



南京时恒电子科技有限公司

规格承认书

APPROVAL SHEET

客户名称:

CUSTOMER _____

产品名称:

PART NAME

片式 NTC 热敏电阻规格书

产品规格:

PART NUMBER

CMF X 103F3950

日期:

DATE

2021 年 08 月 21 日

确 认

CONFIRM

客户

品保部: _____

制造部: _____

工程部: _____

供货商/制造商

规格书制作: 鞠晓丽

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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.

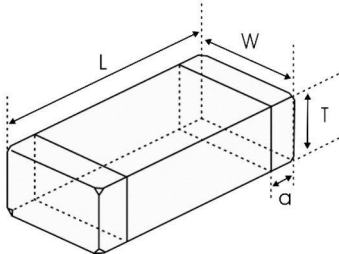


图 1 Fig.1

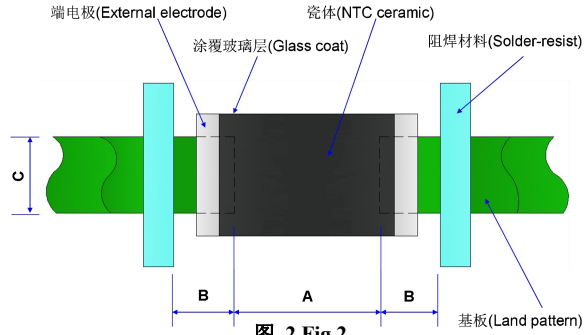


图 2 Fig.2

表 1 (Table 1)

单位 unit: inch[mm]

类别 Type	L	W	T	a	A	B	C
0402 [1005]	0.039±0.006 [1.0±0.15]	0.020±0.006 [0.5±0.15]	0.020±0.006 [0.5±0.15]	0.010±0.004 [0.25±0.1]	[0.45-0.55]	[0.4-0.5]	[0.45-0.55]

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

CMF X 103 F 3950
① ② ③ ④ ⑤

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

② 外形尺寸(mm) External Dimensions (L×W)	
X[0402]	1.0×0.5
A[0603]	1.6×0.8
B[0805]	2.0×1.2

③ 25℃的零功率电阻Nominal Zero-Power Resistance	
223	22kΩ
103	10kΩ
104	100kΩ

④ 电阻值公差 Tolerance of Resistance	
F	±1%
G	±2%
H	±3%
J	±5%

⑤ B 值常数 B Constant	
3380	3380K
3950	3950K
4250	4250K

3 电气特性 Electrical Characteristics

型号 Part No	电阻值 Resistance (25℃) (kΩ)	B 常数B Constant (25/50℃) (K)	B 常数B Constant (25/85℃) (K)	允许工作电流 Permissible Operating Current (25℃) (mA)	耗散系数 Dissipation Factor (mW/℃)	热时间常数 Thermal Time Constant (s)	额定功率 Rated Electric Power (25℃) (mW)	工作温度 Operating ambient temperature (℃)
CMFX 103F3950	10	3900	3950	0.31	1.0	<3	100	-40~+125

4 检验和测试程序

测试条件

如无特别规定，检验和测试的标准大气环境条件如下：

- a. 环境温度：20±15℃；
- b. 相对湿度：65±20%；
- c. 气压：86 kPa~106 kPa

如果对测试结果有异议，则在下述条件下测试：

- a. 环境温度：20±2℃；
- b. 相对湿度：65±5%RH；
- c. 气压：86kPa ~ 106kPa

检查设备

外观检查：20 倍放大镜；

阻值检查：热敏电阻测试仪

4 Test and Measurement Procedures

5 电性测试 Electrical Test

Test Conditions

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

- a. Ambient Temperature: 20±15℃
- b. Relative Humidity: 65±20%
- c. Air Pressure: 86kPa to 106kPa

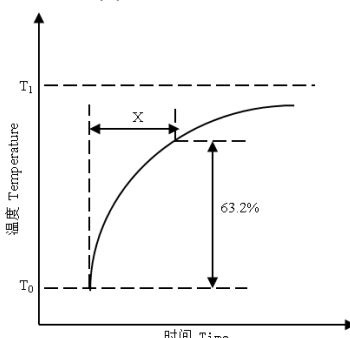
If any doubt on the results, measurements/tests should be made within the following limits:

