

规格承认书

SPECIFICATION

编号(No):

日期(Date):

客户 (Customer):

品名(Product Name): 片式NTC热敏电阻 Chip NTC thermistor

恭成料号 (QAMCN Part Number) : QN0603X103J3435HB

客户规格(Customer's Part Number):

客户承认 CUSTOMER CONFIRM			
承认章 STAMP	核准 APPROVE	审核 CHECK	经办人 SIGNATURE

恭成科技有限公司

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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

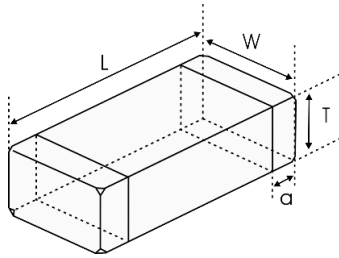


图 1 Fig.1

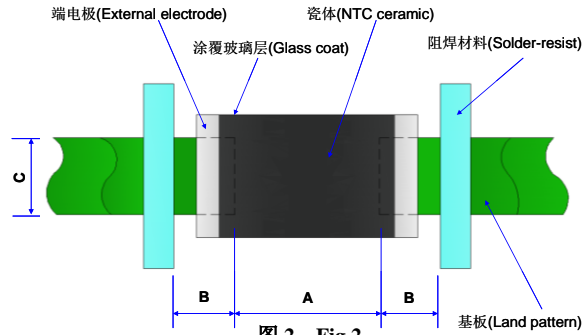


图 2 Fig.2

表 1 (Table 1)

单位 unit: inch[mm]

类别 Type	L	W	T	a	A	B	C
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]

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

QN 0603 X 103 J 3435 H B
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① 类别 Type	
QN	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
1206[3216]	3.20×1.60×0.85
③ 分隔符 Delimiter	
X	

④ 25℃的零功率电阻 Nominal Zero-Power Resistance	
472	4.7kΩ
103	10kΩ
154	150kΩ
⑤ 电阻值公差 Tolerance of Resistance	
F	±1%
G	±2%
H	±3%
J	±5%

⑥ B 值常数 B Constant	
3435	3435K
3950	3950K
4500	4500K
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℃

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 (℃)
QN0603X103J3435HB	10±5%	3435±3%	3480	0.31	1.0	<5	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

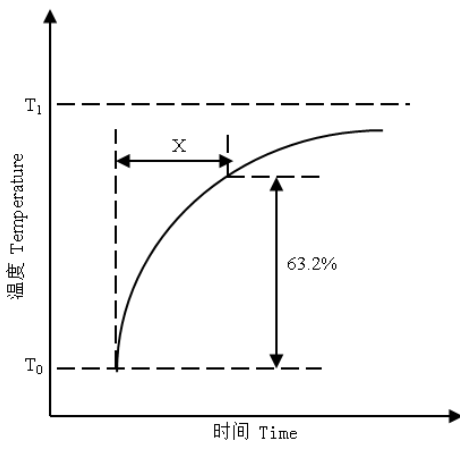
If any doubt on the results, measurements/tests should be made within the following limits:

- a. Ambient Temperature: 25±2℃
- b. Relative Humidity: 65±5%
- c. Air Pressure: 86kPa to 106kPa

▪ **Inspection Equipment**

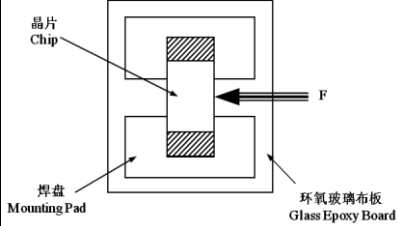
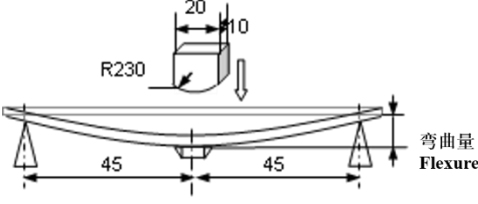
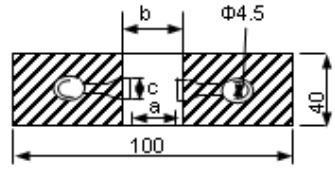
Visual Examination: 20× magnifier
Resistance value test: Thermistor resistance tester

