

贴片安规电容规格书

PATCH SAFETY CAPACITOR SPECIFICATION

客户			
CUSTOMER			
客户料号			
CUSTOMER			
P/N			
规格描述	WD	222M	500V Y5V
DESCRIPTION			
产品编码			
PART	WYS2H222MF4H6R5000		
NUMBER			
日期	2023-09-20	文件编号	WD-WYS-001A
DATE		DOC. NO.	



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
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PATCH SAFETY CAPACITOR SPECIFICATION

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一、 产品优势

PRODUCT ADVANTAGR

1. 产品注塑成型，规格尺寸一致性好。

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。

二、 应用

APPLICATION

1. 本规范适用于安全标准认证SM注塑成型SMD型陶瓷电容器用于通用电气设备。

Application This specification is applied to Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors Type SM used for General Electric equipment

2. 不使用这些产品在任何汽车动力传动系或安全设备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. 批准标准及认证号码

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 AC Rated volt
UL	E334332-20200116 UL 60384-14 CSA E60384-1:14 CSA E60384-14:14	E334332	X1: 500VAC Y1:250/300/400/500VAC
ENEC15	EN 60384-14:2013, EN 60384-14:2013/A1:2016	ENEC-03969	X1: 500VAC Y1:250/300/400/500VAC
CQC	GB/T6346.14-2015	CQC20001237498	X1: 500VAC Y1:250/300/400/500VAC
KC	KC60384-1(2015-09), KC60384-14(2015-09)	SU03125-20003	Y1, AC 250 V

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PATCH SAFETY CAPACITOR SPECIFICATION

三、 额定值 RATING

1. 工作温度范围: -40 ~ +125°C

Operating temperature range

2. 额定电压: 500V (r.m.s.)

Rated voltage

3. 产品编码结构 (仅供参考)

Part number configuration (For Reference)

WYS2H222MF4H6R5000

①

②

③

④

⑤

⑥

⑦

⑧

⑨

① 产品类别

PRODUCT TYPE

代码 CODE	产品类别 Product Type
WYS	贴片电容 PATCH CAPACITOR

② 额定电压

RATED VOLTAGE

2E	250V
2F	300V
2G	400V
2H	500V

③ 标称容量

NOMINAL CAPACITNCE

代码 CODE	681	102	222
标称容量 NOMINAL CAPACITANCE	680PF	1000pF	2200PF

④ 容量误差

CAPACITANCE TOLERANCE

代码 CODE	J	K	M
误差 ERROR	±5%	±10%	±20%

⑤ 温度特性

TEMPERATURE CHARACTERISTICS

代码 CODE	SL	DL	B4	E4	F4
温度特性 TEMPERATURE CHARACTERISTIC	SL	DL	Y5P	Y5U	Y5V

SL: +350 ~ -1000 PPM/°C

DL: -3500 ± 500 PPM/°C

Y5P(ΔC/C: ± 10% (-25°C ~ +85°C)

Y5U(ΔC/C: ≤ +22%/-56% (-25°C ~ +85°C)

Y5V(ΔC/C: ≤ +22%/-82% (-25°C ~ +85°C)

⑥ 脚型

LEADSTYLE

代码 CODE	H
脚型 LEAD STYLE	海鸥脚 Embossed Taping

⑦ 脚距

LEAD SPACING

代码 CODE	6
脚距 LEAD SPACING	10.0MM

⑧ 包装方式

PACKAGING

代码 CODE	包装方式 packaging
R5	卷盘包装 Reel packaging

⑨ 内部码INNER CODE

内部控制码, 本目录不作说明。

INTERNAL CONTROL CODE WILL NOT BE DESCRIBED IN THIS CATALOG

四、 标记 (仅供参考) MARKING (For Reference)

1、 商标: (trademar) : WEIDY

2、 产品系列 (Type) : WYS

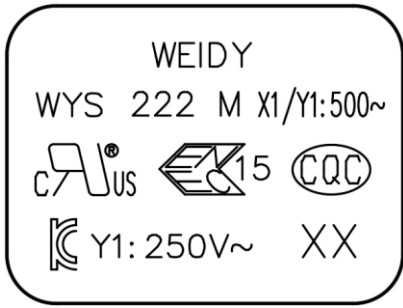
3、 标称容量及公差(Type nameNominal capacitance and Tolerance) :

