NTC thermistors for temperature measurement

Bondable NTC

Series/Type :	**NTCWS Series**
Part No. :	**NTCWS3JF103*C1G****,NTCWS3UF103*C1G*90*,NTCWS4AF104*FC1G*91***
Date :	**2025/12/25**
Version :	**5**

Department : **TDK corporation**
Temperature & Pressure Sensors Business Group

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

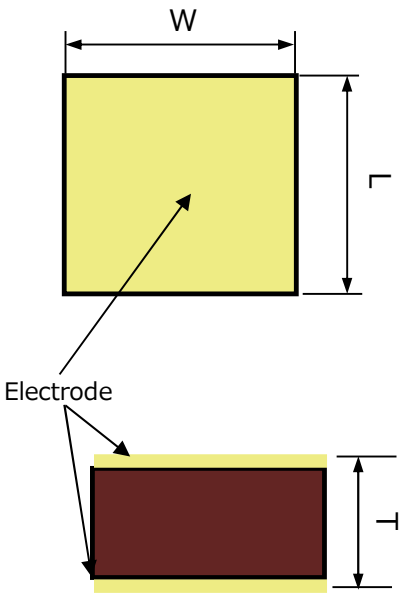
Applications

- Temperature measurement of laser diode of optical transceiver and LiDAR

Options

- 3 types of resistance temperature characteristic available

Dimensional drawings



Package type

- Tray (2inch) - MOQ: 9,600pcs (24 Tray)
- Film with GripRing (6inch) - MOQ: 10,000pcs (5 Grip ring)

Ratings and characteristics

- Operating temperature : -40～125℃
- Thermal time constant (in Air)　1τ[s] : < 2s

NTC thermistors for temperature measurement
NTCWS3JF103*C1G**,NTCWS3UF103*C1G*90*,NTCWS4AF104*FC1G*91***
Bondable NTC

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

Part No.	R25 KΩ	R25 Tolerance	B25/85	Dimensions (mm)	Package type
NTCWS3JF103FC1GT***	10	±1%	3410K ±1%	L,W:0.48±0.04 T : 0.25 max	Tray
NTCWS3JF103FC1GG***					Film
NTCWS3JF103HC1GT***		±3%			Tray
NTCWS3JF103HC1GG***					Film
NTCWS3UF103FC1GT90B	10	±1%	3930K ±1%	L,W:0.33±0.04 T : 0.25 max	Tray
NTCWS3UF103FC1GG90D					Film
NTCWS3UF103HC1GT90A		±3%			Tray
NTCWS3UF103HC1GG90C					Film
NTCWS4AF104FC1GT91F	100	±1%	4050K ±1%	L,W:0.31±0.04 T : 0.25±0.05	Tray
NTCWS4AF104FC1GG91H					Film
NTCWS4AF104HC1GT91E		±3%			Tray
NTCWS4AF104HC1GG91G					Film

Reliability Test

Part No. NTCWS3UF103*C1G*90* , NTCWS3JF103*C1G****

No.	Items	Performance	Test Requirement
1	Dry Heat Test	ΔR≦±1%	Temperature: 125±2°C Test Time: 1000+48/0h
2	Cold Test	ΔR≦±1%	Temperature: -40±5°C Test Time: 1000+48/0h
3	Damp heat Test (Steady state)	ΔR≦±1%	85±5%RH at 85°C±2°C Test Time: 1000+48/0h
4	Thermal Shock Test	ΔR≦±1%	-40℃/30min-125℃/30min Test Cycle : 1000Cyc

Part No. NTCWS4AF104*FC1G*91*

No.	Items	Performance	Test Requirement
1	Dry Heat Test	ΔR≦±2%	Temperature: 125±2°C Test Time: 1000+48/0h
2	Cold Test	ΔR≦±2%	Temperature: -40±5°C Test Time: 1000+48/0h
3	Damp heat Test (Steady state)	ΔR≦±2%	85±5%RH at 85°C±2°C Test Time: 1000+48/0h
4	Thermal Shock Test	ΔR≦±2%	-40℃/30min-125℃/30min Test Cycle : 1000Cyc

