安規陶瓷電容器規格承認書
APPROVAL SPECIFICATION FOR SAFETY CERAMIC CAPACITORS

客戶 CUSTOMER	立創
客戶料號 CUSTOMER P/N	
客戶規格描述 CUST. SPEC	
規格描述 DESCRIPTION	Y2/47PF/J/F7.5/直脚/L24/环氧(蓝)/Y5P/5X/ZNRC/250V～
產品編碼 PART NUMBER	CY2470JD1IEB45X2A8
日期 DATE	2023年10月25日
文件編號 DOC. NO.	DEC-SA-WI001

德爾創承認欄 APPROVED BY DERSONIC			客戶承認欄 APPROVED BY CUSTOMER	
批 準 APPROVED BY	審核 CHECK BY	制訂 FORMULATE BY	批 準 APPROVED BY	審核 CHECK BY
彭少雄	吳成愛	胡明康		

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目 錄
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請確保我們的產品安裝到您的產品上前，已根據您的需求進行了評估。
Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
請您在使用我們的產品時，不要偏離此標準。
You are requested not to use our product deviating from this specification.

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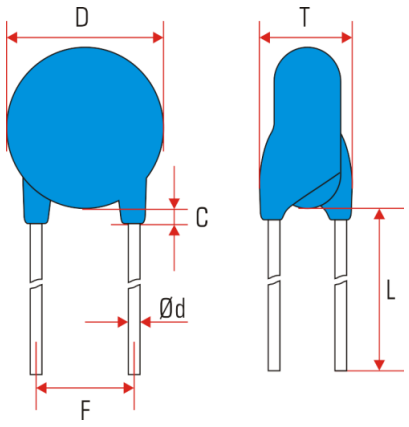
1. 規格表
Data sheet



標示
MARKONG：

ZNRC
CS 47J
250V～ Y2
40/125/21/C

產品編碼 Part number		CY2470JD1IEB45X2A8
規格描述 Description		Y2/47PF/J/F7.5/直脚/L24/环氧(蓝)/Y5P/5X/ZNRC/250V～
客戶料號 Customer P/N		
安規類別 Safety subclass		Y2
工作溫度範圍 Operating temperature range		-40ºC ～ +125ºC
額定電壓 Rated voltage		250V～
電容量 Capacitance		47pF ±5% @ 1MHz 1V 25ºC
損耗角正切 Tangent of loss angle		0.025 max @ 1MHz 1V 25ºC
耐電壓 Testing voltage		2500VAC (Charge/discharge 50mA max), 60s, PASS
絕緣電阻 Insulation resistance		10 000MΩ min @ 500V 60s
溫度特性 Temperature characteristics		Y5P
氣候類別 Climatic category		40/125/21
阻燃等級 Passive flammability category		C
尺寸 DIMENSIONS	D (Diameter)	6.0 mm±1.0mm
	T (Thickness)	3.4 mm±0.8mm
	F (Lead spacing)	7.50 mm±1.0mm
	L (Lead length)	24.0 mm±5.0mm
	ød (Lead diameter)	0.6 mm±0.10mm
	C (Coating rundown on lead)	3.0 mm max

2. 概述
Introduction

2.1. 範圍
Scope

本規格書適用於德爾創制造的安規陶瓷電容器。

This specification applies safety ceramic capacitors for Dersonic manufacture.

2.2. 應用
Applications

Y電容器可使用在開關電源與AC適配器的濾波電路和耦合電路。

Ideal for use as Y capacitors for ac line filter and primary-secondary coupling on switching power supplies and ac adapters.

也可使用在沒有變壓器的DAA模塊的D-A隔離和吸收雜音上。

Ideal for use on D-A isolation and noise absorption for DAA modems without transformers.