222=2200pF

M: $\pm 20\%$

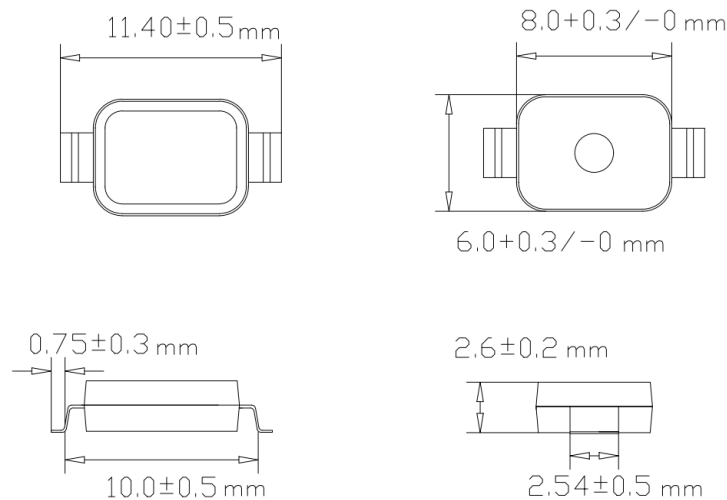
4、 额定电压(Rated Voltage) : 500 V

5、 印字 (Mark) : (Example) XX表示印字周期:年月 (Indicates the printing cycle: year+month)

年 Year	月 Mouth	
G代表2021	1~9代表1~9月份	
H代表2022	O代表10月份	
J代表2023	N代表11月份	
K代表2024	D代表12月份	

五、 产品基本数据表 PART NUMBER LIST

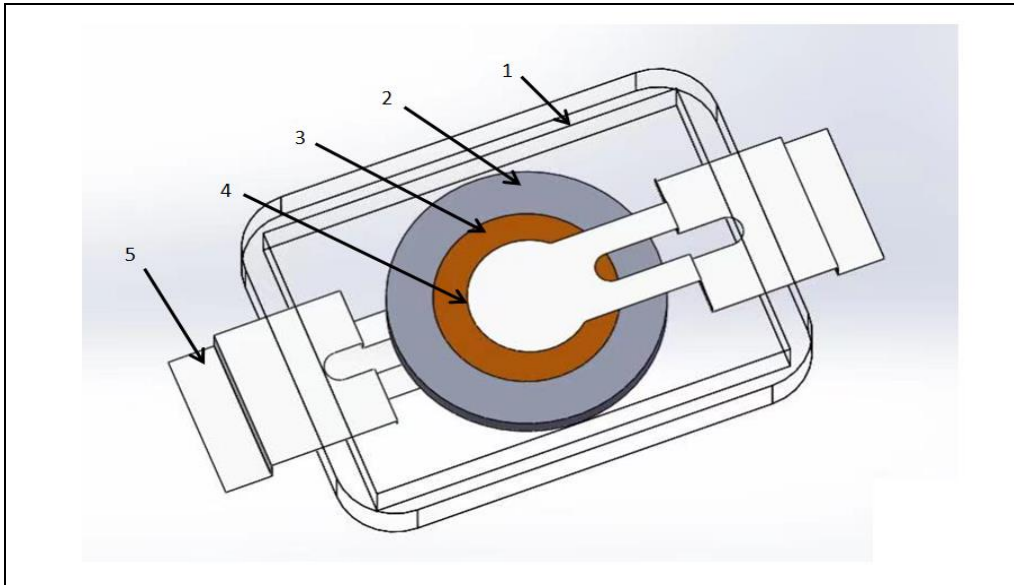
5.1、 产品尺寸:



5.2 容量规格:

序号	材质 T.C	电容量 CAPACITANCE	容量允差 CAP TOL	产品编码 PART NUMBER
1	SL	10 pF	± 5%	WYS2H 100JSLH6R5000
2	SL	15 pF	± 5%	WYS2H 150JSLH6R5000
3	SL	22 pF	± 5%	WYS2H 220JSLH6R5000
4	SL	33 pF	±5%	WYS2H 330JSLH6R5000
5	DL	47 pF	±5%	WYS2H 470JDLH6R5000
6	DL	56 pF	±5%	WYS2H 560JDLH6R5000
7	DL	68 pF	±5%	WYS2H 680JDLH6R5000
8	DL	82 pF	±5%	WYS2H 820JDLH6R5000
9	Y5P	100 pF	±10%	WYS2H101KB4H6R5000
10	Y5P	150 pF	±10%	WYS2H151KB4H6R5000
11	Y5P	220 PF	±10%	WYS2H221KB4H6R5000
12	Y5P	330 pF	±10%	WYS2H331KB4H6R5000
13	Y5P	470 pF	±10%	WYS2H471KB4H6R5000
14	Y5P	680 pF	±10%	WYS2H681KB4H6R5000
15	Y5U	680 pF	±20%	WYS2H681ME4H6R5000
16	Y5U	820 pF	±20%	WYS2H821ME4H6R5000
17	Y5U	1000 pF	±20%	WYS2H102ME4H6R5000
18	Y5U	1200 pF	±20%	WYS2H122ME4H6R5000
19	Y5U	1500 pF	±20%	WYS2H152ME4H6R5000
20	Y5V	1000 pF	±20%	WYS2H102MF4H6R5000
21	Y5V	1200 pF	±20%	WYS2H122MF4H6R5000
22	Y5V	1500 pF	±20%	WYS2H152MF4H6R5000
23	Y5V	2200 pF	±20%	WYS2H222MF4H6R5000
24	Y5V	2700 pF	±20%	WYS2H272MF4H6R5000
25	Y5V	3300 pF	±20%	WYS2H332MF4H6R5000
	尺寸 DIMENSIONS			包装数量 PACK QTY.(Pcs)
	L	W	T	
	11.4mm±0.5mm	6.0mm±0.5mm	2.6mm±0.2mm	2500/卷

