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SPECIFICATION FOR APPROVAL

CUSTOMER	立創電子
CERTIFIED	
MODEL/TYPE	NTSA0103
PART NO.	NTSA0103FH930(RoHS+HF)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Oct.19.2011
REV. NO.	2.3
REV. DATE	JUN.29.2015

FOR CUSTOMER APPROVAL	CHECKED BY
	戶鋒
	APPROVED BY
	朱鳳美



THINKING ELECTRONIC INDUSTRIAL CO.,LTD

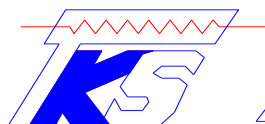
CUSTOMER:立創電子

CUSTOMER P/N:

THINKING P/N:NTSA0103FH930

REVISED RECORD SHEET

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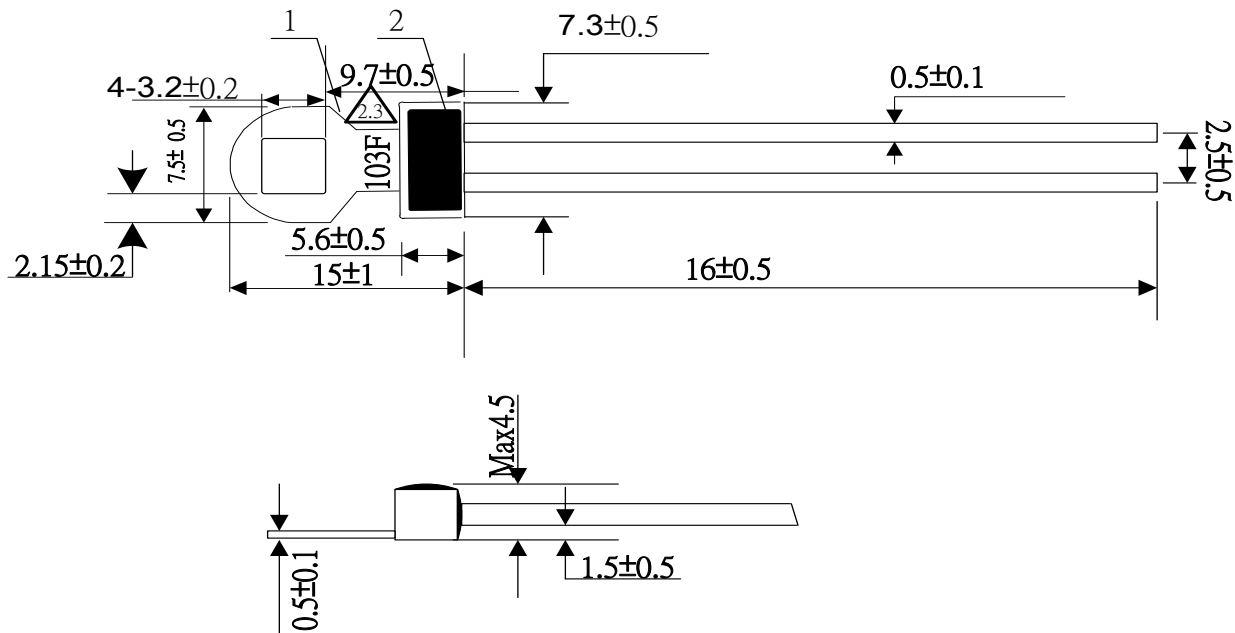


Example :

NTS **A0** **103** **F** **H930**

(1) (2) (3) (4) (5)

No.	Item	Digit	Specification
(1)	Product Type	NTS	Thinking NTC thermistor for temperature sensor
(2)	Type Series	A0	Housing type
(3)	Zero power resistance at 25°C (R ₂₅)	103	$10 \times 10^3 \Omega = 10 \text{ K}\Omega$
(4)	Tolerance of R ₂₅	F	±1%
(5)	Optional Suffix	H930	Special code for customer (RoHS+HF)



