产品规格书
PRODUCT SPECIFICATION

客户名称
CUSTOMER ： _____

产品名称 **柔性端头多层片式陶瓷电容器**
PART NAME：Flexible Terminal Multi-layer Ceramic Capacitor

规格
SPECIFICATION: 1206B333K501AT

版本
VERSION: A4

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

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■ 柔性端头多层片式陶瓷电容器
Flexible terminal multi-layer ceramic capacitor

◆ 特征
Feature

* 叠层独石结构，具有高可靠性能
  There is high reliability on monolithic structure of laminated layers.
* 具有优良的焊接与耐焊性能，适用于回流焊接与波峰焊接
  And its character of excellent soldering ability and
  soldering resistance ability is suitable for reflow soldering and peak soldering.
* 具有较高的容量且容量性能稳定
  It includes high and stable capacitance.
* 具有高强度的抗弯曲性能，下弯可达到 3㎜
  High mechanical performance able to withstand, 3mm bend test.
* 采用柔性端头体系。
  Flexible termination system.
* 可减少线路板因弯曲导致的失效故障。
  Reduction in circuit board flex failures.

执行标准：GB/T 21041-2007　GB/T 21042-2007

Executive Standard: GB/T 21041-2007 GB/T 21042-2007

◆ 应用范围
Application

* 应用于高弯曲的线路板。
  High Flexure Stress Circuit Boards.
* 应用于温度变化的线路。
  Variable Temperature Applications.

◆型号表示法
How To Order

1206	B	333	K	501	A	T

尺寸规格 Size Code

尺寸代码 Size Code	EIA	长×宽 (L×W) mm
0402	0402	1.00×0.50
0603	0603	1.60×0.80
0805	0805	2.00×1.25
1206	1206	3.20×1.60
1210	1210	3.20×2.50
1808	1808	4.50×2.00
1812	1812	4.50×3.20
2211	2211	5.70×2.80
2220	2220	5.70×5.00
2225	2225	5.70×6.30

介质种类 Dielectric Code

介质种类 Dielectric Code	介质材料 Dielectric
CG	C0G
X	X5R
B	X7R
DT	X6T

标称容量 Nominal Capacitance

表示方式 Express Method	实际值 Actual Value
1R0	1.0
333	33×10^3

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.

误差 Tolerance

代码 Code	误差 Tolerance
J	±5%
K	±10%
M	±20%

额定电压 Rated Voltage 单位(unit)：V

表示方式 Express Method	实际值 Actual Value
6R3	6.3
501	50×10^1

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.

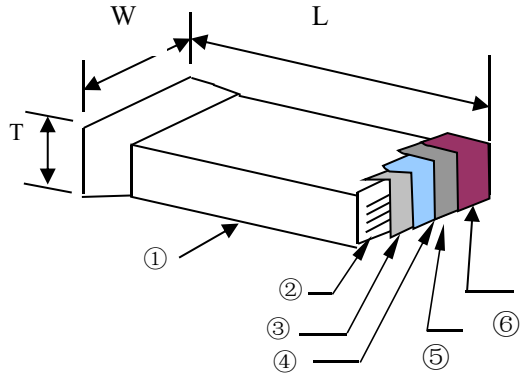
端头材料 Terminal Material Styles

端头类别 Termination Styles	表示方式 Express Method
柔性端头多层片式陶瓷电容器 MLCC with Flexible Solderable Termination	A

包装方式 Package Styles

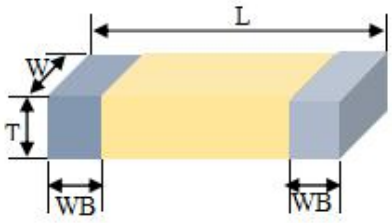
表示方式 Express Method	包装方式 Package Styles
T	编带 7 寸盘包装 Braided 7 inch disc packing
D	编带 13 寸盘包装 Braided 13 inch disc packing

◆产品结构
Product Structure



序号 NO	名称 Name	序号 NO	名称 Name
①	陶瓷介质 Ceramic dielectric	④	导电性树脂 Conductive Resin
②	内电极 Inner electrode	⑤	镍层 Nickel Layer
③	外电极 Substrate electrode	⑥	锡层 Tin Layer

◆ 产品尺寸
Product Dimensions



型号 Type		尺寸 Dimensions (mm)				厚度代码 Thickness code
英制表示 British	公制表示 Metric	L	W	T	WB	
0402	1005	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.05	CA
0603	1608	1.60±0.10	0.80±0.10	0.80±0.10	0.35±0.20	DA
0805	2012	2.00±0.20	1.25±0.25	0.80±0.20	0.50±0.20	EA
		2.00±0.20	1.25±0.25	1.25±0.25	0.50±0.20	EB
1206	3216	3.20±0.30	1.60±0.30	0.80±0.20	0.60±0.30	FA
				1.25±0.25		FB
				1.60±0.30		FC
1210	3225	3.20±0.30	2.50±0.30	1.25±0.25	0.60±0.30	GA
				1.60±0.30		GB
				2.00±0.30		GC
				2.50±0.30		GD
1808	4620	4.60±0.40	2.00±0.20	1.60±0.30	0.60±0.30	HA
				2.00±0.30		HB
1812	4632	4.60±0.40	3.20±0.30	1.25±0.25	0.60±0.30	IA
				1.60±0.30		IB
				2.00±0.30		IC
				2.50±0.30		ID
1825	4663	4.60±0.40	6.30±0.50	1.60±0.30	0.60±0.30	JA
				2.00±0.30		JB
				2.50±0.30		JC
2211	5728	5.70±0.40	2.80±0.40	1.60±0.30	0.60±0.30	KA
				2.50±0.30		KB
2220	5750	5.70±0.40	5.00±0.40	1.60±0.30	0.60±0.30	LA
				2.00±0.30		LB
				2.50±0.30		LC
2225	5763	5.70±0.50	6.30±0.50	1.60±0.30	0.60±0.30	MA
				2.00±0.30		MB
				3.00±0.30		MC

备注：1、产品具体厚度“T”查阅本承认书中“容量范围及其电压”。2、可根据客户的特殊要求设计符合客户需求的产品。

Note：1、The specific thickness of the product can read "capacity range and Voltage "in this approval sheet.

2、We can design according to customer special requirements

◆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
C0G	25°C	0±30ppm/℃	-55℃～125℃
X7R	25°C	±15%	-55℃～125℃

◆ 可靠性测试方法

Reliability Test Methods

二类介质规格测容量前需去老化处理：测试温度：25℃±3℃，测试湿度：＜70%RH.电容器150℃热处理1h±10min，放置24±2h后测量。

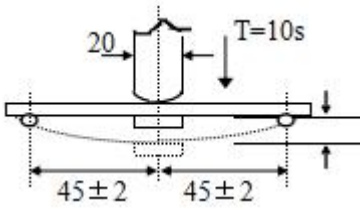
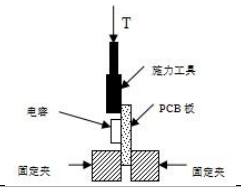
The second type of medium specification needs to be aged before measuring the capacity: test temperature: 25℃±3℃, test humidity: < 70%RH. The capacitors were heat treated at 150℃ for 1 hour ±10minutes and measured after 24±2 hours of placement.

