# 东莞市诚韬电子有限公司

### DONG GUAN CHENG TAO ELECTRONIC CO.,LTD

TEL:0769-85328315 FAX:0769-85532615

# 承认书

客 户:

CUSTOMER

品 名: 贴片安规电容

DESCRIPTION

規 格: Y1 系列

料號:

PART NO.

適用機種:

FOR MODEL NO.

承制方確認

使用方確認

擬制	審核	批准
蔡雯莉	何嘉	王俊华

開發/工程 審核	IQC 審核	批准

#### ■产品特性 Features

#### 1、 特点 Feature

1.1 先进的封装工艺, 封装材料满足 UL94-V0

Advanced packaging technology, packaging materials meet UL94-V0

1.2 结构紧凑,体积小,节省空间

Compact structure, small size, space saving

1.3 优越的高温高湿性能

Superior high temperature and high humidity performance

1.4 强大的耐电压能力

Strong voltage resistance

1.5 SMD 料盘包装,适用于无铅回流焊/波峰焊自动贴装

SMD tray packaging, suitable for lead-free reflow soldering/wave soldering automatic placement 1.6 符合 RoSH,REACH,H.F 无卤

Comply with RoSH, REACH, H.F

1.7 安规认证: Safety certification:









1.8 管理体系认证: ISO9001:2015 质量管理体系 ISO9001:2015 Quality Management System ISO14001:2015 环境管理体系 ISO14001:2015 Environmental Management System IAFT16949 汽车行业质量管理体系 IAFT16949 Automotive Quality Management System

### 2、应用 Application

- 2.1 LED circuit protectionLED 电路保护
- 2.2 Industrial equipment 工业设备
- 2.3 Communication equipment 通讯设备
- 2.4 Automotive Electronics 汽车电子

#### ■测试条件 Test Condition

工作温度:-40℃~125℃ 储存温度: -10℃~40℃

# 一. 品名说明 ( Part No.Explain)

CT 500V Y5P 102 K Y1 752 1 2 3 4 5 6 7

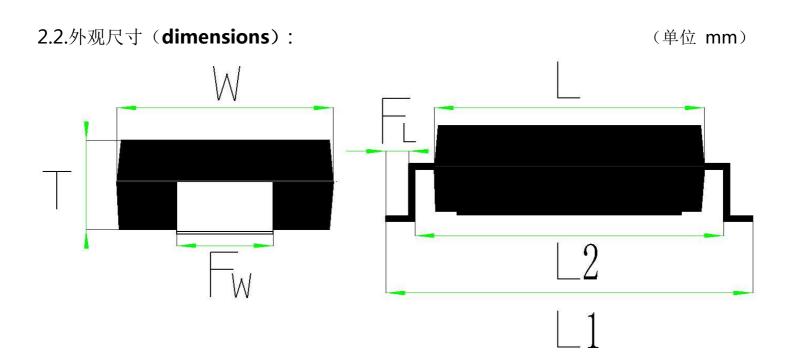
序号	代码	表示说明
1	СТ	系列
2	500V	额定交流电压
3	Y5P	容量温度特性: SL: +350~-1000ppm/℃, Y5P: ±10%, Y5U: (+22%~-56%), Y5V: (+30%~-82%)
4	102	标称静电容量: 102=10 x 10 <sup>2</sup> =1000pF
5	K	静电电容公差: J:±5%, K: ±10%, M: ±20%
6	YI	安规等级
7	752	封装尺寸 7mm*5.6mm *2.4mm

# 二、规格明细及尺寸(Specification details & dimensions)

# 2.1 规格列表:

材质	标称容量(pF)	规格型号
SL	10	CT500VSL100JY1752
SL	22	CT500VSL220JY1752
SL	47	CT500VSL470JY1752
SL	56	CT500VSL560JY1752
SL	68	CT500VSL680JY1752
Y5P	100	CT500VY5P101KY1752
Y5P	110	CT500VY5P111KY1752
Y5P	120	CT500VY5P121KY1752
Y5P	150	CT500VY5P151KY1752
Y5P	200	CT500VY5P201KY1752
Y5P	220	CT500VY5P221KY1752
Y5P	270	CT500VY5P271KY1752
Y5P	330	CT500VY5P331KY1752
Y5P	390	CT500VY5P391KY1752
Y5P	470	CT500VY5P471KY1752
Y5U	560	CT500VY5U561MY1752
Y5U	680	CT500VY5U681MY1752
Y5U	820	CT500VY5U821MY1752

