



# 承 认 书

## APPROVAL SHEET

客户名称

**CUSTOMER :** \_\_\_\_\_

产品名称

高 Q 电容 (HQ 系列)

**PART NAME:** \_\_\_\_\_ **High Q Caps (HQ SERIES)**

规格

**SPECIFICATION:** \_\_\_\_\_ **0201~0805 TYPE**

版本

**VERSION:** \_\_\_\_\_

日期

**DATE OF ISSUE:** \_\_\_\_\_

制 造 MANUFACTURER			客 户 CUSTOMER		
拟制 DESIGN	审核 CHECK	批准 APPROVAL	检验 INSPECTOR	审核 CHECK	批准 APPROVAL



**广东风华高新科技股份有限公司**  
GUANGDONG FENGHUA ADVANCED TECHNOLOGY HOLDING CO., LTD.

## 高 Q 电容 (HQ 系列)

### 概述

#### ●特点:

高 Q 值  
低等效串联电阻

#### ●应用:

通讯设备  
射频功率放大器  
滤波网络  
VCO

## High Q Caps (HQ SERIES)

### SUMMARY

#### ●Features

High Q  
Low equivalent series resistance

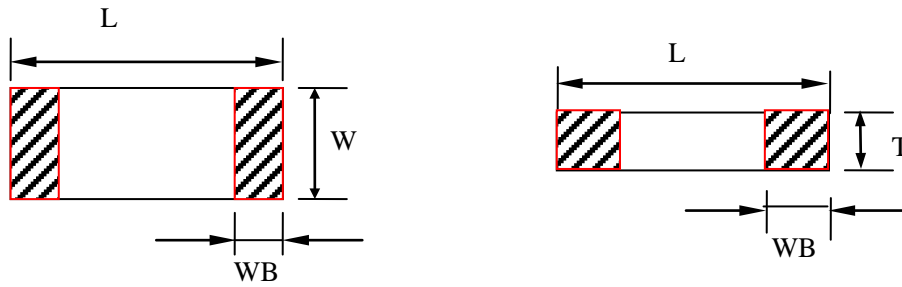
#### ●Applications

Communication devices  
RF power amplifier  
Filter network  
VCO



## 二、尺寸及结构 DIMENSIONS AND STRUCTURE

### ※ 尺寸 DIMENSIONS

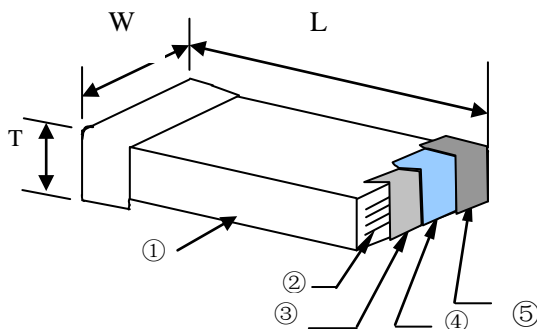


型号 Type		尺寸 Dimensions (mm)			
英制表示 British expression	公制表示 Metric expression	L	W	T	WB
0201	0603	$0.60 \pm 0.03$	$0.30 \pm 0.03$	$0.30 \pm 0.03$	$0.15 \pm 0.05$
0402	1005	$1.00 \pm 0.05$	$0.50 \pm 0.05$	$0.50 \pm 0.05$	$0.25 \pm 0.10$
0603	1608	$1.60 \pm 0.10$	$0.80 \pm 0.10$	$0.80 \pm 0.10$	$0.30 \pm 0.10$
0805	2012	$2.00 \pm 0.20$	$1.25 \pm 0.20$	$0.80 \pm 0.20$	$0.50 \pm 0.20$

备注：可根据客户的特殊要求设计符合客户需求的产品。

Note: We can design according to customer special requirements

### ※ 结构 STRUCTURE



序号 NO	名称 Name
①	陶瓷介质 Ceramic dielectric
②	内电极 Inner electrode
③	外电极 Substrate electrode
④	镍层 Nickel Layer
⑤	锡层 Tin Layer



### 三、型号规格表示方法 HOW TO ORDER

<u>0603</u>	<u>HQ</u>	<u>100</u>	<u>J</u>	<u>500</u>	<u>N</u>	<u>T</u>
①	②	③	④	⑤	⑥	⑦

#### ※说明 NOTES:

#### ①尺寸 DIMENSIONS 单位 (unit): inch/mm

尺寸规格 Size Code	0201	0402	0603	0805
长×宽 (L×W) inch	0.02×0.01	0.04×0.02	0.06×0.03	0.08×0.05
长×宽 (L×W) mm	0.60×0.30	1.00×0.50	1.60×0.80	2.00×1.25

#### ② 介质种类 DIELECTRIC STYLE

介质种类 (Dielectric Code)	HQ
介质材料 (Dielectric)	COG

#### ③ 标称容量 NOMINAL CAPACITANCE

单位(unit): pF

表示方式 (Express Method)	实际值 (Actual Value)	注：头两位数字为有效数字，第三位数字为 0 的个数；R 为小数点。 Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
R47	0.47	
0R5	0.5	
1R0	1.0	
101	$10 \times 10^1$	
102	$10 \times 10^2$	
...	...	



④ 容量误差 CAPACITANCE TOLERANCE

代码 (Code)	A	B	C	D	F	G	J
误差 (Tolerance)	± 0.05pF	± 0.10pF	± 0.25pF	± 0.5pF	± 1.0%	± 2.0%	± 5.0%

备注：A、B、C、D 级误差适用于容量≤10pF 的产品。

Note: These capacitance tolerance A, B, C, D are just applicable the capacitance that equals to or less than 10pF.

⑤ 额定电压 RATED VOLTAGE

单位(unit): V

表示方式 (Express Method)	实际值 (Actual Value)	注：头两位数字为有效数字，第三位数字为 0 的个数； R 为小数点。 Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
500	$50 \times 10^0$	
501	$50 \times 10^1$	
...	...	

