NTC Thermistors

for Temperature Sensor Lead Insulation Type

This product is a sensor type NTC Thermistor to be useful in the normal temperature range developed by the unique ceramic technology and the automatic assembly.

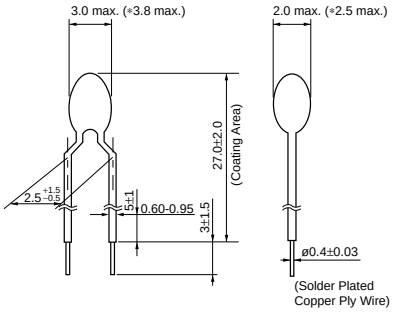
■ Features

1. Electric insulation on lead wire
2. Excellent bending resistance due to suitable hardness of surface coating
3. Easy handling due to most suitable hardness of surface of coating
4. High-accuracy of +-1%
   +-1% of resistance and B-Constant tolerance are realized due to uniform thickness by the precise sheet forming method.

■ Applications

1. Rechargeable batteries
2. Battery charging circuits
3. Head of printers
4. DC fan motors
5. Home appliance equipments

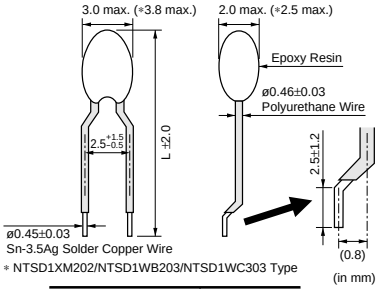
NTSD0 Series



∗ It applies to NTSD0XM202, NTSD0WB203 and NTSD0WC303 Type.

(in mm)

NTSD1 Series



∗ NTSD1XM202/NTSD1WB203/NTSD1WC303 Type

(in mm)

Type	L (mm)
NTSD1_FPB30	30
NTSD1_FPB40	40
NTSD1_FPB50	50

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NTSD0 Series

Part Number	Resistance (25°C) (k ohm)	B-Constant (25-50°C) (K)	Permissive Operating Current (25°C) (mA)	Rated Electric Power (25°C) (mW)	Typical Dissipation Constant (25°C) (mW/°C)	Thermal Time Constant (25°C)(s)	Operating Temperature Range (°C)
NTSD0XM202□E1B0	2.0	3500 ±1%	1.05	21	2.1	7	-40 to 125
NTSD0XR502□E1B0	5.0	3700 ±1%	0.68	21	2.1	7	-40 to 125
NTSD0XH103□E1B0	10	3380 ±1%	0.38	15	1.5	7	-40 to 125
NTSD0XV103□E1B0	10	3900 ±1%	0.46	21	2.1	7	-40 to 125
NTSD0WB203□E1B0	20	4050 ±1%	0.31	21	2.1	7	-40 to 125
NTSD0WC303□E1B0	30	4100 ±1%	0.26	21	2.1	7	-40 to 125
NTSD0WD503□E1B0	50	4150 ±1%	0.20	21	2.1	7	-40 to 125
NTSD0WF104□E1B0	100	4250 ±1%	0.14	21	2.1	7	-40 to 125

A blank column is filled with resistance tolerance codes. (F: ±1%, E: ±3%)

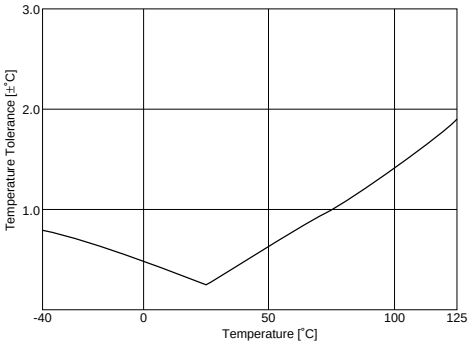
NTSD1 Series

Part Number	Resistance (25°C) (k ohm)	B-Constant (25-50°C) (K)	Permissive Operating Current (25°C) (mA)	Rated Electric Power (25°C) (mW)	Typical Dissipation Constant (25°C) (mW/°C)	Thermal Time Constant (25°C)(s)	Operating Temperature Range (°C)
NTSD1XM202FPB□□	2.0 ±1%	3500 ±1%	1.05	21	2.1	7	-40 to 125
NTSD1XR502FPB□□	5.0 ±1%	3700 ±1%	0.68	21	2.1	7	-40 to 125
NTSD1XH103FPB□□	10 ±1%	3380 ±1%	0.38	15	1.5	7	-40 to 125
NTSD1XV103FPB□□	10 ±1%	3900 ±1%	0.46	21	2.1	7	-40 to 125
NTSD1WB203FPB□□	20 ±1%	4050 ±1%	0.31	21	2.1	7	-40 to 125
NTSD1WC303FPB□□	30 ±1%	4100 ±1%	0.26	21	2.1	7	-40 to 125
NTSD1WD503FPB□□	50 ±1%	4150 ±1%	0.20	21	2.1	7	-40 to 125
NTSD1WF104FPB□□	100 ±1%	4250 ±1%	0.14	21	2.1	7	-40 to 125

