WEIDY® 纬迪
电 容 器 专 业 制 造 商

贴片安规电容规格书
PATCH SAFETY CAPACITOR SPECIFICATION

客户 CUSTOMER	
客户料号 CUSTOMER P/N	
客户规格描述 CUST. DESCRIPTION	
规格描述 DESCRIPTION	SMD Y1 222M 500V Y5V WD
产品编码 PART NUMBER	WYS2H222MF4H6R5000
日期 DATE	2026/1/28
文件编号 DOC. NO.	WD-SPEC-003

纬迪承认栏 APPROVED BY WEIDY		客户承认栏 APPROVED BY CUSTOMER	
批 准 APPROVED BY	制订 FORMULATE BY	批 准 APPROVED BY	审核 CHECK BY
彭少雄	钟茂源		

深圳市纬迪实业发展有限公司 工程部 承认书专用章

深圳市纬迪实业发展有限公司
SHENZHEN WEIDY INDUSTRIAL DEVELOPMENT CO.,LTD

公司地址：深圳市振中路（华强北）新亚洲电子商城五楼506-509室
工厂地址：东莞市塘厦镇石鼓岭南大道142号
TEL: +86-755-82811688 FAX: +86-755-82812688
Website: http://www.szweidy.com

变更履历
CHANGE RECORD

日期 Date	版本 Version	描述 Description	修订 Reviser
	A/0	首次发行	赵光涛
2024-03-26	A/1	升级国标GB/T6346.14-2023版本	钟茂源
2024-07-26	B/0	1. 重新排版，纠错 2. 展开产品编码规则 3. 删除电容量、材质、认证对应表，修订产品结构图	彭少雄
2025-02-18	B/1	修订尺寸规格误差	钟茂源
2025-03-12	B/2	增加动态特性曲线图与镀层结构，修订包装方式	钟茂源
2025-04-02	B/3	编带由WD-WYS-001变更为WD-SPEC-003	钟茂源

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请确保我们的产品安装到您的产品上前，已根据您的需求进行了评估。
Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
请您在使用我们的产品时，不要偏离此标准。
You are requested not to use our product deviating from this specification.

1. 产品优势
PRODUCT ADVANTAGR

1) 产品注塑成型，尺寸规格一致性好。
Product injection molding, specifications and dimensions are consistent.

2) 卷轴包装，适合自动化表面贴装，节省人力成本。
Reel packing, suitable for automatic surface mounting, saving manpower cost.

3) 适合回流焊、波峰焊焊接工艺。
Suitable for reflow soldering and wave soldering.

4) 较好的耐焊接热性能。
Good thermal resistance to welding.

5) 较好的耐湿性能。
Good moisture resistance.

6) 较高的耐电压性能。
High voltage resistance.

2. 应用
APPLICATION

1) 本规范适用于安全标准认证注塑成型SMD型陶瓷电容器用于通用电气设备。
This specification is applied to safety standard certified resin molding SMD type ceramic capacitors used for general electric equipment

2) 不要将这些产品使用在任何汽车动力传动系或安全设备上，包括电动汽车和插电式混合动力车的电池充电器。
Do not use these products in any automotive power train or safety equipment including battery charger for electric vehicles and plug-in hybrids.

3) 批准标准、认证号
Approval standard and recognized number

认证标志 Approval Mark	认证标准 Approval Standards	认证证书号 Certificate number	额定电压 Rated voltage	容量范围 Capacitance range
UL	UL 60384-14 CSA E60384-1:14 CSA E60384-14:14	E334332	X1: 500VAC Y1:250/300/400/500VAC	10PF-3300PF
ENEC15	EN 60384-14:2013 EN 60384-14:2013/A1:2016	ENEC-03969	X1: 500VAC Y1:250/300/400/500VAC	10PF-3300PF
CQC	GB/T6346.14-2023	CQC20001237498	X1: 500VAC Y1:250/300/400/500VAC	10PF-3300PF
KTL	KC60384-1(2015-09) KC60384-14(2015-09)	SU03125-20003	Y1: 250VAC	10PF-3300PF
VDE / ENEC10	IEC60384-14:2013	40051052	X1: 500VAC Y1:250/300/400/500VAC	100PF-1500PF

3. 额定值
RATING

1) 工作温度范围
Operating temperature range: -40˚C ～ +125˚C

2) 额定电压
Rated voltage: 500Vrms

3) 产品编码
Part number

举例说明如下：

Examples are as follows:

WYS	2H	222	M	F4	H6	R5	000
①	②	③	④	⑤	⑥	⑦	⑧

① 产品类别
Product type
WYS: X1/Y1 series SMD safety ceramic capacitors (KTL: Y1)

② 额定电压 (Y Capacitors, KTL certified: 250V～)
Rated voltage (Y Capacitors, KTL certified: 250V～)
2E: 250VAC
2G: 400VAC
2F: 300VAC
2H: 500VAC

③ 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:
222＝22*10＾2＝2200pF

④ 容量偏差
Capacitance tolerance
J: ±5%
K: ±10%
M: ±20%

⑤ 温度特性
Temperature Characteristics
SL: SL(+350～-1000PPM/˚C)
DL: N3300 (-3300±500PPM/˚C)
B4: Y5P (ΔC/C: ±10% @ -25˚C～+85˚C)
E4: Y5U (ΔC/C: +22%/-56% @ -25˚C～+85˚C)
F4: Y5V (ΔC/C: +22%/-82% @ -25˚C～+85˚C)

⑥ 封装
Encapsulation
H6: 11.4*6mm



⑦ 包装方式
Packaging
R5: 13" *24 (Reel packing)



⑧ 内部控制码
Internal control code

4. 标志
MARKING

1)	商标Trademark	WEIDY	
2)	系列Series	WYS	
3)	标称容量Nominal capacitance	222	(三位数表示,＜100pF直标) (Three-digit code; ＜100pF: direct marking capacitance value)
4)	容量误差Tolerance	M	(J: ±5% / K: ±10% / M: ±20%)
5)	安规标志Safety Mark	见示例See examples	
6)	安规等级与额定电压Safety subclass and rated voltage	X1/Y1:500V～	