2.3. 特點
Features

■ 操作溫度高達125ºC

Operating temperature range guaranteed up to 125 degrees

■ 通過cUL、VDE、ENEC和CQC認證，符合IEC 60384-14要求

By cUL, VDE, ENEC, and CQC certified to comply with IEC 60384-14 requirements

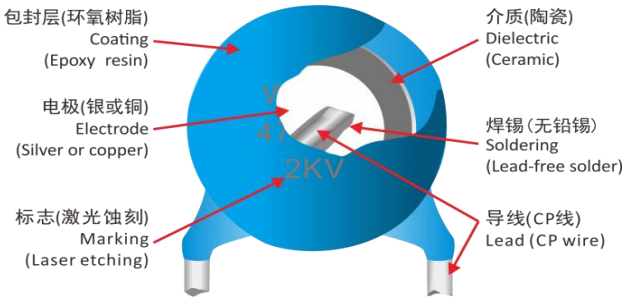
認證標誌 APPROVAL MARK	認證標準 APPROVAL STANDARDS	額定電壓 RATED VOLTAGE	認證證書號 CERTIFICATE NUMBER
cULus	UL 60384-14 CSA E60384-14	AC500V AC400V AC300V AC250V	E472525
	DIN EN 60384-14(VDE 0565-1-1):2014-04 EN 60384-14:2013-08 IEC 60384-14(ed. 4)		Y1: 40040706 Y2: 40045478
cqc	IEC 60384-14:2013		Y1: CQC15001123983 Y2: CQC17001162592

■ 使用阻燃的環氧樹脂包封（符合UL94 V-0標準）

Coated with flame-retardant epoxy resin (conforming to UL94 V-0 standard)

■ 結構如右圖所示

The structure is shown right fig.



■ 可適用於自動化生產線

Cost-saving automatic insertion available

■ 符合RoHS 2.0和REACH標準，無鹵。

Comply with RoHS 2.0 & REACH, halogen-free available

3. 產品編碼
Part Number

CY	2	470	J	D1	I	E	B4	5X	2A8
產品類別 Product type	安規類別 Safety subclass	標稱容量 Nominal capacitance	容量偏差 Capacitance tolerance	引線成型方式 Lead format	包裝方式 Package	包封 Coating	溫度特性 Temperature characteristics	內部碼 Inter code	標誌 Marking

■ 產品類別 Product type
CY: 安規陶瓷電容器 Safety ceramic capacitors

■ 安規類別 Safety subclass
1: Class Y1
2: Class Y2

■ 標稱容量 Nominal capacitance
用3位數表示，單位pF。如下所示：
In 3 digits, unit is pF, as shown in below:
470＝47×10＾0＝47pF

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

■ 引線成型方式 Lead format

代碼 Code	腳距 Lead spacing
C	5.08±0.8mm
D	7.50±1.0mm
E	10.0±1.0mm
F	12.5±1.5mm

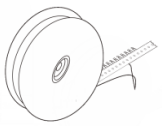
代碼 Code	1	2	5
腳型樣式 Lead style drawing			
	直腳 Straight Lead	外彎腳 Outside kink Lead	平行腳 Vertical kink Lead

■ 包裝方式 Package

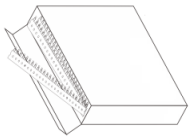
● Bulk (Lead length)

2: 3.0±0.5mm	7: 4.5±1.0mm	B: 10±2.0mm
3: 3.2±0.5mm	8: 5.0±1.0mm	I: 24±5.0mm
4: 3.5±0.5mm	9: 6.0±1.0mm	
5: 3.8±0.5mm	V: 7.0±1.0mm	
6: 4.0±1.0mm	A: 8.0±2.0mm	

● Taping
T: Reel packing
卷盤包裝



P: Ammo packing
折疊包裝



■ 包封 Coating
E: 環氧（藍） Epoxy (Blue)

■ 溫度特性 Temperature characteristics
B4: Y5P (Y1 & Y2: 10pF-1000pF)
E4: Y5U (Y1: 470pF-4700pF, Y2: 470pF-10000pF)
F4: Y5V (Y1: 1000pF-4700pF, Y2: 1000pF-10000pF)

■ 內部碼 Inter code
內部控制碼，本規格書不作說明。
Inter control code will not be described in this an approval specifications.

