



NTC thermistors for temperature measurement

Bondable NTC

Series/Type :	NTCWS Series
Part No. :	NTCWS3JF103*C1GT***,NTCWS3UF103*C1GT***,NTCWS4AF104*FC1GT***
Date :	2024/9/5
Version :	3
Department :	TDK corporation Temperature & Pressure Sensors Business Group

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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

Applications

- Temperature measurement of laser diode of optical transceiver and LiDAR

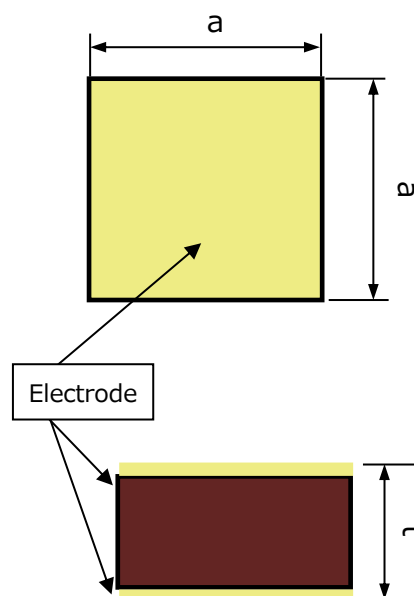
Options

- 3 types of resistance-temperature characteristic available

Delivery mode

- Tray (2inch)
- 9600pcs per cardboard box (24Tray)

Dimensional drawings



Part No. , Resistance R25 , B25/85 and Dimensions

Part No.	R25 KΩ	R25 Tolerance	B25/85 K	B25/85 Tolerance	Dimensions (mm)
NTCWS3JF103FC1GT***	10	±1%	3410	±1%	L,W:0.48±0.04 T : 0.25 max
NTCWS3JF103HC1GT***		±3%			
NTCWS3UF103FC1GT90B	10	±1%	3930	±1%	L,W:0.33±0.04 T : 0.25 max
NTCWS3UF103HC1GT90A		±3%			
NTCWS4AF104FC1GT91B	100	±1%	4050	±1%	L,W:0.31±0.04 T : 0.25 max
NTCWS4AF104HC1GT91A		±3%			

Ratings and characteristics

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

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NTC resistance temperature curve

NTCWS3JF103HC1GT×××

R25 : 10.00kΩ±3.0%

B25/85 : 3410K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	196.6	208.9	221.9
-35	147.9	156.7	165.9
-30	112.5	118.9	125.5
-25	86.45	91.12	95.95
-20	67.09	70.53	74.08
-15	52.53	55.09	57.72
-10	41.48	43.40	45.36
-5	33.02	34.47	35.94
0	26.48	27.58	28.70
5	21.39	22.23	23.08
10	17.39	18.03	18.69
15	14.23	14.73	15.23
20	11.71	12.10	12.49
25	9.700	10.00	10.30
30	8.046	8.310	8.575
35	6.710	6.943	7.177
40	5.625	5.830	6.037
45	4.738	4.919	5.103
50	4.010	4.170	4.333
55	3.409	3.551	3.696
60	2.911	3.037	3.166
65	2.496	2.608	2.723
70	2.148	2.248	2.350
75	1.856	1.945	2.037
80	1.610	1.689	1.771
85	1.401	1.472	1.545
90	1.223	1.287	1.353
95	1.070	1.128	1.187
100	0.9400	0.9917	1.045
105	0.8275	0.8742	0.9226
110	0.7303	0.7725	0.8163
115	0.6460	0.6841	0.7238
120	0.5726	0.6070	0.6430
125	0.5084	0.5396	0.5723

NTCWS3JF103FC1GT×××

R25 : 10.00kΩ±1.0%

B25/85 : 3410K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	200.7	208.9	217.5
-35	150.9	156.7	162.7
-30	114.8	118.9	123.1
-25	88.23	91.12	94.08
-20	68.47	70.53	72.64
-15	53.62	55.09	56.60
-10	42.34	43.40	44.48
-5	33.70	34.47	35.24
0	27.03	27.58	28.14
5	21.83	22.23	22.63
10	17.75	18.03	18.32
15	14.52	14.73	14.93
20	11.96	12.10	12.24
25	9.900	10.00	10.10
30	8.212	8.310	8.409
35	6.848	6.943	7.038
40	5.741	5.830	5.920
45	4.836	4.919	5.004
50	4.093	4.170	4.249
55	3.480	3.551	3.624
60	2.971	3.037	3.104
65	2.547	2.608	2.670
70	2.193	2.248	2.305
75	1.895	1.945	1.997
80	1.643	1.689	1.737
85	1.430	1.472	1.515
90	1.248	1.287	1.326
95	1.093	1.128	1.164
100	0.9593	0.9917	1.025
105	0.8446	0.8742	0.9047
110	0.7454	0.7725	0.8004
115	0.6593	0.6841	0.7097
120	0.5844	0.6070	0.6305
125	0.5189	0.5396	0.5612