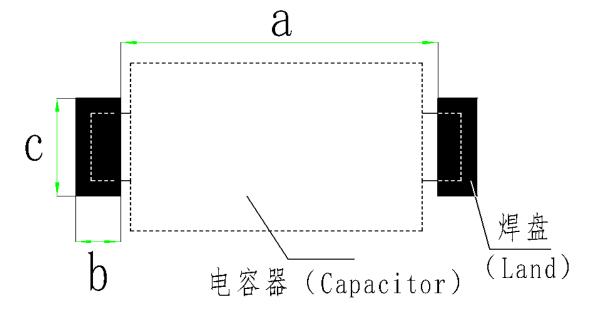
Y5U	1000	CT500VY5U102MY1752
Y5U	1500	CT500VY5U152MY1752
Y5V	1000	CT500VY5V102MY1752
Y5V	1500	CT500VY5V152MY1752
Y5V	2200	CT500VY5V222MY1752



规格	L	W	T	L1	L2	FL	Fw
2822	7.0±0.1	5.6±0.1	2.4±0.2	9.5±0.3	8.3±0.3	0.6±0.3	2.5±0.3

# 2.3 焊盘尺寸(Land):

(单位 mm)



尺寸	a	b	С
2822	8	1	3.5

# 安全认证 Safety Certification:







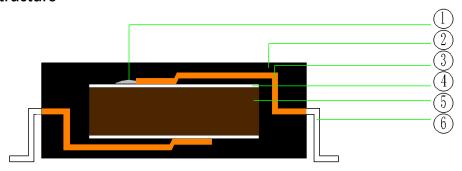


CUL No: E529031

KC No: SU03131-22001

CB No: CN57354

### 五、产品结构图 Structure



序号 No.	名称 Part name	材料 Material	
1	焊料 Solder	高铅锡膏 Sn-Pb-AgRoSH	
		环氧树脂(UL94V-0认定品)	
2	包封层 Coating	Epoxy molding compound	
		(Conforming to UL94V-O standard )	
3	内部引脚 In Lead	电子框架合金 Copper alloys	
4	电极 Electrode	银/铜电极 Ag/Cu	
5	介质 Dielectric	陶瓷介质 Ceramic	
6	SMD 贴片引脚 SMD-Lead	合金镀锡 Cu-Sn	

# 六、特性标准及测试方法(Specification and test method):

	リカーエーのいたぐ	×/% (L/)	A (Specific	ation and test met	inou, .
NO	项目 [		判定标准	PERFORMANCE	试验方法 TESTING METHOD
1	工作温度范围 Operation - 40°C ~ + 125°C Temperature			°C ~ +125°C	/
2	外观尺寸检查 (Appearance and dimension)		组件表面清洁,无异物附着无可见 损伤,尺寸符合规定要求 (Clean surface,, no visible damage. Dimension according to ordain requirement)		目视检外观 Visual check of Appearance 用卡尺测量尺寸 Measure the size with vernier caliper.
3	标志 m	arking	The marking	shall be easily legible	用目测法观测 Visual check
4	静电 <sup>2</sup> (Capaci	tance)	在允许的偏差 To be within th	等级范围内 ne specified tolerance.	环境温度(Temperature)20℃±2℃:
	质量因素:		Y5P/Y5U/Y5V	tgδ≤2.5%	测量频率(Test Frequency): 1KHz±20%
5	角(Quali or Dissipa Factor)		SL	tgδ≤0.15%	(SL/DL:1MHz±20%) 测量电压(Test Voltage): 1.0±2Vrms max
	绝缘				测量电压(Test Voltage):DC500V
6	(Insula Resista		<b>≥</b>	10000ΜΩ	充电时间(Test Time): 60±5s。
	端子间 Betwee n Lead Wires		无失效 No breakdown		在电容两端子间施加下表所要求的电压保持 60 秒 The capacitor should not be damaged when the test voltages from Table 1 are applied between the lead wires 60 sec.  Table 1 Type Test Voitage X1/Y1 AC4000V
7	耐电压 Withsta nd Voltage	端子与 外壳间 Body Insulati on	无失效	No breakdown	将电容器的引线连在一起,主体外紧包一层金属箔,边沿距引线 3-6mm,在电容器引线和金属箔间施加上表 1 电压一分钟。(First, the terminals of the capacitor should be connected together, and the capacitor should be wrapped closely with an aluminum film around the body of the capacitor to a distance about 2 to 3mm from each terminal. Then, put the capacitor into the testing jig as shown in below figure. Finally, apply a voltage of Table 2 for 60 sec)
	温度特性		Y5P	±10%	依表 1 中各温度段进行容量测试,并计算出变化率(he capacitance measurement shall be made at each step specified in table 1)  TABLE 1  STEP TEMPERATURE  1 +20±2℃  2 -25±2℃
8	(Tempe	(Temperature Characteristics)  Y5U  - 56% ~ + 22%		- 56% ~ + 22%	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
			Y5V - 82% ~ + 30%		C1 : Capacitance at standard temperature (20°C). C2 : Capacitance at each temperature. T1: Test temperature (Min. Temp. and Max. Temp.) T2: Reference temperature