■ 標誌 Marking
2A8 marking code represent:
Company trademark: ZNRC
Type name: CS
Nominal capacitance: 47
Capacitance tolerance: J
Safety subclass: Y2
Rated voltage: 250V～
Safety approval mark:
Climatic category and passive flammability category: 40/125/21/C

4. 認證規格清單

Certification specification list

品號 Part Bumber	安規類別 Safety subclass	額定電壓 Rated voltage	材質 T. C.	容量 Capacitance	誤差 Tolerance	包裝方式 Package	腳距 Lead spacing	直徑 Diameter (±1.0mm)	厚度 Thickness (±1.0mm)
CY2100J□1□EB44G2A□	Y2		Y5P	10PF	±5%			6.5mm	3.7mm
CY2120J□1□EB46P2A□	Y2		Y5P	12PF	±5%			7.0mm	3.4mm
CY2150J□1□EB46P2A□	Y2		Y5P	15PF	±5%			7.0mm	3.4mm
CY2180J□1□EB46P2A□	Y2		Y5P	18PF	±5%			7.0mm	3.4mm
CY2220J□1□EB46P2A□	Y2		Y5P	22PF	±5%			7.0mm	3.4mm
CY2270J□1□EB46P2A□	Y2		Y5P	27PF	±5%			7.0mm	3.4mm
CY2330J□1□EB46P2A□	Y2		Y5P	33PF	±5%			7.0mm	3.4mm
CY2390J□1□EB46P2A□	Y2		Y5P	39PF	±5%			7.0mm	3.4mm
CY2470J□1□EB46P2A□	Y2		Y5P	47PF	±5%			7.0mm	3.4mm
CY2560J□1□EB46A2A□	Y2		Y5P	56PF	±5%			8.0mm	3.4mm
CY2680J□1□EB46A2A□	Y2		Y5P	68PF	±5%			8.0mm	3.4mm
CY2820J□1□EB47A2A□	Y2		Y5P	82PF	±5%			8.5mm	3.4mm
CY2101J□1□EB48K2A□	Y2		Y5P	100PF	±5%			9.5mm	3.4mm
CY2101K□1□EB44G2A□	Y2		Y5P	100PF	±10%			6.5mm	3.7mm
CY2151K□1□EB44G2A□	Y2		Y5P	150PF	±10%			6.5mm	3.7mm
CY2221K□1□EB44G2A□	Y2		Y5P	220PF	±10%			6.5mm	3.7mm
CY2271K□1□EB44G2A□	Y2		Y5P	270PF	±10%			6.5mm	3.7mm
CY2331K□1□EB44G2A□	Y2		Y5P	330PF	±10%			6.5mm	3.7mm
CY2391K□1□EB45V2A□	Y2		Y5P	390PF	±10%			6.5mm	3.7mm
CY2471K□1□EB46J2A□	Y2		Y5P	470PF	±10%	T: Taping/Box		7.5mm	3.7mm
CY2561K□1□EB46H2A□	Y2		Y5P	560PF	±10%	P: Taping/Reel		8.0mm	3.7mm
CY2681K□1□EB47J2A□	Y2		Y5P	680PF	±10%	2: Bulk, L3.0mm		8.5mm	3.7mm
