

ALTERNATION HISTORY RECORDS 变更记录

Date 日期	Version 版本	Mark 标记	Page 页码	Description 描述	Drafter 制定者	Approver 审批者
2023-10-04	B	/	/	First release 首次发行	Doris Chang	/

1 外形尺寸 Shape and Dimensions

- 尺寸：见图 1 和表 1
- PCB 焊盘：见图 2 和表 1
- Dimensions: See Fig.1 and Table 1.
- Recommended PCB pattern for reflow soldering: See Fig.2 and Table 1

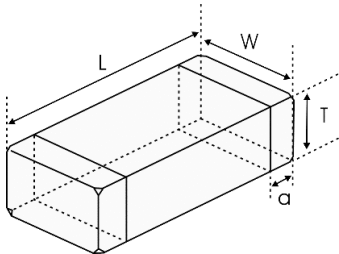


图 1 Fig.1

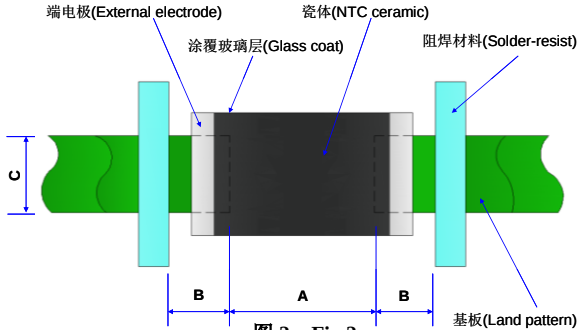


图 2 Fig.2

表 1 (Table 1) 单位 unit: inch[mm]

类别 Type	L	W	T	a	A	B	C
0603 [1608]	0.063±0.006 [1.6±0.15]	0.031±0.006 [0.8±0.15]	0.031±0.006 [0.8±0.15]	0.012±0.008 [0.3±0.2]	[0.6-0.8]	[0.6-0.7]	[0.6-0.8]
0805 [2012]	0.079±0.008 [2.0±0.2]	0.049±0.008 [1.25±0.2]	0.033±0.008 [0.85±0.2]	0.020±0.012 [0.5±0.3]	[1.0-1.1]	[0.6-0.7]	[1.0-1.2]

2 产品标识 (料号) Product Identification(Part Number)

NC 0805 - 103 H 3500 F B T
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① 类别 Type	
NC	片式 NTC 热敏电阻器 Chip NTC Thermistor

② 外形尺寸(mm) External Dimensions (L×W×T)	
0201[0603]	0.60×0.30×0.30
0402[1005]	1.00×0.50×0.50
0603[1608]	1.60×0.80×0.80
0805[2012]	2.00×1.25×0.85

③ 分隔符 Delimiter	
-	

④ 25℃的零功率电阻 Nominal Zero-Power Resistance	
222	2.2kΩ
103	10kΩ
104	100kΩ

⑤ 电阻值公差 Tolerance of Resistance	
F	±1%
G	±2%
H	±3%
J	±5%

⑥ B 值常数 B Constant	
3380	3380K
3500	3500K
4250	4250K

⑦ B 值公差 Tolerance of B Constant	
F	±1%
H	±3%

⑧ B 值计算方式 B constant calculation method	
A	25℃&85℃
B	25℃&50℃

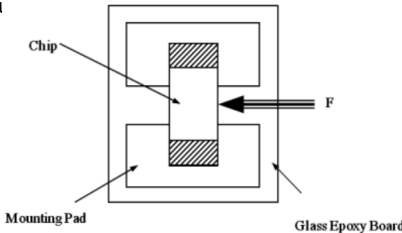
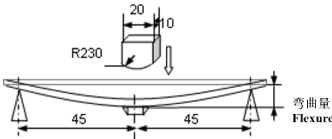
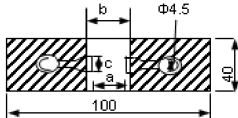
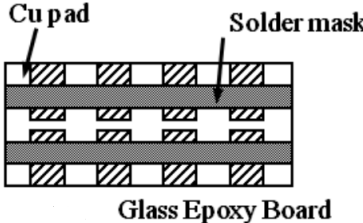
⑨ Packing code	
T	braided packing
B	oos packing