			SL	+350~-1000PPM/°C (+20~85°C)	
	耐振性 (Vibrati on Resista nce)		外观 Appearance	无显着异常(No marked defect)	将电容器焊接在测试夹具上,并经如下振动频率 10Hz-55Hz-10Hz 全振幅 1.5mm, 1 分钟内完全重复振动。此试验如无特别规定应
9		外观 (Appear	容量 Capacitance	Within the specified tolerance	在彼此互相成垂直的方向各操作 2 小时(合计 6 小时)后检查电容器有无机械损伤。 Solder the capacitor to the test jig (glass epoxy board). The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the
		ance)	D.F./Q	Within the specified tolerance	frequency being varied uniformly between the approximate limits of 10 to 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, should be traversed in approximately 1min. This motion should be applied for a period of 2hrs. in each of 3 mutually perpendicular directions (total of 6hrs.).
10	10 (Solderability of (75% of the		(75% of the to	习,覆盖周边 75%区域 erminations are to be enly and continuously.)	电容器引线进入 25%的酒精松香焊剂后,浸入温度为 245℃±5℃(Sn-3.0Ag-0.50u)的熔锡内 2s±0.5s,浸入速度 25±2.5mm/s。 Immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion). Immerse in solder solution for 2±0.5 sec ,Immersing speed: 25±2.5mm/s Temp. of solder: 245±5℃ Lead Free Solder (Sn-3.0Ag-0.5Cu)
11	天显着异常 No marked defect		0 c d	将电容器焊接在图一所示的测试夹具上,施加图一所示的测试力;电容器应采用回流焊法焊接,并应进行护理,以保证电容器不会受热冲击等破坏 Solder the capacitor to the test jig(glass epoxy board)shown in Fig.1; Then apply a force in the direction shown in Fig.1. The soldering should be done using reflow method and should be conducted with care so that the soldering is uniform a free of defects such as heat shock.  Fig.1  Pressurizing speed: 1.0mm/s Pressurize  (in mm)	

12	焊接强度 (Adhesive Strength of Termination)	引脚无偏移或发生其他不良 (No removal of the terminations or other defect should occur.)			将电容器焊接在图 2 所示的测试夹具上,施加箭头所示方向的 10N 推力;电容器应采用回流焊法焊接,并应进行护理,以保证电容器不会受热冲击等破坏.Solder the capacitor to the test jig(glass epoxy board)shown in Fig.2; Then apply 10N force in the direction of the arrow. The soldering should be done using reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.
13	耐焊接热 (Resistance to Soldering Heat)	外观 Appearance 容量变化 Capacitance Change 绝缘电阻 I.R. 耐电压 Dielectric Strength	无显着异常 No marked defect SL ±5% Y5P ±10% Y5U/Y5V ±20% 1000MΩ min  参考项目 7 Per Item 7.		预处理:产品在 150 +0/-10℃下放置 60±5 分钟,然后在室温下放置 24±2h(B/E 材质适用)。按下表方法进行预处理后,将电容器浸入 260+5℃熔锡中 10±1 秒,浸入速度 25±2.5mm/s,在室温下放置 24±2h 后测试。 Preheat the capacitor as in table. Immerse the capacitor in solder solution at 260±5℃ for 10±1 sec. Let sit at room condition for 24±2 hrs., then measured. Immersing speed: 25±2.5mm/s Pretreatment: Perform a heat treatment at 150 +0/-10℃ for 60±5 min. and then let sit for 24±2 hrs. at room condition (for Y5P、Y5U char) Preheating  Step Temperature Time 1 100 to 120℃ 1 min. 2 170 to 200℃ 1 min.
14	稳态湿热 Humidity (under Steady State)	外观 Appearance 容量变化 Capacitance Change 介质损耗/Q 值 D.F./Q	Y5P ±: Y5U/Y5V ±: SL ≤ V5PY5U	efect 5% 10% 20% €0.3%	进行此试验前应首先进行如下试验项目 11:弯项目 12:焊接强度(施加 5N 测试力), 预处理: 产品在 150 +0/-10℃下放置 60±5 分钟,然后在室温下放置 24±2h(B/E 材质适用)。在温度 40±2℃,湿度 90-95%RH 下置 500+24/-0 小时。Before this test, the test shown in the following is performed. • Item 11 Deflection • Item 12 Adhesive Strength of Termination (applied force is 5N) Set the capacitor for 500-0/+24 hrs. at 40±2℃ in 90 to 95% relative humidity. Pretreatment: Perform a heat treatment at 150 +0/-10℃ for