7) 生产周期Production period，如ex: X + X

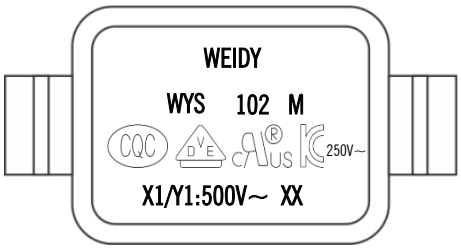
生产年份Manufacturing year	生产月份Manufacturing month	
G: 2021	1: 1月份January	7: 7月份July
H: 2022	2: 2月份February	8: 8月份August
J: 2023	3: 3月份March	9: 9月份September
K: 2024	4: 4月份April	O: 10月份October
L: 2025	5: 5月份May	N: 11月份November
M: 2026	6: 6月份June	D: 12月份December

*如果周期码为3码，最后二码表示当年第几周生产

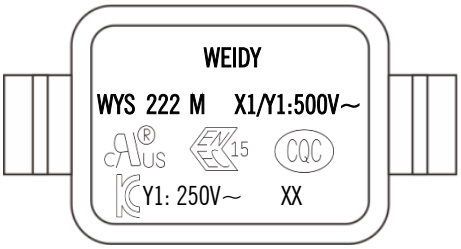
If the production period code is 3 yards, the last two yards indicate the production week.

■ 标志示例
Marking examples

100pF - 1500pF (不含without Y5P 681K)