A. Material List

NO.	ITEM	DESCRIPTION
1	TERMINAL	3.2*3.2*15-1磷青銅鍍錫端子
2	COATING RESIN	BLACK EPOXY
*	THERMISTOR	TTC3A103F34D1EY

B. Electrical Characteristic

ITEM	VALUE
R25℃	10KΩ±1%
B25/85	3435K±1%

2.3	2015/6/29	增加頭部端子印字		曹建暉	戶鋒	朱鳳美			
2.2	2014/4/29	線長公差改為+/-0.5mm		陳健華	戶峰	劉廣旭			
2.1	2012/9/18	線長由15±3變更為16±2		譚蟬	黃春梅	朱鳳美			
2.0	2012/6/26	圖面增加尺寸		羅 瑤	黃春梅	朱鳳美			
1.5	2012/6/14	增加線徑尺寸		羅 瑤	黃春梅	劉廣旭			
1.4	2012/2/21	更換RT		羅 瑤	黃春梅	郭明龍	Customer	立創電子	
1.3	2012/1/10	Hi-Pot Test由'1000V AC 1 sec'變更為'1500V AC 5 sec',增加Insulation test		羅 瑤	黃春梅	郭明龍	Customer P/N		
		增加圖面尺寸2.5±0.5,變更安規認證標誌由for UL變更為for UL+CUL					Thinking P/N	NTSA0103FH930	
1.2	2011/11/4	定義PIN到端子最下面的距離		羅 瑤	黃春梅	郭明龍	Drawing NO.	SA1110019	
1.1	2011/11/1	芯片由M902A103F34D1S改為TTC3A103F34D1EY,更換RT		羅 瑤	黃春梅	朱鳳美	Date	2015/6/29	
		端子由B40320BL-2#改為3.2*3.2*15-1磷青銅鍍銀端子					Scale:		Tol: ±0.3mm Unit: mm
1.0	2011/10/19	新資料制作		羅 瑤	黃春梅	郭明龍	THINKING ELECTRONIC INDUSTRIAL CO.,LTD		
Rev.	Date	Subjects of Change	ECN No	Designed by	Checked by	Approved by			

興勤電子工業股份有限公司

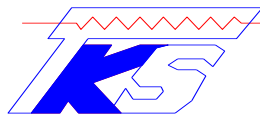
SUBJECT: CERTIFICATION OF MATERIALS

CUSTOMER: 立創電子

THINKING P/N: NTSA0103FH930

NO	PART NAME	PART P/N	Q'TY	FLAMMABILITY SOLID BURNING CLASS	UL FILE NO
1	TERMINAL	3.2*3.2*15-1磷青銅鍍錫端子	1		
2	COATING RESIN	BLACK EPOXY			
*	THERMISTOR	TTC3A103F34D1EY	1		
備 注					

