



# NTC thermistors for temperature measurement

## Bondable NTC

**Series/Type:** NTCWS Series  
**Ordering code:** NTCWS3UF103HC1GT90A, NTCWS3UF103FC1GT90B  
**Date:** 2023-6-14  
**Version:** 1

Identification/Classification 1  
(header 1 + top left bar):

Identification/Classification 2

(header 2 + bottom left header bar):

Ordering code: (top right header bar)

Series/Type: (bottom right header bar)

NTC thermistors for temperature measurement

Bondable NTC

NTCWS3UF103HC1GT90A, NTCWS3UF103FC1GT90B

NTCWS Series

Department:

Date:

Version:

TDK SEN NTC

2023-6-14

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### Applications

- Temperature measurement of laser diode of optical transceiver and LiDAR

### Dimensional drawings

### Features

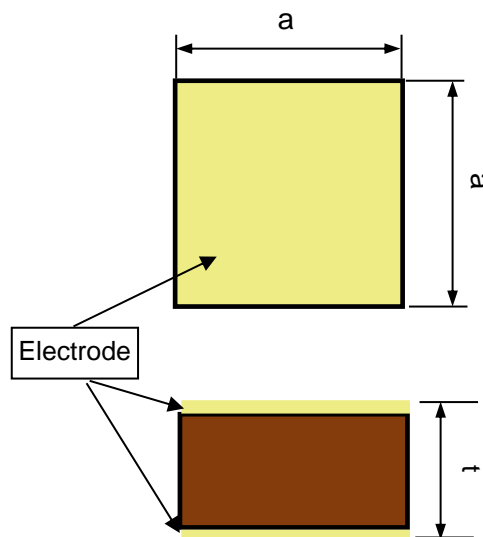
- High accuracy, +/-1% resistance and B value tolerance available
- Available to place in LD package, and wire bonding by Au wire
- Small dimensions
- Lead free

### Delivery mode

- Tray (2inch)
- 9600pcs per cardboard box (24Tray)
- For details see delivery specification

### Ratings and characteristics

- Operating temperature, Min. [°C] : -40°C
- Operating temperature, Max. [°C] : 125 °C
- Thermal time constant (in Air)  $1 \tau$  [s]: < 2s



Dimensions in below

### Part No., Resistance, B25/85 and Dimension

Part No,	R25 KΩ	R25 Tolerance	B25/85 K	B25/85 Tolerance	Dimensions mm
NTCWS3UF103HC1GT90A	10	±3%	3930	±1%	a:0.33±0.04 t : 0.25 max
NTCWS3UF103FC1GT90B		±1%			

**NTC resistance temperature curve**

**NTCWS3UF103HC1GT90A**

R25 : 10.00kΩ±3.0%

B25/85 : 3930K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	342.2	365.8	390.5
-35	245.0	261.0	277.7
-30	177.6	188.5	200.0
-25	130.2	137.7	145.6
-20	96.40	101.7	107.2
-15	72.12	75.87	79.74
-10	54.47	57.14	59.89
-5	41.52	43.43	45.40
0	31.93	33.31	34.73
5	24.76	25.77	26.79
10	19.36	20.10	20.85
15	15.26	15.81	16.35
20	12.12	12.52	12.93
25	9.700	10.00	10.30
30	7.784	8.042	8.301
35	6.290	6.513	6.737
40	5.118	5.310	5.504
45	4.191	4.357	4.525
50	3.454	3.598	3.744
55	2.864	2.988	3.115
60	2.388	2.497	2.607
65	2.003	2.097	2.194
70	1.689	1.771	1.856
75	1.431	1.503	1.578
80	1.219	1.282	1.348
85	1.043	1.099	1.157
90	0.8962	0.9460	0.9976
95	0.7736	0.8178	0.8637
100	0.6706	0.7099	0.7508
105	0.5836	0.6186	0.6552
110	0.5098	0.5411	0.5739
115	0.4470	0.4751	0.5044
120	0.3932	0.4185	0.4449
125	0.3471	0.3699	0.3937