- a. Ambient Temperature: 20±2℃
- b. Relative Humidity: 65±5%
- c. Air Pressure: 86kPa to 106kPa

Inspection Equipment

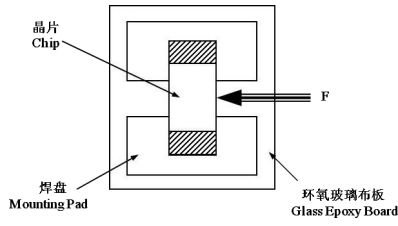
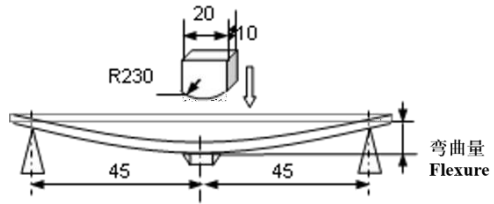
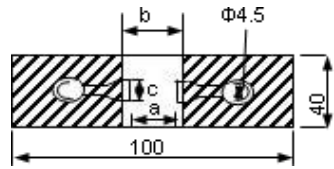
Visual Examination: 20×magnifier

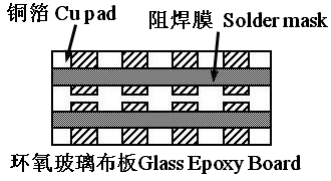
Resistance value test: Thermistor resistance tester

序号 No.	项目 Items	测试方法及备注 Test Methods and Remarks
1	25℃零功率电阻值 Nominal Zero-Power Resistance at 25℃ (R25)	环境温度 Ambient temperature: 25±0.2℃ 测试功率 Measuring electric power: ≤0.1mW
2	B 值常数 Nominal B Constant	分别在环境温度 25±0.2℃, 50±0.2℃或 85±0.2℃下测量电阻值。 Measure the resistance at the ambient temperature of 25±0.2℃, 50±0.2℃ or 85±0.2℃. $B(25-50^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{50}}{\frac{1}{T_{25}} - \frac{1}{T_{50}}}$ $B(25-85^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{85}}{\frac{1}{T_{25}} - \frac{1}{T_{85}}}$ T: 绝对温度 (K) Absolute temperature (K)
3	热时间常数 Thermal Time Constant	在零功率条件下，当热敏电阻的环境温度发生急剧变化时，热敏电阻元件产生最初温度 T ₀ 与最终温度 T ₁ 两者温度差的 63.2% 的温度变化所需要的时间，通常以秒(S)表示。 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	耗散系数 Dissipation Factor	在一定环境温度下，NTC 热敏电阻通过自身发热使其温度升高 1℃时所需要的功率，通常以 mW/℃表示。可由下面公式计算： 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	额定功率 Rated Power	在环境温度 25℃下因自身发热使表面温度升高 100℃所需要的功率。 The necessary electric power makes thermistor's temperature rise 100°C by self-heating at ambient temperature 25°C.
6	允许工作电流 Permissible operating current	在静止空气中通过自身发热使其升温为 1℃的电流。 The current that keep body temperature of chip NTC on the PC board in still air rising 1°C by self-heating.

6 信赖性试验 Reliability Test

项目 Items	测试标准 Standard	测试方法及备注 Test Methods and Remarks	要求 Requirements																				
端头附着力 Terminal Strength	IEC 60068-2-21	① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板），按箭头所示方向施加作用力； 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 0201、0402 和 0603 系列施加 5N 的作用力，0805 系列产品施加 10N 的作用力； 5N force for 0201, 0402 and 0603 series, 10N force for 0805 series. ③ 保持时间 Duration: 10±1s	端电极无脱落且瓷体无损伤。 No removal or split of the termination or other defects shall occur. 																				
抗弯强度 Resistance to Flexure	IEC 60068-2-21	① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板），按下图箭头所示方向施加作用力； 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 弯曲变形量 Flexure 0201: 1mm 0402, 0603, 0805: 2mm ③ 施压速度 Pressurizing Speed: <0.5mm/s; ④ 保持时间 Duration: 10s 	① 无外观损伤。 No visible damage. ② 试验前后 R25 的变化率: ±5%以内； R25 variation: within ±5% 单位 unit: mm <table border="1" data-bbox="1109 1355 1476 1579"> <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
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																				

