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SPECIFICATION FOR APPROVAL

CUSTOMER _____

CERTIFIED
MODEL/TYPE

TTC03-103

PART NO.

TTC3A103F3951EY2(RoHS)

APPLICATION _____

CUSTOMER P/N _____

ISSUE DATE

Jul.10.2019

REV. NO. _____

REV. DATE _____

FOR CUSTOMER APPROVAL	CHECKED BY
	<i>Haili Gong</i>
	APPROVED BY
	<i>Huaifang Zhang</i>





REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT



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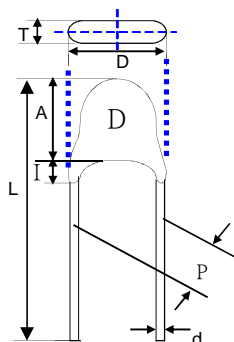
Part Number Code

Example :

TTC **3** **A** **103** **F** **395** **1** **E** **Y2**
(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°C	103	$10 \times 10^3 \Omega = 10 \text{ K}\Omega$
(5)	Tolerance of R _{25°C}	F	±1%
(6)	B Value	395	3950K
(7)	Tolerance of B Value	1	±1%
(8)	Appearance	E	Straight lead epoxy coating (Green)
(9)	Optional Suffix	Y2	RoHS compliance L:20.5±1mm

Structure and Dimensions



(unit:mm)

Item	D	d	P	A	I	L	T
Max	4	0.52	3.04	5	3	21.5	3
Min	2.5	0.48	2.04	2.5	---	19.5	1.5

Electrical Characteristics

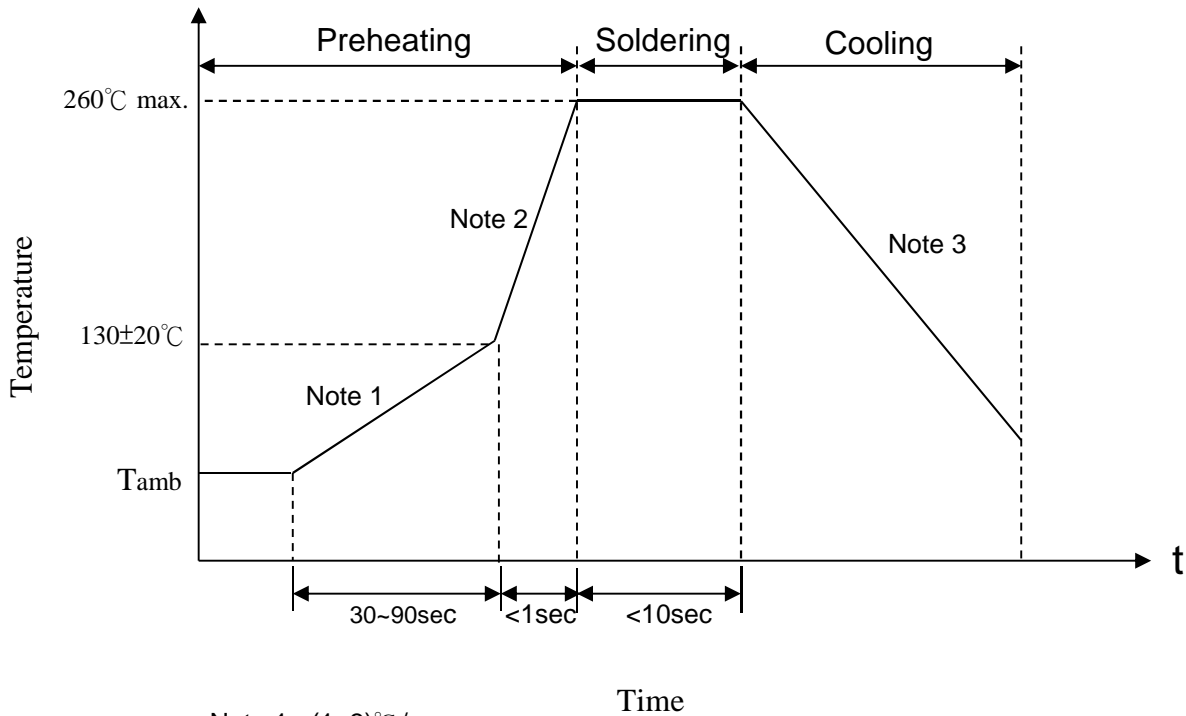
Part No.	Zero Power Resistance at 25°C	Tolerance of R _{25°C}	B _{25/85} Value	Tolerance of B Value	Max. Power Dissipation at 25°C	Dissipation Factor	Thermal Time Constant	Operating Temperature Range
	R _{25°C} (KΩ)	(± %)	(K)	(± %)	P _{max} (mW)	δ(mW/°C)	τ (sec.)	T _L ~T _U (°C)
TTC3A103F3951EY	10	1	3950	1	150	≥ 2.5	≤ 18	-40 ~ +125