CY2821K□1□EB48U2A□	Y2	8: AC250V	Y5P	820PF	±10%	3: Bulk, L3.2mm		10.0mm	3.7mm
CY2102K□1□EB48U2A□	Y2	9: AC300V	Y5P	1000PF	±10%	4: Bulk, L3.5mm	C: F5.08mm	10.0mm	3.7mm
CY2471M□1□EE44G2A□	Y2	2: AC400V	Y5U	470PF	±20%	5: Bulk, L3.8mm	D: F7.5mm	6.5mm	3.7mm
CY2561M□1□EE44G2A□	Y2	6: AC500V	Y5U	560PF	±20%	6: Bulk, L4.0mm	E: F10.0mm	6.5mm	3.7mm
CY2681M□1□EE44G2A□	Y2		Y5U	680PF	±20%	7: Bulk, L4.5mm		6.5mm	3.7mm
CY2821M□1□EE45V2A□	Y2		Y5U	820PF	±20%	8: Bulk, L5.0mm		6.5mm	3.7mm
CY2102M□1□EE46J2A□	Y2		Y5U	1000PF	±20%	9: Bulk, L6.0mm		7.5mm	3.7mm
CY2152M□1□EE47J2A□	Y2		Y5U	1500PF	±20%	V: Bulk, L7.0mm		8.5mm	3.7mm
CY2222M□1□EE47J2A□	Y2		Y5U	2200PF	±20%	A: Bulk, L8.0mm		8.5mm	3.7mm
CY2272M□1□EE48P2A□	Y2		Y5U	2700PF	±20%	B: Bulk, L10mm		9.0mm	3.7mm
CY2332M□1□EE49V2A□	Y2		Y5U	3300PF	±20%	I: Bulk, L24mm		11.0mm	3.7mm
CY2392M□1□EE4AG2A□	Y2		Y5U	3900PF	±20%			11.5mm	3.7mm
CY2472M□1□EE4BF2A□	Y2		Y5U	4700PF	±20%			12.5mm	3.7mm
CY2562M□1□EE4CA2A□	Y2		Y5U	5600PF	±20%			13.5mm	3.7mm
CY2682M□1□EE4DC2A□	Y2		Y5U	6800PF	±20%			14.5mm	3.7mm
CY2103M□1□EE4GB2A□	Y2		Y5U	10000PF	±20%			18.0mm	3.7mm
CY2102M□1□EF44G2A□	Y2		Y5V	1000PF	±20%			6.5mm	3.7mm
CY2152M□1□EF45V2A□	Y2		Y5V	1500PF	±20%			6.5mm	3.7mm
CY2222M□1□EF46J2A□	Y2		Y5V	2200PF	±20%			6.5mm	3.7mm
CY2272M□1□EF47J2A□	Y2		Y5V	2700PF	±20%			7.5mm	3.7mm
CY2332M□1□EF47J2A□	Y2		Y5V	3300PF	±20%			8.5mm	3.7mm
CY2392M□1□EF48F2A□	Y2		Y5V	3900PF	±20%			8.5mm	3.7mm
CY2472M□1□EF48F2A□	Y2		Y5V	4700PF	±20%			9.5mm	3.7mm
CY2562M□1□EF4AG2A□	Y2		Y5V	5600PF	±20%			11.5mm	3.7mm
CY2682M□1□EF4BH2A□	Y2		Y5V	6800PF	±20%			13.0mm	3.7mm
CY2103M□1□EF4CC2A□	Y2		Y5V	10000PF	±20%			14.0mm	3.7mm

