

THINKING ELECTRONIC INDUSTRIAL CO., LTD.

HEAD OFFICE: 12F, No.93, Dashun 1st Rd., Zuoying Dist., Kaohsiung, Taiwan
TEL: 886-7-5577660 FAX: 886-7-5570560

MANUFACTURING SITE

- ☒ KAOHSIUNG FACTORY: No.6, Xinjian S. Rd., Nanzi Dist., Kaohsiung City 811644, Taiwan
TEL: 886-7-9616668 FAX: 886-7-3866990
- ☐ KAOHSIUNG FACTORY 2: No. 2-2, Xinjian S. Rd., N.E.P.Z., Kaohsiung City 81170, Taiwan
TEL: 886-7-9630001 FAX: 886-7-3635113
- ☐ CHANGZHOU FACTORY: No.6 Longmen Rd., Wujin High & New-Tech Industrial Development Zone, Changzhou, Jiangsu, China 213161
TEL: 86-519-86578999 FAX: 86-519-86558643
- ☐ DONG GUAN FACTORY: No.45, East Rd., Sha-Tao Dist., Chang-An Town, Dongguan City, Guangdong, China 523863
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
- ☐ JIANGXI FACTORY: Tangying Road, Ceramics Industry Garden, Jingdezhen City, Jiangxi, China 333400
TEL: 86-798-2621372 FAX: 86-798-2126372

**SPECIFICATION FOR APPROVAL**

CUSTOMER	Blume-Benning
CERTIFIED	
MODEL/TYPE	TSM2A223
PART NO.	TSM2A223J3801RZ (RoHS+HF)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Dec. 26, 2024
REV. NO.	
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	<i>Mei Rong Chen</i>
	APPROVED BY
	<i>Kun Lin Lin</i>





NTC Thermistor TSM Type
Part No. :TSM2A223J3801RZ

REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT



INDEX	Page
■ Part Number Code	1
■ Structure and Dimensions	2
■ Electrical Characteristics	2
■ Reliability	3
■ Soldering Recommendation	4
■ Max. Power Dissipation Derating Curve	5
■ Recommended Soldering Pad Dimensions	6
■ RoHS Compliant Declaration	6
■ Warehouse Storage Conditions of Products	6
■ Restriction of Weapon and Military End-Use	6
■ Packaging	7
■ Safety Approvals & Certificates & Test Report	8
■ R-T Table	9 ~ 13

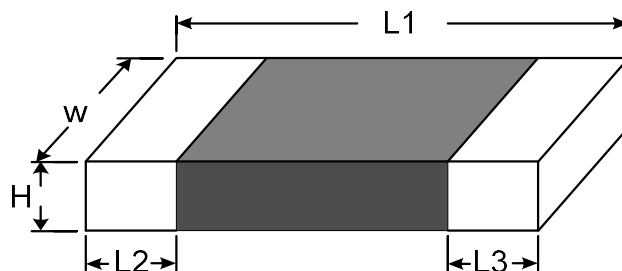
Part Number Code

Example :

TSM **2** **A** **223** **J** **380** **1** **R** **Z**
(1) (2) (3) (4) (5) (6) (7) (8) (9)

No.	Item	Digit	Specification
(1)	Product Type	TSM	Thinking NTC thermistor TSM type
(2)	Size (EIA)	2	0805
(3)	Definition of B Value	A	B _{25/85}
(4)	Zero Power Resistance at 25°C (R ₂₅)	223	22 x 10 ³ Ω = 22 KΩ
(5)	Tolerance of R ₂₅	J	± 5%
(6)	B Value	380	3800 K
(7)	Tolerance of B Value	1	± 1%
(8)	Packaging	R	Reel
(9)	Optional Suffix	Z	RoHS+HF compliance

Structure and Dimensions



(unit : mm)