Reliability

Item	Standard	Test conditions / Methods	Specifications															
Tensile Strength of Terminals	IEC60068-2-21	<p>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.</p> <table border="0"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;"><u>0.3<d≤0.5</u></td> <td style="text-align: center;"><u>0.5</u></td> </tr> <tr> <td style="text-align: center;">0.5<d≤0.8</td> <td style="text-align: center;">1.0</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	<u>0.3<d≤0.5</u>	<u>0.5</u>	0.5<d≤0.8	1.0	No visible damage									
Terminal diameter (mm)	Force (Kg)																	
<u>0.3<d≤0.5</u>	<u>0.5</u>																	
0.5<d≤0.8	1.0																	
Bending Strength of Terminals	IEC60068-2-21	<p>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.</p> <table border="0"> <tr> <td style="text-align: center;">Terminal diameter (mm)</td> <td style="text-align: center;">Force (Kg)</td> </tr> <tr> <td style="text-align: center;"><u>0.3<d≤0.5</u></td> <td style="text-align: center;"><u>0.25</u></td> </tr> <tr> <td style="text-align: center;">0.5<d≤0.8</td> <td style="text-align: center;">0.50</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	<u>0.3<d≤0.5</u>	<u>0.25</u>	0.5<d≤0.8	0.50	No visible damage									
Terminal diameter (mm)	Force (Kg)																	
<u>0.3<d≤0.5</u>	<u>0.25</u>																	
0.5<d≤0.8	0.50																	
Solderability	IEC60068-2-20	245 ± 3 °C , 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-20	260 ± 3 °C , 10 ± 1 sec	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
High Temperature Storage	IEC60068-2-2	125 ± 5 °C , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Damp Heat, Steady State	IEC 60068-2-78	40 ± 2 °C , 90 ~ 95 % RH , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
Rapid Change of Temperature	IEC60068-2-14	<p>The conditions shown below shall be repeated 5 cycles</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <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> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 5	30 ± 3	2	Room temperature	5 ± 3	3	125 ± 5	30 ± 3	4	Room temperature	5 ± 3	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 5	30 ± 3																
2	Room temperature	5 ± 3																
3	125 ± 5	30 ± 3																
4	Room temperature	5 ± 3																
Max. Power Dissipation	IEC60539-1 4.26.3	25 ± 5 °C , Pmax. , 1000 ±24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Dissipation Factor (δ)	Specification	<p>Dissipation factor is ration of thermistor's temperature change caused by its dissipation power under specific ambienttemperature. which stands for dissipation power for thermistor's increase of 1°C.</p> $\delta = V \cdot I / T_2 - T_1 (\text{mW}/^\circ\text{C})$	≥ 2.5mW/°C															
Thermal Time Constant(τ)	Specification	The thermal time constant is a 63.2% change of thermistor's body temperature from its initial temperature (T0) tospecific temperature (T1) under zero-power conditions.	≤ 18Sec															

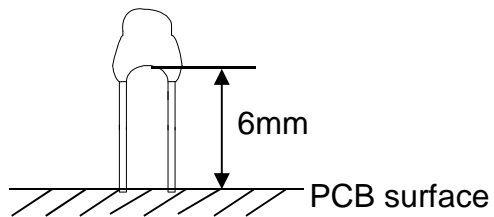
Soldering Recommendation

Wave Soldering Profile



Note 1 : $(1 \sim 3)^{\circ}\text{C}/\text{sec}$
 Note 2 : Approx. $200^{\circ}\text{C}/\text{sec}$
 Note 3 : $5^{\circ}\text{C}/\text{sec Max}$

