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 CMFX 503F3950

日期：

DATE 2021年08月21日

确 认

CONFIRM

客户	供货商/制造商
品保部：_____	规格书制作：鞠晓丽
制造部：_____	业务员审核：_____
工程部：_____	技术部审核：程鹏 品质部审核：李竹媛

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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

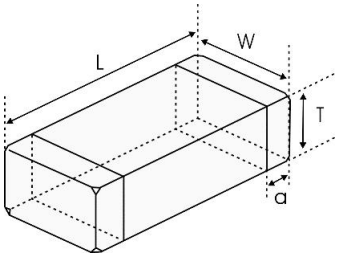


图 1 Fig.1

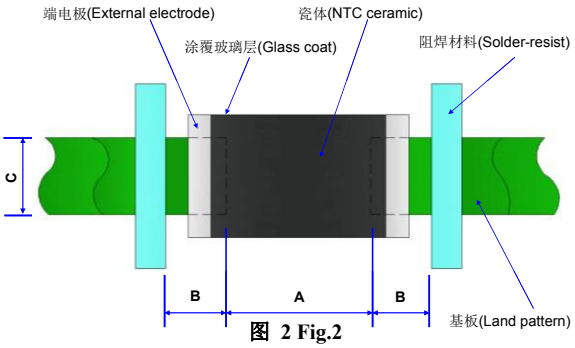


图 2 Fig.2

表 1（Table 1） 单位 unit: inch[mm]

类别Type	L	W	T	a	A	B	C
X [0402]	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	503	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×T)	
0201[A]	0.60×0.3 0×0.3 0
X[0402]	1.00×0.5 0×0.5 0
A[0603]	1.60×0.8 0×0. 80
B[0805]	2.00×1.2 5×0. 85

③ 25℃的零功率电阻 Nominal Zero-Power Resistance	
472	4.7kΩ
503	50kΩ
104	100kΩ

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

⑤B 值常数 B Constant	
3450	3450K
3950	3950K
4250	4250K

⑥ B 值公差 Tolerance of B Constant	
F	±1%
H	±3%

⑦ B 值计算方式 B constant calculation method	
A	25℃&85℃
B	25℃&50℃

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 (℃)

CMFXX503F3950FB	50±1%	3950±1%	4010	0.13	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：25±2 ℃；

b. 相对湿度：65±5%

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

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: 25±2℃

b. Relative Humidity: 65±5%

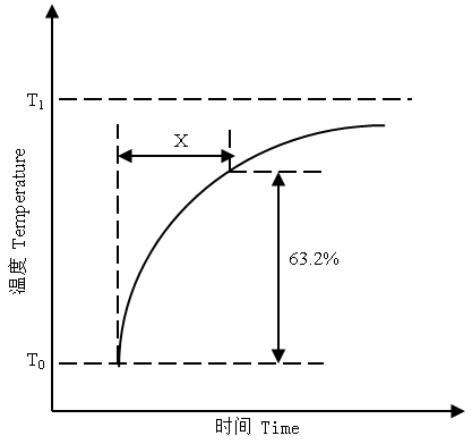
c. Air Pressure: 86kPa to 106kPa

Inspection Equipment

Visual Examination: 20×magnifier

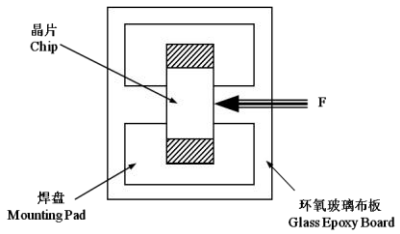
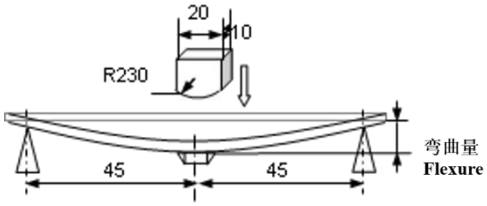
Resistance value test: Thermistor resistance tester