振动 Vibration	IEC 60068-2-80	<p>① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板）； Solder the chip to the testing jig (glass epoxy board shown in the left) using eutectic solder.</p> <p>② 晶片以全振幅为 1.5mm 进行振动，频率范围为 10Hz ~ 55 Hz； 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.</p> <p>③ 振动频率按 10Hz→55Hz→10Hz 循环，周期为 1 分钟，在空间三个互相垂直的方向上各振动 2 小时（共 6 小时）。 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).</p>	<p>无外观损伤。 No visible damage.</p> 															
坠落 Dropping	IEC 60068-2-32	<p>从 1m 的高度让晶片自由坠落至水泥地面 10 次。 Drop a chip 10 times on a concrete floor from a height of 1 meter.</p>	<p>无外观损伤。 No visible damage.</p>															
可焊性 Solderability	IEC 60068-2-58	<p>① 焊接温度 Solder temperature: 245±5℃. ② 浸渍时间 Duration: 3±0.3s. ③ 焊锡成分 Solder: Sn/3.0Ag/0.5Cu. ④ 助焊剂 Flux: (重量比) 25%松香和 75%酒精 25% Resin and 75% ethanol in weight.</p>	<p>① 无外观损伤； No visible damage. ② 元件端电极的焊锡覆盖率不小于 95%。 Wetting shall exceed 95% coverage.</p>															
耐焊性 Resistance to Soldering Heat	IEC 60068-2-58	<p>① 焊接温度 Solder temperature: 260±5℃. ② 浸渍时间 Duration: 10±1s. ③ 焊锡成分 Solder: Sn/3.0Ag/0.5Cu. ④ 助焊剂 Flux: (重量比) 25%松香和 75%酒精 25% Resin and 75% ethanol in weight. ⑤ 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>	<p>① 无外观损伤； No visible damage. ② 试验前后 R25 的变化率：±3%以内； R25 variation: within ±3% ③ 试验前后 B 值的变化率：±2%以内。 B constant variation: within ±2%</p>															
温度周期 Temperature cycling	IEC 60068-2-14	<p>① 无负载于下表所示的环境条件下重复 5 次。 5 cycles of following sequence without loading.</p> <table border="1" data-bbox="475 1377 1026 1570"> <thead> <tr> <th>步骤 Step</th> <th>温度 Temperature</th> <th>时间 Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±5℃</td> <td>30±3min</td> </tr> <tr> <td>2</td> <td>25±2℃</td> <td>5±3min</td> </tr> <tr> <td>3</td> <td>125±2℃</td> <td>30±3min</td> </tr> <tr> <td>4</td> <td>25±2℃</td> <td>5±3min</td> </tr> </tbody> </table> <p>② 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>	步骤 Step	温度 Temperature	时间 Time	1	-40±5℃	30±3min	2	25±2℃	5±3min	3	125±2℃	30±3min	4	25±2℃	5±3min	<p>① 无外观损伤； No visible damage. ② 试验前后 R25 的变化率：±3%以内； R25 variation: within ±3% ③ 试验前后 B 值的变化率：±2%以内。 B constant variation: within ±2%</p>
步骤 Step	温度 Temperature	时间 Time																
1	-40±5℃	30±3min																
2	25±2℃	5±3min																
3	125±2℃	30±3min																
4	25±2℃	5±3min																
高温存放 Resistance to dry heat	IEC 60068-2-2	<p>① 在 125±5℃空气中，无负载放置 1000±24 小时。 125±5℃ in air, for 1000±24 hours without loading. ② 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>	<p>① 无外观损伤； No visible damage. ② 试验前后 R25 的变化率：±5%以内； R25 variation: within ±5% ③ 试验前后 B 值的变化率：±2%以内。 B constant variation: within ±2%</p>															

