Dersonic®
德信立業 創新開拓

圆板陶瓷电容器规格承认书

APPROVAL SPECIFICATION FOR DISC CERAMIC CAPACITORS

客户 CUSTOMER	立创		
客户料号 CUSTOMER P/N			
客户规格描述 CUST. DESCRIPTION			
规格描述 DESCRIPTION	3KV/331/M/F7.5/直脚/L24/环氧(蓝)/Y5P(Ⅱ)/4G/0MF		
产品编码 PART NUMBER	CC3F331MD1IEB44G60MF		
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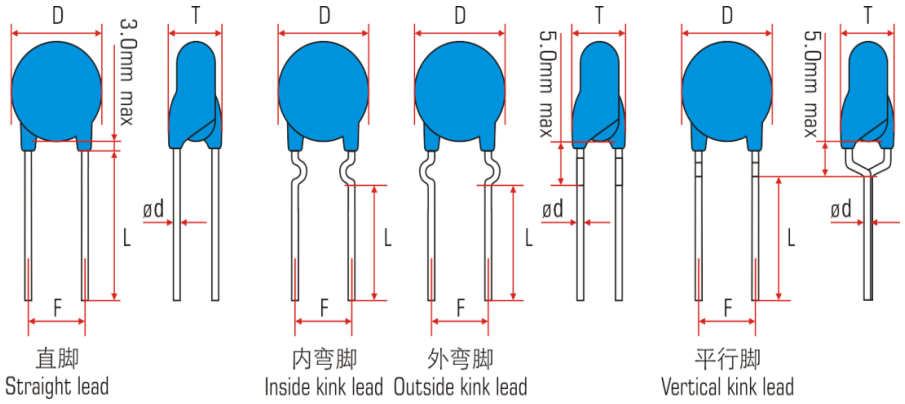
1. 规格表
DATA SHEET



产品编码 Part number		CC3F331MD1IEB44G60MF
规格描述 Description		3KV/331/M/F7.5/直脚/L24/环氧(蓝)/Y5P(Ⅱ)/4G/0MF
客户料号 Customer P/N		
介质类别 Dielectric class		Class 2
额定电压 Rated voltage		3KVdc
电容量 Capacitance		330pF ±20% @ 1kHz 1.0V 25ºC
损耗角正切 Tangent of loss angle		0.035 max @ 1kHz 1.0V 25ºC
耐电压 Testing voltage		4500Vdc (Charge/discharge 2mA max) 3s PASS
绝缘电阻 Insulation resistance		4 000MΩ min @ 500V 60s, RH≤70%
温度特性 Temperature characteristics		Y5P(Ⅱ) ΔC/C: ±10% @ -25ºC~85ºC; +10%/-40% @ +85ºC~125ºC
尺寸 DIMENSIONS	D (Diameter)	4.8mm+2.0/-0.3mm
	T (Thickness)	3.5mm±0.8mm
	F (Lead spacing)	7.5mm±0.8mm
	L (Lead length)	24mm±4.0mm
	ød (Lead diameter)	0.6mm max
	C (Coating rundown on leads)	3.0mm max
标志 Marking		⊖Ⓦ 331 3KV

2. 总则
GENERAL

1) 本规格书适用于额定电压不超过直流10kV的电子设备用高介电常数型圆板陶瓷电容器。
This specification applies to the high dielectric constant type disc ceramic capacitors for the electronic equipment with a rated voltage not exceeding 10k VDC.

2) 高介电常数型瓷介电容器是是适用于作旁路、耦合或用在对损耗和电容量稳定性要求不高的电路中的具有高介电常数的一种电容器。
Capacitor which has a dielectric with a high permittivity and is suitable for by-pass and coupling applications or for frequency discriminating circuits where low losses and high stability of capacitance are not of major importance.

该类陶瓷介质是以在类别温度范围内电容量非线性变化来表征。
The ceramic dielectric is characterized by the non-linear change of capacitance over the category temperature range.

