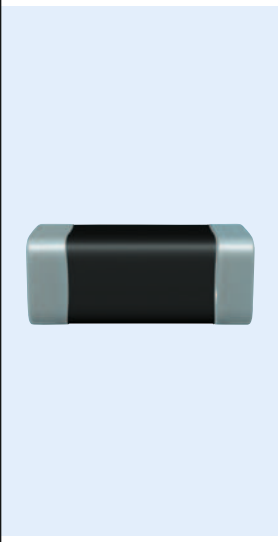
EPCOS Sample Kit 2012

SMD NTC Thermistors

for LED Applications



www.epcos.com

Why thermal sensing?

Today's LED system designers face the challenge of reducing costs whilst satisfying the increasing demands for high lumen efficiency and long lifetime requirements.
The efficiency of LEDs depends very much on the LED junction temperature. Temperature extremes must be avoided, as these lead to faster power degradation, flux reduction, color shift, shortened life time, and even fatal damage to the LED. For maximum efficiency, the LED temperature must be controlled at its specific optimum. The LED temperature is finally an essential indicator of lumen efficiency and the thermal sensor is a key component in the control circuit.

Benefits of thermal sensing with SMD NTC thermistors

SMD NTC thermistors can be used as an integral part of the LED module and can easily be integrated in the assembly process. Small size, good thermal contact to the PCB and negligible self warming make SMD NTC thermistors very sensitive and accurate sensors.
If an SMD NTC is integrated into an LED module, any deviation from the optimum operating temperature of the LED will cause a significant resistance change of the NTC. This will change the current flow through the SMD NTC thermistor and hence change the voltage drop across it. This change can be read by the comparator of the LED driver to adjust the LED driving current which will reduce the power dissipation in the LED increasing its' life-time.

Features

- Highly accurate temperature sensing with low resistance tolerance down to ±1%
- High temperature capability up to +125 °C standard and +150 °C automotive
- Excellent long-term aging stability in high-temperature environments
- Nickel barrier termination and lead-free solderability
- Automotive product range AEC-Q200 qualified
- Resistance values 10 kΩ up to 470 kΩ
- Small EIA case sizes 0402 and 0603
- PSpice library available

Components

Automotive LED illumination (T_{op} –40 ... +150 °C)

B57232 V5103F360	B57251 V5103J060	B57332 V5103F360	B57332 V5103J360	B57352 V5103J060	B57352 V5223J060	B57352 V5473J060	B57352 V5104F360	B57352 V5104J360

General LED illumination (T_{op} –40 ... +125 °C)

B57230 V2103F260	B57261 V2223J060	B57221 V2473J060	B57330 V2103F260	B57321 V2103J60	B57371 V2223J60	B57371 V2473J60	B57374 V2104F60	B57371 V2474J60

