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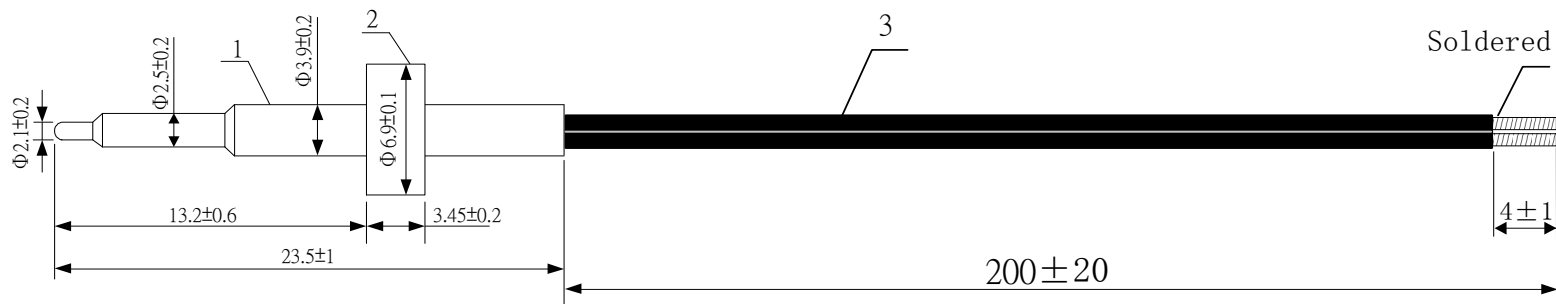
SPECIFICATION FOR APPROVAL

CUSTOMER	TRG-ORAS
CERTIFIED MODEL/TYPE	NTSF0103
PART NO.	NTSF0103HZD08(RoHS)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Oct.12.2015
REV. NO	1.0
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	HuFeng
	APPROVED BY
	IM Lu



A. Material List		
NO.	ITEM	DESCRIPTION
*	THERMISTOR	NTC Thermistor
1	Cap	Stainless steel 316L
2	Ring	Brass
3	Lead Wire	UL2651#30 TS (BLACK)
B. Electrical Characteristic		
ITEM	VALUE	
R25°C	10KΩ± 3%	
B25/85	3984K±0.5%	



							Customer	TRG-ORAS	
							Customer P/N		
							Thinking P/N	NTSF0103HZD08	
							Drawing NO.	SF1610008	
							Date	2016/10/12	
							Tol: ±mm	Unit: mm	Scale:
1.0	2016/10/12	New Released		Mengzhibin	HuFeng	IMLu	<i>THINKING ELECTRONIC INDUSTRIAL CO.,LTD</i>		
Rev.	Date	Subjects of Change	ECN No.	Designed by	Checked by	Approved by			



THINKING ELECTRONIC INDUSTRIAL CO.,LTD

SUBJECT: CERTIFICATION OF MATERIALS

CUSTOMER: TRG-ORAS

THINKING P/N: NTSF0103HZD08

NO	PART NAME	PART P/N	Q'TY	FLAMMABILITY SOLID BURNING CLASS	UL FILE NO
*	THERMISTOR	NTC THERMISTOR	1		
1	Cap	Stainless steel 316L	1		
2	Ring	Brass	1		
3	Lead Wire	UL2651#30 TS (BLACK)	1		
REMARK					