L1	W	H max.	L2 and L3
2.00±0.20	1.25±0.20	1.00	0.40±0.20

Electrical Characteristics

Part No.	Zero Power Resistance at 25°C	Tolerance of R ₂₅	B _{25/85} Value	Tolerance of B Value	Max. Power Dissipation at 25°C	Dissipation Factor (Approx.)	Thermal Time Constant (Approx.)	Maximum Operating Current at 25°C	Operating Temperature Range
	R ₂₅ (KΩ)	(± %)	(K)	(± %)	P _{max} (mW)	δ (mW/°C)	τ (sec.)	I _{max} (mA)	T _L ~T _U (°C)
TSM2A223J3801RZ	22	5	3800	1	240	2.4	5.4	0.33	-40 ~ +125

Note: Maximum operating current(I_{max}) is defined at which self-heating becomes 1°C when operating current flows through the NTC thermistor. It is calculated from the following equation:

Maximum operating current(mA)=√(Dissipation factor (mW/°C) / Resistance(KΩ))

Reliability

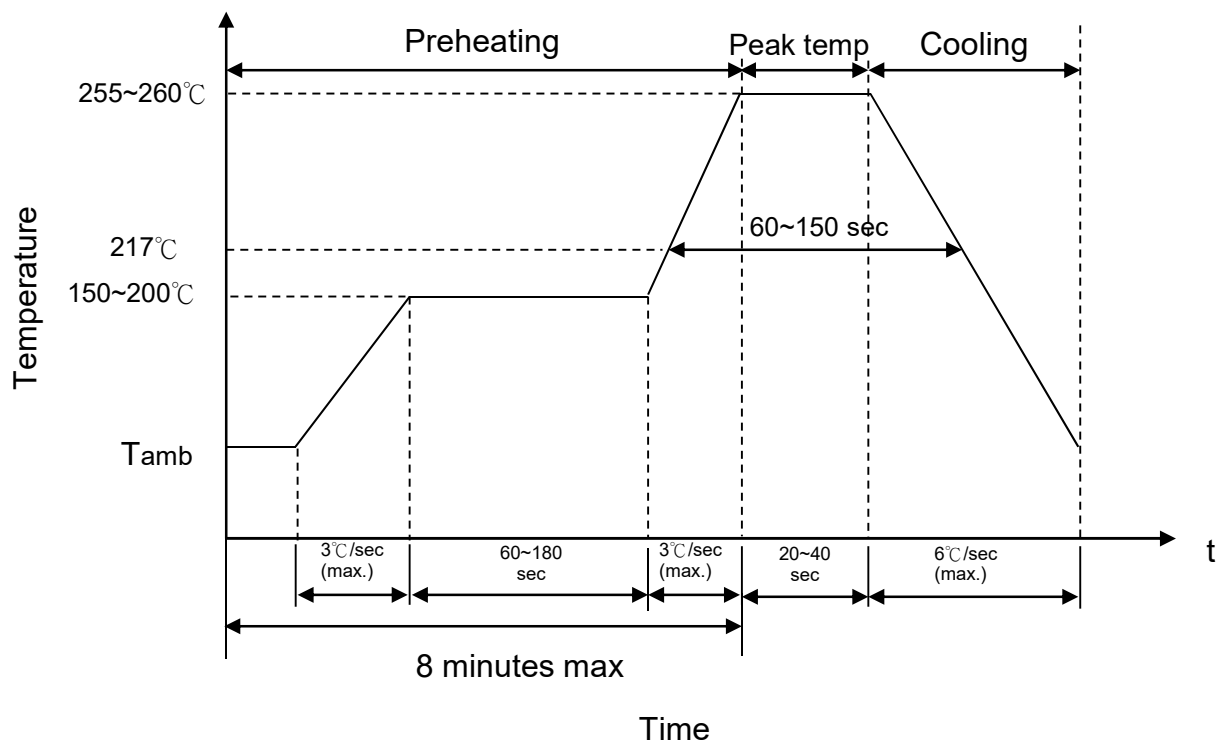
Item	Standard	Test conditions / Methods	Specifications															
Bending Strength	IEC 60068-2-21	Warp : 2mm ; Speed < 0.5mm/sec. Duration : 10 sec on PCB. 	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Solderability	IEC60068-2-58	245 ± 5°C , 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC60068-2-58	260 ± 5°C , 10 ±1 sec	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
High Temperature Storage	IEC60068-2-2	125 ± 2°C , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Damp Heat, Steady State	IEC60068-2-78	40 ± 2°C , 9 0 ~ 95 % RH , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
Rapid Change of Temperature	IEC60068-2-14	The conditions shown below shall be repeated 5 cycles on PCB <table><tr><th>Step</th><th>Temperature (°C)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-40 ± 3</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>≤3</td></tr><tr><td>3</td><td>125 ± 2</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>≤3</td></tr></table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 3	30 ± 3	2	Room temperature	≤3	3	125 ± 2	30 ± 3	4	Room temperature	≤3	No visible damage ΔR ₂₅ /R ₂₅ ≤ 3 %
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 3	30 ± 3																
2	Room temperature	≤3																
3	125 ± 2	30 ± 3																
4	Room temperature	≤3																
Max. Power Dissipation	IEC60539-1 4.26.3	25 ± 5°C , P _{max.} , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 5 %															

