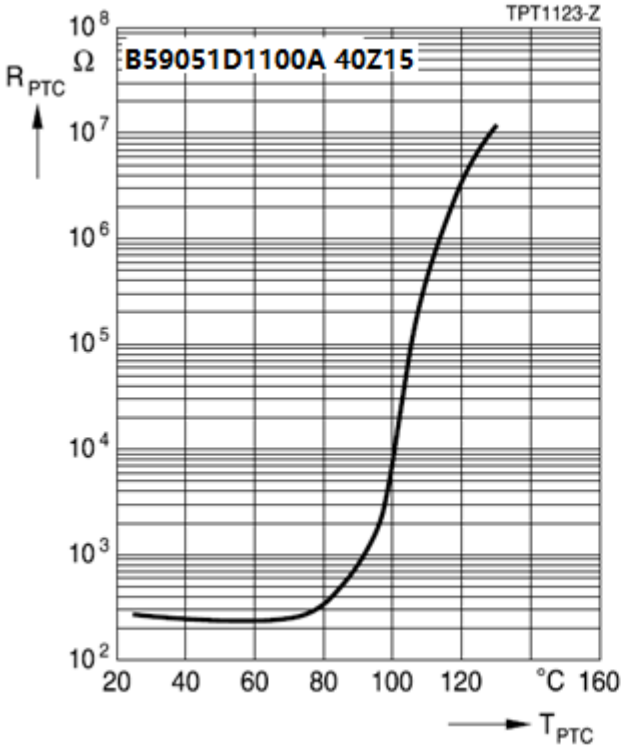


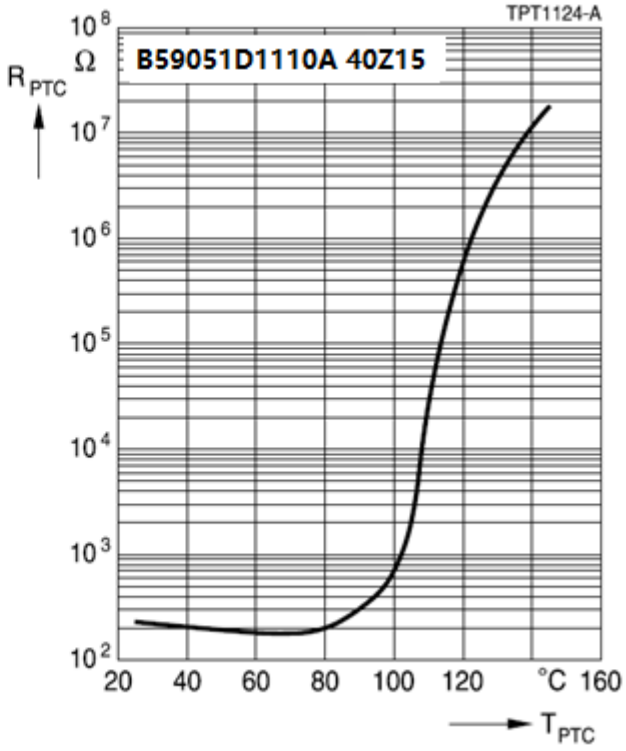
Reliability data

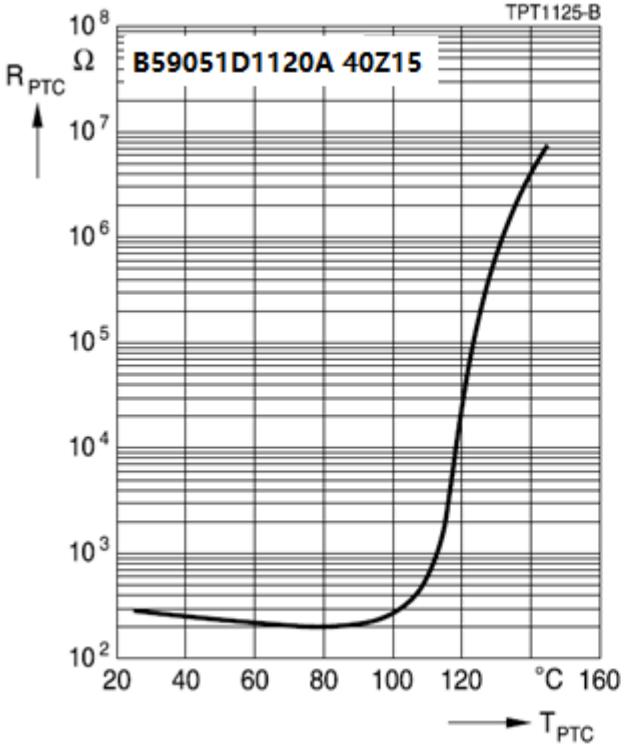
Test	Standard	Test conditions	$I\Delta R_{25}/R_{25}I$
Electrical endurance, constant	IEC 60738-1	Storage at V_{max} /$T_{op,max}$ (V_{max}) Test duration: 1000 h	< 25%
Damp heat	IEC 60738-1	Temperature of air: 40 °C Relative humidity of air: 93% Duration: 56 days Test according to IEC 60068-2-78	< 10%
Rapid change of temperature	IEC 60738-1	$T_1 = T_{op,min}$ (0 V), $T_2 = T_{op,max}$ (0 V) Number of cycles: 5 Test duration: 30 min Test according to IEC 60068-2-14, Test Na	< 25%