Approved by: IM Lu Checked by: HuFeng Designed by: Mengzhibin

Specification of NTC Thermistor for Temperature Measurement and Control

PART NO. NTSF0103HZD08

CUSTOMER P/N. _____

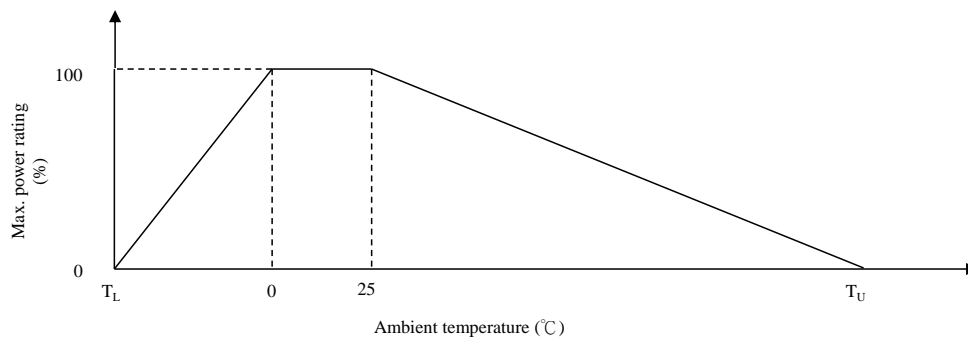
1. Electrical characteristics

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit.
a.	Resistance At 25°C	R25	Ta=25°C±0.01°C P _T ≤0.1mW	9.700	10.000	10.300	KΩ
b.	B Constant	B25/85	1779.707* Ln(R25/R85)	3964	3984	4004	K
c.	Thermal Dissipation Constant (in air)	δ	Ta=25°C	-----	approx 2.8	-----	mW/°C
d.	Thermal Time Constant (in water)	τ	25°C→85°C T1=25+(85-25)*63.2%=62.9°C	-----	approx 5.6	-----	Sec
e.	Hi-Pot Test	-----	500V AC 1sec	-----	-----	10	mA
f.	Insulation test	-----	DC 100V	100	-----	-----	MΩ

2. Maximum Ratings

	Parameter	Specification	Unit
a.	Operation Temperature Limit	-40----- +105	°C
b.	Maximum power rating	4	m W

Max. Power Dissipation Derating Curve



Note: T_L = Minimum Temp. of Operating Temp. Range (°C)

T_U = Maximum Temp. of Operating Temp. Range (°C)

3. Reliability Test

Item	Test Conditions	Variable
Temp. cycle test	$\left. \begin{matrix} -40^{\circ}\text{C} \times 30\text{min} \rightarrow +25^{\circ}\text{C} \times 5\text{min} \\ +105^{\circ}\text{C} \times 30\text{min} \rightarrow +25^{\circ}\text{C} \times 5\text{min} \end{matrix} \right\} \times 5\text{Cycles}$	Within ± 3 %
Low temp.test	-40± 5°C X 1000 HRS	Within ± 3 %
High temp.test	105± 5°C X 1000 HRS	Within ± 3 %
Humidity test	40 °C 95 % RH × 1000 HRS	Within ± 3 %

*This product is made by high temperature resistant glass which contains lead.

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.

Warehouse Storage Conditions of Products

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:

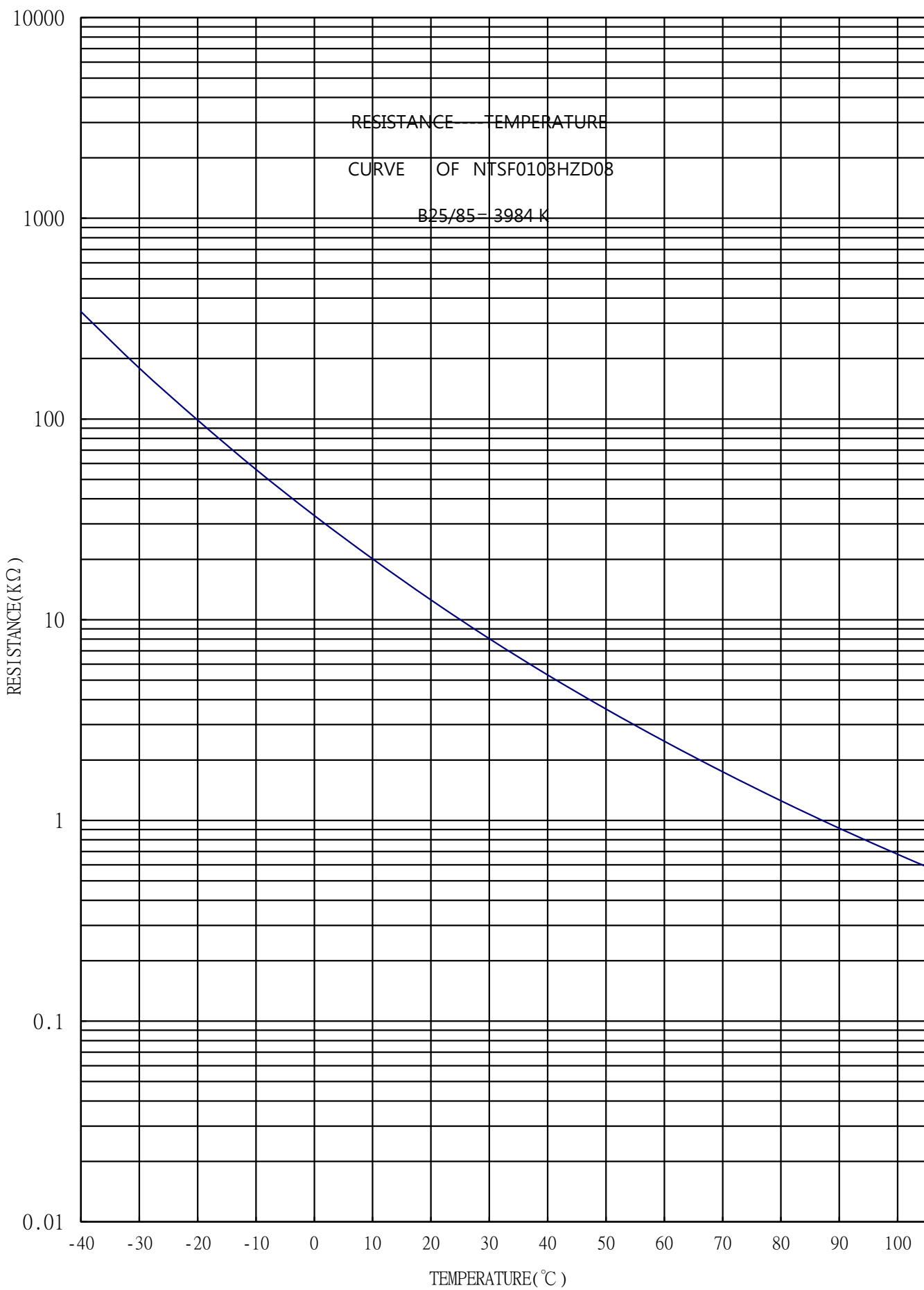
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

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. : NTSF0103HZD08

R25 = 10 K Ω \pm 3%B25/85 = 3984 K \pm 0.5%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
-40	359.06	342.49	326.40	-0.71	0.74
-39	335.43	320.07	305.13	-0.71	0.74
-38	313.51	299.25	285.38	-0.71	0.74
-37	293.20	279.96	267.07	-0.71	0.74
-36	274.41	262.10	250.12	-0.71	0.74
-35	257.01	245.57	234.42	-0.71	0.74
-34	240.91	230.25	219.87	-0.71	0.74
-33	225.99	216.06	206.38	-0.71	0.74
-32	212.14	202.89	193.86	-0.71	0.74
-31	199.28	190.64	182.22	-0.71	0.74
-30	187.30	179.24	171.37	-0.71	0.74
-29	176.13	168.60	161.25	-0.71	0.74
-28	165.70	158.67	151.79	-0.71	0.74
-27	155.95	149.38	142.95	-0.71	0.74
-26	146.83	140.68	134.67	-0.71	0.74
-25	138.28	132.525	126.90	-0.71	0.74
-24	130.26	124.88	119.61	-0.70	0.73
-23	122.74	117.70	112.77	-0.70	0.73
-22	115.68	110.97	106.35	-0.70	0.73
-21	109.06	104.65	100.32	-0.70	0.73
-20	102.84	98.711	94.660	-0.70	0.73
-19	97.007	93.137	89.340	-0.69	0.73
-18	91.529	87.902	84.343	-0.69	0.72
-17	86.386	82.987	79.651	-0.69	0.72
-16	81.559	78.373	75.243	-0.69	0.72
-15	77.028	74.040	71.103	-0.69	0.72
-14	72.775	69.972	67.215	-0.69	0.72
-13	68.782	66.151	63.563	-0.69	0.72
-12	65.033	62.563	60.132	-0.69	0.72
-11	61.513	59.193	56.909	-0.69	0.72
-10	58.206	56.026	53.879	-0.69	0.72
-9	55.098	53.049	51.030	-0.69	0.72
-8	52.177	50.250	48.351	-0.69	0.72
-7	49.431	47.618	45.830	-0.69	0.72
-6	46.846	45.141	43.458	-0.69	0.72
-5	44.414	42.808	41.223	-0.69	0.72
-4	42.124	40.611	39.118	-0.69	0.72
-3	39.966	38.541	37.134	-0.69	0.72
-2	37.932	36.589	35.262	-0.69	0.72
-1	36.013	34.747	33.496	-0.69	0.72
0	34.203	33.009	31.828	-0.69	0.72