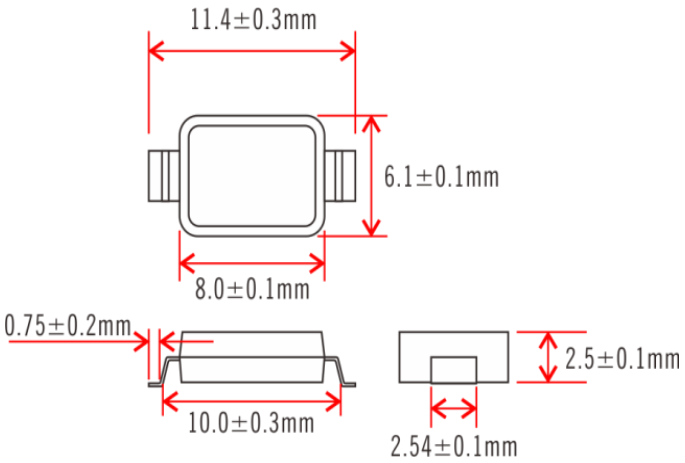


10pF - 82pF, 681K, 2200pF - 3300pF



5. 产品基本数据表

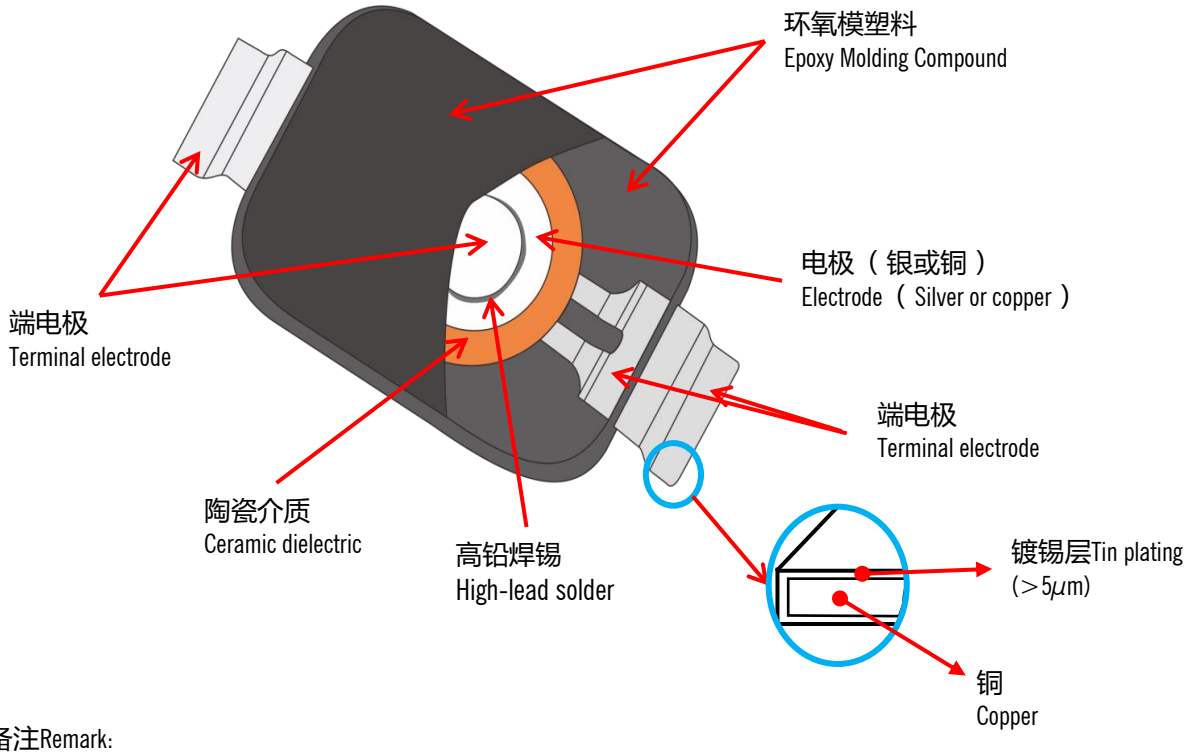
PART NUMBER LIST



序 NO	产品编码 PART NUMBER	安规等级 Safety subclass	额定电压 Rated voltage	材质 T. C.	电容量 Capacitance (pF)	容量误差 Tolerance	包装数量 Pack Q`ty (PCS/REEL)
1	WYS2H100JSLH6R5000	X1/Y1	500VAC	SL	10	±5%	2500
2	WYS2H150JSLH6R5000	X1/Y1	500VAC		15	±5%	2500
3	WYS2H220JSLH6R5000	X1/Y1	500VAC		22	±5%	2500
4	WYS2H330JSLH6R5000	X1/Y1	500VAC		33	±5%	2500
5	WYS2H470JDLH6R5000	X1/Y1	500VAC	DL	47	±10%	2500
6	WYS2H560KDLH6R5000	X1/Y1	500VAC		56	±10%	2500
7	WYS2H680KDLH6R5000	X1/Y1	500VAC		68	±10%	2500
8	WYS2H820KDLH6R5000	X1/Y1	500VAC		82	±10%	2500
9	WYS2H101KB4H6R5000	X1/Y1	500VAC	Y5P	100	±10%	2500
10	WYS2H151KB4H6R5000	X1/Y1	500VAC		150	±10%	2500
11	WYS2H221KB4H6R5000	X1/Y1	500VAC		220	±10%	2500
12	WYS2H331KB4H6R5000	X1/Y1	500VAC		330	±10%	2500
13	WYS2H471KB4H6R5000	X1/Y1	500VAC		470	±10%	2500
14	WYS2H681KB4H6R5000	X1/Y1	500VAC		680	±10%	2500
15	WYS2H681ME4H6R5000	X1/Y1	500VAC	Y5U	680	±20%	2500
16	WYS2H821ME4H6R5000	X1/Y1	500VAC		820	±20%	2500
17	WYS2H102ME4H6R5000	X1/Y1	500VAC		1000	±20%	2500
18	WYS2H122ME4H6R5000	X1/Y1	500VAC		1200	±20%	2500
19	WYS2H152ME4H6R5000	X1/Y1	500VAC		1500	±20%	2500
20	WYS2H102MF4H6R5000	X1/Y1	500VAC	Y5V	1000	±20%	2500
21	WYS2H122MF4H6R5000	X1/Y1	500VAC		1200	±20%	2500
22	WYS2H152MF4H6R5000	X1/Y1	500VAC		1500	±20%	2500
23	WYS2H222MF4H6R5000	X1/Y1	500VAC		2200	± 20%	2500
24	WYS2H272MF4H6R5000	X1/Y1	500VAC		2700	±20%	2500
25	WYS2H332MF4H6R5000	X1/Y1	500VAC		3300	±20%	2500

■ 产品结构图

Product structure drawing



备注Remark:

端电极：按MIL-STD-750，方法2026可焊接的电镀引线

Terminals: Plated leads solderable per MIL-STD-750, Method 2026

重量Weight: 0.011盎司ounce / 0.33g

■ 焊盘尺寸(仅供参考)

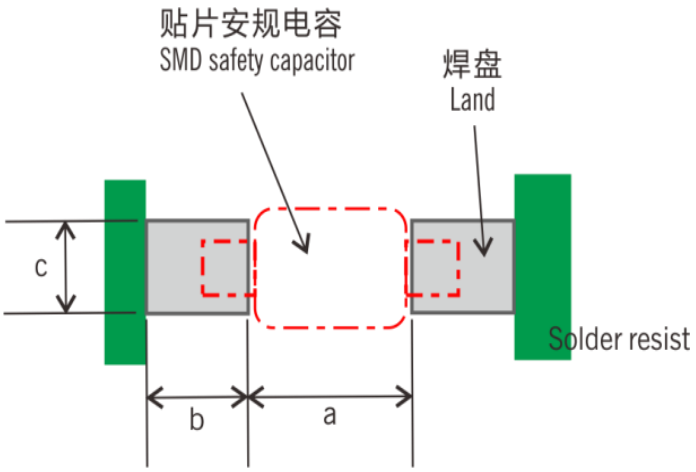
Land dimensions (For reference only)

下面是回流焊的推荐焊接尺寸。

The recommandable land dimensions for reflow soldering are follows.

尺寸a是为了保证设备要求的安全标准爬电距离。

Regarding the "a" dimension, to ensure the creepage distance required by the safety standard applys to your equipment.