NTC resistance temperature curve

NTCWS3JF103HC1GT×××
NTCWS3JF103HC1GG×××

R25 : 10.00kΩ±3.0%
B25/85 : 3410K±1.0%

Temp. (℃)	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×××
NTCWS3JF103FC1GG×××

R25 : 10.00kΩ±1.0%
B25/85 : 3410K±1.0%

Temp. (℃)	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

NTC resistance temperature curve

NTCWS3UF103HC1GT90A
NTCWS3UF103HC1GG90C

R25 : 10.00kΩ±3.0%
B25/85 : 3930K±1.0%

Temp. (℃)	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
NTCWS3UF103FC1GG90D

R25 : 10.00kΩ±1.0%
B25/85 : 3930K±1.0%

Temp. (℃)	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

NTC resistance temperature curve

NTCWS4AF104HC1GT91E
NTCWS4AF104HC1GG91G

R25 : 100.0kΩ±3.0%
B25/85 : 4050K±1.0%

Temp. (℃)	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

NTCWS4AF104FC1GT91F
NTCWS4AF104FC1GG91H

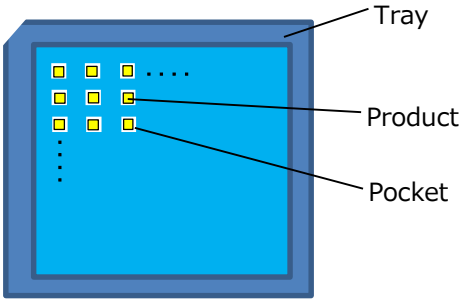
R25 : 100.0kΩ±1.0%
B25/85 : 4050K±1.0%

Temp. (℃)	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

Package type ① (Part No. NTCWS3UF103HC1GT90A,NTCWS3UF103FC1GT90B)

Tray package

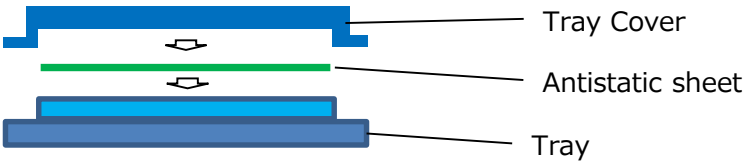
・Tray specification



Items	Dimensions
Tray Size	□ : 50.8mm
	Thickness : 3.96mm
Pocket Size	□ : 0.46mm
	Depth : 0.23mm
Pocket Pitch	2.156mm
Number of products	400pcs/Tray (20pcs×20pcs)

・Packaging condition

Place the antistatic sheet and tray cover on the tray and fix them with clip. Label the tray cover.
On the label, write the product name (p #), lot number, quantity, and manufacturer name.



・Delivery unit

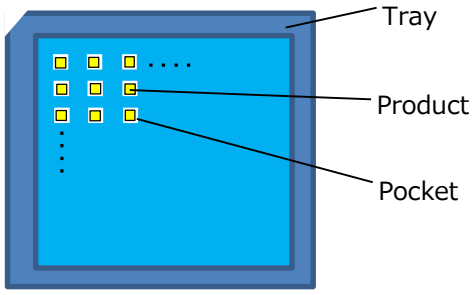
MOQ: 9,600pcs (24 Tray)

Please contact us for packaging specifications for other products.