A blank column is filled with Total-length codes. (30, 40, 50)

■ Temperature Tolerance-Temperature Characteristics

Resistance Tolerance +/-1% Type



for Temperature Sensor Temperature Characteristics (Center Value)

Part Number	NTS□□XM202	NTS□□XR502	NTS□□XH103	NTS□□XV103	NTS□□WB203	NTS□□WC303	NTS□□WD503	NTS□□WF104
Resistance	2.0kΩ	5.0kΩ	10kΩ	10kΩ	20kΩ	30kΩ	50kΩ	100kΩ
B-Constant	3500K	3700K	3380K	3900K	4050K	4100K	4150K	4250K
Temp. (°C)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)	Resistance (kΩ)
−40	44.657	123.484	195.652	347.808	733.007	1149.500	1948.575	4256.752
−35	33.505	92.295	148.171	248.591	524.831	819.651	1387.289	3005.888
−30	25.388	69.614	113.347	179.973	380.184	591.391	999.456	2148.514
−25	19.402	52.860	87.559	131.832	277.845	430.529	728.895	1555.020
−20	14.961	40.480	68.237	97.679	205.260	316.870	537.039	1137.312
−15	11.644	31.275	53.650	73.119	153.642	236.337	399.167	839.314
−10	9.133	24.339	42.506	55.301	116.016	177.842	299.469	625.338
−5	7.198	19.154	33.892	42.257	88.125	134.630	226.186	469.127
0	5.716	15.148	27.219	32.582	67.522	102.816	172.393	355.224
5	4.571	11.964	22.021	25.324	52.168	79.183	132.857	272.045
10	3.682	9.520	17.926	19.847	40.617	61.460	103.089	209.803
15	2.987	7.624	14.674	15.679	31.847	48.045	80.430	162.713
20	2.437	6.160	12.081	12.478	25.151	37.834	63.201	127.117
25	2.000	5.000	10.000	10.000	20.000	30.000	50.000	100.000
30	1.651	4.082	8.315	8.068	16.014	23.955	39.825	79.215
35	1.371	3.354	6.948	6.552	12.902	19.249	31.918	63.150
40	1.143	2.773	5.834	5.353	10.457	15.560	25.733	50.649
45	0.958	2.299	4.917	4.399	8.527	12.657	20.877	40.885
50	0.807	1.914	4.161	3.635	6.993	10.354	17.034	33.195
55	0.683	1.607	3.535	3.020	5.771	8.525	13.929	27.014
60	0.582	1.356	3.014	2.521	4.789	7.058	11.439	22.079
65	0.497	1.149	2.586	2.115	3.992	5.869	9.485	18.226
70	0.426	0.978	2.228	1.783	3.343	4.905	7.906	15.124
75	0.367	0.834	1.925	1.510	2.809	4.113	6.614	2.598
80	0.318	0.714	1.669	1.284	2.371	3.463	5.558	10.542
85	0.276	0.612	1.452	1.096	2.020	2.945	4.686	8.852
90	0.240	0.527	1.268	0.939	1.729	2.516	3.967	7.463
95	0.210	0.456	1.110	0.808	1.476	2.143	3.373	6.321
100	0.183	0.396	0.974	0.698	1.264	1.832	2.878	5.374
105	0.161	0.345	0.858	0.605	1.085	1.571	2.465	4.585
110	0.142	0.302	0.758	0.527	0.935	1.350	2.118	3.925
115	0.125	0.264	0.671	0.460	0.812	1.171	1.828	3.376
120	0.111	0.232	0.596	0.403	0.708	1.019	1.583	2.913
125	0.099	0.205	0.531	0.354	0.617	0.886	1.374	2.520

for Temperature Sensor Lead Type/Lead Insulation Type ⚠Caution/Notice

■ ⚠Caution (Storage and Operating Conditions)

This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).
Do not use under the following conditions because all these factors can deteriorate the product characteristics or cause failures and burn-out.

