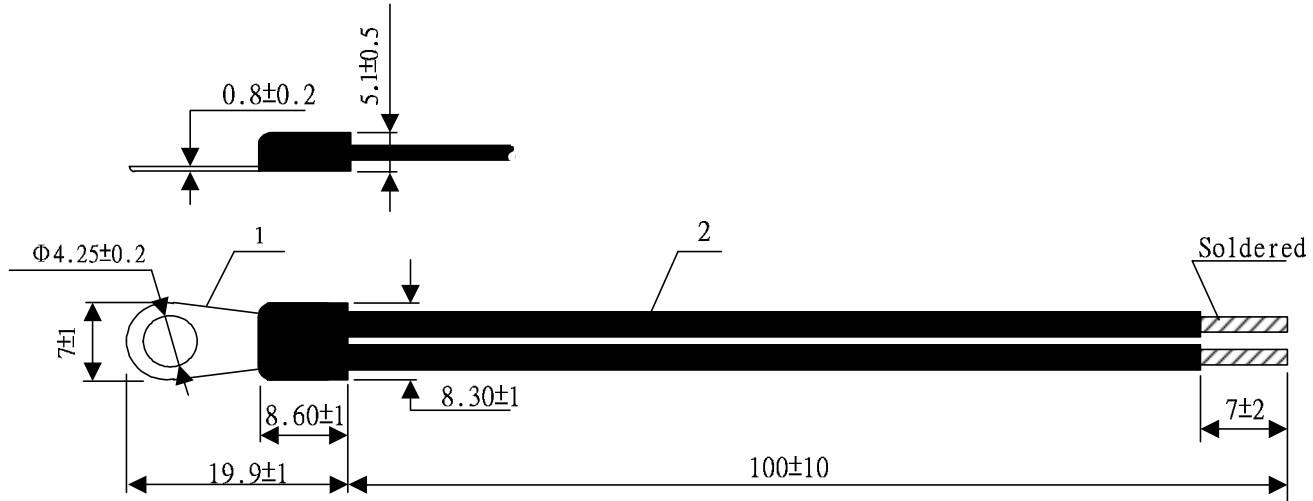


**A. Material List**

NO.	ITEM	DESCRIPTION
1	TERMINAL	MA242519II101000
2	COATING RESIN	UL3266#24 TS BLACK WIRE

**B. Electrical Characteristic**

ITEM	VALUE
R25°C	5KΩ±1%
B25/85°C	3435K±2%



						Customer	
						Customer P/N	
						Thinking P/N	NTSA0502FZ148
						Drawing NO.	SA1410009
						Date	2014/10/10
						Scale:	Tol: ±mm Unit: mm
1.0	2014/10/10	New Released	HE MEI QIONG	HU FENG	FM CHU	THINKING ELECTRONIC INDUSTRIAL CO.,LTD	
Rev.	Date	Subjects of Change	Designed by	Checked by	Approved by		

# THINKING ELECTRONIC INDUSTRIAL CO., LTD

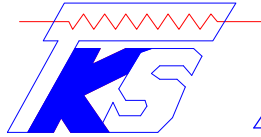
## SUBJECT: CERTIFICATION OF MATERIALS

CUSTOMER:

THINKING P/N: NTSA0502FZ148

NO	PART NAME	PART P/N	Q'TY	FLAMMABILITY SOLID BURNING CLASS	UL FILE NO
1	TERMINAL	MA242519II101000	1		
2	TUBE	UL3266#24 TS BLACK WIRE	2	VW-1	UL APPROVED
REMARK					
REMARK					
REMARK					

