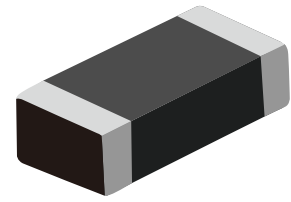


FEATURES

- | Small size, large power, strong capacity of suppression of inrush current
- | Fast response
- | Big material constant(Bvalue), small residual resistance
- | Long life and high reliability
- | Complete series, wide applications



0805

APPLICATIONS

- | Switching power-supply, switch power, ups power
- | Monitor, Sps, Fax, Telecom, Adaptor etc.
- | All kinds of RT, display
- | Bulb and other lighting lamps

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

PRODUCT IDENTIFICATION(PART NUMBER)

SND	—	CMFB	104	F	4250	F	B
①	②	③	④	⑤	⑥	⑦	⑧

①Code		②Type		③External Dimensions (L×W×T)(mm)		④Nominal Zero-Power Resistance	
SND	Logo	-	Delimiter	0402[CMFD]	1.00×0.50×0.50	472	4.7kΩ
				0603[CMFA]	1.60×0.80×0.80	103	10kΩ
				0805[CMFB]	2.00×1.25×0.85	104	100kΩ
				1206[CMFC]	3.20×1.60×0.85		

⑤Tolerance of Resistance		⑥B Constant		⑦Tolerance of B Constant		⑧B constant calculation method	
F	±1%	4250	4250K	F	±1%	A	25°C&85°C
G	±2%			H	±3%	B	25°C&50°C
H	±3%						
J	±5%						

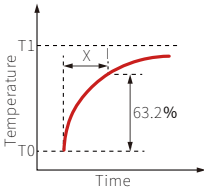
ELECTRICAL CHARACTERISTICS

Part No	Resistance (25°C) (kΩ)	B Constant (25/50°C) (K)	Permissible Operating Current (25°C) (mA)	Dissipation Factor (mW/°C)	Thermal Time Constant (s)	Rated Electric Power(25°C) (mW)	Operating ambient temperature (°C)
SND-CMFB104F4250FB	100±1%	4250±1%	0.14	2.0	<5	200	-40~+125

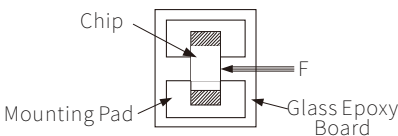
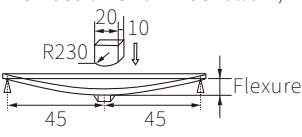
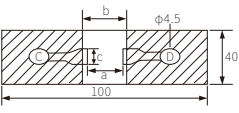
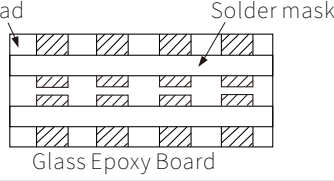
TEST AND MEASUREMENT PROCEDURES

Test Conditions	Inspection Equipment
Unless otherwise specified, the standard atmospheric conditions for measurement/test as: a. Ambient Temperature: 20±15°C b. Relative Humidity: 65±20% c. Air Pressure: 86kPa to 106kPa	Visual Examination: 20× magnifier Resistance value test: Thermistor resistance tester
If any doubt on the results, measurements/tests should be made within the following limits: a. Ambient Temperature: 25±2°C b. Relative Humidity: 65±5% c. Air Pressure: 86kPa to 106kPa	