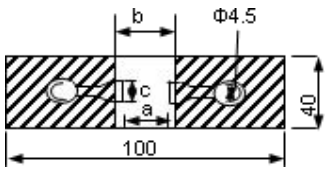
5 电性测试 Electrical Test

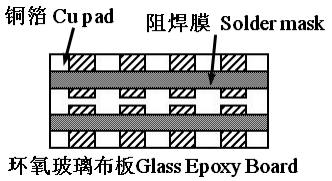
序号 No.	项目 Items	测试方法及备注 Test Methods and Remarks
1	25℃零功率电阻值 Nominal Zero-Power Resistance at 25℃(R25)	环境温度Ambient temperature：25±0. 05℃ 测试功率Measuring electric power：≤0.1mW
2	B 值常数 Nominal B Constant	分别在环境温度 25±0. 05℃， 50±0. 05℃或 85±0. 05℃下测量电阻值。 Measure the resistance at the ambient temperature of 25±0. 05℃, 50±0. 05℃ or 85±0.05℃. $B(25\text{-}50℃)=\frac{\ln R25-\ln R50}{1/T_{25}-1/T_{50}}$ $B(25\text{-}85℃)=\frac{\ln R25-\ln R85}{1/T_{25}-1/T_{85}}$ 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 T0 与最终温度 T1 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 (℃) to T_1 (℃) 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℃ through self-heated, normally expressed in milliwatts per degree Celsius (mW/℃). 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℃ by self-heating at ambient temperature 25℃.
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℃by self-heating.

6 信赖性试验 Reliability Test

<table>
<tr><th>项目
Items</th><th>测试标准
Standard</th><th>测试方法及备注
Test Methods and Remarks</th><th>要求
Requirements</th></tr>
<tr><td>端头附着力
Terminal Strength</td><td>IEC 60068-2-21</td><td>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.
<table><tr><th>尺寸 Size</th><th>F</th><th>保持时间 Duration</th></tr><tr><td>0201</td><td>2N</td><td rowspan="3">10±1s</td></tr><tr><td>X, A</td><td>5N</td></tr><tr><td>B</td><td>10N</td></tr></table></td><td>端电极无脱落且瓷体无损伤。
No removal or split of the termination or other defects shall occur.
 
</td></tr>
<tr><td>抗弯强度
Resistance to Flexure</td><td>IEC 60068-2-21</td><td>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;
 

<table><tr><th>尺寸
Size</th><th>弯曲变形量
Flexure</th><th>施压速度
Pressurizing Speed</th><th>保持时间
Duration</th></tr><tr><td>0201,</td><td>1mm</td><td rowspan="2">＜0.5mm/s</td><td rowspan="2">10±1s</td></tr><tr><td>X, A, B</td><td>2mm</td></tr></table></td><td>① 无外观损伤。
No visible damage.
② ｜ΔR25/R25｜≤2%
单位 unit：mm
<table><tr><th>类型 Type</th><th>a</th><th>b</th><th>c</th></tr><tr><td>0201</td><td>0.25</td><td>0.3</td><td>0.3</td></tr><tr><td>X</td><td>0.4</td><td>1.5</td><td>0.5</td></tr><tr><td>A</td><td>1.0</td><td>3.0</td><td>1.2</td></tr><tr><td>B</td><td>1.2</td><td>4.0</td><td>1.65</td></tr></table> 
</td></tr>
</table>

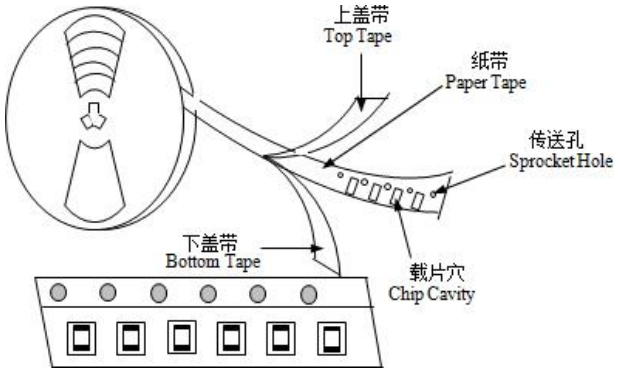
<table>
<tr>
<td>振动
Vibration</td>
<td>IEC 60068-2-80</td>
<td>① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板）；
Solder the chip to the testing jig (glass epoxy board shown in the left) using eutectic solder.
② 晶片以全振幅为 1.5mm 进行振动，频率范围为 10Hz ～55 Hz；
The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz.
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 3mutually perpendicular directions (total of 6 hours).</td>
<td>无外观损伤。
No visible damage.
 