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℃. $B(25-50^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{50}}{1/T_{25} - 1/T_{50}}$ $B(25-85^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{85}}{1/T_{25} - 1/T_{85}}$ T: 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 (°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℃ 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

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	<p>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.</p> <table border="1"> <tr> <th>尺寸 Size</th> <th>F</th> <th>保持时间 Duration</th> </tr> <tr> <td>0201, 0402, 0603</td> <td>5N</td> <td rowspan="2">10±1s</td> </tr> <tr> <td>0805</td> <td>10N</td> </tr> </table>	尺寸 Size	F	保持时间 Duration	0201, 0402, 0603	5N	10±1s	0805	10N	<p>端电极无脱落且瓷体无损伤。 No removal or split of the termination or other defects shall occur.</p> 																						
尺寸 Size	F	保持时间 Duration																															
0201, 0402, 0603	5N	10±1s																															
0805	10N																																
抗弯强度 Resistance to Flexure	IEC 60068-2-21	<p>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;</p>  <table border="1"> <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>0402, 0603, 0805</td> <td>2mm</td> </tr> </table>	尺寸 Size	弯曲变形量 Flexure	施压速度 Pressurizing Speed	保持时间 Duration	0201,	1mm	<0.5mm/s	10±1s	0402, 0603, 0805	2mm	<p>① 无外观损伤。 No visible damage. ② $\Delta R_{25}/R_{25} \leq 2\%$</p> <p>单位 unit: mm</p> <table border="1"> <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>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> </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
尺寸 Size	弯曲变形量 Flexure	施压速度 Pressurizing Speed	保持时间 Duration																														
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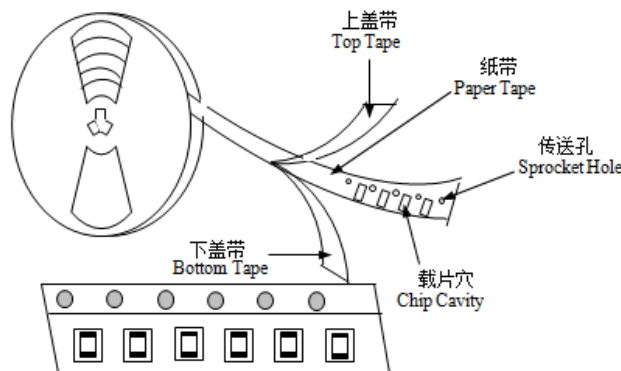
<p>振动 Vibration</p>	<p>IEC 60068-2-80</p>	<p>① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板）； Solder the chip to the testing jig (glass epoxy board shown in the left) using eutectic solder.</p> <p>② 晶片以全振幅为 1.5mm 进行振动，频率范围为 10Hz ~55 Hz； The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, 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> 															
<p>坠落 Dropping</p>	<p>IEC 60068-2-32</p>	<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>															
<p>可焊性 Solderability</p>	<p>IEC 60068-2-58</p>	<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: 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.</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>															
<p>耐焊性 Resistance to Soldering Heat</p>	<p>IEC 60068-2-58</p>	<p>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.</p>	<p>① 无外观损伤； No visible damage. ② $\Delta R_{25}/R_{25} \leq 2\%$ ③ $\Delta B/B \leq 1\%$</p>															
<p>温度周期 Temperature cycling</p>	<p>IEC 60068-2-14</p>	<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="491 1429 1040 1624"> <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 $\Delta R_{25}/R_{25} \leq 2\%$ ③ $\Delta B/B \leq 1\%$</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>高温存放 Resistance to dry heat</p>	<p>IEC 60068-2-2</p>	<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 $\Delta R_{25}/R_{25} \leq 2\%$ ③ $\Delta B/B \leq 1\%$</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 $ \Delta R25/R25 \leq 2\%$ ③ $ \Delta B/B \leq 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 $ \Delta R25/R25 \leq 2\%$ ③ $ \Delta B/B \leq 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 $ \Delta R25/R25 \leq 2\%$ ③ $ \Delta B/B \leq 1\%$