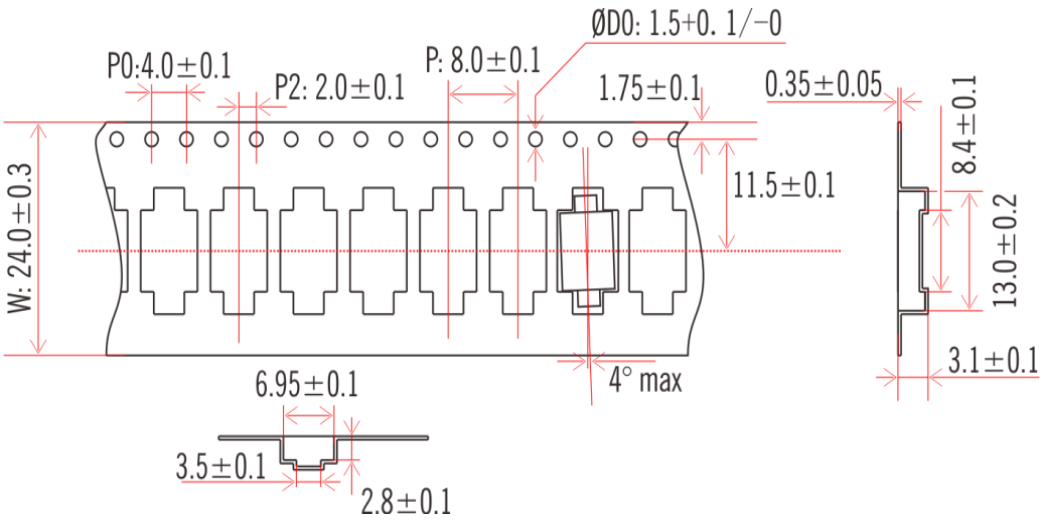


规格	a	b	c
H6	8.0-9.7mm	2.2mm	3.6mm

6. 包装标准
PACKAGING STANDARD

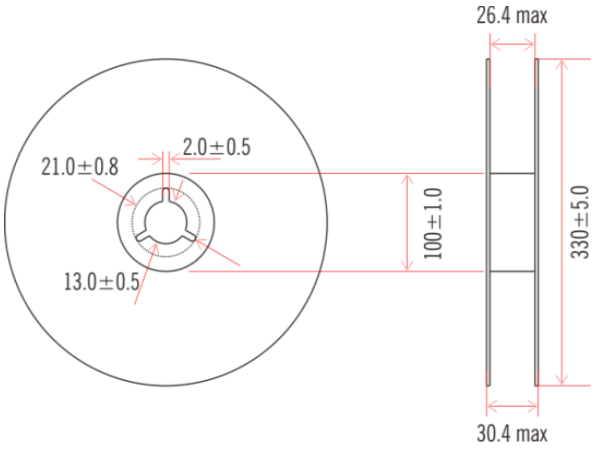
6.1 载带尺寸
Tape dimensions

单位unit: mm



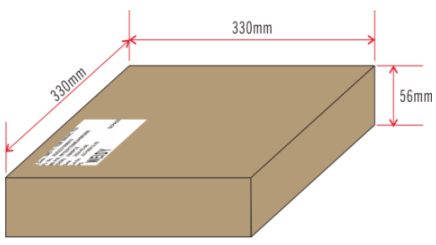
6.2 卷轴尺寸
Reel dimensions

单位unit: mm

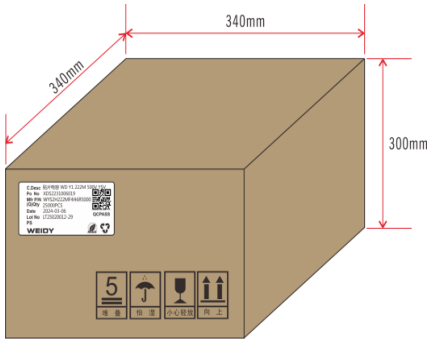


6.3 纸箱尺寸
Carton dimensions

■ 纸盒Box



■ 纸箱Carton



含堆叠高度、防潮、易碎与向上警告标志
Stacking height limit, moisture-proof, fragile, and upward warning signs

6.4 包装
Packing

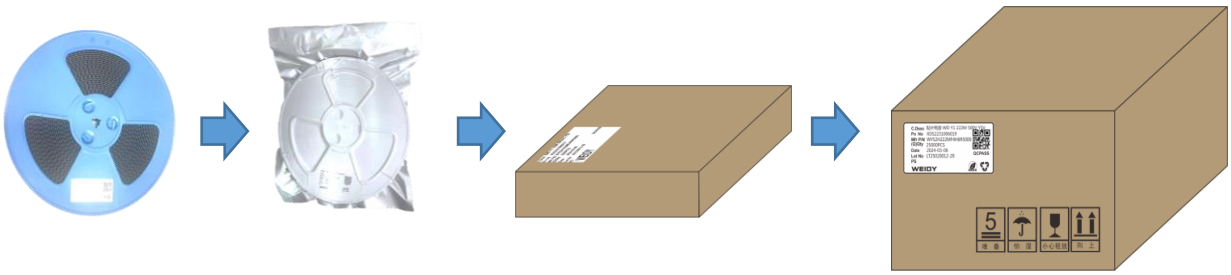
■ 标签Lable

标签含品名、料号、规格、数量、标保标志与公司商标等内容，具体如右图所示。
The label contains the product name, part number, specification, quantity, environmental protection mark and company trademark, as shown in the figure on the right.



卷轴、防静电袋、内盒与外箱均有粘贴片标签。
Reels, anti-static bags, inner boxes and outer boxes are labeled with stickers.

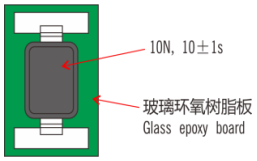
■ 包装方式
Packing

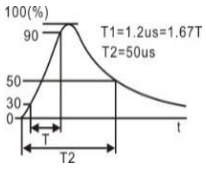
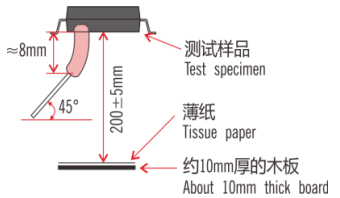


2500PCS/Reel　2500PCS/Bag　1盒装2盘，计5000PCS
2 reels in 1 box, total 5000PCS　1箱装5盒，计25000PCS
5 boxes in 1 carton, total 25000PCS