ELECTRICAL TEST

No.	Items	Test Methods and Remarks
1	Nominal Zero-Power Resistance at 25°C(R25)	Ambient temperature: 25±0.05°C Measuring electric power: ≤0.1mW
2	Nominal B Constant	Measure the resistance at the ambient temperature of 25±0.05°C, 50±0.05°C or, 85±0.05°C. $B(25-50^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{50}}{1/T_{25} - 1/T_{50}}$ $B(25-85^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{85}}{1/T_{25} - 1/T_{85}}$ T: Absolute temperature (K)
3	Thermal Time Constant	The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T ₀ (°C) to T ₁ (°C) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second(S). 
4	Dissipation Factor	The required power which makes the NTC thermistor body temperature raise 1°C through self-heated, normally expressed in milliwatts per degree Celsius (mW/°C). It can be calculated by the following formula: $\delta = \frac{W}{T - T_0}$
5	Rated Power	The necessary electric power makes thermistor's temperature rise 100°C by self-heating at ambient temperature 25°C
6	Permissible operating current	The current that keep body temperature of chip NTC on the PC board in still air rising 1°C by self-heating.

RELIABILITY TEST

Items	Standard	Test Methods and Remarks	Requirements																														
Terminal Strength	IEC 60068-2-21	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. <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Size</th> <th>F</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>0201,0402,0603</td> <td>5N</td> <td rowspan="2">10±1s</td> </tr> <tr> <td>0805</td> <td>10N</td> </tr> </tbody> </table>	Size	F	Duration	0201,0402,0603	5N	10±1s	0805	10N	No removal or split of the termination or other defects shall occur. 																						
Size	F	Duration																															
0201,0402,0603	5N	10±1s																															
0805	10N																																
Resistance to Flexure	IEC 60068-2-21	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;  <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Size</th> <th>Flexure</th> <th>Pressurizing Speed</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>0201</td> <td>1mm</td> <td rowspan="2"><0.5mm/s</td> <td rowspan="2">10±1s</td> </tr> <tr> <td>0402,0603,0805</td> <td>2mm</td> </tr> </tbody> </table>	Size	Flexure	Pressurizing Speed	Duration	0201	1mm	<0.5mm/s	10±1s	0402,0603,0805	2mm	① No visible damage ② $ \Delta R_{25}/R_{25} \leq 5\%$ <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>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> 	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
Size	Flexure	Pressurizing Speed	Duration																														
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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 3 mutually 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: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin 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: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin 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 $ \Delta R_{25}/R_{25} \leq 5\%$ ③ $ \Delta B/B \leq 2\%$																														
Temperature cycling	IEC 60068-2-14	5 cycles of following sequence without loading <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <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±2°C</td> <td>30±3min</td> </tr> <tr> <td>4</td> <td>25±2°C</td> <td>5±3min</td> </tr> </tbody> </table> The chip shall be stabilized at normal condition for 1~2 hours before measuring	Step	Temperature	Time	1	-40±5°C	30±3min	2	25±2°C	5±3min	3	125±2°C	30±3min	4	25±2°C	5±3min	① No visible damage ② $ \Delta R_{25}/R_{25} \leq 3\%$ ③ $ \Delta B/B \leq 2\%$															
Step	Temperature	Time																															
1	-40±5°C	30±3min																															
2	25±2°C	5±3min																															
3	125±2°C	30±3min																															
4	25±2°C	5±3min																															
Resistance to dry heat	IEC 60068-2-2	① 125±5°C 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 $ \Delta R_{25}/R_{25} \leq 5\%$ ③ $ \Delta B/B \leq 2\%$																														

Items	Standard	Test Methods and Remarks	Requirements
Resistance to cold	IEC 60068-2-1	①-40±3°C in air, for 1000±24 hours without loading. ②The chip shall be stabilized at normal condition for 1~2 hours before measuring.	①No visible damage ② $\Delta R_{25}/R_{25}$ ≤5% ③ $\Delta B/B$ ≤2%
Resistance to damp heat	IEC 60068-2-78	①40±2°C, 90~95%RH in air, for 1000±24 hours without loading. ②The chip shall be stabilized at normal condition for 1~2 hours before measuring	①No visible damage ② $\Delta R_{25}/R_{25}$ ≤3% ③ $\Delta B/B$ ≤2%
Resistance to high temperature load	IEC 60539-1 5.25.4	①85±2°C in air with permissive operating current for 1000±48 hours ②The chip shall be stabilized at normal condition for 1~2 hours before measuring	①No visible damage ② $\Delta R_{25}/R_{25}$ ≤5% ③ $\Delta B/B$ ≤2%

