

**Document No.**

**TS-AS-04-38**

# APPROVAL SHEET

## Radial type NTC Thermistor

**PART NUMBER : LNTE502FW**

**CUSTOMER :**

**DATE :**

**You can re-approve only the changed quality request recorded in spec sheet.**

**And, We can decide other changed parts.**

<b>ESTABLISHMENT</b>	<b>2005-04-29</b>	<b>APPROVED</b>	<b>R&amp;D</b>	<b>QC</b>	<b>SALES</b>
<b>REVISION</b>	<b>0</b>				

MODEL	Radial type NTC Thermistor	Rev. No	0
		Rev. Date	2005.04.29
		Page No.	1 / 3

## THERMISTOR SPECIFICATIONS



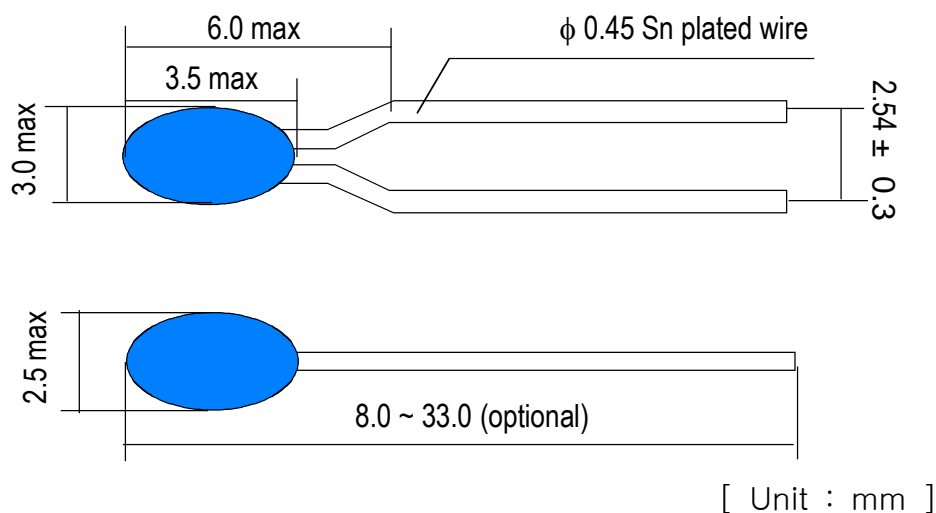
### 1. Scope

This specification covers shape, dimension, electric characteristics, reliability test, etc, for epoxy coated radial type NTC Thermistor.

### 2. Part No and Dimension

2.1) PART NO. : LNTE502FW

2.2) DIMENSIONS



### 3. Electrical Characteristics

3.1) Rated zero-power resistance.

$$R = 5.00k\Omega \pm 1\% \text{ (at } 25^{\circ}\text{C)}$$

3.2) B constant

$$B(25/50) : 3470K \pm 1\%$$

– The B constant is calculated using the zero-power resistance values measured at 25°C and 50°C.

3.3) Dissipation constant : 3mW/°C (min, in air)

3.4) Thermal time constant : 12sec (max, in air)

3.5) Operating temperature : -40°C ~ 120°C

Designed	C. H. Lee		Approved	K. S. Yang	
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MODEL	Radial type NTC Thermistor	Rev. No	0
		Rev. Date	2005.04.29
		Page No.	2 / 3

#### 4. Reliability Test

Test item	Test condition	Characteristics Drift
Dry Heat Test	Elements are placed in a oven of temp. at $110 \pm 5^{\circ}\text{C}$ for 1000 (+48, -0)hr.	( $\Delta R$ , $\Delta B$ ) after test are less than $\pm 1\%$ .
Cold Test	Elements are placed in an oil bath of temperature at $-30^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 1000 (+48, -0)hr.	( $\Delta R$ , $\Delta B$ ) after test are less than $\pm 1\%$ .
Thermal Shock Test	$-30^{\circ}\text{C}$ (oil bath, 30 minute) $\rightarrow$ RT(Air, under 1min) $\rightarrow 90^{\circ}\text{C}$ (oil bath, 30 minute) for 100 cycle.	( $\Delta R$ , $\Delta B$ ) after test are less than $\pm 1\%$
Damp Heat Test	Elements are placed in a chamber of temp. at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90~95%RH for 1344 (+48, -0)hr.	( $\Delta R$ , $\Delta B$ ) after test are less than $\pm 1\%$

#### 5. Mechanical Test

The sensor part of element shall fixed and then the static weight of 2.0kgf shall be applied to terminal for  $10 \pm 1$  sec. After test,  $\Delta R$  and  $\Delta B$  are less than 1%.