Products have been tested at Thinking Electronic

Industrial Co.,Ltd. Laboratory recognized by UL (Underwriters Laboratories Inc.) under CTPD
(Client Test Data Program).

Soldering Recommendation

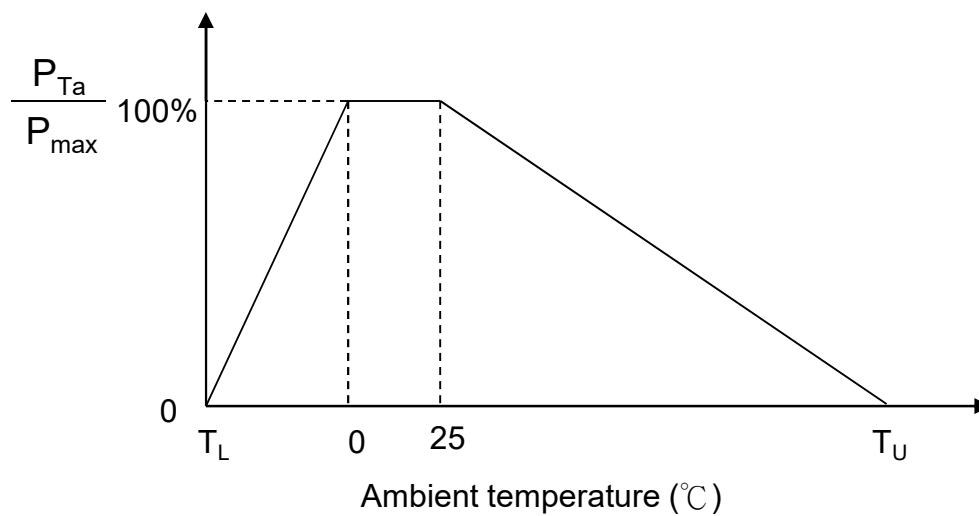
■ IR-Reflow Soldering Profile



■ Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Diameter of Soldering Iron-tip	φ 3mm (max.)
Caution: Not to touch the component surface with soldering iron directly to prevent component damage.	

Max. Power Dissipation Derating Curve



Note: T_L = Minimum operating temperature ($^{\circ}\text{C}$)

T_U = Maximum operating temperature ($^{\circ}\text{C}$)

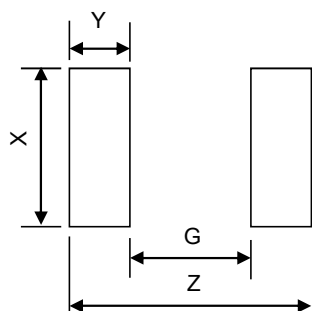
For example :

Ambient temperature(T_a)=55 $^{\circ}\text{C}$

Maximum operating temperature(T_u)= 125 $^{\circ}\text{C}$

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

Recommended Soldering Pad Dimensions



Size (EIA)	0805
Z	3.4 mm
G	1.0 mm
X	1.4 mm
Y	1.2 mm

(I) Notice of Mounting on Flexible Printed Circuit (FPC) :

1. Before SMDs mounting, a support plate should be attached to the back of the SMDs mounting position on the FPC to avoid undue stress being imposed on the SMDs body during the placing process.
2. After SMDs mounting is completed, a protective frame should be attached around the outside of the SMDs mounting position to avoid inappropriate stress being directly applied to the SMDs body during the subsequent assembly process.