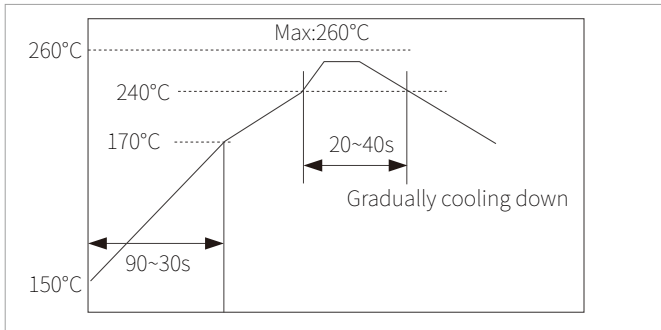
STORAGE

Storage Conditions	
a. Storage Temperature: -10°C~40°C	b. Relative Humidity: ≤75%RH
c. Keep away from corrosive atmosphere and sunlight	
Period of Storage: 6 Months after delivery	

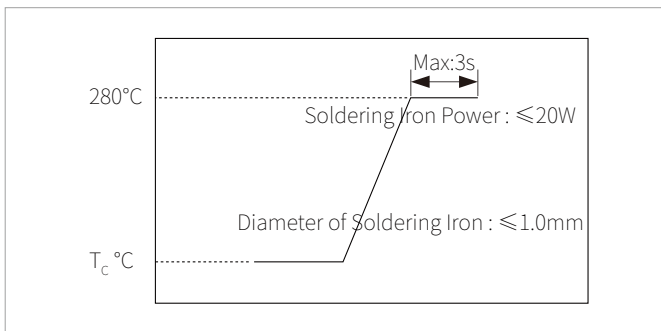
NOTES & WARNINGS

The SND series thermistors shall not be operated and stored under the following environmental condition:	
(1) Corrosive or deoxidized atmospheres (such as chlorine, sulfurated hydrogen, ammonia, sulfuric acid, nitric oxide and so on)	(2) Volatile or inflammable atmospheres
(3) Dusty condition	(4) Excessively high or low pressure condition
(5) Humid site	(6) Places with brine, oil, chemical liquid or organic solvent
(7) Intense vibration	(8) Places with analogously deleterious conditions
The ceramic body of the SND series thermistors is fragile, no excessive pressure or impact shall be exerted on it.	
The SND series thermistors shall not be operated beyond the specified "Operating Temperature Range" in the catalog.	

RECOMMENDED SOLDERING TECHNOLOGIES



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°CMax./10 sec.
Solder paste: Sn/3.0Ag/0.5Cu
Max.2 times for re-flowing



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: Sn/3.0Ag/0.5Cu
Max.1 times for iron soldering

