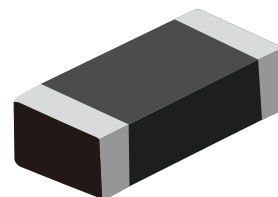


FEATURES

- | 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



0402

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	—	CMFD	104	F	3987	F	A
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	103	10kΩ
				0603[CMFA]	1.60×0.80×0.80	104	100kΩ
				0805[CMFB]	2.00×1.25×0.85	154	150kΩ
				1206[CMFC]	3.20×1.60×0.85	474	470kΩ

⑤Tolerance of Resistance		⑥B Constant		⑦Tolerance of B Constant		⑧B constant calculation method	
F	±1%	3380	3380K	F	±1%	A	25℃&85℃
G	±2%	3435	3435K	H	±3%	B	25℃&50℃
H	±3%	3950	3950K				
J	±5%	3987	3987K				

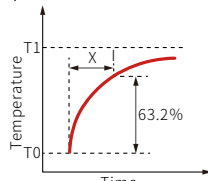
ELECTRICAL CHARACTERISTICS

Part Number	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-CMFD104F3987FA	100±1%	3987±1%	0.10	1.0	<3	100	-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 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	Visual Examination: 20× magnifier Resistance value test: Thermistor resistance tester

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 T0 (°C) to T1 (°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.

Items	Standard	Test Methods and Remarks	Requirements
Resistance to cold	IEC 60068-2-1	① $-40 \pm 3^{\circ}\text{C}$ 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\%$
Resistance to damp heat	IEC 60068-2-78	① $40 \pm 2^{\circ}\text{C}$, 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 $ \Delta R_{25}/R_{25} \leq 3\%$ ③ $ \Delta B/B \leq 2\%$
Resistance to high temperature load	IEC 60539-1 5.25.4	① $85 \pm 2^{\circ}\text{C}$ in 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 $ \Delta R_{25}/R_{25} \leq 5\%$ ③ $ \Delta B/B \leq 2\%$

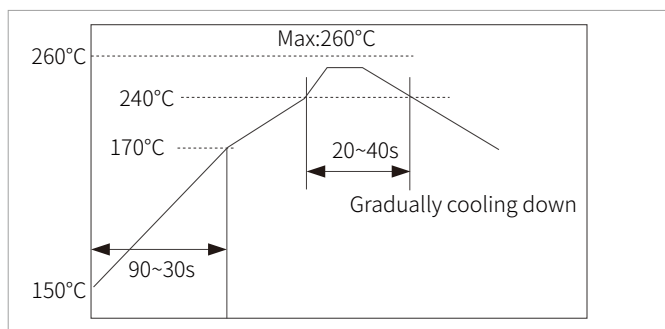
STORAGE

Storage Conditions	
a. Storage Temperature: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$	b. Relative Humidity: $\leq 75\% \text{RH}$
c. Keep away from corrosive atmosphere and sunlight	
Period of Storage: 6 Months after delivery	