Approved by: FM CHU    Checked by: HU FENG    Designed by: HE MEI QIONG



**Specification of NTC Thermistor for Temperature Measurement and Control**

**PART NO.** NTSA0502FZ148

**CUSTOMER P/N.** \_\_\_\_\_

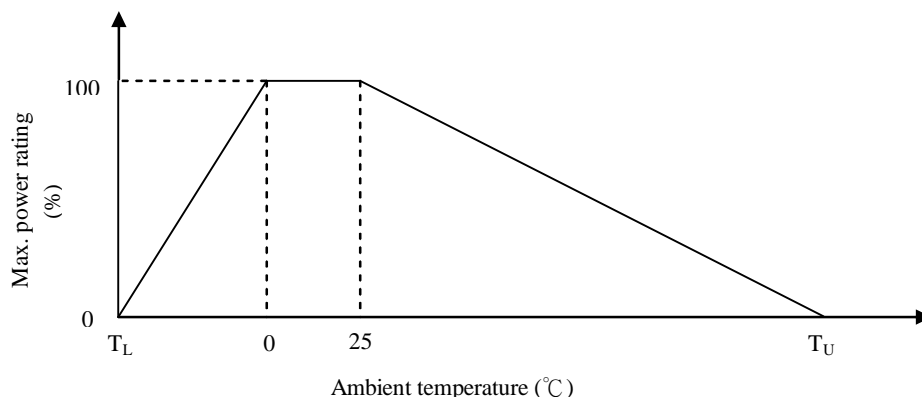
**1. Electrical characteristics**

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit.
a.	Resistance At 25°C	R <sub>25</sub>	T <sub>a</sub> =25°C±0.05°C P <sub>T</sub> ≤0.1mW	4.95	5.00	5.05	KΩ
b.	Resistance At 85°C	R <sub>85</sub>	T <sub>a</sub> =85°C±0.05°C P <sub>T</sub> ≤0.1mW	-----	0.726	-----	KΩ
c.	R <sub>25</sub> /R <sub>85</sub>	K	-----	-----	6.890	-----	-----
d	B Constant	B <sub>25/85</sub>	(1779.707* LnK)	3366	3435	3504	K
e.	Thermal Dissipation Constant	δ	T <sub>a</sub> =25°C±0.05°C	-----	Approx.7	-----	mW/°C
f.	Thermal Time Constant	τ	T <sub>a</sub> =25°C±0.05°C	-----	Approx.20	-----	Sec
g.	Hi-Pot Test	-----	1000V AC 3 sec	-----	-----	10	mA

**2. Maximum Ratings**

	Parameter	Specification	Unit
a.	Operation Temperature Range	-20 ----- +125	°C
b.	Maximum Power Rating (At 25°C)	150	mW

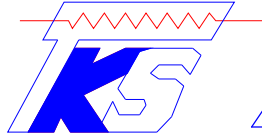
**Maximum power rating (Pmax)**



Note: T<sub>L</sub> = Minimum Temp. of Operating Temp. Range (°C)

T<sub>U</sub> = Maximum Temp. of Operating Temp. Range (°C)

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## Specification of NTC Thermistor for Temperature Compensation

### 3. Mechanical Characteristics

#### Leads Terminal Tensile Strength

Conditions	Test Result	
Fasten body with a Load Applied to each lead 1.0 kg for 10 sec.	No break out	OK
	and damage	

### 4. Reliability Test

Item	Test Conditions	Variable
Temp. cycle test	-20 °C X 30min → +25 °C X 5min X 10Cycles +125 °C X 30min → +25 °C X 5min	Within ± 5 %
Humidity test	40 °C 95 % RH X 1000 HRS	Within ± 5 %
Insulation test	DC 500 V	MIN: 100 MΩ

## **Install and use**

1. Use this product within the specified temperature range.
2. Higher temperature may cause deterioration of the characteristics or the material quality of this product.
3. Do not melt the solder in resin head, when you solder this product. If you melt the solder in resin head, it has possibility that the break of wire, short and insulation damage.
4. Do not touch the resin head directly by solder iron. It may cause the melt of solder in resin head.
5. At least away from resin head 10mm above when lead dividing.
6. In case you cut the lead wire of this product less than 10mm from resin head, the heat of melted solder at lead wire edge is propagated easily to the resin head along the lead wire.
7. Radius of lead bending should be more than 1mm when lead bending.  
Holding element by side lead wire is recommended when lead wire is bent or cut.
8. Do not apply an excessive force to the lead. Otherwise, it may cause junction between lead and element to break or crack.
9. 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.
10. If you mold by resin this product, please evaluate the quality of this product before you use it.