<table>
<tr><td>项目
Item</td><td colspan="2">技术规格
Technical Specification</td><td colspan="3">测 试 方 法
Test Method and Remarks</td></tr>
<tr><td rowspan="3">容量
Capacitance</td><td rowspan="2">Ⅰ类
Class Ⅰ</td><td rowspan="2">应符合指定的误差级别
Should be within the specified tolerance.</td><td>标称容量
Capacitance</td><td>测试频率
Measuring Frequency</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td>≤1000pF</td><td>1MHz±10%</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td>Ⅱ类
Class Ⅱ</td><td>应符合指定的误差级别
Should be within the specified tolerance.</td><td colspan="3">＞1000 pF　1KHz±10%
测试温度： 25℃±3℃　Test Temperature: 25℃±3℃
C≤10μF：测试频率：1KHz±10%　测试电压：1.0±0.2Vrms
Test Frequency: 1KHz±10%　Test Voltage: 1.0±0.2Vrms
C＞10μF　测试频率：120±24 Hz　测试电压：0.5±0.1Vrms
Test Frequency: 120±24 Hz　Test Voltage: 0.5±0.1Vrms</td></tr>
<tr><td rowspan="2">绝缘电阻(IR)
Insulation Resistance</td><td>Ⅰ类
Class Ⅰ</td><td>C≤10 nF, Ri≥50000MΩ
C＞10 nF, Ri•C_R≥500S</td><td colspan="3" rowspan="2">测试电压：额定电压（最高500V）
测试时间：60±5秒　测试湿度：≤75%
测试温度： 25℃±3℃　测试充放电电流：≤50mA
Measuring Voltage: Rated Voltage（Max 500V）
Duration: 60±5s　Test Humidity: ≤75%
Test Temperature: 25℃±3℃　Test Current: ≤50mA</td></tr>
<tr><td>Ⅱ类
Class Ⅱ</td><td>C≤25 nF, Ri≥10000MΩ
C＞25 nF, Ri•C_R＞100S</td></tr>
<tr><td rowspan="3">损耗角正切
(DF, tanδ)
Dissipation Factor</td><td rowspan="3">Ⅰ类
Class Ⅰ</td><td>DF</td><td>标称容量
Capacitance</td><td>测试频率
Measuring Frequency</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td>≤1/（400+20C）</td><td>C＜30 pF</td><td rowspan="2">1MHz±10%
（C＞1000 pF，1KHz±10%）</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td>≤0.1%</td><td>C≥30pF</td></tr>
</table>

<table>
<tr>
<td>损耗角正切
(DF, tanδ)
Dissipation
Factor</td>
<td>Ⅱ类
Class
Ⅱ(≤
50V)</td>
<td>
<table>
<tr><th>电压</th><th>DF(×10⁻⁴)</th><th>0402</th><th>0603</th><th>0805</th><th>1206 及以上</th></tr>
<tr><td rowspan="5">50V</td><td>≤250</td><td>≤10nF</td><td>＜100nF</td><td>——</td><td>≤680nF</td></tr>
<tr><td>≤350</td><td>≤47nF</td><td>＜470nF</td><td>≤1uF</td><td>≤2.2uF</td></tr>
<tr><td>≤500</td><td>≤0.1μF</td><td>——</td><td>——</td><td>——</td></tr>
<tr><td>≤750</td><td>——</td><td>——</td><td>≤2.2uF</td><td>≤4.7uF</td></tr>
<tr><td>≤1000</td><td>——</td><td>≤2.2μF</td><td>≤10μF</td><td>≤10μF</td></tr>
<tr><td rowspan="5">25V</td><td>≤250</td><td>≤10nF</td><td>＜100nF</td><td>——</td><td>≤680nF</td></tr>
<tr><td>≤350</td><td>≤47nF</td><td>＜470nF</td><td>≤1uF</td><td>——</td></tr>
<tr><td>≤500</td><td>≤220nF</td><td>——</td><td>——</td><td>——</td></tr>
<tr><td>≤750</td><td>——</td><td>——</td><td>≤2.2μF</td><td>≤10μF</td></tr>
<tr><td>≤1000</td><td>≤2.2μF</td><td>≤10μF</td><td>≤22μF</td><td>≤22μF</td></tr>
<tr><td rowspan="5">16V</td><td>≤250</td><td>≤10nF</td><td>＜100nF</td><td>——</td><td>≤680nF</td></tr>
<tr><td>≤350</td><td>≤47nF</td><td>＜470nF</td><td>≤1uF</td><td>——</td></tr>
<tr><td>≤500</td><td>≤220nF</td><td>——</td><td>——</td><td>——</td></tr>
<tr><td>≤750</td><td>——</td><td>——</td><td>≤4.7μF</td><td>≤10μF</td></tr>
<tr><td>≤1000</td><td>≤470nF</td><td>≤10μF</td><td>≤22μF</td><td>≤47μF</td></tr>
<tr><td rowspan="5">10V</td><td>≤250</td><td>≤10nF</td><td>＜100nF</td><td>——</td><td>≤680nF</td></tr>
<tr><td>≤350</td><td>≤47nF</td><td>＜470nF</td><td>≤1uF</td><td>——</td></tr>
<tr><td>≤500</td><td>≤220nF</td><td>——</td><td>——</td><td>——</td></tr>
<tr><td>≤750</td><td>——</td><td>——</td><td>≤2.2μF</td><td>≤10μF</td></tr>
<tr><td>≤1000</td><td>≤10μF</td><td>≤22μF</td><td>≤47μF</td><td>≤47μF</td></tr>
<tr><td rowspan="5">≤6.
3V</td><td>≤250</td><td>≤10nF</td><td>＜100nF</td><td>——</td><td>≤680nF</td></tr>
<tr><td>≤350</td><td>47nF</td><td>＜470nF</td><td>≤1uF</td><td>——</td></tr>
<tr><td>≤500</td><td>≤220nF</td><td>——</td><td>——</td><td>——</td></tr>
<tr><td>≤750</td><td>——</td><td>——</td><td>≤2.2uF</td><td>≤10μF</td></tr>
<tr><td>≤1000</td><td>≤1μF</td><td>≤4.7μF</td><td>≤47μF</td><td>≤100μF</td></tr>
</table>
</td>
<td>C≤10μF
测试频率：1KHz±10%
测试电压：1.0±0.2Vrms
Test Frequency: 1KHz ±10%
Test Voltage: 1.0 ±0.2Vrms
C＞10μF
测试频率：120±24 Hz
测试电压:0.5±0.1Vrms
Test Frequency: 120 ±24 Hz
Test Voltage: 0.5 ±0.1Vrms</td>
</tr>
</table>

