

**THINKING ELECTRONIC INDUSTRIAL CO., LTD.**

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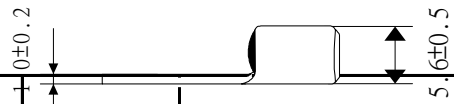
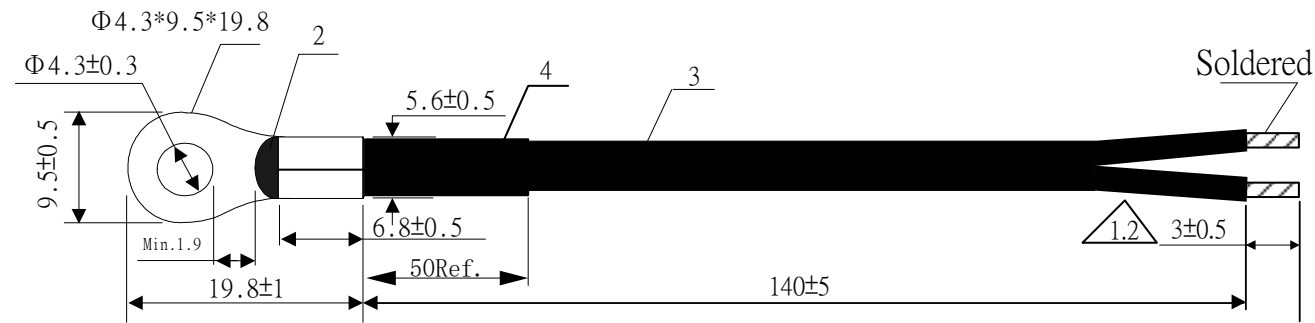
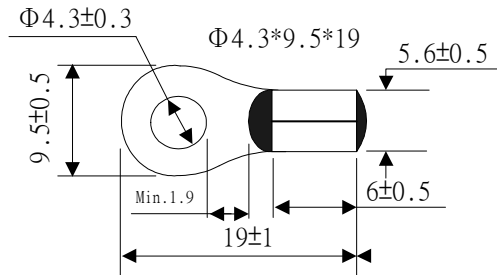
**SPECIFICATION FOR APPROVAL**

CUSTOMER	立創電子
CERTIFIED MODEL/TYPE	NTSA3103
PART NO.	NTSA3103FVA50(RoHS)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	DEC.02.2020
REV. NO.	1.2
REV. DATE	May.22.2018

FOR CUSTOMER APPROVAL	CHECKED BY
	戶鋒
	APPROVED BY
	朱鳳美







### A. Material List

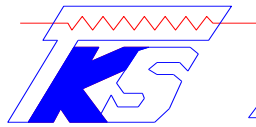
NO.	ITEM	DESCRIPTION
1	THERMINAL	$\Phi 4.3 * 9.5 * 19$ OR $\Phi 4.3 * 9.5 * 19.8$ 鍍錫端子
2	COATING RESIN	BLACK EPOXY
3	LEAD WIRE	UL4484#26x2C TS黑色線
4	TUBE	$\Phi 3.0$ 黑色熱縮套管
*	ELEMENT	NTC THERMISTOR

B. Electrical Characteristic	
ITEM	VALUE
R25°C	10K $\Omega$ ±1%
B25/50	4100 K ± 1%

							Customer	立創電子	
							Customer P/N		
							Thinking P/N	NTSA3103FVA50	
							Drawing NO.	SA1711012	
1.2	2018/5/22	尾端沾錫由5+/-1變更為3+/-0.5		曹建暉	戶鋒	朱鳳美	Date	2018/5/22	
1.1	2018/5/7	線長由500+/-10變更為140+/-5		曹建暉	戶鋒	盧宜睦	Tol: ±0.3mm	Unit: mm	Scale:
1.0	2017/11/21	新規格制作		曹建暉	戶鋒	朱鳳美	THINKING ELECTRONIC INDUSTRIAL CO.,LTD		
Rev.	Date	Subjects of Change	ECN No	Designed by	Checked by	Approved by			