⑥ 端头材料 TERMINAL MATERIAL STYLES

端头类别 (Termination Styles)	表示方式 (Express Method)
三层电镀端头 (Nickel Barrier Termination)	N

⑦ 包装方式 PACKAGE STYLES

B	T
散包装 (Bulk Bag)	编带包装 (Taping Package)

四、温度系数/特性 Temperature Coefficient /Characteristics

介质种类 Dielectric	参考温度点 Reference Temperature Point	标称温度系数 Temperature Coefficient	工作温度范围 Operation Temperature Range
COG	20°C	0±30ppm/°C	-55°C ~ 125°C



五、电容量范围（注：■ 和 ■ 表示可生产的容值）

项目	0201	
材料	COG	
电容量		
工作电压	25V	50V
0.1pF	■	■
0.2pF	■	■
0.3pF	■	■
0.4pF	■	■
0.5pF	■	■
0.6 pF	■	■
0.7pF	■	■
1.0pF	■	■
1.2pF	■	■
1.5pF	■	■
1.8pF	■	■
2.0pF	■	■
2.2pF	■	■
3.3pF	■	■
3.9pF	■	■
4.7pF	■	■
5.6pF	■	■
6.8pF	■	■
8.2pF	■	■
9.0pF	■	■
10pF	■	■
12pF	■	■
15pF	■	■
18pF	■	■
20pF	■	■
22pF	■	■



项目	0402	
材料	COG	
电容量		
工作电压	25V	50V
0.5pF		
0.6pF		
0.7pF		
0.8pF		
0.9pF		
1.0pF		
1.2pF		
1.5pF		
1.8pF		
2.2pF		
2.7pF		
3.3pF		
3.9pF		
4.7pF		
5.6pF		
6.8pF		
8.2pF		
10pF		
12pF		
15pF		
18pF		
22pF		
27pF		
33pF		
39pF		
47pF		
56pF		
68pF		
82pF		
100pF		
120pF		
150pF		
180pF		



项目	0603			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
0.5pF				
0.6pF				
0.7pF				
0.8pF				
0.9pF				
1.0pF				
1.2pF				
1.5pF				
1.8pF				
2.2pF				
2.7pF				
3.3pF				
3.9pF				
4.7pF				
5.6pF				
6.8pF				
8.2pF				
10pF				
12pF				
15pF				
18pF				
22pF				
27pF				
33pF				
39pF				
47pF				





项目	0603			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
56pF				
68pF				
82pF				
100pF				
120pF				
150pF				
180pF				
220pF				
270pF				
330pF				
390pF				
470pF				
560pF				
680pF				



项目	0805			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
0.5pF				
0.6pF				
0.7pF				
0.8pF				
0.9pF				
1.0pF				
1.2pF				
1.5pF				
1.8pF				
2.2pF				
2.7pF				
3.3pF				
3.9pF				
4.7pF				
5.6pF				
6.8pF				
8.2pF				
10pF				
12pF				
15pF				
18pF				
22pF				
27pF				
33pF				
39pF				
47pF				



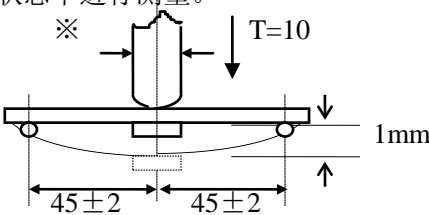
项目	0805			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
56pF				
68pF				
82pF				
100pF				
120pF				
150pF				
180pF				
220pF				
270pF				
330pF				
390pF				
470pF				
560pF				
680pF				
820pF				
1000pF				
1200pF				
1500pF				



## 六、可靠性测试 Reliability Test

项目 Item	技术规格 Technical Specification	测试方法 Test Method and Remarks
容量 Capacitance	应符合指定的误差级别 Should be within the specified tolerance.	测试温度: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Test Temperature: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ $C \leq 1000\text{pF}$ : 测试频率: $1\text{MHz} \pm 10\%$ 测试电压: $1.0 \pm 0.2\text{Vrms}$ Test Frequency: $1\text{MHz} \pm 10\%$ Test Voltage: $1.0 \pm 0.2\text{Vrms}$ $C > 1000\text{pF}$ : 测试频率: $1\text{KHz} \pm 10\%$ 测试电压: $1.0 \pm 0.2\text{Vrms}$ Test Frequency: $1\text{KHz} \pm 10\%$ Test Voltage: $1.0 \pm 0.2\text{Vrms}$
Q	$C \geq 30\text{pF}$ , $Q \geq 1000$ $C \leq 30\text{pF}$ , $Q \geq 400 + 20C$	测试频率: $1\text{MHz} \pm 10\%$ 测试电压: $1.0 \pm 0.2\text{Vrms}$ Test Frequency: $1\text{MHz} \pm 10\%$ Test Voltage: $1.0 \pm 0.2\text{Vrms}$
绝缘电阻 (IR) Insulation Resistance	$\geq 10,000\text{M}\Omega$	测试电压: 额定电压 测试时间: $60 \pm 5$ 秒 测试湿度: $\leq 75\%$ 测试温度: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 测试充放电电流: $\leq 50\text{mA}$ Measuring Voltage: Rated Voltage Duration: $60 \pm 5\text{s}$ Test Humidity: $\leq 75\%$ Test Temperature: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Test Current: $\leq 50\text{mA}$
介质耐电强度 (DWV) Dielectric Withstanding Voltage	不应有介质被击穿或损伤 No breakdown or damage.	测量电压: 额定电压 $< 100\text{V}$ , 300% 额定电压 $100\text{V} \leq$ 额定电压 $\leq 500\text{V}$ , 250% 额定电压 时间: 1~5 秒 充/放电电流: 不应超过 50mA Measuring Voltage: Rated voltage $< 100\text{V}$ , 300% Rated voltage $100\text{V} \leq$ Rated voltage $\leq 500\text{V}$ , 250% Rated voltage Duration: 1~5s Charge/ Discharge Current: 50mA max.



项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks
可焊性 Solderability	上锡率应大于 95% 外观: 无可见损伤. At least 95% of the terminal electrode is covered by new solder. Visual Appearance: No visible damage.		将电容在 80~120℃ 的温度下预热 10~30 秒. Preheating conditions: 80 to 120°C; 10~30s.
			有铅焊料: (SnPb: 63/37) 浸锡温度: 235±5℃ 浸锡时间: 2±0.5s Solder Temperature: 235±5°C Duration: 2±0.5s
耐焊接热 Resistance to Soldering Heat	Δ CC	在±0.5%或±0.5pF 范围内, 取较大值 Within ±0.5% or ±0.5pF, whichever is larger	将电容在 100~200℃ 的温度下预热 10±2 分钟. 浸锡温度: 265±5℃ 浸锡时间: 10±1s 然后取出溶剂清洗干净, 在 10 倍以上的显微镜底下观察. 放置时间: 24±2 小时 放置条件: 室温 Preheating conditions: 100 to 200°C; 10±2min. Solder Temperature: 265±5°C Duration: 10±1s Clean the capacitor with solvent and examine it with a 10X(min.) microscope. Recovery Time: 24±2h Recovery condition: Room temperature
	Q	同初始标准 Same to initial value.	
	IR	同初始标准 Same to initial value.	
	外观: 无可见损伤 上锡率: ≥95% Appearance: No visible damage. At least 95% of the terminal electrode is covered by new solder.		
抗弯曲强度 Resistance to Flexure of Substrate (Bending Strength)	外观: 无可见损伤. Appearance: No visible damage.		试验基板: Al <sub>2</sub> O <sub>3</sub> 或 PCB 弯曲深度: 1mm 施压速度: 0.5mm/sec. 单位: mm 应在弯曲状态下进行测量。 
	Δ C/C	在±0.5%或±0.5pF 范围内, 取较大值 Within ±0.5% or ±0.5pF, whichever is larger	Test Board: Al <sub>2</sub> O <sub>3</sub> or PCB Warp: 1mm Speed: 0.5mm/sec. Unit: mm The measurement should be made with the board in the bending position.