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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

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NTCWS3JF103*C1GT***,NTCWS3UF103*C1GT***,NTCWS4AF104*FC1GT***

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NTC resistance temperature curve

NTCWS4AF104HC1GT91A

R25 : 100.0kΩ±3.0%

B25/85 : 4050K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	3461	3699	3950
-35	2475	2636	2806
-30	1792	1903	2019
-25	1313	1390	1470
-20	972.4	1026	1082
-15	727.5	765.4	804.6
-10	549.4	576.4	604.2
-5	418.7	438.1	458.0
0	321.9	335.9	350.1
5	249.4	259.6	269.9
10	194.8	202.2	209.8
15	153.3	158.8	164.3
20	121.5	125.5	129.6
25	97.00	100.0	103.0
30	77.62	80.20	82.79
35	62.53	64.74	66.97
40	50.68	52.58	54.51
45	41.32	42.96	44.63
50	33.89	35.30	36.74
55	27.94	29.17	30.41
60	23.16	24.22	25.30
65	19.30	20.22	21.16
70	16.16	16.95	17.77
75	13.59	14.28	15.00
80	11.48	12.09	12.72
85	9.741	10.27	10.82
90	8.299	8.767	9.252
95	7.099	7.511	7.939
100	6.096	6.459	6.838
105	5.254	5.575	5.911
110	4.545	4.830	5.128
115	3.945	4.198	4.463
120	3.435	3.661	3.897
125	3.001	3.202	3.414

NTCWS4AF104FC1GT91B

R25 : 100.0kΩ±1.0%

B25/85 : 4050K±1.0%

Temp. (°C)	R min (KΩ)	R nom (KΩ)	R max (KΩ)
-40	3532	3699	3874
-35	2526	2636	2751
-30	1829	1903	1979
-25	1340	1390	1441
-20	992.4	1026	1061
-15	742.5	765.4	788.9
-10	560.8	576.4	592.5
-5	427.4	438.1	449.1
0	328.5	335.9	343.4
5	254.6	259.6	264.7
10	198.8	202.2	205.7
15	156.4	158.8	161.1
20	124.0	125.5	127.1
25	99.00	100.0	101.0
30	79.22	80.20	81.18
35	63.81	64.74	65.67
40	51.72	52.58	53.45
45	42.18	42.96	43.76
50	34.59	35.30	36.03
55	28.52	29.17	29.82
60	23.64	24.22	24.81
65	19.70	20.22	20.75
70	16.49	16.95	17.43
75	13.87	14.28	14.71
80	11.72	12.09	12.47
85	9.941	10.27	10.61
90	8.470	8.767	9.072
95	7.246	7.511	7.785
100	6.222	6.459	6.705
105	5.363	5.575	5.796
110	4.639	4.830	5.028
115	4.026	4.198	4.376
120	3.506	3.661	3.822
125	3.063	3.202	3.348

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Reliability Test

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

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INSTRUCTIONS BEFORE USING NTC THERMISTORS

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

SAFETY WARNING

Operate in accordance with safety specifications.

Improper use, may result in failure or damage to NTC thermistor and other electronic systems.

CAUTION

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

Use thermistors only within the specified operating temperature range.

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

Over exposure to vibration, shock, power, or pressure may damage the element.

The thermistor in the application should not be touched by bare hands to avoid oils affecting solderability and environmental stability.

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

Temperature: -10°C~+40°C

Relative humidity: less than 75%

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

The material contacted by the thermistor must be carefully selected to avoid electric potential difference between the thermistor and surface to avoid corrosion.

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Thermistor should be used within 1 year after receipt from TDK.

Please avoid exposure to the following:

Corrosive gas(Cl₂, NH₃, SO_x, NO_x, etc)

Acidic, alkaline and solvent

Electrolyte, water, salt water, etc.

Dust

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 applications if the functional safety may result if the 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