



## **PTC thermistors for telecom**

Leaded disks

**Series/Type:** B59\*\*\*  
**Date:** March 2006

**Telecom**

**Leaded disks**

**Applications**

- Overcurrent protection for telecom applications
- Suitable for line card applications e.g. POTS, access networks, customer premises equipment (CPE) or intergated voice data (IVD)

**Features**

- Compliant with ITU-T standards
  - basic level lightning surges (10/700  $\mu$ s)
  - basic level power induction (600 V, 1 A, 0.2 s)
  - power contact criteria A/B (230 V, 15 min.)
- Suitable for continuous connection to mains voltages of 110/230 VAC in tripped (high ohmic) condition
- Matching available with narrow resistance tolerance
- Marked with manufacturer's logo, type designation and date code
- RoHS-compatible

**Options**

- Alternative tolerances and resistances on request

**Delivery mode**

- Cardboard tape, 360-mm reel, taping to IEC 60286-2 or untaped on cardboard strips

**General technical data**

Max. operating voltage		$V_{\max}$	245	VAC
Operating temperature range	( $V = 0$ )	$T_{\text{op}}$	-20/+125	$^{\circ}\text{C}$
Operating temperature range	( $V = 230\text{ V}$ )	$T_{\text{op}}$	0/+70	$^{\circ}\text{C}$

**Electrical specifications and ordering codes**

Type	R <sub>R</sub>	ΔR <sub>R</sub>	R <sub>25,match</sub> (per packing unit)	I <sub>R</sub> @ 25 °C	I <sub>R</sub> @ 70 °C	I <sub>S</sub> @ 25 °C	I <sub>Smax</sub> @ 230 VAC	Ordering code
	Ω	%	Ω	mA	mA	mA	A	
C1098	6	±17	No	185	110	440	1.0	B59098C1100B051
B1010	9	±20	No	150	100	370	3.0	B59010B1120A070
C1063	9	+20/-10	±0.2	160	100	375	1.0	B59063C1105B151
B1042	10	±15	±0.5	150	100	350	1.0	B59042B1120B151
B1076	10	±20	No	140	95	340	1.0	B59076B1120B053
B1076	10	±20	±0.5	140	95	340	1.0	B59076B1120B151
B1076	10	±20	±0.5	140	95	340	1.0	B59076B1120B153
B1610	10	±20	No	140	95	350	2.5	B59610B1120A070
B1070	10	±20	±0.5	135	90	340	5.0	B59070B1105B151
S1122	10	±15	No	170	115	400	2.5	B59122S1120A051
S1022	10	±15	No	160	110	375	2.5	B59022S1120A051
S1022	10	±15	No	160	110	375	2.5	B59022S1120A070
B1012	12	±15	No	90	35	210	1.0	B59012B1080B070
B1084	20	+20/-10	±0.25	100	65	240	3.0	B59084B1120A151
B1069	25	±20	No	60	25	150	0.9	B59069B1080B051
B1636	25	±20	±0.5	95	65	235	2.0	B59636B1120B151
B1069	25	±15	No	85	55	200	0.9	B59069B1120A051
B1204	25	±20	No	90	60	220	0.7	B59204B1120B051
B1045	25	±15	±0.5	90	60	210	3.0	B59045B1120B151
S1023	25	±15	No	95	65	225	2.8	B59023S1120A070
C1053	25	±20	±0.2	100	65	245	1.5	B59053C1120B151
B1008	25	±15	±0.5	100	70	240	3.0	B59008B1130A051
S1024	35	±15	No	80	50	190	1.0	B59024S1120A070
S1024	35	±15	±1.0	70	45	170	1.0	B59024S1120A151
B1184	50	±15	±0.5	60	40	140	2.5	B59184B1120A151
C1184	50	±15	±0.5	65	45	150	4.0	B59184C1120B153

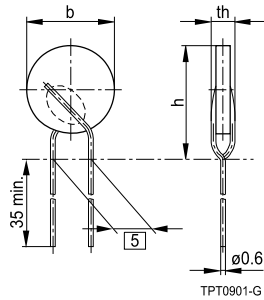
**Switching times and ordering codes**

Type	$t_S$ (typ) @ $I_{Smax}$ , 230 VAC s	$t_S$ (typ) @ 1 A, 230 VAC s	$t_S$ (typ) @ 500 mA, 230 VAC s	Ordering code
C1098	14.0	14.0	70.0	B59098C1100B051
B1010	0.7	6.5	30.0	B59010B1120A070
C1063	5.5	5.5	25.0	B59063C1105B151
B1042	3.8	3.8	17.0	B59042B1120B151
B1076	1.8	1.8	8.0	B59076B1120B053
B1076	1.8	1.8	8.0	B59076B1120B151
B1076	1.8	1.8	8.0	B59076B1120B153
B1610	1.0	6.0	27.0	B59610B1120A070
B1070	0.2	5.0	22.0	B59070B1105B151
S1122	1.0	6.0	29.0	B59122S1120A051
S1022	1.0	6.0	28.0	B59022S1120A051
S1022	1.0	6.0	28.0	B59022S1120A070
B1012	1.0	1.0	3.8	B59012B1080B070
B1084	0.1	0.9	3.8	B59084B1120A151
B1069	0.25	--	0.8	B59069B1080B051
B1636	0.5	1.9	7.8	B59636B1120B151
B1069	0.4	--	1.4	B59069B1120A051
B1204	2.3	--	4.8	B59204B1120B051
B1045	0.08	0.7	3.0	B59045B1120B151
S1023	0.2	1.5	6.3	B59023S1120A070
C1053	1.5	3.5	14.0	B59053C1120B151
B1008	0.2	1.7	7.0	B59008B1130A051
S1024	1.4	1.4	5.5	B59024S1120A070
S1024	1.4	1.4	5.5	B59024S1120A151
B1184	0.1	0.8	3.0	B59184B1120A151
C1184	0.06	0.8	3.1	B59184C1120B153