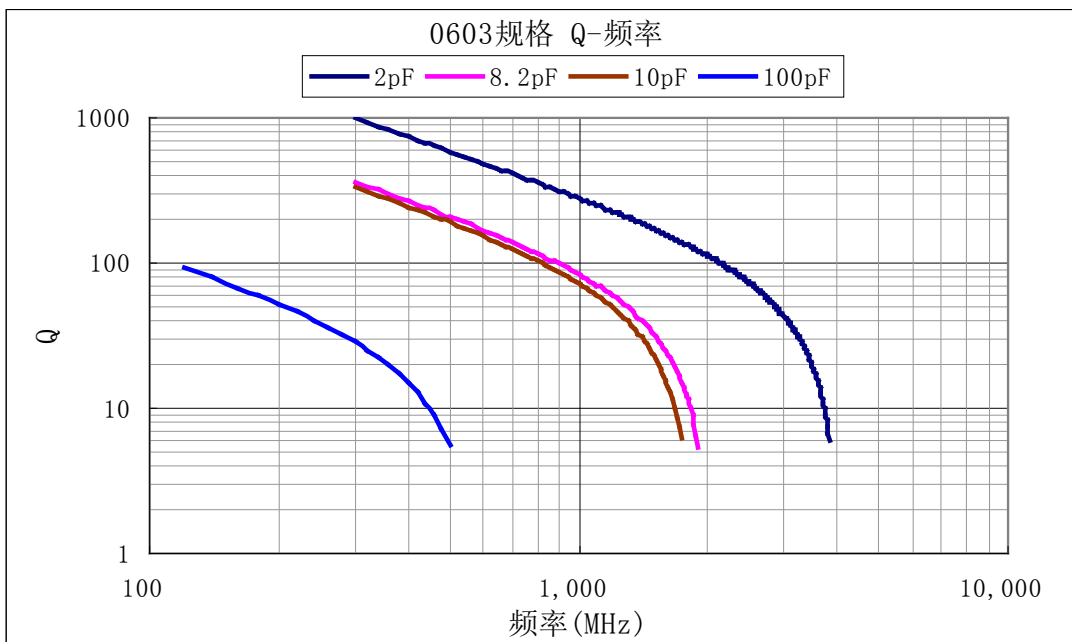
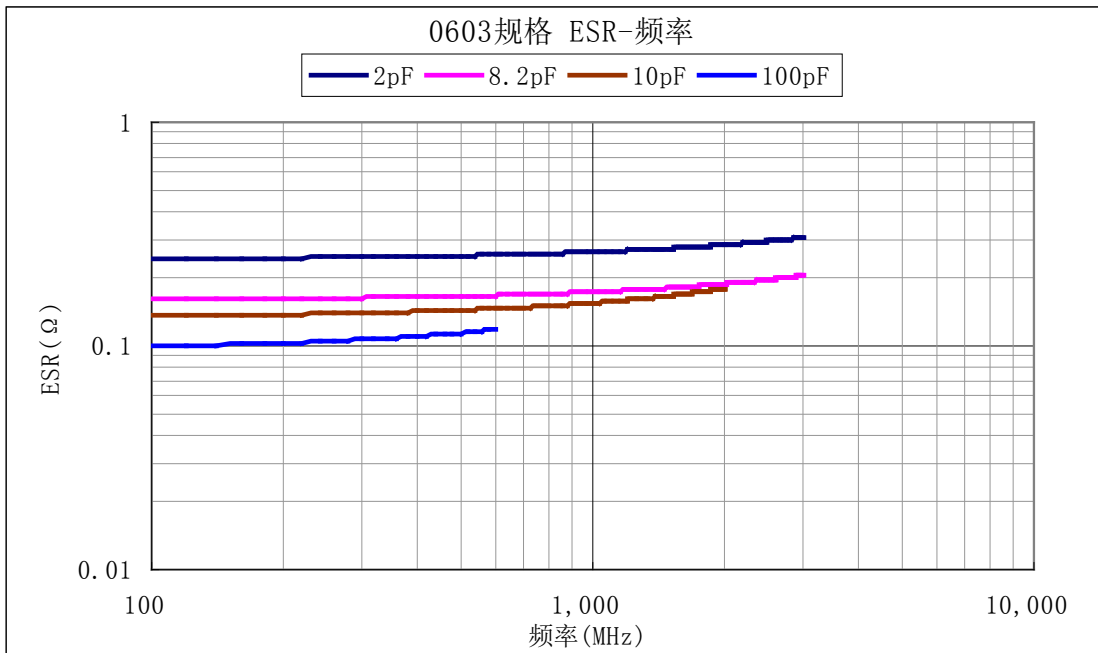
项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks																														
端头结合强度 Termination Adhesion	外观无可见损伤 No visible damage.		施加的力: 5N      时间: 10±1S Applied Force: 5N      Duration: 10±1S																														
温度循环 Temperature Cycle	Δ C/C	在±1%或±1pF 范围内, 取两者中最大者 Δ C/C: Within ±1% or ±1pF, whichever is larger.	初始测量 循环次数: 5 次, 一个循环分以下 4 步: <table border="1" data-bbox="837 593 1364 817"> <thead> <tr> <th>阶段</th> <th>温度 (°C)</th> <th>时间 (分钟)</th> </tr> </thead> <tbody> <tr> <td>第 1 步</td> <td>下限温度</td> <td>30</td> </tr> <tr> <td>第 2 步</td> <td>常温(+20)</td> <td>2~3</td> </tr> <tr> <td>第 3 步</td> <td>上限温度</td> <td>30</td> </tr> <tr> <td>第 4 步</td> <td>常温(+20)</td> <td>2~3</td> </tr> </tbody> </table> 试验后放置 (恢复) 时间: 24±2h Preheating conditions: up-category temperature, 1h Recovery time: 24±1h Initial Measurement Cycling Times: 5 times, 1 cycle, 4 steps: <table border="1" data-bbox="837 1019 1364 1243"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Low- category temp.</td> <td>30</td> </tr> <tr> <td>2</td> <td>Normal temp. (+20)</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>Up- category temp.</td> <td>30</td> </tr> <tr> <td>4</td> <td>Normal temp. (+20)</td> <td>2~3</td> </tr> </tbody> </table> Recovery time after test: 24±2h	阶段	温度 (°C)	时间 (分钟)	第 1 步	下限温度	30	第 2 步	常温(+20)	2~3	第 3 步	上限温度	30	第 4 步	常温(+20)	2~3	Step	Temperature (°C)	Time (min.)	1	Low- category temp.	30	2	Normal temp. (+20)	2~3	3	Up- category temp.	30	4	Normal temp. (+20)	2~3
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IR	同初始标准 Same to initial value.																																
DWV	同初始标准 Same to initial value.																																
潮湿试验 Moisture Resistance	Δ C/C	在±2%或±1pF 范围内, 取两者中最大者 Within ±2% or ±1pF, whichever is larger.	温度: 40±2°C 湿度: 90~95%RH 时间: 500 小时 放置条件: 室温 放置时间: 48 小时 Temperature: 40±2°C Humidity: 90~95%RH Duration: 500h Recovery conditions: Room temperature Recovery Time: 48h																														
	Q	C≥30pF, Q≥350 10pF≤C≤30pF, Q≥275+5C/2 C≥10pF, Q≥200+10C																															
	IR	Ri≥2500MΩ 或 Ri·CR≥25S 取两者之中较小者. Ri ≥ 2500MΩ 或 Ri · CR ≥ 25S whichever is smaller.																															
	外观: 无损伤 Appearance: No visible damage.																																