5.3、产品结构图Product structure drawing



序号No	名称Part name	材料Material	型号Model
1	包封层Coating	环氧模塑料 Epoxy Molding Compound	Y1
2	介质Dielectric	陶瓷Ceramic	Y1
3	电极Electrode	铜/银: Copper/Silver	Y1
4	焊料Solder	SnPbAg 合金 SnPbAg Sol der	Y1
5	引脚Lead wire	铜合金Copper alloys	Y1

5.4、机械数据 MECHANICAL DATA

外壳:模制塑料本体 Case: Molded plastic body

电路端子: 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

安装位置:任何 Mounting Position: Any

重量:0.011盎司, 0.33克 Weight: 0.011 ounce., 0.33 grams

六、 包装标准 (PACKAGING STANDARD)

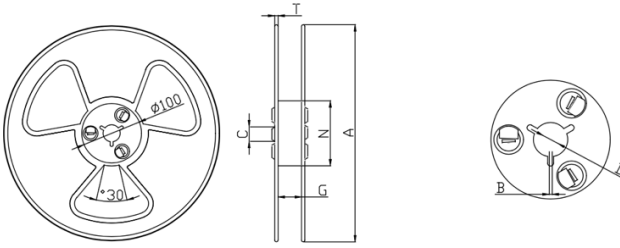
6.1、 卷轴尺寸:

R——卷轴编带 (Reeling)

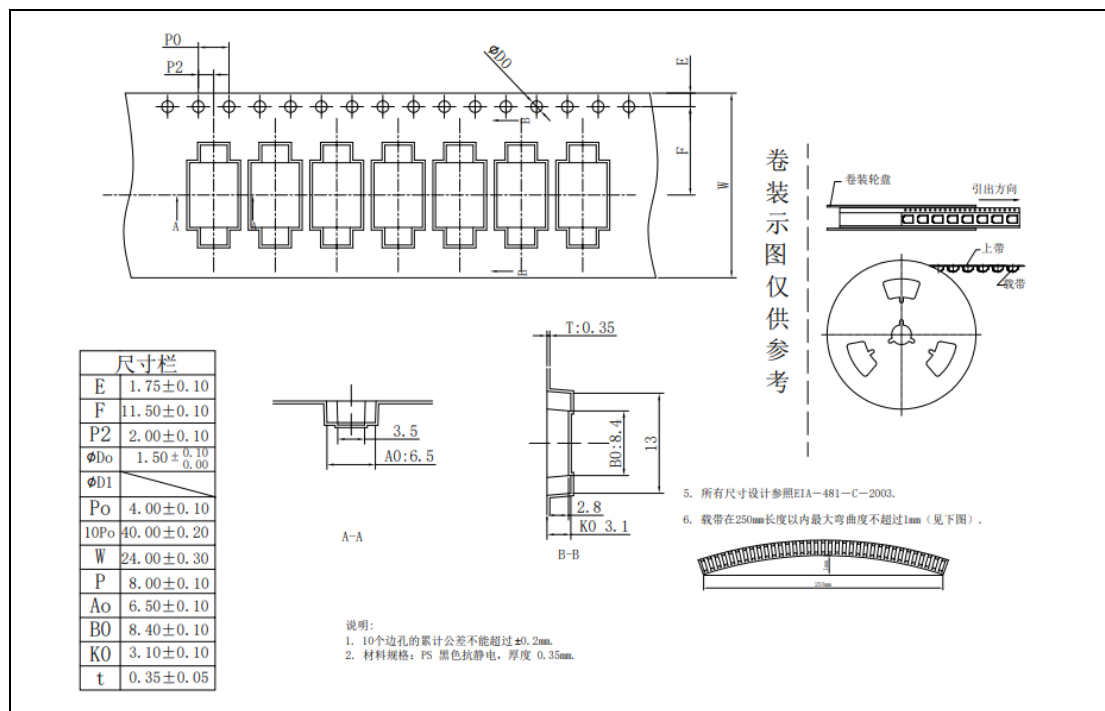
包装数量: 2500 Pcs/卷

图 I 卷式编带盘图形及尺寸 (mm)