(II) Not suitable for mounting on Direct Bond Copper (DBC) ceramic substrate.

RoHS Compliant Declaration

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

Restriction of Weapon and Military End-Use

Thinking has established and implemented the fundamental policy on none of our product should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or goods or systems specially designed or intended for military end-use or utilization by military end-users.

Warehouse Storage Conditions of Products

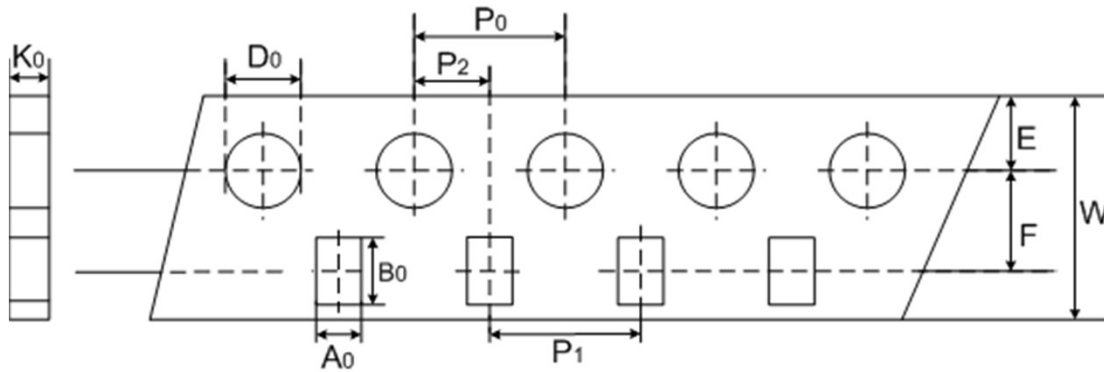
(I) Storage Conditions :

- 1.Storage Temperature : -10°C~+40°C
- 2.Relative Humidity : ≤75%RH
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

Packaging

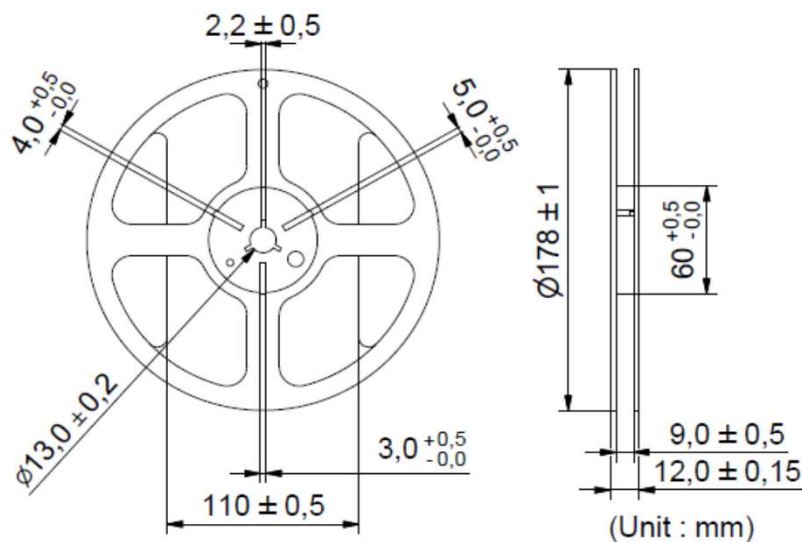
■ Taping Specification (0805 Series)



(Unit : mm)