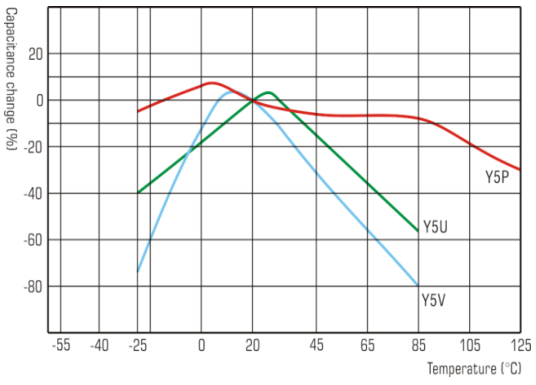
表 — 温度特性表
Table – Temperature characteristics chart

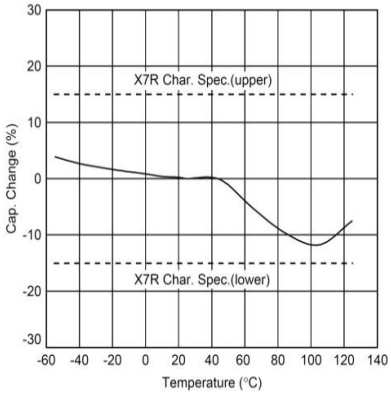
表中用X表示的施加和不施加直流电压时的电容量温度特性优先值，还给出了表示等级代码的方法；例如温度范围在-55℃～+125℃，不施加直流电压时电容量变化为±20%的介质被称为2C1级介质。
Table denotes with a cross the preferred values of temperature characteristics with and without d.c. voltage applied. The method of coding the subclass is also given; for example a dielectric with a percentage change of ±20% without d.c. voltage applied over the temperature range from -55°C to +125°C, will be defined as a dielectric of Class 2C1.

等级字码 代码 Subclass letter code	施加和不施加直流电压时，在类别温度范围内，相对于20°C时测得的电容量最大相对变化(%) Maximum capacitance change in percent within the category temperature range with respect to the capacitance at 20°C measured with and without a d.c. voltage applied		类别温度范围和对应的数字代码 Category temperature range and corresponding number code				
			-55°C/ +125°C	-55°C/ +85°C	-40°C/ +85°C	-25°C/ +85°C	+10°C/ +85°C
	不施加直流电压 Without d.c. voltage applied	施加直流电压* With d.c. voltage applied *	1	2	3	4	5
2B	±10	按相关规范规定 As specified in the specification		X	X	X	
2C	±20		X	X	X		
2D	+20/-30					X	
2E	+22/-56			X	X	X	X
2F	+30/-80			X	X	X	X
2R	±15		X				
2X	±15	+15/-25	X				

*: 施加直流电压是额定直流电压或按有关规范的规定。
The applied voltage is the rated d.c. voltage or as specified in the specification.

■ 几种常见的温度特性曲线图，如下图所示。
Several common temperature characteristic curve, as shown below.





3) 符合RoHS 2.0
Complies with RoHS 2.0

3. 适用标准
APPLICABLE STANDARD

本产品符合下列标准，且本规格书的相关内容引用以下标准，当双方对此存在争议时，可依以下标准进行仲裁。

This product complies with the following standards, and the relevant content of this specification refers to the following standards, when the two sides in dispute, the following criteria for arbitration.

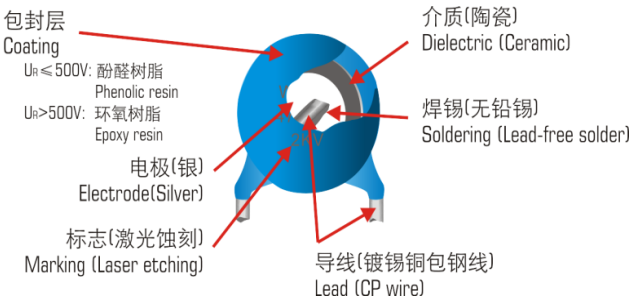
GB/T 2693-2001 电子设备用固定电容器 第1部分 总规范(IDT IEC 60384-1)
Fixed capacitors for use in electronic equipmen — Part 1: Generic specification (IDT IEC 60384-1)