3. Electrical Characteristics

Items	Symbol	Test condition	unit	performance requirement
Nominal Zero-Power Resistance	R25℃	At=25±0.05℃ P≤0.1mW	K Ω	10±3%
B Constant	B25/50	B value between 25±0.05℃ and 85±0.05℃ B=Ln (R25/R50)/(1/T25-1/T50); T1= (273.15+25)K,T2= (273.15+50) K Note:273.15 is the absolute temperature。	K	3500±1%
Dissipation Factor	δ	The required power which makes the NTC thermistor body temperature raise 1℃ through self-heated, normally expressed in milliwatts per degree Celsius (mW/℃).	mW/℃	≈2.0
Thermal Time Constant	τ	The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T0 (℃) to T1 (℃) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second(S).	sec	<5S
Rated Electric Power	P	The necessary electric power makes thermistor's temperature rise 100℃ by self-heating at ambient temperature 25℃.	mW	100
Permissible Operating Current	I	The current that keep body temperature of chip NTC on the PC board in still air rising 1 ° C by self-heating.	mA	0.44
Operating ambient temperature	/	Temperature range under specified conditions of use	℃	-40℃～+125℃

Notes: When measured at 25℃ in still air, as a single unit without mounting.

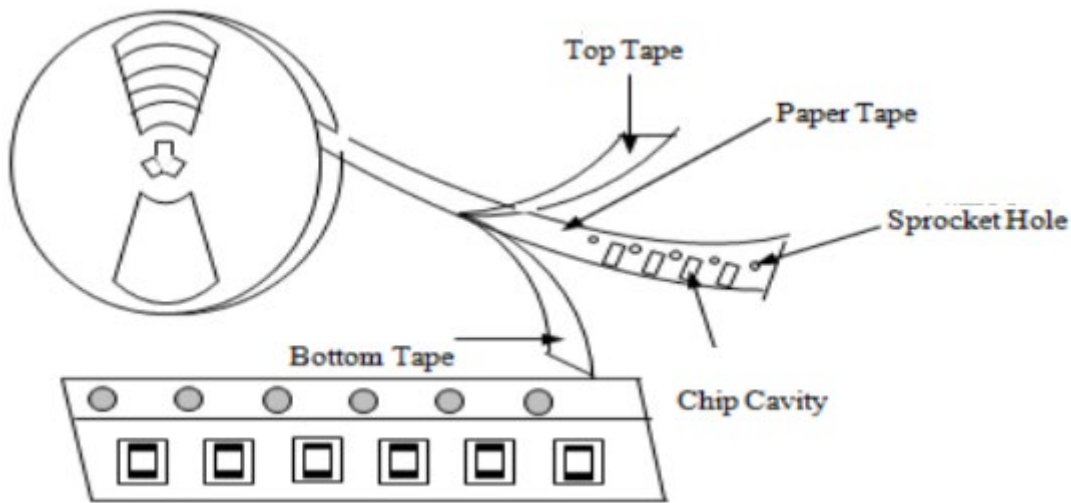
4. Reliability Test (一)

Item	Standard	Test Method and Remarks	Requirements																				
Terminal Strength	IEC 60068-2-21	1.Solder the chip to the testing jig (glass epoxy board shown in the right) using eutectic solder. Then apply a force in the direction of the arrow. 2.Apply a force of 5N 3 .Duration: 10±1S	No removal or split of the termination or other defects shall occur 																				
Resistance to Flexure	IEC 60068-2-21	1.Solder the chip to the test jig (glass epoxy board shown in the right) using a eutectic solder. Then apply a force in the direction shown as follow;  2 Flexure:Pressurizing Speed : <0.5mm/s, 3.Duration: 10s	1.No visible damage. 2. ΔR25/R25 ≤2% 单位 unit: mm <table border="1"> <thead> <tr> <th>类型 Type</th><th>a</th><th>b</th><th>c</th></tr> </thead> <tbody> <tr> <td>0201</td><td>0.25</td><td>0.3</td><td>0.3</td></tr> <tr> <td>0402</td><td>0.4</td><td>1.5</td><td>0.5</td></tr> <tr> <td>0603</td><td>1.0</td><td>3.0</td><td>1.2</td></tr> <tr> <td>0805</td><td>1.2</td><td>4.0</td><td>1.65</td></tr> </tbody> </table> 	类型 Type	a	b	c	0201	0.25	0.3	0.3	0402	0.4	1.5	0.5	0603	1.0	3.0	1.2	0805	1.2	4.0	1.65
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Vibration	IEC 60068-2-80	1.Solder the chip to the testing jig (glass epoxy board shown in the left) using eutectic solder. 2.The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz. 3.The frequency ranges from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3mutually perpendicular directions (total of 6 hours).。	No visible damage. 																				
Dropping	IEC 60068-2-32	Drop a chip 10 times on a concrete floor from a height of 1 meter.。	No visible damage.																				