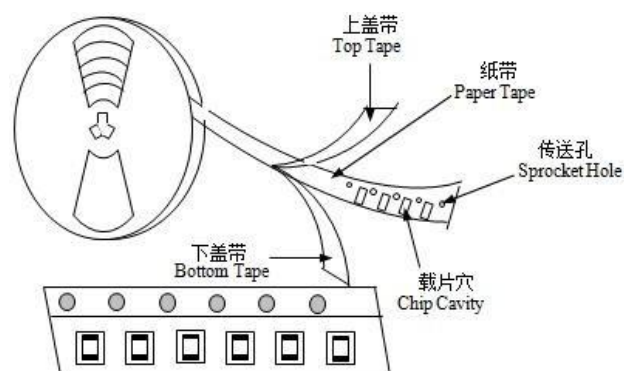
低温存放 Resistance to cold	IEC 60068-2-1	① 在-40±3℃空气中, 无负载放置 1000±24 小时。 -40±3℃ in air, for 1000±24 hours without loading. ② 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.	① 无外观损伤; No visible damage. ② 试验前后 R25 的变化率: ±5%以内; R25 variation: within ±5% ③ 试验前后 B 值的变化率: ±2%以内。 B constant variation: within ±2%
湿热存放 Resistance to damp heat	IEC 60068-2-78	① 在 40±2℃, 相对湿度 90~95%空气中, 无负载放置 1000±24 小时。 40±2℃, 90~95%RH in air, for 1000±24 hours without loading. ② 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.	① 无外观损伤; No visible damage. ② 试验前后 R25 的变化率: ±3%以内; R25 variation: within ±3% ③ 试验前后 B 值的变化率: ±2%以内。 B constant variation: within ±2%
高温负荷 Resistance to high temperature load	IEC 60539-1 5.25.4	① 在 85±2℃空气中, 施加允许工作电流1000±48 小时。 85±2℃ in air with permissive operating current for 1000±48 hours ② 试验后标准条件下放置 1~2 小时后测量。 The chip shall be stabilized at normal condition for 1~2 hours before measuring.	① 无外观损伤; No visible damage. ② 试验前后 R25 的变化率: ±5%以内; R25 variation: within ±5% ③ 试验前后 B 值的变化率: ±2%以内。 B constant variation: within ±2%

7 编带和储存 Taping & Storage

编带 Taping

类型 Type	0201	0402	0603	0805
编带厚度 Tape thickness(mm)	0.5±0.15	0.5±0.15	0.8±0.15	0.85±0.2
编带材质 Tape material	纸带 Paper Tape			
每盘数量 Quantity per Reel	15K	10K	4K	4K

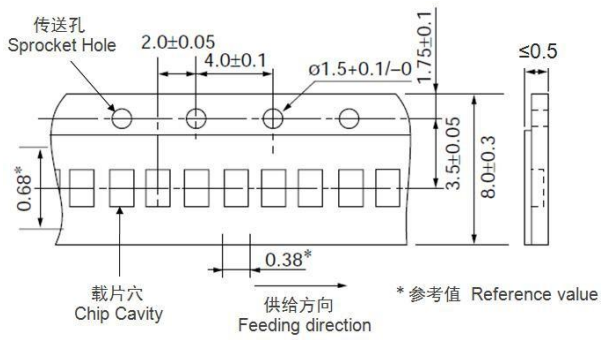
(1) 编带图 Taping Drawings



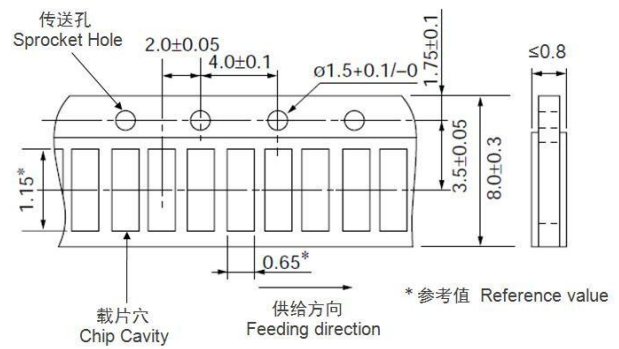
(2) 纸带尺寸 Paper Tape Dimensions

(单位 Unit: mm)