#### 6. Inspection standard

Inspection	Standard	Related item
Resistance value	$n = 20, Ac = 0, Re = 1$	3.1
B constant	$n = 20, Ac = 0, Re = 1$	3.2
Dimension	$n = 20, Ac = 0, Re = 1$	2.2

#### 7. Packing

Every 1,000ea (or 250ea : depends on the length of the thermistor lead) are made up into a PVC pack and packed into a box.

MODEL	Radial type NTC Thermistor	Rev. No	0
		Rev. Date	2005.04.29
		Page No.	3 / 3

### 8. Explanation of Part No.

ex) LNT    A    502    H    W    S    B  
           1        2        3        4        5        6        7

1	2	3	4	5	6	7
Type	B constant	Resistance value	R Value & B constant tolerance	Lead wire type	Lead wire form	Epoxy color
Epoxy coated radial type NTC Thermistor	According to nominated value A =3970K, K =3435K, ..... See the catalog or home page	502=50X10 <sup>2</sup> =5.00KΩ  10.18 = 10.18KΩ	F : R±1%,B±1% G : R±2%,B±2% H : R±3%,B±2% J : R±5%,B±2%	W : lead wire  R : lead frame	Empty : Kink type S : Straight type	Empty : Blue B : Black

### 9. Soldering Conditions

Soldering type : Hand soldering

3sec under at 270 ± 5°C.

1sec under at 300 ± 5°C.

※ Flow and reflow soldering are not available.

### ※ Appendix

Table A. R-T table about NTC Thermistor



## R-T data for LNTE 502FW

B25/50 3470 K  $\pm$  1%  
R25 5.00 k $\Omega$   $\pm$  1%

T( )	Rmin(k $\Omega$ )	Rcent(k $\Omega$ )	Rmax(k $\Omega$ )	DR(%)	DT( )
-40	104.2	108.5	113.0	4.16%	0.69
-39	98.4	102.4	106.6	4.10%	0.68
-38	92.9	96.7	100.6	4.04%	0.68
-37	87.8	91.3	95.0	3.98%	0.67
-36	83.0	86.3	89.7	3.92%	0.67
-35	78.5	81.6	84.7	3.86%	0.66
-34	74.3	77.1	80.1	3.80%	0.66
-33	70.3	73.0	75.7	3.74%	0.65
-32	66.58	69.0	71.6	3.69%	0.65
-31	63.06	65.36	67.7	3.63%	0.64
-30	59.76	61.90	64.11	3.57%	0.64
-29	56.64	58.64	60.70	3.52%	0.63
-28	53.71	55.58	57.50	3.46%	0.63
-27	50.95	52.69	54.48	3.41%	0.62
-26	48.35	49.97	51.65	3.35%	0.62
-25	45.89	47.41	48.97	3.30%	0.61
-24	43.58	45.00	46.45	3.24%	0.60
-23	41.39	42.72	44.08	3.19%	0.60
-22	39.33	40.57	41.84	3.14%	0.59
-21	37.39	38.54	39.73	3.08%	0.59
-20	35.55	36.63	37.74	3.03%	0.58
-19	33.81	34.83	35.86	2.98%	0.58
-18	32.17	33.12	34.09	2.93%	0.57
-17	30.62	31.51	32.41	2.88%	0.56
-16	29.15	29.98	30.83	2.83%	0.56
-15	27.77	28.54	29.33	2.77%	0.55
-14	26.45	27.18	27.92	2.72%	0.55
-13	25.21	25.89	26.58	2.67%	0.54
-12	24.03	24.66	25.31	2.62%	0.53
-11	22.91	23.51	24.11	2.58%	0.53
-10	21.86	22.41	22.98	2.53%	0.52
-9	20.85	21.37	21.90	2.48%	0.51
-8	19.90	20.39	20.88	2.43%	0.51
-7	19.00	19.46	19.92	2.38%	0.50
-6	18.15	18.57	19.00	2.33%	0.49
-5	17.33	17.73	18.14	2.29%	0.49
-4	16.56	16.93	17.31	2.24%	0.48
-3	15.83	16.18	16.53	2.19%	0.47
-2	15.13	15.46	15.79	2.15%	0.47
-1	14.47	14.78	15.09	2.10%	0.46
0	13.84	14.13	14.42	2.05%	0.45

