■径向引线多层陶瓷电容器
Radial Lead MLCCs

◆特征 Feature

*体积小，容量大，适合自动安装的卷（编）带包装;

Miniature size, large capacitance, tape and reel packaging suitable for auto-placement.

*环氧树脂封装，从而具有优良的防潮性能、机械强度及耐热性

Epoxy resin coating creates excellent performance in humidity resistance, mechanical strength and heat resistance.

*工业生产标准尺寸及多种脚型产品.

Standard size, various lead configuration.

介质种类 Dielectric Type	I 类介质 Class I	II 类介质 Class II	
介质材料 Dielectric Material	温度补偿型 Temperature Compensating	X7R/X5R(B)	Y5V(Y/F)
电气性能 Electrical Properties	电气性能最稳定，几乎不随温度、电压和时间的变化而变化。 It is the most stable one in electrical properties and has little change with temperature, voltage and time.	具有较高的介电常数，容量可做到比 I 类电容器高，具有稳定的温度特性。 X7R material has high dielectric constant, and its capacitance is higher than class I. These capacitors are classified as having a semi-stable T.C..	介电常数最大，但温度特性较差，对温度、电压等条件较敏感。 Y5V material has highest dielectric constant. Its capacitance and dissipation is sensible to temperature and voltage.
应用 Application	适用于低损耗，稳定性要求高的高频电路，如滤波器、振动器和计时电路等。 Used in applications where low-losses and high-stability are required, such as filters, oscillators, and timing circuits so on.	适用于容量范围广，稳定性要求不高的电路中，如隔直、耦合、旁路及鉴频等电路中。 Used over a wide temperature range , such in these kinds of circuits, DC-blocking, coupling, bypassing, frequency discriminating etc.	适用于要求大容量，温度变化不大的电路中 Used over a moderate temperature range in application where high capacitance is required.
容量范围 Available capacitance range	0.5pF~0.1uF	100pF~1uF	1nF~1uF

◆应用 Application

*一般用途品.

General purpose goods

◆型号表示法 Part Number

CT4	-	0805	B	103	K	101		F3
①		②	③	④	⑤	⑥	⑦	⑧

①

产品类别 Product Type	
代号 Code	类别 Type
CC4	Ⅰ类径向引线多层陶瓷电容器 Class Ⅰ Dielectric Radial Leaded Mlcc
CT4	Ⅱ类径向引线多层陶瓷电容器 Class Ⅱ Dielectric Radial Leaded Mlcc

②

单位：英寸 UNIT: INCHES			
本体外形尺寸规格（长 x 宽） Nominal Body Size (Length x Width)			
0805	0.17x0.15	1812	0.34 ×0.26
1206	0.20x0.18	1209/1210	0.22 ×0.22

③

温度特性 Temperature Characteristics			
CG(N)	C0G(NP0)	0±30ppm/℃	（-55~+125℃）
B	X7R	±15%	（-55~+125℃）
Y/F	Y5V	-80%~+30%	(-25~+85 ℃)

④

标称容量 Nominal Capacitance
前两位数字为有效数字，后一位数字表示零的个数 First two digits are significant,and the third,digit is number of zeros .例如： For example: 104=100000pF 5R6=5.6pF

⑤

容量公差 Tolerance							
C	D	J	K	M	N	S	Z
±0.25pF	±0.5pF	±5.0%	±10%	±20%	±30%	+50%~-20%	+80%~-20%
C.D 适用 C＜10PF C.D for C＜10PF NP0:C.D.J.K.M, X7R:K.M.N,S,Z，Y5V:M,N,S.Z							

⑥

额定电压 Rated Voltage
前两位数字为有效数字，后一位数字表示零的个数 First two digits are significant,and the third,digit is number of zeros .例如： For example: 500=50V,250=25V