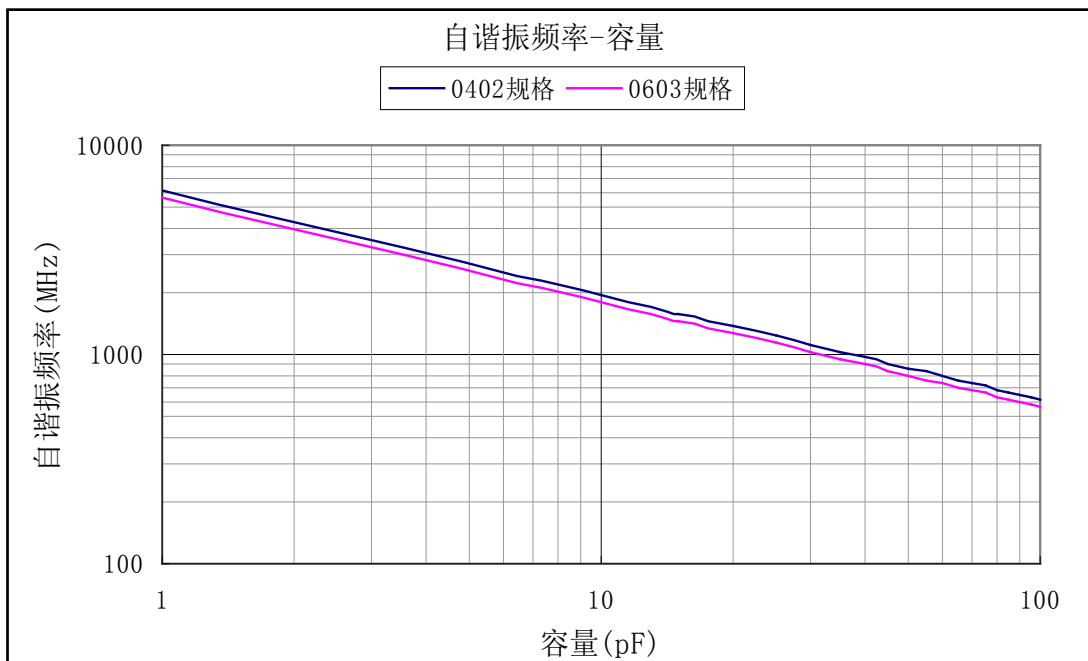
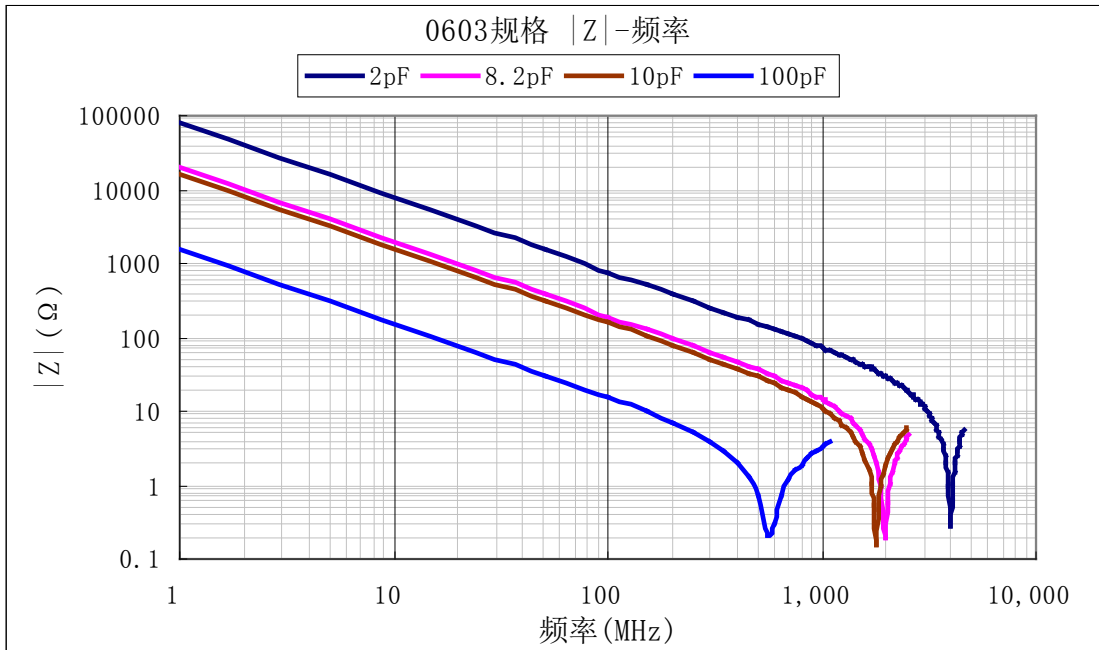
项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks
寿命试验 Life Test	$\Delta$ C/C	在 $\pm 2\%$ 或 $\pm 1\text{pF}$ 范围内, 取两者中最大者 Within $\pm 2\%$ or $\pm 1\text{pF}$ , whichever is larger.	低压产品 ( $<100\text{V}$ ) 电压: 1.5 倍额定工作电压 时间: 1000 小时 温度: $125^\circ\text{C}$ 充电电流: 不应超过 50mA 放置条件: 室温 放置时间: 24 小时 Low-Voltage ( $<100\text{V}$ ) Applied Voltage: $1.5 \times \text{Rated Voltage}$ Duration: 1000h Temperature: $125^\circ\text{C}$ Charge/ Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h
	Q	$C \geq 30\text{pF}$ , $Q \geq 350$ $10\text{pF} \leq C \leq 30\text{pF}$ , $Q \geq 275 + 5C/2$ $C \geq 10\text{pF}$ , $Q \geq 200 + 10C$	
	IR	$R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ 取两者之中较小者. $R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ whichever is smaller.	
	外观: 无损伤 Visual Appearance: No visible damage.		