Index	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
Size	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0805	1.5	2.3	8	1.75	3.5	4	2	4	1.55	1

■ Quantity (3500 pcs / reel)



(Unit : mm)

Safety Approvals (Certified Model/Type : TSM2A223)

* UL 1434 / cUL recognized (File # E138827)



* TÜV recognized (File # R 50167657)



* CQC GB/T 6663.1-2007 recognized (File # CQC12001080962)

Certificates

- (1) IATF 16949 certificate
- (2) ISO 9001 certificate
- (3) QC 080000 certificate

Test Report

- (1) RoHS test report
- (2) Halogen-free test report

R - T Table

Part No. : TSM2A223J3801RZ

R25 = 22 K Ω $\pm$ 5%B25/85 = 3800 K $\pm$ 1%

Temperature ($^{\circ}$ C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. ($^{\circ}$ C)		Resistance Tol. (%)	
-40	660.64	608.63	559.32	-1.36	1.38	8.5%	-8.1%
-39	621.35	572.79	526.70	-1.35	1.37	8.5%	-8.0%
-38	584.58	539.22	496.13	-1.35	1.37	8.4%	-8.0%
-37	550.14	507.75	467.46	-1.35	1.37	8.3%	-7.9%
-36	517.86	478.24	440.56	-1.34	1.36	8.3%	-7.9%
-35	487.59	450.56	415.30	-1.34	1.36	8.2%	-7.8%
-34	459.21	424.58	391.59	-1.33	1.35	8.2%	-7.8%
-33	432.58	400.20	369.32	-1.33	1.35	8.1%	-7.7%
-32	407.59	377.31	348.40	-1.32	1.34	8.0%	-7.7%
-31	384.15	355.81	328.74	-1.32	1.34	8.0%	-7.6%
-30	362.14	335.63	310.27	-1.31	1.34	7.9%	-7.6%
-29	341.49	316.67	292.92	-1.31	1.33	7.8%	-7.5%
-28	322.10	298.87	276.61	-1.31	1.33	7.8%	-7.4%
-27	303.91	282.14	261.29	-1.30	1.33	7.7%	-7.4%
-26	286.82	266.44	246.88	-1.30	1.33	7.7%	-7.3%
-25	270.79	251.68	233.34	-1.29	1.32	7.6%	-7.3%
-24	255.73	237.82	220.61	-1.29	1.32	7.5%	-7.2%
-23	241.58	224.79	208.65	-1.29	1.32	7.5%	-7.2%
-22	228.30	212.55	197.40	-1.29	1.32	7.4%	-7.1%
-21	215.82	201.05	186.82	-1.28	1.32	7.3%	-7.1%
-20	204.10	190.23	176.86	-1.28	1.31	7.3%	-7.0%
-19	193.08	180.06	167.50	-1.28	1.31	7.2%	-7.0%
-18	182.72	170.49	158.69	-1.28	1.31	7.2%	-6.9%
-17	172.98	161.49	150.39	-1.28	1.31	7.1%	-6.9%
-16	163.82	153.02	142.58	-1.27	1.31	7.1%	-6.8%
-15	155.20	145.05	135.22	-1.27	1.31	7.0%	-6.8%
-14	147.09	137.54	128.29	-1.27	1.31	6.9%	-6.7%
-13	139.45	130.47	121.76	-1.27	1.31	6.9%	-6.7%
-12	132.26	123.81	115.60	-1.27	1.31	6.8%	-6.6%
-11	125.49	117.52	109.79	-1.27	1.31	6.8%	-6.6%
-10	119.10	111.60	104.31	-1.27	1.30	6.7%	-6.5%
-9	113.08	106.01	99.140	-1.26	1.30	6.7%	-6.5%
-8	107.40	100.74	94.256	-1.26	1.30	6.6%	-6.4%
-7	102.04	95.760	89.643	-1.26	1.30	6.6%	-6.4%
-6	96.978	91.058	85.285	-1.26	1.30	6.5%	-6.3%
-5	92.201	86.615	81.164	-1.26	1.30	6.4%	-6.3%
-4	87.687	82.416	77.268	-1.26	1.30	6.4%	-6.2%
-3	83.421	78.445	73.582	-1.25	1.29	6.3%	-6.2%
-2	79.388	74.689	70.093	-1.25	1.29	6.3%	-6.2%
-1	75.574	71.135	66.790	-1.25	1.29	6.2%	-6.1%