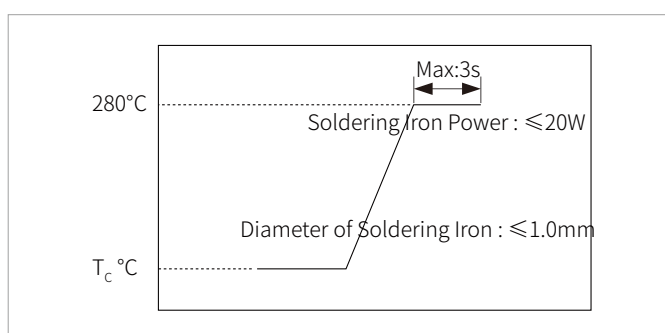
NOTES & WARNINGS

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	3,084.269	3,225.545	3,372.955	4.57%	0.67
-39	2,892.785	3,023.332	3,159.454	4.50%	0.66
-38	2,714.318	2,834.987	2,960.724	4.44%	0.66
-37	2,547.912	2,659.483	2,775.662	4.37%	0.65
-36	2,392.685	2,495.874	2,603.252	4.30%	0.65
-35	2,247.826	2,343.289	2,442.561	4.24%	0.64
-34	2,112.585	2,200.924	2,292.728	4.17%	0.64
-33	1,986.272	2,068.041	2,152.960	4.11%	0.63
-32	1,868.248	1,943.955	2,022.527	4.04%	0.63
-31	1,757.924	1,828.036	1,900.755	3.98%	0.62
-30	1,654.757	1,719.704	1,787.021	3.91%	0.62
-29	1,558.243	1,618.419	1,680.751	3.85%	0.61
-28	1,467.918	1,523.686	1,581.415	3.79%	0.61
-27	1,383.351	1,435.046	1,488.524	3.73%	0.60
-26	1,304.144	1,352.073	1,401.624	3.66%	0.59
-25	1,229.928	1,274.376	1,320.298	3.60%	0.59
-24	1,160.363	1,201.590	1,244.157	3.54%	0.58
-23	1,095.132	1,133.379	1,172.844	3.48%	0.58
-22	1,033.942	1,069.430	1,106.026	3.42%	0.57
-21	976.520	1,009.455	1,043.396	3.36%	0.57
-20	922.616	953.185	984.670	3.30%	0.56
-19	871.994	900.373	929.583	3.24%	0.55
-18	824.437	850.787	877.890	3.19%	0.55
-17	779.744	804.212	829.365	3.13%	0.54
-16	737.728	760.451	783.797	3.07%	0.54
-15	698.212	719.319	740.990	3.01%	0.53
-14	661.037	680.643	700.761	2.96%	0.52
-13	626.050	644.265	662.943	2.90%	0.52
-12	593.112	610.035	627.379	2.84%	0.51
-11	562.091	577.816	593.921	2.79%	0.50
-10	532.867	547.478	562.435	2.73%	0.50
-9	505.325	518.903	532.793	2.68%	0.49
-8	479.360	491.979	504.879	2.62%	0.48
-7	454.874	466.601	478.582	2.57%	0.48
-6	431.775	442.674	453.801	2.51%	0.47
-5	409.977	420.105	430.441	2.46%	0.46
-4	389.400	398.813	408.412	2.41%	0.46

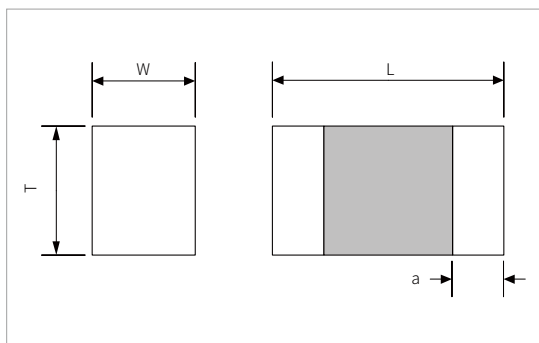
Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
-3	369.970	378.717	387.631	2.35%	0.45
-2	351.616	359.744	368.023	2.30%	0.44
-1	334.274	341.826	349.514	2.25%	0.43
0	317.882	324.899	332.037	2.20%	0.43
1	302.384	308.903	315.530	2.15%	0.42
2	287.726	293.781	299.934	2.09%	0.41
3	273.859	279.483	285.193	2.04%	0.41
4	260.735	265.958	271.258	1.99%	0.40
5	248.312	253.161	258.078	1.94%	0.39
6	236.548	241.049	245.611	1.89%	0.38
7	225.405	229.582	233.813	1.84%	0.38
8	214.847	218.722	222.645	1.79%	0.37
9	204.841	208.435	212.071	1.74%	0.36
10	195.354	198.687	202.056	1.70%	0.35
11	186.358	189.447	192.568	1.65%	0.34
12	177.824	180.686	183.576	1.60%	0.34
13	169.727	172.377	175.052	1.55%	0.33
14	162.041	164.495	166.969	1.50%	0.32
15	154.745	157.015	159.302	1.46%	0.31
16	147.816	149.914	152.028	1.41%	0.30
17	141.233	143.173	145.124	1.36%	0.30
18	134.979	136.770	138.571	1.32%	0.29
19	129.035	130.688	132.348	1.27%	0.28
20	123.384	124.908	126.437	1.22%	0.27
21	118.010	119.413	120.822	1.18%	0.26
22	112.898	114.190	115.485	1.13%	0.25
23	108.035	109.222	110.412	1.09%	0.25
24	103.406	104.497	105.588	1.04%	0.24
25	99.000	100.000	101.000	1.00%	0.23
26	94.722	95.720	96.720	1.04%	0.24
27	90.650	91.646	92.643	1.09%	0.25
28	86.775	87.766	88.760	1.13%	0.26
29	83.086	84.071	85.059	1.18%	0.27
30	79.572	80.550	81.532	1.22%	0.29
31	76.225	77.195	78.169	1.26%	0.30
32	73.036	73.997	74.962	1.30%	0.31
33	69.997	70.947	71.903	1.35%	0.32