<table>
<tr><th>项目
Item</th><th colspan="4">技术规格
Technical Specification</th><th colspan="3">测试方法
Test Method and Remarks</th></tr>
<tr><td rowspan="3">损耗角正切
(DF, tanδ)
Dissipation
Factor</td><td rowspan="3">Ⅱ类Class Ⅱ
（≥100V）</td><td colspan="2">DF</td><td>标称容量
Capacitance</td><td>测试频率
Measuring
Frequency</td><td>测试电压
Measuring
Voltage</td></tr>
<tr><td colspan="2">≤250×10⁻⁴</td><td>C＜1 uF</td><td rowspan="2">1KHz±10%</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td colspan="2">≤750×10⁻⁴</td><td>1 uF≤C≤4.7 uF</td></tr>
<tr><td>耐焊接热
Resistance to
Soldering
Heat</td><td colspan="4">
<table>
<tr><td>项目
Item</td><td>Ⅰ类
Class Ⅰ</td><td>Ⅱ类
Class Ⅱ</td></tr>
<tr><td>ΔC/C</td><td>≤±2.5%或±0.25pF，取较大值
≤ ± 2.5% or ± 0.25PF，
whichever is larger</td><td>±15%</td></tr>
<tr><td>DF</td><td colspan="2">同初始标准
Same to initial value.</td></tr>
<tr><td>IR</td><td colspan="2">同初始标准
Same to initial value.</td></tr>
<tr><td colspan="3">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.</td></tr>
</table>
</td><td colspan="3">将电容在 100~200℃的温度下预热 60-120 秒.
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.
试验后放置时间：24±2h。
放置条件：室温
Preheating conditions: 100 to 200℃; 60-120s.
Solder Temperature: 265±5℃ Duration: 10±1s
Clean the capacitor with solvent and examine it with a 10X(min.) microscope.
Recovery Time: 24±2h.
Recovery condition: Room temperature</td></tr>
</table>

<table>
<tr>
<td>抗弯曲强度
Resistance to Flexure of Substrate (Bending Strength)</td>
<td>外观：无可见损伤.
Appearance: No visible damage.

ΔC/C:
Ⅰ类：≤±5%或±0.5pF，取两者中最大者
Ⅱ类： ≤±10%
Class Ⅰ: ≤±5%或±0.5pF,whichever is larger.
Class Ⅱ: ≤±10%</td>
<td>试验基板：PCB 弯曲深度：3mm
施压速度：1mm/sec. 单位：mm
应在弯曲状态下进行测量。
Test Board: PCB Warp: 3mm
Speed: 1mm/sec. Unit: mm
The measurement should be made with the board in the bending position.

</td>
</tr>
<tr>
<td>端头结合强度
Termination Adhesion</td>
<td>外观无可见损伤
No visible damage.</td>
<td>如图所示：慢慢施加一个 T 的力到电容侧面瓷体上，并保持 60+1 秒。
As shown in the picture， Slowly apply a T force to the porcelain body on the side of the capacitor and hold for 60+1 seconds.
<table>
<tr><td>规格</td><td>施加力 T</td></tr>
<tr><td>≤0402</td><td>2N</td></tr>
<tr><td>≥0603</td><td>5N</td></tr>
</table>

</td>
</tr>
<tr>
<td>温度循环
Temperature Cycle</td>
<td>
<table>
<tr><td>项目
Item</td><td>Ⅰ类
Class Ⅰ</td><td>Ⅱ类
Class Ⅱ</td></tr>
<tr><td>ΔC/C</td><td>≤±1%或±1PF，取较大值
≤±1% or ±1pF， whichever is larger</td><td>-15% ~+15%</td></tr>
</table>
外观无可见损伤
No visible damage.</td>
<td>初始测量 Initial Measurement
循环次数：5 次，一个循环分以下 4 步：
Cycling Times: 5 times, 1 cycle, 4 steps:
<table>
<tr><td>阶段
Step</td><td>温度（Temperature）（℃）</td><td>时间 (Time)</td></tr>
<tr><td>1</td><td>下限温度(Low- category temp.):
:-55</td><td>30min</td></tr>
<tr><td>2</td><td>常温 (Normal temp.)：+20℃</td><td>2～3min</td></tr>
<tr><td>3</td><td>上限温度 (Up- category temp.)
+125</td><td>30min</td></tr>
<tr><td>4</td><td>常温 (Normal temp.)：+20℃</td><td>2～3min</td></tr>
</table>
试验后放置（恢复）时间：24±2h
Recovery time after test:24±2h</td>
</tr>
<tr>
<td>可焊性
Solderability</td>
<td>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.</td>
<td>将电容在 80~120℃的温度下预热 10~30 秒.
Preheating conditions:80 to 120℃; 10~30s.
无铅焊料：浸锡温度：245±5℃
浸锡时间：2±0.5s
Lead-free soldering
Solder Temperature:235±5℃
Duration: 2±0.5s</td>
</tr>
</table>