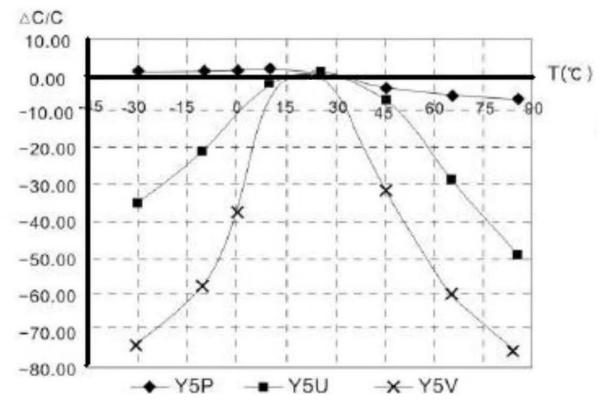
		耐电压 Dielectric Strength		·项目 7. Item 7.	$60\pm5$ min. and then let sit for $24\pm2$ hrs. at room condition (for Y5P、Y5U char) Post-treatment: The capacitor should be stored for 1 to 2 hours at room condition.
		外观 Appearance		着异常 No ked defect	│ 进行此试验前应首先进行如下试验: │ 项目 11:弯曲 - 项目 12:焊接强度(施加 5N 测试力)
		容量变化	SL	±5%	预处理:产品在 150 +0/-10℃下放置 60±5 分钟,然后
		Capacitance	Y5P Y5U	±10%	在室温下放置 24±2h(B/E 材质适用)。
		Change	Y5V	±20%	在温度 40±2℃,湿度 90-95%RH 下施加额定电压 500+24/-0 小时。
			SL	≤0.3%	500+24/-0 小时。   后处理:电容器应在室温环境下放置 24±2h
15	湿热负荷 Humidity Loading	介质损耗/Q 值 D.F./Q	Y5P Y5U Y5V	≤5.0%	Before this test, the test shown in the following is performed: Item 11 Deflection/Item 12 Adhesive Strength of Termination (applied force is 5N)
		绝缘电阻 I.R.		000ΜΩ	Pretreatment: Perform a heat treatment at 150 +0/-10°C for
		耐电压 Dielectric Strength		·项目 7. tem 7.	60±5 min. and then let sit for 24±2 hrs. at room condition (for Y5P、Y5U char) Apply the rated voltagefor 500 -0/+24hrs. at 40±2°C in 90% to 95% relative humidity Post-treatment: Capacitor should be stored for 24± 2 hours at room condition.
16	寿命试验 Life	外观 Appearance		着异常 marked defect	进行此试验前应首先进行如下试验: 项目 11:弯曲 项目 12:焊接强度(施加 5N 测试力) 预处理: 产品在 150 +0/-10℃下放置 60±5 分钟, 然后在室温下放置 24±2h(B/E 材质适用)。 脉冲电压: 应对每个电容器实施 5KV(X1Y2)/8KV(X1Y1) 脉冲电压测试三次后,完成后进行寿命测试 寿命测试: 在 125±2℃及相对湿度低于 50%的条件下施加 170%额定电压 1000h,每小时将电压增大至
		容量变化 Capacitance Change	With	nin±20%	后处理:电容器应在室温环境下放置 24±2h Before this test, the test shown in the following is performed.
		绝缘电阻 I.R.	≥3000MΩ		Item 11 Deflection Item 12 Adhesive Strength of Termination (applied

		耐电压 Dielectric Strength	参考项目 7. Per Item 7.	force is 5N) Pretreatment: Perform a heat treatment at $150 + 0/-10^{\circ}$ C for $60\pm 5$ min. and then let sit for $24\pm 2$ hrs. at room condition (for Y5P、Y5U char) Impulse voltage Each individual capacitor should be subjected to a 5KV (X1Y2) / 8KV (X1Y1) impulse for three times. Then the capacitors are applied to life test. Apply a voltage of 170% of rated voltage except that once each hour the voltage is increased to AC1000V (r.m.s.) for 0.1sec for 1000 hrs., at $125^{+2}_{-0}$ °C and relative humidity of 50% max. Post-treatment::Capacitors should be stored for $24\pm 2$ hrs at room condition. $ \begin{array}{c} 100 \\ 90 \\ \hline                                   $		
17	被动可燃性试验 (Passive Flammability)	燃烧时间不超过 30 秒。 薄纸不燃烧。 The burning time shall not be exceeded the time 30sec. The tissue paper shall not ignite.		测试的电容器应在燃烧效果最佳的位置。每个样品应一次性燃烧。 燃烧时间: 30 秒 火焰尺寸: 12±1mm 喷烧器: 35mm 长 内径: 0.5±0.1mm 外径: 最大 0.9mm 气体 : 纯度 95%以上的丁烷 The capacitor under test shall be held in the position,which best promotes burning. Each specimen shall only be exposed once to flame. Time of exposure to flame: 30sec. Length of flame: 12±1mm Gas burner: Length 35mm min. Inside Dia.: 0.5±0.1mm Outside Dia.: 0.9mm max. Gas: Butane gas Purity 95% min.		