Approved by: 朱鳳美 Checked by: 戶鋒 Designed by: 曹建暉



Specification of NTC Thermistor for Temperature Compensation

PART NO. NTSA0103FH930

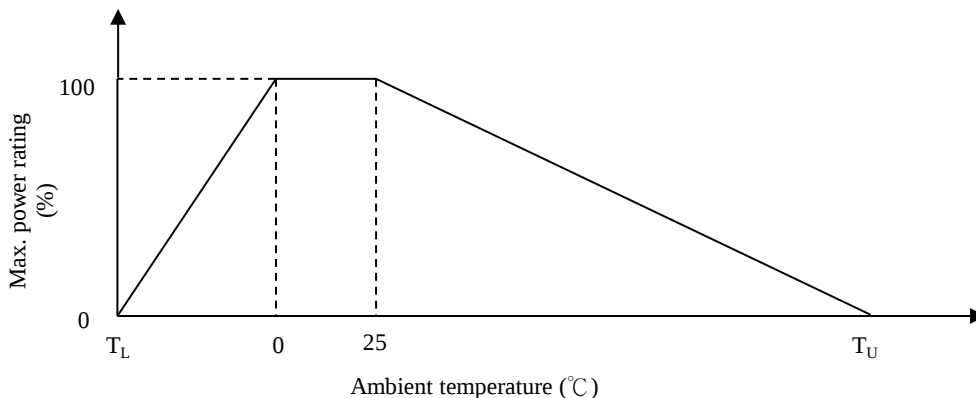
CUSTOMER P/N. _____

1. Electrical characteristics

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit.
a.	Resistance At 25°C	R ₂₅	Ta=25°C±0.05°C I<0.5mA	9.90	10.00	10.10	KΩ
b.	Resistance At 85°C	R ₈₅	Ta=85°C±0.05°C I<0.5mA	-----	1.451	-----	KΩ
c.	R ₂₅ / R ₈₅	K	-----	-----	6.890	-----	-----
d.	B Constant	B	(1779.707* LnK)	3401	3435	3469	K
e.	Thermal Dissipation Constant	C	Ta=25°C (in air)	-----	Apporx5	-----	mW/°C
f.	Thermal Time Constant	-----	25°C→85°C T1=25+(85-25)*63.2%=62.9°C	-----	Apporx14	-----	Sec
g.	Insulation test	-----	DC 500V 3Sec	100	-----	-----	MΩ
h.	Hi-Pot Test	-----	1500V AC 3 sec	-----	-----	10	mA

2. Maximun Ratings

	Parameter	Specification	Unit
a.	Operation Temperature Range	-40 ----- +125	°C
b.	Max' power rating at 25°C (finished product)	270	mW
c.	Max' power rating at 25°C (Chip)	150	mW



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

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

3. Mechanical Characteristics

Leads Terminal Tensile Strength

Conditions	Test Result	
Fasten body with a Load Applied to each lead 0.5 kg for 10 sec.	No break out and damage	OK