R - T Table

Part No. : TSM2A223J3801RZ

R25 =22 KOhm $\pm$ 5%B25/85 = 3800 K $\pm$ 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
0	71.965	67.771	63.662	-1.25	1.29	6.2%	-6.1%
1	68.548	64.585	60.698	-1.24	1.29	6.1%	-6.0%
2	65.314	61.567	57.890	-1.24	1.29	6.1%	-6.0%
3	62.250	58.706	55.226	-1.24	1.28	6.0%	-5.9%
4	59.346	55.995	52.700	-1.24	1.28	6.0%	-5.9%
5	56.594	53.423	50.304	-1.23	1.28	5.9%	-5.8%
6	53.984	50.983	48.029	-1.23	1.28	5.9%	-5.8%
7	51.509	48.668	45.869	-1.23	1.27	5.8%	-5.8%
8	49.160	46.471	43.818	-1.22	1.27	5.8%	-5.7%
9	46.931	44.384	41.870	-1.22	1.27	5.7%	-5.7%
10	44.815	42.401	40.018	-1.22	1.27	5.7%	-5.6%
11	42.805	40.518	38.258	-1.21	1.26	5.6%	-5.6%
12	40.895	38.728	36.584	-1.21	1.26	5.6%	-5.5%
13	39.081	37.026	34.992	-1.21	1.26	5.5%	-5.5%
14	37.356	35.408	33.478	-1.20	1.25	5.5%	-5.5%
15	35.716	33.869	32.037	-1.20	1.25	5.5%	-5.4%
16	34.156	32.404	30.665	-1.20	1.25	5.4%	-5.4%
17	32.673	31.010	29.359	-1.19	1.24	5.4%	-5.3%
18	31.261	29.684	28.115	-1.19	1.24	5.3%	-5.3%
19	29.918	28.420	26.930	-1.19	1.24	5.3%	-5.2%
20	28.639	27.217	25.801	-1.18	1.24	5.2%	-5.2%
21	27.421	26.071	24.725	-1.18	1.23	5.2%	-5.2%
22	26.261	24.979	23.700	-1.17	1.23	5.1%	-5.1%
23	25.156	23.938	22.722	-1.17	1.23	5.1%	-5.1%
24	24.103	22.946	21.789	-1.17	1.22	5.0%	-5.0%
25	23.100	22.000	20.900	-1.16	1.22	5.0%	-5.0%
26	22.162	21.098	20.035	-1.18	1.24	5.0%	-5.0%
27	21.267	20.237	19.209	-1.20	1.25	5.1%	-5.1%
28	20.413	19.416	18.423	-1.21	1.27	5.1%	-5.1%
29	19.597	18.633	17.672	-1.23	1.29	5.2%	-5.2%
30	18.818	17.885	16.956	-1.25	1.30	5.2%	-5.2%
31	18.075	17.171	16.272	-1.27	1.32	5.3%	-5.2%
32	17.364	16.490	15.620	-1.28	1.34	5.3%	-5.3%
33	16.685	15.839	14.998	-1.30	1.35	5.3%	-5.3%
34	16.037	15.217	14.403	-1.32	1.37	5.4%	-5.3%
35	15.417	14.623	13.835	-1.34	1.39	5.4%	-5.4%
36	14.824	14.055	13.293	-1.35	1.40	5.5%	-5.4%
37	14.257	13.512	12.774	-1.37	1.42	5.5%	-5.5%
38	13.715	12.994	12.279	-1.39	1.44	5.6%	-5.5%
39	13.197	12.497	11.806	-1.41	1.46	5.6%	-5.5%