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

**PART NO .NTSA3103FVA50**

**CUSTOMER P/N .**

**1. Electrical characteristics**

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit.
a.	Resistance At 25°C	R <sub>25</sub>	Ta=25°C±0.05°C P <sub>T</sub> ≤0.1mW	9.90	10.0	10.10	KΩ
b.	Resistance At 50°C	R <sub>50</sub>	Ta=50°C±0.05°C P <sub>T</sub> ≤0.1mW	-----	3.451	-----	KΩ
c.	R <sub>25</sub> /R <sub>50</sub>	K	-----	-----	2.898	-----	-----
d.	B Constant	B <sub>25/50</sub>	(3853.887* LnK)	4059	4100	4141	K
e.	Thermal Dissipation Constant (in air)	δ	Ta=25°C	-----	Approx.7	-----	mW/°C
f.	Thermal Time Constant (in air)	τ	25°C→85°C T1=25+(85-25)*63.2%=62.92°C	-----	Approx.30	-----	Sec
g.	Hi-Pot Test	-----	3000V AC 60 sec	-----	-----	1	mA
h.	Insulation test	-----	1000V DC 60 Sec	500	-----	-----	MΩ

**2.Maximun Ratings**

	Parameter	Specification	Unit
a.	Operation Temperature Range	-40 ----- +125	°C

**3. Reliability Test**

Item	Test Conditions	Variable
Temp. cycle test	-40 °C X 30min → +25 °C X 5 min +125°C X 30min → +25 °C X 5 min X 10Cycles	Within ± 5 %
High Temperature Storage	125± 5 °C , 1000 ± 24 hrs	No visible damage   ΔR25/R25   ≤ 3 %
low Temperature Storage	-40 °C± 5 °C , 1000 ± 24 hrs	No visible damage   ΔR25/R25   ≤ 3 %
Humidity test	40°C 95 % RH X 1000 HRS	Within ± 5 %

## **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.

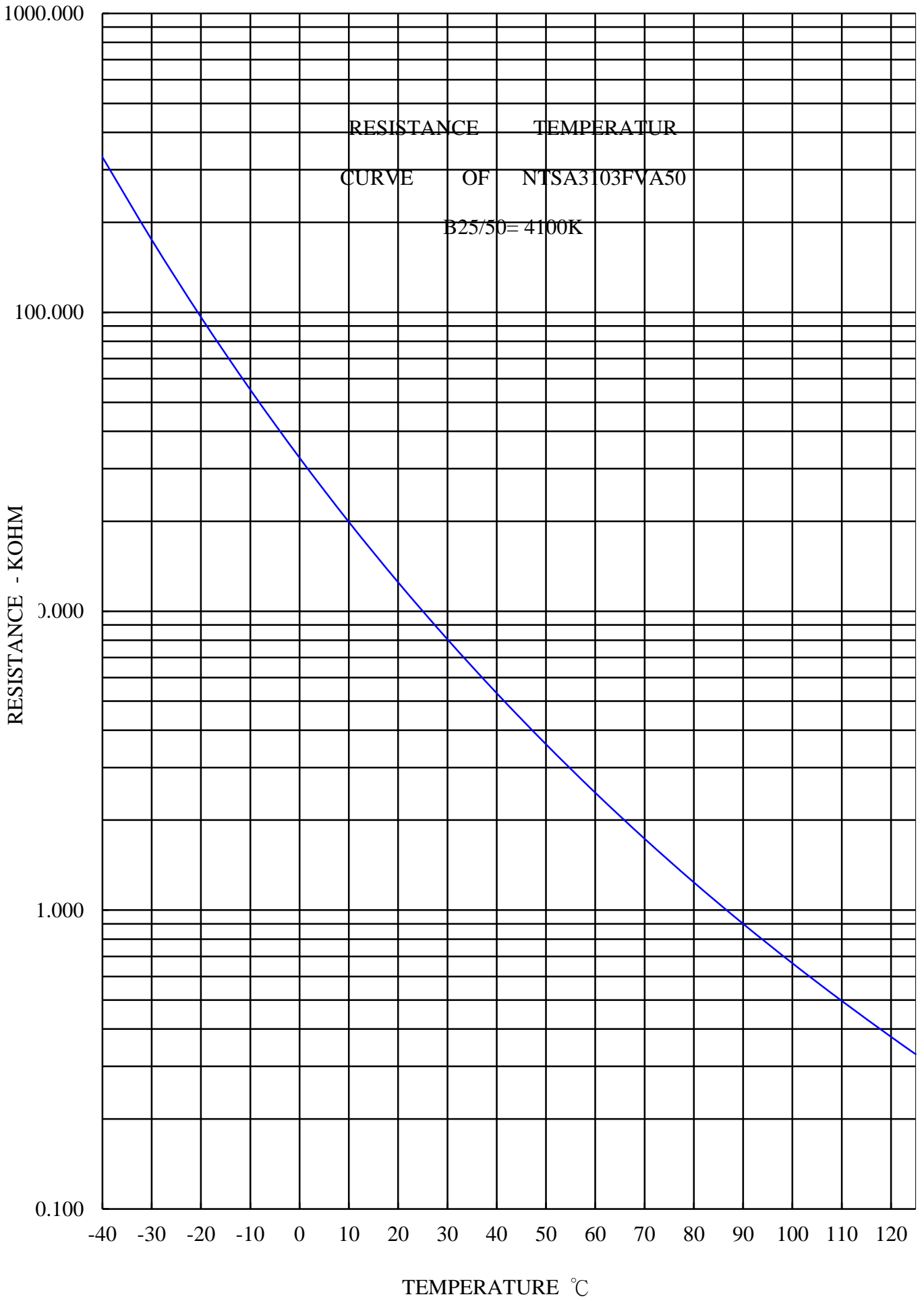
1. Storage condition:  
Temperature -10°C to +40°C  
Humidity less than 75%RH (not dewing condition)
2. Storage term:  
Use this product within 1 year after delivery by first-in and first-out stocking system.
3. Handling after unpacking:  
After unpacking, reseal product promptly or store it in a sealed 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. :NTSA3103FVA50