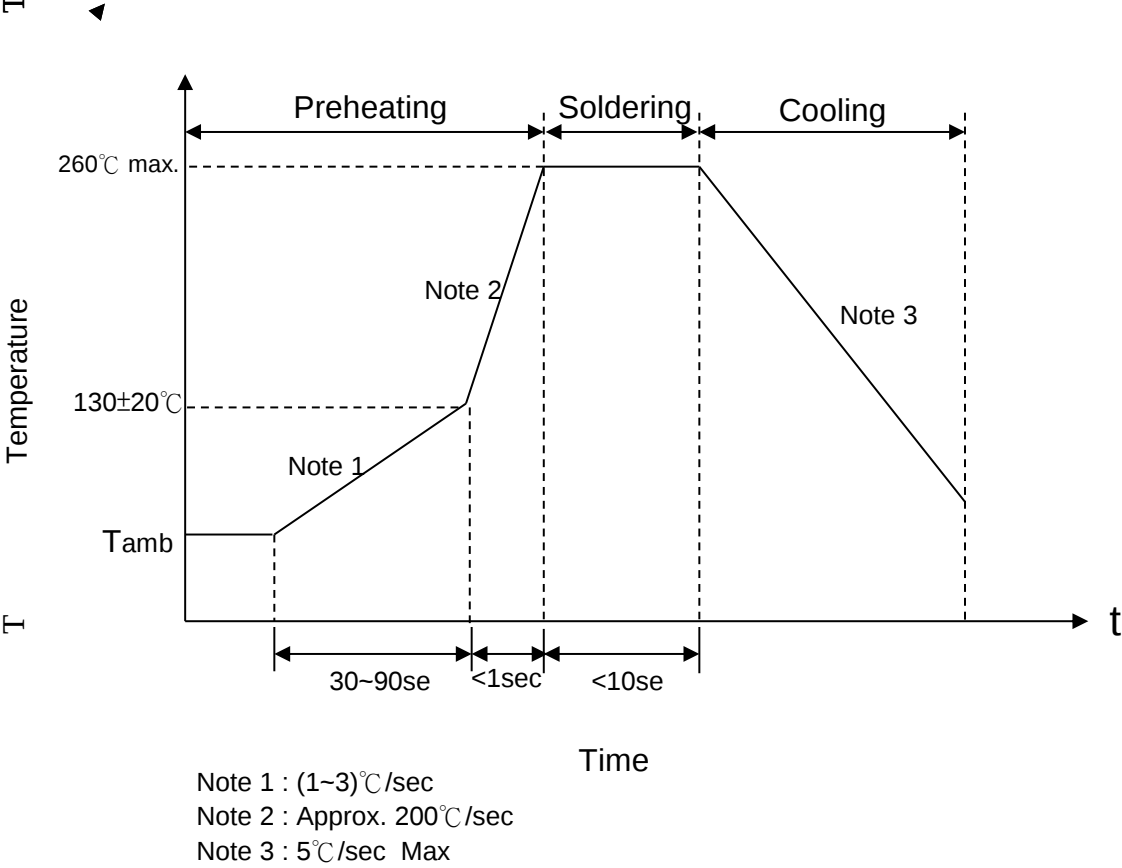
4. Reliability Test

Item	Test Conditions	Variable
Temp. cycle test	-40 °C × 30 min → +25 °C × 5 min +125 °C × 30 min → +25 °C × 5 min } X 10cycles	Within ± 5 %
Humidity test	40 °C 95 % RH × 1000 HRS	Within ± 5 %
High Temperature Storage	125 ± 5 °C , 1000 ± 24 hrs	No visible damage △R25/R25 ≤ 5 %
low Temperature Storage	-40 °C ± 5 °C , 1000 ± 24 hrs	No visible damage △R25/R25 ≤ 5 %
Life Test	25 ± 5 °C , 270mW. , 1000 ± 24 hrs	No visible damage △R25/R25 ≤ 5 %

5. Solderability Test (TERMINAL)

Item	Standard	Conditions
Soldering Temperature	IEC60068-2-20	245±3°C
Soldering Time		3 ±0.5sec
Immersed Degree		95% of Immersed

6. Wave Flow Soldering Profile



7. Recommended Reworking Conditions With Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	10 mm (max.)

8.Storage condition of products

(I)產品使用條件：

- 1.产品使用的最大工作温度，最大功率等，均依照规格书要求作业，不可超出规格书之范围。
- 2.产品移动、安装必须轻拿轻放，不可用力拉动。
- 3.感温端子发生变形、氧化等现象时，不要使用，以免影响感温精度。
- 4.产品外观发现变形、破损时，不可使用，以免影响电性能。

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:

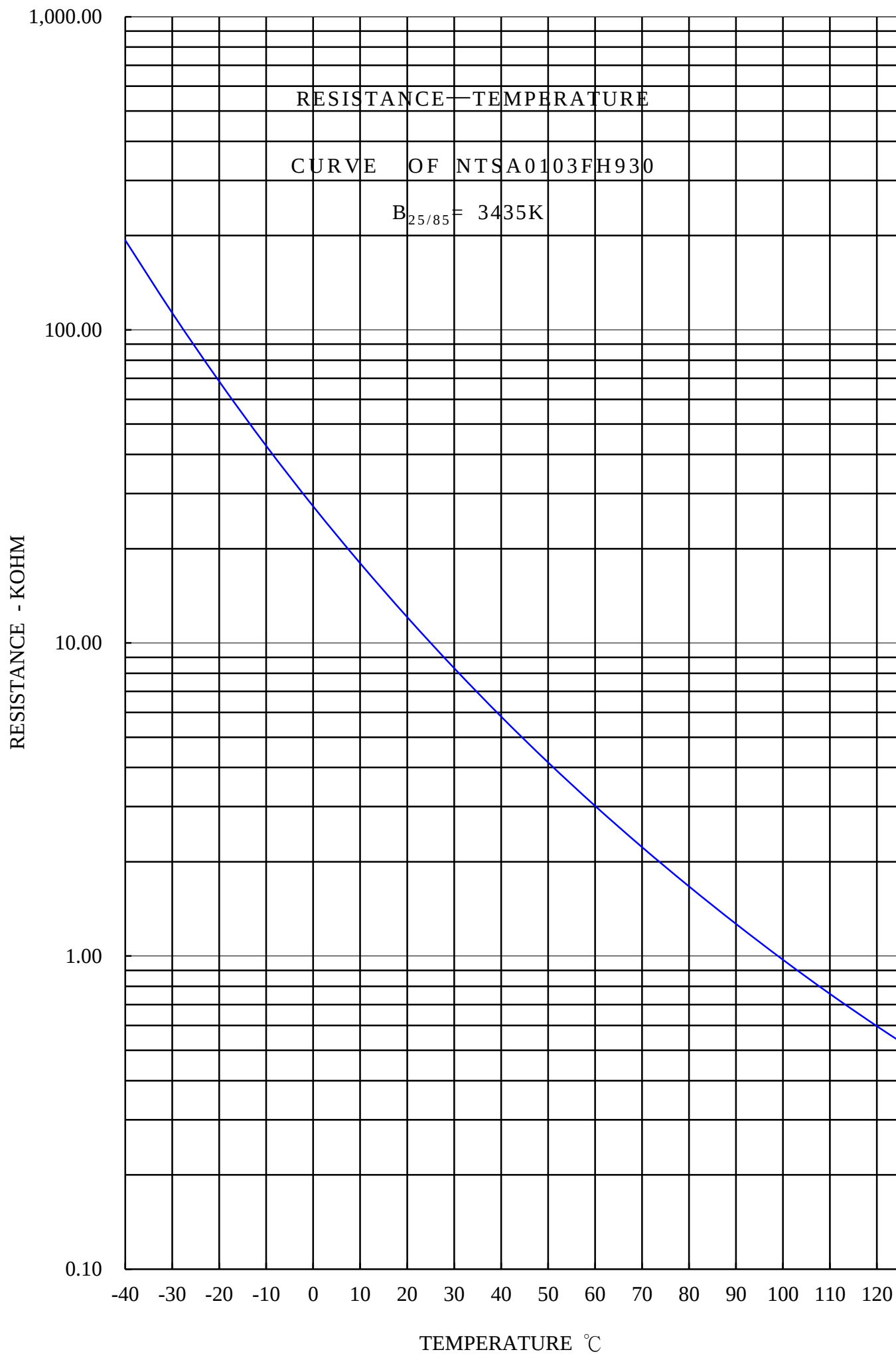
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