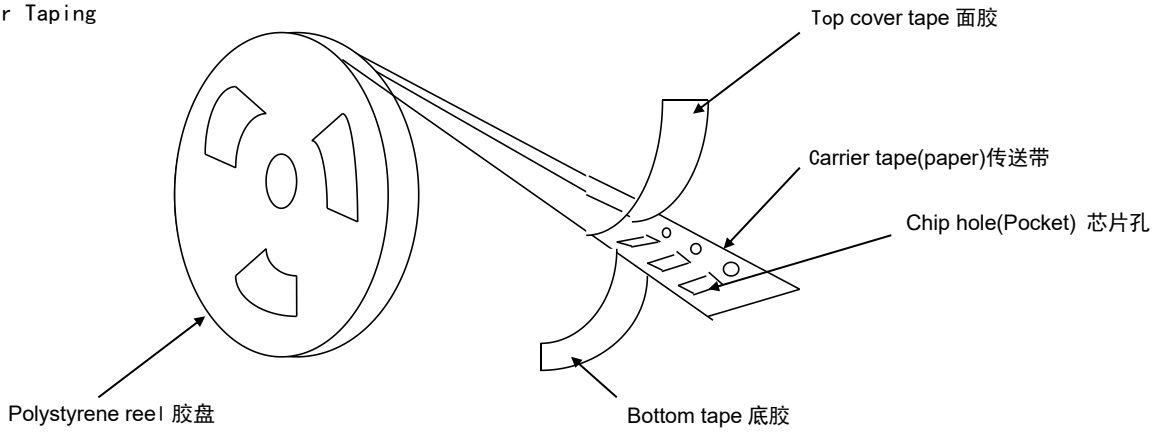
<table>
<tr><th>项目
Item</th><th>技术规格
Technical Specification</th><th>测 试 方 法
Test Method and Remarks</th></tr>
<tr><td>耐湿负荷
Humidity load</td><td>
<table>
<tr><td>ΔC/C</td><td colspan="2">Ⅰ类: ±7.5%或±0.75pF,取两者之中较大者
Ⅱ类: : ≤±12.5%
Class Ⅰ: ±7.5% or ±0.75pF, whichever is larger.
Class Ⅱ: ≤±12.5%</td></tr>
<tr><td>DF</td><td colspan="2">≤2 倍初始标准
Not more than twice of initial value.</td></tr>
<tr><td rowspan="2">IR</td><td>Class Ⅰ</td><td>Ri≥5000MΩ或 Ri•C_R≥50S 取两者之中较小者.
Ri≥5000MΩ或 Ri•C_R≥50S whichever is smaller.</td></tr>
<tr><td>Class Ⅱ</td><td>Ri≥1000MΩ或 Ri•C_R≥10S 取两者之中较小者.
Ri≥1000MΩ或 Ri•C_R≥10S whichever is smaller.</td></tr>
<tr><td colspan="3">外观：无损伤
Appearance: No visible damage.</td></tr>
</table>
</td><td>温度：40±2℃ 湿度：90~95%RH
电压：电压：额定电压 Ur≤1000V 时，按 Ur 测试；
额定电压 Ur＞1000V 时，最高按 1000V 测试
时间：500 小时
放置条件：室温
放置时间：24±2h 小时；
Ⅱ类：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF 产品试验后需在 150℃温度下保持 1h ,再放置 24±2h 后测试电性能.
Temperature: 40±2℃
Humidity: 90~95%RH
Voltage: Rated Voltage
Duration: 500h
Recovery conditions: Room temperature
Recovery Time: 24h±2h
Class 2：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF product need to keep in 150℃、1h after the test，and measurement to be made after being kept at room temperature for 24±2h.</td></tr>
<tr><td>寿命试验
Life Test</td><td>
<table>
<tr><td rowspan="2">ΔC/C</td><td>Ⅰ类
Class Ⅰ</td><td>≤±3%或±0.3pF,取两者之中较大者
≤ ± 3% 或 ± 0.3pF, whichever is larger.</td></tr>
<tr><td>Ⅱ类
Class Ⅱ</td><td>-20% ~ +20%</td></tr>
<tr><td>DF</td><td colspan="2">≤2 倍初始标准
Not more than twice of initial value.</td></tr>
<tr><td rowspan="2">IR</td><td>Ⅰ类
Class Ⅰ</td><td>Ri≥4000MΩ或 Ri•C_R≥40S 取两者之中较小者
Ri≥4000MΩ或 Ri•C_R≥40S whichever is smaller.</td></tr>
<tr><td>Ⅱ类
Class Ⅱ</td><td>Ri≥2000MΩ或 Ri•C_R≥50S 取两者之中较小者.
Ri≥2000MΩ或 Ri•C_R≥50S whichever is smaller.</td></tr>
<tr><td colspan="3">外观：无损伤
Appearance: No visible damage.</td></tr>
</table>
</td><td>温度：125℃（C0G、X7R）
充电电流：不应超过 50mA. 时间：1000 小时
电压：低压产品（＜100V）2 倍额定工作电压，除表 1 外
100V≤额定电压≤200V：1.5Ur
200V＜额定电压＜500V：1.3Ur
500V≤额定电压：1.2Ur
放置条件：室温
放置时间：24±2h 小时；
Ⅱ类：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF 产品试验后需在 150℃温度下保持 1h ,再放置 24±2h 后测试电性能.
Temperature:125℃(C0G、X7R)
Charge/Discharge Current:50mA max. Time:1000h.
Applied Voltage:1.Low Voltage products (< 100V) 2 times rated operating Voltage, except Table 1.
2. Medium and high pressure products:
100V≤Rated Voltage≤200V：1.5 Multiple
200V＜Rated Voltage＜500V：1.3 Multiple
500V≤Rated Voltage：1.2 Multiple
Recovery Conditions: Room Temperature
Recovery Time: 24h±2h
Class 2：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF product need to keep in 150℃、1h after the test，and measurement to be made after being kept at room temperature for 24±2h.
<table>
<tr><th>容量 Capacitance</th><th>试验电压 Voltage</th></tr>
<tr><td>100nF≤0201＜220nF</td><td rowspan="6">1.5Ur</td></tr>
<tr><td>47nF≤0402＜2.2uF</td></tr>
<tr><td>220nF≤0603＜4.7uF</td></tr>
<tr><td>0.47uF≤0805＜10uF</td></tr>
<tr><td>1uF≤1206＜22uF</td></tr>
<tr><td>1uF≤1210＜22uF</td></tr>
<tr><td>0201≥220nF</td><td rowspan="6">1.0Ur</td></tr>
<tr><td>0402≥2.2uF</td></tr>
<tr><td>0603≥4.7uF</td></tr>
<tr><td>0805≥10uF</td></tr>
<tr><td>1206≥22uF</td></tr>
<tr><td>1210≥22uF</td></tr>
</table>
</td></tr>
</table>

项目 Item	技术规格 Technical Specification	测 试 方 法 Test Method and Remarks	
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.	Ur＜100V	测量电压： I 类：300% Ur　　II 类：250% Ur 时间： 1~5 秒　充/放电电流：不应超过 50mI。 Measuring Voltage: I class:300% Ur　　II class :250% Ur Duration: 1~5s　Charge/ Discharge Current: 50mA max.
		100V≤Ur＜500V	施加额定电压的 200%, 5 秒, 最大电流不超过 50mA Force 200%Rated Voltage for 5 second. Charge / Discharge current limit: 50mA max
		500V≤Ur≤1000V	施加额定电压的 150%, 5 秒, 最大电流不超过 50mA Force 150%Rated Voltage for 5 second. Charge / Discharge current limit: 50mA max
		1000V＜Ur≤2000V	施加额定电压的 120%, 5 秒, 最大电流不超过 50mA Force 120%Rated Voltage for 5 seconds. Charge / Discharge current limit: 50mA max
		2000V＜Ur≤5000V	施加额定电压的 120%, 5 秒, 最大电流不超过 10mA Force 120%Rated Voltage for 5 seconds. Max..current should not exceed 10 mA.