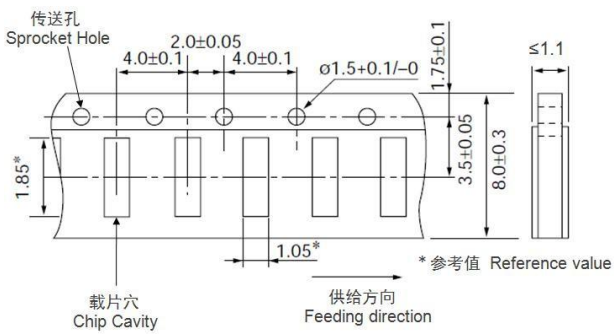
0201 系列 0201 series



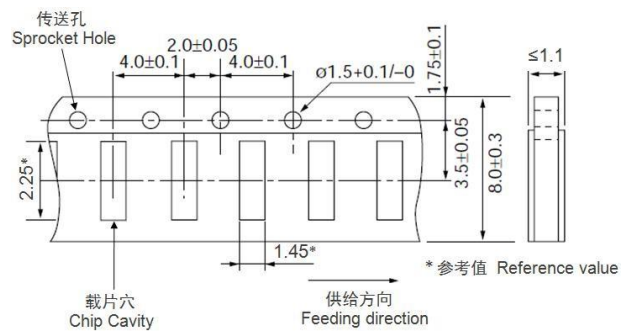
0402 系列 0402 series



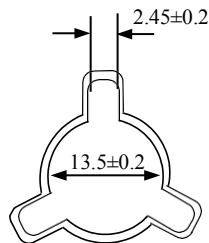
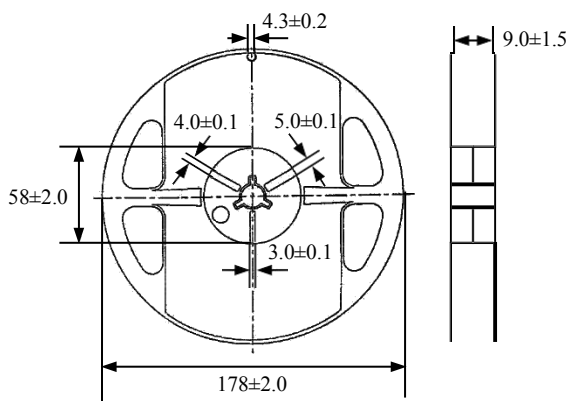
0603 系列 0603 series



0805 系列 0805 series



(3) 卷盘尺寸 Reel Dimensions (单位 Unit: mm)



8 储存

• 储存条件

a. 储存温度: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$

b. 相对湿度: $\leq 75\%RH$

c. 避免接触粉尘、腐蚀性气氛和阳光

- **储存期限: 6 个月**

9 注意事项

- 系列热敏电阻不可在以下条件下工作或储存:
 - (1) 腐蚀性气体或还原性气体
(氯气、硫化氢气体、氨气、硫酸气体、一氧化氮等)。
 - (2) 挥发性或易燃性气体
 - (3) 多尘条件
 - (4) 高压或低压条件
 - (5) 潮湿场所
 - (6) 存在盐水、油、化学液体或有机溶剂的场所
 - (7) 强烈振动
 - (8) 存在类似有害条件的其他场所
- 系列热敏电阻的陶瓷属于易碎材料, 使用时不可施加过大压力或冲击。
- 系列热敏电阻不可在超过目录规定的温度范围情况下工作。

8 Storage

• **Storage Conditions**

a. Storage Temperature: $-10^{\circ}C \sim 40^{\circ}C$

b. Relative Humidity: $\leq 75\%RH$

c. Keep away from corrosive atmosphere and sunlight.

• **Period of Storage: 6 Months**

9 Notes & Warnings

- The 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) Excessive 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 series thermistors is fragile, no excessive pressure or impact shall be exerted on it.
- The series thermistors shall not be operated beyond the specified "Operating Temperature Range" in the catalog.

10 建议焊接条件

• 回流焊

温升 1~2°C/sec.