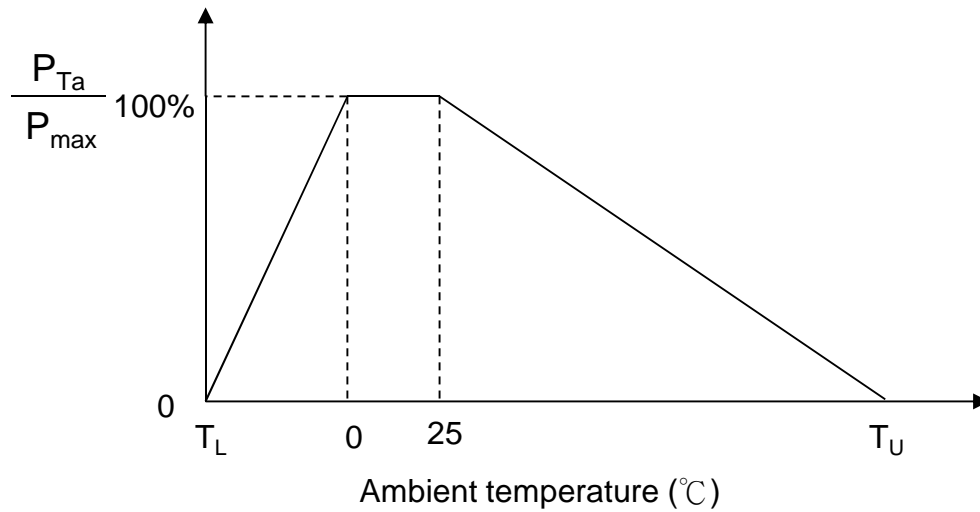
Caution: It has be better to keep the minimum distance as 6mm between the bottom of the thermistor body and PCB surface to prevent component damage.



Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	6 mm (min.)

Max. Power Dissipation Derating Curve



Note: T_L = Minimum operating temperature (°C)

T_U = Maximum operating temperature (°C)

For example :

Ambient temperature(T_a)=55°C

Maximum operating temperature(T_u)= 125°C

$P_{Ta}=(T_u-T_a)/(T_u-25) \times P_{max} = 70\% P_{max}$

RoHS Compliant Declaration

We hereby declare that the components delivered to your company are compliant with RoHS directive 2015/863/EU.

Warehouse Storage Conditions of Products

(I) Storage Conditions :

- 1.Storage Temperature : -10°C ~+40°C
- 2.Relative Humidity : $\leq 75\%RH$
- 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)



* TÜV recognized (File # R 50050155)



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

* CQC GB6663-86 recognized (File# CQC04001011966)

Certificates

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

Test Report

- (1) RoHS test report

R - T Table

Part No. : TTC3A103F3951EY

R25=10KOhm \pm 1%B25/85 = 3950 K \pm 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)		Resistance Tol. (%)	
-40	332.914	318.406	304.500	-0.71	0.71	4.6%	-4.4%
-39	312.241	298.823	285.953	-0.69	0.70	4.5%	-4.3%
-38	292.726	280.326	268.424	-0.67	0.69	4.4%	-4.2%
-37	274.423	262.967	251.963	-0.66	0.68	4.4%	-4.2%
-36	257.326	246.740	236.566	-0.65	0.67	4.3%	-4.1%
-35	241.388	231.604	222.195	-0.65	0.67	4.2%	-4.1%
-34	226.546	217.500	208.795	-0.64	0.66	4.2%	-4.0%
-33	212.725	204.359	196.302	-0.64	0.66	4.1%	-3.9%
-32	199.851	192.109	184.650	-0.63	0.65	4.0%	-3.9%
-31	187.849	180.684	173.774	-0.63	0.65	4.0%	-3.8%
-30	176.652	170.017	163.615	-0.62	0.64	3.9%	-3.8%
-29	166.195	160.049	154.116	-0.62	0.64	3.8%	-3.7%
-28	156.421	150.727	145.226	-0.61	0.63	3.8%	-3.6%
-27	147.278	142.001	136.900	-0.60	0.62	3.7%	-3.6%
-26	138.718	133.827	129.096	-0.60	0.62	3.7%	-3.5%
-25	130.699	126.165	121.777	-0.59	0.61	3.6%	-3.5%
-24	123.182	118.980	114.909	-0.58	0.60	3.5%	-3.4%
-23	116.134	112.237	108.460	-0.58	0.60	3.5%	-3.4%
-22	109.522	105.909	102.404	-0.57	0.59	3.4%	-3.3%
-21	103.318	99.9666	96.7145	-0.56	0.58	3.4%	-3.3%
-20	97.4942	94.3861	91.3680	-0.56	0.58	3.3%	-3.2%
-19	92.0269	89.1441	86.3429	-0.55	0.57	3.2%	-3.1%
-18	86.8932	84.2191	81.6190	-0.54	0.56	3.2%	-3.1%
-17	82.0720	79.5912	77.1776	-0.54	0.55	3.1%	-3.0%
-16	77.5434	75.2417	73.0011	-0.53	0.55	3.1%	-3.0%
-15	73.2891	71.1534	69.0731	-0.52	0.54	3.0%	-2.9%
-14	69.2917	67.3099	65.3783	-0.52	0.53	2.9%	-2.9%
-13	65.5351	63.6959	61.9021	-0.51	0.53	2.9%	-2.8%
-12	62.0040	60.2969	58.6310	-0.50	0.52	2.8%	-2.8%
-11	58.6842	57.0996	55.5523	-0.50	0.51	2.8%	-2.7%
-10	55.5622	54.0912	52.6539	-0.49	0.51	2.7%	-2.7%
-9	52.6256	51.2599	49.9247	-0.48	0.50	2.7%	-2.6%
-8	49.8625	48.5945	47.3539	-0.48	0.49	2.6%	-2.6%
-7	47.2619	46.0844	44.9318	-0.47	0.49	2.6%	-2.5%
-6	44.8134	43.7200	42.6489	-0.46	0.48	2.5%	-2.4%
-5	42.5074	41.4919	40.4966	-0.46	0.47	2.4%	-2.4%
-4	40.3347	39.3916	38.4667	-0.45	0.47	2.4%	-2.3%
-3	38.2869	37.4110	36.5514	-0.44	0.46	2.3%	-2.3%
-2	36.3561	35.5426	34.7437	-0.44	0.45	2.3%	-2.2%
-1	34.5349	33.7793	33.0369	-0.43	0.45	2.2%	-2.2%