在电容本体外包裹 1-2 层纱布, 在下示回路每隔 5s 放电 一次, 放电 20 次。最后一次放电后, 持续施加 2 分钟 UAC Ui=5KV The capacitors should be individually wrapped in at least one but more than two complete layers of cheese-cloth. The capacitor should be subjected to 20 discharges. The interval between successive discharges should be 5 s. The UAc should be maintained for 2min after the last discharge. Ui=5KV 缠绕在电容器上的纱布不燃烧。 主动可燃性(Active 18 flammability) The cheese-cloth should not be on (Y2 适用) fire. : 1μF±10%, C3: 0.033μF±5% 10kV C1,2 1 | IµF±10%, C3 0.033µF±3% 10N L1 to L4 : 1.5mH±20% 16A Rod core choke R :100Ω±2%, C1: 3µF±5% 10kV UAc :UR ±5% UR : Rated voltage Cx : Capacitor under test Сх Fuse, Rated 10A

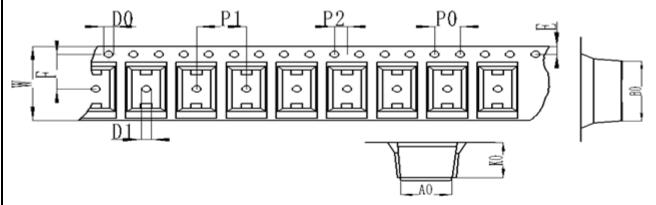
Voltage applied to Ct

# 七.温度特性(Temperature characteristic):



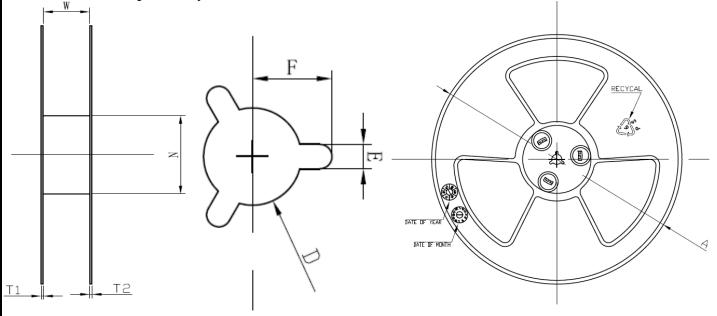
# 八.包装说明(packing description):

8.1 编带包装方式说明 Taping Packaging



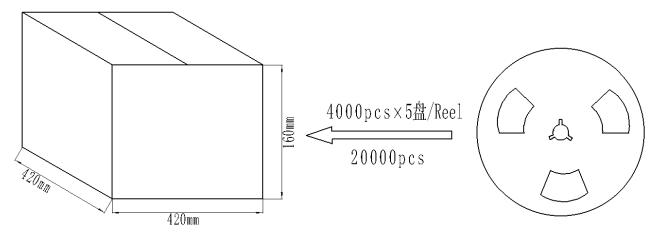
ΑO	В0	KO	P0	P1	P2
6.5±0.1	12.2±01	2.8±01	4.0±0.1	8.0±0.1	2.0±0.05
W	Е	F	D0	D1	Pcs/Ree1
16.0±02	1.75±0.1	7.5±0.1	1.5±01	1.5±01	4000

8.2 胶盘尺寸 15 inch plastic tray size



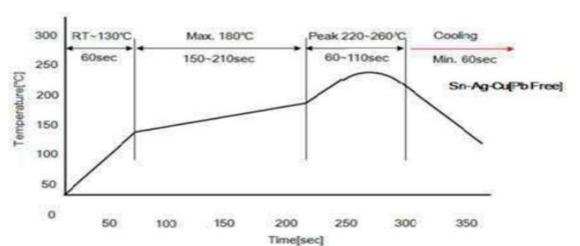
SPEC	W	N	T1	T2	A	D	Е	F
	16.0±0.3	$\Phi 100 \pm 3.0$	2.2±0.3	$2.2 \pm 0.3$	Ф380±3.0	13.3±0.3	$2.3 \pm 0.5$	$10.75 \pm 0.5$

