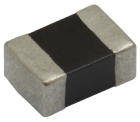
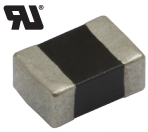
# The Art of Thermistors

### NTC - SMD
**NTCS....E3...SMT**



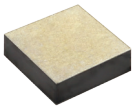
Monolithic with Ni and Sn
Enhanced stability
-40 °C to +125 °C
One $R_{25}$-value per case
0402, 0603, and 0805

### NTC - SMD
**NTCS....E3.....T**



Monolithic with Ni and Sn
Glass protected
-40 °C to +150 °C
Tolerance on $R_{25}$ down to 1 %
Full range in 0402, 0603, and 0805
AEC-Q200 qualified

### NTC - SMD
**NTCC200E4..., NTCC300E4...**



Flat chip metallized (Ag or Au)
Suitable for wire bonding
-55 °C to +175 °C
Resistant to thermal shocks and to leaching
AEC-Q200 qualified

### NTC - SMD
**NTCSMELFE3...**

SOD-80 glass encapsulated
Diameter down to 1.7 mm
Response time down to 0.9 s
For corrosive atmospheres and harsh environments

### NTC - SMD
**NTHS...**

Wide resistance range
Monolithic with Ni and Sn
Design flexibility for temperature sensing and compensation
0402, 0603, 0805, and 1206

### NTC - LEADED
**NTCLE100E3...**

Wide resistance range
Color band coded
High conductivity copper wires

### NTC - LEADED
**NTCLE400...**

Special long lead sensors
Accuracy over wide temperature range
High stability and excellent price / performance ratio

### NTC - LEADED
**NTCLE413..., NTCLE428...**

Mini PVC insulated leads
Battery sensor
Accurate down to ± 0.3 °C
Small body of max. 3 mm for easy installation

### NTC - LEADED
**NTCLG100E2...**

SOD-27 glass encapsulated
Temperature up to 200 °C
Diameter down to 1.8 mm
Response time down to 0.9 s
For corrosive atmospheres and harsh environments

### NTC - LEADED
**NTCV101E4964HMB0**

Temperature up to 900 °C
Long lifetime stability
Resistant to thermal shocks
Small body diameter
High sensitivity

### NTC - LEADED
**T, M, C**

Small size
Wide resistance range
Available in different curves
Tolerance on $R_{25}$ down to 1 %
Precision down to ± 0.2 °C

### NTC - ASSEMBLIES
**NTCLP100...**

Special long lead sensors
Accuracy over wide temperature range
High stability and excellent price / performance ratio

### NTC - ASSEMBLIES
**NTCALUG91A...**

Robust surface sensor
-40 °C to +150 °C
Easy mounting M4
Rugged construction
PTFE insulated cable
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCASCWE3...**

Screw threaded sensors
Easy mounting M4
Rugged construction
For surface temperature applications

### NTC - ASSEMBLIES
**NTCACAP...**

Refrigerator sensors
Enabling class A+++
Very good water, moisture, and ice resistance
Thermal cycle resistant

### NTC - ASSEMBLIES
**NTCASRFE3C90406**

Ice cube sensor
FDA-grade housing
Enabling class A+++
Very good water, moisture, and ice resistance
Thermal cycle resistant

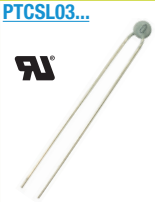
### NTC - ASSEMBLIES
**NTCAFLEX05...**

Flex foil sensor for narrow space applications
Response time down to 2 s
Insulated and humidity resistant
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCAIMME3...**

Stainless steel immersion sensor
Fast response time
Reduced thermal gradient
For permanent contact with liquids

### PTC - LEADED
**PTCSL03...**



Over-temperature protection
Fast response time
Tolerance of ± 5 °C
Excellent long term behavior

### PTC - LEADED
**PTCCL...D/E..**

For overload protection
30 V to 60 V
Small trip-hold ratio of 1.5
High maximum overload current

### PTC - LEADED
**PTCCL...F..**

For overload protection
145 V
Small trip-hold ratio of 1.5
High maximum overload current

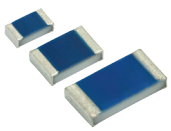
### PTC - LEADED
**PTCCL...H/S/T/V..**

For overload protection
265 V to 600 V
Small trip-hold ratio of 1.5
High maximum overload current

### PTC - LEADED
**PTCEL...**

Inrush current limiting
440 $V_{RMS}$ to 560 $V_{RMS}$ (800 $V_{DC}$)
High energy absorption 150 J to 270 J

### RTD - SMD
**PTS....0... (PTS)**



Platinum thin film chip
Size 0603, 0805, and 1206
Lead (Pb)-free
Short reaction times
High accuracy and stability

## LEGEND

**Negative Temperature Coefficient (NTC):**

- NTC - SMD (Surface-Mount Device)
- NTC - Leaded (Through-Hole)
- NTC - Assemblies