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
34	67.100	68.039	68.985	1.39%	0.33
35	64.337	65.265	66.200	1.43%	0.35
36	61.703	62.618	63.541	1.47%	0.36
37	59.189	60.092	61.003	1.52%	0.37
38	56.791	57.681	58.579	1.56%	0.38
39	54.502	55.379	56.264	1.60%	0.40
40	52.317	53.180	54.052	1.64%	0.41
41	50.230	51.080	51.938	1.68%	0.42
42	48.237	49.073	49.918	1.72%	0.43
43	46.334	47.155	47.986	1.76%	0.45
44	44.515	45.321	46.138	1.80%	0.46
45	42.776	43.569	44.371	1.84%	0.47
46	41.114	41.892	42.681	1.88%	0.49
47	39.525	40.289	41.063	1.92%	0.50
48	38.005	38.755	39.515	1.96%	0.51
49	36.551	37.286	38.033	2.00%	0.53
50	35.160	35.881	36.613	2.04%	0.54
51	33.829	34.536	35.254	2.08%	0.55
52	32.555	33.248	33.952	2.12%	0.57
53	31.335	32.014	32.704	2.16%	0.58
54	30.166	30.832	31.508	2.20%	0.59
55	29.047	29.699	30.362	2.23%	0.61
56	27.975	28.614	29.264	2.27%	0.62
57	26.948	27.573	28.210	2.31%	0.64
58	25.963	26.576	27.199	2.35%	0.65
59	25.020	25.619	26.230	2.38%	0.66
60	24.115	24.701	25.300	2.42%	0.68
61	23.247	23.821	24.407	2.46%	0.69
62	22.415	22.976	23.550	2.50%	0.71
63	21.616	22.166	22.727	2.53%	0.72
64	20.850	21.388	21.937	2.57%	0.73
65	20.114	20.641	21.179	2.61%	0.75
66	19.408	19.923	20.450	2.64%	0.76
67	18.731	19.234	19.749	2.68%	0.78
68	18.080	18.572	19.076	2.71%	0.79
69	17.454	17.936	18.430	2.75%	0.81
70	16.854	17.325	17.808	2.79%	0.82

Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
71	16.277	16.738	17.210	2.82%	0.84
72	15.722	16.173	16.635	2.86%	0.85
73	15.189	15.630	16.082	2.89%	0.87
74	14.676	15.108	15.550	2.93%	0.88
75	14.184	14.605	15.038	2.96%	0.90
76	13.710	14.122	14.545	3.00%	0.91
77	13.254	13.657	14.071	3.03%	0.93
78	12.815	13.209	13.614	3.07%	0.95
79	12.393	12.779	13.175	3.10%	0.96
80	11.987	12.364	12.751	3.13%	0.98
81	11.596	11.965	12.344	3.17%	0.99
82	11.220	11.580	11.951	3.20%	1.01
83	10.857	11.210	11.572	3.23%	1.02
84	10.508	10.853	11.207	3.27%	1.04
85	10.172	10.509	10.856	3.30%	1.06
86	9.848	10.177	10.517	3.33%	1.07
87	9.536	9.858	10.190	3.37%	1.09
88	9.235	9.550	9.875	3.40%	1.10
89	8.945	9.253	9.571	3.43%	1.12
90	8.666	8.967	9.277	3.47%	1.14
91	8.396	8.691	8.995	3.50%	1.15
92	8.136	8.424	8.722	3.53%	1.17
93	7.885	8.167	8.458	3.56%	1.19
94	7.644	7.919	8.204	3.59%	1.20
95	7.410	7.680	7.958	3.63%	1.22
96	7.185	7.449	7.721	3.66%	1.24
97	6.968	7.226	7.492	3.69%	1.25
98	6.758	7.010	7.271	3.72%	1.27
99	6.556	6.802	7.057	3.75%	1.29
100	6.360	6.601	6.851	3.78%	1.31
101	6.171	6.407	6.652	3.81%	1.32
102	5.989	6.220	6.459	3.84%	1.34
103	5.813	6.039	6.273	3.88%	1.36
104	5.643	5.864	6.093	3.91%	1.38
105	5.478	5.694	5.918	3.94%	1.39
106	5.319	5.531	5.750	3.97%	1.41
107	5.166	5.373	5.587	4.00%	1.43

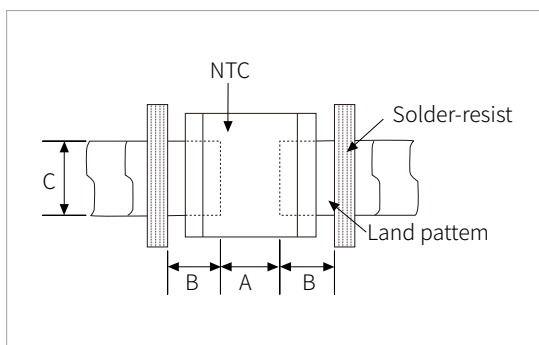
Temp. (°C)	R_Min (Kohm)	R_Cent (Kohm)	R_Max (Kohm)	Res TOL	Temp. TOL.(°C)
108	5.017	5.220	5.430	4.03%	1.45
109	4.873	5.072	5.277	4.06%	1.46
110	4.735	4.929	5.130	4.09%	1.48
111	4.600	4.790	4.987	4.12%	1.50
112	4.470	4.656	4.849	4.15%	1.52
113	4.345	4.527	4.716	4.18%	1.54
114	4.223	4.401	4.586	4.20%	1.56
115	4.105	4.280	4.461	4.23%	1.57
116	3.992	4.162	4.340	4.26%	1.59
117	3.881	4.048	4.222	4.29%	1.61
118	3.775	3.938	4.108	4.32%	1.63
119	3.671	3.831	3.998	4.35%	1.65
120	3.571	3.728	3.891	4.38%	1.67
121	3.474	3.628	3.788	4.41%	1.69
122	3.381	3.531	3.687	4.43%	1.70
123	3.290	3.437	3.590	4.46%	1.72
124	3.202	3.346	3.496	4.49%	1.74
125	3.116	3.257	3.405	4.52%	1.76

DIMENSION SPECIFICATION



Size	L(mm)	W(mm)	T(mm)	a(mm)
0402	0.039 ± 0.006	0.020 ± 0.006	0.020 ± 0.006	0.010 ± 0.004
[1005]	$[1.0 \pm 0.15]$	$[0.5 \pm 0.15]$	$[0.5 \pm 0.15]$	$[0.25 \pm 0.1]$

DIMENSION SPECIFICATION



A(mm)	B(mm)	C(mm)
$[0.45-0.55]$	$[0.4-0.5]$	$[0.45-0.55]$

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

Website



Wechat

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