GB/T 5968-2011 电子设备用固定电容器 第9部分 分规范 2类瓷介固定电容器(IDT IEC 60384-9)
Fixed capacitors for use in electronic equipmen — Part 9: Sectional specification: Fixed capacitors of ceramic dielectric, Class 2 (IDT IEC 60384-9)

4. 结构
STRUCTURE

本产品结构如下图所示，外部包封层为环氧树脂（蓝色）或酚醛树脂（土黄色），内部介质为陶瓷，银电极，导线为镀锡铜包钢线，电极与导线采用无铅锡焊接而成，经过激光打标而成。

The structure of this product is shown in the following figure, external coating layer to epoxy resin (blue) or phenolic resin (yellowish), internal dielectric for ceramics, silver electrodes, lead wires for tin-plated copper clad steel wire, electrodes and lead wires using lead-free tin soldering, through laser marking.



5. 特性
GENERAL SPECIFICATIONS

工作温度范围 Operating temperature range	Y5U, Y5V: -25°C to +85°C; Y5P: -25°C to +125°C X7R: -55°C to +125°C
电容量 Capacitance (C_R)	100pF to 0.1uF 在25±1°C下使用1kHz 1.0Vrms进行测量，在允许偏差范围内。 Measured at 1kHz, 1.0Vrms and 25°C±1°C, within the specified tolerance.
损耗角正切 (tanδ) Tangent of loss angle (tanδ)	0.035 max
额定电压 Rated Voltage (U_R),DC	50V to 6 300V 在两导线间施加下列电压无异常，时间1s到5s（充/放电流小于5mA）： The capacitor should not be damaged when the following voltage is applied between the lead wires for 1 to 5 sec (Charge / Discharge current ≤5mA). ≤500V，$2.5U_R$ >500V，$1.5U_R$
绝缘电阻 Insulation resistance (IR)	4 000MΩ min 施加额定电压(额定电压大于500V时，使用500V)进行测量，时间不超过1分钟。 The insulation resistance should be measured with a DC voltage not exceeding the rated voltage (above 500V rated voltage tested by 500V) at normal temperature and humidity and less than 1 min. of charging.
温度特性 Temperature characteristic	Y5P, Y5U, Y5V, X7R etc.

6. 产品编码

PART NUMBER

本公司产品编码方式，举例说明如下：

The product part number representation of the company, examples are as follows：

CC	**3F**	**331**	**M**	**D1**	**I**	**E**	**B4**	**4G6**	**0MF**
系列 Series	额定电压 Rated voltage	标称容量 Nominal capacitance	容量偏差 Capacitance tolerance	引线成型方式 Leads format	编带包装或脚长 Taping packing or Leads length	包封材质 Coating material	温度系数 Temperature coefficient	生产识别码 Production identification code	标志 Marking

■ 系列 Series

CC: 圆板陶瓷电容器 Disc ceramic capacitors

■额定电压 Rated voltage

1H: 50V	3A: 1kV	3G: 4kV	3K: 8kV
2A: 100V	3D: 2kV	3H: 5kV	
2H: 500V	3F: 3kV	3I: 6kV	

■标称容量 Nominal capacitance

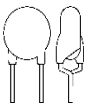
用3位数表示，单位pF。如下所示：
In 3 digits, unit is pF, as shown in below:
331: 330pF

■容量偏差 Capacitance tolerance

C: ±	J: ±5%	S: +50%/-20%
D: ±	K: ±10%	Z: +80%/-20%
	M: ±20%	P: +100%/-0%

■引线成型方式 Leads format

代码 Code	脚距 Leads spacing
A	2.54mm
C	5.08mm
D	7.50mm
E	10.0mm

代码 Code	1	2	4	5	7
脚型样式 Leads style drawing					

■编带包装或脚长 Taping packing or Leads length

● Taping
T: Reel packing
P: Ammo packing

● Bulk (Leads length)