## **Storage place condition**

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

1. Storage condition:

Temperature -10°C to +40°C

Humidity less than 75%RH (not dewing condition)

2. Storage term:

Use this product within 1 year 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:

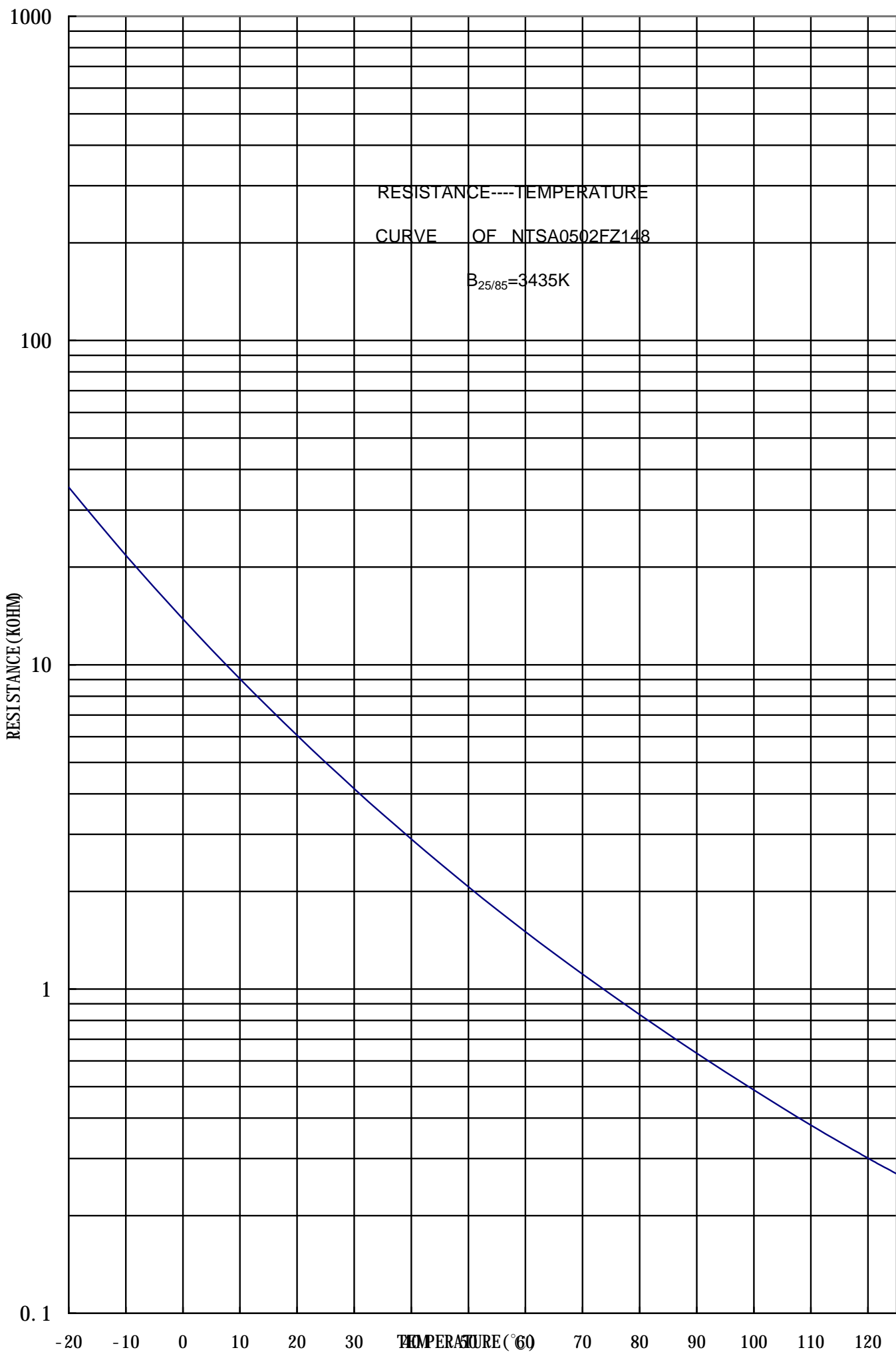
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