### 七、典型特性曲线



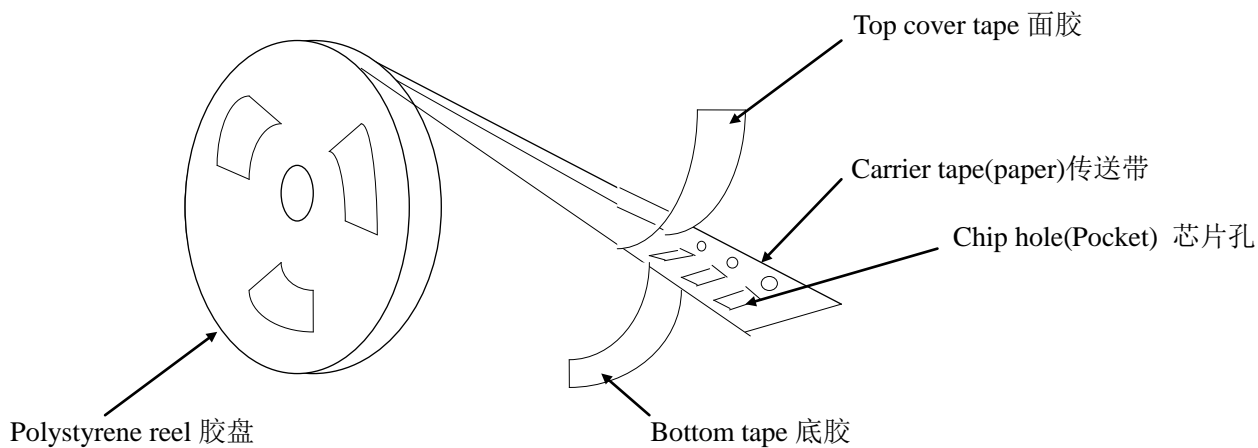






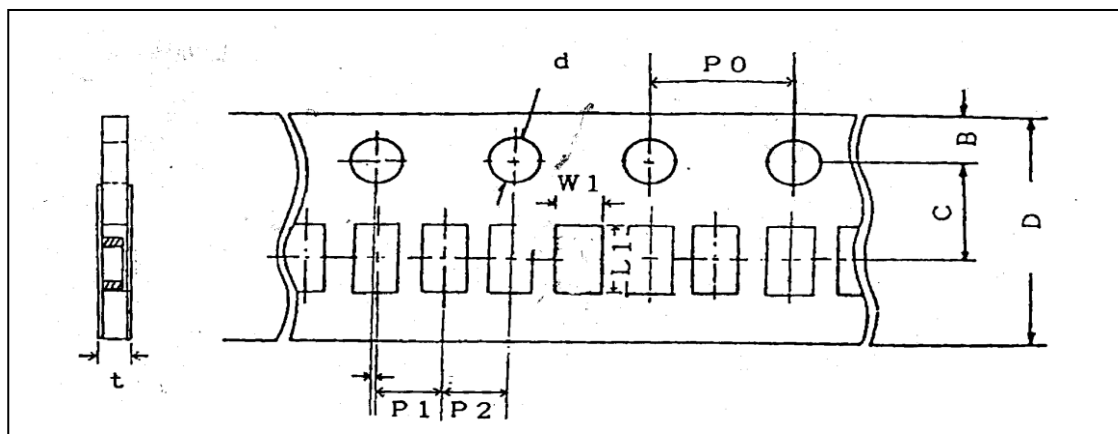
## 八、包装 PACKAGE

### ●纸带卷盘结构 PAPER TAPING



※ 0201、0402 纸带编带尺寸大小

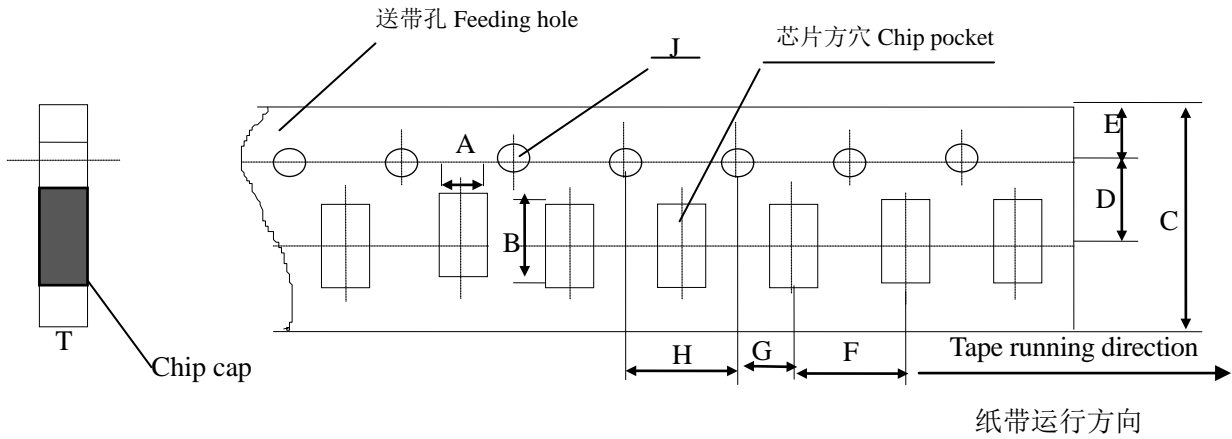
Dimensions of paper taping for 0201、0402 type



代号 Code	W1	L1	D	C	B	P1	P2	P0	d	t
0201	0.37±	0.67±	8.00±	3.50±	1.75±	2.00±	2.00±	4.00±	1.50	0.80
	0.10	0.10	0.10	0.05	0.10	0.05	0.05	0.10	-0/+0.10	Below
0402	0.65±	1.15±	8.00±	3.50±	1.75±	2.00±	2.00±	4.00±	1.50	0.80
	0.10	0.10	0.10	0.05	0.10	0.05	0.05	0.10	-0/+0.10	Below



※适合‘0603, 0805’常规尺寸产品的纸带尺寸  
Dimensions of paper taping for 0603, 0805 types.



