THINKING ELECTRONIC INDUSTRIAL CO., LTD.

HEAD OFFICE: 8F-1, No.93, Ta-Shun 1st Rd., Kaohsiung, Taiwan
TEL: 886-7-5577660 FAX: 886-7-5570560

MANUFACTURING SITE

☐ **KAOHSIUNG FACTORY: No.51, Kaifa Road, Nantze Export Processing Zone, Kaohsiung City 81170, Taiwan**
TEL: 886-7-9616668 FAX: 886-7-9616698

R **CHANGZHOU FACTORY: No.82,Renmin Mid Rd.,WuJin High&New-Tech Industrial Development Zone,ChangZhou,JiangSu,China**
TEL:86-519-86578999 FAX:86-519-86558643

R **DONG GUAN FACTORY: Chiao-Tou Tsun, Sha-Tao Hsiang, Chang-An Town, Dong-Guan City 523863, Guangdong, China**
TEL:86-769-85542016 FAX:86-769-85546890

☐ **YICHANG FACTORY: No. 283 Xiaoting Avenue, Xiaoting Dist., Yichang City 443007, Hubei, China**
TEL:86-717-6510010 FAX:86-717-6511430

SPECIFICATION FOR APPROVAL

CUSTOMER	全緯
CERTIFIED MODEL/TYPE	TTC03-103
PART NO.	TTC3A103F39H1EY(RoHS)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Aug.02,2016
REV. NO.	
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	柳麗君
	APPROVED BY
	陳振東

REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT

INDEX

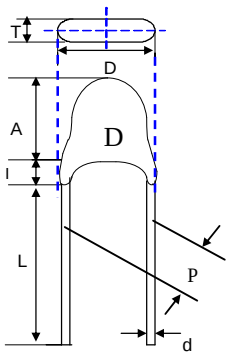
Part Number Code

Example :

TTC	**3**	**A**	**103**	**F**	**39H**	**1**	**E**	**Y**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**

No.	Item	Digit	Specification
(1)	Product Type	TTC	Thinking NTC thermistor TTC type
(2)	Body Size	3	ϕ 4 mm x H 5.0 mm (max.)
(3)	Definition of B Value	A	$B_{25/85}$
(4)	Zero Power Resistance at 25℃	103	$10 \times 10^3\ \Omega = 10\ K\Omega$
(5)	Tolerance of R25℃	F	±1%
(6)	B Value	39H	3975K
(7)	Tolerance of B Value	1	±1%
(8)	Appearance	E	Straight lead epoxy coating (Green)
(9)	Optional Suffix	Y	RoHS compliance

Structure and Dimensions



(unit:mm)