R25=10KΩ ±1%

B25/50 = 4100 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)	
-40	381.348	364.239	347.863	-0.69	0.71
-39	356.991	341.198	326.070	-0.69	0.70
-38	334.258	319.678	305.704	-0.68	0.69
-37	313.026	299.567	286.658	-0.67	0.69
-36	293.193	280.769	268.844	-0.66	0.68
-35	274.667	263.198	252.182	-0.65	0.67
-34	257.366	246.778	236.602	-0.64	0.66
-33	241.213	231.439	222.038	-0.64	0.66
-32	226.139	217.114	208.428	-0.63	0.65
-31	212.075	203.741	195.714	-0.62	0.64
-30	198.957	191.259	183.840	-0.62	0.64
-29	186.722	179.610	172.752	-0.61	0.63
-28	175.311	168.739	162.397	-0.60	0.63
-27	164.668	158.593	152.728	-0.60	0.62
-26	154.739	149.122	143.695	-0.59	0.61
-25	145.472	140.278	135.255	-0.59	0.61
-24	136.821	132.015	127.366	-0.58	0.60
-23	128.740	124.293	119.988	-0.58	0.60
-22	121.187	117.071	113.084	-0.57	0.59
-21	114.124	110.314	106.620	-0.56	0.58
-20	107.515	103.987	100.564	-0.56	0.58
-19	101.327	98.0598	94.8880	-0.55	0.57
-18	95.5304	92.5036	89.5638	-0.54	0.56
-17	90.0963	87.2923	84.5670	-0.54	0.56
-16	84.9995	82.4016	79.8751	-0.53	0.55
-15	80.2166	77.8095	75.4671	-0.52	0.54
-14	75.7262	73.4957	71.3238	-0.52	0.54
-13	71.5084	69.4415	67.4277	-0.51	0.53
-12	67.5451	65.6299	63.7625	-0.50	0.52
-11	63.8196	62.0449	60.3134	-0.50	0.51
-10	60.3166	58.6720	57.0666	-0.49	0.51
-9	57.0217	55.4979	54.0093	-0.48	0.50
-8	53.9218	52.5099	51.1297	-0.47	0.49
-7	51.0047	49.6965	48.4170	-0.46	0.48
-6	48.2589	47.0469	45.8607	-0.46	0.48
-5	45.6740	44.5511	43.4515	-0.45	0.47
-4	43.2399	42.1998	41.1805	-0.44	0.46
-3	40.9475	39.9840	39.0394	-0.43	0.45
-2	38.7881	37.8958	37.0203	-0.43	0.44
-1	36.7536	35.9272	35.1160	-0.42	0.44
0	34.8364	34.0713	33.3196	-0.41	0.43
1	33.0294	32.3210	31.6246	-0.40	0.42
2	31.3260	30.6702	30.0251	-0.40	0.41
3	29.7197	29.1127	28.5152	-0.39	0.41