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. : NTSA0103FH930

R25 =10 KOhm $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
-40	201.08	193.28	185.76	-0.71	0.73
-39	190.23	182.95	175.93	-0.70	0.72
-38	180.01	173.22	166.67	-0.70	0.72
-37	170.40	164.05	157.93	-0.69	0.71
-36	161.35	155.43	149.71	-0.69	0.70
-35	152.83	147.30	141.96	-0.68	0.70
-34	144.82	139.65	134.66	-0.68	0.69
-33	137.27	132.44	127.77	-0.67	0.69
-32	130.16	125.65	121.28	-0.66	0.68
-31	123.46	119.24	115.16	-0.66	0.68
-30	117.14	113.20	109.38	-0.65	0.67
-29	111.18	107.50	103.93	-0.65	0.66
-28	105.56	102.12	98.77	-0.64	0.66
-27	100.25	97.03	93.90	-0.63	0.65
-26	95.24	92.23	89.30	-0.63	0.64
-25	90.51	87.687	84.95	-0.62	0.64
-24	86.03	83.39	80.83	-0.61	0.63
-23	81.81	79.34	76.93	-0.61	0.63
-22	77.81	75.50	73.24	-0.60	0.62
-21	74.03	71.86	69.75	-0.60	0.61
-20	70.45	68.424	66.45	-0.59	0.61
-19	67.07	65.17	63.32	-0.58	0.60
-18	63.86	62.09	60.35	-0.58	0.59
-17	60.83	59.17	57.55	-0.57	0.59
-16	57.96	56.41	54.88	-0.56	0.58
-15	55.25	53.79	52.36	-0.56	0.57
-14	52.67	51.30	49.97	-0.55	0.57
-13	50.23	48.95	47.70	-0.54	0.56
-12	47.92	46.72	45.55	-0.54	0.56
-11	45.73	44.60	43.50	-0.53	0.55
-10	43.65	42.60	41.56	-0.53	0.54
-9	41.68	40.69	39.72	-0.52	0.54
-8	39.808	38.883	37.975	-0.51	0.53
-7	38.033	37.165	36.314	-0.51	0.52