R - T Table

Part No. : NTSF0103HZD08

R25 = 10 K Ω \pm 3%B25/85 = 3984 K \pm 0.5%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
1	32.494	31.368	30.253	-0.69	0.72
2	30.880	29.817	28.765	-0.69	0.72
3	29.355	28.351	27.358	-0.68	0.72
4	27.912	26.965	26.027	-0.68	0.72
5	26.549	25.654	24.768	-0.68	0.71
6	25.258	24.414	23.576	-0.68	0.71
7	24.037	23.239	22.447	-0.68	0.71
8	22.881	22.127	21.378	-0.68	0.71
9	21.786	21.073	20.365	-0.68	0.71
10	20.749	20.075	19.405	-0.68	0.71
11	19.766	19.129	18.495	-0.67	0.71
12	18.835	18.232	17.632	-0.67	0.71
13	17.952	17.381	16.813	-0.67	0.70
14	17.115	16.574	16.037	-0.67	0.70
15	16.321	15.809	15.300	-0.67	0.70
16	15.568	15.083	14.601	-0.67	0.70
17	14.853	14.395	13.937	-0.67	0.70
18	14.176	13.741	13.307	-0.66	0.70
19	13.532	13.120	12.709	-0.66	0.70
20	12.922	12.531	12.141	-0.66	0.70
21	12.342	11.972	11.602	-0.66	0.70
22	11.791	11.440	11.089	-0.66	0.69
23	11.268	10.935	10.603	-0.66	0.69
24	10.772	10.456	10.140	-0.66	0.69
25	10.300	10.000	9.7000	-0.66	0.69
26	9.8560	9.5668	9.2777	-0.67	0.70
27	9.4337	9.1549	8.8763	-0.68	0.71
28	9.0321	8.7633	8.4947	-0.69	0.72
29	8.6500	8.3907	8.1319	-0.70	0.73
30	8.2864	8.0363	7.7867	-0.71	0.74
31	7.9404	7.6990	7.4583	-0.72	0.75
32	7.6109	7.3780	7.1457	-0.73	0.76
33	7.2970	7.0723	6.8482	-0.74	0.77
34	6.9981	6.7811	6.5649	-0.75	0.78
35	6.7133	6.5037	6.2951	-0.76	0.79
36	6.4417	6.2394	6.0379	-0.77	0.80
37	6.1829	5.9874	5.7929	-0.78	0.81
38	5.9360	5.7471	5.5593	-0.79	0.82
39	5.7004	5.5179	5.3365	-0.80	0.83
40	5.4756	5.2993	5.1240	-0.81	0.84
41	5.2610	5.0906	4.9212	-0.82	0.85