### 8.3 包装纸箱 Carton Packing



### 九.焊接说明 Welding according to the instruction

### Reflow Soldering Temperature Profile



	温区	温度范围Temp range(°C)	Time(sec)	备注 Remark
а	固化 Curing	RT-130	60	焊料 Solder:
b	预热 Preheat	180max	150-210	锡银铜 Sn-Ag-Cu
С	焊接 Soldering	220-260 (260max)	60-110	Temp max Time(sec)
d	冷却 Cooling	220-RT	60min	最高温时间<10 sec

当焊接温度低于锡的熔点时,贴片镀锡端子的可焊性将下降。使用前请确认贴片镀锡端子的可焊性。

焊接出风口及炉内最高温不超过 280℃,温度超过会造成产品发生失效。超温使用造成的不良,我司不承担责任。

When the welding temperature is below the melting point of tin, the weldability of SMT tin-plated terminals will decrease. Confirm the weldability of SMT tin-plated terminals before use.

The maximum temperature for welding exhaust outlets and oven interiors must not exceed 280°C. Exceeding this temperature will cause product failure. We assume no liability for defects resulting from overheating during use.

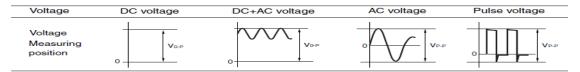
#### 十.注意事项 HANDLING PRECAUTIONS FOR CERAMIC CAPACITORS

#### 10.1 使用电压(Operating voltage)

使用电容器时,端子间施加的电压应该低于额定电压。直流电压上迭加交流电压时,峰值电压应该低于额定电压。用交流电压或脉冲电压时,峰电压也应该低于额定电压。另外,确认使用的电源设备是不是有可能印加异常电压(浪涌电压,静电,开关突峰电压),如果产生则异常电压也应该低于额定电压(如下图标)。交流一次侧回路时,用于防止杂波的电容器其交流耐压试验的实验条件不能超过规定的条件(电压、时间、波形)。

Use within the rated voltage of capacitor between terminals. For DC rated voltage application, you should control the peak voltage (Vo-p) under the rated voltage in case the AC voltage is superimposed on the DC voltage. Use within the rate voltage includes peak voltage (Vp-p) when AC voltage or impulse voltage applied in a circuit. Confirm irregular voltage (surge voltage, static electricity, switching noise, etc) occurs in the equipment used, and use within the rated voltage containing the irregular voltage.

When the capacitor is used as a noise suppressor in the AC primary circuit, the voltage proof test should be within the specified conditions (voltage, time, wave form, etc).



#### 10.2 工作温度和自生热(Temperature & Self-exothermal)

使用时,电容器的表面温度,包括其自身发热,必须低于规格书规定的最高使用温度。在环境温度25℃,无冷却风扇工作的状态下,自身发热(电容器的表面温度与环境温度的差值)必须在20℃以下。在连续印加交流电压或脉冲电压,电流较大的回路中,更要特别的注意,在连续印加高频电压,高频脉冲电压的回路中,虽然在额定电压以下,也有可能影响到信赖性,所以使用时要考虑减轻负荷及自身发热。

Be sure to use only those operating temperature described in our catalogue or specification. Keep the surface temperature under the maximum temperature, which includes the maximum self-heat temperature.

Self-exothermal temperature should be within 20°C on the condition of atmosphere temperature 25°C without the influence of wind such as the cooling fan. Be sure to use a capacitor in a circuit of current increase by AC voltage or pulse voltage applied.

When high frequency voltage or impulse voltage applied in a circuit, reliability should be influenced. Take into considerations the load reduction and self-exothermal temperature, even if voltage should be within the rated voltage.

#### 10.3 耐电压的测试条件:

- (1)测试设备 TEST EQUIPMENT
- 1、交流耐压的测试设备应具有能够产生类似于50/60Hz正弦波的性能。

Test equipment for AC withstanding voltage should be used with the performance of the wave similar to 50/60 Hz sine wave.

2、 如果施加变形的正弦波或超过规定电压值的过载电压后,则可能会导致故障。

If the distorted sine wave or over load exceeding the specified voltage value is applied, the defective may be caused.