Product range

EPCOS

Electrical specifications and ordering codes

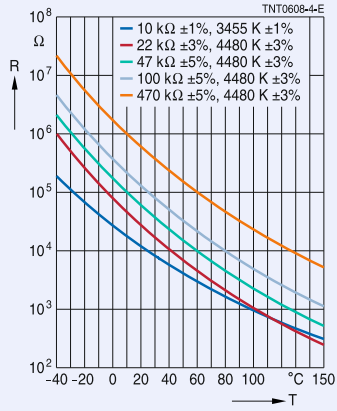
Temperature range (min/max) [°C]	R_{25} [kΩ]	ΔR_R %	$B_{25/50}$ [K]	$B_{25/85}$ [K]	$B_{25/100}$ [K]	Ordering code
EIA case size 0402 – automotive LED illumination						
–40 ... + 150	10	±1	3380	3435	3455 ±1%	B57232V5103F360
–40 ... + 150	10	±5	3380	3435	3455 ±1%	B57232V5103J360
–40 ... + 150	10	±5	3940	3980	4000 ±3%	B57251V5103J060
EIA case size 0603 – automotive LED illumination						
–40 ... + 150	10	±1	3380	3435	3455 ±1%	B57332V5103F360
–40 ... + 150	10	±5	3380	3435	3455 ±1%	B57332V5103J360
–40 ... + 150	10	±3	4386	4455	4480 ±3%	B57352V5103H060
–40 ... + 150	10	±5	4386	4455	4480 ±3%	B57352V5103J060
–40 ... + 150	22	±3	4386	4455	4480 ±3%	B57352V5223H060
–40 ... + 150	22	±5	4386	4455	4480 ±3%	B57352V5223J060
–40 ... + 150	47	±3	4386	4455	4480 ±3%	B57352V5473H060
–40 ... + 150	47	±5	4386	4455	4480 ±3%	B57352V5473J060
–40 ... + 150	100	±1	4386	4455	4480 ±1%	B57352V5104F360
–40 ... + 150	100	±5	4386	4455	4480 ±1%	B57352V5104J360
EIA case size 0402 – general LED illumination						
–40 ... + 125	10	±1	3380	3435	3455 ±1%	B57230V2103F260
–40 ... + 125	10	±5	3380	3435	3455 ±1%	B57230V2103J260
–40 ... + 125	10	±5	3940	3980	4000 ±3%	B57221V2103J060
–40 ... + 125	22	±5	4473	4548	4575 ±3%	B57261V2223J060
–40 ... + 125	47	±5	3940	3980	4000 ±3%	B57221V2473J060
EIA case size 0603 – general LED illumination						
–40 ... + 125	10	±1	3380	3435	3455 ±1%	B57330V2103F260
–40 ... + 125	10	±5	3380	3435	3455 ±1%	B57330V2103J260
–40 ... + 125	10	±3	3940	3980	4000 ±3%	B57321V2103H060
–40 ... + 125	10	±5	3940	3980	4000 ±3%	B57321V2103J060
–40 ... + 125	22	±3	4386	4455	4480 ±3%	B57371V2223H060
–40 ... + 125	22	±5	4386	4455	4480 ±3%	B57371V2223J060
–40 ... + 125	47	±3	4386	4455	4480 ±3%	B57371V2473H060
–40 ... + 125	47	±5	4386	4455	4480 ±3%	B57371V2473J060
–40 ... + 125	100	±1	4386	4455	4480 ±1%	B57374V2104F060
–40 ... + 125	100	±5	4386	4455	4480 ±1%	B57374V2104J060
–40 ... + 125	470	±3	4386	4455	4480 ±3%	B57371V2474H060
–40 ... + 125	470	±5	4386	4455	4480 ±3%	B57371V2474J060

The table is a selection of recommended types.
Special tolerances at selected working temperature can be offered upon request.
See enclosed CD-ROM for data sheets and further details.

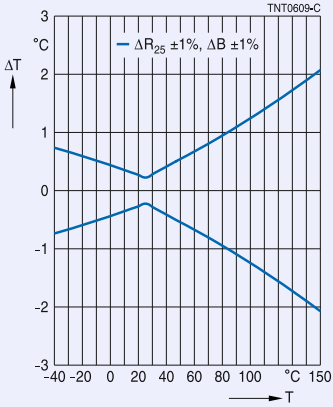
Application examples for SMD NTC thermistors

Characteristics

R (T) characteristics



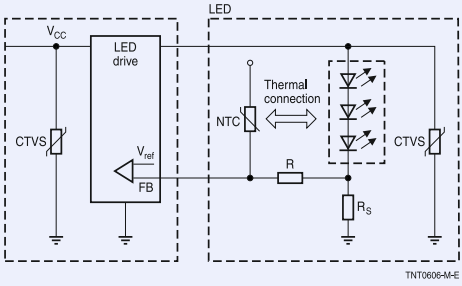
Temperature sensing accurancy



A web-based R/T curve calculation tool is available at http://www.epcos.com/designtools/ntc/index.html

Application examples

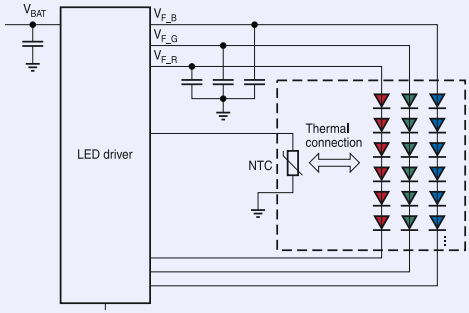
Simplified circuit example: LED module



- LED modules for indoor and outdoor illumination
- LED retrofit bulbs and tubes
- LED for consumer and entertainment applications
- LED automotive lighting
- LED industrial applications

CTVS is a ceramic transient voltage suppressor for the ESD protection of LEDs. More information about CTVS for LED applications is available upon request.

Simplified circuit example: RGB backlight



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В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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