4: 3.5mm	9: 6.0mm	E: 16.0mm	I: 24.0mm
6: 4.0mm	A: 8.0mm	F: 18.0mm	
8: 5.0mm	B: 10.0mm	G: 20.0mm	

■包封材质 Coating material

D: 酚醛（黄） Phenolic (Yellow)
E: 环氧（蓝） Epoxy (Blue)

■温度系数 Temperature coefficient

如“温度系数表”（页码4）
See "Temperature coefficient (α) chart" (P4)
B4: Y5P E4: Y5U F4: Y5V R1: X7R

■生产识别码 Production identification code

内部控制码，本规格书不作说明。
Inteer control code will not be described in this an approval specifications.

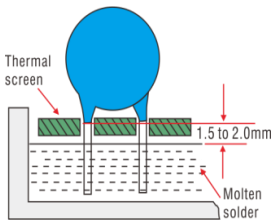
■标志 Marking

见规格表最后一栏
See the last column of the Data sheet

7. 测量和试验
MEASUREMENT AND TEST

序 No.	项目 Item	标准 Specifications	试验方法 Testing Method
1	工作温度范围 Operating temp. range	Y5U, Y5V: -25ºC - +85ºC Y5P: -25ºC - +125ºC X7R: -55ºC - +125ºC	
2	额定电压 Rated voltage (U_R)	见"规格表"（页码3） See "Data sheet" (P3).	额定电压是指在工作温度范围内，可连续施加在电容器上的最大直流电压或最大交流电压有效值或脉冲电压的峰值。 当交流电压附加于直流电压时，Vp-p或Vo-p（以较大者为准）应维持在额定电压范围内。 The rated voltage is defined as the maximum voltage which may be applied continuously to the capacitor within the operating temperature range. When AC voltage is superimposed on DC voltage, Vp-p or Vo-p, whichever is larger, should be maintained within the rated voltage range.
3	外观与尺寸 Appearance (APP) and Dimension	外观形状没有明显的缺点，尺寸在标准范围内。 No marked defect on appearance form and dimensions are within specified range.	电容必须用目视检查其明显的缺点。 The capacitor should be visually inspected for evidence of defect. 尺寸用游标卡尺测量。 Dimensions should be measured with slide calipers.
4	标志 Marking	清晰易于识别。 To be easily legible.	目视检查。 The capacitor should be visually inspected.
5	容量 (C_R) Capacitance (C_R)	在误差范围内。 Within specified tolerance	容量与tanδ在25±1°C下，使用1kHz和1Vrms下测量。 The capacitance, tanδ should be measured at 25°C±1°C with 1kHz and 1.0V (r.m.s.).
6	损耗角正切(tanδ) Tangent of loss angle (tanδ)	0.035 max	
7	绝缘电阻 Insulation Resistance (IR)	>4 000MΩ	在两导线间施加额定电压(额定电压大于500V时，使用500V)进行测量，时间不超过1分钟。 The insulation resistance should be measured with a DC voltage not exceeding the rated voltage (above 500V rated voltage tested by 500V) at normal temperature and humidity and less than 1 min. of charging.
8	耐电压 Testing Voltage (TV)	没有不合格 No failure.	在电容器两导线间施加下列测试电压1到5s后不被破坏（充/放电流不大于5mA）。 The capacitor should not be damaged when test voltages of below are applied between the lead wires for 1 to 5 sec. (Charge/Discharge current ≤ 5mA) ≤500V， $2.5U_R$ >500V， $1.5U_R$
9	导线抗张强度 Terminal Tensile Strength	引线不应断开，电容器不应破裂。 Lead wire should not be cut off capacitor should not be broken.	固定住电容器，在引线上逐步施加径向拉力直至10N，并保持10±1秒钟。 Fix the body of the capacitor and apply a tensile weight gradually to each lead wire in the radial direction of the capacitor up to 10N and keep it for 10±1 sec.
10	导线抗折强度 Terminal Bending Strengt	引线不应断开，电容器不应破裂。 Lead wire should not be cut off capacitor should not be broken.	在引线出口处沿一个方向施加5N、90°的弯曲压力，再恢复至初始状态。之后，在2至3秒内再以相反方向施加一次90°的弯曲压力。 Each lead wire should be subjected to 5N of weight and bent 90° at the point of egress, in one direction, then returned to its original position and bent 90° in the opposite direction at the rate of one bent in 2 to 3 sec.
11	可焊性 Solderability of Leads	导线必须有3/4以上的面积均匀附着焊锡 Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.	引线必须浸入焊料中3±0.5秒钟，浸入深度离导线根部1.5-2.0mm。 The lead wire of a capacitor should be dipped into molten solder for 3±0.5 sec. The depth of immersion is up to about 1.5 to 2.0mm from the root of lead wires. 焊锡温度： 无铅焊(Sn-3Ag-0.5Cu) 245±5°C Temp. of solder: Lead Free Solder (Sn-3Ag-0.5Cu) 245±5°C 易溶解的H63号锡235±5°C H63 Eutectic Solder 235±5°C