R - T Table

Part No. : TSM2A223J3801RZ

R25 =22 KOhm $\pm$ 5%B25/85 = 3800 K $\pm$ 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
40	12.701	12.023	11.353	-1.43	1.48	5.6%	-5.6%
41	12.226	11.569	10.920	-1.45	1.49	5.7%	-5.6%
42	11.771	11.135	10.506	-1.47	1.51	5.7%	-5.6%
43	11.336	10.719	10.110	-1.48	1.53	5.8%	-5.7%
44	10.920	10.321	9.7312	-1.50	1.55	5.8%	-5.7%
45	10.521	9.9403	9.3686	-1.52	1.57	5.8%	-5.8%
46	10.138	9.5756	9.0214	-1.54	1.59	5.9%	-5.8%
47	9.7721	9.2262	8.6891	-1.56	1.60	5.9%	-5.8%
48	9.4211	8.8915	8.3708	-1.58	1.62	6.0%	-5.9%
49	9.0846	8.5708	8.0659	-1.60	1.64	6.0%	-5.9%
50	8.7620	8.2635	7.7738	-1.62	1.66	6.0%	-5.9%
51	8.4527	7.9688	7.4939	-1.64	1.68	6.1%	-6.0%
52	8.1559	7.6863	7.2256	-1.66	1.70	6.1%	-6.0%
53	7.8713	7.4154	6.9684	-1.68	1.72	6.1%	-6.0%
54	7.5981	7.1555	6.7218	-1.70	1.74	6.2%	-6.1%
55	7.3359	6.9061	6.4852	-1.72	1.76	6.2%	-6.1%
56	7.0842	6.6668	6.2583	-1.74	1.78	6.3%	-6.1%
57	6.8426	6.4371	6.0406	-1.77	1.80	6.3%	-6.2%
58	6.6105	6.2166	5.8316	-1.79	1.82	6.3%	-6.2%
59	6.3875	6.0049	5.6310	-1.81	1.84	6.4%	-6.2%
60	6.1733	5.8015	5.4384	-1.83	1.86	6.4%	-6.3%
61	5.9674	5.6061	5.2535	-1.85	1.88	6.4%	-6.3%
62	5.7696	5.4184	5.0758	-1.87	1.90	6.5%	-6.3%
63	5.5793	5.2379	4.9051	-1.89	1.92	6.5%	-6.4%
64	5.3964	5.0644	4.7411	-1.91	1.94	6.6%	-6.4%
65	5.2204	4.8977	4.5834	-1.93	1.96	6.6%	-6.4%
66	5.0511	4.7373	4.4318	-1.96	1.98	6.6%	-6.4%
67	4.8882	4.5830	4.2860	-1.98	2.00	6.7%	-6.5%
68	4.7314	4.4345	4.1458	-2.00	2.02	6.7%	-6.5%
69	4.5805	4.2916	4.0110	-2.02	2.04	6.7%	-6.5%
70	4.4351	4.1541	3.8812	-2.04	2.06	6.8%	-6.6%
71	4.2952	4.0217	3.7563	-2.07	2.08	6.8%	-6.6%
72	4.1604	3.8942	3.6360	-2.09	2.10	6.8%	-6.6%
73	4.0305	3.7714	3.5202	-2.11	2.12	6.9%	-6.7%
74	3.9053	3.6532	3.4087	-2.13	2.14	6.9%	-6.7%
75	3.7847	3.5392	3.3013	-2.15	2.17	6.9%	-6.7%
76	3.6684	3.4293	3.1979	-2.18	2.19	7.0%	-6.7%
77	3.5562	3.3235	3.0982	-2.20	2.21	7.0%	-6.8%
78	3.4481	3.2214	3.0021	-2.22	2.23	7.0%	-6.8%
79	3.3437	3.1229	2.9094	-2.24	2.25	7.1%	-6.8%