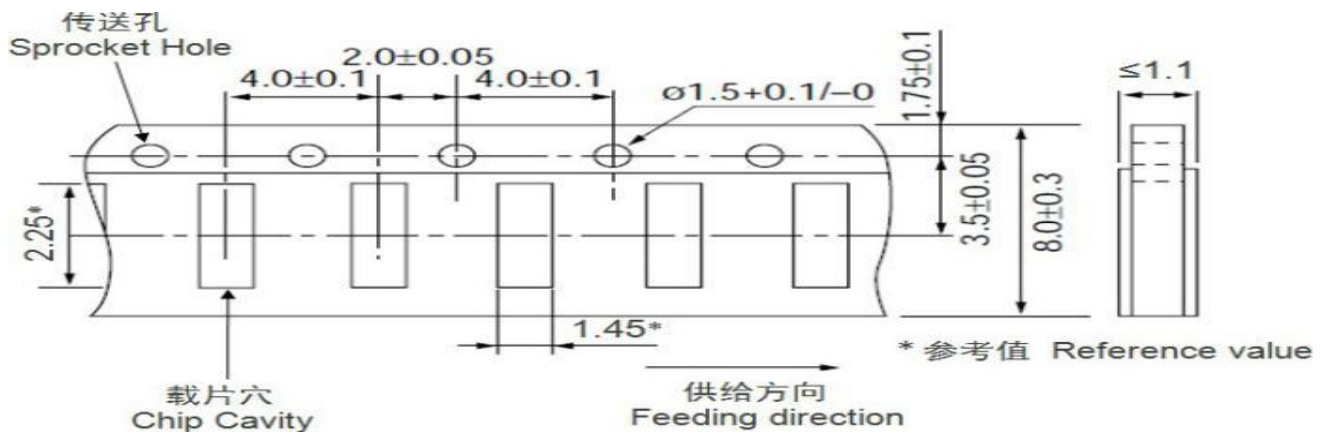
Solderability	IEC 60068-2-58	1.Solder temperature: 245±5°C. 2.Duration: 3±0.3s.. 3.Solder: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu. 4.Flux(weight ratio): 25% Rosin and 75% ethanol in weight.	1.No visible damage; 2.Wetting shall exceed 95% coverage..															
Resistance to Soldering Heat	IEC 60068-2-58	1.Solder temperature: 260±5°C. 2.Duration: 10±1s.. 3.Solder: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu. 4.Flux(weight ratio):25% Rosin and 75% ethanol in weight. 5.The chip shall be stabilized at normal condition for 1~2 hours before measuring.	1 No visible damage; 2. ΔR25/R25 ≤2% 3. ΔB/B ≤1%															
Temperature cycling	IEC 60068-2-14	1.5 cycles of following sequence without loading. <table border="1"><tr><td>Step</td><td>Temperature</td><td>ime</td></tr><tr><td>1</td><td>-40±5°C</td><td>30±3min</td></tr><tr><td>2</td><td>25±2°C</td><td>5±3min</td></tr><tr><td>3</td><td>125±5°C</td><td>30±3min</td></tr><tr><td>4</td><td>25±2°C</td><td>5±3min</td></tr></table> 2.The chip shall be stabilized at normal condition for 1~2 hours before measuring.	Step	Temperature	ime	1	-40±5°C	30±3min	2	25±2°C	5±3min	3	125±5°C	30±3min	4	25±2°C	5±3min	1 No visible damage; 2 ΔR25/R25 ≤2% 3. ΔB/B ≤1%
Step	Temperature	ime																
1	-40±5°C	30±3min																
2	25±2°C	5±3min																
3	125±5°C	30±3min																
4	25±2°C	5±3min																
Resistance to dry heat	IEC 60068-2-2	1.125±5°Cin air, for 1000±24 hours without loading. 2.The chip shall be stabilized at normal condition for 1~2 hours before measuring.	1 No visible damage; 2 ΔR25/R25 ≤2% 3. ΔB/B ≤1%															
Resistance to cold	IEC 60068-2-1	1.-40±3°Cin air, for 1000±24 hours without loading. 2.The chip shall be stabilized at normal condition for 1~2 hours before measuring.	1 No visible damage; 2 ΔR25/R25 ≤2% 3. ΔB/B ≤1%															
Resistance to damp heat	IEC 60068-2-78	1.60±2°C, 90~95%RH in air, for 1000±24 hours without loading. 2. The chip shall be stabilized at normal condition for 1~2 hours before measuring.	1 No visible damage; 2 ΔR25/R25 ≤2% 3. ΔB/B ≤1%															
Resistance to high temperature load	IEC 60539-15.25.4	1.85±2°Cin air with permissive operating current for 1000±48 hours 2.The chip shall be stabilized at normal condition for 1~2 hours before measuring.	1 No visible damage; 2 ΔR25/R25 ≤2% 3. ΔB/B ≤1%															