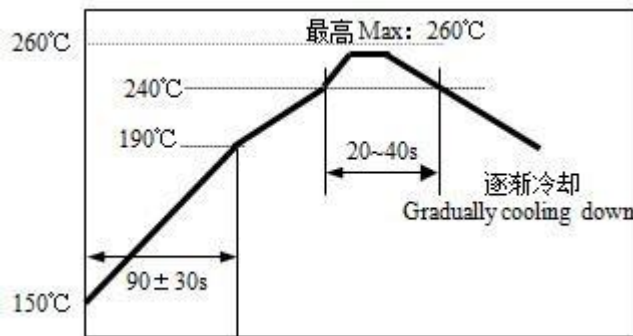
预热: 150~190°C/90±30 sec.

大于 240°C时间: 20~40sec

峰值温度: 最高 260°C/10 sec.

焊锡: Sn/3.0Ag/0.5Cu

回流焊: 最多 2 次



10 Recommended Soldering Technologies

• Re-flowing Profile

1~2°C/sec. Ramp

Pre-heating: 150~190°C/90±30 sec.

Time above 240°C: 20~40 sec.

Peak temperature: 260°C Max./10 sec.

Solder paste: Sn/3.0Ag/0.5Cu

Max.2 times for re-flowing.

• 手工焊

烙铁功率: 最大 30W

预热: 150°C/60sec.

烙铁头温度: 最高 350°C

焊接时间: 最多 3sec.

焊锡: Sn/3.0Ag/0.5Cu

手工焊: 最多 1 次

• Iron Soldering Profile

Iron soldering power: Max.30W

Pre-heating: 150°C/60sec.

Soldering Tip temperature: 350°C Max.

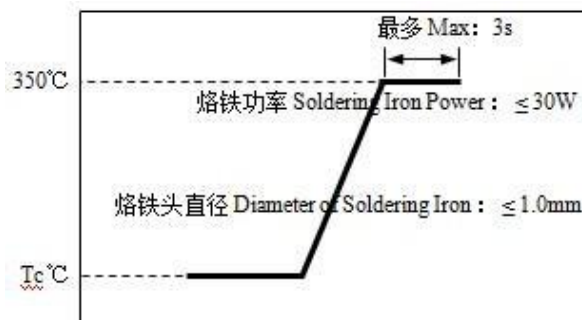
Soldering time: 3 sec Max.

Solder paste: Sn/3.0Ag/0.5Cu

Max.1 times for iron soldering

[注: 不要使烙铁头接触到端头]

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



11 R-T 表 R-T table

温度 Temp. (°C)	R 最小值 R_Min (Kohm)	R 中心值 R_Cent (Kohm)	R 最大值 R_Max (Kohm)	阻值公差 Res TOL.	温度公差 Temp. TOL.(°C)
-40	314.524	328.996	344.099	4.59%	0.67
-39	294.558	307.907	321.829	4.52%	0.66
-38	275.994	288.312	301.150	4.45%	0.66
-37	258.725	270.096	281.939	4.38%	0.65
-36	242.652	253.153	264.082	4.32%	0.65
-35	227.687	237.387	247.476	4.25%	0.64
-34	213.708	222.670	231.985	4.18%	0.64
-33	200.682	208.965	217.568	4.12%	0.63
-32	188.536	196.194	204.143	4.05%	0.63
-31	177.206	184.289	191.635	3.99%	0.62
-30	166.633	173.185	179.977	3.92%	0.62
-29	156.759	162.823	169.104	3.86%	0.61
-28	147.535	153.148	158.959	3.79%	0.61
-27	138.915	144.112	149.489	3.73%	0.60
-26	130.854	135.668	140.645	3.67%	0.59
-25	123.313	127.773	132.381	3.61%	0.59
-24	116.271	120.404	124.672	3.54%	0.58
-23	109.675	113.507	117.461	3.48%	0.58
-22	103.495	107.048	110.712	3.42%	0.57
-21	97.702	100.998	104.394	3.36%	0.57
-20	92.270	95.327	98.476	3.30%	0.56
-19	87.153	89.989	92.908	3.24%	0.55
-18	82.353	84.984	87.690	3.18%	0.55
-17	77.848	80.289	82.799	3.13%	0.54
-16	73.617	75.883	78.211	3.07%	0.54
-15	69.643	71.746	73.906	3.01%	0.53
-14	65.921	67.874	69.878	2.95%	0.52
-13	62.421	64.235	66.095	2.90%	0.52
-12	59.128	60.813	62.540	2.84%	0.51
-11	56.027	57.593	59.196	2.78%	0.50
-10	53.110	54.564	56.053	2.73%	0.50
-9	50.347	51.698	53.080	2.67%	0.49
-8	47.746	49.001	50.284	2.62%	0.48
-7	45.295	46.461	47.652	2.56%	0.48
-6	42.985	44.068	45.174	2.51%	0.47
-5	40.807	41.813	42.840	2.46%	0.46
-4	38.755	39.690	40.643	2.40%	0.46
-3	36.819	37.688	38.573	2.35%	0.45
-2	34.991	35.798	36.620	2.30%	0.44
-1	33.264	34.014	34.777	2.24%	0.44
0	31.633	32.330	33.039	2.19%	0.43