Package type ② (Part No. NTCWS4AF104HC1GT91E,NTCWS4AF104FC1GT91F)

Tray package

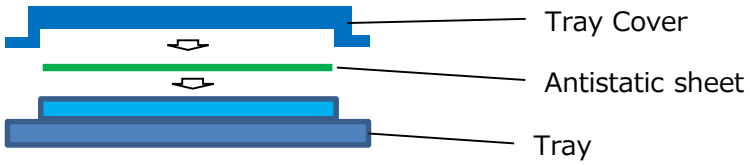
・Tray specification



Items	Dimensions
Tray Size	□ : 50.8mm
	Thickness : 3.96mm
Pocket Size	□ : 0.56mm
	Depth : 0.30mm
Pocket Pitch	1.83mm
Number of products	400pcs/Tray (20pcs×20pcs)

・Packaging condition

Place the antistatic sheet and tray cover on the tray and fix them with clip. Label the tray cover.
On the label, write the product name (p #), lot number, quantity, and manufacturer name.



・Delivery unit

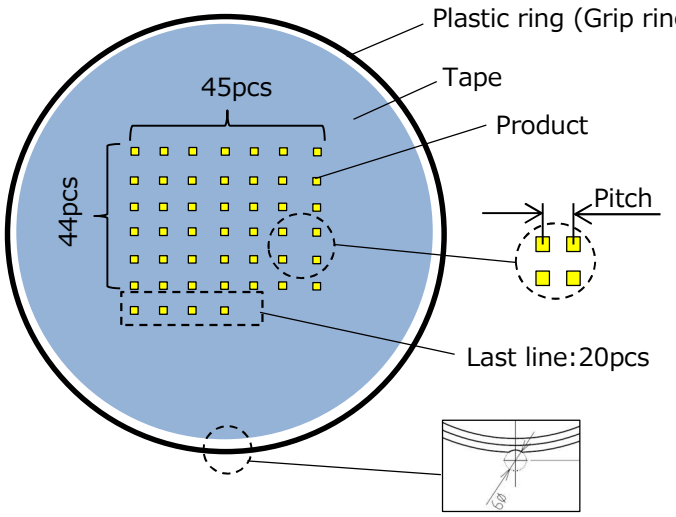
MOQ: 9,600pcs (24 Tray)

Please contact us for packaging specifications for other products.

Package type ③(Part No. NTCWS3UF103HC1GG90C,NTCWS3UF103FC1GT90D)

Film package

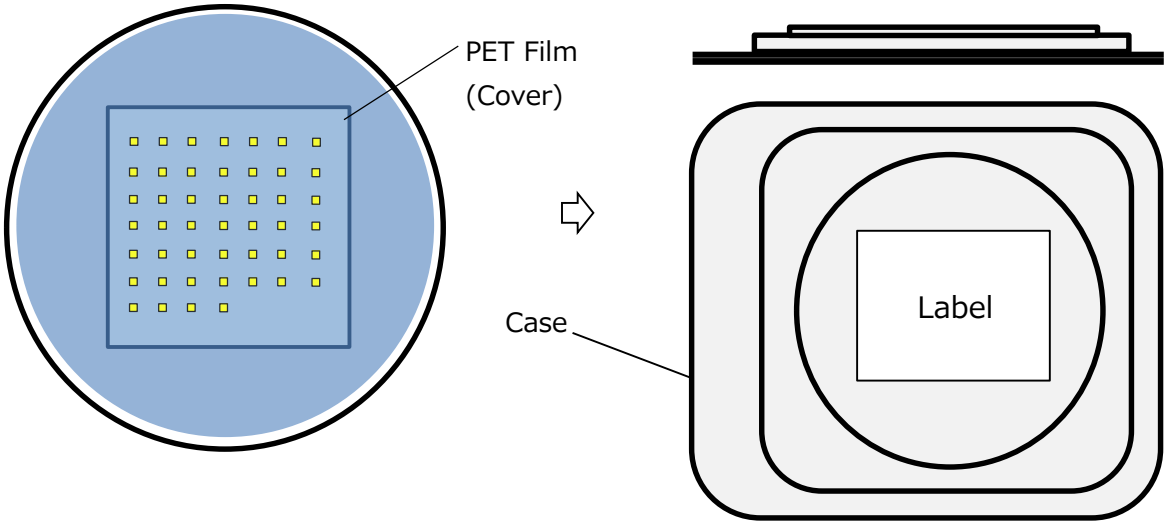
・Film package specification



Items	Dimensions
Ring Size (Inner)	φ140 mm
	Thickness : 6mm
Ring Size (Outer)	φ152mm
	Thickness : 6mm
Pitch Products	1.3mm
Number of products	2,000pcs (45×44+20)pcs

・Packaging condition

Case label includes product name, lot number, and package quantity.