## **Warn and note item**

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 of 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 vacuum, or under high or low pressure
5. Wet or humid locations; soak in the liquid or wash with liquid
6. Places with salt water, oils, chemical liquids or organic solvents and do not use directly with quick-drying glue.
7. Strong vibrations
8. Other places where similar hazardous conditions exist
9. 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.



## R-T TABLE

Part No: NTSA0502FZ148

$R_{25^{\circ}\text{C}} = 5\text{K}\Omega \pm 1\%$

$B_{25/85^{\circ}\text{C}} = 3435\text{K} \pm 2\%$

T	Rmax.	Rnor.	Rmin.	Temp. Tolerance	
(°C)	(KΩ)	(KΩ)	(KΩ)	(°C)	
-20	37.076	35.302	33.609	-0.97	0.98
-19	35.234	33.581	32.003	-0.96	0.97
-18	33.495	31.955	30.484	-0.95	0.96
-17	31.853	30.419	29.046	-0.93	0.94
-16	30.302	28.966	27.686	-0.92	0.93
-15	28.836	27.592	26.398	-0.91	0.92
-14	27.451	26.292	25.179	-0.89	0.90
-13	26.141	25.061	24.024	-0.88	0.89
-12	24.903	23.897	22.929	-0.86	0.88
-11	23.731	22.794	21.892	-0.85	0.86
-10	22.622	21.749	20.908	-0.84	0.85
-9	21.572	20.759	19.975	-0.82	0.84
-8	20.578	19.821	19.089	-0.81	0.82
-7	19.636	18.930	18.249	-0.79	0.81
-6	18.743	18.086	17.450	-0.78	0.79
-5	17.896	17.284	16.692	-0.76	0.78
-4	17.092	16.523	15.972	-0.75	0.76
-3	16.330	15.800	15.287	-0.73	0.75
-2	15.606	15.114	14.635	-0.72	0.73
-1	14.919	14.461	14.015	-0.70	0.72
0	14.266	13.840	13.425	-0.69	0.70
1	13.645	13.249	12.864	-0.67	0.69
2	13.055	12.687	12.329	-0.65	0.67
3	12.494	12.152	11.819	-0.64	0.65
4	11.960	11.643	11.333	-0.62	0.64
5	11.452	11.158	10.870	-0.61	0.62
6	10.968	10.696	10.429	-0.59	0.61
7	10.507	10.255	10.008	-0.57	0.59
8	10.069	9.8349	9.6057	-0.56	0.57
9	9.6504	9.4343	9.2221	-0.54	0.56
10	9.2518	9.0521	8.8558	-0.52	0.54
11	8.8718	8.6874	8.5060	-0.51	0.52
12	8.5093	8.3393	8.1719	-0.49	0.50
13	8.1636	8.0070	7.8526	-0.47	0.49
14	7.8337	7.6896	7.5475	-0.45	0.47
15	7.5188	7.3865	7.2558	-0.44	0.45
16	7.2183	7.0969	6.9769	-0.42	0.43
17	6.9312	6.8201	6.7101	-0.40	0.42
18	6.6571	6.5556	6.4550	-0.38	0.40
19	6.3953	6.3027	6.2108	-0.37	0.38

**R-T TABLE**

Part No: NTSA0502FZ148

 $R_{25^{\circ}\text{C}}=5\text{K}\Omega\pm 1\%$  $B_{25/85^{\circ}\text{C}}=3435\text{K}\pm 2\%$ 