T( )	Rmin(k $\Omega$ )	Rcent(k $\Omega$ )	Rmax(k $\Omega$ )	DR(%)	DT( )
1	13.25	13.51	13.78	2.01%	0.45
2	12.68	12.93	13.18	1.96%	0.44
3	12.14	12.37	12.61	1.92%	0.43
4	11.62	11.84	12.06	1.87%	0.42
5	11.13	11.34	11.54	1.83%	0.42
6	10.66	10.86	11.05	1.79%	0.41
7	10.22	10.40	10.58	1.74%	0.40
8	9.80	9.96	10.13	1.70%	0.39
9	9.39	9.55	9.71	1.66%	0.39
10	9.008	9.155	9.30	1.61%	0.38
11	8.642	8.778	8.916	1.57%	0.37
12	8.292	8.419	8.548	1.53%	0.36
13	7.958	8.077	8.197	1.49%	0.36
14	7.639	7.751	7.862	1.44%	0.35
15	7.336	7.439	7.543	1.40%	0.34
16	7.045	7.142	7.239	1.36%	0.33
17	6.768	6.858	6.949	1.32%	0.33
18	6.503	6.587	6.671	1.28%	0.32
19	6.250	6.328	6.407	1.24%	0.31
20	6.009	6.081	6.154	1.20%	0.30
21	5.778	5.845	5.913	1.16%	0.29
22	5.557	5.619	5.682	1.12%	0.28
23	5.345	5.404	5.462	1.08%	0.28
24	5.143	5.197	5.251	1.04%	0.27
25	4.950	5.000	5.050	1.00%	0.26
26	4.761	4.811	4.861	1.04%	0.27
27	4.581	4.631	4.680	1.08%	0.28
28	4.408	4.458	4.507	1.12%	0.29
29	4.243	4.292	4.342	1.15%	0.31
30	4.085	4.134	4.183	1.19%	0.32
31	3.933	3.982	4.031	1.23%	0.33
32	3.788	3.836	3.885	1.27%	0.34
33	3.649	3.697	3.745	1.31%	0.36
34	3.516	3.564	3.611	1.34%	0.37
35	3.388	3.436	3.483	1.38%	0.38
36	3.266	3.313	3.360	1.42%	0.39
37	3.149	3.195	3.242	1.45%	0.41
38	3.037	3.082	3.128	1.49%	0.42
39	2.929	2.974	3.019	1.53%	0.43
40	2.826	2.870	2.915	1.56%	0.44