R - T Table

Part No. : NTSA0103FH930

R25 =10 KOhm $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
-6	36.347	35.534	34.736	-0.50	0.52
-5	34.747	33.984	33.235	-0.49	0.51
-4	33.226	32.511	31.809	-0.49	0.50
-3	31.780	31.111	30.452	-0.48	0.49
-2	30.406	29.779	29.161	-0.47	0.49
-1	29.100	28.511	27.932	-0.46	0.48
0	27.857	27.305	26.762	-0.46	0.47
1	26.674	26.157	25.648	-0.45	0.47
2	25.548	25.064	24.586	-0.44	0.46
3	24.476	24.022	23.575	-0.44	0.45
4	23.455	23.030	22.610	-0.43	0.44
5	22.482	22.084	21.690	-0.42	0.44
6	21.555	21.182	20.813	-0.41	0.43
7	20.671	20.321	19.976	-0.41	0.42
8	19.827	19.500	19.177	-0.40	0.41
9	19.023	18.717	18.414	-0.39	0.41
10	18.256	17.969	17.686	-0.38	0.40
11	17.523	17.255	16.990	-0.38	0.39
12	16.824	16.573	16.325	-0.37	0.38
13	16.156	15.922	15.689	-0.36	0.37
14	15.518	15.299	15.082	-0.35	0.37
15	14.908	14.704	14.501	-0.34	0.36
16	14.326	14.135	13.945	-0.34	0.35
17	13.769	13.590	13.413	-0.33	0.34
18	13.236	13.070	12.905	-0.32	0.33
19	12.727	12.572	12.418	-0.31	0.32
20	12.240	12.095	11.952	-0.30	0.32
21	11.773	11.639	11.505	-0.29	0.31
22	11.327	11.202	11.078	-0.29	0.30
23	10.900	10.784	10.668	-0.28	0.29
24	10.491	10.384	10.276	-0.27	0.28
25	10.100	10.000	9.900	-0.26	0.27
26	9.732	9.632	9.532	-0.27	0.28
27	9.380	9.280	9.180	-0.28	0.30



R - T Table

Part No. : NTSA0103FH930

R25 = 10 K Ω $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
28	9.042	8.942	8.843	-0.29	0.31
29	8.718	8.619	8.520	-0.31	0.32
30	8.407	8.308	8.210	-0.32	0.33
31	8.109	8.011	7.913	-0.33	0.34
32	7.823	7.725	7.628	-0.34	0.35
33	7.548	7.451	7.355	-0.35	0.37
34	7.285	7.189	7.093	-0.36	0.38
35	7.032	6.936	6.8420	-0.38	0.39
36	6.7885	6.6944	6.6009	-0.39	0.40
37	6.5552	6.4620	6.3695	-0.40	0.41
38	6.3311	6.2389	6.1474	-0.41	0.43
39	6.1158	6.0246	5.9342	-0.43	0.44
40	5.9089	5.8188	5.7295	-0.44	0.45
41	5.7101	5.6210	5.5329	-0.45	0.46
42	5.5189	5.4310	5.3440	-0.46	0.48
43	5.3352	5.2485	5.1626	-0.48	0.49
44	5.1586	5.0729	4.9882	-0.49	0.50
45	4.9887	4.9042	4.8207	-0.50	0.51
46	4.8252	4.7420	4.6596	-0.51	0.53
47	4.6680	4.5859	4.5048	-0.53	0.54
48	4.5167	4.4358	4.3559	-0.54	0.55
49	4.3711	4.2914	4.2127	-0.55	0.57
50	4.2310	4.1524	4.0749	-0.57	0.58
51	4.0960	4.0187	3.9424	-0.58	0.59
52	3.9661	3.8899	3.8149	-0.59	0.61
53	3.8410	3.7660	3.6921	-0.60	0.62
54	3.7204	3.6466	3.5739	-0.62	0.63
55	3.6043	3.5316	3.4601	-0.63	0.65
56	3.4923	3.4209	3.3505	-0.65	0.66
57	3.3844	3.3141	3.2449	-0.66	0.67
58	3.2804	3.2113	3.1432	-0.67	0.69
59	3.1801	3.1121	3.0452	-0.69	0.70
60	3.0834	3.0165	2.9508	-0.70	0.71
61	2.9901	2.9243	2.8597	-0.71	0.73