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

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
-40	4,191.522	4,397.119	4,612.340	4.89%	0.66
-39	3,904.301	4,092.874	4,290.126	4.82%	0.65
-38	3,638.686	3,811.717	3,992.576	4.74%	0.65
-37	3,392.915	3,551.749	3,717.646	4.67%	0.64
-36	3,165.377	3,311.236	3,463.470	4.60%	0.64
-35	2,954.603	3,088.599	3,228.349	4.52%	0.63
-34	2,759.251	2,882.396	3,010.735	4.45%	0.63
-33	2,578.097	2,691.310	2,809.213	4.38%	0.62
-32	2,410.018	2,514.137	2,622.492	4.31%	0.62
-31	2,253.988	2,349.778	2,449.393	4.24%	0.61
-30	2,109.070	2,197.225	2,288.836	4.17%	0.61
-29	1,974.402	2,055.558	2,139.835	4.10%	0.60
-28	1,849.196	1,923.932	2,001.488	4.03%	0.59
-27	1,732.729	1,801.573	1,872.966	3.96%	0.59
-26	1,624.337	1,687.773	1,753.511	3.89%	0.58
-25	1,523.411	1,581.881	1,642.430	3.83%	0.58
-24	1,429.203	1,483.100	1,538.875	3.76%	0.57
-23	1,341.418	1,391.113	1,442.505	3.69%	0.57
-22	1,259.579	1,305.413	1,352.779	3.63%	0.56
-21	1,183.249	1,225.531	1,269.196	3.56%	0.55
-20	1,112.022	1,151.037	1,191.301	3.50%	0.55
-19	1,045.527	1,081.535	1,118.671	3.43%	0.54
-18	983.422	1,016.661	1,050.919	3.37%	0.53
-17	925.389	956.080	987.689	3.31%	0.53
-16	871.138	899.481	928.652	3.24%	0.52
-15	820.400	846.579	873.505	3.18%	0.52
-14	772.928	797.111	821.969	3.12%	0.51
-13	728.490	750.834	773.786	3.06%	0.50
-12	686.877	707.524	728.718	3.00%	0.50
-11	647.891	666.972	686.547	2.93%	0.49
-10	611.352	628.988	647.069	2.87%	0.48
-9	577.042	593.342	610.042	2.81%	0.48
-8	544.864	559.931	575.357	2.75%	0.47
-7	514.674	528.602	542.852	2.70%	0.46
-6	486.337	499.212	512.377	2.64%	0.46
-5	459.730	471.632	483.794	2.58%	0.45
-4	434.767	445.772	457.009	2.52%	0.44

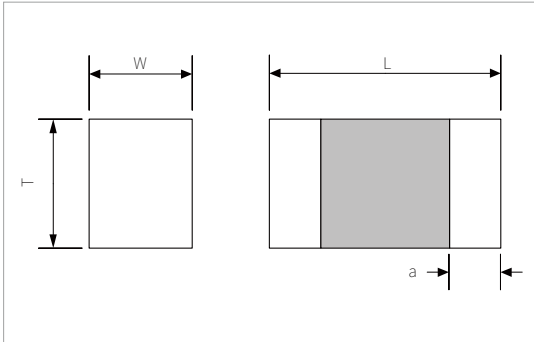
Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
-3	411.305	421.480	431.863	2.46%	0.43
-2	389.245	398.652	408.245	2.41%	0.43
-1	368.496	377.193	386.056	2.35%	0.42
0	348.972	357.012	365.200	2.29%	0.41
1	330.575	338.006	345.569	2.24%	0.41
2	313.254	320.122	327.107	2.18%	0.40
3	296.941	303.287	309.737	2.13%	0.39
4	281.571	287.434	293.389	2.07%	0.38
5	267.084	272.500	277.997	2.02%	0.38
6	253.425	258.426	263.501	1.96%	0.37
7	240.541	245.160	249.842	1.91%	0.36
8	228.386	232.649	236.968	1.86%	0.35
9	216.913	220.847	224.830	1.80%	0.34
10	206.081	209.710	213.381	1.75%	0.34
11	195.850	199.196	202.579	1.70%	0.33
12	186.184	189.268	192.384	1.65%	0.32
13	177.048	179.890	182.758	1.59%	0.31
14	168.411	171.028	173.667	1.54%	0.30
15	160.243	162.651	165.078	1.49%	0.30
16	152.512	154.726	156.957	1.44%	0.29
17	145.197	147.232	149.281	1.39%	0.28
18	138.273	140.142	142.022	1.34%	0.27
19	131.717	133.432	135.156	1.29%	0.26
20	125.508	127.080	128.659	1.24%	0.25
21	119.626	121.066	122.510	1.19%	0.25
22	114.052	115.368	116.689	1.14%	0.24
23	108.766	109.970	111.175	1.10%	0.23
24	103.754	104.852	105.951	1.05%	0.22
25	99.000	100.000	101.000	1.00%	0.21
26	94.400	95.398	96.397	1.05%	0.22
27	90.037	91.032	92.029	1.09%	0.23
28	85.899	86.889	87.881	1.14%	0.25
29	81.973	82.956	83.942	1.19%	0.26
30	78.247	79.222	80.200	1.24%	0.27
31	74.710	75.675	76.645	1.28%	0.28
32	71.351	72.306	73.266	1.33%	0.29
33	68.161	69.104	70.054	1.37%	0.31