◆ 包装
Package

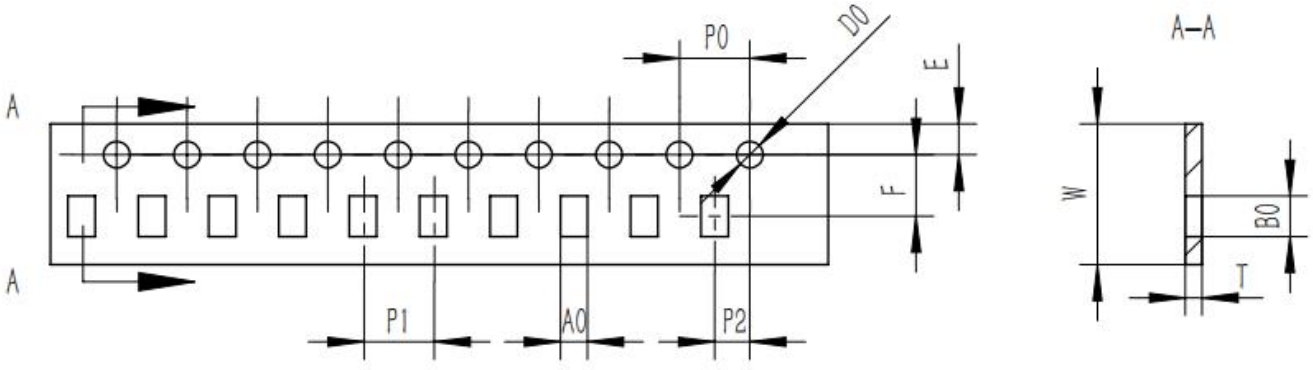
＊ 纸带卷盘结构

Paper Taping



＊ 0402 纸带编带尺寸大小

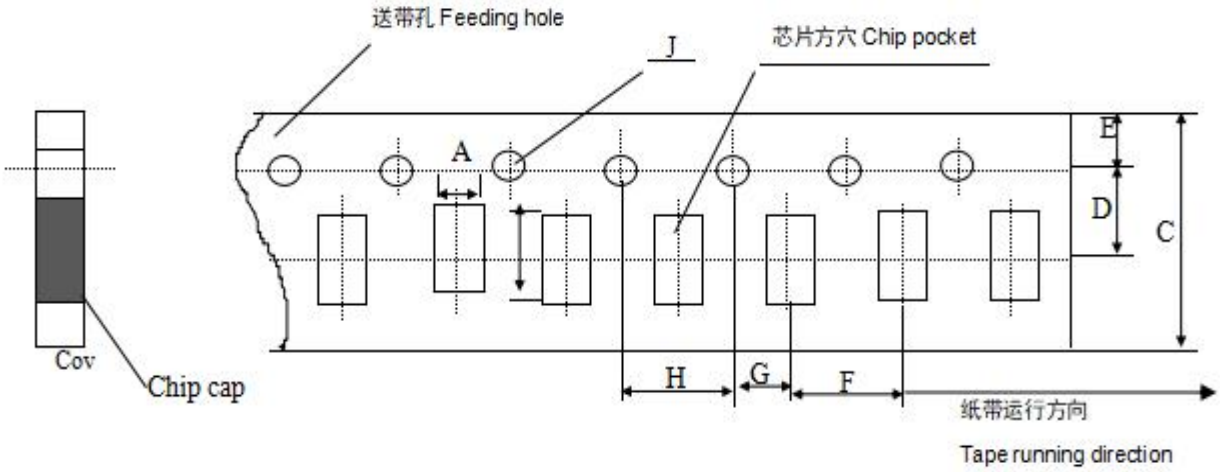
Dimensions of paper taping for 0402 type



代号 Code	A0	B0	W	F	E	P1	P2	P0	D0	T
0402	0.65± 0.10	1.15± 0.10	8.00± 0.10	3.50± 0.05	1.75± 0.10	2.00± 0.05	2.00± 0.05	4.00±0 .10	1.55 -0/+0.05	0.80 Below

* 适合‘0603，0805，1206’常规尺寸产品的纸带尺寸

Dimensions of paper taping for 0603，0805，1206 types.

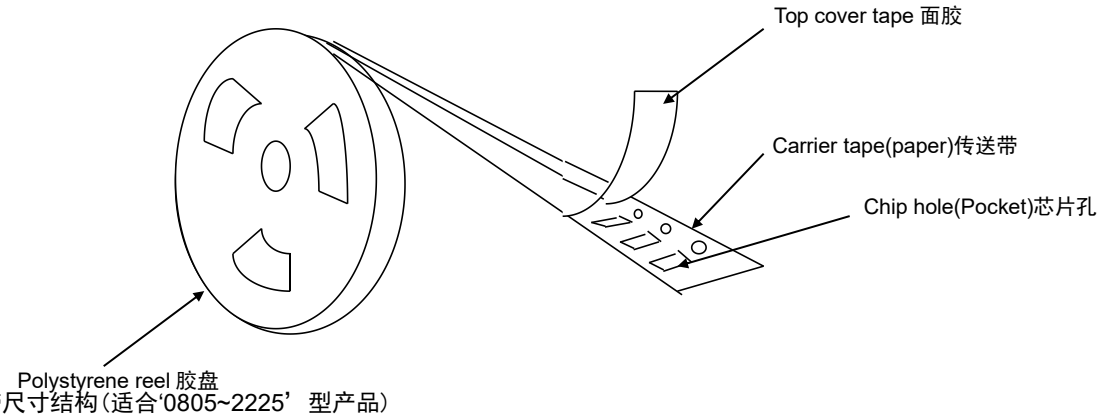


注意：*表示此处对尺寸的要求非常精确。

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

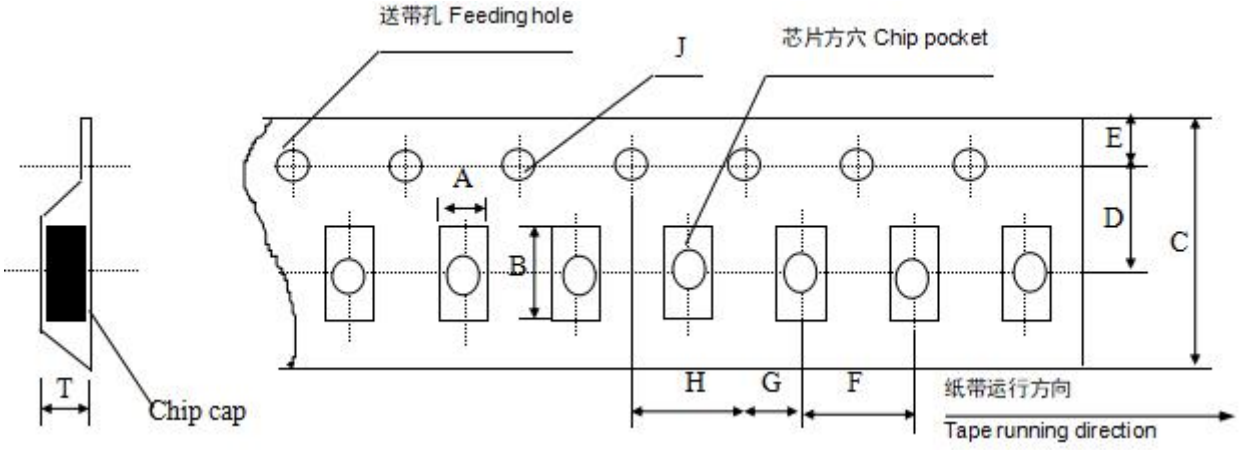
* 塑胶卷盘结构

Embossed taping



* 塑胶带尺寸结构(适合‘0805~2225’型产品)