Vibration	IEC 60738-1	Frequency range: 10 to 55 Hz Displacement amplitude: 0.75 mm Test duration: 3 x 2 h Test according to IEC 60068-2-6, Test Fc	< 5%

Characteristics (typical)

PTC resistance R_{PTC} versus PTC temperature T_{PTC} (measured at low signal voltage)







Labelling (example)

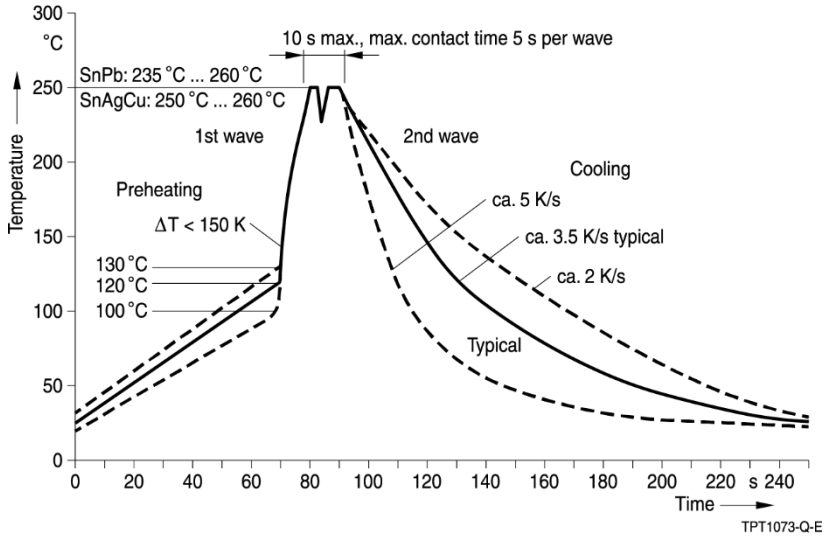
Explanation to label:

PROD ID:	Material number
PROD ORDER NO:	Lot number
BATCH NO:	Production batch number (serial number)
D/C:	Date code of production (YYMMDD)
QTY:	Quantity of goods

Soldering instructions

- Wave soldering

  Recommended temperature profile for wave soldering following IEC 61760-1.
  Applicable for leaded PTCs and selected SMD PTCs (case sizes 3225 and 4032)