5. Taping

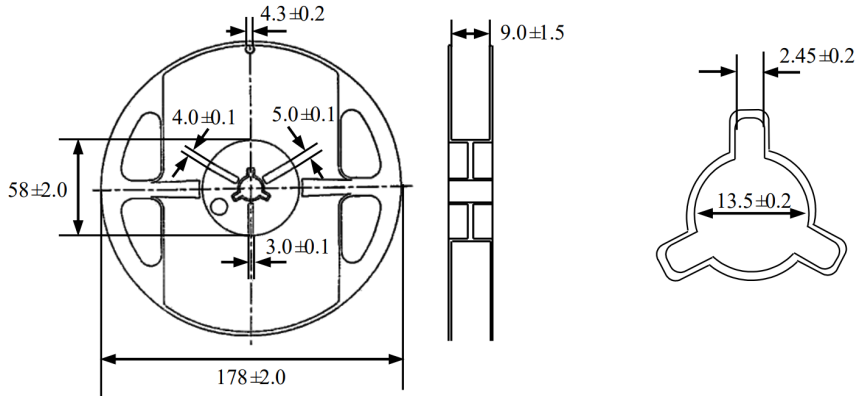
5.1 Taping Drawings



5.2 Paper Tape Dimensions (0805series) (Unit: mm)



5. 3Reel Dimensions (Unit: mm) /Quantity per Reel: (4K)



6. Storage

Storage Conditions

- Storage Temperature: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$
- Relative Humidity: $\leq 75\% \text{RH}$
- Keep away from corrosive atmosphere and sunlight.

Period of Storage: 6 Months after delivery

7. Notes & Warnings

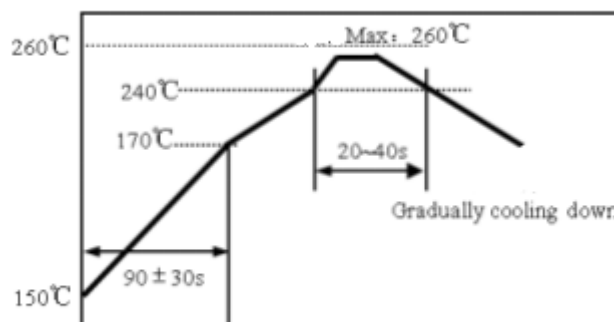
The Chengdu Shunkang SANSEN series thermistors shall not be operated and stored under the following environmental condition:

- Corrosive or deoxidized atmospheres
(such as chlorine, sulfurated hydrogen, ammonia, sulfuric acid, nitric oxide and so on)
- Volatile or inflammable atmospheres
- Dusty condition
- Excessively high or low pressure condition
- Humid site
- Places with brine, oil, chemical liquid or organic solvent
- Intense vibration
- Places with analogously deleterious condition