Dimensions of embossed taping for 0805~2225 type



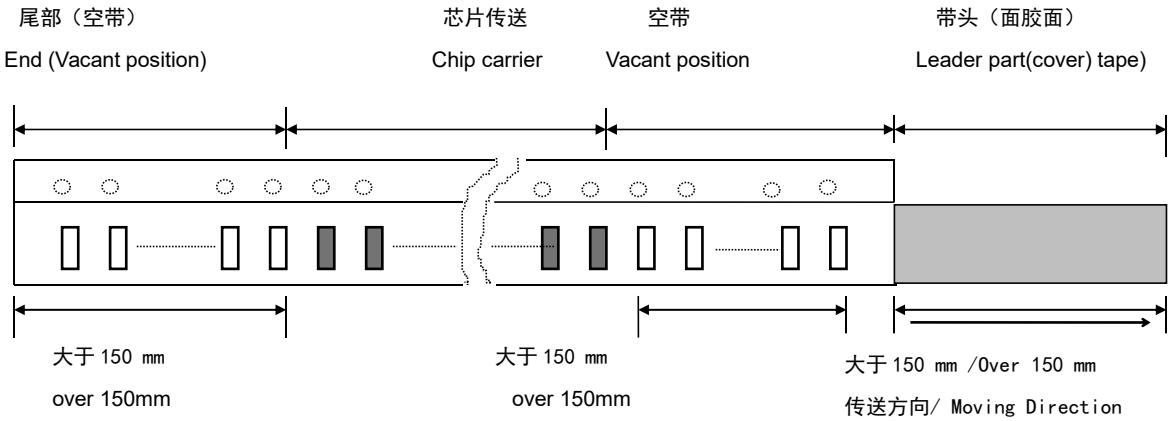
代号 Code / 规格 Tape size	A	B	C	D*	E	F	G*	H	J	T
0805	1.55 ± 0.20	2.35 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.10	1.55 -0/+0.05	1.50 Max
1206	1.95 ± 0.20	3.60 ± 0.20	8.00 ± 0.20	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	4.00 ± 0.1	1.55 -0/+0.05	1.85 Max
1210	2.70 ± 0.10	3.42 ± 0.10	8.00 ± 0.10	3.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.05	3.2 Max
1808	2.20 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.05	3.0 Max
1812	3.66 ± 0.10	4.95 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.05	4.0 Max
2211/ 2220/2225	6.2 ±0.1	6.7 ±0.1	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	8.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.55 -0/+0.05	2.4 ± 0.10

备注：*表示此处对尺寸的要求非常精确。

Note：The place with "*" means where needs exactly dimensions

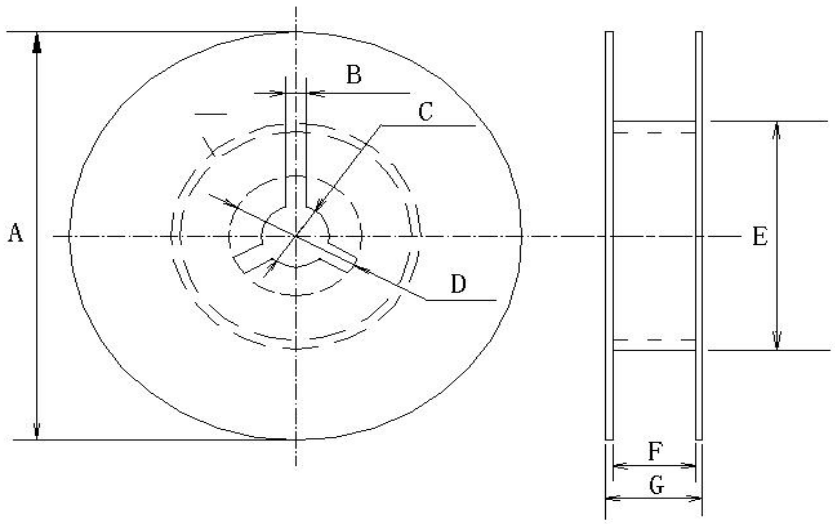
* 传送带的前后结构

Structure of leader part and end part of the carrier paper



* 卷盘尺寸

Reel dimensions (unit: mm)

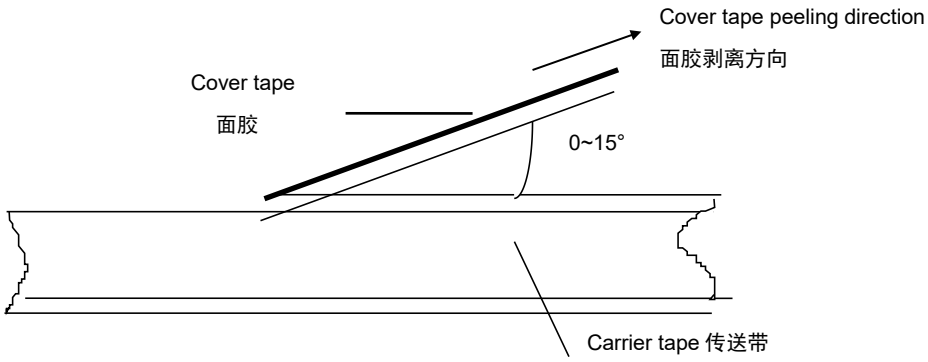


卷盘型号 Reel Code	A	B	C	D	E	F	G
7′REEL	φ178±2.0	3.0	φ13±0.5	φ21±0.8	φ50 或更大 φ50 or more	10.0±1.5	12max

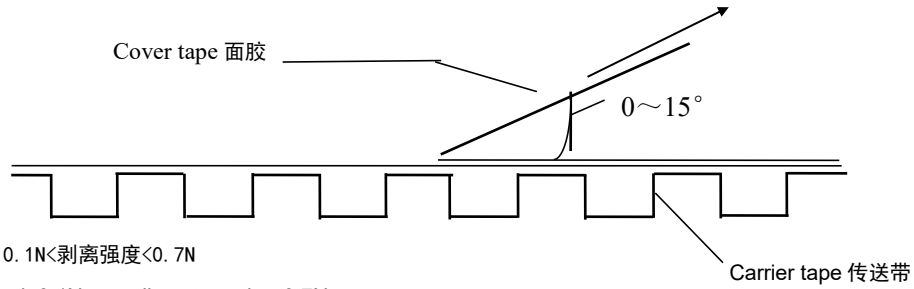
* 关于卷带的说明：面胶剥离强度

Taping specification：top tape peeling strength

* 纸带 Paper Taping



* 塑料胶盘 Embossed Taping



标准：0.1N<剥离强度<0.7N

Standard: 0.1N < 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.

* 包装数量

Packing Quantity

尺寸代码 SizeCode	厚度（T） Thickness	7 寸纸带卷盘（PT）	7 寸胶带卷盘（ET）	13 寸纸带卷盘(PT)	13 寸胶带卷盘(ET)
0402	0.50±0.05	10000	——	50000	
	0.50±0.15	10000	——	50000	
	0.50±0.20	10000	——	50000	
0603	0.80±0.10	4000	——	15000	
	0.80±0.20	4000	——	15000	
0805	0.80±0.20	4000	——	15000	——
	1.25±0.25	——	T≤1.35mm 3000 T＞1.35mm 2000	——	10000
1206	0.80±0.20	4000	——	15000	——
	1.25±0.25	——	T≤1.35mm 3000 T＞1.35mm 2000	——	10000
	1.60±0.30	——	2000	——	8000
1210	1.25±0.25	——	2000	——	8000
	1.60±0.30	——	2000	——	8000
	2.50±0.30	——	1000	——	8000
1808	1.60±0.30	——	2000	——	8000
	2.00±0.30	——	2000	——	8000
1812	1.60±0.30	——	——	——	3000
	2.00±0.30	——	——	——	3000
2211	1.60±0.30	——	500	——	——
2222	ALL		500		
2225	ALL		500		

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.