<b>T</b>	<b>Rmax.</b>	<b>Rnor.</b>	<b>Rmin.</b>	<b>Temp. Tolerance</b>	
(°C)	(KΩ)	(KΩ)	(KΩ)	(°C)	
20	6.1451	6.0609	5.9772	-0.35	0.36
21	5.9060	5.8296	5.7536	-0.33	0.34
22	5.6774	5.6083	5.5395	-0.31	0.33
23	5.4589	5.3966	5.3344	-0.29	0.31
24	5.2499	5.1939	5.1381	-0.28	0.29
25	5.0500	5.0000	4.9500	-0.26	0.27
26	4.8661	4.8143	4.7626	-0.28	0.29
27	4.6900	4.6365	4.5832	-0.30	0.31
28	4.5211	4.4662	4.4116	-0.32	0.33
29	4.3592	4.3031	4.2473	-0.34	0.36
30	4.2040	4.1468	4.0900	-0.37	0.38
31	4.0551	3.9971	3.9394	-0.39	0.40
32	3.9124	3.8535	3.7952	-0.41	0.42
33	3.7754	3.7159	3.6570	-0.43	0.45
34	3.6440	3.5840	3.5246	-0.45	0.47
35	3.5178	3.4574	3.3977	-0.48	0.49
36	3.3968	3.3360	3.2761	-0.50	0.52
37	3.2805	3.2196	3.1595	-0.52	0.54
38	3.1689	3.1079	3.0477	-0.55	0.56
39	3.0617	3.0006	2.9404	-0.57	0.58
40	2.9588	2.8977	2.8376	-0.59	0.61
41	2.8598	2.7988	2.7389	-0.62	0.63
42	2.7648	2.7039	2.6442	-0.64	0.66
43	2.6734	2.6128	2.5533	-0.66	0.68
44	2.5855	2.5252	2.4660	-0.69	0.70
45	2.5010	2.4410	2.3822	-0.71	0.73
46	2.4198	2.3601	2.3017	-0.74	0.75
47	2.3416	2.2824	2.2244	-0.76	0.78
48	2.2664	2.2076	2.1501	-0.79	0.80
49	2.1941	2.1357	2.0787	-0.81	0.82
50	2.1244	2.0666	2.0101	-0.84	0.85
51	2.0574	2.0000	1.9441	-0.86	0.87
52	1.9928	1.9360	1.8806	-0.89	0.90
53	1.9306	1.8744	1.8196	-0.91	0.92
54	1.8707	1.8150	1.7608	-0.94	0.95
55	1.8130	1.7579	1.7043	-0.96	0.97
56	1.7574	1.7029	1.6499	-0.99	1.00
57	1.7037	1.6499	1.5975	-1.02	1.02
58	1.6520	1.5988	1.5471	-1.04	1.05
59	1.6022	1.5496	1.4986	-1.07	1.08
60	1.5541	1.5021	1.4518	-1.09	1.10
61	1.5077	1.4564	1.4067	-1.12	1.13
62	1.4629	1.4123	1.3632	-1.15	1.15



**R-T TABLE**

Part No: NTSA0502FZ148

 $R_{25^{\circ}\text{C}}=5\text{K}\Omega\pm 1\%$  $B_{25/85^{\circ}\text{C}}=3435\text{K}\pm 2\%$ 