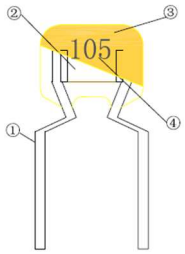
⑦

包装方式 Packaging Style		
编带 Tape	P	盒带包装 Ammo
	T	卷带包装 Reel
散包装 Bulk	空白 Blank	

⑧

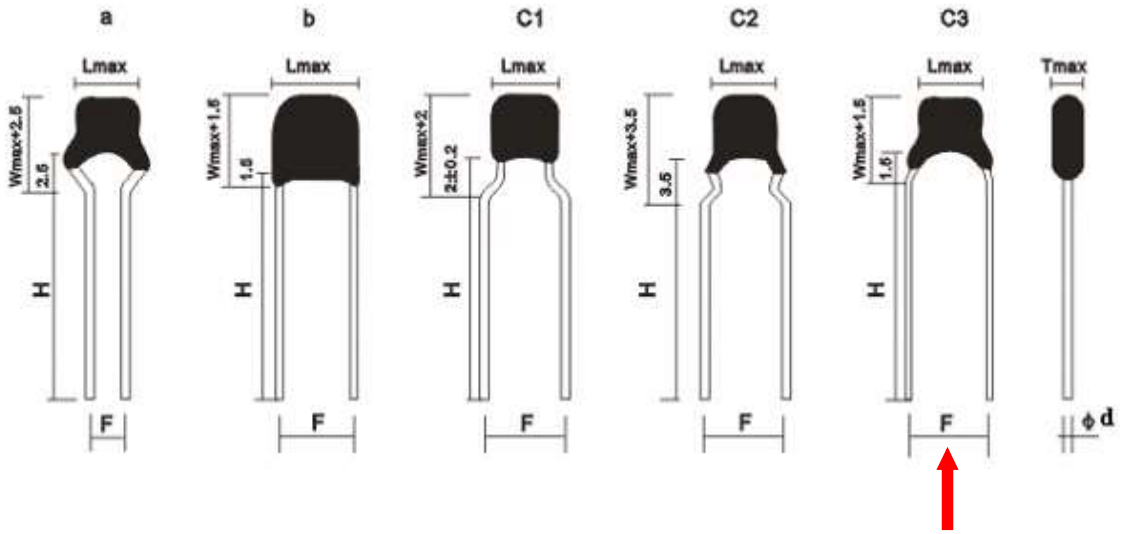
脚距（单位：mm） Lead Space (Unit: mm)	
F1	2.54
F2	4.57
F3	5.08

◆产品结构 Product Structure



序号 No.	部位 Component
1	引线 Lead wire
2	芯片Chip
3	涂层Coating
4	标记m ark

◆尺寸、工作电压、容量关系表 Size code, capacitance and voltage



尺寸规格 Size code	外形 Shape	尺寸（单位：mm） Dimensions (Unit: mm)						工作电压 Voltage	标称容量范围 Available Capacitance Range		
		F ±0.5	H ±1.0	L max	W max	T max	Φd ±0.1		C0G (NP0)	X7R	
0805	a b c1 c2 c3	2.54 2.54 5.08 5.08 5.08	5 10 25	4.2	3.8	3.8	0.50	50 63 100 250 500	0R5~222 0R5~222 0R5~102 0R5~821 0R5~391	101~105 101~105 101~104 101~223 101~103	102~105 102~105 / / /
1206	b C1 C2	2.54 5.08 5.08	5 10 25	5.5	4.5	3.8	0.50	50 63 100 250 500	0R5~472 0R5~472 0R5~332 0R5~152 0R5~102	101~225 101~225 151~105 221~333 151~223	102~105 102~105 / / /
1209/1210	C1	5.08	10	5.5	5.5	3.8	0.50	50 63 100 250 500	100~103 100~103 100~682 100~332 100~202	471~105 471~105 151~105 151~104 151~333	472~155 472~155 / / /
1812	b	4.57	10	8.5	6.5	3.8	0.50	50 60 100 250 500	100~103 100~103 100~103 100~562 100~103	471~225 471~225 270~105 151~154 151~104	103~225 103~225 / / /

*其它规格可直接和我们联系。Others are available, contact FH.