D	d	P	A	I max	L	T
2.5~4.0	0.5±0.02	2.54± 0.5	2.5~5.0	3.0	30~40	1.5~3.0

Electrical Characteristics

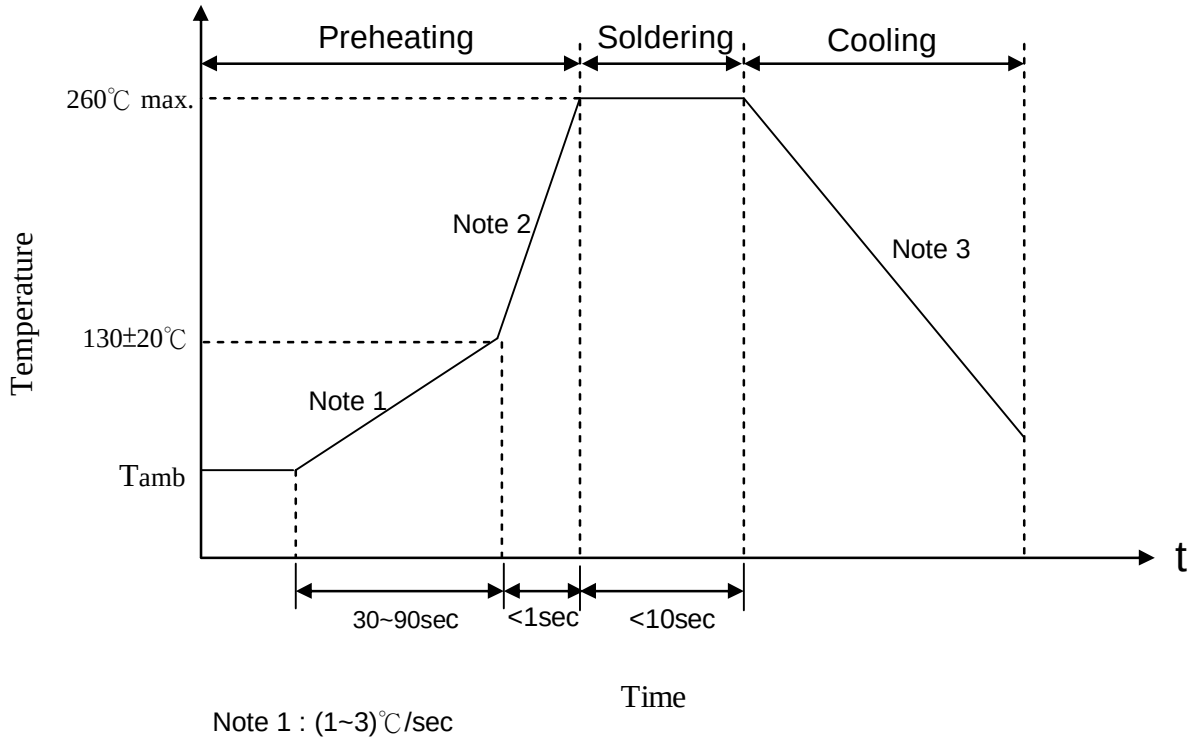
Part No.	Zero Power Resistance at 25℃	Tolerance of $R_{25℃}$	$B_{25/85}$ Value	Tolerance of B Value	Max. Power Dissipation at 25℃	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	$R_{25℃}$ (KΩ)	(± %)	(K)	(± %)	P_{max} (mW)	δ(mW/℃)	τ (sec.)	T_L~T_U (℃)
TTC3A103F39H1EY	10	1	3975	1	150	≧2.5	≦18	-40 ~+125

Reliability

<table>
<tr><th>Item</th><th>Standard</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Tensile Strength of Terminals</td><td>IEC60068-2-21</td><td>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.
<table><tr><th>Terminal diameter (mm)</th><th>Force (Kg)</th></tr><tr><td>0.3<d≦0.5</td><td>0.5</td></tr><tr><td>0.5<d≦0.8</td><td>1.0</td></tr></table></td><td>No visible damage</td></tr>
<tr><td>Bending Strength of Terminals</td><td>IEC60068-2-21</td><td>Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction.
<table><tr><th>Terminal diameter (mm)</th><th>Force (Kg)</th></tr><tr><td>0.3<d≦0.5</td><td>0.25</td></tr><tr><td>0.5<d≦0.8</td><td>0.50</td></tr></table></td><td>No visible damage</td></tr>
<tr><td>Solderability</td><td>IEC60068-2-20</td><td>245 ± 3 ℃ , 3 ± 0.3 sec</td><td>At least 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC60068-2-20</td><td>260 ± 3 ℃ , 10 ± 1 sec</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\ \%$</td></tr>
<tr><td>High Temperature Storage</td><td>IEC60068-2-2</td><td>125 ± 5 ℃ , 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 5\ \%$</td></tr>
<tr><td>Damp Heat, Steady State</td><td>IEC 60068-2-78</td><td>40 ± 2 ℃ , 9 0 ~ 95 % RH , 1000 ± 24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\ \%$</td></tr>
<tr><td>Rapid Change of Temperature</td><td>IEC60068-2-14</td><td>The conditions shown below shall be repeated 5 cycles
<table><tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-40 ± 5</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>5 ± 3</td></tr><tr><td>3</td><td>125 ± 5</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>5 ± 3</td></tr></table></td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 3\ \%$</td></tr>
<tr><td>Max. Power Dissipation</td><td>IEC60539-1 4.26.3</td><td>25 ± 5 ℃, Pmax. , 1000 ±24 hrs</td><td>No visible damage
$|\triangle R_{25}/R_{25}| \leqq 5\ \%$</td></tr>
</table>