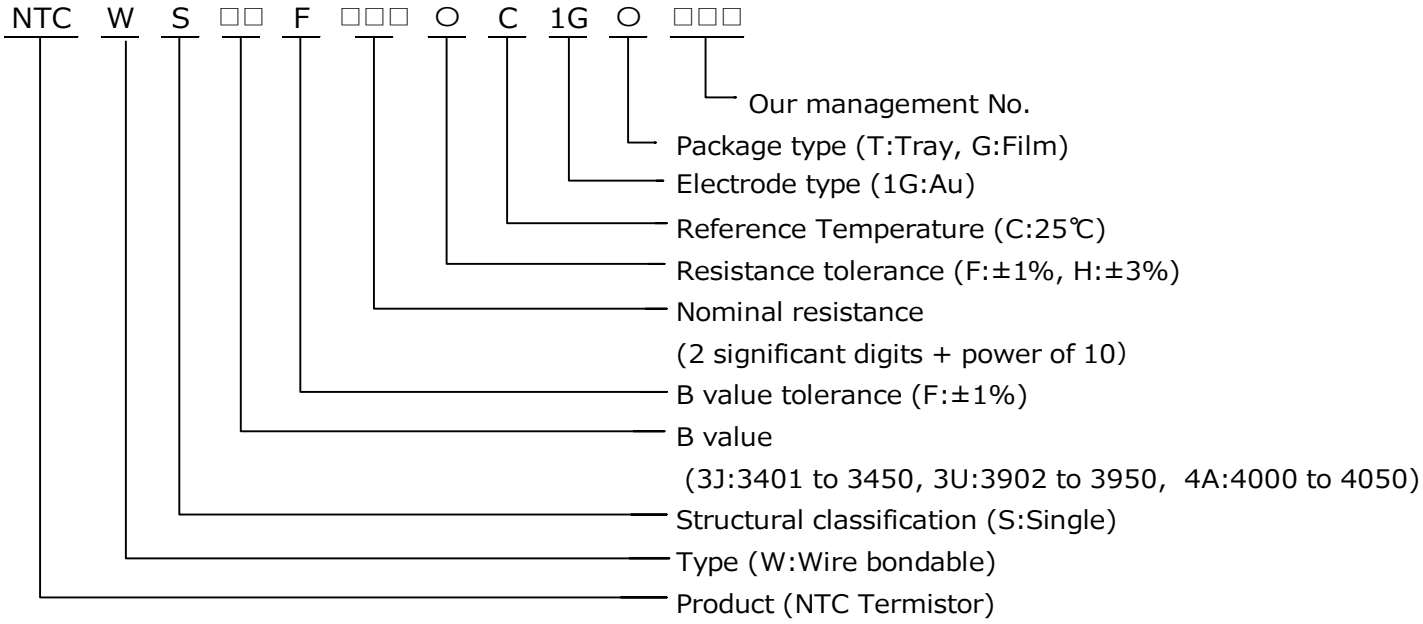


・Delivery unit

MOQ: 10,000pcs (5 Grip ring)

Please contact us for packaging specifications for other products.

Part Number Construction



INSTRUCTIONS BEFORE USING NTC THERMISTORS

Be sure to read these instructions 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℃～+40℃
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.

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

Avoid exposure to the following substances and environments.

Corrosive gases (Cl_2, NH_3, SOx, NOx, H_2etc.)
Liquids such as acids, alkalis, solvents etc.
Liquids such as electrolytes, water, and salt water etc.
Dusty environments
Environments where static electricity or electromagnetic waves are generated
Environments where condensation occurs on the product

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