R - T Table

Part No. : TTC3A103F3951EY

R25=10KOhm ±1%

B25/85 = 3950 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
0	32.8164	32.1146	31.4247	-0.42	0.44	2.2%	-2.1%
1	31.1941	30.5423	29.9012	-0.41	0.43	2.1%	-2.1%
2	29.6620	29.0568	28.4610	-0.41	0.42	2.1%	-2.1%
3	28.2146	27.6525	27.0990	-0.40	0.42	2.0%	-2.0%
4	26.8465	26.3247	25.8104	-0.39	0.41	2.0%	-2.0%
5	25.5530	25.0685	24.5908	-0.39	0.40	1.9%	-1.9%
6	24.3294	23.8798	23.4361	-0.38	0.39	1.9%	-1.9%
7	23.1716	22.7543	22.3423	-0.37	0.39	1.8%	-1.8%
8	22.0755	21.6884	21.3059	-0.36	0.38	1.8%	-1.8%
9	21.0375	20.6785	20.3235	-0.36	0.37	1.7%	-1.7%
10	20.0542	19.7213	19.3919	-0.35	0.36	1.7%	-1.7%
11	19.1223	18.8137	18.5082	-0.34	0.35	1.6%	-1.6%
12	18.2389	17.9529	17.6697	-0.33	0.35	1.6%	-1.6%
13	17.4010	17.1362	16.8737	-0.32	0.34	1.5%	-1.5%
14	16.6062	16.3611	16.1179	-0.32	0.33	1.5%	-1.5%
15	15.8520	15.6251	15.4000	-0.31	0.32	1.5%	-1.4%
16	15.1360	14.9262	14.7179	-0.30	0.31	1.4%	-1.4%
17	14.4561	14.2623	14.0696	-0.29	0.31	1.4%	-1.4%
18	13.8103	13.6313	13.4533	-0.28	0.30	1.3%	-1.3%
19	13.1968	13.0316	12.8671	-0.28	0.29	1.3%	-1.3%
20	12.6137	12.4613	12.3096	-0.27	0.28	1.2%	-1.2%
21	12.0593	11.9190	11.7791	-0.26	0.27	1.2%	-1.2%
22	11.5322	11.4031	11.2742	-0.25	0.26	1.1%	-1.1%
23	11.0309	10.9121	10.7936	-0.24	0.25	1.1%	-1.1%
24	10.5539	10.4449	10.3359	-0.23	0.24	1.0%	-1.0%
25	10.1000	10.0000	9.90000	-0.22	0.24	1.0%	-1.0%
26	9.67633	9.57638	9.47651	-0.24	0.25	1.0%	-1.0%
27	9.27262	9.17289	9.07332	-0.25	0.26	1.1%	-1.1%
28	8.88783	8.78847	8.68936	-0.26	0.27	1.1%	-1.1%
29	8.52100	8.42215	8.32363	-0.27	0.28	1.2%	-1.2%
30	8.17120	8.07300	7.97518	-0.28	0.29	1.2%	-1.2%
31	7.83758	7.74013	7.64312	-0.29	0.31	1.3%	-1.3%
32	7.51931	7.42271	7.32661	-0.30	0.32	1.3%	-1.3%
33	7.21562	7.11995	7.02485	-0.32	0.33	1.3%	-1.3%
34	6.92578	6.83113	6.73709	-0.33	0.34	1.4%	-1.4%
35	6.64910	6.55553	6.46263	-0.34	0.35	1.4%	-1.4%
36	6.38492	6.29249	6.20078	-0.35	0.37	1.5%	-1.5%
37	6.13263	6.04139	5.95091	-0.36	0.38	1.5%	-1.5%
38	5.89163	5.80162	5.71242	-0.38	0.39	1.6%	-1.5%
39	5.66137	5.57263	5.48474	-0.39	0.40	1.6%	-1.6%