8. Recommended Soldering Technologies

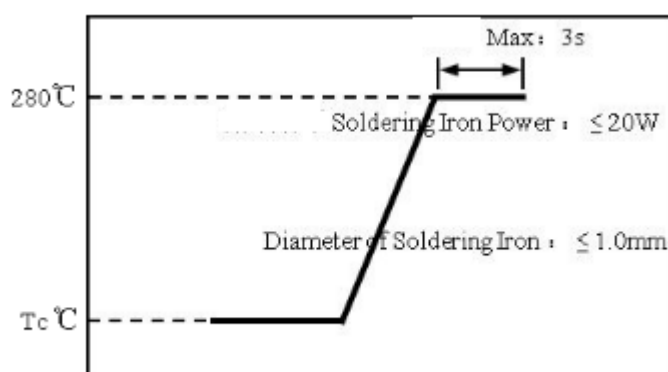
8.1 Re-flowing Profile

- 1~2°C/sec. Ramp.
- Pre-heating: 150~170°C/90±30 sec.
- Time above 240°C: 20~40 sec.
- Peak temperature: 260°C Max./10 sec.
- Solder paste: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu.
- Max.2 times for re-flowing.



8.2 Iron Soldering Profile

- Iron soldering power: Max.20W
- Pre-heating: 150°C/60sec.
- Soldering Tip temperature: 280°CMax.
- Soldering time: 3 sec Max.
- Solder paste: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu
- Max.1 times for iron soldering

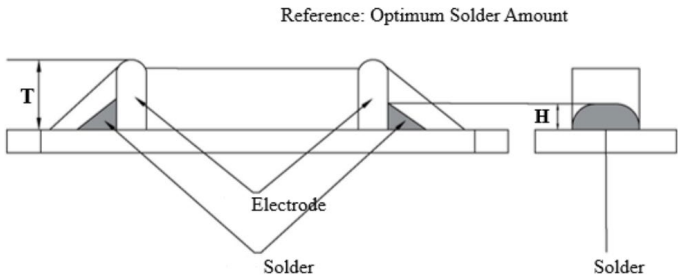


[Note: Take care not to apply the tip of the soldering iron to the

terminal electrodes.]

8.3 Printing Conditions of Solder Paste

- The amount of solder is critical . Standard height of fillet is shown in the table below.
- Too much solder may cause mechanical stress , resulting in cracking , mechanical and / or electronic damage.



Type	Solder Paste Thickness	H
0201	100μm	1/3T≤H≤T
0402	150μm	1/3T≤H≤T
0603, 0805	200μm	0.2mm≤H≤T

● After Soldering

For removing the flux after soldering, observe the following points in order to avoid deterioration of the characteristics or any change of the external electrodes quality.

- 1)Please keep mounted parts and a substrate from an occurrence of resonance in ultrasonic cleaning.
- 2)Please do not clean the products in the case of using a non-wash-type flux

Type	0201 , 0402	0603 , 0805
Solvent	Isopropyl Alcohol	
Dipping cleaning	Less than 5 min.at room temp. or Less than 2 min. at 40°C max.	
Ultrasonic cleaning	Less than 5 min, 20W/L Frequency of several 28kHz to several 40kHz.	Less than 1 min, 20W/L Frequency of several 10kHzto several 100kHz