## R - T Table

Part No. :NTSA3103FVA50

R25=10KΩ ±1%

B25/50 = 4100 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)	
4	28.2048	27.6431	27.0898	-0.38	0.40
5	26.7757	26.2559	25.7436	-0.37	0.39
6	25.4271	24.9463	24.4721	-0.37	0.38
7	24.1542	23.7095	23.2707	-0.36	0.38
8	22.9525	22.5413	22.1352	-0.35	0.37
9	21.8175	21.4374	21.0618	-0.34	0.36
10	20.7452	20.3940	20.0467	-0.34	0.35
11	19.7320	19.4075	19.0864	-0.33	0.34
12	18.7741	18.4745	18.1778	-0.32	0.34
13	17.8683	17.5918	17.3177	-0.31	0.33
14	17.0115	16.7563	16.5034	-0.31	0.32
15	16.2007	15.9654	15.7320	-0.30	0.31
16	15.4332	15.2163	15.0011	-0.29	0.30
17	14.7064	14.5067	14.3083	-0.28	0.29
18	14.0179	13.8342	13.6514	-0.27	0.29
19	13.3655	13.1966	13.0284	-0.27	0.28
20	12.7471	12.5919	12.4373	-0.26	0.27
21	12.1607	12.0182	11.8762	-0.25	0.26
22	11.6045	11.4738	11.3435	-0.24	0.25
23	11.0767	10.9570	10.8375	-0.23	0.24
24	10.5757	10.4662	10.3568	-0.22	0.23
25	10.1000	10.0000	9.90000	-0.21	0.23
26	9.65693	9.55698	9.45713	-0.23	0.24
27	9.23558	9.13588	9.03635	-0.24	0.25
28	8.83478	8.73549	8.63645	-0.25	0.26
29	8.45341	8.35468	8.25628	-0.26	0.27
30	8.09042	7.99239	7.89475	-0.27	0.28
31	7.74484	7.64762	7.55087	-0.28	0.29
32	7.41574	7.31944	7.22367	-0.29	0.31
33	7.10224	7.00696	6.91226	-0.30	0.32
34	6.80354	6.70935	6.61580	-0.32	0.33
35	6.51887	6.42584	6.33351	-0.33	0.34
36	6.24749	6.15569	6.06464	-0.34	0.35
37	5.98872	5.89821	5.80848	-0.35	0.37
38	5.74193	5.65274	5.56438	-0.36	0.38
39	5.50650	5.41868	5.33172	-0.38	0.39
40	5.28186	5.19543	5.10991	-0.39	0.40
41	5.06746	4.98246	4.89839	-0.40	0.41
42	4.86280	4.77924	4.69664	-0.41	0.43
43	4.66739	4.58529	4.50418	-0.42	0.44
44	4.48077	4.40014	4.32052	-0.44	0.45
45	4.30252	4.22336	4.14524	-0.45	0.46
46	4.13221	4.05452	3.97791	-0.46	0.48
47	3.96946	3.89326	3.81813	-0.47	0.49