**Positive Temperature Coefficient (PTC):**

- PTC - SMD (Surface-Mount Device)
- PTC - Assemblies
- PTC - Leaded (Through-Hole)

A WORLD OF SOLUTIONS

*Vishay Intertechnology manufactures a broad range of thermistors. We provide one-stop service to engineers who need industry-leading components for demanding and diverse applications.*

### NTC - LEADED
**NTCLE201E3C90028**

Long and flexible leads for special mounting
Fast response time of less than 0.5 s
Small head diameter

### NTC - LEADED
**NTCLE203E3...**

High accuracy
Tolerance down to 1 %
Stability over a long lifetime
Low heat conductivity
Thin nickel wires

### NTC - LEADED
**NTCLE203E3...SB0**

2-point accurate sensor
Tolerance down to 0.5 K
-55 °C to +150 °C
Stable, thermal shock-withstanding
AEC-Q200 qualified

### NTC - LEADED
**NTCLE301E4C90059**

Long and flexible leads
Small diameter
Accuracy of ± 0.4 °C at 0 °C
Designed for cold temperature applications

### NTC - LEADED
**NTCLE305E4...SB**

Miniature epoxy-ETFE insulated leads
Fast reacting and accurate
Exceptional withstanding to thermal shocks
AEC-Q200 qualified

### NTC - LEADED
**NTCLE213E3...**

Advanced mini sensor
-55 °C to +150 °C
Thermal shock resistant
Fast response time
High sensitivity
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCLP450E3...**

Pipe type with fast time response and high stability
High resistance to humidity
Accurate over wide temperature range

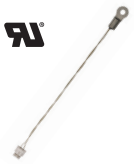
### NTC - ASSEMBLIES
**NTCALUG01A...**

Robust surface sensor
-40 °C to +150 °C
Easy mounting M3 and M3.5
Rugged construction
PTFE insulated cable
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCALUG02A...**

Low thermal gradient surface sensor
Tolerance on $R_{25}$ down to 1 %
PEEK AWG30 nickel wires
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCALUG03A...**



Miniature surface sensor
Fast response time
Low thermal mass
Stud screw mounted M2
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCALUG39A...**

Miniature surface sensor
Fast response time
Low thermal mass
Stud screw mounted M3
AEC-Q200 qualified

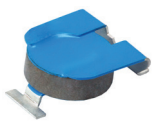
### NTC - ASSEMBLIES
**NTCALUG54A...**

Robust surface sensor
-40 °C to +150 °C
Easy mounting M5
Rugged construction
PTFE insulated cable
AEC-Q200 qualified

### NTC - ASSEMBLIES
**NTCASRFE4C90132**

Surface temperature sensor with triangular shape housing
Fast response time
Mounted in a gauge or with a spring

### PTC - SMD
**PTCTZ..R....TT**



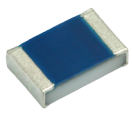
Overload protection
30 $V_{RMS}$ to 300 $V_{RMS}$ operating
Fast response time to overload
Low heat transfer

### PTC - ASSEMBLIES
**PTCSGM3T...**

Over-temperature protection
Wide range of well defined protection temperatures
Excellent long term behavior

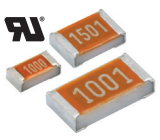
# The Varistor Gallery

### RTD - SMD
**PTS....M... (PTS AT)**



Platinum thin film chip
High accuracy and stability
Extended temperature range of -50 °C to +175 °C
Short reaction times
High thermal cycling capability
AEC-Q200 qualified

### RTD - SMD
**TFPT...**

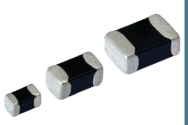



Nickel thin film chip
Wide resistance range
Size 0603, 0805, and 1206
Tolerance on $R_{25}$ down to 0.5 %
-55 °C to +150 °C
High stability

### RTD - LEADED
**TFPTL...**

Thin film linear thermistors
Tolerance on $R_{25}$ down to 1 %
-55 °C to +150 °C
High stability

### SMD
**MLV...**



Multilayer surge suppressor
Inherent bidirectional clamping
4 $V_{RMS}$ to 95 $V_{RMS}$
Excellent energy / volume ratio
Sizes 0402 up to 2220

### LEADED
**VDRS...**

Standard surge
14 $V_{RMS}$ to 680 $V_{RMS}$
$I_{surge}$ up to 6500 A (8/20 µs)
Lead (Pb)-free and halogen-free

### LEADED
**VDRH...**

High surge
11 $V_{RMS}$ to 680 $V_{RMS}$
$I_{surge}$ up to 10 kA (8/20 µs)
Lead (Pb)-free and halogen-free

**Thin Film - Resistance Temperature Detectors (RTD):**

- RTD - SMD (Surface-Mount Device)
- RTD - Leaded (Through-Hole)

**Voltage Dependent Resistors:**

- Varistors - SMD (Surface-Mount Device)
- Varistors - Leaded (Through-Hole)

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