7 编带 Taping

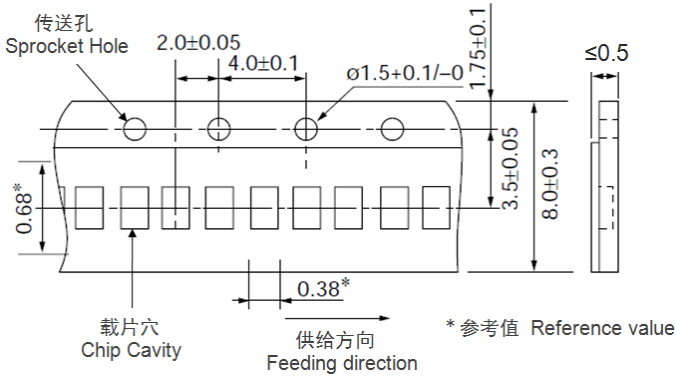
类型 Type	0201	0402	0603	0805
编带厚度 Tape thickness(mm)	0.5±0.15	0.5±0.15	0.8±0.15	0.85±0.2
编带材质 Tape material	纸带 Paper Tape			
每盘数量 Quantity per Reel	15K	10K	4K	4K

(1) 编带图 Taping Drawings

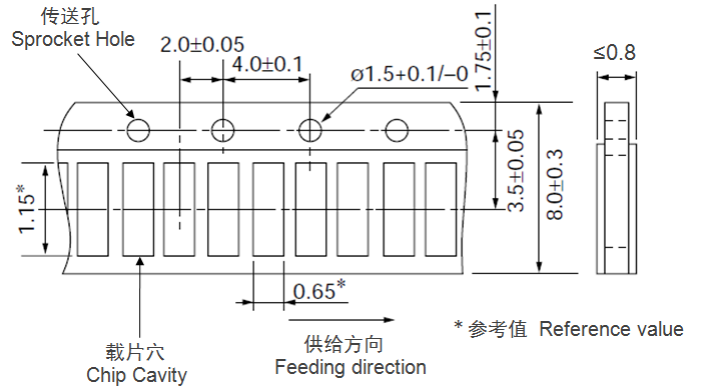


(2) 纸带尺寸 Paper Tape Dimensions (单位 Unit: mm)