</td>
</tr>
<tr>
<td>坠落
Dropping</td>
<td>IEC 60068-2-32</td>
<td>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.</td>
<td>无外观损伤。
No visible damage.</td>
</tr>
<tr>
<td>可焊性
Solderability</td>
<td>IEC 60068-2-58</td>
<td>① 焊接温度Solder temperature: 245±5 ℃.
② 浸渍时间Duration: 3±0.3s.
③ 焊锡成分Solder: 96.5Sn/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.</td>
<td>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.</td>
</tr>
<tr>
<td>耐焊性
Resistance to Soldering Heat</td>
<td>IEC 60068-2-58</td>
<td>① 焊接温度 Solder temperature: 260±5 ℃.
② 浸渍时间 Duration: 10±1s.
③ 焊锡成分 Solder: 96.5Sn/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.</td>
<td>① 无外观损伤；
No visible damage.
② ｜ΔR25/R25｜≤2%
③ ｜ΔB/B｜≤1%</td>
</tr>
<tr>
<td>温度周期
Temperature cycling</td>
<td>IEC 60068-2-14</td>
<td>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.
<table>
<tr><th>步骤 Step</th><th>温度Temperature</th><th>时间Time</th></tr>
<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>
</table>
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.</td>
<td>① 无外观损伤；
No visible damage.
② ｜ΔR25/R25｜≤2%
③ ｜ΔB/B｜≤1%</td>
</tr>
<tr>
<td>高温存放
Resistance to dry heat</td>
<td>IEC 60068-2-2</td>
<td>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.</td>
<td>① 无外观损伤；
No visible damage.
② ｜ΔR25/R25｜≤2%
③ ｜ΔB/B｜≤1%</td>
</tr>
</table>

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 ｜ΔR25/R25｜≤2% ③ ｜ΔB/B｜≤1%
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 ｜ΔR25/R25｜≤2% ③ ｜ΔB/B｜≤1%
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 ｜ΔR25/R25｜≤2% ③ ｜ΔB/B｜≤1%

7 编带 Taping

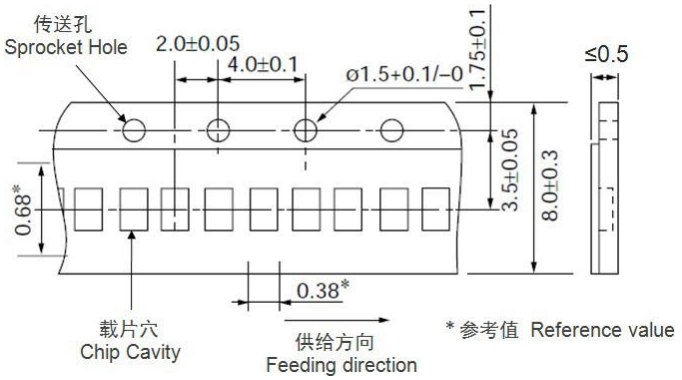
类型 Type	0201	X	A	B
编带厚度 Tape thickness(mm)	0.5±0.15	0.5±0.15	0.8±0.15	0.85±0.2
编带材质 Tape material	纸 带 Paper Tape			
每盘数量 Quantity per Reel	15K	10K	4K	4K

(1) 编带图 Taping Drawings

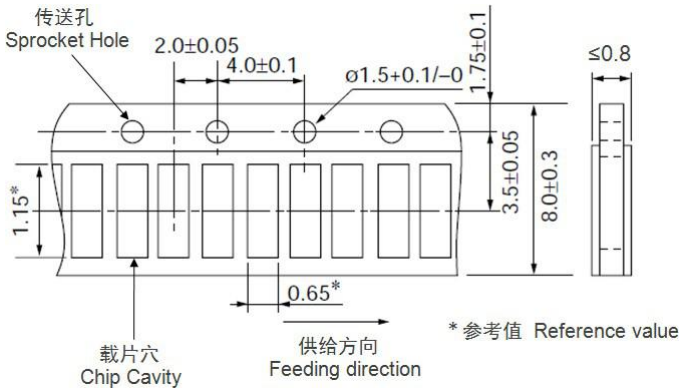


(2) 纸带尺寸 Paper Tape Dimensions (单位 Unit：mm)