(2) 电压测试方法及要求:

耐压测试时,电容器的端子应与耐电压测试设备的输出端连接牢固;然后将电压从近零增加到测试电压。如果测试电压不从近零逐渐提高而是直接施加在电容器上,则施加时应包含过零点\*。测试结束时,测试电压应降到近零;然后再将电容器引线或端子从耐电压测试设备的输出端取下。

zero cross

如果测试不从近零逐步升压而是直直压加载在电容器上,则可能会出现浪涌电压,从而导致故障\*过零点是指电压正弦通过0V的位置,参见右图。

#### (2) VOLTAGE APPLIED METHOD

When the withstanding voltage is applied, capacitor's lead or terminal should be firmly connected to the out-put of the withstanding voltage test equipment, and then the voltage should be raised from near zero to the test voltage.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the \*zero cross. At the end of the test time, the test voltage should be reduced to near zero, and then capacitor's lead or terminal should be taken off the out-put of the withstanding voltage test equipment.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may arise, and therefore, the defective may be caused. \*ZERO CROSS is the point where voltage sine wave pass 0V.

See the right figure -

#### 10.4.失效安全性: FAIL-SAFE

电容器损坏时,失效可能会导致短路。为了避免再短路时引起出点、冒烟、火灾等危险情况,请在电路中使用熔丝等原 件来设置自动防故障功能。

When capacitor would be broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure would follow an electric shock, fire or fume.

### // 警告(保管和使用条件)

电容器的绝缘涂层不具有完全的密封作用: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、盐等的场所。同时应防潮。在对本产品进行清洗、覆膜或封膜前,请先在指定设备上测试经清洗、覆膜或封膜 的产品的性能,以确定上述过程不会影响产品质量。

The insulating coating of the capacitor does not provide a complete seal; therefore, do not store capacitors in environments with corrosive gases, especially those containing chlorine, sulfur, acids, alkalis, salts, etc. Additionally, ensure moisture prevention. Prior to cleaning, coating, or sealing the product, test the performance of the product after such processes on designated equipment to confirm that these procedures do not affect product quality. Moisture-proof measures should be implemented to protect against environmental humidity, as excessive moisture can degrade insulation performance. For enhanced protection, consider using thermal conductive encapsulants to seal capacitors, which provide both insulation and resistance to environmental contaminants. Post-processing steps such as sealing must be rigorously tested to ensure no compromise in electrical integrity or operational stability. 这是 MSL3 产品。因此,为了避免吸收水分,电容器采用防潮包装。

在下述条件下储存产品,并在交付后6个月内使用产品。

温度:10to30℃ 湿度:60%max.

如果超过 6 个月的储存期或包装打开后有明显受潮迹象则应在焊接前进行烘烤60℃\*168hr.

当打开包装的产品曝露时间超过裸露寿命,或者其它情况导致产品周围的温度、湿度超过要求以后,回流焊前产 品湿度超过要求以后进行烘烤的参考数据(烘烤后裸露寿命从零开始计时)

This is an MSL3 product. To prevent moisture absorption, the capacitor is packaged with moisture-proof protection.

Store the product under the following conditions and use it within 6 months after delivery:

Temperature:  $10^{\circ}$ C to  $30^{\circ}$ C | Humidity:  $\leq 60\%$ RH.

If the storage period exceeds 6 months, or if obvious signs of moisture ingress are observed after opening the package, bake the product at 60°C for 168 hours before welding.

When the exposed time of the unpacked product exceeds the bare life, or other conditions cause the temperature/humidity around the product to exceed the requirements, refer to the following baking data before reflow soldering (the bare life is reset to zero after baking):

Level₽	Bake@40C ζ5%RH₄				
	Saturated@30C/85%RH₽	At limit of Floor life+72hr@30C/60RH₽			
3₽	79days₽	67days₽			

# <u>/!\</u> 警告

警告(焊接、安装与使用) (Warning (Welding, Installation, and Use)

#### 1、振荡与冲击

使用时请勿使电容器或引线受到过度冲击或振荡,过度冲击或振荡会对安装在电路板上的引线造成疲劳破坏。使用粘合剂、 封膜树脂或其它涂层将电容器固定在电路板上。使用指定设备进行固定时,请确认固定措施对产品不会造成影响。

Oscillation and Shock

Do not subject the capacitor or its leads to excessive shock or vibration during use, as this can cause fatigue failure to the leads mounted on the circuit board.

**Fixation Methods** 

Use adhesives, encapsulation resins, or other coatings to secure the capacitor to the circuit board. When using specified equipment for fixation, ensure that the securing measures do not adversely affect the product.