◆可靠性测试方法 Reliability Test Method

<table>
<tr><td>项目
Item</td><td colspan="2">技术要求
Technical Specification</td><td colspan="3">测试方法和备注
Test Method and Remarks</td></tr>
<tr><td rowspan="5">容量
Capacitance
(C)</td><td rowspan="3">I 类
Class I</td><td rowspan="3">应符合指定的误差级别
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>C≤1000pF</td><td>1MHZ±10%</td><td rowspan="2">1.0±0.2V</td></tr>
<tr><td>C＞1000 pF</td><td>1KHZ±10%</td></tr>
<tr><td rowspan="3">II 类
Class II</td><td rowspan="3">应符合指定的误差级别
within the specified
tolerance.</td><td>额定电压
Nominal voltage</td><td>测试频率
Measuring Frequency</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td>UR＞6.3V</td><td>1KHZ±10%</td><td>1.0±0.2V</td></tr>
<tr><td>UR≤6.3V</td><td>1KHZ±10%</td><td>0.5±0.2V</td></tr>
<tr><td rowspan="5">损耗角正切
Dissipation
Factor
(DF)</td><td rowspan="2">I 类
Class I</td><td colspan="2" rowspan="2">C≥50pF
DF≤0.15%
C＜50pF
DF≤1.5[(150/C)+7] X10^{-4}</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±0.2V</td></tr>
<tr><td rowspan="3">II 类
Class II</td><td>B</td><td>DF ≤3.5%</td><td>＞1000 pF</td><td>1KHZ±10%</td></tr>
<tr><td>测试频率
Measuring
Frequency</td><td>额定电压
Nominal voltage</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td rowspan="2">Y(F)</td><td rowspan="2">≤7.5%(C≤ 0.1uF)
≤10.0%
(1uF ＞ C＞0.1uF)
≤15% (C≥1uF)</td><td>1KHZ±10%</td><td>UR＞6.3V</td><td>1.0±0.2V</td></tr>
<tr><td>1KHZ±10%</td><td>UR≤6.3V</td><td>0.5±0.2V</td></tr>
<tr><td rowspan="2">绝缘电阻
Insulation
Resistance</td><td>I 类
Class I</td><td colspan="2">C≤10nF
IR≥10000MΩ
C>10nF
R. C≥100 ΩF</td><td colspan="3" rowspan="2">测试电压:额定电压
Measuring Voltage: Rated Voltage
测试时间: 60±5 秒
Duration: 60±5s</td></tr>
<tr><td>II 类
Class II</td><td colspan="2">C≤25nF
IR≥4000MΩ
C>25nF
R.C≥100 ΩF</td></tr>
</table>

项目 Item	技术要求 Technical Specification	测试方法和备注 Test Method and Remarks
耐电压 Withstandi-ng Voltage	不应有介质被击穿或损伤 No breakdown or damage.	端子间 Between terminals： 测试电压 Measuring Voltage ： Ⅰ类: Vr＜100V 300%额定电压 Vr＜100V300%Rated voltage 100V≤Vr＜500V 200%额定电压 100V≤Vr＜500V200% Rated voltage Ⅱ类: Vr＜100V 300%额定电压 Vr＜100V 300%Rated voltage 100V≤Vr＜500V 200%额定电压 100V≤Vr＜500V 200% Rated voltage 500V≤Vr＜1000V 150%额定电压 500V≤Vr＜1000V 150% Rated voltage 持续时间：5±1 秒 Duration: 5±1s 充/放电电流不应超过 50mA The charge/ discharge current is less than 50mA.
可焊性 Solder ability	上锡率应大于 95% Lead wire shall be at least 95% covered with a new solder coating.	将电容器引线浸入含有 25%松香的酒精溶液中 5-10 秒，然后浸入温度为: 245±5℃的金属焊锡（Sn-3Ag-0.5Cu）中 2.5(+0.5,-0.5)秒，注意：电容器本体底面距离锡面约 1.5~2mm。 The lead wire of capacitor is dipping into a 25% rosin solution of ethanol for 5s-10s and then into molten solder(Sn-3Ag-0.5Cu ）of 245±5℃ for 2.5(+0.5,-0.5)s. In both cases the depth of dipping is up to about 1.5~2mm from the terminal body.