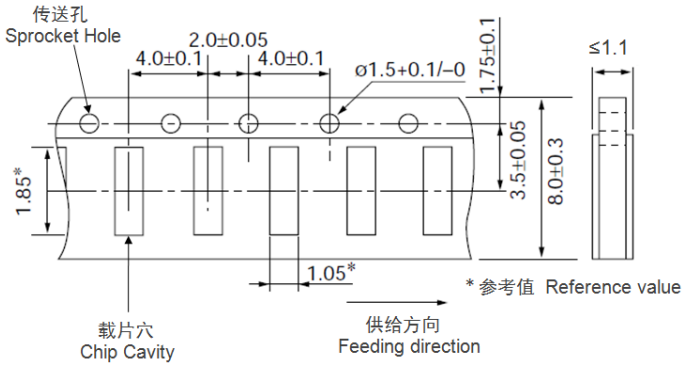
QN0201 系列 QN0201 series



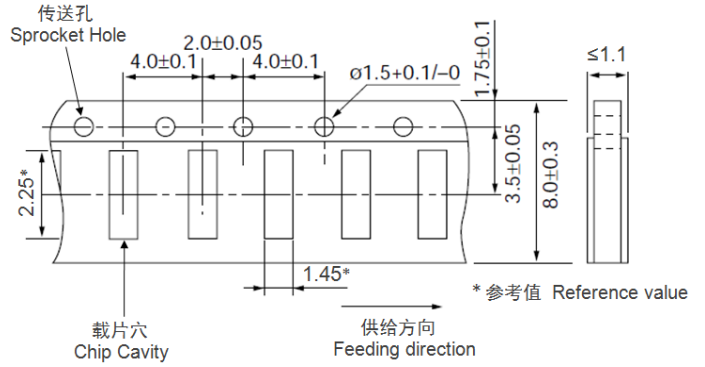
QN0402 系列 QN0402 series



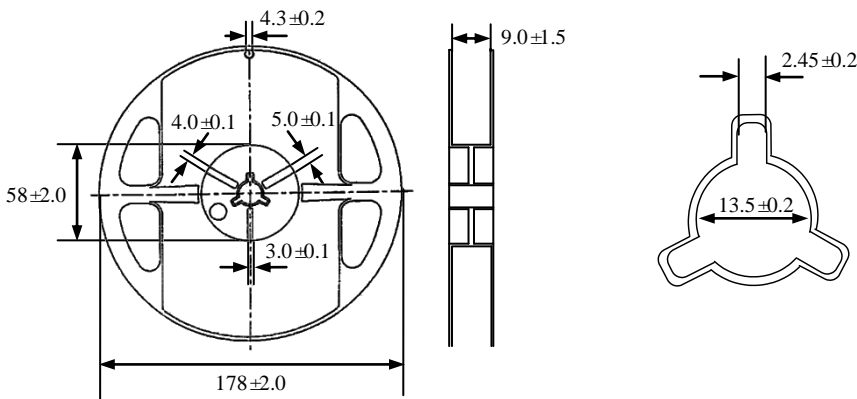
QN0603 系列 QN0603 series



QN0805 系列 QN0805 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: $\leq 75\% \text{RH}$
 - 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**

9 注意事项

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

9 Notes & Warnings

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

10 建议焊接条件

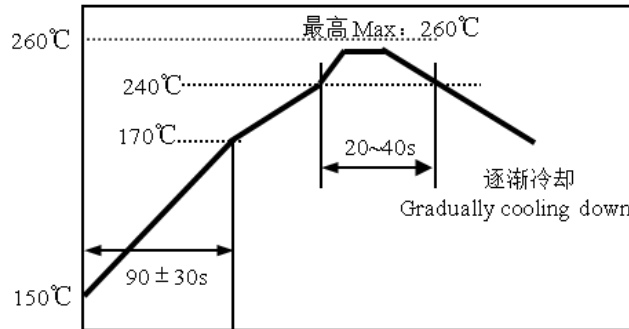
• 回流焊

- 温升 1~2°C/sec.
- 预热：150~170°C/90±30 sec.
- 大于 240°C 时间：20~40sec
- 峰值温度：最高 260°C/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°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: 96.5Sn/3.0Ag/0.5Cu
- Max.2 times for re-flowing



• 手工焊

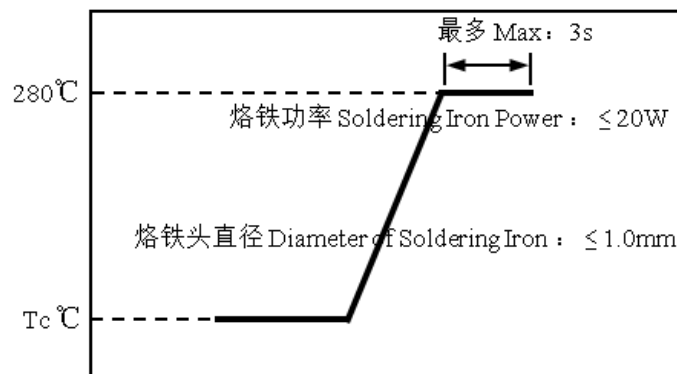
- 烙铁功率：最大 20W
- 预热：150°C/60sec.
- 烙铁头温度：最高 280°C
- 焊接时间：最多 3sec.
- 焊锡：96.5Sn/3.0Ag/0.5Cu
- 手工焊：最多 1 次

• **Iron Soldering Profile**

- Iron soldering power: Max.20W
- Pre-heating: 150°C/60sec.
- Soldering Tip temperature: 280°C Max.
- Soldering time: 3 sec Max.
- Solder paste: 96.5Sn/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