Soldering Recommendation

■ Wave Soldering Profile

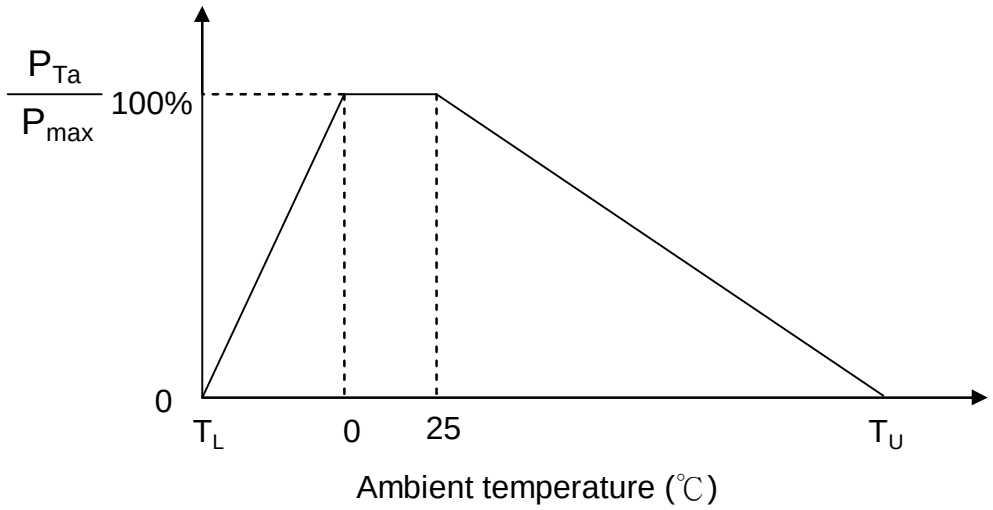


Note 1 : (1~3)℃/sec
Note 2 : Approx. 200℃/sec
Note 3 : 5℃/sec Max

■ Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	2 mm (min.)

Max. Power Dissipation Derating Curve



Note: T_L = Minimum operating temperature (℃)

T_U = Maximum operating temperature (℃)

For example：

Ambient temperature(Ta)＝55℃

Maximum operating temperature(Tu)＝125℃

P_{Ta}=(Tu-Ta)/(Tu-25)×Pmax＝70% Pmax

RoHS Compliant Declaration

We hereby declare that the components delivered to your company are compliant with RoHS directive 2011/65/EU.

Warehouse Storage Conditions of Products

(I) Storage Conditions :

1.Storage Temperature : -10℃~+40℃

2.Relative Humidity : ≦75%RH

3.Keep away from corrosive atmosphere and sunlight

(II) Period of Storage : 1 year

Safety Approvals **(Certified Model/Type : TTC03-103)**

* UL 1434 / cUL recognized (File # E138827)

* CQC GB/T 6663.1-2007 recognized (File# CQC04001011945)
* CQC GB6663-86 recognized (File# CQC04001011966)

. .
* TUV recognized (File # R 50050155)