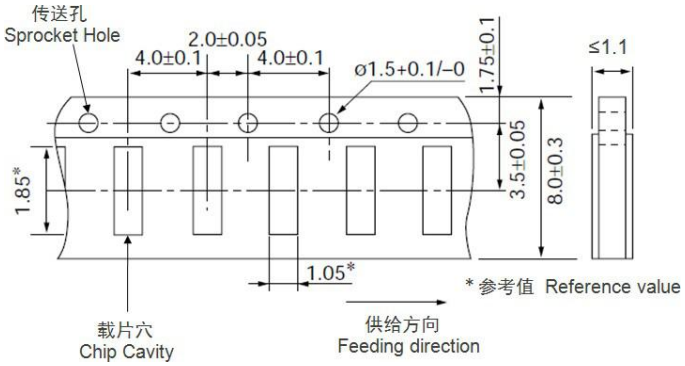
CMF0201 系 列 CMF0201 series



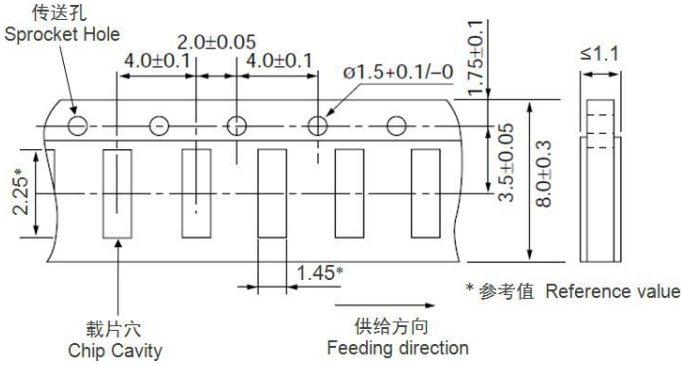
CMFX 系 列 CMFX series



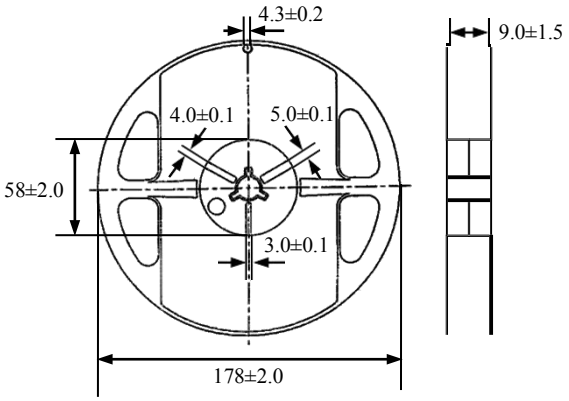
CMFA 系 列 CMFA series

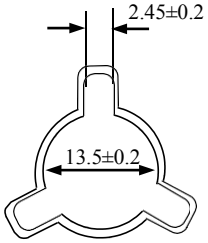


CMFB 系 列 CMFB series



(3) 卷盘尺寸 Reel Dimensions(单位 Unit：mm)





8 储存

- **储存条件**

  a. 储存温度：-10℃～40℃

  b. 相对湿度：≤75%RH

  c. 避免接触粉尘、腐蚀性气氛和阳光

- **储存期限：产品交付后 6 个月**

8 Storage

- **Storage Conditions**

  a. Storage Temperature: -10℃～40℃

  b. Relative Humidity: ≦75%RH

  c. Keep away from corrosive atmosphere and sunlight.

- **Period of Storage: 6 Months after delivery**

9 注意事项

- CMF 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

- CMF 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。

- CMF 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。

9 Notes & Warnings

- The CMF 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 CMF series thermistors is fragile, no excessive pressure or impact shall be exerted on it.

- The CMF 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℃/sec.

预热：150~170℃/90±30 sec.

大于 240℃时间：20~40sec

峰值温度：最高 260℃/10 sec.