QN0603X103J3435HB

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	173.859	200.225	230.014	14.88%	2.52
-39	164.838	189.524	217.362	14.69%	2.51
-38	156.332	179.449	205.470	14.50%	2.50
-37	148.307	169.961	194.289	14.31%	2.48
-36	140.735	161.022	183.773	14.13%	2.47
-35	133.589	152.600	173.880	13.95%	2.45
-34	126.842	144.661	164.570	13.76%	2.44
-33	120.471	137.176	155.806	13.58%	2.42
-32	114.453	130.117	147.554	13.40%	2.41
-31	108.766	123.457	139.782	13.22%	2.39
-30	103.392	117.173	132.459	13.05%	2.38
-29	98.311	111.241	125.557	12.87%	2.36
-28	93.506	105.640	119.051	12.69%	2.35
-27	88.961	100.351	112.916	12.52%	2.33
-26	84.661	95.354	107.129	12.35%	2.32
-25	80.591	90.632	101.669	12.18%	2.30
-24	76.738	86.168	96.515	12.01%	2.28
-23	73.089	81.948	91.650	11.84%	2.27
-22	69.634	77.956	87.056	11.67%	2.25
-21	66.360	74.180	82.715	11.51%	2.23
-20	63.257	70.607	78.614	11.34%	2.22
-19	60.315	67.225	74.738	11.18%	2.20
-18	57.526	64.022	71.074	11.01%	2.18
-17	54.881	60.989	67.608	10.85%	2.17
-16	52.371	58.116	64.330	10.69%	2.15
-15	49.989	55.393	61.228	10.53%	2.13
-14	47.728	52.812	58.292	10.38%	2.11
-13	45.582	50.366	55.512	10.22%	2.10
-12	43.543	48.045	52.880	10.06%	2.08
-11	41.607	45.844	50.386	9.91%	2.06
-10	39.767	43.755	48.023	9.75%	2.04
-9	38.018	41.772	45.783	9.60%	2.02
-8	36.355	39.890	43.660	9.45%	2.00
-7	34.774	38.103	41.646	9.30%	1.99
-6	33.270	36.405	39.736	9.15%	1.97
-5	31.839	34.792	37.924	9.00%	1.95
-4	30.477	33.259	36.204	8.85%	1.93
-3	29.181	31.802	34.571	8.71%	1.91
-2	27.947	30.416	33.020	8.56%	1.89
-1	26.771	29.098	31.548	8.42%	1.87
0	25.651	27.844	30.148	8.28%	1.85
1	24.584	26.651	28.818	8.13%	1.83

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)
2	23.568	25.515	27.554	7.99%	1.81
3	22.598	24.434	26.352	7.85%	1.79
4	21.674	23.404	25.209	7.71%	1.77
5	20.792	22.423	24.121	7.57%	1.75
6	19.951	21.488	23.087	7.44%	1.73
7	19.148	20.598	22.102	7.30%	1.71
8	18.382	19.749	21.164	7.17%	1.69
9	17.651	18.939	20.271	7.03%	1.67
10	16.952	18.167	19.420	6.90%	1.65
11	16.285	17.431	18.610	6.76%	1.62
12	15.648	16.728	17.837	6.63%	1.60
13	15.039	16.057	17.101	6.50%	1.58
14	14.457	15.417	16.399	6.37%	1.56
15	13.901	14.806	15.730	6.24%	1.54
16	13.369	14.222	15.091	6.12%	1.52
17	12.860	13.664	14.482	5.99%	1.49
18	12.373	13.131	13.900	5.86%	1.47
19	11.907	12.621	13.345	5.74%	1.45
20	11.461	12.134	12.815	5.61%	1.43
21	11.034	11.669	12.309	5.49%	1.40
22	10.626	11.224	11.826	5.36%	1.38
23	10.234	10.798	11.364	5.24%	1.36
24	9.859	10.390	10.922	5.12%	1.33
25	9.500	10.000	10.500	5.00%	1.31
26	9.135	9.627	10.120	5.12%	1.35
27	8.786	9.269	9.755	5.24%	1.39
28	8.452	8.927	9.405	5.36%	1.43
29	8.132	8.599	9.070	5.48%	1.47
30	7.826	8.285	8.748	5.59%	1.51
31	7.533	7.984	8.440	5.71%	1.55
32	7.253	7.695	8.144	5.83%	1.59
33	6.985	7.419	7.860	5.94%	1.64
34	6.728	7.153	7.587	6.06%	1.68
35	6.481	6.899	7.325	6.18%	1.72
36	6.245	6.655	7.074	6.29%	1.76
37	6.019	6.421	6.832	6.40%	1.80
38	5.802	6.196	6.600	6.52%	1.85
39	5.594	5.980	6.377	6.63%	1.89
40	5.395	5.773	6.163	6.74%	1.93
41	5.204	5.575	5.957	6.86%	1.98
42	5.020	5.384	5.759	6.97%	2.02
43	4.844	5.200	5.568	7.08%	2.07
44	4.675	5.024	5.385	7.19%	2.11
45	4.513	4.855	5.209	7.30%	2.16