Fig.I Skech & Dimensions of reel (mm)

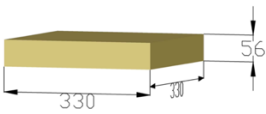
代码	尺寸	
A	330±5.0	
D	100±1	
G	24.4±1	
T1	2.0±0.1	

6.2、 载带尺寸:



6.3、包装箱尺寸 Packing case size

内盒/外箱 INNER BOX /Outer Box

					
ITEM	W (mm)	L(mm)	H(mm)	Quantity of Product	Inner Box Weight
INNER BOX	330	330	56	5000/BOX	---
Outer Box	340	340	300	25000/BoX	---

6.4、标签 (label) :

标签图示(仅供参考):

位置	数量 Quantity (PCS)	标签尺寸 The label size	标签格式 INNER LABEL
内卷 VoLume	2500	80*40mm	我司型号规格 → C.Desc 贴片安规电容 WD Y1 470J 500V DL 我司库存批号 → Po No XDS2210818073 我司料号 → Mfr P/N WYS2H470JDLH6R5000 数量 → (Q)Qty 5000PCS 出货日期 → Date 2021-11-06 流卡生产批号 → Lot No GT21110004 PS  QCPASS  MADE IN CHINA
内盒 InnerBox	5000	80*40mm	
外箱 Carton	25000	100*50mm	

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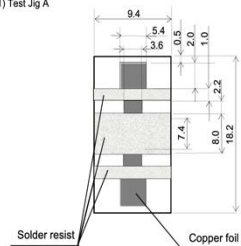
七、规格和测试方法

SPECIFICATIONS AND TEST METHODS

序 NO.	项目 ITEM	规范 SPECIFICATION	测试方法 TEST METHOD												
1	工作温度范围 Operating Temperature	-40~+125℃													
2	外观 Appearance	无缺陷或异常 No defects or abnormalities	目视检查 Visual inspection.												
3	尺寸 Dimensions	尺寸在规定范围内 Within the specified dimension.	使用卡尺或千分尺 Using calipers and micrometers.												
4	介电强度 Dielectric strength	无缺陷或异常 No defects or abnormalities.	在两根引线之间施加AC4000V试验电压达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 2 s.												
5	绝缘电阻 Insulation Resistance(I.R.)	6000 MΩ or more	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±5 s of charging.The voltage should be applied to the capacitor through a resistor of 1MΩ.												
6	静电容量 Capacitance	在规定偏差范围内 Within the specified tolerance.	在20℃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 20℃ with the frequency of 1±0.2kHz and a voltage of AC1±0.2V(r.m.s.).												
7	损耗因素 Dissipation Factor (D.F.)	0.025 max.													
8	温度特性 Capacitance Temperature Characteristics	Cap. Change SL: +350 ~ -1000 PPM/℃ DL: -3500 ± 500 PPM/℃ Y5P(ΔC/C: ±10%(-25℃ ~ +85℃) Y5U(ΔC/C: ≤+22%/-56% (-25℃ ~ +85℃) Y5V(ΔC/C: ≤+22%/-82% (-25℃ ~ +85℃)	电容测量应在表中的每一步进行。 •预处理B、E、F特性。 执行热处理150 + 0/-10℃ 60 ± 5分钟,然后在室温状态下静置24 ± 2h。 The capacitance measurement shall be made at each step in table. •Pretreatment for B、E、F. char.Perform the heat treatment at 150+0/-10 °C for 60±5 min and then let sit for 24±2 h at *room condition. <table><tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Temp.(℃)</td><td>20±2</td><td>-25±2</td><td>20±2</td><td>85±2</td><td>20±2</td></tr></table>	Step	1	2	3	4	5	Temp.(℃)	20±2	-25±2	20±2	85±2	20±2
Step	1	2	3	4	5										
Temp.(℃)	20±2	-25±2	20±2	85±2	20±2										
9	抗振性 Vibration resistance	外观 Appearance	无明显缺陷 No marked defect.	将电容器焊接到“测试方法补充”中所示的测试夹具A(玻璃环氧树脂板)上。电容器应当受到简谐运动总振幅1.5毫米,多样统一的频率近似极限之间的10 - 55 HZ。 Solder the capacitor to the Test Jig A (glass epoxy board) shown in “Complement of test method”. The capacitor shall be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. 频率范围,从10到55 HZ,回到10 HZ,遍历在大约1分钟。 适用这个运动一段2 h的三个互相垂直的方向(共6 h)。 The frequency range, from 10 to 55Hz and return to 10Hz, shall be traversed in approximately 1 min.This motion shall be applied for a period of 2 h in each of 3 mutually perpendicular directions (total of 6h). 测试方法的补充Complement of Test Method Test Jig A The test jig should be Jig A as described in “Specifications and Test methods”. The specimen should be soldered by the conditions as described below Soldering Method : Reflow soldering Solder : Sn-3.0Ag-0.5Cu •Material : Glass Epoxy Board •Thickness : 1.6mm •Thickness of copper foil : 0.035mm											
		静电容量 Capacitance	在规格范围内 Within the specified tolerance.												
		损耗因素 D.F.	按照第7项 Pass the item No.7.												