7. 规格和测试方法
SPECIFICATIONS AND TEST METHODS

<table>
<tr><th>序
NO</th><th colspan="2">项目
LTEM</th><th>标准
SPECIFICATION</th><th>测试方法
TEST METHOD</th></tr>
<tr><td>1</td><td colspan="2">工作温度范围
Operating temperature</td><td>-40˚C～+125˚C</td><td></td></tr>
<tr><td>2</td><td colspan="2">外观
Appearance</td><td>无缺陷或异常
No defects or abnormalities</td><td>目视检查
Visual inspection.</td></tr>
<tr><td>3</td><td colspan="2">尺寸
Dimensions</td><td>在规定范围内
Within the specified dimension.</td><td>使用卡尺或千分尺
Using calipers and micrometers.</td></tr>
<tr><td>4</td><td colspan="2">介电强度
Dielectric strength</td><td>无缺陷或异常
No defects or abnormalities.</td><td>在两引线之间施加AC4000V试验电压2秒时，电容器不应有任何损坏。
The capacitor shall not be damage when AC4000V(r.m.s.) is applied between the terminations for 2s.</td></tr>
<tr><td>5</td><td colspan="2">绝缘电阻
Insulation resistance
(I.R.)</td><td>10000 MΩ min.</td><td>在DC500±50V条件下,在充电开始60±5秒内测量绝缘电阻。 应通过1MΩ电阻器向电容器施加电压。
The insulation resistance shall be measured with DC500±50V within 60±5s of charging.The voltage should be applied to the capacitor through a resistor of 1MΩ.</td></tr>
<tr><td>6</td><td colspan="2">电容量
Capacitance</td><td>在规定偏差范围内
Within the specified tolerance.</td><td rowspan="2">在25˚C时，以最高1±0.1kHz 和AC1±0.2V(r.m.s.)的频率和电压，测量静电容量、损耗因数。
Capacitance/D.F. shall be measured at 25˚C with the frequency of 1±0.2kHz and a voltage of AC1±0.2V(r.m.s.).</td></tr>
<tr><td>7</td><td colspan="2">损耗因素
Dissipation factor
(D.F.)</td><td>0.025 max.</td></tr>
<tr><td>8</td><td colspan="2">温度特性
Temperature characteristics</td><td>SL: +350 ～ -1000 PPM/˚C
DL: -3300 ± 500 PPM/˚C
Y5P: ΔC/C≤±10%
Y5U: ΔC/C≤+22%/-56%
Y5V: ΔC/C≤+22%/-82%</td><td>电容测量应在表中的每一步进行。
The capacitance measurement shall be made at each step in table.
<table>
<tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Temperature (˚C)</td><td>20±2</td><td>-25±2</td><td>20±2</td><td>+85±2</td><td>20±2</td></tr>
</table>
•预处理Y5P、Y5U、Y5V特性。
•Pretreatment for Y5P, Y5U, Y5V char.
150+0/-10˚C热处理60±5分钟,然后在室温状态下静置24±2小时。
Perform the heat treatment at 150+0/-10˚C for 60±5 min and then let sit for 24±2h at room condition.</td></tr>
<tr><td>9</td><td colspan="2">可焊性
Solderability</td><td>引脚75%以上的均匀焊锡
75% of the terminations are to be soldered .</td><td>将端电极浸入25%松香比例的助焊剂中2±0.5秒，焊锡温度245±5˚C。
Immerse the capacitor in the solution of ethanol and rosin (25% rosin in weight proportion).Immerse in solder solution for 2±0.5s.Temperature of solder 245±5˚C</td></tr>
<tr><td rowspan="4">10</td><td rowspan="4">焊接耐热
(回流焊)
Soldering
effect
(Reflow)</td><td>外观
Appearance</td><td>无明显缺陷
No marked defects.</td><td rowspan="4">在150到180˚C下预热电容器90±30秒。
Preheat the capacitor at 150 to 180˚C for 90±30s.
回流温度Reflow temp : 230˚C min, 260˚C max.
回流时间Reflow time :30±10s。
回流次数Reflow number of times : 4 times
室温下静置24±2小时后测量。
Let sit at room condition for 24±2h, then measure.
•在样品温度降至室温后进行下一次回流处理。
• The next reflow porcess should be done after the temperature of the sample has dropped to room temperature.
•Y5P、Y5U、Y5V特性的预处理：电容器应存储在150+0/-10˚C环境下1小时,并在施加AC4000V(r.m.s)、2秒后放在室温下静置24±2h后测量初值。
• Pretreatment for Y5P、Y5U、Y5V char: Capacitor should be stored at 150+0/-10˚C for 1h, and apply the AC4000V(r.m.s.) 2s then placed at room condition for 24±2h before initial measurements.</td></tr>
<tr><td>电容量变化
Capacitance
change</td><td>±20%</td></tr>
<tr><td>绝缘电阻
I.R.</td><td>1000 MΩ min.</td></tr>
<tr><td>介电强度
Dielectric strength</td><td>按照第4项
Pass the item No.4.</td></tr>
</table>

序 NO	项目 LTEM		标准 SPECIFICATION	测试方法 TEST METHOD
11	抗拉强度 Adhesive strength of termination		不移开端子或有其他缺陷 No removal of the terminations or other defects should occur.	将电容器焊接到测试夹具(玻璃环氧树脂板)上。然后按照箭头的方向施加10N的力量10±1秒。 Solder the capacitor to the Test Jig (glass epoxy board), Then apply 10N force in the direction of the arrow 10±1s. 
12	抗振性 Vibration resistance	外观 Appearance	无明显缺陷 No marked defect.	将电容器端子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 termination 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 6h, 2h each in 3 mutually perpendicular directions.
		电容量 Capacitance	在误差范围内 Within the specified tolerance.	
		损耗 D.F.	0.025 max.	
13	温度循环 Temperature cycle	外观 Appearance	无明显缺陷 No marked defects.	将电容器固定在配套试验夹具(玻璃环氧树脂板)上。 Fix the capacitor to the supporting Test Jig (glass epoxy board). 根据下表列出的4个热处理条件，执行5周期的试验。 Perform the 5 cycles according to the 4 heat treatments listed the following table. <table><tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Templ(℃)</td><td>-40±3</td><td>Room Temp.</td><td>125±3</td><td>Room Temp.</td></tr><tr><td>Time(min.)</td><td>30±3</td><td>2 - 3</td><td>30±3</td><td>2 - 3</td></tr></table> •Y5P、Y5U、Y5V特性的预处理：电容器应存储在150+0/-10℃环境下1小时,并在施加AC4000V(r.m.s)、2秒后放在室温下静置24±2h后测量初值。 • Pretreatment for Y5P、Y5U、Y5V char: Capacitor should be stored at 150+0/-10℃ for 1h, and apply the AC4000V(r.m.s.) 2s then placed at room condition for 24±2h before initial measurements.
		电容量变化 Capacitance change	±20%	
		损耗 D.F.	DL、SL：0.025 Max Y5P、Y5U、Y5V:0.05 Max	
		绝缘电阻 I.R.	3000 MΩ min.	
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.	
14	稳态湿热 Humidity (Steady state)	外观 Appearance	无明显缺陷 No marked defects.	电容保持在温度为40±2℃、相对湿度为90-95%条件下500+24/-0小时。 Sit the capacitor at 40±2℃ and relative humidity 90 to 95% for 500+24/-0h 然后在室温条件下静置24±2 h后测量。 Remove and let sit for 24±2h at room condition, then measure. •Y5P、Y5U、Y5V特性的预处理：电容器应存储在150+0/-10℃环境下1小时,并在施加AC4000V(r.m.s)、2秒后放在室温下静置24±2h后测量初值。 • Pretreatment for Y5P、Y5U、Y5V char: Capacitor should be stored at 150+0/-10℃ for 1h, and apply the AC4000V(r.m.s.) 2s then placed at room condition for 24±2h before initial measurements.
		电容量变化 Capacitance change	±20%	
		损耗 D.F.	DL、SL：0.025 Max Y5P、Y5U、Y5V:0.05 Max	
		绝缘电阻 I.R.	3000 MΩ min.	
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.	
15	耐湿负荷 Humidity Loading	外观 Appearance	无明显缺陷 No marked defects.	电容保持在温度为85℃、相对湿度为85%条件下施加额定电压1000小时。 Apply the rated voltage for 1000 hrs. at 85℃ in 85% relative humidity. 然后在室温条件下静置24± 2h后测量。 Remove and let sit for 24± 2h at room condition, then measure. •Y5P、Y5U、Y5V特性的预处理：电容器应存储在150+0/-10℃环境下1小时,并在施加AC4000V(r.m.s)、2秒后放在室温下静置24±2h后测量初值。 • Pretreatment for Y5P、Y5U、Y5V char: Capacitor should be stored at 150+0/-10℃ for 1h, and apply the AC4000V(r.m.s.) 2s then placed at room condition for 24±2h before initial measurements.
		电容量变化 Capacitance change	±20%	
		损耗 D.F.	DL、SL：0.025 Max Y5P、Y5U、Y5V:0.05 Max	
		绝缘电阻 I.R.	3000 MΩ min.	
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.	