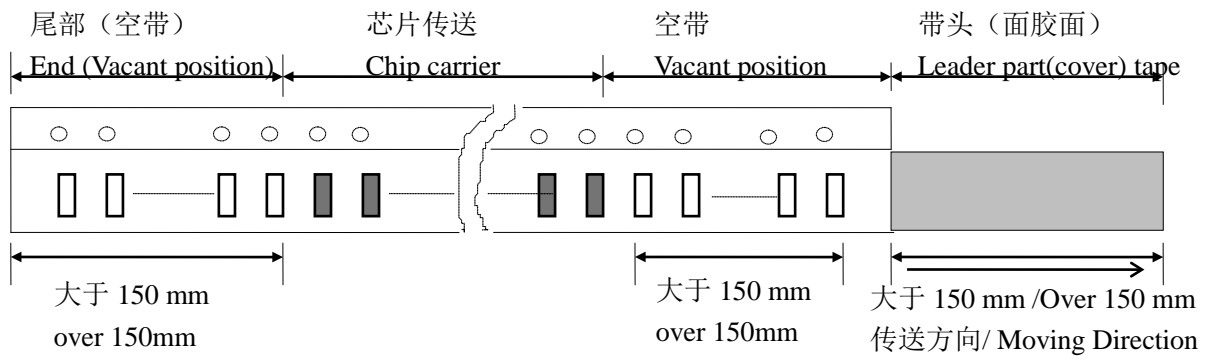
Unit: mm

代号 Code 纸带规格 paper size	A	B	C	D*	E	F	G*	H	J	T
0603	1.10 ±0.10	1.90 ±0.10	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.10	4.00 ±0.10	1.50 -0/+0.10	1.10 Max
0805	1.45 ±0.15	2.30 ±0.15	8.0 ±0.15	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.10	4.00 ±0.10	1.50 -0/+0.10	1.10 Max

注意：\*表示此处对尺寸的要求非常精确。

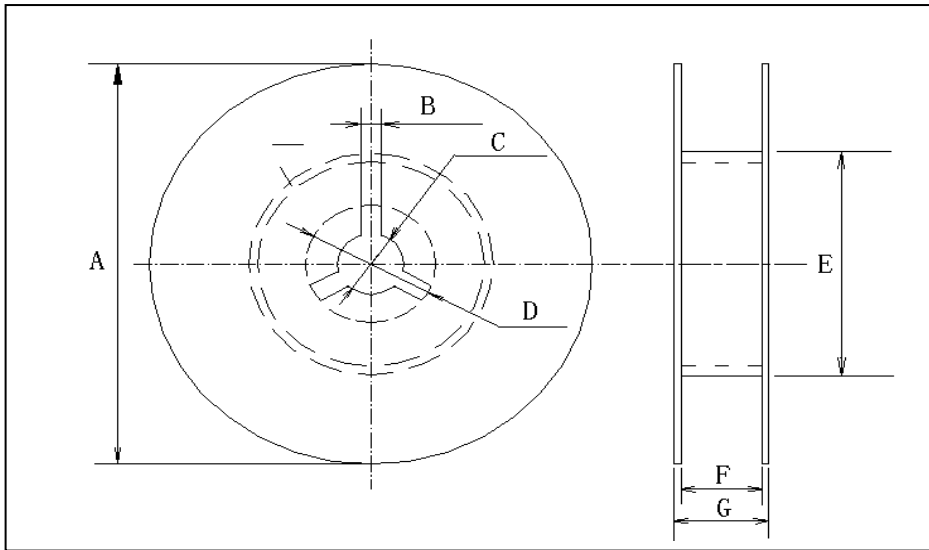
Note: The place with “\*” means where needs exactly dimensions.

● 传送带的前后结构 Structure of leader part and end part of the carrier paper





※ 卷盘尺寸 Reel Dimensions (unit: mm)



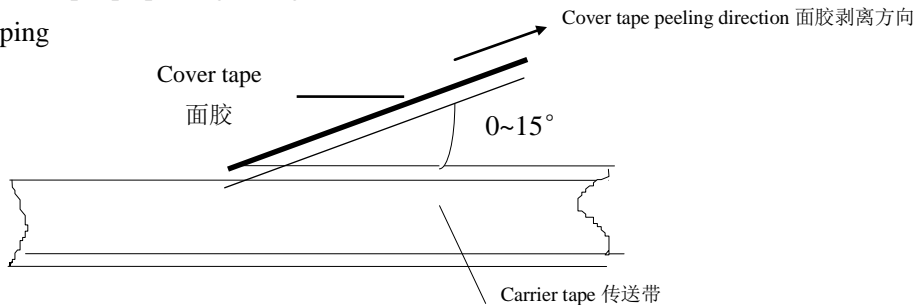
※ 尺寸代码 (CODE)

卷盘型号	A	B	C	D	E	F	G
7' REEL	$\phi 178 \pm 20$	3.0	$\phi 13 \pm 0.5$	$\phi 21 \pm 0.8$	$\phi 50$ 或更大 $\phi 50$ or more	$100 \pm 1.5$	12max
13' REEL	$\phi 330 \pm 20$	3.0	$\phi 13 \pm 0.5$	$\phi 21 \pm 0.8$	$\phi 50$ 或更大 $\phi 50$ or more	$100 \pm 1.5$	12max

● 关于卷带的说明 Taping specification

※面胶剥离强度 Top tape peeling strength

纸带 Paper Taping



标准:  $0.1N < \text{剥离强度} < 0.7N$

Standard:  $0.1N < \text{peeling strength} < 0.7N$

在剥离时, 纸带不能有纸碎, 也不能粘在底、面胶上。

No paper dirty remains on the scotch when peeling, and sticks to top and bottom tape.

※塑料盒散包装 Bulk Case Package

单位 (unit) :mm

Symbol	A	B	T	C	D	E
Dimension	$6.80 \pm 0.10$	$8.80 \pm 1.00$	$12.00 \pm 0.10$	$15.00 + 0.10 / -0$	$2.00 + 0 / -0.10$	$4.70 \pm 0.10$
Symbol	F	W	G	H	L	I
Dimension	$31.50 + 0.20 / -0$	$36.00 + 0 / -0.20$	$19.00 \pm 0.35$	$7.00 \pm 0.35$	$110.00 \pm 0.70$	$5.00 \pm 0.35$



※ 包装数量 Packing Quantity

尺寸 (SIZE)	包装形式和数量 (PACKAGE STYLE & QUANTITY) unit: pcs				
	塑料压纹带卷盘 (EPT)	纸带卷盘 (PT)	胶带卷盘 (ET)	塑料盒散装 (BC)	一般散装 (BP)
0201	-----	15000	-----	20000	5000
0402	-----	10000	-----	20000	5000
0603	-----	4000	-----	15000	5000
0805	-----	4000	3000	10000	5000

注意：包装的形式和数量可根据客户的要求来定。

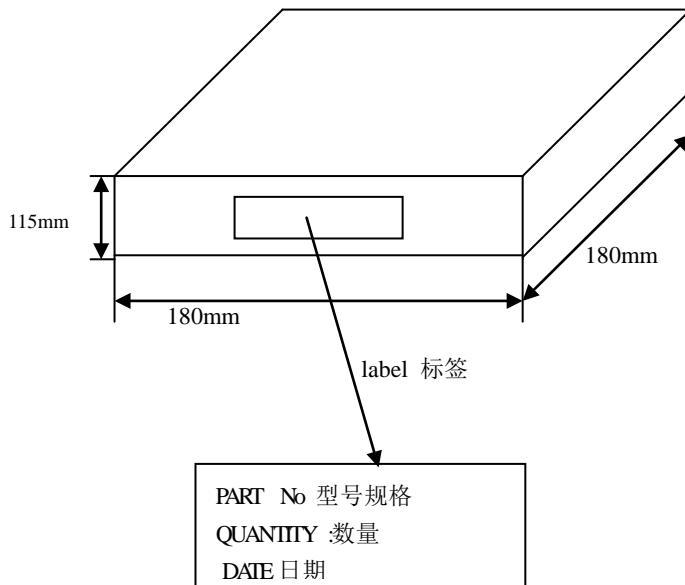
Note: We can choose packing style and quantity can be according to the customer's requirement.