<table>
<tr><th>项目
Item</th><th colspan="2">技术要求
Technical Specification</th><th>测试方法和备注
Test Method and Remarks</th></tr>
<tr><td rowspan="5">耐焊接热
Resistance to Soldering Heat</td><td>项目
Item</td><td>ΔC/C≤</td><td rowspan="5">锡温：260 ±5℃时间：10±1 s
Solder temperature: 260 ±5℃ Duration: 10±1 s
浸入条件：将电容器插入厚度为 1.6mm，孔径为 1.0mm 的 PC 板。
Immersed conditions: Inserted into the PC board (with t=1.6mm, hole=1.0mm diameter)
对于 I 类介质，试验后，应在标准条件下恢复 24±2 小时后才测试。
Recovery: For class I, 24±2 hours of recovery under the standard condition after test.
对于 II 类介质，在试验前应先进行如下预处理： 150(-10, +0) ℃，1 小时，接着在标准条件下恢复 48 ±4 小时。
Preconditioning（Class II）: 1 hour of preconditioning at 150(-10,+0) ℃, followed by 48 ±4 hours of recovery under the standard condition.
恢复：对于 II 类介质试验后，应在标准条件下恢复 48 ±4 小时后才测试。
Recovery（ Class II） : 48 ±4 hours of recovery under the standard condition after test.</td></tr>
<tr><td>Class I</td><td>± 2.5%
or ± 0.25pF
Whichever is lager</td></tr>
<tr><td>B</td><td>±10%</td></tr>
<tr><td>Y(F)</td><td>±20%</td></tr>
<tr><td colspan="2">外观无可见损伤
No significant abnormality in appearance.</td></tr>
<tr><td>耐湿负荷
Dampheat load</td><td colspan="2">△C/C：
I 类介质 Class I：
-3%≤ΔC/C≤+ 3% or ± 0.1 pF，取较大值 whichever is greater。
II 类介质 Class II：
X7R(B)：-10%≤ΔC/C≤+ 10%；

DF:
I 类介质 Class I：
小于原始值的两倍 Less than twice the original value.
II 类介质 Class II：
X7R(B)：≤ 5.0%

IR ：≥ 500MΩ or 25 Ω.F，取较小值 Take the smaller value。

外观 Appearance：
无可见损伤 No visible damage</td><td>电压：额定电压
温度： T=（40±2）℃ ；
相对湿度：RH=（90～95）%；
持续时间：t=（500～524）h；
恢复时间：
I 类介质 I ：（24 ±2）小时 hours；
II 类介质：（48 ±4）小时 hours；
Voltage: rated voltage
Temperature: T=(40 ± 2) ℃;
Relative humidity: RH=(90-95)%;
Duration: t=(500~524) h;
Recovery time:
Class I : (24 ± 2) hours;
Class II : (48 ± 4) hours;</td></tr>
</table>

项目 Item	技术要求 Technical Specification	测试方法和备注 Test Method and Remarks
振动 Vibrate	△C/C： Ⅰ类介质 Class Ⅰ： Class Ⅰ： -3%≤ΔC/C≤+ 3% or ± 0.1 pF，取较大值 whichever is greater。 Ⅱ类介质 Class Ⅱ： X7R(B)：-10%≤ΔC/C≤+ 10%； DF: Ⅰ类介质 Class Ⅰ： 小于原始值的两倍 Less than twice the original value. Ⅱ类介质 Class Ⅱ： X7R(B)：≤ 5.0% IR ：≥ 500MΩ or 25 Ω.F，取较小值 Take the smaller value。 外观 Appearance： 无可见损伤 No visible damage	振幅 0.75mm 或加速度 98m/s2,取振幅较低者。选取下列频率范围之一 10Hz～55Hz；10Hz～100Hz 和 10Hz～2000Hz。总持续时间为 6h。 对于轴向引出并预定只用引线安装时的电容器，其本体与引线安装点之间的距离应为 6mm±1mm。 The amplitude is 0.75mm or the acceleration is 98m/s2, whichever is lower. Selectone of the following frequency ranges; 10Hz~55Hz; 10Hz to 100Hz and 10Hz to 2000Hz. The total duration is 6 hours. For capacitors with axial lead out and intended to be installed with only leads, the distance between their body and the lead installation point should be 6mm ± 1mm.
气候顺序 Climatic sequence		干热：（C0G/X7R）125℃， （Y5V）85℃，持续时间 16h； 循环湿热：条件：试验 Db（交变湿热）温度：+55 ℃，循环周期：1 个周期（24h）； 寒冷：（C0G/X7R）-55 ℃，（Y5V）-25 ℃，持续时间：2h 循环湿热：条件：试验 Db（交变湿热）温度：+55 ℃，循环周期：1 个周期（24h）； 恢复时间：Ⅰ类介质：（24±2）小时，Ⅱ类介质：（48±4）小时 Dry heat: (C0G/X7R) 125 ℃, (Y5V) 85 ℃, lasting for 16 hours; Cyclic damp heat: Condition: Test Db (alternating damp heat) Temperature:+55 ℃, Cycle cycle: 1 cycle (24 hours); Cold: (C0G/X7R) -55 ℃, (Y5V) -25 ℃, duration: 2 hours Cyclic damp heat: Condition: Test Db (alternating damp heat) Temperature:+55 ℃, Cycle cycle: 1 cycle (24 hours); Recovery time: Class I: (24 ± 2) hours, Class II: (48 ± 4) hours Dry heat: (C0G/X7R) 125 ℃, (Y5V) 85 ℃, lasting for 16 hours; Cyclic damp heat: Condition: Test Db (alternating damp heat) Temperature:+55 ℃, Cycle cycle: 1 cycle (24 hours); Cold: (C0G/X7R) -55 ℃, (Y5V) -25 ℃, duration: 2 hours Cyclic damp heat: Condition: Test Db (alternating damp heat) Temperature:+55 ℃, Cycle cycle: 1 cycle (24 hours); Recovery time: Class I media: (24 ± 2) hours, Class II media: (48 ± 4) hours