Certificates

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

Test Report

(1) RoHS test report

R -T Table

Part No.:TTC3A103F39H1EY

R25 = 10 KOhm ± 1%

B25/85 = 3975 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)		Resistance Tol. (%)	
-40	340.36	325.46	311.17	-0.71	0.71	4.6%	-4.4%
-39	319.10	305.32	292.11	-0.68	0.69	4.5%	-4.3%
-38	299.03	286.30	274.09	-0.67	0.68	4.4%	-4.3%
-37	280.22	268.46	257.18	-0.66	0.68	4.4%	-4.2%
-36	262.65	251.80	241.37	-0.65	0.67	4.3%	-4.1%
-35	246.29	236.26	226.61	-0.65	0.67	4.2%	-4.1%
-34	231.05	221.78	212.86	-0.64	0.66	4.2%	-4.0%
-33	216.87	208.30	200.05	-0.64	0.66	4.1%	-4.0%
-32	203.66	195.74	188.10	-0.63	0.65	4.0%	-3.9%
-31	191.36	184.02	176.95	-0.63	0.65	4.0%	-3.8%
-30	179.88	173.09	166.55	-0.62	0.64	3.9%	-3.8%
-29	169.17	162.88	156.82	-0.62	0.64	3.9%	-3.7%
-28	159.16	153.34	147.72	-0.61	0.63	3.8%	-3.7%
-27	149.80	144.41	139.20	-0.60	0.62	3.7%	-3.6%
-26	141.04	136.04	131.21	-0.60	0.62	3.7%	-3.6%
-25	132.83	128.21	123.73	-0.59	0.61	3.6%	-3.5%
-24	125.15	120.86	116.71	-0.58	0.60	3.5%	-3.4%
-23	117.94	113.97	110.12	-0.58	0.60	3.5%	-3.4%
-22	111.19	107.50	103.93	-0.57	0.59	3.4%	-3.3%
-21	104.85	101.43	98.120	-0.56	0.58	3.4%	-3.3%
-20	98.903	95.737	92.662	-0.56	0.57	3.3%	-3.2%
-19	93.323	90.387	87.535	-0.55	0.57	3.2%	-3.2%
-18	88.085	85.363	82.716	-0.54	0.56	3.2%	-3.1%
-17	83.167	80.643	78.187	-0.53	0.55	3.1%	-3.0%
-16	78.550	76.209	73.930	-0.53	0.55	3.1%	-3.0%
-15	74.214	72.043	69.928	-0.52	0.54	3.0%	-2.9%
-14	70.141	68.127	66.164	-0.51	0.53	3.0%	-2.9%
-13	66.315	64.447	62.624	-0.51	0.53	2.9%	-2.8%
-12	62.720	60.987	59.295	-0.50	0.52	2.8%	-2.8%
-11	59.341	57.733	56.162	-0.49	0.51	2.8%	-2.7%
-10	56.165	54.672	53.214	-0.49	0.51	2.7%	-2.7%
-9	53.178	51.793	50.439	-0.48	0.50	2.7%	-2.6%
-8	50.369	49.083	47.825	-0.47	0.49	2.6%	-2.6%
-7	47.726	46.532	45.364	-0.47	0.49	2.6%	-2.5%
-6	45.238	44.130	43.045	-0.46	0.48	2.5%	-2.5%
-5	42.896	41.867	40.859	-0.45	0.47	2.5%	-2.4%
-4	40.690	39.735	38.799	-0.45	0.47	2.4%	-2.4%
-3	38.611	37.725	36.855	-0.44	0.46	2.3%	-2.3%
-2	36.652	35.829	35.021	-0.43	0.45	2.3%	-2.3%
-1	34.805	34.041	33.290	-0.43	0.44	2.2%	-2.2%

