



**THE DATASHEET OF
B57800K0472A 001**





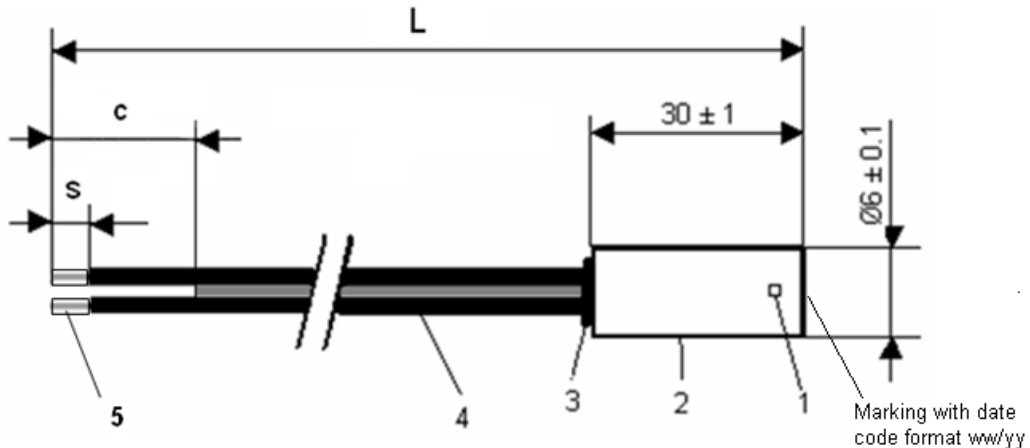
NTC thermistors for temperature measurement

NTC Probes

Series/Type: K800/4.7k/A1
Ordering code: B57800K0472A001
Date: 2008-07-10
Version: 1

Application Version

Temperature sensor for heat pumps
 NTC-thermistor soldered to black PVC-insulated twin wire AWG26 (7x Ø0.16 mm, heat proof up to 105°C) and coated with epoxy resin



L = 4000 ± 30 mm
 s = 5 ± 0.5 mm
 c...splitted 40 ± 2 mm

| No. | Item | Material | Property | Remarks |
|-----|------------|----------------|-------------------------|--------------------------|
| 1 | Thermistor | ceramics | EPCOS NTC-wafer | |
| 2 | casing | copper | Ø6 x 30 mm | |
| 3 | casting | epoxy resin | flexible | black |
| 4 | cable | PVC insulation | 2 x AWG 26 (7xØ0.16 mm) | black (2.2 x 1.1)±0.1 mm |
| 5 | end splice | brass | Stocko RSB 7999 V-0.5 | |

Ratings and characteristics

| | | |
|--|------------------------------------|-----------------|
| Climatic category (IEC 60068-1) | | : 40 / 100 / 56 |
| Lower category temperature | [°C] | : -40 |
| Upper category temperature | [°C] | : 100 |
| Rated resistance R _N // Tolerance | R _N [Ω // %] | : 4700 // 1 |
| Rated temperature | T _N [°C] | : 25 |
| B-value : B _(25/100) // Tolerance | B _N [K//%] | : 3988 // 1 |
| R/T-Curve no. // R ₂₅ | [n//Ω] | : 8016 |
| Max power rating at 25°C | P ₂₅ [mW] | : 60 mW |
| Thermal time constant (water) | τ _a [s] | : approx. 8* |
| Dissipation factor (in air) | δ _{th} [mW/K] | : approx. 5* |
| Thermal cooling time constant (in air) | τ _C [s] | : approx. 50* |
| Heat capacity | C _{th} [mJ/K] | : approx. 250* |
| Insulation resistance | R _{is} [MΩ] | : > 100 MΩ |
| Voltage proof | V _{is} [V _{AC}] | : 1500 |

*typical values

Remarks: IVT p/n 14766

NTC-RESISTANCE-TEMPERATURE-CURVE

R/T-Curve = 8016 / A01
R_N at 25 °C = 4700 Ω ± 1.0 %
R at 25°C = 4700 Ω
B(25/100) = 3988 K ± 1.0 %

| Temp. [°C] | R Nom [Ω] | R Min [Ω] | R Max [Ω] | ΔR [±%] | ΔT [±°C] | α [%/K] |
|------------|-------------|-------------|-------------|------------|------------|------------|
| -30 | 83190 | 79799 | 86580 | 4,1 | 0,7 | 6,2 |
| -25 | 61274 | 58979 | 63569 | 3,7 | 0,6 | 6,0 |
| -20 | 45623 | 44059 | 47187 | 3,4 | 0,6 | 5,8 |
| -15 | 34277 | 33206 | 35347 | 3,1 | 0,6 | 5,6 |
| -10 | 26005 | 25269 | 26741 | 2,8 | 0,5 | 5,4 |
| -5 | 19888 | 19382 | 20394 | 2,5 | 0,5 | 5,3 |
| 0 | 15346 | 14997 | 15694 | 2,3 | 0,4 | 5,1 |
| 5 | 11932 | 11692 | 12172 | 2,0 | 0,4 | 5,0 |
| 10 | 9353 | 9189 | 9517 | 1,8 | 0,4 | 4,8 |
| 15 | 7383 | 7271 | 7494 | 1,5 | 0,3 | 4,7 |
| 20 | 5870 | 5795 | 5945 | 1,3 | 0,3 | 4,5 |
| 25 | 4700 | 4653 | 4747 | 1,0 | 0,2 | 4,4 |
| 30 | 3787 | 3739 | 3835 | 1,3 | 0,3 | 4,3 |
| 35 | 3070 | 3024 | 3115 | 1,5 | 0,4 | 4,1 |
| 40 | 2504 | 2461 | 2546 | 1,7 | 0,4 | 4,0 |
| 45 | 2053 | 2014 | 2092 | 1,9 | 0,5 | 3,9 |
| 50 | 1693 | 1658 | 1729 | 2,1 | 0,5 | 3,8 |
| 55 | 1404 | 1372 | 1435 | 2,3 | 0,6 | 3,7 |
| 60 | 1169 | 1141 | 1198 | 2,5 | 0,7 | 3,6 |
| 65 | 979 | 953,3 | 1005 | 2,6 | 0,8 | 3,5 |
| 70 | 823,4 | 800,4 | 846,5 | 2,8 | 0,8 | 3,4 |
| 75 | 696,2 | 675,6 | 716,9 | 3,0 | 0,9 | 3,3 |
| 80 | 591,3 | 572,7 | 609,8 | 3,1 | 1,0 | 3,2 |
| 85 | 504 | 487,4 | 520,6 | 3,3 | 1,0 | 3,2 |
| 90 | 431,3 | 416,5 | 446,2 | 3,4 | 1,1 | 3,1 |
| 95 | 370,6 | 357,3 | 383,9 | 3,6 | 1,2 | 3,0 |
| 100 | 319,6 | 307,7 | 331,5 | 3,7 | 1,3 | 2,9 |