<table>
<tr><td>项目
Item</td><td>技术要求
Technical Specification</td><td colspan="2">测试方法和备注
Test Method and Remarks</td></tr>
<tr><td rowspan="4">高温负荷
High Temperature Loading Test</td><td rowspan="4">容量变化 Capacitance Change:
I 类介质 Class I:
≤ ±3% or ±0.3pF 取较大值 Whichever is larger.
II 类介质 Class II:
B:≤ ±12.5%
Y(F): ≤ ±30%
损耗角正切 Dissipation Factor:
I 类介质：小于原始值的两倍
Class I：Not more than twice of initial value.
II 类介质 Class II：
B: ≤ 5.0%
Y(F): ≤12.5% (CR ≤ 0.1uF)
≤15.0%(1uF ＞ CR ＞ 0.1uF)
≤17.5% (CR ≥1uF)
绝缘电阻 Insulation Resistance:
≥ 500MΩ or 25 Ω.F 取较小值 Whichever is smaller
外观无可见损伤 No significant abnormality in appearance.</td><td colspan="2">温度
Temperature</td></tr>
<tr><td>CG（N）</td><td>X7R(B)</td><td>Y5V(Y/F)</td></tr>
<tr><td>125(-0,+3)℃</td><td colspan="2">85(-0,+3) ℃</td></tr>
<tr><td colspan="2">电压：1.5 倍额定电压
Applied voltage: 1.5 times rated voltage
充放电流不超过 50mA
The charge/ discharge current is less than 50mA.
时间：1000（-0，+48）小时
Duration: 1000（-0，+48）hours
恢复时间：
Recovery Time：
I 类介质：24 ±2 小时，
Class I Dielectric : 24 ±2 hours
II 类介质；48 ±4 小时
Class II Dielectric: 48 ±4 hours</td></tr>
<tr><td rowspan="2">端头强度
Terminal Strength</td><td>抗拉强度
Tensile Strength</td><td rowspan="2">无引线断裂或松动等可见不良。
No abnormality such as cut lead or looseness.</td><td colspan="2">固定电容器本体，沿引线方向逐步施加拉力直至 10N，然后保持 10 ±1 秒。
Fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N, and then keeping the force for 10 ±1 sec.</td></tr>
<tr><td>弯折强度
Bending Strength</td><td colspan="2">对电容器引出端施加一 2.5N 的力，使引线弯曲 90 度，持续 5 秒，然后使引线回到原始位置，接着反方向操作一次为一个循环，共重复 2 次。
Each lead wire shall be subjected to a force of 2.5N and then be bent a angle of 90 degree then returned to initial position. This operation is done over a period of 5 sec. Then second bend in the opposite direction shall be made, repeat 2 times.</td></tr>
</table>