(1) Test Jig A

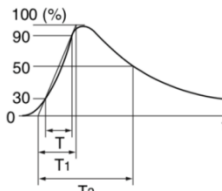
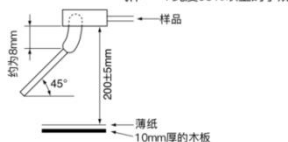
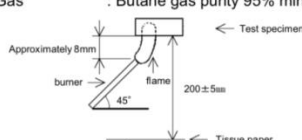
(1) Test Jig A

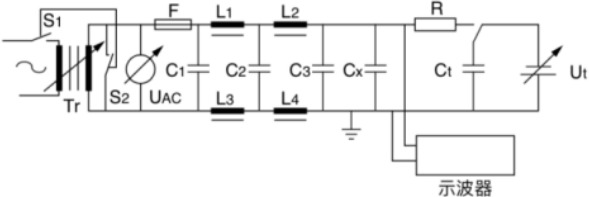
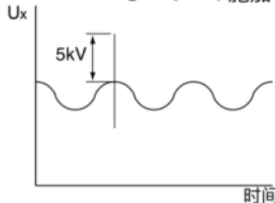
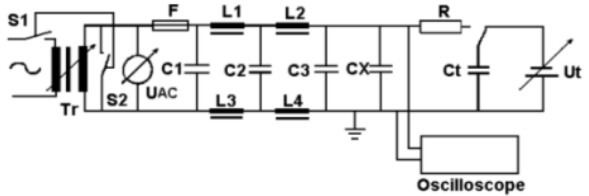
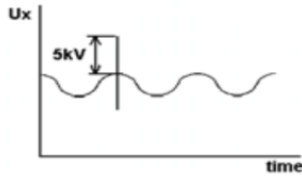