焊锡：96.5Sn/3.0Ag/0.5Cu

回流焊：最多 2 次

10 Recommended Soldering Technologies

- **Re-flowing Profile**

1~2℃/sec. Ramp

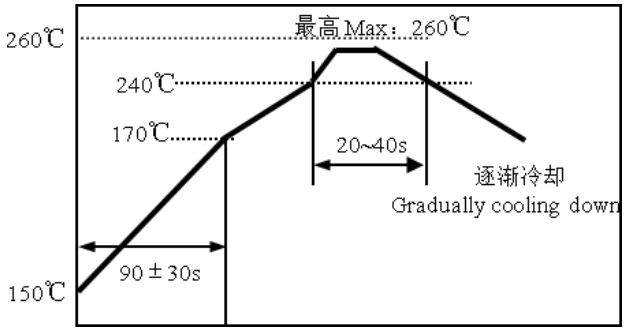
Pre-heating: 150~170℃/90±30 sec.

Time above 240℃: 20~40 sec.

Peak temperature: 260℃Max./10 sec.

Solder paste: 96.5Sn/3.0Ag/0.5Cu

Max.2 times for re-flowing



- **手工焊**

烙铁功率：最大 20W

预热：150℃/60sec.

烙铁头温度：最高 280℃

焊接时间：最多 3sec.

焊锡：96.5Sn/3.0Ag/0.5Cu

手工焊：最多 1 次

[注：不要使烙铁头接触到端头]

- **Iron Soldering Profile**

Iron soldering power: Max.20W

Pre-heating: 150℃/60sec.

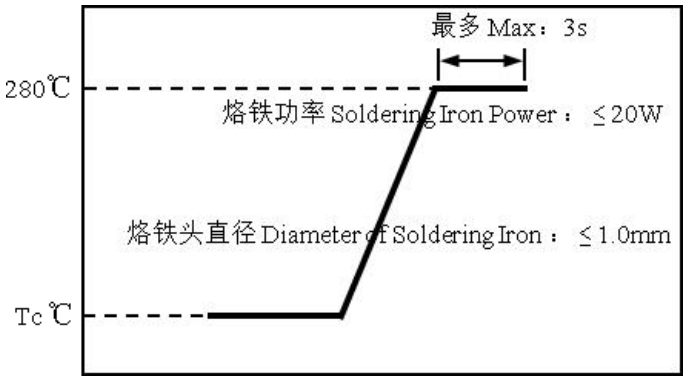
Soldering Tip temperature: 280℃Max.

Soldering time: 3 sec Max.

Solder paste: 96.5Sn/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.]



11 R-T 表 R-T table

CMFXX503F3950FB

温度 Temp. (℃)	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.(℃)
-40	1,542.135	1,612.772	1,686.477	4.57%	0.67
-39	1,446.393	1,511.666	1,579.727	4.50%	0.66
-38	1,357.159	1,417.493	1,480.362	4.44%	0.66
-37	1,273.956	1,329.741	1,387.831	4.37%	0.65
-36	1,196.343	1,247.937	1,301.626	4.30%	0.65
-35	1,123.913	1,171.644	1,221.280	4.24%	0.64
-34	1,056.293	1,100.462	1,146.364	4.17%	0.64
-33	993.136	1,034.020	1,076.480	4.11%	0.63
-32	934.124	971.977	1,011.264	4.04%	0.63
-31	878.962	914.018	950.377	3.98%	0.62
-30	827.379	859.852	893.510	3.91%	0.62
-29	779.122	809.210	840.375	3.85%	0.61
-28	733.959	761.843	790.708	3.79%	0.61
-27	691.675	717.523	744.262	3.73%	0.60
-26	652.072	676.037	700.812	3.66%	0.59
-25	614.964	637.188	660.149	3.60%	0.59
-24	580.182	600.795	622.079	3.54%	0.58
-23	547.566	566.689	586.422	3.48%	0.58
-22	516.971	534.715	553.013	3.42%	0.57
-21	488.260	504.727	521.698	3.36%	0.57
-20	461.308	476.593	492.335	3.30%	0.56
-19	435.997	450.186	464.791	3.24%	0.55
-18	412.219	425.393	438.945	3.19%	0.55
-17	389.872	402.106	414.683	3.13%	0.54
-16	368.864	380.226	391.899	3.07%	0.54
-15	349.106	359.660	370.495	3.01%	0.53
-14	330.518	340.322	350.381	2.96%	0.52
-13	313.025	322.132	331.472	2.90%	0.52
-12	296.556	305.017	313.689	2.84%	0.51
-11	281.045	288.908	296.960	2.79%	0.50
-10	266.433	273.739	281.217	2.73%	0.50
-9	252.662	259.452	266.397	2.68%	0.49
-8	239.680	245.989	252.439	2.62%	0.48
-7	227.437	233.301	239.291	2.57%	0.48
-6	215.888	221.337	226.901	2.51%	0.47
-5	204.989	210.053	215.220	2.46%	0.46
-4	194.700	199.406	204.206	2.41%	0.46
-3	184.985	189.358	193.816	2.35%	0.45
-2	175.808	179.872	184.011	2.30%	0.44
-1	167.137	170.913	174.757	2.25%	0.43
0	158.941	162.449	166.019	2.20%	0.43
1	151.192	154.451	157.765	2.15%	0.42