R - T Table

Part No. : TTC3A103F3951EY

R25=10KOhm ±1%

B25/85 = 3950 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
40	5.44132	5.35389	5.26734	-0.40	0.41	1.6%	-1.6%
41	5.23098	5.14488	5.05970	-0.41	0.43	1.7%	-1.7%
42	5.02989	4.94514	4.86134	-0.42	0.44	1.7%	-1.7%
43	4.83759	4.75421	4.67180	-0.44	0.45	1.8%	-1.7%
44	4.65366	4.57166	4.49066	-0.45	0.46	1.8%	-1.8%
45	4.47769	4.39708	4.31749	-0.46	0.48	1.8%	-1.8%
46	4.30931	4.23009	4.15191	-0.47	0.49	1.9%	-1.8%
47	4.14814	4.07032	3.99356	-0.49	0.50	1.9%	-1.9%
48	3.99386	3.91743	3.84208	-0.50	0.51	2.0%	-1.9%
49	3.84612	3.77108	3.69714	-0.51	0.53	2.0%	-2.0%
50	3.70463	3.63097	3.55843	-0.53	0.54	2.0%	-2.0%
51	3.56908	3.49680	3.42565	-0.54	0.55	2.1%	-2.0%
52	3.43920	3.36829	3.29852	-0.55	0.57	2.1%	-2.1%
53	3.31472	3.24517	3.17677	-0.56	0.58	2.1%	-2.1%
54	3.19540	3.12719	3.06014	-0.58	0.59	2.2%	-2.1%
55	3.08098	3.01411	2.94840	-0.59	0.61	2.2%	-2.2%
56	2.97126	2.90571	2.84132	-0.60	0.62	2.3%	-2.2%
57	2.86601	2.80175	2.73867	-0.62	0.63	2.3%	-2.3%
58	2.76502	2.70205	2.64026	-0.63	0.65	2.3%	-2.3%
59	2.66811	2.60641	2.54588	-0.65	0.66	2.4%	-2.3%
60	2.57508	2.51463	2.45536	-0.66	0.67	2.4%	-2.4%
61	2.48577	2.42655	2.36851	-0.67	0.69	2.4%	-2.4%
62	2.40000	2.34200	2.28517	-0.69	0.70	2.5%	-2.4%
63	2.31763	2.26081	2.20517	-0.70	0.71	2.5%	-2.5%
64	2.23849	2.18285	2.12838	-0.71	0.73	2.5%	-2.5%
65	2.16244	2.10795	2.05464	-0.73	0.74	2.6%	-2.5%
66	2.08935	2.03600	1.98381	-0.74	0.75	2.6%	-2.6%
67	2.01909	1.96685	1.91577	-0.76	0.77	2.7%	-2.6%
68	1.95153	1.90039	1.85040	-0.77	0.78	2.7%	-2.6%
69	1.88656	1.83649	1.78758	-0.78	0.80	2.7%	-2.7%
70	1.82407	1.77506	1.72719	-0.80	0.81	2.8%	-2.7%
71	1.76395	1.71597	1.66913	-0.81	0.82	2.8%	-2.7%
72	1.70609	1.65913	1.61329	-0.83	0.84	2.8%	-2.8%
73	1.65041	1.60444	1.55959	-0.84	0.85	2.9%	-2.8%
74	1.59681	1.55181	1.50793	-0.85	0.87	2.9%	-2.8%
75	1.54520	1.50116	1.45823	-0.87	0.88	2.9%	-2.9%
76	1.49550	1.45240	1.41040	-0.88	0.89	3.0%	-2.9%
77	1.44763	1.40544	1.36435	-0.90	0.91	3.0%	-2.9%
78	1.40151	1.36023	1.32003	-0.91	0.92	3.0%	-3.0%
79	1.35708	1.31667	1.27735	-0.93	0.94	3.1%	-3.0%