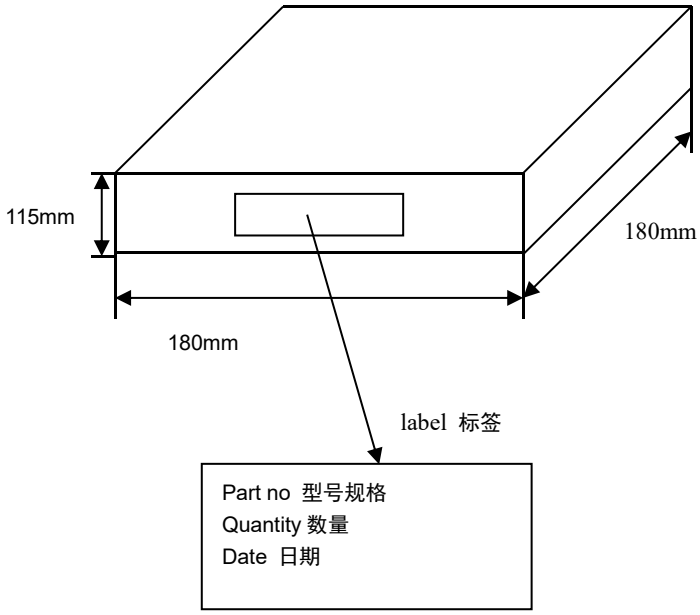
*** 外包装**

Outer packing

小包装 The first package

Quantity: 10 reels

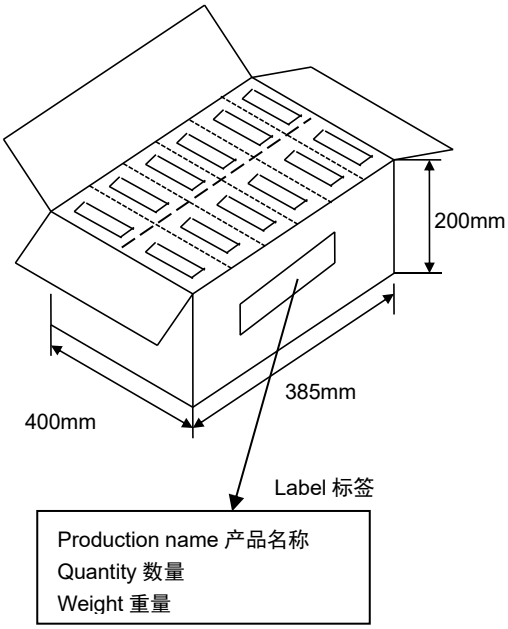
数量： 10 卷



大包装 The second package

Quantity: 6 cases

数量：6 盒



◆储存注意事项

*MLCC 的储存条件：相对湿度为 20~70%，储存温度为 5~40℃，建议温度低于 30℃。

*MLCC 的性能可能会受到储存条件的影响，交货后请立即使用。高温高湿条件、长期储存可能会导致包装材料变质、产品端头电极氧化。如自交付后已超过六个月，使用前检查包装、外观等。如果交付后超过一年，在使用前要检查可焊性。

* 不要将电容器存放在含有腐蚀性气体(例如硫化氢、二氧化硫、氯气、氨气等)的环境中。

* 不要在阳光直射下或高湿度条件下储存电容器。

◆ Storage Precautions

* Storage Conditions for MLCC: Relative humidity: 20~70%, storage temperature: 5~40℃, recommended temperature is below 30°C.

* The performance of MLCCs may be affected by storage conditions. Please use immediately after delivery. High temperature and high humidity conditions, or long-term storage, may lead to packaging material deterioration and oxidation of the product's end electrodes. If it has been over six months since delivery, check the packaging and appearance before use. If it has been over a year, check the solderability before use.

* Do not store capacitors in environments containing corrosive gases (e.g., hydrogen sulfide, sulfur dioxide, chlorine, ammonia, etc.).

* Do not store capacitors under direct sunlight or in high humidity conditions.

◆使用前注意事项

*安装前的信息

1、不要重复使用从设备上拆下的电容器。

2、确认额定容量、额定电压等电气特性。

3、确认施加电压下的电容特性。

4、确认使用下的机械应力。

5、确认长期存放的电容器的可焊性。

6、在测量电容之前，对长期存放的电容器进行热处理。

◆ Precautions Before Use

Pre-installation Information

1、Do not reuse capacitors removed from equipment.

2、Confirm electrical characteristics such as rated capacitance and rated Voltage.

3、Confirm the capacitor characteristics under applied Voltage.

4、Confirm the mechanical stress under use conditions.

5、Confirm the solderability of capacitors stored for long periods.

6、Perform heat treatment on capacitors that have been stored for a long time before measuring capacitance.

◆应用限制 Application Restrictions

1、我们的产品旨在用于一般消费电子设备(例如家用电器、办公设备、信息和通信设备，AV 设备、OA 设备、包括但不限于手机和 PC 等)，产品的设计基于正常操作和使用条件下的通用应用和标准用途。

2、不推荐用于下列高可靠性应用场景，包括但不限于：航天设备、医疗设备、航空设备、原子能设备、灾难预防设备、犯罪预防设备、电加热设备、燃烧设备、公共信息网络设备、数据处理设备、军事设备、发电控制设备、安全设备、车载设备、交通信号设备、运输设备和海底设备。

3、除非您事先获得风华的书面同意，否则风华不对您或第三方因将我们的产品用于第 2 点设备而产生的任何损害承担任何责任。

1、Our products are intended for use in general consumer electronic devices (such as household appliances, office equipment, information and communication devices, AV equipment, OA equipment, including but not limited to mobile phones and PCs), based on general applications and standard uses under normal operating and usage conditions.

2、Our products are not recommended for the following high-reliability application scenarios, including but not limited to: aerospace equipment, medical devices, aviation equipment, atomic energy equipment, disaster prevention equipment, crime prevention equipment, electric heating equipment, combustion equipment, public information network devices, data processing equipment, military equipment, power generation control equipment, safety equipment, vehicle-mounted devices, traffic signal equipment, transportation equipment, and underwater equipment.

3、Unless you have prior written consent from Fenghua, Fenghua is not liable for any damages caused to you or third parties by using our products in the devices mentioned in point 2.

* 焊接的条件与相关图表

Soldering Condition and 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).

* 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.