序 NO	项目 LTEM		标准 SPECIFICATION	测试方法 TEST METHOD
16	寿命 Life	外观 Appearance	无明显缺陷 No marked defects.	每个供试验电容必须承受8kV脉冲电压三次，然后再进行寿命试验。 Each individual capacitor should be subjected to a 8kV impulses for three times. After the capacitors are applied to life test.  在125+2/-0°C的条件下使用下列所要求的电压进行1000小时。 Apply a voltage of following for 1000h at 125+2/-0°C 施加1.7倍额定电压，每隔1小时将电压增加到AC1000V(rms)，持续0.1s Applied Voltage of 1.7 times rated voltage, except that once each hour the voltage is increased to AC1000V(rms) for 0.1s. 然后在室温条件下静置24±2h后测量。 Remove and let sit for 24±2h at room condition, then measure. •Y5P、Y5U、Y5V特性的预处理：电容器应存储在150+0/-10°C环境下1小时,并在施加AC4000V(r.m.s)、2秒后放在室温下静置24±2h后测量初值。 • Pretreatment for Y5P、Y5U、Y5V char: Capacitor should be stored at 150+0/-10°C for 1h, and apply the AC4000V(r.m.s.) 2s then placed at room condition for 24±2h before initial measurements.
		电容量变化 Capacitance change	±20%	
		绝缘电阻 I.R.	3000MΩ min.	
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.	
17	被动燃烧 Passive flammability		燃烧时间不应超过30秒，纸不应该点燃。 The burning time should not be exceeded the time 30s.The tissue paper should not ignite.	电容器在下面试验中，火焰在适当的位置被最大燃烧，各个试验样品应只承受一次燃烧，燃烧时间30秒钟。 The capacitor under test should be held in the flame in the position which best promotes burning. Each specimen should only be exposed once to the flame. Time of exposure to flame: 30s.  火焰长度：12±1mm Length of flame: 12±1mm 煤气火焰：长度35mm最小, 内径0.5±0.1mm，外径0.9mm最大 Gas burner: length 35mm min., inside dia. 0.5±0.1mm, outside dia. 0.9mm max. 煤气：丁烷煤气，纯度95%最小 gas: butane gas, purity 95% min.

备注：

Remark:

1) 室温是指温度 15至35°C，相对湿度45至75%，大气压86至106kPa

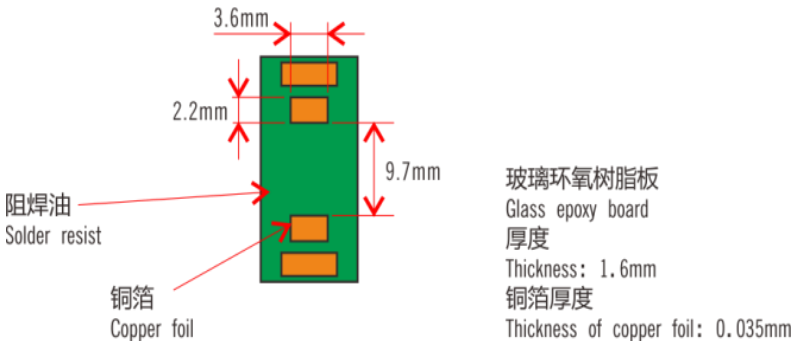
Room condition: Temperature 15 to 35°C, Relative humidity 45 to 75%, Atmosphere pressure 86 to 106kPa.

2) 测试夹具

Test Jig

该测试夹具可用于第11项抗拉强度、第12项抗振性、与第13项温度循环试验。

This Test Jig can be used for the 11th adhesive strength of termination, 12th vibration resistance and 13th temperature cycle test.

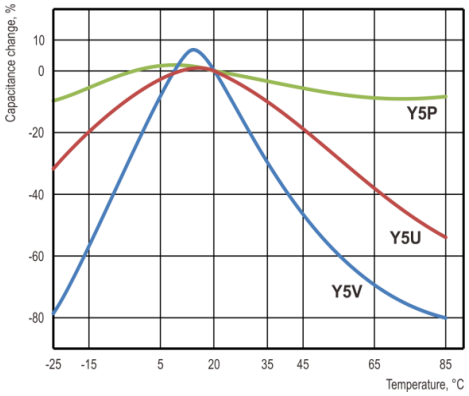


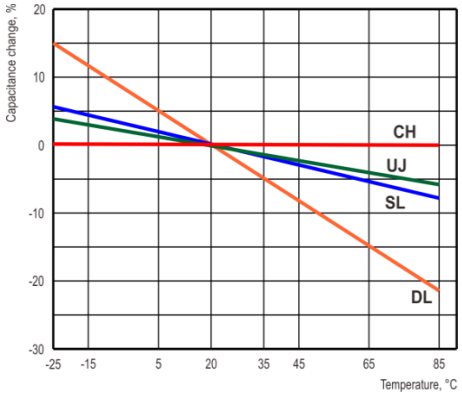
将产品焊接到测试夹具时，请使用回流焊(参考8.8项)，锡膏成份为Sn-3.0Ag-0.5Cu

When soldering the product to the Test Jig, use reflow soldering (See item 8.8) with a solder paste composition of Sn-3.0Ag-0.5Cu