R -T Table

Part No.:TTC3A103F39H1EY

R25 = 10 KOhm ± 1%

B25/85 = 3975 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)		Resistance Tol. (%)	
0	33.062	32.353	31.655	-0.42	0.44	2.2%	-2.2%
1	31.418	30.759	30.111	-0.41	0.43	2.1%	-2.1%
2	29.865	29.254	28.652	-0.41	0.42	2.1%	-2.1%
3	28.399	27.831	27.272	-0.40	0.42	2.0%	-2.0%
4	27.013	26.486	25.967	-0.39	0.41	2.0%	-2.0%
5	25.704	25.215	24.733	-0.38	0.40	1.9%	-1.9%
6	24.465	24.012	23.564	-0.38	0.39	1.9%	-1.9%
7	23.294	22.873	22.458	-0.37	0.39	1.8%	-1.8%
8	22.185	21.795	21.410	-0.36	0.38	1.8%	-1.8%
9	21.135	20.774	20.416	-0.35	0.37	1.7%	-1.7%
10	20.141	19.806	19.475	-0.35	0.36	1.7%	-1.7%
11	19.200	18.889	18.582	-0.34	0.35	1.6%	-1.6%
12	18.307	18.020	17.735	-0.33	0.35	1.6%	-1.6%
13	17.461	17.195	16.931	-0.32	0.34	1.5%	-1.5%
14	16.659	16.412	16.168	-0.31	0.33	1.5%	-1.5%
15	15.897	15.669	15.443	-0.31	0.32	1.5%	-1.4%
16	15.175	14.964	14.755	-0.30	0.31	1.4%	-1.4%
17	14.489	14.294	14.101	-0.29	0.30	1.4%	-1.4%
18	13.838	13.658	13.479	-0.28	0.30	1.3%	-1.3%
19	13.219	13.053	12.888	-0.27	0.29	1.3%	-1.3%
20	12.631	12.479	12.327	-0.27	0.28	1.2%	-1.2%
21	12.073	11.932	11.792	-0.26	0.27	1.2%	-1.2%
22	11.542	11.413	11.284	-0.25	0.26	1.1%	-1.1%
23	11.037	10.918	10.799	-0.24	0.25	1.1%	-1.1%
24	10.557	10.448	10.339	-0.23	0.24	1.0%	-1.0%
25	10.100	10.000	9.9000	-0.22	0.23	1.0%	-1.0%
26	9.6737	9.5738	9.4739	-0.23	0.25	1.0%	-1.0%
27	9.2676	9.1679	9.0683	-0.25	0.26	1.1%	-1.1%
28	8.8806	8.7813	8.6822	-0.26	0.27	1.1%	-1.1%
29	8.5118	8.4130	8.3145	-0.27	0.28	1.2%	-1.2%
30	8.1602	8.0621	7.9643	-0.28	0.29	1.2%	-1.2%
31	7.8250	7.7276	7.6306	-0.29	0.30	1.3%	-1.3%
32	7.5053	7.4087	7.3127	-0.30	0.32	1.3%	-1.3%
33	7.2003	7.1047	7.0096	-0.31	0.33	1.3%	-1.3%
34	6.9093	6.8147	6.7207	-0.33	0.34	1.4%	-1.4%
35	6.6315	6.5380	6.4452	-0.34	0.35	1.4%	-1.4%
36	6.3664	6.2741	6.1824	-0.35	0.36	1.5%	-1.5%
37	6.1133	6.0221	5.9318	-0.36	0.38	1.5%	-1.5%
38	5.8716	5.7817	5.6926	-0.37	0.39	1.6%	-1.5%
39	5.6407	5.5520	5.4643	-0.39	0.40	1.6%	-1.6%