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PATCH SAFETY CAPACITOR SPECIFICATION					
序NO.	项目ITEM		规范SPECIFICATION	测试方法TEST METHOD	
10	引脚可焊性 Solderability of termination		引脚75%以上的均匀焊锡 75% of the terminations are to be soldered .	将引脚浸入25%松香比例的助焊剂中2±0.5s。 焊锡温度245±5℃ Immerse the capacitor in the solution of ethanol(JIS K 8101) and rosin (JIS K 5902) (25% rosin in weight proportion).Immerse in solder solution for 2±0.5s.Temp. of solder : 245±5℃	
11	焊接效果 (回流焊) Soldering effect (Reflow)	外观 Appearance	无明显缺陷 No marked defects.	预热的电容器150到180℃时间为90±30s。回流温度:230℃ Min。(Max. 温度:260° C)回流时间:30±10 s。回流次数:4次 Preheat the capacitor at 150 to 180℃ for 90±30s. Reflow temp. : 230℃ min. (Max. temp. : 260℃) Reflow time : 30±10s.Reflow number of times : 4 times 室温下静置24±2 h后测量。 Let sit at *room condition for 24±2 h, then measure.	
		静电容量 Capacitance	在±20%范围内 Within ±20%	•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.	
		绝缘电阻 I.R.	最小1000 MΩ 1000 MΩ or more	•B、E、F 特性的预处理。 电容器应该存储在150 + 0/-10° C 1 h,并施加AC4000V 60S(r.m.s)然后放在室温下静置24±2 h后测量初值。	
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.	• Pretreatment for B,E char.Capacitor should be stored at 150+0/-10℃ for 1 h, and apply the AC4000V(r.m.s.) 60s then placed at *room condition for 24±2 h before initial measurements.	
12	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“测试方法补充”中所示的测试夹具A(玻璃环氧树脂板)上。参见9项中。 然后按照箭头的方向施加10 n的力量。10±1 s Solder the capacitor to the Test Jig A (glass epoxy board) shown in “Complement of Test method”. Pass the item No.9. Then apply 10N force in the direction of the arrow. 10N, 10±1s Glass Epoxy Board	
13	温度循环 Temperature cycle	外观 Appearance	无明显缺陷 No marked defect.	将电容器固定在配套试验夹具A(玻璃环氧树脂板)上。参见9项中。 根据下表列出的4个热处理条件，执行5周期的试验。 Fix the capacitor to the supporting Test Jig A (glass epoxy board) shown in “Complement of test method”.Pass the item No.9. Perform the 5 cycles according to the 4 heat treatments listed the following table.	
		静电容量 Capacitance	在±15%范围内 Within ±15%		
		损耗因素 D.F.	DL、SL: 0.025 Max Y5P、Y5U、Y5V:0.05 Max.		
		绝缘电阻 I.R.	最小3000 MΩ 3000 MΩ or more		
		介电强度 Dielectric strength	按照第4项 Pass the item No.4.		
14	湿度（稳态） Humidity (Steady state)	外观 Appearance	无明显缺陷No marked defect.	电容器置于40±2° C,相对湿度90~95%的空间。500 + 24/-0移除,室温条件下静置24±2 h,然后测量。 Sit the capacitor at 40±2℃ and relative humidity 90 to 95% for 500+24/-0 h. Remove and let sit for 24±2 h at *room condition, then measure.	
		静电容量 Capacitance	在±20%范围内 Within ±20%	电容器应该存储在150 + 0/-10° C 1 h,并施加AC4000V 60S(r.m.s)然后放在室温下静置24±2 h后测量初值。	
		损耗因素 D.F.	DL、SL: 0.025 Max Y5P、Y5U、Y5V: 0.05 Max.	• Pretreatment for B,E char.Capacitor should be stored at 150+0/-10℃ for 1 h, and apply the AC4000V(r.m.s.) 60s then placed at *room condition for 24 ±2 h before initial measurements.	
		绝缘电阻 I.R.	3000 MΩ or more		
		绝缘强度 Dielectric strength	按照第4项 Pass the item No.4.		

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PATCH SAFETY CAPACITOR SPECIFICATION

序 NO	项目 ITEM		规范 SPECIFICATION	测试方法 TEST METHOD		
15	耐湿负荷 Humidity Loading	外观 Appearance	No marked defect.	电容器施加额定电压, 置于 $40\pm 2^{\circ}$ C,相对湿度90~95%的空间。500 + 24/-0 移除,室温条件下静置 24 ± 2 h,然后测量。 Apply the rated voltage at $40\pm 2^{\circ}$ C and relative humidity90 to 95% for 500+24/-0 h. Remove and let sit for 24 ± 2 h at *room condition, then measure. 电容器应该存储在 $150 + 0/-10^{\circ}$ C 1 h,并施加AC4000V 60S(r.m.s)然后放在室温下静置 24 ± 2 h后测量初值 • Pretreatment for B,E char.Capacitor should be stored at $150+0/-10^{\circ}$ C for 1 h, and apply the AC4000V(r.m.s.) 60s then placed at *room condition for 24 ± 2 h before initial measurements.		
		静电容量 Capacitance	Within $\pm 20\%$			
		损耗因素 D.F.	DL、SL: 0.025 Max Y5P、Y5U、Y5V: 0.05 max.			
		绝缘电阻 I.R.	最小3000 MΩ 3000 MΩ or more			
		绝缘强度 Dielectric strength	按照第4项 Pass the item No. 4.			
16	寿命 Life	外观 Appearance	无明显缺陷 No marked defect.	脉冲电压完成寿命测试后, 均应对每个电容器实施8kV的脉冲电压测试。 mpulse Voltage test is performed.Each individual capacitor shall be subjected to a 8kV Impulse the voltage value means zero to peak) for 3 times. Then the capacitors are applied to life test.  前端时间(T_1)= 1.2μ s= $1.67T$ 到达电压半值的时间(T_2)= 50μ s 在 $125+2/-0^{\circ}$ C及相对湿度低于50%的条件下施加表4所示的电 压1000小时 Apply voltage as Table for 1000 h at $125+2/-0^{\circ}$ C, relative humidity 50% max. <table><tr><td>外加电压 Applied voltage</td></tr><tr><td>AC550V (r.m.s.), 但每小时一次将电压增大至AC1000V (r.m.s.) 0.1秒的情况除外。 AC550V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1s.</td></tr></table> Remove and let sit for 24 ± 2 h at *room condition, then measure. Pretreatment for B、E、F. char.Capacitor should be stored at $150+0/-10^{\circ}$ C for 1 h, and apply the AC4000V(r.m.s.) 60s then placed at *room condition for 24 ± 2 h before initial measurements.	外加电压 Applied voltage	AC550V (r.m.s.), 但每小时一次将电压增大至AC1000V (r.m.s.) 0.1秒的情况除外。 AC550V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1s.
		外加电压 Applied voltage				
		AC550V (r.m.s.), 但每小时一次将电压增大至AC1000V (r.m.s.) 0.1秒的情况除外。 AC550V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1s.				
		静电容量 Capacitance	在 $\pm 20\%$ 范围内 Within $\pm 20\%$			
绝缘电阻 I.R.	最小3000 MΩ 3000 MΩ or more					
绝缘强度 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.	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 ± 1 mm 喷嘴器 : 35mm长 内径: 0.5 ± 0.1 mm 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 flame in the position which best promotes burning. Each specimen shall only be exposed once to the flame. Time of exposure to flame : 30 s. Length of flame : 12 ± 1 mm Gas burner : Length 35mm min. Inside dia : 0.5 ± 0.1 mm Outside dia : 0.9mm max. Gas : Butane gas purity 95% min.  Wood board of approximately 10mm in thickness			