R - T Table

Part No. : NTSF0103HZD08

R25 = 10 K Ω \pm 3%B25/85 = 3984 K \pm 0.5%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
42	5.0561	4.8913	4.7276	-0.83	0.86
43	4.8604	4.7010	4.5428	-0.84	0.87
44	4.6733	4.5192	4.3663	-0.85	0.88
45	4.4945	4.3455	4.1976	-0.86	0.89
46	4.3236	4.1794	4.0364	-0.87	0.90
47	4.1602	4.0206	3.8823	-0.88	0.91
48	4.0038	3.8688	3.7349	-0.89	0.92
49	3.8541	3.7234	3.5939	-0.90	0.93
50	3.7109	3.5844	3.4590	-0.91	0.94
51	3.5737	3.4512	3.3299	-0.92	0.95
52	3.4424	3.3238	3.2063	-0.93	0.96
53	3.3165	3.2016	3.0880	-0.94	0.97
54	3.1959	3.0847	2.9746	-0.95	0.98
55	3.0803	2.9725	2.8659	-0.96	0.99
56	2.9695	2.8651	2.7618	-0.97	1.00
57	2.8632	2.7620	2.6620	-0.98	1.01
58	2.7613	2.6632	2.5663	-0.99	1.02
59	2.6635	2.5684	2.4745	-1.00	1.03
60	2.5696	2.4775	2.3864	-1.01	1.04
61	2.4796	2.3902	2.3019	-1.02	1.05
62	2.3931	2.3064	2.2209	-1.03	1.06
63	2.3100	2.2260	2.1430	-1.05	1.07
64	2.2303	2.1487	2.0683	-1.06	1.08
65	2.1536	2.0745	1.9965	-1.07	1.09
66	2.0800	2.0033	1.9276	-1.08	1.11
67	2.0093	1.9348	1.8614	-1.09	1.12
68	1.9413	1.8690	1.7978	-1.10	1.13
69	1.8759	1.8058	1.7367	-1.11	1.14
70	1.8131	1.7450	1.6779	-1.12	1.15
71	1.7527	1.6865	1.6215	-1.13	1.16
72	1.6945	1.6303	1.5672	-1.14	1.17
73	1.6386	1.5763	1.5149	-1.15	1.18
74	1.5849	1.5243	1.4647	-1.16	1.19
75	1.5331	1.4743	1.4164	-1.18	1.20
76	1.4833	1.4261	1.3699	-1.19	1.21
77	1.4353	1.3798	1.3252	-1.20	1.22
78	1.3892	1.3352	1.2822	-1.21	1.24
79	1.3448	1.2923	1.2408	-1.22	1.25
80	1.3020	1.2510	1.2009	-1.23	1.26
81	1.2608	1.2112	1.1625	-1.25	1.27
82	1.2211	1.1729	1.1255	-1.26	1.28

R - T Table

Part No. : NTSF0103HZD08

R25 = 10 K Ω \pm 3%

B25/85 = 3984 K \pm 0.5%

Temperature ($^{\circ}$ C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. ($^{\circ}$ C)	
83	1.1828	1.1359	1.0899	-1.27	1.29
84	1.1460	1.1004	1.0557	-1.28	1.31
85	1.1105	1.0661	1.0226	-1.29	1.32
86	1.0762	1.0331	0.99078	-1.31	1.33
87	1.0432	1.0013	0.96011	-1.32	1.34
88	1.0114	0.97057	0.93054	-1.33	1.35
89	0.98074	0.94099	0.90204	-1.34	1.37
90	0.95116	0.91247	0.87456	-1.36	1.38
91	0.92262	0.88496	0.84806	-1.37	1.39
92	0.89510	0.85842	0.82251	-1.38	1.40
93	0.86853	0.83282	0.79786	-1.39	1.42
94	0.84290	0.80812	0.77408	-1.41	1.43
95	0.81816	0.78428	0.75113	-1.42	1.44
96	0.79427	0.76127	0.72899	-1.43	1.45
97	0.77121	0.73906	0.70761	-1.45	1.47
98	0.74894	0.71761	0.68698	-1.46	1.48
99	0.72743	0.69690	0.66705	-1.47	1.49
100	0.70666	0.67690	0.64781	-1.49	1.51
101	0.68658	0.65757	0.62923	-1.50	1.52
102	0.66718	0.63890	0.61127	-1.51	1.53
103	0.64844	0.62086	0.59392	-1.53	1.54
104	0.63031	0.60342	0.57716	-1.54	1.56
105	0.61279	0.58656	0.56096	-1.56	1.57