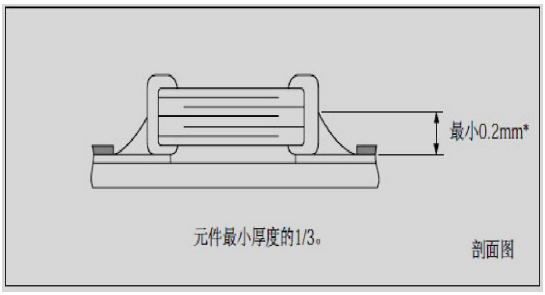
Manual soldering can pose a great risk of creating thermal cracks in capacitors. The hot soldering iron tip comes into direct contact with the end terminations, and operator’s careless may cause the tip of the soldering iron to come into direct contact with the ceramic body of the capacitor. Therefore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

* 推荐焊料用量

Recommended Soldering amounts

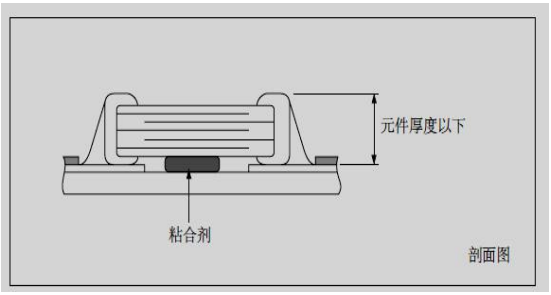
回流焊接的最佳焊料用量

The optimal solder fillet amounts for re-flow soldering



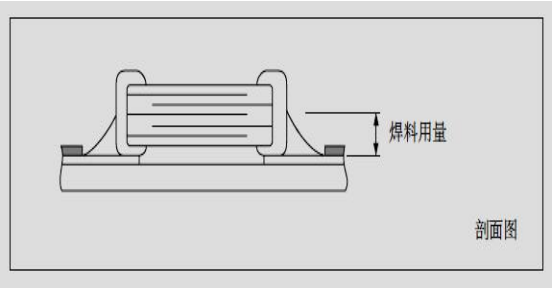
波峰焊接的最佳焊料用量

The optimal solder fillet amounts for wave soldering



使用烙铁返修时的最佳焊料量

The optimal solder fillet amounts for reworking by using soldering iron



* 推荐焊接方式

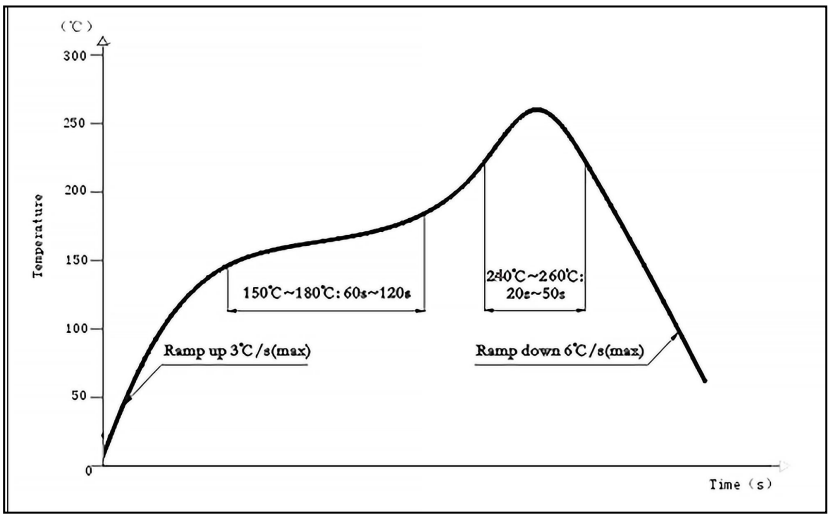
Recommended Soldering Method

规格尺寸 Size	温度特性 Temperature Characteristics	容量范围 Capacitance	焊接方式 Soldering Method
0402	X7R	/	R
0603	C0G	/	R/W
	X7R	C≥1uf	R
		C＜1uf	R/W
0805	C0G	/	R/W
	X7R	C≥4.7uf	R
		C＜4.7uf	R/W
1206	C0G	/	R/W
	X7R	C≥10uf	R
		C＜10uf	R/W
≥1210	C0G	/	R
	X7R	/	R

焊接方式 Soldering method： R—回流焊 Reflow soldering W—波峰焊 Wave Soldering

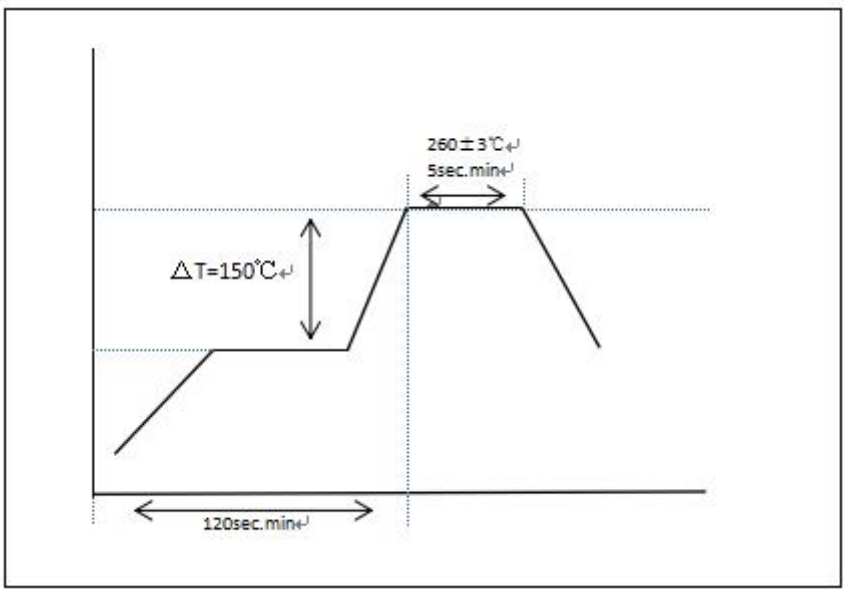
◆ 推荐焊接温度曲线图
The temperature profile for soldering

* 回流焊接（Re-flow soldering）



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≤150℃。
While in preheating,please keep the temperature difference between soldering temperature and surface temperature of chips as: T≤150℃.

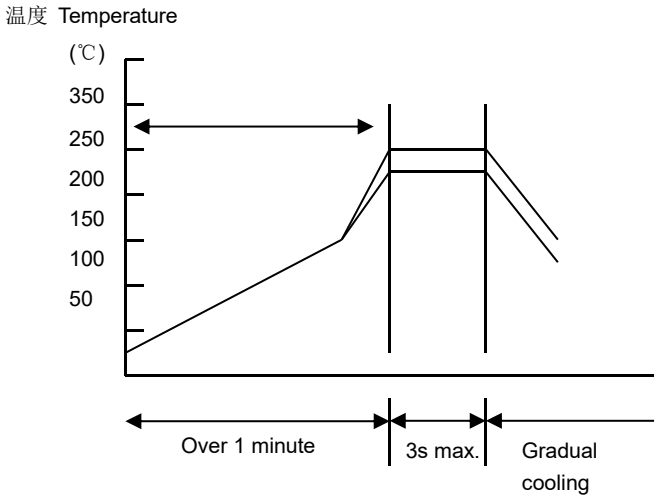
* 波峰焊接（Wave soldering）



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≤150℃。
While in preheating,please keep the temperature difference between soldering temperature and surface temperature of chips as: T≤150℃.

* 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
△≤130℃	最高 350℃ Highest temperature:350℃	最大 20W 20W at the highest	建议 1mm 1mm recommended	最长 3s 3s at the longest	≤1/2 芯片厚度 ≤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

* 备注：产品规格书仅供设计选型参考用，不作为交货依据。

Note:The product specification is for design and selection reference only and shall not serve as a basis for delivery.