1	30.090	30.737	31.395	2.14%	0.42
2	28.632	29.233	29.844	2.09%	0.41
3	27.252	27.810	28.377	2.04%	0.41
4	25.948	26.466	26.992	1.99%	0.40
5	24.713	25.194	25.682	1.94%	0.39
6	23.544	23.991	24.444	1.89%	0.38
7	22.437	22.852	23.272	1.84%	0.38
8	21.389	21.774	22.164	1.79%	0.37
9	20.396	20.753	21.114	1.74%	0.36
10	19.454	19.785	20.120	1.69%	0.35
11	18.561	18.868	19.178	1.64%	0.35
12	17.715	17.999	18.286	1.60%	0.34
13	16.911	17.174	17.440	1.55%	0.33
14	16.149	16.393	16.639	1.50%	0.32
15	15.425	15.651	15.878	1.45%	0.31
16	14.738	14.947	15.157	1.41%	0.31
17	14.086	14.279	14.473	1.36%	0.30
18	13.466	13.644	13.823	1.31%	0.29
19	12.876	13.041	13.206	1.27%	0.28
20	12.316	12.468	12.620	1.22%	0.27
21	11.784	11.924	12.064	1.18%	0.26
22	11.277	11.406	11.535	1.13%	0.26
23	10.795	10.914	11.033	1.09%	0.25
24	10.337	10.446	10.555	1.04%	0.24
25	9.900	10.000	10.100	1.00%	0.23
26	9.476	9.576	9.676	1.04%	0.24
27	9.072	9.172	9.272	1.09%	0.25
28	8.689	8.788	8.887	1.13%	0.27
29	8.322	8.421	8.520	1.17%	0.28
30	7.974	8.072	8.170	1.22%	0.29
31	7.643	7.740	7.837	1.26%	0.30
32	7.326	7.422	7.519	1.30%	0.31
33	7.025	7.120	7.216	1.34%	0.32
34	6.737	6.831	6.926	1.39%	0.34
35	6.463	6.556	6.650	1.43%	0.35
36	6.201	6.293	6.385	1.47%	0.36
37	5.953	6.043	6.134	1.51%	0.37
38	5.714	5.803	5.893	1.55%	0.39
39	5.487	5.575	5.664	1.59%	0.40
40	5.269	5.356	5.443	1.63%	0.41
41	5.063	5.148	5.234	1.67%	0.42
42	4.864	4.948	5.033	1.71%	0.44
43	4.675	4.757	4.840	1.75%	0.45