Appose: R-T table

R25 =10 KOhm $\pm$ 3%

B25/50= 3500 K $\pm$ 1%

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL.	Temp. TOL.(°C)
-40	211.471	224.905	238.977	6.26%	1.02
-39	199.517	212.067	225.203	6.19%	1.02
-38	188.319	200.048	212.316	6.13%	1.02
-37	177.825	188.791	200.253	6.07%	1.01
-36	167.986	178.242	188.955	6.01%	1.01
-35	158.756	168.353	178.369	5.95%	1.01
-34	150.069	159.050	168.418	5.89%	1.01
-33	141.916	150.324	159.087	5.83%	1.00
-32	134.259	142.134	150.336	5.77%	1.00
-31	127.066	134.445	142.124	5.71%	1.00
-30	120.306	127.221	134.414	5.65%	1.00
-29	113.949	120.434	127.172	5.60%	0.99
-28	107.970	114.052	120.368	5.54%	0.99
-27	102.343	108.050	113.972	5.48%	0.99
-26	97.046	102.402	107.957	5.42%	0.99
-25	92.057	97.086	102.297	5.37%	0.98
-24	87.356	92.079	96.971	5.31%	0.98
-23	82.925	87.363	91.956	5.26%	0.98
-22	78.747	82.918	87.231	5.20%	0.97
-21	74.806	78.727	82.780	5.15%	0.97
-20	71.087	74.774	78.583	5.09%	0.97
-19	67.575	71.045	74.625	5.04%	0.96
-18	64.259	67.524	70.891	4.99%	0.96
-17	61.127	64.200	67.367	4.93%	0.96
-16	58.166	61.060	64.040	4.88%	0.95
-15	55.367	58.092	60.897	4.83%	0.95
-14	52.714	55.282	57.922	4.78%	0.95
-13	50.205	52.624	55.111	4.72%	0.94
-12	47.831	50.111	52.453	4.67%	0.94
-11	45.583	47.733	49.940	4.62%	0.94
-10	43.455	45.483	47.562	4.57%	0.93
-9	41.439	43.352	45.312	4.52%	0.93
-8	39.529	41.334	43.182	4.47%	0.92
-7	37.718	39.422	41.165	4.42%	0.92
-6	36.001	37.610	39.254	4.37%	0.92
-5	34.373	35.891	37.444	4.32%	0.91
-4	32.828	34.262	35.727	4.28%	0.91
-3	31.361	32.716	34.099	4.23%	0.91
-2	29.968	31.249	32.555	4.18%	0.90
-1	28.646	29.857	31.091	4.13%	0.90
0	27.390	28.534	29.700	4.09%	0.89
1	26.194	27.276	28.378	4.04%	0.89

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL.	Temp. TOL.(°C)
2	25.058	26.081	27.123	3.99%	0.88
3	23.977	24.946	25.930	3.95%	0.88
4	22.950	23.866	24.797	3.90%	0.88
5	21.972	22.840	23.720	3.85%	0.87
6	21.043	21.864	22.697	3.81%	0.87
7	20.158	20.936	21.724	3.76%	0.86
8	19.316	20.052	20.798	3.72%	0.86
9	18.513	19.211	19.917	3.67%	0.85
10	17.749	18.410	19.078	3.63%	0.85
11	17.019	17.646	18.278	3.59%	0.84
12	16.324	16.917	17.517	3.54%	0.84
13	15.661	16.223	16.791	3.50%	0.83
14	15.028	15.562	16.100	3.46%	0.83
15	14.425	14.931	15.441	3.41%	0.82
16	13.849	14.329	14.812	3.37%	0.82
17	13.300	13.755	14.213	3.33%	0.81
18	12.775	13.207	13.641	3.29%	0.81
19	12.274	12.683	13.095	3.25%	0.80
20	11.795	12.184	12.574	3.20%	0.80
21	11.338	11.707	12.077	3.16%	0.79
22	10.900	11.250	11.602	3.12%	0.79
23	10.482	10.815	11.148	3.08%	0.78
24	10.082	10.398	10.714	3.04%	0.78
25	9.700	10.000	10.300	3.00%	0.77
26	9.327	9.619	9.912	3.04%	0.79
27	8.970	9.255	9.540	3.08%	0.80
28	8.629	8.906	9.184	3.12%	0.82
29	8.303	8.573	8.844	3.16%	0.83
30	7.990	8.253	8.517	3.20%	0.85
31	7.692	7.948	8.205	3.24%	0.86
32	7.406	7.655	7.906	3.28%	0.88
33	7.132	7.375	7.619	3.31%	0.89
34	6.869	7.106	7.344	3.35%	0.91
35	6.618	6.849	7.081	3.39%	0.93
36	6.377	6.602	6.828	3.43%	0.94
37	6.147	6.366	6.586	3.47%	0.96
38	5.926	6.139	6.354	3.50%	0.97
39	5.714	5.921	6.131	3.54%	0.99
40	5.510	5.713	5.917	3.58%	1.01
41	5.315	5.512	5.712	3.62%	1.02
42	5.128	5.320	5.515	3.65%	1.04
43	4.948	5.136	5.325	3.69%	1.06
44	4.776	4.958	5.143	3.73%	1.07