↘ 续上表
Continued on the table

序 No.	项目 Item		标准 Specifications	试验方法 Testing Method
12	焊锡耐热性 Soldering Effect	APP	没有可见损伤 No marked defect	如图所示，导线浸入离导线根部1.5-2.0mm处、锡温为260±10°C中3.5±0.5秒。 As shown in figure, the lead wires should be immersed in solder of 260±5°C up to 1.5 to 2.0mm from the root of terminal for 3.5±0.5 sec. 试验后处理： Post-treatment: 电容必须存放在室温下24小时。 Capacitor should be stored for 24 h at room condition. 
		ΔC/C	Y5P: ±10% X7R: ±15% Y5U, Y5V: ±20%	
		IR	>1 000MΩ	
		TV	如第8项进行试验，没有不合格 Per Item 8.	
13	振动 Vibration Resistance	APP	没有可见损伤 No marked defect	将电容器导线焊稳和调整振动频率范围为10-55Hz、总振幅为1.5mm，振动从10Hz到55Hz，然后再回到10Hz，大约一分钟。 The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10Hz to 55Hz and back to 10Hz. 总时间六个小时，每两小时在相互垂直方向来回三次。 Apply for a total of 6 hours, 2 hours each in 3 mutually perpendicular directions.
		C_R	如第5项进行试验，没有不合格 Per Item 5.	
		tanδ	如第6项进行试验，没有不合格 Per Item 6.	
14	温度系数 Temperature Characteristic (TC)		Y5P: ±10% (85ºC to 125ºC: +10%/-40%) X7R: ±15% Y5U: +22/-56% Y5V: +30/-80%	电容器必须按照下列每一步骤进行测量。 The capacitance measurement should be made at each step specified in below. Stwp Temperature (±1ºC) 1 +20 2 -25 (X7R: -55) 3 +20 4 +85 (Y5P, X7R: +125) 5 +20
15	耐湿负荷 Humidity Loading	APP	没有可见损伤 No marked defect	施加额定电压的电容保持在温度为40±2°C、相对湿度为90-95%条件下500±12小时。 Apply the rated voltage for 500±12 hours at 40±2°C in 90 to 95% relative humidity. 试验后处理： Post-treatment: 电容必须贮存在室温条件下24小时。 Capacitor should be stored for 24 h. at room condition.
		ΔC/C	Y5P: ±10% X7R: ±15% Y5U: ±20% Y5V: ±30%	
		tanδ	小于初始标准的2倍 Less than 200% initial specified value.	
		IR	>1 000MΩ	
		TV	如第8项进行试验，没有不合格 Per Item 8.	
16	高温负荷 High Temperature Load	APP	没有可见损伤 No marked defect	在85±2°C (Y5P, X7R: 125°C)、相对温度不大于50%条件下施加下列电压1000+48/-0小时（充/放电流小于5mA） Apply a DC voltage of below of the rated voltage for 1000+48/-0 hours at 85±2°C (Y5P, X7R: 125°C) with a relative humidity of 50% max. (Charge/discharge current ≤5mA) ≤500V， $1.5U_R$ >500V， $1.2U_R$ 试验后处理: 电容器应在室温下储存24小时。 Post-treatment: Capacitor shall be stored for 24 h at room condition.
		ΔC/C	Y5P: ±10% X7R: ±15% Y5U: ±20% Y5V: ±30%	
		tanδ	小于初始标准的1.5倍 Less than 150% of initial specified value.	
		IR	>2 000MΩ	
		TV	如第8项进行试验，没有不合格 Per Item 8.	