R - T Table

Part No. : TTC3A103F3951EY

R25=10KOhm ±1%

B25/85 = 3950 K ± 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
80	1.31426	1.27472	1.23624	-0.94	0.95	3.1%	-3.0%
81	1.27299	1.23429	1.19665	-0.96	0.97	3.1%	-3.0%
82	1.23320	1.19533	1.15850	-0.97	0.98	3.2%	-3.1%
83	1.19484	1.15778	1.12175	-0.99	1.00	3.2%	-3.1%
84	1.15785	1.12158	1.08633	-1.00	1.01	3.2%	-3.1%
85	1.12217	1.08667	1.05219	-1.02	1.02	3.3%	-3.2%
86	1.08775	1.05301	1.01928	-1.03	1.04	3.3%	-3.2%
87	1.05455	1.02055	0.98754	-1.05	1.05	3.3%	-3.2%
88	1.02250	0.98923	0.95694	-1.06	1.07	3.4%	-3.3%
89	0.99158	0.95901	0.92742	-1.08	1.08	3.4%	-3.3%
90	0.96173	0.92986	0.89895	-1.09	1.10	3.4%	-3.3%
91	0.93292	0.90172	0.87148	-1.11	1.11	3.5%	-3.4%
92	0.90509	0.87456	0.84497	-1.12	1.13	3.5%	-3.4%
93	0.87823	0.84834	0.81939	-1.14	1.14	3.5%	-3.4%
94	0.85228	0.82303	0.79470	-1.16	1.16	3.6%	-3.4%
95	0.82722	0.79859	0.77087	-1.17	1.17	3.6%	-3.5%
96	0.80300	0.77498	0.74786	-1.19	1.19	3.6%	-3.5%
97	0.77961	0.75218	0.72563	-1.20	1.20	3.6%	-3.5%
98	0.75700	0.73015	0.70417	-1.22	1.22	3.7%	-3.6%
99	0.73516	0.70886	0.68345	-1.24	1.24	3.7%	-3.6%
100	0.71404	0.68830	0.66342	-1.25	1.25	3.7%	-3.6%
101	0.69362	0.66842	0.64408	-1.27	1.27	3.8%	-3.6%
102	0.67388	0.64921	0.62538	-1.28	1.28	3.8%	-3.7%
103	0.65480	0.63064	0.60732	-1.30	1.30	3.8%	-3.7%
104	0.63634	0.61269	0.58986	-1.32	1.32	3.9%	-3.7%
105	0.61848	0.59533	0.57298	-1.33	1.33	3.9%	-3.8%
106	0.60121	0.57854	0.55666	-1.35	1.35	3.9%	-3.8%
107	0.58450	0.56230	0.54088	-1.37	1.36	3.9%	-3.8%
108	0.56834	0.54659	0.52562	-1.38	1.38	4.0%	-3.8%
109	0.55269	0.53139	0.51087	-1.40	1.40	4.0%	-3.9%
110	0.53755	0.51669	0.49659	-1.42	1.41	4.0%	-3.9%
111	0.52290	0.50246	0.48278	-1.44	1.43	4.1%	-3.9%
112	0.50871	0.48869	0.46942	-1.45	1.45	4.1%	-3.9%
113	0.49497	0.47536	0.45649	-1.47	1.46	4.1%	-4.0%
114	0.48167	0.46246	0.44398	-1.49	1.48	4.2%	-4.0%
115	0.46878	0.44997	0.43187	-1.51	1.50	4.2%	-4.0%
116	0.45631	0.43787	0.42014	-1.52	1.51	4.2%	-4.0%
117	0.44422	0.42616	0.40879	-1.54	1.53	4.2%	-4.1%
118	0.43251	0.41481	0.39780	-1.56	1.55	4.3%	-4.1%
119	0.42116	0.40382	0.38716	-1.58	1.57	4.3%	-4.1%