序 NO.	项目 ITEM	规范 SPECIFICATION	测试方法 TEST METHOD
18	主动燃烧 Active flammability	粗绵布不燃烧。 The cheese-cloth should not be on fire	应将电容器单独包裹在至少1层粗绵布中, 但不得超过2层。然后, 对电容器实施20次放电。逐次放电间隔应为5秒。实施最后一次放电后, 应保持UAC2分钟。  示波器 $C_{1,2} : 1\mu F \pm 10\%$ $C_3 : 0.033\mu F \pm 5\% 10kV$ $L1至4 : 1.5mH \pm 20\% 16A$ 杆状扼流 $C_t : 3\mu F \pm 5\% 10kV$ $R : 100\Omega \pm 2\%$ C_x : 电容器 (测试对象) $U_{AC} : U_R \pm 5\%$ F : 保险丝 额定电流10A U_R : 额定电压 U_t : 施加电压到 C_t 上  时间 The capacitor shall be individually wrapped in at least one but more than two complete layers of cheesecloth. The capacitor shall be subjected to 20 discharges. The interval between successive discharges shall be 5 s. The UAC shall be maintained for 2 min after the last discharge.  Oscilloscope $C_{1,2} : 1\mu F \pm 10\%$, $C_3 : 0.033\mu F \pm 5\% 10kV$ $L1-4 : 1.5mH \pm 20\% 16A$ Rod core choke Capacitance/Q/D.F. shall be measured at 20°C with the $UAC : U_R \pm 5\%$, U_R : Rated Voltage F : Fuse, rated 16A C_x : Capacitor specimens U_t : Voltage impressed on the tank capacitor C_t  time

*1 "室内条件" 温度: 15至35℃, 相对湿度: 45至75%, 大气压: 86至106kPa

* "room condition" Temperature:15 to 35℃, Relative humidity:45 to 75%, Atmosphere pressure:86 to 106kPa

八、使用注意事项

MATTERS NEEDING ATTENTION



警告CAUTION

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 V_{p-p} 值或包含直流偏置电压的 V_{o-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 V_{p-p} value of the applied voltage or the V_{o-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	直流电压	直流+交流电压	交流电压	冲激电压 (1)	冲激电压 (2)
位置测量					

2. 工作温度和自生热 (适用于B/E/F特性)

OPERATING TEMPERATURE AND SELF-GENERATED HEAT

电容器的表面温度应保持在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。电容器在高频电流、冲激电流等中使用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°C周围温度条件下不超过20°C范围。测量时应使用 $\phi 0.1\text{mm}$ 小热容量的(K)的热电偶，而且电容器不应受到其它元件的散热或周围温度波动影响。过热可能会导致电容器特性及可靠性下降。

(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)

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. When the capacitor is used in a high-frequency current, pulse current or the like, it may have the self-generated heat due to dielectric-loss. Applied voltage should be the load such as self-generated

heat is within 20 C on the condition of atmosphere temperature 25 C. When measuring, use a thermocouple of small thermal capacity-K of 0.1mm and be in the condition where capacitor is not affected by radiant heat of other components and wind of surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.

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

3. 耐电压的测试条件

TEST CONDITION FOR WITHSTANDING VOLTAGE

(1) 测试设备

TEST EQUIPMENT

交流耐电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，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 50/60 Hz sine wave. If the distorted sine wave or over load exceeding the specified voltage value is applied, the defective may be caused.