● 外包装 Outer packing

小包装 The first package

Quantity: 10 reels

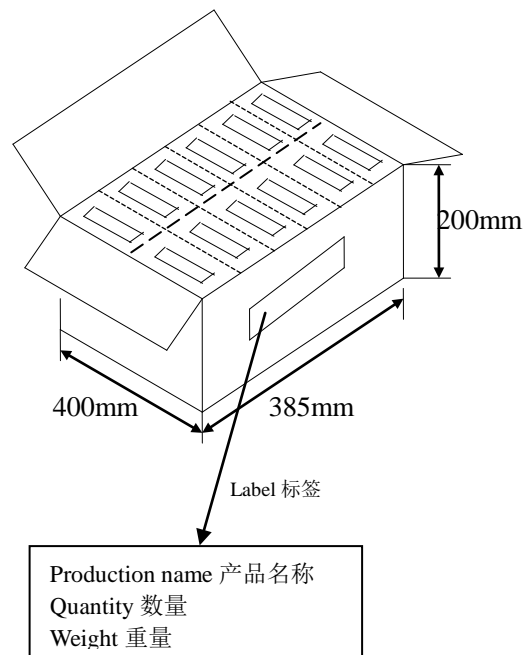
数量： 10 卷



大包装 The second package

Quantity: 6 cases

数量： 6 盒





## 十、储存方法 Storage Methods

确保芯片可焊性良好的贮存期限为 6 个月(在包装好已交付的情况下)。

The guaranteed period for solderability is 6 months (Under deliver package condition).

储存条件/Storage conditions:

储存温度/Temperature 5~40℃

储存相对湿度/Relative Humidity 20~70%

## 十一、使用前的注意事项 Precautions For Use

多层片式瓷介电容器(MLCC)在短路或开路的电路中都有可能失效,在超出本承认书或相关说明书中所述使用频率的恶劣工作环境,或外界机械力超压作用下,电容芯片都有可能着火、燃烧甚至爆炸,所以在使用的時候,首先应考虑按本承认书的有关说明来进行,如有不明之处,请联系我们技术部、品管部或生产部。

The Multi-layer Ceramic Capacitors (MLCC) may fail in a short circuit mode or in an open circuit mode when subjected to severe conditions of electrical environment and / or mechanical stress beyond the specified “rating” and specified “conditions” in the specification, which will result in burn out, flaming or glowing in the worst case. Following “precautions for “safety” and Application Notes shall be taken in your major consideration. If you have a question about the precautions for handling, please contact our engineering section or factory.

### 1. 焊接的条件与相关图表 Soldering Profile

为避免因温度的突然变化而引起的芯片开裂或局部爆炸的现象发生,请按有关温度曲线图表来进行。(请参考附页中的图表)

To avoid the crack problem by sudden temperature change, follow the temperature profile in the adjacent graph (refer to the graph in the enclosure page).

### 2. 手工焊接 Manual Soldering

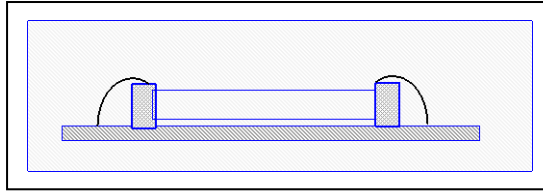
手工焊接很容易因为芯片局部受热不均而引起瓷体微裂或局部爆炸的现象,在焊接时,如果操作者不小心,会使烙铁头直接同电容芯片的瓷体部分接触,这样很容易使电容芯片因热冲击而受损或出现其他意外.因此,使用电烙铁手工焊接时应仔细操作,并对电烙铁的尖端的选择和尖端温度控制应多加小心.

Manual soldering can pose a great risk of creating thermal cracks in capacitors. The hot soldering iron tip comes into direct contact with the end terminations, and operator’s careless may cause the tip of the soldering iron to come into direct contact with the ceramic body of the capacitor. Therefore the soldering iron must be handled carefully, and pay much attention to the selection of the soldering iron tip and temperature contact of the tip.



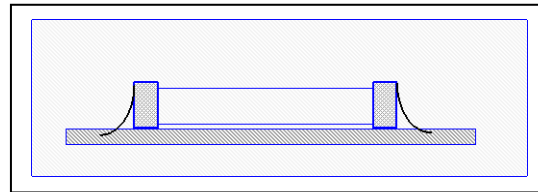
### 3. 适量的焊料 Optimum Solder Amount for Reflow Soldering

焊料过多  
Too much solder



这样会因端头压力过大而  
可能引起芯片受损  
Cracks tend to occur due to large stress.

焊料太少  
Not enough solder

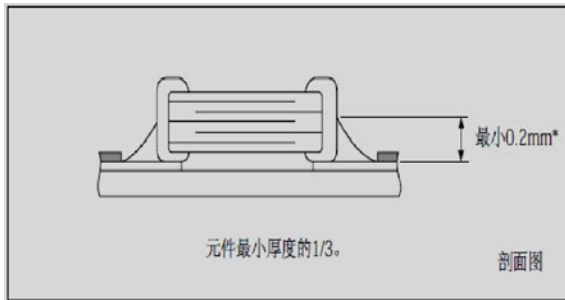


固定力量不足,可能会引起  
电容芯片与线路接触不良  
Weak holding force may cause bad  
connection between the capacitor and  
PCB.