**Dimensional drawings**

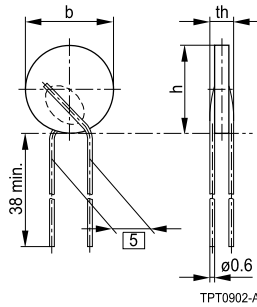
**Figure 1**

Kinked leads, uncoated



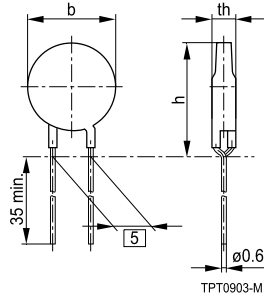
**Figure 2**

Straight leads, uncoated



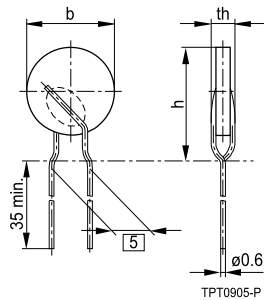
**Figure 3**

Kinked leads, coated



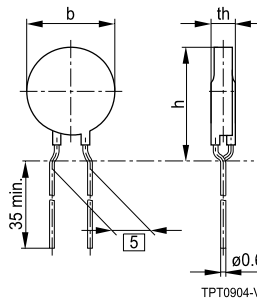
**Figure 4**

Kinked leads, uncoated



**Figure 5**

Kinked leads, coated



**Dimensions in mm<sup>1)</sup>**

Ordering code	b <sub>max</sub>	h <sub>max</sub>	th <sub>max</sub>	Feature	Figure	Packaging
B59098C1100B051	13.0	17.0	5.0	Kinked, coated	Figure 3	Taped on reel
B59010B1120A070	10.1	10.1	4.2	Straight, uncoated	Figure 2	Cardboard strips
B59063C1105B151	10.5	13.5	5.0	Kinked, coated	Figure 3	Taped on reel
B59042B1120B151	8.2	12.1	4.0	Kinked, uncoated	Figure 1	Taped on reel
B59076B1120B053	6.6	7.5	4.0	Straight, uncoated	Figure 2	Taped on reel
B59076B1120B151	6.6	8.0	4.0	Kinked, uncoated	Figure 1	Taped on reel
B59076B1120B153	6.6	7.5	4.0	Straight, uncoated	Figure 2	Taped on reel
B59610B1120A070	10.2	13.1	5.0	Kinked, uncoated	Figure 1	Cardboard strips
B59070B1105B151	10.2	14.0	4.5	Kinked, uncoated	Figure 4	Taped on reel
B59122S1120A051	10.5	14.5	4.2	Kinked, coated	Figure 5	Taped on reel
B59022S1120A051	10.5	14.5	4.2	Kinked, uncoated	Figure 4	Taped on reel
B59022S1120A070	10.5	14.5	4.2	Kinked, uncoated	Figure 4	Cardboard strips
B59012B1080B070	6.0	10.0	4.0	Kinked, uncoated	Figure 1	Cardboard strips
B59084B1120A151	6.6	7.5	4.0	Straight, uncoated	Figure 2	Taped on reel
B59069B1080B051	5.2	5.2	3.5	Straight, uncoated	Figure 2	Taped on reel
B59636B1120B151	8.2	12.5	4.5	Kinked, uncoated	Figure 4	Taped on reel
B59069B1120A051	5.2	5.2	3.5	Straight, uncoated	Figure 2	Taped on reel
B59204B1120B051	7.2	10.5	4.3	Kinked, uncoated	Figure 1	Taped on reel
B59045B1120B151	6.6	9.5	4.0	Kinked, uncoated	Figure 4	Taped on reel
B59023S1120A070	8.2	10.5	4.0	Kinked, uncoated	Figure 4	Cardboard strips
B59053C1120B151	11.0	13.5	5.0	Kinked, coated	Figure 3	Taped on reel
B59008B1130A051	8.2	10.5	4.0	Kinked, uncoated	Figure 4	Taped on reel
B59024S1120A070	8.2	10.5	4.5	Kinked, uncoated	Figure 4	Cardboard strips
B59024S1120A151	8.2	12.1	4.5	Kinked, uncoated	Figure 1	Taped on reel
B59184B1120A151	8.2	12.1	4.0	Kinked, uncoated	Figure 1	Taped on reel
B59184C1120B153	9.0	12.5	4.5	Kinked, coated	Figure 3	Taped on reel

<sup>1)</sup>The lead length stated in the dimensional drawing refers to the untaped version. For dimensions of the taped version, see chapter "Taping and packing".

## Cautions and warnings

### General

- EPCOS thermistors are designed for specific applications and should not be used for purposes not identified in our specifications, application notes and data books unless otherwise agreed with EPCOS 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  $-25\text{ °C} \dots +45\text{ °C}$ , relative humidity  $\leq 75\%$  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 6 months after delivery.

### 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.

### Mounting

- Electrode must not be scratched before/during/after 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 temperatures 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 an appropriate fail-safe function to prevent secondary product damage caused by abnormal function (e.g. use VDR for limitation of overvoltage condition).

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of passive 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 a passive 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 a passive electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as “hazardous”)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
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