■ 温度特性典型曲线图（仅供参考）

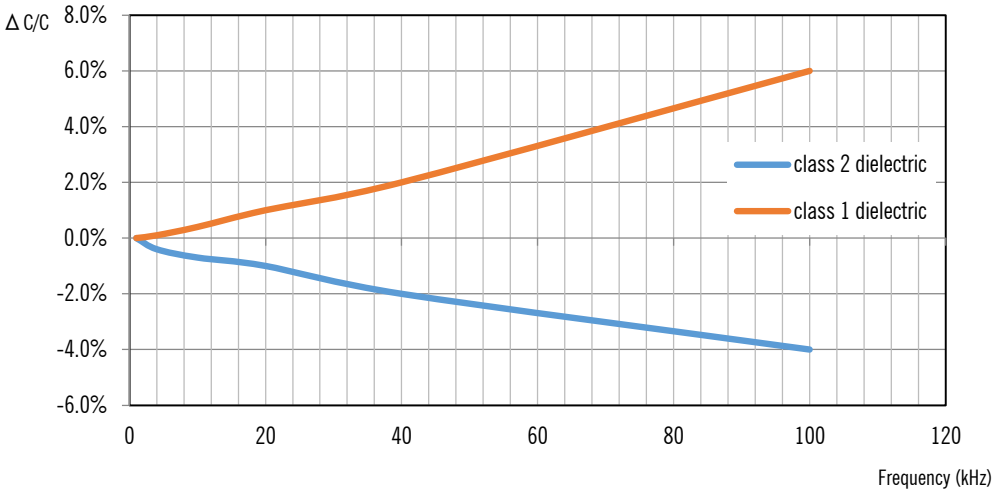
Typical temperature characteristic curves (for reference)





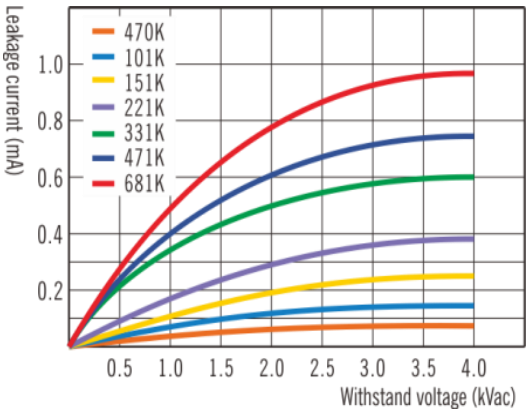
■ 容量与频率典型曲线图（仅供参考）

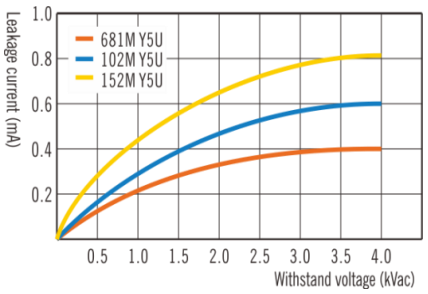
Typical capacitance vs frequency curves (for reference)

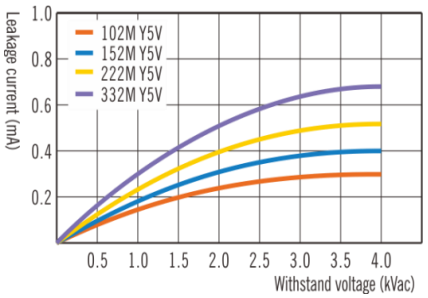


■ 耐电压与漏电流典型曲线图（仅供参考）

Typical withstand voltage vs leakage current curves (for reference)







8. 使用注意事项

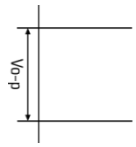
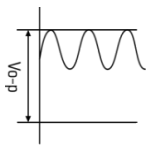
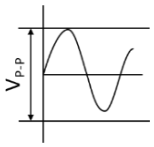
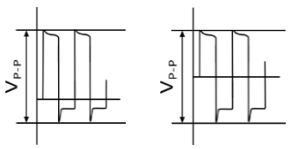
MATTERS NEEDING ATTENTION

8.1 工作电压

OPERATING VOLTAGE

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。 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 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. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rated voltage containing these irregular 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				

8.2 工作温度与自生热

Operating temperature and self-generated heat

适用于Y5P、Y5U、Y5V特性。

Apply to Y5P, Y5U, Y5V char.

电容器的表面温度应保持在其额定工作温度范围的上限以下。务必考虑到电容器的自生热。

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself.

电容器在高频电流、脉冲电流等中使用时可能会因介电损耗发出自生热。外加电压应使自生热等负荷在25℃周围温度条件下不超过20℃范围。

When the capacitor is used in a high frequency current, pulse current or similar current, it may have self-generated heat due to dielectric loss. Applied voltage load should be such that self-generated heat is within 20℃ under the condition where the capacitor is subjected at an atmosphere temperature of 25℃.

测量时应使用ø0.1mm小热容量（K）的热电偶，而且电容器不应受到其它元件的散热或环境温度波动影响。

When measuring, use a thermocouple of small thermal capacity-k of ø0.1mm under conditions where the capacitor is not affected by radiant heat from other components or wind from surroundings.

过热可能会导致电容器特性及可靠性下降。

Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.

（切勿在冷却风扇运转时进行测量。否则无法确保测量数据的精确性。）

(never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

8.3 耐电压的测试条件

Test condition for withstanding voltage

1) 测试设备

Test equipment

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。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。

Test equipment for ac withstanding voltage should be used with the performance of the wave similar to 50/60Hz sine wave. If the distorted sine wave or overload exceeding the specified voltage value is applied, a defect may be caused.

2) 电压外加方法

Voltage applied method

测试耐电压时，电容器的引线或端子应与耐电压测试设备的输出端连接牢固；然后再将电压从近零增加到测试电压(速度150V/s)。

When the withstanding voltage is applied, capacitor's lead or terminal should be firmly connected to the output of the withstanding voltage test equipment, and then the voltage should be raised from near zero to the test voltage (rising speed 150V/s).

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。

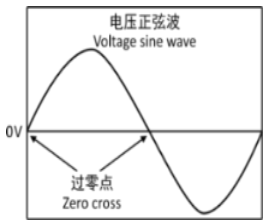
If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the zero cross. At the end of the test time, the test voltage should be reduced to near zero, and then capacitor's lead or terminal should be taken off the output of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

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，则可能会出现浪涌电压，从而导致故障。

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may arise, and therefore,a defect may be caused.