<b>T</b>	<b>Rmax.</b>	<b>Rnor.</b>	<b>Rmin.</b>	<b>Temp. Tolerance</b>	
(°C)	(KΩ)	(KΩ)	(KΩ)	(°C)	
63	1.4197	1.3697	1.3213	-1.17	1.18
64	1.3780	1.3287	1.2810	-1.20	1.20
65	1.3377	1.2890	1.2420	-1.23	1.23
66	1.2988	1.2508	1.2045	-1.26	1.26
67	1.2612	1.2139	1.1682	-1.28	1.28
68	1.2250	1.1783	1.1332	-1.31	1.31
69	1.1899	1.1439	1.0995	-1.34	1.33
70	1.1560	1.1106	1.0669	-1.36	1.36
71	1.1232	1.0785	1.0354	-1.39	1.39
72	1.0915	1.0475	1.0051	-1.42	1.41
73	1.0609	1.0175	0.97572	-1.45	1.44
74	1.0313	0.98847	0.94737	-1.48	1.47
75	1.0026	0.96044	0.91997	-1.50	1.49
76	0.97484	0.93333	0.89349	-1.53	1.52
77	0.94800	0.90711	0.86790	-1.56	1.55
78	0.92202	0.88175	0.84316	-1.59	1.57
79	0.89687	0.85721	0.81923	-1.62	1.60
80	0.87252	0.83347	0.79609	-1.64	1.63
81	0.84893	0.81049	0.77371	-1.67	1.65
82	0.82610	0.78825	0.75206	-1.70	1.68
83	0.80397	0.76671	0.73111	-1.73	1.71
84	0.78254	0.74586	0.71084	-1.76	1.73
85	0.76178	0.72567	0.69121	-1.79	1.76
86	0.74165	0.70612	0.67222	-1.82	1.79
87	0.72215	0.68718	0.65383	-1.85	1.82
88	0.70325	0.66882	0.63602	-1.88	1.84
89	0.68492	0.65104	0.61878	-1.91	1.87
90	0.66715	0.63381	0.60208	-1.93	1.90
91	0.64992	0.61712	0.58591	-1.96	1.93
92	0.63321	0.60093	0.57024	-1.99	1.96
93	0.61701	0.58524	0.55506	-2.02	1.98
94	0.60129	0.57004	0.54035	-2.06	2.01
95	0.58605	0.55529	0.52610	-2.09	2.04
96	0.57125	0.54099	0.51229	-2.12	2.07
97	0.55690	0.52713	0.49890	-2.15	2.10
98	0.54298	0.51368	0.48592	-2.18	2.13
99	0.52947	0.50064	0.47334	-2.21	2.16
100	0.51636	0.48800	0.46115	-2.24	2.19
101	0.50363	0.47573	0.44933	-2.27	2.22
102	0.49128	0.46383	0.43786	-2.31	2.25
103	0.47929	0.45228	0.42675	-2.34	2.28
104	0.46765	0.44108	0.41597	-2.37	2.31
105	0.45636	0.43021	0.40552	-2.41	2.34
106	0.44539	0.41966	0.39538	-2.44	2.37

## R-T TABLE

Part No: NTSA0502FZ148

$R_{25^{\circ}\text{C}} = 5\text{K}\Omega \pm 1\%$

$B_{25/85^{\circ}\text{C}} = 3435\text{K} \pm 2\%$

T	Rmax.	Rnor.	Rmin.	Temp. Tolerance	
(°C)	(KΩ)	(KΩ)	(KΩ)	(°C)	
107	0.43475	0.40943	0.38555	-2.47	2.41
108	0.42441	0.39950	0.37601	-2.51	2.44
109	0.41438	0.38986	0.36676	-2.54	2.47
110	0.40463	0.38051	0.35779	-2.58	2.50
111	0.39518	0.37144	0.34909	-2.62	2.54
112	0.38599	0.36263	0.34065	-2.65	2.57
113	0.37707	0.35408	0.33246	-2.69	2.61
114	0.36841	0.34579	0.32452	-2.73	2.64
115	0.36001	0.33774	0.31682	-2.77	2.68
116	0.35184	0.32993	0.30934	-2.81	2.71
117	0.34392	0.32234	0.30209	-2.84	2.75
118	0.33622	0.31498	0.29506	-2.89	2.79
119	0.32875	0.30784	0.28824	-2.93	2.83
120	0.32149	0.30091	0.28162	-2.97	2.87
121	0.31444	0.29418	0.27520	-3.01	2.91
122	0.30760	0.28765	0.26897	-3.06	2.95
123	0.30096	0.28132	0.26293	-3.10	2.99
124	0.29452	0.27517	0.25707	-3.15	3.03
125	0.28826	0.26920	0.25138	-3.19	3.08