### 4. 推荐焊料用量 Recommended Soldering amounts

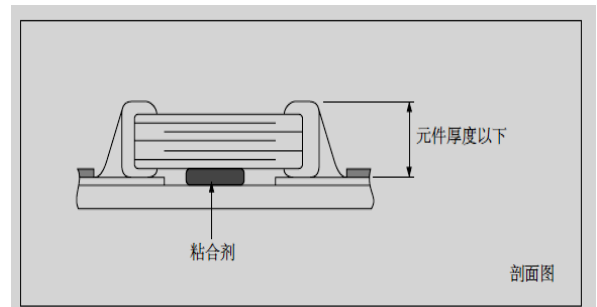
#### 4.1 回流焊接的最佳焊料用量

The optimal solder fillet amounts for re-flow soldering



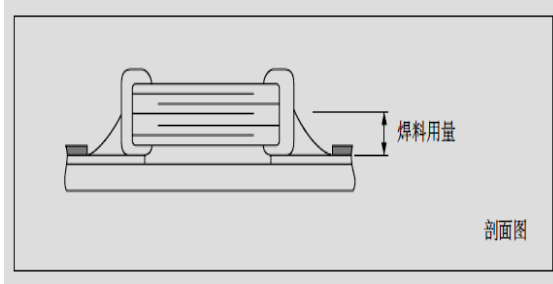
#### 4.2 波峰焊接的最佳焊料用量

The optimal solder fillet amounts for wave soldering



#### 4.3 使用烙铁返修时的最佳焊料量

The optimal solder fillet amounts for reworking by using sold





## 十二、推荐焊接方式 Recommended Soldering Method

规格尺寸 Size	温度特性 Temperature Characteristics	额定电压 Rated Voltage	容量范围 Capacitance	焊接方式 Soldering Method
0201	NPO	/	/	R
	X7R/X5R/X7S/X6S	/	/	R
	Y5V	/	/	R
0402	NPO	/	/	R
	X7R/X5R/X7S/X6S	/	/	R
	Y5V	/	/	R
0603	NPO	/	/	R/W
	X7R/X5R/X7S/X6S	/	$C \geq 1\mu\text{f}$	R
			$C < 1\mu\text{f}$	R/W
	Y5V	/	$C \geq 1\mu\text{f}$	R
			$C < 1\mu\text{f}$	R/W
0805	NPO	/	/	R/W
	X7R/X5R/X7S/X6S	/	$C \geq 4.7\mu\text{f}$	R
			$C < 4.7\mu\text{f}$	R/W
	Y5V	/	$C \geq 1\mu\text{f}$	R
			$C < 1\mu\text{f}$	R/W

焊接方式 Soldering method: R—回流焊 Reflow Soldering

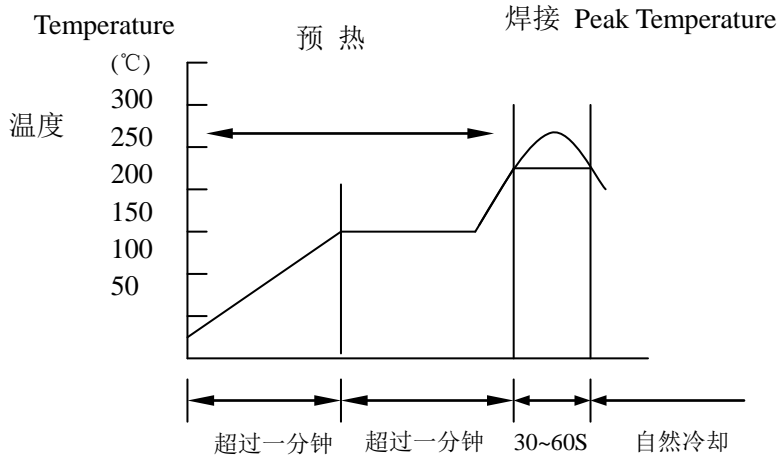
W—波峰焊 Wave Soldering





### 十三、推荐焊接温度曲线图 The temperature profile for soldering

#### 回流焊接 (Re-flow soldering)

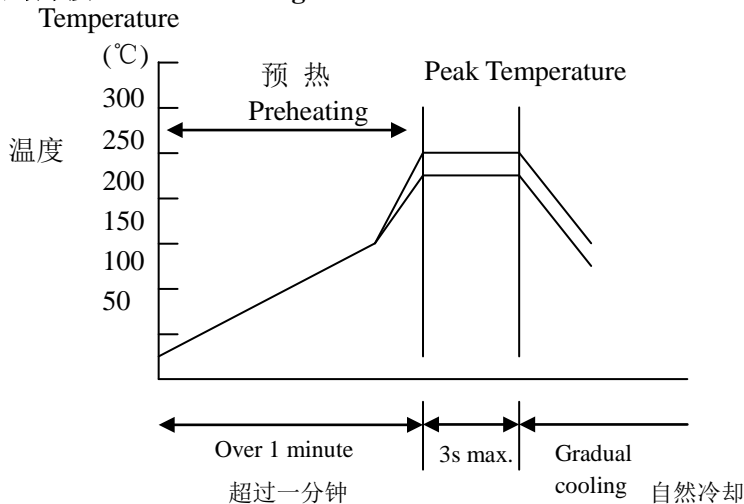


	Pb-Sn 焊接 Pb-Sn soldering	无铅焊接 Lead-free soldering
尖峰温度 Peak temperature	230°C ~ 250°C	240°C ~ 260°C

在预热时, 请将焊接温度与芯片表面温度之间的温差维持在  $T \leq 150^\circ\text{C}$ 。

While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as:  $T \leq 150^\circ\text{C}$ .

#### 波峰焊接 (Wave soldering)



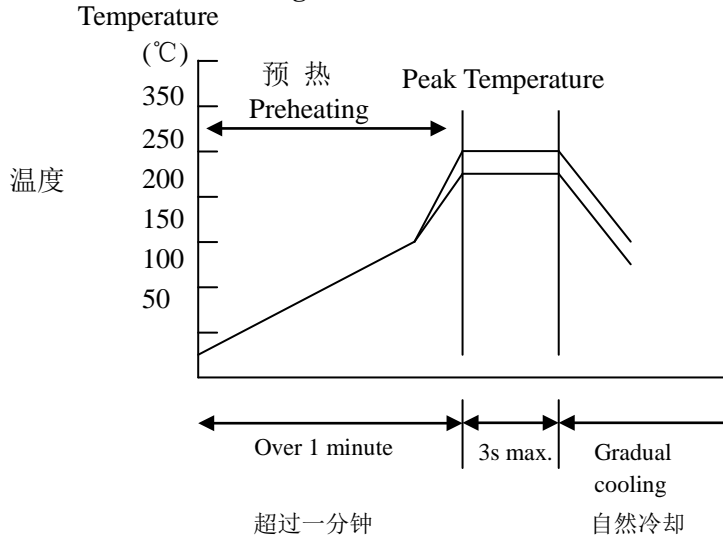
	Pb-Sn 焊接 Pb-Sn soldering	无铅焊接 Lead-free soldering
尖峰温度 Peak temperature	230°C ~ 260°C	240°C ~ 270°C

在预热时, 请将焊接温度与芯片表面温度之间的温差维持在  $T \leq 150^\circ\text{C}$ 。

While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as:  $T \leq 150^\circ\text{C}$ .



手工焊接 (Hand soldering)



条件 Conditions:

预热 Preheating	烙铁头温度 Temperature of soldering iron head	烙铁功率 Power of soldering iron	烙铁头直径 Diameter of soldering iron head	焊接时间 Soldering time	锡膏量 Solder paste amount	限制条件 Restricted conditions
$\Delta \leq 130^{\circ}\text{C}$	最高 $350^{\circ}\text{C}$ Highest temperature: $350^{\circ}\text{C}$	最大 20W 20W at the highest	建议 1mm 1mm recommended	最长 3s 3s at the longest	$\leq 1/2$ 芯片厚度 $\leq 1/2$ chip thickness	请勿使用烙铁头直接接触陶瓷元件 Please avoid the direct contact between soldering iron head and ceramic components

※以最新版本的内容为准