RELIABILITY DATA :

| Test | Test conditions | $\Delta R_{25}/R_{25}$ (typical) | Remarks |
|--|--|-------------------------------------|-------------------|
| Storage in dry heat IEC 60068-2-2 | Storage at upper category temperature in air; temperature: 100°C; duration: 1000 h | < 2 % | No visible damage |
| Storage in coldness | Storage at lower category temperature in air; temperature: -40°C; duration: 1000 h | < 2 % | No visible damage |
| Storage in damp heat, steady state IEC 60068-2-78 | Temperature of air: 40°C Relative humidity of air: 93 %; duration: 56 days | < 3 % | No visible damage |
| Rapid temperature cycling in air IEC 60068-2-14 | Lower test temperature: -30°C Upper test temperature: 100°C Dwelling time: 15 minutes Number of cycles: 1000 | < 3 % | No visible damage |
| Rapid temperature cycling in liquid | Lower test temperature: -30°C Upper test temperature: +90°C Medium: water+ethyleneglycol Dwelling time: 2 minutes Load : 5 V _{DC} with 6.8 kΩ pre-resistor Number of cycles: 5000 | < 3% | No visible damage |
| Freezing / Thawing | Lower test temperature: -25°C Upper test temperature: +30°C Dwelling time: 4 minutes Sensors heads are placed in rubber bags, filled with water; Load: 5 V _{DC} with 6.8 kΩ pre-resistor Number of cycles: 5000 | < 3% | No visible damage |
| Storage in water | Storage in water with total immersed head temperature: 80°C; duration: 1000 h | < 3% | No visible damage |
| Vibration test IEC 60068-2-6 | Frequency range: 5 Hz to 500 Hz Amplitude: 7.5 mm / 2 g Linear sweep; X,Y and Z direction for 8 h each | < 3 % | No visible damage |
| Voltage proof | 1500 V _{AC} , 50 Hz, 1 sec | -- | No flashover |
| Insulation test | The sensors are placed in a vessel containing metallic balls of 1 mm diameter (with total immersed head) The applied voltage is 500 V _{DC} | -- | ABOVE 100 MΩ |

Cautions and warnings

Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature $-25^{\circ}\text{C} \dots +45^{\circ}\text{C}$, relative humidity $\leq 75\%$ annual mean, maximum 95%, dew precipitation is inadmissible.
- Do not store thermistors where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed or components may stick together, causing problems during mounting.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environments like corrosive gases (Sox, Cl etc.)
- After opening the factory seals, such as polyvinyl-sealed packages, use the components as soon as possible.
- Solder thermistors after shipment from EPCOS within the time specified:
Leaded components: 24 months

Handling

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

Soldering

- Use resin-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

- When thermistors are sealed, potted or overmolded, there must be no mechanical stress caused by thermal expansion during the production process (curing/overmolding process) and during later operation. The upper category temperature of the thermistor must not be exceeded. Ensure that the materials used (sealing/potting compound and plastic material) are chemically neutral.
- Electrodes/contacts must not be scratched before/during/after the mounting process.
- Contacts and housing used for assembly with thermistor have to be clean before mounting.
- During operation, the thermistor's surface temperature can be very high (ICL). Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling of the thermistors.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of the thermistor. Be sure that surrounding parts and materials can withstand the temperature.
- Make sure that thermistors (ICLs) are adequately ventilated to avoid overheating.
- Avoid contamination of thermistor surface during processing.
- During mounting and operation tensile forces on the leads are to be avoided.
- Bending or twisting of the leads directly on the thermistor body is not permissible.
- During operation of the sensor in the application, bending or twisting of cables and/or wires is not permissible.

Operation

- Use thermistors only within the specified operating temperature range.
- Use thermistors only within the specified voltage and current ranges (ICLs).
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions.
- Contact of NTC thermistors with any liquids and solvents should be prevented. It must be ensured that no water enters the NTC thermistors (e.g. through plug terminals). For measurement purposes (checking the specified resistance vs. temperature), the component must not be immersed in water but in suitable liquids (e.g. Galden).
- Avoid dewing and condensation unless thermistor is specified for these conditions.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by malfunction (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 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.
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). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CSSP, CTVS, DSSP, MiniBlue, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseMod, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View B57800K0472A 001 on WIN SOURCE](#)
-  [EPCOS \(TDK\) Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management