44	4.494	4.575	4.657	1.79%	0.46
45	4.321	4.401	4.482	1.83%	0.48
46	4.156	4.234	4.313	1.87%	0.49
47	3.997	4.074	4.152	1.91%	0.50
48	3.846	3.921	3.997	1.95%	0.52
49	3.701	3.775	3.850	1.99%	0.53
50	3.562	3.635	3.709	2.03%	0.54
51	3.430	3.501	3.573	2.07%	0.56
52	3.303	3.373	3.444	2.10%	0.57
53	3.182	3.250	3.320	2.14%	0.58
54	3.065	3.132	3.200	2.18%	0.60
55	2.953	3.019	3.086	2.22%	0.61
56	2.847	2.911	2.977	2.25%	0.63
57	2.744	2.807	2.871	2.29%	0.64
58	2.646	2.708	2.771	2.33%	0.65
59	2.551	2.612	2.674	2.37%	0.67
60	2.462	2.521	2.582	2.40%	0.68
61	2.375	2.433	2.492	2.44%	0.70
62	2.291	2.348	2.406	2.47%	0.71
63	2.211	2.267	2.324	2.51%	0.72
64	2.135	2.190	2.246	2.55%	0.74
65	2.062	2.115	2.170	2.58%	0.75
66	1.991	2.043	2.096	2.62%	0.77
67	1.922	1.973	2.025	2.65%	0.78
68	1.857	1.907	1.958	2.69%	0.80
69	1.794	1.843	1.893	2.72%	0.81
70	1.733	1.781	1.830	2.76%	0.83
71	1.675	1.722	1.770	2.79%	0.84
72	1.620	1.666	1.713	2.83%	0.86
73	1.567	1.612	1.658	2.86%	0.87
74	1.515	1.559	1.604	2.89%	0.89
75	1.466	1.509	1.553	2.93%	0.90
76	1.419	1.461	1.504	2.96%	0.92
77	1.373	1.414	1.456	3.00%	0.94
78	1.329	1.369	1.410	3.03%	0.95
79	1.286	1.326	1.367	3.06%	0.97
80	1.245	1.284	1.324	3.09%	0.98
81	1.206	1.244	1.283	3.13%	1.00
82	1.168	1.205	1.243	3.16%	1.01
83	1.131	1.167	1.204	3.19%	1.03
84	1.096	1.131	1.167	3.23%	1.05
85	1.062	1.097	1.133	3.26%	1.06
86	1.029	1.063	1.098	3.29%	1.08

87	0.998	1.031	1.065	3.32%	1.09
88	0.967	1.000	1.034	3.35%	1.11
89	0.938	0.970	1.003	3.38%	1.13
90	0.910	0.941	0.973	3.42%	1.14
91	0.882	0.913	0.944	3.45%	1.16
92	0.856	0.886	0.917	3.48%	1.18
93	0.831	0.860	0.890	3.51%	1.19
94	0.805	0.834	0.864	3.54%	1.21
95	0.782	0.810	0.839	3.57%	1.23
96	0.760	0.787	0.815	3.60%	1.25
97	0.737	0.764	0.792	3.63%	1.26
98	0.716	0.742	0.769	3.66%	1.28
99	0.695	0.721	0.748	3.69%	1.30
100	0.676	0.701	0.727	3.72%	1.31
101	0.656	0.681	0.707	3.75%	1.33
102	0.638	0.662	0.687	3.78%	1.35
103	0.619	0.643	0.667	3.81%	1.37
104	0.602	0.625	0.649	3.84%	1.38
105	0.585	0.608	0.632	3.87%	1.40
106	0.569	0.591	0.614	3.90%	1.42
107	0.553	0.575	0.598	3.93%	1.44
108	0.538	0.559	0.581	3.96%	1.46
109	0.523	0.544	0.566	3.98%	1.47
110	0.510	0.530	0.551	4.01%	1.49
111	0.496	0.516	0.537	4.04%	1.51
112	0.482	0.502	0.522	4.07%	1.53
113	0.470	0.489	0.509	4.09%	1.55
114	0.457	0.476	0.496	4.12%	1.56
115	0.445	0.463	0.482	4.15%	1.58
116	0.433	0.451	0.470	4.18%	1.60
117	0.421	0.439	0.457	4.21%	1.62
118	0.411	0.428	0.446	4.23%	1.64
119	0.400	0.417	0.435	4.26%	1.66
120	0.389	0.406	0.423	4.29%	1.68
121	0.380	0.396	0.413	4.31%	1.70
122	0.370	0.386	0.403	4.34%	1.71
123	0.360	0.376	0.392	4.37%	1.73
124	0.352	0.367	0.383	4.39%	1.75
125	0.343	0.358	0.374	4.42%	1.77