

EPCOS Sample Kit 2012

# SMD NTC Thermistors

General-Use Components for Temperature  
Measurement and Compensation



# What are SMD NTC thermistors?

- As defined by IEC 60539, NTC (Negative Temperature Coefficient) thermistors are thermally sensitive semiconductor resistors which show a decrease in resistance as temperature increases.
- SMD NTCs are designed for temperature measurement and compensation.

## Benefits for customer applications

- Available case sizes 0402, 0603 and 0805 (1206 upon request)
- Resistance values 1 k $\Omega$  up to 680 k $\Omega$
- Operating temperature range: -55 ... +125 °C
- Excellent long-term aging stability in high-temperature environment
- Nickel barrier termination and lead-free solderability



**Important information:** 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. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The *Important notes* ([www.epcos.com/ImportantNotes](http://www.epcos.com/ImportantNotes)) and the product-specific *Cautions and warnings* must be observed. All relevant information is available through our sales offices.

# Components

B57221 V2472J060	B57230 V2103F260	B57221 V2103J060	B57261 V2223J060	B57221 V2473J060	B57321 V2102J060	B57301 V2472J060	B57330 V2103F260	B57321 V2103J060
---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------

B57371 V2103J060	B57321 V2223J060	B57371 V2223J060	B57321 V2473J060	B57371 V2473J060	B57371 V2104J060	B57371 V2474J060	B57421 V2102J062	B57421 V2222J062
---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------

B57401 V2472J062	B57471 V2472J062	B57421 V2103J062	B57471 V2103J062	B57421 V2223J062	B57471 V2223J062	B57471 V2473J062	B57471 V2104J062	B57471 V2474J062
---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------	---------------------

## Electrical specifications and ordering codes

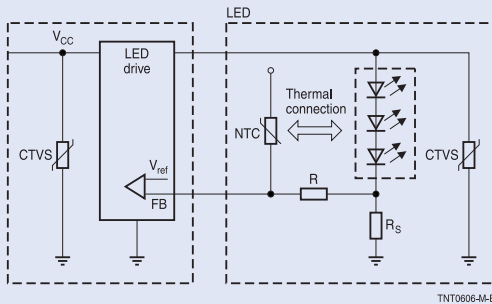
EIA case size	R <sub>25</sub> [kΩ]	ΔR <sub>R</sub> %	B <sub>25/50</sub> [K]	B <sub>25/85</sub> [K]	B <sub>25/100</sub> [K]	Ordering code
<b>Case size 0402</b>						
0402	4.7	±5	3940	3980	4000 ±3%	B57221V2472J060
0402	10	±1	3380	3435	3455 ±1%	B57230V2103F260 <b>NEW</b>
0402	10	±5	3940	3980	4000 ±3%	B57221V2103J060
0402	22	±5	4473	4548	4575 ±3%	B57261V2223J060
0402	47	±5	3940	3980	4000 ±3%	B57221V2473J060
<b>Case size 0603</b>						
0603	1	±3, ±5	3940	3980	4000 ±3%	B57321V2102+060
0603	4.7	±3, ±5	3590	3635	3650 ±3%	B57301V2472+060
0603	10	±1	3380	3435	3455 ±1%	B57330V2103F260 <b>NEW</b>
0603	10	±3, ±5	3940	3980	4000 ±3%	B57321V2103+060
0603	10	±3, ±5	4386	4455	4480 ±3%	B57371V2103+060
0603	22	±3, ±5	3940	3980	4000 ±3%	B57321V2223+060
0603	22	±3, ±5	4386	4455	4480 ±3%	B57371V2223+060
0603	47	±3, ±5	3940	3980	4000 ±3%	B57321V2473+060
0603	47	±3, ±5	4386	4455	4480 ±3%	B57371V2473+060
0603	100	±3, ±5	4386	4455	4480 ±3%	B57371V2104+060
0603	470	±3, ±5	4386	4455	4480 ±3%	B57371V2474+060
<b>Case size 0805</b>						
0805	1	±3, ±5	3940	3980	4000 ±3%	B57421V2102+062
0805	2.2	±3, ±5	3940	3980	4000 ±3%	B57421V2222+062
0805	4.7	±3, ±5	3590	3635	3650 ±3%	B57401V2472+062
0805	4.7	±3, ±5	4386	4455	4480 ±3%	B57471V2472+062
0805	10	±3, ±5	3940	3980	4000 ±3%	B57421V2103+062
0805	10	±3, ±5	4386	4455	4480 ±3%	B57471V2103+062
0805	22	±3, ±5	3940	3980	4000 ±3%	B57421V2223+062
0805	22	±3, ±5	4386	4455	4480 ±3%	B57471V2223+062
0805	47	±3, ±5	4386	4455	4480 ±3%	B57471V2473+062
0805	100	±3, ±5	4386	4455	4480 ±3%	B57471V2104+062
0805	470	±3, ±5	4386	4455	4480 ±3%	B57471V2474+062

See enclosed CD-ROM for data sheets and further details.

+ = Resistance tolerance: H = ±3%, J = ±5%

# Application examples for SMD NTC thermistors

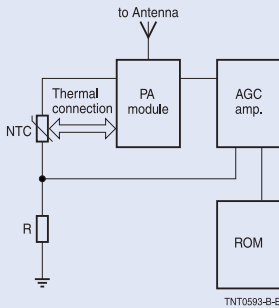
## Diagrams for LED, power amplifier and battery pack



### LED

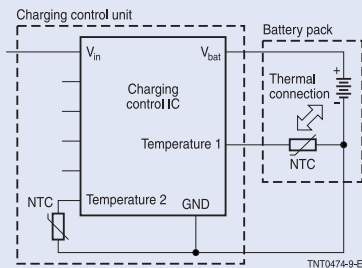
LED lifetime is extended if the current through the LED is controlled by using a NTC thermistor as temperature sensor.

10 k $\Omega$   $\pm$ 5%  
10 k $\Omega$   $\pm$ 1%  
100 k $\Omega$   $\pm$ 5%



### Power amplifier

Compensation circuit of a power amplifier using a NTC thermistor as temperature sensor.



### Battery pack

Schematic drawing of the charging control unit of a battery pack using NTC thermistors as temperature sensors.

10 k $\Omega$   $\pm$ 5%  
10 k $\Omega$   $\pm$ 1%

### Further applications:

Temperature sensing and compensation in e.g.

- Household electronics (refrigerators and deep-freezers, washing machines, water boilers, LED lighting etc.)
- Heating and air-conditioning
- Industrial electronics
- Computer and consumer electronics
- Telecommunications