温度 Temp. (℃)	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.(℃)
2	143.863	146.891	149.967	2.09%	0.41
3	136.929	139.741	142.597	2.04%	0.41
4	130.368	132.979	135.629	1.99%	0.40
5	124.156	126.580	129.039	1.94%	0.39
6	118.274	120.524	122.805	1.89%	0.38
7	112.702	114.791	116.906	1.84%	0.38
8	107.424	109.361	111.323	1.79%	0.37
9	102.420	104.218	106.036	1.74%	0.36
10	97.677	99.343	101.028	1.70%	0.35
11	93.179	94.723	96.284	1.65%	0.34
12	88.912	90.343	91.788	1.60%	0.34
13	84.863	86.189	87.526	1.55%	0.33
14	81.021	82.247	83.484	1.50%	0.32
15	77.372	78.507	79.651	1.46%	0.31
16	73.908	74.957	76.014	1.41%	0.30
17	70.617	71.586	72.562	1.36%	0.30
18	67.490	68.385	69.286	1.32%	0.29
19	64.517	65.344	66.174	1.27%	0.28
20	61.692	62.454	63.219	1.22%	0.27
21	59.005	59.707	60.411	1.18%	0.26
22	56.449	57.095	57.742	1.13%	0.25
23	54.017	54.611	55.206	1.09%	0.25
24	51.703	52.248	52.794	1.04%	0.24
25	49.500	50.000	50.500	1.00%	0.23
26	47.361	47.860	48.360	1.04%	0.24
27	45.325	45.823	46.322	1.09%	0.25
28	43.388	43.883	44.380	1.13%	0.26
29	41.543	42.035	42.529	1.18%	0.27
30	39.786	40.275	40.766	1.22%	0.29
31	38.113	38.597	39.084	1.26%	0.30
32	36.518	36.998	37.481	1.30%	0.31
33	34.999	35.474	35.952	1.35%	0.32
34	33.550	34.020	34.492	1.39%	0.33
35	32.169	32.633	33.100	1.43%	0.35
36	30.851	31.309	31.771	1.47%	0.36
37	29.595	30.046	30.502	1.52%	0.37
38	28.395	28.841	29.290	1.56%	0.38
39	27.251	27.689	28.132	1.60%	0.40
40	26.158	26.590	27.026	1.64%	0.41
41	25.115	25.540	25.969	1.68%	0.42
42	24.119	24.536	24.959	1.72%	0.43
43	23.167	23.577	23.993	1.76%	0.45
44	22.257	22.661	23.069	1.80%	0.46
45	21.388	21.784	22.186	1.84%	0.47
46	20.557	20.946	21.340	1.88%	0.49