*以上所示“标准条件”解释如下：温度：5~35℃，相对湿度：40%RH～85%RH，

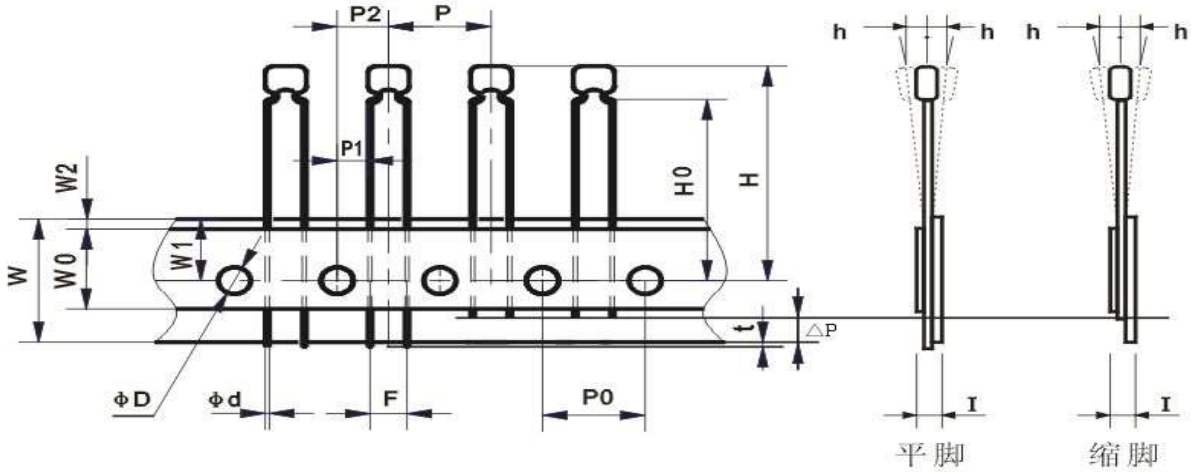
* Note on standard condition: " standard condition " referred to herein should be defined as follows:

5 to 35℃ of temperature, 45 to 75% of relative humidity, and 86 to 106kPa of atmospheric pressure.

* 若测试结果有争议时，仲裁试验用标准大气条件为：温度：25±1℃，相对湿度：48%~52%，

* When there are questions concerning measurement results:In order to provide correlation data, the test should be conducted under a condition of 25 degrees plus/minus 1 centigrade of temperature, 48% through 52% of relative humidity

◆包装 Packaging



代号 Code	P	P0	P1	P2	d	△ h	W	W0	W1	W2	H	H0	I	D	t	△P
尺寸 Dim.	12.7	12.7	3.85 5.1	6.35	0.5 0	0	18.5	6~ 10	9	1.5	32.25	16 19.5	1.42	4.0	0	0≤P<12
误差 Tol.	± 1.0	± 0.2	± 0.7	± 1.3	± 0.1	± 1.0	± 1.0	± 1.0	± 0.5	± 1.5	Max.	± 1.0	Ma x	± 0.2	Max	

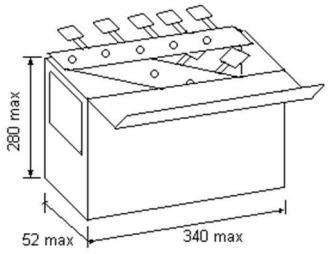
*注意 Note：

P1=3.85mm for F=5.08mm；P1=5.1mm for F=2.54mm.

Ammo Packaging/Tape and Reel Packaging: H0＝16±1mm（Pin size 7mm）

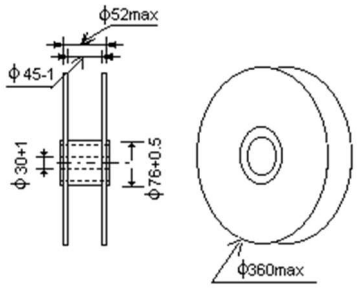
H0＝19.5±1mm （Pin size 7mm）

*盒带包装 Ammo Packaging



*卷带包装

Tape and Reel Packaging



＊ 包装数量

Packaging Quantity

尺寸规格 Size Code	散包装 Bulk		盒带包装 Ammo	卷带包装 Tape and Reel
	pin≤25mm	pin>25mm		
0805	1000pcs	500pcs	2500pcs	4000pcs
1206	1000pcs	500pcs	2000pcs	2000pcs
1209/1210	1000pcs	500pcs	2000pcs	2000pcs
1812	1000pcs	500pcs	1000pcs	1000pcs

◆推荐焊接条件 Recommended Soldering Conditions

*本产品建议使用波峰焊接法。

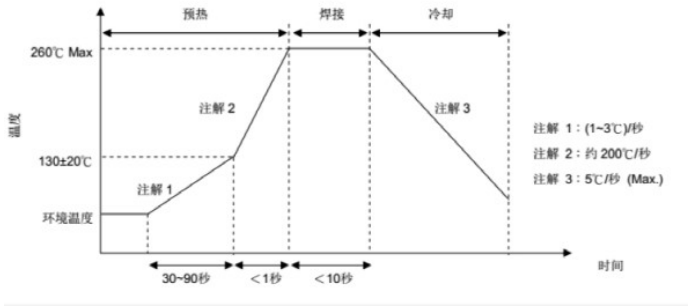
Applicable soldering process to the products is reflow soldering.