R - T Table

Part No. : TSM2A223J3801RZ

R25 =22 KOhm $\pm$ 5%B25/85 = 3800 K $\pm$ 1%

Temperature (°C)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (°C)		Resistance Tol. (%)	
80	3.2431	3.0280	2.8201	-2.27	2.27	7.1%	-6.9%
81	3.1459	2.9364	2.7339	-2.29	2.29	7.1%	-6.9%
82	3.0522	2.8480	2.6509	-2.31	2.31	7.2%	-6.9%
83	2.9617	2.7627	2.5707	-2.33	2.33	7.2%	-7.0%
84	2.8743	2.6804	2.4933	-2.36	2.35	7.2%	-7.0%
85	2.7899	2.6009	2.4187	-2.38	2.37	7.3%	-7.0%
86	2.7084	2.5242	2.3466	-2.40	2.40	7.3%	-7.0%
87	2.6296	2.4500	2.2770	-2.42	2.42	7.3%	-7.1%
88	2.5535	2.3784	2.2098	-2.45	2.44	7.4%	-7.1%
89	2.4800	2.3093	2.1449	-2.47	2.46	7.4%	-7.1%
90	2.4089	2.2424	2.0822	-2.49	2.48	7.4%	-7.1%
91	2.3402	2.1778	2.0217	-2.51	2.50	7.5%	-7.2%
92	2.2738	2.1154	1.9631	-2.54	2.52	7.5%	-7.2%
93	2.2096	2.0551	1.9066	-2.56	2.54	7.5%	-7.2%
94	2.1474	1.9967	1.8519	-2.58	2.57	7.6%	-7.3%
95	2.0873	1.9403	1.7990	-2.61	2.59	7.6%	-7.3%
96	2.0292	1.8857	1.7479	-2.63	2.61	7.6%	-7.3%
97	1.9729	1.8329	1.6985	-2.65	2.63	7.6%	-7.3%
98	1.9185	1.7818	1.6507	-2.68	2.65	7.7%	-7.4%
99	1.8658	1.7323	1.6044	-2.70	2.67	7.7%	-7.4%
100	1.8147	1.6845	1.5597	-2.72	2.70	7.7%	-7.4%
101	1.7653	1.6382	1.5164	-2.75	2.72	7.8%	-7.4%
102	1.7175	1.5933	1.4744	-2.77	2.74	7.8%	-7.5%
103	1.6712	1.5499	1.4339	-2.79	2.76	7.8%	-7.5%
104	1.6263	1.5079	1.3946	-2.82	2.78	7.9%	-7.5%
105	1.5828	1.4672	1.3566	-2.84	2.81	7.9%	-7.5%
106	1.5407	1.4278	1.3198	-2.87	2.83	7.9%	-7.6%
107	1.4999	1.3896	1.2841	-2.89	2.85	7.9%	-7.6%
108	1.4604	1.3526	1.2496	-2.91	2.87	8.0%	-7.6%
109	1.4221	1.3167	1.2162	-2.94	2.90	8.0%	-7.6%
110	1.3849	1.2820	1.1838	-2.96	2.92	8.0%	-7.7%
111	1.3489	1.2483	1.1524	-2.99	2.94	8.1%	-7.7%
112	1.3140	1.2157	1.1220	-3.01	2.96	8.1%	-7.7%
113	1.2801	1.1841	1.0925	-3.04	2.99	8.1%	-7.7%
114	1.2473	1.1534	1.0639	-3.06	3.01	8.1%	-7.8%
115	1.2155	1.1237	1.0362	-3.09	3.03	8.2%	-7.8%
116	1.1846	1.0949	1.0094	-3.11	3.06	8.2%	-7.8%
117	1.1547	1.0669	0.98335	-3.14	3.08	8.2%	-7.8%
118	1.1256	1.0398	0.95812	-3.17	3.11	8.3%	-7.9%
119	1.0974	1.0135	0.93365	-3.19	3.13	8.3%	-7.9%

R - T Table

Part No. : TSM2A223J3801RZ

R25 =22 KOhm $\pm$ 5%

$$B_{25/85} = 3800 \text{ K} \pm 1\%$$
[illegible]