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)
46	4.357	4.692	5.039	7.41%	2.20
47	4.207	4.535	4.876	7.52%	2.25
48	4.064	4.385	4.719	7.63%	2.29
49	3.926	4.240	4.568	7.74%	2.34
50	3.793	4.101	4.423	7.85%	2.38
51	3.665	3.967	4.282	7.95%	2.43
52	3.543	3.838	4.147	8.06%	2.48
53	3.425	3.714	4.017	8.17%	2.53
54	3.312	3.595	3.892	8.27%	2.57
55	3.203	3.480	3.771	8.38%	2.62
56	3.098	3.369	3.655	8.48%	2.67
57	2.997	3.262	3.542	8.59%	2.72
58	2.900	3.160	3.434	8.69%	2.77
59	2.806	3.061	3.330	8.80%	2.81
60	2.716	2.965	3.229	8.90%	2.86
61	2.629	2.873	3.132	9.00%	2.91
62	2.546	2.785	3.038	9.11%	2.96
63	2.465	2.699	2.948	9.21%	3.01
64	2.388	2.617	2.860	9.31%	3.06
65	2.313	2.537	2.776	9.41%	3.11
66	2.241	2.461	2.695	9.51%	3.16
67	2.172	2.387	2.616	9.61%	3.21
68	2.105	2.315	2.540	9.71%	3.27
69	2.041	2.246	2.467	9.81%	3.32
70	1.978	2.180	2.396	9.91%	3.37
71	1.918	2.116	2.327	10.01%	3.42
72	1.861	2.054	2.261	10.11%	3.47
73	1.805	1.994	2.197	10.20%	3.53
74	1.751	1.936	2.135	10.30%	3.58
75	1.699	1.880	2.076	10.40%	3.63
76	1.649	1.826	2.018	10.50%	3.69
77	1.600	1.774	1.962	10.59%	3.74
78	1.553	1.724	1.908	10.69%	3.79
79	1.508	1.675	1.855	10.78%	3.85
80	1.464	1.628	1.805	10.88%	3.90
81	1.422	1.582	1.756	10.97%	3.96
82	1.381	1.538	1.708	11.07%	4.01
83	1.342	1.495	1.662	11.16%	4.07
84	1.304	1.454	1.618	11.25%	4.12
85	1.267	1.414	1.575	11.35%	4.18
86	1.231	1.375	1.533	11.44%	4.24
87	1.197	1.338	1.492	11.53%	4.29
88	1.163	1.302	1.453	11.62%	4.35
89	1.131	1.267	1.415	11.71%	4.41

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)
90	1.100	1.233	1.378	11.80%	4.46
91	1.070	1.200	1.343	11.90%	4.52
92	1.041	1.168	1.308	11.99%	4.58
93	1.012	1.137	1.275	12.08%	4.64
94	0.985	1.108	1.242	12.17%	4.70
95	0.958	1.079	1.211	12.25%	4.76
96	0.933	1.051	1.180	12.34%	4.82
97	0.908	1.023	1.151	12.43%	4.87
98	0.884	0.997	1.122	12.52%	4.93
99	0.861	0.971	1.094	12.61%	4.99
100	0.838	0.947	1.067	12.69%	5.05
101	0.816	0.923	1.041	12.78%	5.12
102	0.795	0.899	1.015	12.87%	5.18
103	0.774	0.877	0.990	12.95%	5.24
104	0.754	0.855	0.966	13.04%	5.30
105	0.735	0.833	0.943	13.13%	5.36
106	0.716	0.813	0.920	13.21%	5.42
107	0.698	0.793	0.898	13.30%	5.48
108	0.680	0.773	0.877	13.38%	5.55
109	0.663	0.754	0.856	13.46%	5.61
110	0.647	0.736	0.836	13.55%	5.67
111	0.630	0.718	0.816	13.63%	5.74
112	0.615	0.701	0.797	13.72%	5.80
113	0.600	0.684	0.779	13.80%	5.86
114	0.585	0.668	0.760	13.88%	5.93
115	0.571	0.652	0.743	13.96%	5.99
116	0.557	0.637	0.726	14.04%	6.06
117	0.543	0.622	0.709	14.13%	6.12
118	0.530	0.607	0.693	14.21%	6.19
119	0.517	0.593	0.678	14.29%	6.25
120	0.505	0.579	0.662	14.37%	6.32
121	0.493	0.566	0.647	14.45%	6.38
122	0.481	0.553	0.633	14.53%	6.45
123	0.470	0.540	0.619	14.61%	6.52
124	0.459	0.528	0.605	14.69%	6.58
125	0.448	0.516	0.592	14.77%	6.65

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