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL.	Temp. TOL.(°C)
45	4.610	4.788	4.968	3.76%	1.09
46	4.451	4.625	4.800	3.80%	1.11
47	4.299	4.468	4.639	3.83%	1.12
48	4.152	4.317	4.484	3.87%	1.14
49	4.012	4.172	4.335	3.90%	1.16
50	3.876	4.033	4.191	3.94%	1.18
51	3.746	3.899	4.053	3.97%	1.19
52	3.621	3.770	3.921	4.01%	1.21
53	3.501	3.646	3.793	4.04%	1.23
54	3.385	3.527	3.670	4.08%	1.25
55	3.274	3.412	3.552	4.11%	1.26
56	3.167	3.301	3.438	4.15%	1.28
57	3.064	3.195	3.329	4.18%	1.30
58	2.965	3.093	3.223	4.22%	1.32
59	2.869	2.994	3.121	4.25%	1.33
60	2.777	2.899	3.023	4.28%	1.35
61	2.689	2.807	2.929	4.32%	1.37
62	2.604	2.719	2.838	4.35%	1.39
63	2.521	2.634	2.750	4.38%	1.41
64	2.442	2.552	2.665	4.42%	1.43
65	2.366	2.473	2.583	4.45%	1.44
66	2.293	2.397	2.505	4.48%	1.46
67	2.222	2.324	2.429	4.51%	1.48
68	2.154	2.254	2.356	4.55%	1.50
69	2.088	2.185	2.285	4.58%	1.52
70	2.024	2.120	2.217	4.61%	1.54
71	1.963	2.056	2.152	4.64%	1.56
72	1.904	1.995	2.088	4.67%	1.58
73	1.847	1.936	2.027	4.71%	1.60
74	1.792	1.879	1.967	4.74%	1.62
75	1.739	1.823	1.910	4.77%	1.64
76	1.688	1.770	1.855	4.80%	1.66
77	1.638	1.719	1.802	4.83%	1.67
78	1.590	1.669	1.750	4.86%	1.69
79	1.544	1.621	1.700	4.89%	1.71
80	1.499	1.574	1.652	4.92%	1.73
81	1.456	1.530	1.605	4.95%	1.75
82	1.414	1.486	1.560	4.98%	1.77
83	1.374	1.444	1.516	5.01%	1.79
84	1.335	1.403	1.474	5.04%	1.81
85	1.297	1.364	1.433	5.07%	1.84
86	1.261	1.326	1.394	5.10%	1.86

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL.	Temp. TOL.(°C)
87	1.226	1.290	1.356	5.13%	1.88
88	1.192	1.254	1.319	5.16%	1.90
89	1.159	1.220	1.283	5.19%	1.92
90	1.127	1.187	1.249	5.22%	1.94
91	1.096	1.155	1.215	5.25%	1.96
92	1.066	1.124	1.183	5.28%	1.98
93	1.037	1.093	1.151	5.31%	2.00
94	1.009	1.064	1.121	5.33%	2.02
95	0.982	1.036	1.092	5.36%	2.04
96	0.956	1.009	1.063	5.39%	2.07
97	0.931	0.982	1.035	5.42%	2.09
98	0.906	0.956	1.008	5.45%	2.11
99	0.882	0.931	0.982	5.47%	2.13
100	0.859	0.907	0.957	5.50%	2.15
101	0.837	0.884	0.933	5.53%	2.17
102	0.815	0.861	0.909	5.56%	2.20
103	0.794	0.839	0.886	5.58%	2.22
104	0.774	0.818	0.864	5.61%	2.24
105	0.754	0.797	0.842	5.64%	2.26
106	0.735	0.777	0.821	5.67%	2.28
107	0.716	0.758	0.801	5.69%	2.31
108	0.698	0.739	0.781	5.72%	2.33
109	0.680	0.720	0.762	5.75%	2.35
110	0.663	0.702	0.743	5.77%	2.37
111	0.647	0.685	0.725	5.80%	2.40
112	0.631	0.669	0.707	5.82%	2.42
113	0.616	0.652	0.690	5.85%	2.44
114	0.601	0.636	0.674	5.88%	2.47
115	0.586	0.621	0.658	5.90%	2.49
116	0.572	0.606	0.642	5.93%	2.51
117	0.558	0.592	0.627	5.95%	2.54
118	0.545	0.578	0.612	5.98%	2.56
119	0.531	0.564	0.598	6.00%	2.58
120	0.519	0.551	0.584	6.03%	2.61
121	0.507	0.538	0.570	6.05%	2.63
122	0.495	0.525	0.557	6.08%	2.65
123	0.483	0.513	0.545	6.10%	2.68
124	0.472	0.501	0.532	6.13%	2.70
125	0.461	0.490	0.520	6.15%	2.72