R - T Table

Part No. : NTSA0103FH930

R25 =10 KOhm $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
62	2.9001	2.8354	2.7719	-0.73	0.74
63	2.8132	2.7497	2.6872	-0.74	0.75
64	2.7294	2.6669	2.6056	-0.76	0.77
65	2.6485	2.5870	2.5268	-0.77	0.78
66	2.5703	2.5100	2.4507	-0.78	0.80
67	2.4949	2.4355	2.3774	-0.80	0.81
68	2.4220	2.3637	2.3065	-0.81	0.82
69	2.3516	2.2943	2.2382	-0.83	0.84
70	2.2836	2.2273	2.1721	-0.84	0.85
71	2.2178	2.1625	2.1084	-0.85	0.87
72	2.1543	2.0999	2.0467	-0.87	0.88
73	2.0929	2.0395	1.9872	-0.88	0.89
74	2.0335	1.9810	1.9297	-0.90	0.91
75	1.9760	1.9245	1.8741	-0.91	0.92
76	1.9205	1.8698	1.8204	-0.93	0.94
77	1.8667	1.8170	1.7684	-0.94	0.95
78	1.8147	1.7659	1.7182	-0.96	0.96
79	1.7644	1.7164	1.6696	-0.97	0.98
80	1.7157	1.6686	1.6226	-0.98	0.99
81	1.6685	1.6222	1.5771	-1.00	1.01
82	1.6229	1.5774	1.5331	-1.01	1.02
83	1.5787	1.5340	1.4905	-1.03	1.04
84	1.5359	1.4920	1.4493	-1.04	1.05
85	1.4944	1.4513	1.4094	-1.06	1.07
86	1.4543	1.4120	1.3707	-1.07	1.08
87	1.4154	1.3738	1.3333	-1.09	1.09
88	1.3777	1.3368	1.2971	-1.10	1.11
89	1.3411	1.3010	1.2620	-1.12	1.12
90	1.3057	1.2663	1.2280	-1.13	1.14
91	1.2714	1.2327	1.1951	-1.15	1.15
92	1.2381	1.2001	1.1632	-1.17	1.17
93	1.2059	1.1686	1.1323	-1.18	1.18
94	1.1746	1.1379	1.1023	-1.20	1.20
95	1.1442	1.1083	1.0733	-1.21	1.21



R - T Table

Part No. : NTSA0103FH930

R25 = 10 K Ω $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature ($^{\circ}$ C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. ($^{\circ}$ C)	
96	1.1148	1.0795	1.0452	-1.23	1.23
97	1.0863	1.0516	1.01790	-1.24	1.25
98	1.0586	1.02455	0.99145	-1.26	1.26
99	1.03180	0.99831	0.96581	-1.28	1.28
100	1.00576	0.97287	0.94096	-1.29	1.29
101	0.98050	0.94819	0.91685	-1.31	1.31
102	0.95599	0.92425	0.89347	-1.33	1.33
103	0.93221	0.90103	0.87080	-1.34	1.34
104	0.90913	0.87850	0.84882	-1.36	1.36
105	0.88674	0.85665	0.82749	-1.38	1.37
106	0.86500	0.83544	0.80681	-1.39	1.39
107	0.84391	0.81487	0.78674	-1.41	1.41
108	0.82344	0.79491	0.76728	-1.43	1.43
109	0.80358	0.77554	0.74840	-1.45	1.44
110	0.78429	0.75674	0.73008	-1.47	1.46
111	0.76558	0.73850	0.71231	-1.48	1.48
112	0.74741	0.72080	0.69507	-1.50	1.50
113	0.72978	0.70363	0.67835	-1.52	1.52
114	0.71266	0.68696	0.66212	-1.54	1.54
115	0.69605	0.67078	0.64637	-1.56	1.56
116	0.67992	0.65509	0.63110	-1.58	1.57
117	0.66426	0.63985	0.61628	-1.60	1.59
118	0.64907	0.62507	0.60190	-1.62	1.62
119	0.63432	0.61072	0.58794	-1.64	1.64
120	0.62000	0.59680	0.57441	-1.67	1.66
121	0.60610	0.58329	0.56128	-1.69	1.68
122	0.59261	0.57018	0.54853	-1.71	1.70
123	0.57952	0.55745	0.53617	-1.73	1.72
124	0.56681	0.54511	0.52418	-1.76	1.75
125	0.55448	0.53313	0.51255	-1.78	1.77

THINKING ELECTRONIC INDUSTRIAL CO.,LTD

THINKING P/N:NTSA0103FH930

Safety Approvals (Certified Model/Type :NTSA0103)



* UL 1434 recognized→File No. E138827

Certificates

- (1) TS 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report