**NTCWS3UF103FC1GT90B**

R25 : 10.00kΩ±1.0%

B25/85 : 3930K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	349.3	365.8	382.9
-35	250.1	261.0	272.4
-30	181.3	188.5	196.1
-25	132.8	137.7	142.8
-20	98.39	101.7	105.1
-15	73.60	75.87	78.20
-10	55.59	57.14	58.72
-5	42.37	43.43	44.52
0	32.58	33.31	34.05
5	25.27	25.77	26.27
10	19.76	20.10	20.44
15	15.58	15.81	16.04
20	12.37	12.52	12.68
25	9.900	10.00	10.10
30	7.944	8.042	8.140
35	6.420	6.513	6.606
40	5.223	5.310	5.397
45	4.278	4.357	4.437
50	3.525	3.598	3.671
55	2.923	2.988	3.055
60	2.438	2.497	2.557
65	2.044	2.097	2.152
70	1.723	1.771	1.820
75	1.460	1.503	1.548
80	1.244	1.282	1.322
85	1.064	1.099	1.135
90	0.9147	0.9460	0.9782
95	0.7896	0.8178	0.8469
100	0.6844	0.7099	0.7362
105	0.5956	0.6186	0.6424
110	0.5203	0.5411	0.5627
115	0.4562	0.4751	0.4946
120	0.4014	0.4185	0.4363
125	0.3543	0.3699	0.3861

### Reliability Test

No.	ITEMS	PERFORMANCE	TEST REQUIREMENT
1	Dry Heat Test	$\Delta R \leq \pm 2\%$	Temperature: 125±2°C Teat Time: 1000+48/0h
2	Cold Test	$\Delta R \leq \pm 2\%$	Temperature: -40±5°C Teat Time: 1000+48/0h
3	Damp heat Test (Steady state)	$\Delta R \leq \pm 2\%$	85±5%RH at 85°C±2°C Teat Time: 1000+48/0h
4	Thermal Shock Test	$\Delta R \leq \pm 2\%$	-40°C/30min-125°C/30min Test Cycle : 1000Cyc

## INSTRUCTIONS BEFORE USING NTC THERMISTORS

Be sure to read these instruction before using the NTC thermistor.

### WARNING

Pay careful attention to all warnings and operate only in accordance with safety specifications. Improper use may cause failure or damage to the NTC thermistor and to the electronic machines or other devices that install the NTC thermistor.

### CAUTION

Ensure to use thermistors under proper operating and mounting condition and only as specified in a product catalogue or final specification.

Use thermistors only within the specified operating temperature range.

Do not apply too much vibration, shock, power, or pressure which may damage the element.

Alert consumers that the thermistor in the application must not be touched by bare hands directly.

The thermistor should be stored in original packaging under the following environment :

Temperature:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$

Relative humidity: less than 75%

Avoid rapid temperature change, direct sunshine, corrosive gas, dust, mechanical stress or pressure.

When thermistors are sealed, sealing material and volume, hardening condition and adhesive property should be carefully considered and thermistor's reliability should be confirmed.

Use under no higher relative humidity than 85% for long term.

The material contacted by the thermistor must be carefully selected to avoid electric potential difference between the thermistor and metal part which may cause metal corrosion.

Use the thermistor within 1 year after shipment from TDK.

Do not use in the following environmental conditions:

Corrosive gas( $\text{Cl}_2, \text{NH}_3, \text{SO}_x, \text{NO}_x$ , etc)

Acidic, alkaline and solvent

Electrolyte, water, salt water, etc.

Dust

Prevent solder paste and conductive paste from adhering to the sides of the product during mounting.

Please take consideration an appropriate fail-safe function in customer application which requires a very high level of operational safety and reliability or could endanger society or human life.

Please contact us before using the NTC thermistor assembled for the following application if those malfunction of failure might have serious damage to human life, health or one's property and severe influence on society.

Application : cars, aerospace/aviation equipment, medical equipment,  
nuclear power plant equipment

Please contact us also in case of the usage of the thermistor beyond the condition described in this specification.

## 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 we are 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 a 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.
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6. Unless otherwise agreed in individual contracts, **all orders are subject to our General Terms and Conditions of Supply**.
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## Important notes

8. The trade names EPCOS, CarXield, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, InsuGate, LeaXield, MiniBlue, MiniCell, MKD, MKK, ModCap, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap, XieldCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.tdk-electronics.tdk.com/trademarks](http://www.tdk-electronics.tdk.com/trademarks).

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