### R-T data for LNTE 502FW

B25/50 3470 K  $\pm$  1%  
R25 5.00 k $\Omega$   $\pm$  1%

T( )	Rmin(k $\Omega$ )	Rcent(k $\Omega$ )	Rmax(k $\Omega$ )	DR(%)	DT( )
41	2.726	2.770	2.814	1.60%	0.46
42	2.631	2.674	2.718	1.63%	0.47
43	2.540	2.582	2.626	1.67%	0.48
44	2.452	2.494	2.537	1.70%	0.50
45	2.368	2.409	2.451	1.74%	0.51
46	2.287	2.328	2.369	1.78%	0.52
47	2.209	2.249	2.290	1.81%	0.54
48	2.134	2.174	2.214	1.84%	0.55
49	2.063	2.102	2.141	1.88%	0.56
50	1.994	2.032	2.071	1.91%	0.58
51	1.927	1.965	2.003	1.95%	0.59
52	1.864	1.901	1.938	1.98%	0.60
53	1.802	1.839	1.876	2.02%	0.62
54	1.743	1.779	1.816	2.05%	0.63
55	1.686	1.722	1.758	2.08%	0.64
56	1.632	1.666	1.702	2.12%	0.66
57	1.579	1.613	1.648	2.15%	0.67
58	1.528	1.562	1.596	2.18%	0.69
59	1.480	1.513	1.546	2.21%	0.70
60	1.433	1.465	1.498	2.25%	0.72
61	1.387	1.419	1.452	2.28%	0.73
62	1.344	1.375	1.407	2.31%	0.74
63	1.302	1.333	1.364	2.34%	0.76
64	1.261	1.292	1.322	2.38%	0.77
65	1.222	1.252	1.282	2.41%	0.79
66	1.1847	1.214	1.243	2.44%	0.80
67	1.1484	1.1769	1.2060	2.47%	0.82
68	1.1134	1.1414	1.1700	2.50%	0.83
69	1.0797	1.1071	1.1352	2.53%	0.85
70	1.0471	1.0741	1.1016	2.57%	0.86
71	1.0156	1.0421	1.0692	2.60%	0.88
72	0.9853	1.0113	1.0378	2.63%	0.89
73	0.9560	0.9815	1.0076	2.66%	0.91
74	0.9277	0.9527	0.9784	2.69%	0.93
75	0.9004	0.9250	0.9501	2.72%	0.94
76	0.8740	0.8981	0.9228	2.75%	0.96
77	0.8485	0.8722	0.8964	2.78%	0.97
78	0.8239	0.8471	0.8709	2.81%	0.99
79	0.8001	0.8228	0.8462	2.84%	1.00
80	0.7770	0.7994	0.8223	2.87%	1.02

T( )	Rmin(k $\Omega$ )	Rcent(k $\Omega$ )	Rmax(k $\Omega$ )	DR(%)	DT( )
81	0.7548	0.7767	0.7993	2.90%	1.04
82	0.7333	0.7548	0.7769	2.93%	1.05
83	0.7125	0.7336	0.7553	2.96%	1.07
84	0.6924	0.7131	0.7344	2.99%	1.08
85	0.6729	0.6933	0.7142	3.02%	1.10
86	0.6541	0.6740	0.6946	3.04%	1.12
87	0.6358	0.6554	0.6756	3.07%	1.13
88	0.6182	0.6374	0.6572	3.10%	1.15
89	0.6011	0.6200	0.6394	3.13%	1.17
90	0.5846	0.6031	0.6221	3.16%	1.18
91	0.5686	0.5867	0.6054	3.19%	1.20
92	0.5530	0.5709	0.5892	3.22%	1.22
93	0.5380	0.5555	0.5735	3.24%	1.23
94	0.5235	0.5406	0.5583	3.27%	1.25
95	0.5093	0.5262	0.5436	3.30%	1.27
96	0.4957	0.5122	0.5293	3.33%	1.28
97	0.4824	0.4987	0.5154	3.36%	1.30
98	0.4696	0.4855	0.5019	3.38%	1.32
99	0.4571	0.4727	0.4889	3.41%	1.34
100	0.4450	0.4604	0.4762	3.44%	1.35
101	0.4333	0.4483	0.4639	3.47%	1.37
102	0.4219	0.4367	0.4519	3.49%	1.39
103	0.4109	0.4254	0.4403	3.52%	1.41
104	0.4001	0.4144	0.4291	3.55%	1.42
105	0.3897	0.4037	0.4181	3.57%	1.44
106	0.3796	0.3934	0.4075	3.60%	1.46
107	0.3698	0.3833	0.3972	3.63%	1.48
108	0.3603	0.3735	0.3872	3.65%	1.49
109	0.3511	0.3640	0.3774	3.68%	1.51
110	0.3421	0.3548	0.3679	3.71%	1.53
111	0.3333	0.3458	0.3587	3.73%	1.55
112	0.3249	0.3371	0.3498	3.76%	1.57
113	0.3166	0.3286	0.3411	3.79%	1.59
114	0.3086	0.3204	0.3326	3.81%	1.60
115	0.3008	0.3124	0.3244	3.84%	1.62
116	0.2932	0.3046	0.3163	3.87%	1.64
117	0.2858	0.2970	0.3085	3.89%	1.66
118	0.2786	0.2896	0.3009	3.92%	1.68
119	0.2717	0.2824	0.2935	3.94%	1.70
120	0.2649	0.2754	0.2864	3.97%	1.72