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
34	65.130	66.061	66.999	1.42%	0.32
35	62.249	63.167	64.093	1.47%	0.33
36	59.510	60.415	61.327	1.51%	0.34
37	56.906	57.797	58.696	1.56%	0.35
38	54.429	55.306	56.190	1.60%	0.37
39	52.073	52.934	53.805	1.64%	0.38
40	49.830	50.677	51.532	1.69%	0.39
41	47.697	48.528	49.369	1.73%	0.40
42	45.666	46.482	47.308	1.78%	0.42
43	43.732	44.533	45.343	1.82%	0.43
44	41.890	42.675	43.470	1.86%	0.44
45	40.134	40.904	41.684	1.91%	0.46
46	38.459	39.213	39.978	1.95%	0.47
47	36.863	37.601	38.350	1.99%	0.48
48	35.340	36.063	36.797	2.04%	0.49
49	33.888	34.595	35.314	2.08%	0.51
50	32.502	33.195	33.898	2.12%	0.52
51	31.182	31.859	32.548	2.16%	0.53
52	29.921	30.584	31.258	2.20%	0.55
53	28.718	29.366	30.025	2.25%	0.56
54	27.569	28.203	28.847	2.29%	0.57
55	26.472	27.091	27.721	2.33%	0.59
56	25.424	26.028	26.645	2.37%	0.60
57	24.422	25.013	25.615	2.41%	0.62
58	23.464	24.042	24.631	2.45%	0.63
59	22.549	23.113	23.688	2.49%	0.64
60	21.674	22.224	22.787	2.53%	0.66
61	20.837	21.374	21.924	2.57%	0.67
62	20.036	20.561	21.097	2.61%	0.69
63	19.269	19.782	20.306	2.65%	0.70
64	18.536	19.036	19.548	2.69%	0.72
65	17.834	18.323	18.822	2.73%	0.73
66	17.163	17.640	18.128	2.77%	0.74
67	16.521	16.986	17.463	2.81%	0.76
68	15.906	16.360	16.825	2.85%	0.77
69	15.316	15.760	16.214	2.88%	0.79
70	14.752	15.184	15.628	2.92%	0.80

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
71	14.209	14.631	15.064	2.96%	0.82
72	13.689	14.101	14.523	3.00%	0.83
73	13.190	13.592	14.004	3.04%	0.85
74	12.712	13.104	13.506	3.07%	0.86
75	12.253	12.635	13.029	3.11%	0.88
76	11.814	12.187	12.571	3.15%	0.89
77	11.393	11.757	12.131	3.19%	0.91
78	10.988	11.344	11.709	3.22%	0.92
79	10.600	10.947	11.304	3.26%	0.94
80	10.228	10.566	10.914	3.30%	0.96
81	9.870	10.200	10.539	3.33%	0.97
82	9.526	9.848	10.180	3.37%	0.99
83	9.196	9.510	9.834	3.40%	1.00
84	8.879	9.185	9.501	3.44%	1.02
85	8.574	8.873	9.181	3.48%	1.03
86	8.281	8.572	8.873	3.51%	1.05
87	7.999	8.283	8.577	3.55%	1.07
88	7.728	8.006	8.292	3.58%	1.08
89	7.467	7.738	8.018	3.62%	1.10
90	7.217	7.481	7.754	3.65%	1.12
91	6.976	7.234	7.501	3.69%	1.13
92	6.745	6.997	7.258	3.72%	1.15
93	6.523	6.769	7.023	3.76%	1.17
94	6.309	6.548	6.797	3.79%	1.18
95	6.102	6.337	6.579	3.83%	1.20
96	5.903	6.132	6.368	3.86%	1.22
97	5.711	5.934	6.165	3.89%	1.23
98	5.526	5.744	5.969	3.93%	1.25
99	5.348	5.561	5.781	3.96%	1.27
100	5.177	5.384	5.599	3.99%	1.28
101	5.012	5.214	5.424	4.03%	1.30
102	4.853	5.051	5.256	4.06%	1.32
103	4.700	4.893	5.093	4.09%	1.34
104	4.553	4.741	4.937	4.13%	1.35
105	4.410	4.594	4.785	4.16%	1.37
106	4.273	4.453	4.639	4.19%	1.39
107	4.141	4.316	4.498	4.22%	1.41