R -T Table

Part No.:TTC3A103F39H1EY

R25 = 10 KOhm ± 1%

B25/85 = 3975 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)		Resistance Tol. (%)	
40	5.4201	5.3328	5.2463	-0.40	0.41	1.6%	-1.6%
41	5.2092	5.1233	5.0382	-0.41	0.42	1.7%	-1.7%
42	5.0077	4.9232	4.8395	-0.42	0.44	1.7%	-1.7%
43	4.8151	4.7319	4.6496	-0.44	0.45	1.8%	-1.7%
44	4.6309	4.5491	4.4682	-0.45	0.46	1.8%	-1.8%
45	4.4547	4.3743	4.2949	-0.46	0.48	1.8%	-1.8%
46	4.2861	4.2071	4.1291	-0.47	0.49	1.9%	-1.9%
47	4.1248	4.0472	3.9707	-0.49	0.50	1.9%	-1.9%
48	3.9705	3.8943	3.8191	-0.50	0.51	2.0%	-1.9%
49	3.8227	3.7479	3.6742	-0.51	0.53	2.0%	-2.0%
50	3.6812	3.6078	3.5355	-0.52	0.54	2.0%	-2.0%
51	3.5457	3.4736	3.4027	-0.54	0.55	2.1%	-2.0%
52	3.4158	3.3452	3.2757	-0.55	0.57	2.1%	-2.1%
53	3.2914	3.2221	3.1540	-0.56	0.58	2.2%	-2.1%
54	3.1722	3.1043	3.0375	-0.58	0.59	2.2%	-2.2%
55	3.0579	2.9913	2.9259	-0.59	0.60	2.2%	-2.2%
56	2.9483	2.8831	2.8190	-0.60	0.62	2.3%	-2.2%
57	2.8432	2.7793	2.7165	-0.62	0.63	2.3%	-2.3%
58	2.7424	2.6798	2.6183	-0.63	0.64	2.3%	-2.3%
59	2.6457	2.5843	2.5241	-0.64	0.66	2.4%	-2.3%
60	2.5529	2.4928	2.4338	-0.66	0.67	2.4%	-2.4%
61	2.4638	2.4049	2.3472	-0.67	0.68	2.4%	-2.4%
62	2.3783	2.3206	2.2641	-0.68	0.70	2.5%	-2.4%
63	2.2961	2.2396	2.1843	-0.70	0.71	2.5%	-2.5%
64	2.2172	2.1619	2.1078	-0.71	0.73	2.6%	-2.5%
65	2.1414	2.0873	2.0343	-0.73	0.74	2.6%	-2.5%
66	2.0686	2.0156	1.9637	-0.74	0.75	2.6%	-2.6%
67	1.9986	1.9467	1.8960	-0.75	0.77	2.7%	-2.6%
68	1.9313	1.8805	1.8309	-0.77	0.78	2.7%	-2.6%
69	1.8666	1.8169	1.7683	-0.78	0.79	2.7%	-2.7%
70	1.8044	1.7557	1.7082	-0.80	0.81	2.8%	-2.7%
71	1.7446	1.6969	1.6504	-0.81	0.82	2.8%	-2.7%
72	1.6870	1.6404	1.5949	-0.82	0.84	2.8%	-2.8%
73	1.6316	1.5860	1.5415	-0.84	0.85	2.9%	-2.8%
74	1.5783	1.5336	1.4901	-0.85	0.86	2.9%	-2.8%
75	1.5269	1.4832	1.4407	-0.87	0.88	2.9%	-2.9%
76	1.4775	1.4348	1.3931	-0.88	0.89	3.0%	-2.9%
77	1.4299	1.3881	1.3473	-0.90	0.91	3.0%	-2.9%
78	1.3841	1.3432	1.3033	-0.91	0.92	3.0%	-3.0%
79	1.3399	1.2999	1.2609	-0.93	0.94	3.1%	-3.0%