(2) 电压外加方法

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VOLTAGE APPLIED METHOD

施加耐电压时，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。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。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。

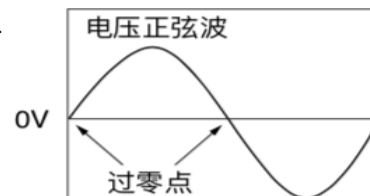
*过零点是指电压正弦通过0V的位置。参见下图。

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 –



4. 失效安全性

FAIL-SAFE

如果电容器破损，会导致短路电路故障。务必在本产品上适当提供例如保险丝等自动防故障功能，以免导致电击、火灾、或冒烟等。

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.

5. 振动和冲击

VIBRATION AND IMPACT

在使用过程中，不要过度冲击或振动导致电容器或引脚暴露

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

6. 焊接

SOLDERING

回流焊焊接电容器时,它应该在以下条件下执行。

行。

Reflow Soldering When soldering capacitor, it should be performed in following conditions.

焊接温度Soldering temperature : 230 ~ 260°C

焊接时间Soldering time : 10 ~ 30s

预热温度Preheating temperature : 170 °C max.

波峰焊焊接电容时,它应该在以下条件下执行

Wave Soldering When soldering capacitor, it should be performed in following conditions.

焊接温度: 260°C max.

Soldering temperature

焊接时间: 5s max.

Soldering time

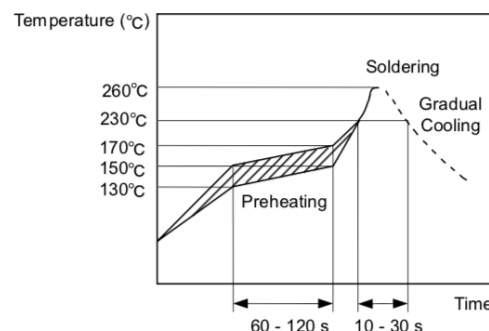
预热温度: 120 °C max.

Preheating temperature

预热时间: 60s max.

Preheating time

[Standard Conditions for Reflow Soldering]



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焊接时烙铁

本产品PCB / PWB,不超过电容器的焊锡耐热性规范。使该产品受热过度可能会熔化内部连接焊料,并可能导致热冲击,使陶瓷元件破裂。

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.

烙铁焊接电容时,应该表现在以下条件下执行。

When soldering capacitor with a soldering iron, it should be performed in following conditions.

烙铁尖端温度: 400°C max.

Temperature of iron-tip

烙铁瓦数: 50W max.

Soldering iron wattage

焊接时间: 3.5s max.

Soldering time

7. 粘合、成型或涂装

BONDING, RESIN MOLDING AND COATING

在粘合、成型或涂装本产品之前,通过测试在预定设备内的粘合、模制或涂覆产品的性能,验证这些过程不会影响电容器的质量。

在应用程序的数量的情况下,干燥/粘合剂硬化条件和成型树脂含有有机溶剂(乙酸乙酯、甲基乙基酮、甲苯、等等)是不合适的,有机溶剂可能导致电容器外层的树脂损坏,出现损坏的案例或短路。

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.

在温度循环过程中,胶粘剂、成型树脂或涂层厚度的变化可能会导致外壳树脂开裂和/或陶瓷元件开裂

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.

8. 操作和存储环境

OPERATING AND STORAGE ENVIRONMENT

电容器的绝缘涂层不能形成完美的密封;因此,不要在腐蚀性的环境中使用或储存电容器,特别是在氯化物气体、硫化物气体、酸、碱、盐或类似物质存在的环境中。避免接触湿气。对这个产品清洗、焊接或成型之前,验证这些过程不影响产品质量。

The insulation 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. 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: 10 to 30°C

Temperature

湿度: 60% max.

Humidity

贮藏期已经超过6个月或封闭包被打开时,在焊接之前执行烘烤(60°C 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°C x 168 hr) before soldering.

9. 限制的应用程序**LIMITATION OF APPLICATIONS**

在使用我们的产品之前，请联系我们，以下列出的应用程序需要特别高的可靠性，以防止可能直接对第三方的生命、身体或财产造成损害的缺陷。

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.

1. 航空设备
Aircraft equipment
2. 航天设备
Aerospace equipment
3. 水下设备
Undersea equipment
4. 电站控制设备
Power plant control equipment
5. 医疗
Medical equipment
6. 运输设备
Transportation equipment (automotives, trains, ships, etc.)
7. 交通信号设备
Traffic signal equipment
8. 灾害预防/犯罪预防设备
Disaster prevention / crime prevention equipment
9. 对公众产生影响的数据处理设备
Data-processing equipment exerting influence on public
10. 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.