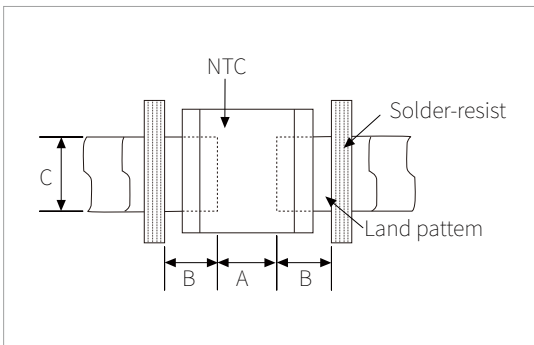
Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
108	4.013	4.184	4.362	4.26%	1.42
109	3.890	4.057	4.231	4.29%	1.44
110	3.771	3.934	4.104	4.32%	1.46
111	3.656	3.816	3.982	4.35%	1.48
112	3.545	3.701	3.863	4.38%	1.49
113	3.438	3.591	3.749	4.42%	1.51
114	3.335	3.484	3.639	4.45%	1.53
115	3.235	3.380	3.532	4.48%	1.55
116	3.139	3.281	3.429	4.51%	1.57
117	3.047	3.185	3.330	4.54%	1.59
118	2.957	3.093	3.234	4.57%	1.60
119	2.871	3.003	3.141	4.60%	1.62
120	2.787	2.916	3.052	4.63%	1.64
121	2.706	2.832	2.964	4.66%	1.66
122	2.627	2.751	2.880	4.70%	1.68
123	2.551	2.672	2.798	4.73%	1.70
124	2.478	2.596	2.719	4.76%	1.72
125	2.407	2.522	2.643	4.79%	1.74

DIMENSION SPECIFICATION



Size	L(mm)	W(mm)	T(mm)	a(mm)
0805	0.079 ± 0.008	0.049 ± 0.008	0.033 ± 0.008	0.020 ± 0.012
[2012]	$[2.0 \pm 0.20]$	$[1.25 \pm 0.2]$	$[0.85 \pm 0.2]$	$[0.5 \pm 0.3]$

DIMENSION SPECIFICATION



A(mm)	B(mm)	C(mm)
$[1.0-1.1]$	$[0.6-0.7]$	$[1.0-1.2]$

TAPING

Type	0201	0402	0603	0805
Tape thickness(mm)	0.5 ± 0.15	0.5 ± 0.15	0.8 ± 0.15	0.85 ± 0.2
Tape material	Paper Tape			
Quantity per Reel	15K	10K	4K	4K

Headquarters

No.3387 Shendu Road
Pujiang I&E Park
Minhang Shanghai China
201000

Hotline

400-021-5756

Web

<https://www.semiware.com>

Sales Center

Tel: 86-21-3463-7458
Email: sales18@semiware.com

Customer Service

Tel: 86-21-5484-1001
Email: sales17@semiware.com

Technical Support

Tel: 86-21-3463-7654
Email: fae01@semiware.com

Complaint & Suggestions

Tel: 86-21-3463-7172
Ext: 8868
Email: cs03@semiware.com

By QR Code

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