#### 2、焊接

当将本产品焊接到 PCB/PWB 上时,不得超过电容器的耐焊热性规格。本产品如果过热,可能导致内部连接点锡焊料熔化,导致温度骤变,从而使陶瓷组件产生裂纹。

当使用烙铁焊接电容器时,应遵循以下条件:烙铁头温度:最高 400C,烙铁功率: 最大 50W 焊接时间: 最多 3.5 秒

#### 2. Soldering Iron

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification 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.

When soldering capacitor with a soldering iron,

it should be performed in following conditions.

Temperature of iron-tip: 400 □C max.

Soldering iron wattage: 50W max.

Soldering time: 3.5s max

#### 3、粘合、树脂封膜和树脂涂敷

在对本产品进行粘合、封膜或施加涂层前,请先在指定设备上测试经粘合、封膜或涂敷的产品的性能,以确定上述过程不会影响电容器的质量。

当含有有机溶剂(乙酸乙醋、甲基乙基酣、甲苯等)的粘合剂和封膜树脂的使用量、干燥/硬化条件不适当时,有机溶剂可能损坏电容器的外涂层树脂,最坏条件下可能导致短路。

粘合剂 封膜树脂和有机溶剂的厚度变化也会造成电容器表面树脂涂层和陶瓷组件在温度周期变化过程中产生裂纹。

粘合、树脂封膜和树脂涂敷后的处理

焊接后, 当外涂层很热(超过 100C)时, 外涂层会变得很软、易醉。

因此、请注意不要对涂层施加机械冲击力。

Before bonding, molding or coating this product, verify that these processes do not affect the quality of capacitor by testing the performance of the bonded, molded or coated product in the intended equipment. In case of the amount of applications, dryness / hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc.) are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit.

The variation in thickness of adhesive, molding resin or coating may cause a outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

### 注意事项(焊接与安装)

清洗(超声波清洗)

进行超声清洗时,遵守下列条件:

洗涤槽容量:每升输出 20W 或更少。洗涤时间:最长 5分钟。

不得直接振荡 PCB/PWB。超声波清洗过度可能导致引线疲劳性破坏。

Precautions (Welding and Installation)

Ultrasonic Cleaning

Comply with the following conditions during ultrasonic cleaning:

Tank Capacity: Use a tank with a power output of 20 W per liter or less.

Cleaning Duration: Maximum 5 minutes per cycle.

Do not directly apply ultrasonic oscillation to PCBs/PWBs.

Excessive ultrasonic cleaning may cause lead fatigue failure due to mechanical stress on the component leads

### 注意事项(额定值)Notice(Rating)

- 1. 电容器的电容量变化
  - (1) SL、DL 特性

电容量由于周围的温度或施加的电压可能会改变一点点。如果应用于严格的时间常数电路,与我公司联系。

(2) Y5P、Y5U 特性

电容器具有老化特性;因此电容器若长时间存放使用,其电容量会逐渐降低。而且,静电容量还可能会因周围温度或外加电压而发生巨大变化。所以不适合用于时间常数电路。

若需详情, 请与我公司联系。

2. 使用设备进行性能检查

使用电容器之前,请先检查设备的性能和特性没有问题。

一般而言, 2 类陶瓷电容器(Y5P、Y5U 特性)的电容量具有电压相关特性和温度相关特性。所以, 其电容值可能会 随设备的工作条件而发生变化。因此, 一定要确认仪器接收性能对电容器的静电容值变化的影响, 如漏电流和静噪 特性。

此外,必要时还要检查电容器在设备中的防电涌性能,因为通过电路的感应,浪涌电压可能会超过规定值。

- 1. Capacitance Variation of Capacitors
- (1) SL/DL Characteristics

The capacitance of capacitors may slightly vary due to ambient temperature or applied voltage. For applications in strict time constant circuits, please contact our company for consultation.

(2) Y5P/Y5U Characteristics

Capacitors with Y5P/Y5U characteristics exhibit aging behavior; their capacitance gradually decreases over long-term storage and use. Moreover, their electrostatic capacitance may significantly change due to surrounding temperature or applied voltage. Therefore, they are not suitable for time constant circuits.

For detailed information, contact our company.

#### 2. Performance Verification Before Use

Before using capacitors, verify that the equipment's performance and characteristics are functioning properly.

Generally, Type II ceramic capacitors (Y5P/Y5U series) exhibit both voltage-dependent and temperature-dependent capacitance characteristics. Their capacitance values may vary under actual operating conditions of the equipment. Therefore, it is essential to confirm that the instrument's acceptance criteria account for capacitance variations (e.g., leakage current, noise characteristics).

Additionally, if necessary, inspect the capacitor's surge protection performance in the equipment, as inductive coupling in circuits may induce surge voltages exceeding specified limits.