1. Corrosive gas or deoxidizing gas
   (Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
2. Volatile or flammable gas
3. Dusty conditions
4. Under high or low pressure
5. Wet or humid locations
6. Places with salt water, oils, chemical liquids or organic solvents
7. Strong vibrations
8. Other places where similar hazardous conditions exist

■ ⚠Caution (Others)

Be sure to provide an appropriate fail-safe function on your product to prevent secondary damages that may be caused by the abnormal function or the failure of our product.

■ Notice (Storage and Operating Conditions)

To keep solderability of product from declining, the following storage condition is recommended.

1. Storage condition:
   Temperature -10 to +40 degree C
   Humidity less than 75%RH (not dewing condition)
2. Storage term:
   Use this product within 6 months after delivery by first-in and first-out stocking system.
3. Handling after unpacking:
   After unpacking, reseal product promptly or store it in a sealed container with a drying agent.
4. Storage place:
   Do not store this product in corrosive gas (sulfuric acid gas, chlorine gas, etc.) or in direct sunlight.

■ Notice (Rating)

Use this product within the specified temperature range.
Higher temperature may cause deterioration of the characteristics or the material quality of this product.

■ Notice (Soldering and Mounting)

1. Be sure that the preheat-up does not melt the soldering of this product. Excessive heat may cause failure to open, short or insulation break down.
2. Do not touch the body with soldering iron.
   The soldering point should be min. 5mm away from the root of lead wire.

■ Notice (Handling)

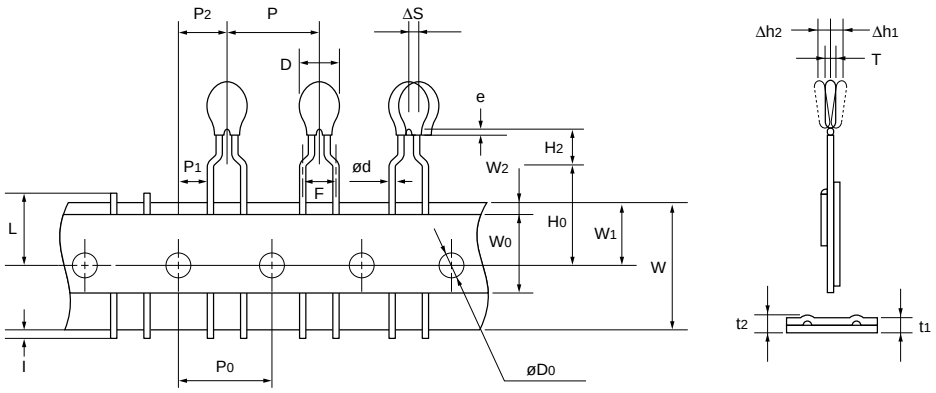
1. The ceramic element of this product is fragile, and care must be taken not to load an excessive press-force or not to give a shock at handling. Such forces may cause cracking or chipping.
2. Do not apply an excessive force to the lead.
   Otherwise, it may cause junction between lead and element to break or crack. Holding element by side lead wire is recommended when lead wire is bent or cut.

for Temperature Sensor Lead Type/Lead Insulation Type NTSA/NTSD Series Package

■ Minimum Quantity

Part Number	Minimum Quantity (pcs.)	
	Ammo Pack	Bulk
NTSA	3000	100
NTSD	-	100

■ Taping Dimensions (NTSA Series)



Item	Code	Dimensions (mm)
Pitch of Component	P	12.7
Pitch of Sprocket Hole	P_0	12.7±0.3
Lead Spacing	F	5.0+0.8/–0.2
Lead Length from Hole Center to Component Center	P_2	6.35±1.3
Lead Length from Hole Center to Lead	P_1	3.85±0.8
Body Diameter	D	3.5 max.
Deviation along Tape, Left or Right	ΔS	0±2.0
Carrier Tape Width	W	18.0±0.5
Position of Sprocket Hole	W_1	9.0±0.5
Lead Distance between Reference and Bottom Planes	H_0	16.0±1.0
Height of Component	H_2	4.0 max.
Overflow of Lead	I	+0.5 to –1.0
Diameter of Sprocket Hole	D_0	4.0±0.1
Lead Diameter	d	0.50±0.03
Total Tape Thickness	t_1	0.6±0.3
Total Thickness, Tape and Lead Wire	t_2	1.6 max.
Deviation across Tape	Δh_1, Δh_2	1.0 max.
Portion to Cut in Case of Defect	L	11.0+0/–2.0
Hole Down Tape Width	W_0	11.0 min.
Hole Down Tape Position	W_2	1.5±1.5
Coating Extension on Lead	e	Up to the crimp point
Thickness	T	2.6 max.

(in mm)