- **Iron soldering**

  Soldering iron temperature 350 ±10 °C, soldering time 3 ±1 s

Packing

The two digits 40 of the complete ordering code state the packing mode:

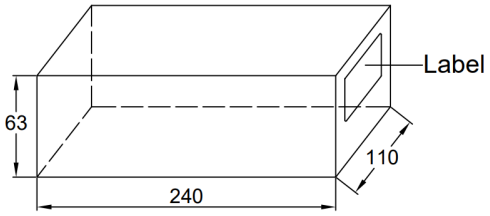
Packing		Code	Number of pieces	Ordering code
Bulk packing	Tape	40	540	B59053D1xxxA040

Packing dimensions (typical)

Packing	Pieces / unit	Dimensions (mm)
Bulk	540	x = 240; y = 110; z = 63

Dimensions x. y. z acc. to figure below

Drawing of bulk Packing (cardboard box)



Factory Addresses for PTC

Powder production
TDK Electronics GmbH & Co OG
Siemensstrasse 43 · 8530 Deutschlandsberg. Austria

Ceramics production
TDK Electronics s.r.o.
Piezo and Protection Devices Business Group
Office: Feritová 1. 787 15 Šumperk. Czech Republic

Final Production
TDK (Zhuhai FTZ) Co., Ltd.
No. 4 Lianfeng Road, Xiangzhou District
519030, Zhuhai City, PR CHINA

Cautions and warnings

General

- TDK thermistors are designed for specific applications and should not be used purposes not identified in our specifications, application notes and data books unless otherwise agreed with TDK during the design-in-phase.
- Ensure suitability of thermistor through reliability testing during the design-in phase. The thermistors should be evaluated taking into consideration worst-case conditions.

Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature -25 °C… +45 °C, relative humidity ≤ 75% annual mean, maximum 95%, dew precipitation is inadmissible.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environment with effect on function on long-term operation (examples given under operation precautions).
- Use thermistor within the following period after delivery:
  - Through-hole devices (housed and leaded PTCs): 24 months
  - Motor protection sensors, glass-encapsulated sensors and probe assemblies: 24 months
  - Telecom pair and quattro protectors (TPP, TQP): 24 months
  - Leadless PTC thermistors for pressure contacting: 12 months
  - Leadless PTC thermistors for soldering: 6 months
  - SMDs in EIA sizes 3225 and 4032, and for PTCs with metal tags: 24 months
  - SMDs in EIA sizes 0402, 0603, 0805 and 1210: 12 months

Handling

- PTCs must not be dropped. Chip-offs must not be caused during handling of PTCs.
- Components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.

Soldering

- Use rosin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.
- Standard PTC heaters are not suitable for soldering.

Mounting

- Electrode must not be scratched before/during/after in the mounting process.
- Contacts and housing used for assembly with thermistor have to be clean before mounting. Especially grease or oil must be removed.
- When PTC thermistors are encapsulated with sealing material, the precautions given in chapter “Mounting instructions”, “Sealing and potting” must be observed.
- When the thermistor is mounted, there must not be any foreign body between the electrode of the thermistor and the clamping contact.
- The minimum force of the clamping contacts pressing against the PTC must be 10 N.

- During operation, the thermistor's surface temperature can be very high. Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling at the thermistors.
- Ensure that adjacent materials are designed for operation at temperature comparable to the surface temperature of thermistor. Be sure that surrounding parts and materials can withstand this temperature.
- Avoid contamination of thermistor surface during processing.

Operation

- Use thermistors only within the specified temperature operating range.
- Use thermistors only within the specified voltage and current ranges.
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions. Avoid use in deoxidizing gases (chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas etc), corrosive agents, humid or salty conditions. Contact with any liquids and solvents should be prevented.

Be sure to provide and appropriate fail-safe function to prevent secondary product damage caused by abnormal function (e.g. use VDR for limitation of over voltage condition).

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2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
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Important notes

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Release 2024-02