温度 Temp. (℃)	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.(℃)
47	19.762	20.144	20.532	1.92%	0.50
48	19.002	19.377	19.757	1.96%	0.51
49	18.276	18.643	19.016	2.00%	0.53
50	17.580	17.941	18.307	2.04%	0.54
51	16.914	17.268	17.627	2.08%	0.55
52	16.277	16.624	16.976	2.12%	0.57
53	15.667	16.007	16.352	2.16%	0.58
54	15.083	15.416	15.754	2.20%	0.59
55	14.524	14.850	15.181	2.23%	0.61
56	13.988	14.307	14.632	2.27%	0.62
57	13.474	13.787	14.105	2.31%	0.64
58	12.982	13.288	13.600	2.35%	0.65
59	12.510	12.809	13.115	2.38%	0.66
60	12.057	12.351	12.650	2.42%	0.68
61	11.623	11.911	12.203	2.46%	0.69
62	11.207	11.488	11.775	2.50%	0.71
63	10.808	11.083	11.364	2.53%	0.72
64	10.425	10.694	10.969	2.57%	0.73
65	10.057	10.320	10.589	2.61%	0.75
66	9.704	9.962	10.225	2.64%	0.76
67	9.365	9.617	9.875	2.68%	0.78
68	9.040	9.286	9.538	2.71%	0.79
69	8.727	8.968	9.215	2.75%	0.81
70	8.427	8.663	8.904	2.79%	0.82
71	8.138	8.369	8.605	2.82%	0.84
72	7.861	8.086	8.317	2.86%	0.85
73	7.594	7.815	8.041	2.89%	0.87
74	7.338	7.554	7.775	2.93%	0.88
75	7.092	7.303	7.519	2.96%	0.90
76	6.855	7.061	7.273	3.00%	0.91
77	6.627	6.828	7.035	3.03%	0.93
78	6.408	6.605	6.807	3.07%	0.95
79	6.197	6.389	6.587	3.10%	0.96
80	5.994	6.182	6.376	3.13%	0.98
81	5.798	5.982	6.172	3.17%	0.99
82	5.610	5.790	5.975	3.20%	1.01
83	5.429	5.605	5.786	3.23%	1.02
84	5.254	5.426	5.604	3.27%	1.04
85	5.086	5.254	5.428	3.30%	1.06
86	4.924	5.089	5.258	3.33%	1.07
87	4.768	4.929	5.095	3.37%	1.09
88	4.618	4.775	4.937	3.40%	1.10
89	4.473	4.627	4.785	3.43%	1.12
90	4.333	4.483	4.639	3.47%	1.14
91	4.198	4.345	4.497	3.50%	1.15

温度 Temp. (℃)	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.(℃)
92	4.068	4.212	4.361	3.53%	1.17
93	3.943	4.084	4.229	3.56%	1.19
94	3.822	3.960	4.102	3.59%	1.20
95	3.705	3.840	3.979	3.63%	1.22
96	3.593	3.724	3.861	3.66%	1.24
97	3.484	3.613	3.746	3.69%	1.25
98	3.379	3.505	3.636	3.72%	1.27
99	3.278	3.401	3.529	3.75%	1.29
100	3.180	3.301	3.426	3.78%	1.31
101	3.086	3.204	3.326	3.81%	1.32
102	2.994	3.110	3.229	3.84%	1.34
103	2.906	3.019	3.136	3.88%	1.36
104	2.821	2.932	3.046	3.91%	1.38
105	2.739	2.847	2.959	3.94%	1.39
106	2.660	2.765	2.875	3.97%	1.41
107	2.583	2.686	2.794	4.00%	1.43
108	2.509	2.610	2.715	4.03%	1.45
109	2.437	2.536	2.639	4.06%	1.46
110	2.367	2.464	2.565	4.09%	1.48
111	2.300	2.395	2.494	4.12%	1.50
112	2.235	2.328	2.425	4.15%	1.52
113	2.172	2.263	2.358	4.18%	1.54
114	2.112	2.201	2.293	4.20%	1.56
115	2.053	2.140	2.230	4.23%	1.57
116	1.996	2.081	2.170	4.26%	1.59
117	1.941	2.024	2.111	4.29%	1.61
118	1.887	1.969	2.054	4.32%	1.63
119	1.836	1.916	1.999	4.35%	1.65
120	1.786	1.864	1.946	4.38%	1.67
121	1.737	1.814	1.894	4.41%	1.69
122	1.690	1.765	1.844	4.43%	1.70
123	1.645	1.718	1.795	4.46%	1.72
124	1.601	1.673	1.748	4.49%	1.74
125	1.558	1.629	1.702	4.52%	1.76