过零点是指电压正弦通过0V的位置。参见右图。

Zero cross is the point where voltage sine wave passes 0V. See figure at right.



8.4 失效安全性

Fail-safe

电容器损坏时，失效可能会导致短路。为了避免在短路时引起触电、冒烟、火灾等危险情况，请在电路中使用熔丝等元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 result in an electric shock, fire or fuming.

8.5 电容器容量变化

Capacitance change of capacitors

1) SL、DL特性

SL, DL char.

电容量可能会因环境温度或外加电压而发生轻微变化。若要将本产品用于时间常数电路，请与我公司联系。

Capacitance might change a little depending on a surrounding temperature or an applied voltage. Please contact us if you use for the constant time circuit.

2) Y5P、Y5U、Y5V特性

Y5P, Y5U, Y5V char.

电容器具有老化特性；因此，电容器若长时间使用，其静电容量会逐渐降低。而且，静电容量还可能会因环境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。

Capacitors have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor is left on for a long time. Moreover, capacitance might change greatly depending on the surrounding temperature or an applied voltage. So, it is not likely to be suitable for use in a constant time circuit.

若需详情，请与我公司联系。

Please contact us if you need detailed information.

8.6 使用设备检查

Performance check by equipment

使用电容器之前，请先检查设备的性能和特性没有问题。

Before using a capacitor, check that there is no problem in the equipment's performance and the specifications.

一般而言，二类瓷(Y5P、Y5U、Y5V特性)陶瓷电容器的静电容量具有电压和温度相关特性。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量值变化的影响，如漏电流和静噪特性。

Generally speaking, class 2 (Y5P, Y5U, Y5V char.) Ceramic capacitors have voltage dependence characteristics and temperature dependence characteristics in capacitance. So, the capacitance value may change depending on the operating condition in the equipment. Therefore, be sure to confirm the apparatus performance of receiving influence in the capacitance value change of a capacitor, such as leakage current and noise suppression characteristic.

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。

Moreover, check the surge-proof ability of a capacitor in the equipment, if needed, because the surge voltage may exceed specific value by the inductance of the circuit.

8.7 贮存与使用条件

Operating and 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。

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.

在对本产品进行清洗、焊接或成型前，请先在指定设备上测试经清洗、焊接或成型的产品的性能，以确定上述过程不会影响产品质量。

Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment.

电容器储存在下列条件下,并在交付后6个月内使用。

Store the capacitors in the following conditions at all times, and use within 6 months after delivered.

- 温度Temperature: 10～30℃
- 相对湿度Relative humidity: 60% max

贮藏期已经超过6个月或封闭包装被打开时, 在焊接之前执行烘烤(60℃ x 168小时)。

In case the storage period has been exceeded 6 months or the indicator color of a enclosed HIC card has changed when the package has been opened, perform baking (60℃ x 168 hr) before soldering.

8.8 焊锡和安装

Soldering and mounting

1) 振动与碰撞

Vibration and impact

使用时请勿使电容器受到过度冲击或振动。

Do not expose a capacitor or its lead to excessive shock or vibration during use.

2) 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.

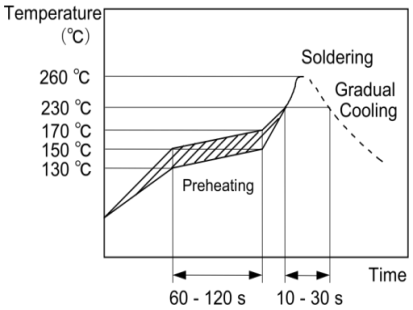
■ 回流焊

Reflow Soldering

焊锡温度Soldering temperature: 230 ～ 260˚C

焊锡时间Soldering time: 10 ～ 30s

预热温度Preheating temperature: 170 ˚C max.



推荐回流焊接条件

Reflow soldering temperature-time profile to recommend

■ 波峰焊

Flow Soldering

焊锡温度Soldering temperature: 260˚C max

焊锡时间Soldering time: 5s max

预热温度Preheating temperature: 120 ˚C max.

预热时间Preheating time: 60s max

■ 烙铁焊接

Soldering Iron

焊锡温度Temperature of iron-tip: 400 ˚C max.

烙铁头Soldering iron wattage: 50W max.

焊锡时间Soldering time: 3.5s Max.

3) 压焊、树脂涂层与包封

Bonding, resin molding and coating

在压焊、树脂涂层和封膜之前，请先使用指定设备确认对产品没有影响，然后再进行使用。

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.

在粘合、树脂涂层、封膜的干燥、硬化条件使用到有机溶剂（乙酸乙酯、甲基乙酮、甲苯等），可能会破坏电容器的包封树脂，而造成短路不良。

In case 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.

粘合、树脂涂层、封膜厚度的偏差可能会在冷却与加热过程中使电容器的包封树脂和/或陶瓷介质破裂。

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

4) 清洗（超声波清洗）

Cleaning (ultrasonic cleaning)

要进行超声波清洗，应遵守下列条件。

To perform ultrasonic cleaning, observe the following conditions.

清洗槽容量：每升输出功率20瓦特或以下。

Rinse bath capacity: output of 20 watts per liter or less.

清洗时间：最多5分钟。

Rinsing time: 5 min. Maximum.

不得直接振动 pcb/pwb。

Do not vibrate the pcb/pwb directly.

过度的超声波清洗会导致导线的过载损坏。

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

9. 应用限制

LIMITATION OF APPLICATIONS

为防止可能直接对第三方的生命、身体或财产造成损害，在将我们的产品应用于下列可靠性要求特别高的需求前，请联系我们。

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- ■ 航空/航天设备

  Aircraft, aerospace equipment

- ■ 水下设备

  Undersea equipment

- ■ 电站控制设备

  Power plant control equipment

- ■ 医疗

  Medical equipment

- ■ 运输设备

  Transportation equipment (automotives, trains, ships, etc.)

- ■ 交通信号设备

  Traffic signal equipment

- ■ 灾害预防/犯罪预防设备

  Disaster prevention / crime prevention equipment

- ■ 对公众产生影响的数据处理设备

  Data-processing equipment exerting influence on public

- ■ 类似复杂性和/或可靠性要求的应用程序

  Application of similar complexity and/or reliability requirements to the applications listed in the above.