↘ 续上表
Continued on the table

序 No.	项目 Item		标准 Specifications	试验方法 Testing Method
17	温度循环 Temperature and Immersion Cycle	APP	没有可见损伤 No marked defect	温度循环试验按以下条件进行试验和测量 Temperature cycling shall be measured in the following test. Step 1 2 Temperature -25±2°C +85±2°C (X7R: -55°C) (Y5P, X7R: 125°C) Time 30min 30min 循环次数：5次 Cycle numbers: 5 cycles 试验后处理: 电容器应在室温下储存24小时。 Post-treatment: Capacitor shall be stored for 24 h at room condition.
		ΔC/C	Y5P: ±10% X7R: ±15% Y5U, Y5V: ±20%	
		tanδ	小于初始标准的1.5倍 Less than 150% of initial specified value.	
		IR	>1 000MΩ	
		TV	如第8项进行试验，没有不合格 Per Item 8.	

8. 包装和储存
PACKAGING AND STORAGE

8.1. 包装
PACKAGING

盒装编带品，每盒2000pcs（每箱20 000pcs）。
Taping of ammo packing, 2000 pcs/box (20 000 pcs/carton)
散包包装，每包1000pcs（视瓷片大小不等，每箱20 000～100 000pcs）。
Bulk packing, 1000 pcs/bag (Depending on the disc size, each carton is 20 000～100 000pcs)

8.2. 贮存条件
STORAGE ENVIRONMENT

电容器绝缘包封层不是完美的密封形式，因此，请勿将电容器存放在腐蚀性气体中，尤其是存在氯气、硫气、酸、碱、盐等场所，同时应防潮。电容器应存放在温度及相对湿度分别不超出5～40°C及15～70%范围的场所。
The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Store the capacitors where the temperature and relative humidity do not exceed 5 to 40 degrees centigrade and 15 to 70%.

请在6个月内使用电容器。超过6个月，在使用前确认其可焊性和电容量。
Use capacitors within 6 months after delivered. for more than 6 months, confirm the solderability and capacitance before use.

9. 测量和使用注意事项
MEASURING AND APPLICATION NOTICE

9.1. 测量注意事项
Measurement notice
请在以下条件下测量。
Please measure under the following conditions.

9.1.1. 标准大气条件
Standard atmospheric conditions
除非另有规定，所有试验和测量应按在IEC 60068-1的5.3中规定的试验用标准大气条件下表进行。
Unless otherwise specified, all tests and measurements shall be made under standard atmospheric conditions for testing as given in 5.3 of IEC 60068-1.

温度 Temperature	相对湿度 Relative humidity	气压 Air pressure
15°C～35°C	25%～75%	86kPa～106kPa