## R - T Table

Part No. :NTSA3103FVA50

R25=10KΩ ±1%

B25/50 = 4100 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)	
48	3.81390	3.73918	3.66555	-0.48	0.50
49	3.66519	3.59194	3.51979	-0.50	0.51
50	3.52300	3.45121	3.38054	-0.51	0.53
51	3.38701	3.31667	3.24746	-0.52	0.54
52	3.25693	3.18802	3.12027	-0.54	0.55
53	3.13247	3.06499	2.99867	-0.55	0.56
54	3.01336	2.94730	2.88240	-0.56	0.58
55	2.89937	2.83470	2.77120	-0.57	0.59
56	2.79024	2.72694	2.66482	-0.59	0.60
57	2.68574	2.62381	2.56305	-0.60	0.62
58	2.58566	2.52507	2.46565	-0.61	0.63
59	2.48980	2.43053	2.37242	-0.63	0.64
60	2.39796	2.33998	2.28318	-0.64	0.65
61	2.30995	2.25325	2.19772	-0.65	0.67
62	2.22559	2.17015	2.11587	-0.67	0.68
63	2.14473	2.09051	2.03747	-0.68	0.70
64	2.06719	2.01419	1.96235	-0.69	0.71
65	1.99283	1.94102	1.89036	-0.71	0.72
66	1.92151	1.87086	1.82137	-0.72	0.74
67	1.85308	1.80358	1.75522	-0.74	0.75
68	1.78743	1.73904	1.69180	-0.75	0.76
69	1.72441	1.67713	1.63097	-0.76	0.78
70	1.66392	1.61771	1.57263	-0.78	0.79
71	1.60585	1.56069	1.51665	-0.79	0.80
72	1.55008	1.50595	1.46294	-0.81	0.82
73	1.49652	1.45340	1.41138	-0.82	0.83
74	1.44507	1.40294	1.36190	-0.83	0.85
75	1.39564	1.35447	1.31438	-0.85	0.86
76	1.34813	1.30791	1.26875	-0.86	0.88
77	1.30247	1.26317	1.22493	-0.88	0.89
78	1.25858	1.22018	1.18283	-0.89	0.90
79	1.21638	1.17886	1.14239	-0.91	0.92
80	1.17580	1.13914	1.10352	-0.92	0.93
81	1.13677	1.10095	1.06616	-0.94	0.95
82	1.09922	1.06422	1.03024	-0.95	0.96
83	1.06309	1.02890	0.99571	-0.97	0.98
84	1.02833	0.99492	0.96250	-0.98	0.99
85	0.99487	0.96223	0.93056	-1.00	1.01
86	0.96266	0.93077	0.89984	-1.01	1.02
87	0.93165	0.90049	0.87028	-1.03	1.04
88	0.90179	0.87134	0.84183	-1.04	1.05
89	0.87304	0.84328	0.81445	-1.06	1.07
90	0.84534	0.81626	0.78810	-1.08	1.08
91	0.81865	0.79023	0.76272	-1.09	1.10
92	0.79293	0.76516	0.73829	-1.11	1.11

## R - T Table

Part No. :NTSA3103FVA50

R25=10K $\Omega$   $\pm$ 1%

B25/50 = 4100 K  $\pm$  1%

Temperature (°C)	Rmax. (K $\Omega$ )	Rnor. (K $\Omega$ )	Rmin. (K $\Omega$ )	Temperature Tol. (°C)	
93	0.76815	0.74101	0.71476	-1.12	1.13
94	0.74427	0.71774	0.69209	-1.14	1.14
95	0.72124	0.69531	0.67025	-1.16	1.16
96	0.69904	0.67370	0.64921	-1.17	1.18
97	0.67763	0.65286	0.62893	-1.19	1.19
98	0.65698	0.63276	0.60938	-1.21	1.21
99	0.63706	0.61339	0.59054	-1.22	1.22
100	0.61784	0.59470	0.57237	-1.24	1.24
101	0.59929	0.57667	0.55484	-1.25	1.25
102	0.58139	0.55927	0.53794	-1.27	1.27
103	0.56412	0.54249	0.52164	-1.29	1.29
104	0.54744	0.52629	0.50591	-1.31	1.30
105	0.53133	0.51065	0.49073	-1.32	1.32
106	0.51577	0.49555	0.47608	-1.34	1.34
107	0.50075	0.48097	0.46193	-1.36	1.35
108	0.48624	0.46689	0.44828	-1.37	1.37
109	0.47221	0.45329	0.43509	-1.39	1.39
110	0.45866	0.44015	0.42235	-1.41	1.40
111	0.44556	0.42746	0.41005	-1.43	1.42
112	0.43290	0.41519	0.39816	-1.44	1.44
113	0.42065	0.40333	0.38668	-1.46	1.45
114	0.40881	0.39186	0.37558	-1.48	1.47
115	0.39736	0.38077	0.36485	-1.50	1.49
116	0.38628	0.37005	0.35447	-1.51	1.50
117	0.37556	0.35968	0.34444	-1.53	1.52
118	0.36519	0.34965	0.33474	-1.55	1.54
119	0.35515	0.33994	0.32535	-1.57	1.55
120	0.34543	0.33054	0.31627	-1.58	1.57
121	0.33602	0.32145	0.30748	-1.60	1.59
122	0.32691	0.31265	0.29898	-1.62	1.60
123	0.31808	0.30412	0.29075	-1.64	1.62
124	0.30954	0.29587	0.28278	-1.66	1.64
125	0.30126	0.28788	0.27506	-1.67	1.65

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