R -T Table

Part No.:TTC3A103F39H1EY

R25 = 10 KOhm ± 1%

B25/85 = 3975 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)		Resistance Tol. (%)	
80	1.2974	1.2582	1.2201	-0.94	0.95	3.1%	-3.0%
81	1.2564	1.2181	1.1808	-0.96	0.96	3.1%	-3.1%
82	1.2169	1.1794	1.1429	-0.97	0.98	3.2%	-3.1%
83	1.1788	1.1421	1.1064	-0.98	0.99	3.2%	-3.1%
84	1.1421	1.1062	1.0712	-1.00	1.01	3.2%	-3.2%
85	1.1067	1.0715	1.0374	-1.01	1.02	3.3%	-3.2%
86	1.0725	1.0381	1.0047	-1.03	1.04	3.3%	-3.2%
87	1.0396	1.0059	0.9732	-1.05	1.05	3.3%	-3.2%
88	1.0078	0.9748	0.9429	-1.06	1.07	3.4%	-3.3%
89	0.9771	0.9449	0.9136	-1.08	1.08	3.4%	-3.3%
90	0.9475	0.9160	0.8854	-1.09	1.10	3.4%	-3.3%
91	0.9190	0.8881	0.8582	-1.11	1.11	3.5%	-3.4%
92	0.8914	0.8612	0.8319	-1.12	1.13	3.5%	-3.4%
93	0.8648	0.8352	0.8066	-1.14	1.14	3.5%	-3.4%
94	0.8390	0.8101	0.7821	-1.15	1.16	3.6%	-3.5%
95	0.8142	0.7859	0.7585	-1.17	1.17	3.6%	-3.5%
96	0.7902	0.7625	0.7357	-1.19	1.19	3.6%	-3.5%
97	0.7671	0.7400	0.7137	-1.20	1.20	3.7%	-3.5%
98	0.7447	0.7182	0.6925	-1.22	1.22	3.7%	-3.6%
99	0.7231	0.6971	0.6720	-1.23	1.23	3.7%	-3.6%
100	0.7022	0.6767	0.6522	-1.25	1.25	3.8%	-3.6%
101	0.6820	0.6571	0.6330	-1.27	1.27	3.8%	-3.7%
102	0.6624	0.6381	0.6145	-1.28	1.28	3.8%	-3.7%
103	0.6436	0.6197	0.5967	-1.30	1.30	3.8%	-3.7%
104	0.6253	0.6020	0.5794	-1.32	1.31	3.9%	-3.7%
105	0.6076	0.5848	0.5627	-1.33	1.33	3.9%	-3.8%
106	0.5906	0.5682	0.5466	-1.35	1.35	3.9%	-3.8%
107	0.5741	0.5521	0.5310	-1.37	1.36	4.0%	-3.8%
108	0.5581	0.5366	0.5159	-1.38	1.38	4.0%	-3.9%
109	0.5426	0.5216	0.5014	-1.40	1.39	4.0%	-3.9%
110	0.5277	0.5071	0.4873	-1.42	1.41	4.1%	-3.9%
111	0.5132	0.4930	0.4736	-1.43	1.43	4.1%	-3.9%
112	0.4992	0.4794	0.4604	-1.45	1.44	4.1%	-4.0%
113	0.4856	0.4663	0.4477	-1.47	1.46	4.1%	-4.0%
114	0.4725	0.4536	0.4353	-1.49	1.48	4.2%	-4.0%
115	0.4598	0.4412	0.4234	-1.50	1.49	4.2%	-4.0%
116	0.4474	0.4293	0.4118	-1.52	1.51	4.2%	-4.1%
117	0.4355	0.4177	0.4006	-1.54	1.53	4.3%	-4.1%
118	0.4240	0.4065	0.3898	-1.56	1.55	4.3%	-4.1%
119	0.4128	0.3957	0.3793	-1.58	1.56	4.3%	-4.1%

R -T Table

Part No.:TTC3A103F39H1EY

R25 = 10 KOhm ± 1%

B25/85 = 3975 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)		Resistance Tol. (%)	
120	0.4019	0.3852	0.3691	-1.59	1.58	4.3%	-4.2%
121	0.3914	0.3750	0.3593	-1.61	1.60	4.4%	-4.2%
122	0.3812	0.3652	0.3498	-1.63	1.61	4.4%	-4.2%
123	0.3714	0.3556	0.3405	-1.65	1.63	4.4%	-4.2%
124	0.3618	0.3464	0.3316	-1.67	1.65	4.5%	-4.3%
125	0.3525	0.3374	0.3229	-1.69	1.67	4.5%	-4.3%