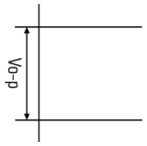
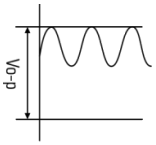
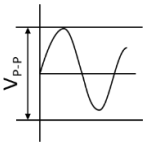
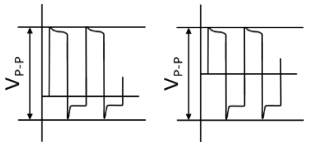
在进行测量之前，电容器应在测量温度下存放足够时间，以使整个电容器都达到这一温度。为此目的，规定与试验后恢复时间同样的时间，通常是足够的。
Before the measurements are made, the capacitor shall be stored at the measuring temperature for a time sufficient to allow the entire capacitor to reach this temperature. The period as prescribed for recovery at the end of a test is normally sufficient for this purpose.
在标准大气条件下进行测量，其测量结果存在争议时应采用仲裁温度（见9.1.3）重复测量。
Test and measurement shall be made under standard atmospheric conditions for testing, in the event of a dispute, the measurements shall be repeated using one of the referee temperatures (as given in 9.1.3).
当按某一顺序进行试验时，一个试验的最后测量可以作为下一试验的初始测量。
When tests are conducted in a sequence, the final measurements of one test may be taken as the initial measurements for the succeeding test.
在测量期间，不应使电容器受到气流、阳光直射或可能引起误差的其他影响。
During measurements the capacitor shall not be exposed to draughts, direct sunlight or other influences likely to cause error.

9.1.2. 恢复条件
Recovery conditions
除非另有规定，恢复应在试验用标准大气条件（见9.1.1）下进行。
Unless otherwise specified recovery shall take place under the standard atmospheric conditions for testing (9.1.1).
如果恢复必须在严格控制的条件下进行，应采用IEC 60068-1中5.4.1的控制条件。
If recovery under closely controlled conditions is necessary, the controlled recovery conditions of 5.4.1 of IEC 60068-1 shall be used.
除非有关规范另有规定，恢复时间应为1h～2h。
Unless otherwise specified in the relevant specification, a duration of 1 h to 2 h shall be used.

9.1.3. 仲裁条件
Referee conditions
在仲裁情况下，应选用IEC 60068-1中5.2中规定的仲裁试验用标准大气条件。
For referee purposes, one of the standard atmospheric conditions for referee tests taken from 5.2 of IEC 60068-1, as given in table 1 below, shall be selected:

温度 Temperature	相对湿度 Relative humidity	气压 Air pressure
25°C±1°C	48%～52%	86kPa～106kPa

9.2. 工作电压
Operating voltage
向电容器施加的电压切勿超过额定电压。
The voltage applied to the capacitor must not exceed the rated voltage.

电压 Voltage	直流电压 DC Voltage	直流+交流电压 DC+AC Voltage	交流电压 AC Voltage	脉冲电压 Pulse Voltage
测量位置 Positional Measurement				

在交流电路或纹波电流电路中使用直流额定电压电容器时，请务必将外加电压的Vp-p值或包含直流偏置电压的Vo-p值维持在额定电压范围内。
When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p which contains DC bias within the rated voltage range.
若向电路施加电压，开始或停止时可能会因谐振或切换产生暂时的异常电压。请务必使用额定电压范围包含这些异常电压的电容器。
When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

9.3. 过电压影响
Overvoltage effects
施加到电容器的过电压可能会导致电容器内部介质层击穿而引起电路短路。
The overvoltage applied to the capacitor may cause the dielectric layer of the capacitor to break down and cause a short circuit.
击穿前的可持续时间取决于施加电压和周围温度。
The duration before the breakdown depends on the applied voltage and the ambient temperature.

9.4. 焊锡
Soldering
当在PCB/PWB焊锡这个产品时，不要超过电容器的焊锡耐热性标准。过度的热量会使电容器内部焊锡熔化，可能导致热冲击而使陶瓷介质出现暗裂。
When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specifications of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

注意：请不要使用于双波峰焊锡中，如果需要使用于双波峰焊锡，请提前通知我公司。
Note: please do not use in double wave soldering. If you use double wave soldering, please inform our company in advance.