*在焊接安装时，产品本体至焊接点距离，请预留 1.5mm Min。

During welding and installation, please reserve 1.5mm Min from the product body to the welding point

* 焊接曲线

Soldering Profile



*烙铁焊接 Soldering Iron

使用烙铁进行返修时要求在 150℃下预热至少 1 分钟，不能直接用焊头接触磁体，返修焊接条件如下：

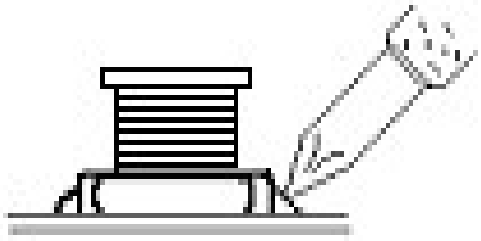
Reworking with Sodering Iron must preheating at 150℃ for 1 minute is required, and do not directly touch the core with the tip of the soldering iron. The reworking soldering conditions are as follows:

烙铁头温度：Temperature of soldering iron tip: 350℃;

烙铁输出功率：Soldering iron power output: 30W max.

烙铁头直径：≤1.0mm Diameter of soldering iron end: 1.0mm max.

焊接时间：Soldering time: within 3 sec.



◆贮存方法 Storage Methods

*存储期限 Storage Period

为保证端子电极的焊接特性和包装材料处于良好状态，请于本公司发货后 6 个月内使用本产品。同时，由于端子电极的焊接特性会随时间发生变化，如果贮存时间超过 6 个月，请首先确认其焊接特性后再安装使用。

To maintain the solderability of terminal electrodes and to keep the packing material in good condition, product should be used within 6 months from the time of delivery. And the solderability of products electrodes may decrease as time passes, so in case of storage over 6 months, solderability shall be checked before actual usage.

*存储条件 Storage conditions

存放货物的仓库应满足以下条件:The warehouse must meet with the following condition:

温度(Temperature): Inductors (product with taping):(+5~+35)℃;

相对湿度(Humidity): (40~85)%RH.

*禁止将产品保管在腐蚀性物质中，如硫磺、氯气或酸，否则将引起端头氧化，导致降低焊接性。Don’t keep products in corrosive gases such as sulfur, chlorine gas or acid , or it may case oxidization of Electrodes resulting in poor solder ability.

*为了避免受潮气、灰尘等物质的影响，产品应保管于货架上。

Products should be storaged on the palette for the prevention of the influence from humidity, dust and so on.

*产品保管在库房中，应避免热冲击、振动以及直接光照等等。

Products should be storaged in the warehouse without heat shock, vibration, direct sunlight and so on.

*产品应密封包装。

Products should be storaged under the airtight packaged condition.

◆使用注意事项 Precautions For Use

*本公司产品适用于 AV 设备、OA 设备、家电、信息服务等一般电子设备中。

Our products are designed and promoted for use in general electronic devices such as audio-video equipment, office automation equipment, home appliance and information service.

*当本公司的产品使用在一般电子设备以外的领域时，对于此所引发的设备失效我司将不承担任何法律责任。

In case of using the product for the purpose other than general electronics devices, we shall not be held liable for any dysfunctions in or damage to the equipment with which the product is used.

*本承认书只保证我司产品作为一个单体时的质量情况，当我司产品被安装到贵司产品上时，请贵司对使用在贵司电路上的产品情况进行了有效评价和确认。

Our specification limits the quality of the component as a single unit. Please ensure the component is thoroughly evaluated in your application circue.

*不要对产品施加过大的振动或机械冲击；

Do not apply excessive vibration or mechanical shock to products.

*为防止断线，请不要使用锋利的物体接触线圈，如镊子

Do not touch wire with sharp objects such as tweezers to prevent wire breakage.

在产品贴装时不要使用过大的压力，避免磁芯断裂。

Do not apply excessive stress to products mounted on boards to prevent core breakage

■修改履历 Revision History

版本 Version No.	日期 Date	修订内容 Modify Details	修订人 Reviser
A0	2025-4-25	首次发行	

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Note: The above content is the specification of products, Fenghua reserves the right to modify this content without prior notice, and any product changes will be notified to customers via PCN.