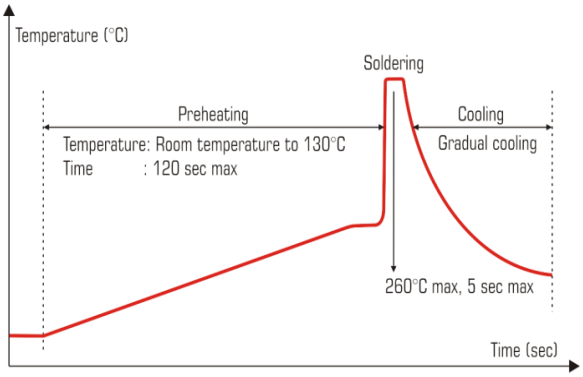
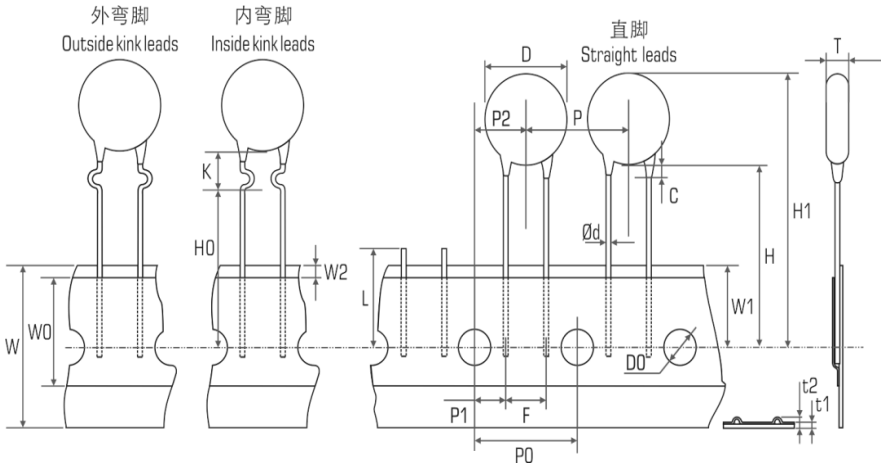


Fig.: Wave-soldering temperature-time profile to recommend

当使用烙铁进行手工焊锡时，应该遵照下列条件：
When soldering capacitor with a soldering iron, it should be performed in the following conditions.
焊锡温度：320°C最大
Temperature of iron-tip: 320 degrees C. Max.
烙铁头：不超过40W
Soldering iron wattage: 40W max.
焊锡时间：不超过3.0秒
Soldering time: 3.0 sec. Max.

10. 编带尺寸规格

TAPING SPECIFICATIONS



项目 Item		代码 Symbol	标准 (mm) Specification (mm)	备注 Remarks
导线直径 Lead-wire diameter		d	0.50±0.05	
元件间间距 Pitch of component		P	12.7±1.0	
进料孔间距 Feed hole pitch		P0	12.7±0.3	间距累积误差：每20孔1.0mm Cumulative pitch error: 1.0mm/20 pitch
进料孔与导线垂直距离 Feed hole center to lead		P1	3.85±0.7	
进料孔与元件垂直距离 Hole center to component center		P2	6.35±1.3	
脚距 Lead-to-lead distance		F	5.0±0.8	
元件偏移 Component alignment		Δh	≤2.0	
元件沿编带偏离，左或右 Deviation along tape, Left or right		ΔS	≤1.3	
纸带宽 Tape width		W	18.0+1.0/-0.5	
胶带宽 Hold-down tape width		W0	≥7.0	
孔位 Hole position		W1	9.0+0.75/-0.5	
胶带位置 Hole-down tape position		W2	≤3.0	
元件到纸带的高度 Height of component from tape center	直脚类型 For straight lead type	H	18.0+2/-0	
	弯脚类型 For kinked lead type	H0	16.0±0.5	
元件高度 Component height		H1	≤32.25	
进料孔直径 Feed hole diameter		D0	4.0±0.3	
编带厚度 Total tape thickness		t1	≤0.9	纸带厚度：0.5±0.1mm Ground paper: 0.5±0.1mm
编带厚度（含导线） Total thickness, tape and lead wire		t2	≤1.5	
剪切长度 Length of snipped		L	≤11.0	