當上述產品尺寸規格與規格表規定有差異時，以規格表爲準。

When there is a discrepancy between the dimensions of the above products and the Data sheet, the Data sheet shall prevail.

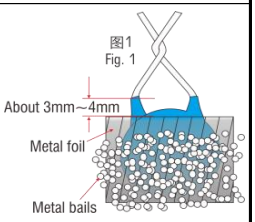
安規陶瓷電容器規格承認書
APPROVAL SPECIFICATION FOR SAFETY CERAMIC CAPACITORS

品號 Part Bumber	安規类别 Safety subclass	額定電壓 Rated voltage	材質 T. C.	容量 Capacitance	誤差 Tolerance	包裝方式 Package	腳距 Lead spacing	直徑 Diameter (±1.0mm)	厚度 Thickness (±1.0mm)
CY1100JE1□EB44G2A□	Y1		Y5P	10PF	±5%		10.0mm	6.5mm	3.7mm
CY1120JE1□EB46P2A□	Y1		Y5P	12PF	±5%		10.0mm	7.0mm	3.4mm
CY1150JE1□EB46P2A□	Y1		Y5P	15PF	±5%		10.0mm	7.0mm	3.4mm
CY1180JE1□EB46P2A□	Y1		Y5P	18PF	±5%		10.0mm	7.0mm	3.4mm
CY1220JE1□EB46P2A□	Y1		Y5P	22PF	±5%		10.0mm	7.0mm	3.4mm
CY1270JE1□EB46P2A□	Y1		Y5P	27PF	±5%		10.0mm	7.0mm	3.4mm
CY1330JE1□EB46P2A□	Y1		Y5P	33PF	±5%		10.0mm	7.0mm	3.4mm
CY1390JE1□EB46P2A□	Y1		Y5P	39PF	±5%		10.0mm	7.0mm	3.4mm
CY1470JE1□EB46P2A□	Y1		Y5P	47PF	±5%		10.0mm	7.0mm	3.4mm
CY1560JE1□EB46A2A□	Y1		Y5P	56PF	±5%		10.0mm	8.0mm	3.4mm
CY1680JE1□EB46A2A□	Y1		Y5P	68PF	±5%		10.0mm	8.0mm	3.4mm
CY1820JE1□EB47A2A□	Y1		Y5P	82PF	±5%		10.0mm	8.5mm	3.4mm
CY1101JE1□EB48K2A□	Y1		Y5P	100PF	±5%		10.0mm	9.5mm	3.4mm
CY1101KE1□EB45W2A□	Y1		Y5P	100PF	±10%		10.0mm	6.5mm	4.4mm
CY1151KE1□EB45W2A□	Y1		Y5P	150PF	±10%		10.0mm	6.5mm	4.4mm
CY1221KE1□EB45W2A□	Y1		Y5P	220PF	±10%		10.0mm	6.5mm	4.4mm
CY1271KE1□EB46L2A□	Y1		Y5P	270PF	±10%		10.0mm	7.5mm	4.4mm
CY1331KE1□EB46L2A□	Y1		Y5P	330PF	±10%	T: Taping/Box P: Taping/Reel 2: Bulk, L3.0mm 3: Bulk, L3.2mm 4: Bulk, L3.5mm 5: Bulk, L3.8mm 6: Bulk, L4.0mm 7: Bulk, L4.5mm 8: Bulk, L5.0mm 9: Bulk, L6.0mm V: Bulk, L7.0mm A: Bulk, L8.0mm B: Bulk, L10mm J: Bulk, L24mm	10.0mm	7.5mm	4.4mm
CY1391KE1□EB46X2A□	Y1		Y5P	390PF	±10%		10.0mm	8.0mm	4.4mm
CY1471KE1□EB46X2A□	Y1	8: AC250V 9: AC300V 2: AC400V 6: AC500V	Y5P	470PF	±10%		10.0mm	8.0mm	4.4mm
CY1561KE1□EB47M2A□	Y1		Y5P	560PF	±10%		10.0mm	8.5mm	4.4mm
CY1681KE1□EB48I2A□	Y1		Y5P	680PF	±10%		10.0mm	9.5mm	4.4mm
CY1821KE1□EB48I2A□	Y1		Y5P	820PF	±10%		10.0mm	9.5mm	4.4mm
CY1102KE1□EB49H2A□	Y1		Y5P	1000PF	±10%		10.0mm	11.0mm	4.4mm
CY1471ME1□EE45W2A□	Y1		Y5U	470PF	±20%		10.0mm	6.5mm	4.4mm
CY1561ME1□EE45S2A□	Y1		Y5U	560PF	±20%		10.0mm	6.5mm	4.4mm
CY1681ME1□EE46L2A□	Y1		Y5U	680PF	±20%		10.0mm	7.5mm	4.4mm
CY1821ME1□EE46L2A□	Y1		Y5U	820PF	±20%		10.0mm	7.5mm	4.4mm
CY1102ME1□EE46L2A□	Y1		Y5U	1000PF	±20%		10.0mm	7.5mm	4.4mm
CY1152ME1□EE47G2A□	Y1		Y5U	1500PF	±20%		10.0mm	9.0mm	4.4mm
CY1222ME1□EE48O2A□	Y1		Y5U	2200PF	±20%		10.0mm	10.0mm	4.4mm
CY1272ME1□EE4BI2A□	Y1		Y5U	2700PF	±20%		10.0mm	13.0mm	4.4mm
CY1332ME1□EE4BI2A□	Y1		Y5U	3300PF	±20%		10.0mm	13.0mm	4.4mm
CY1392ME1□EE4DD2A□	Y1		Y5U	3900PF	±20%		10.0mm	14.5mm	4.4mm
CY1472ME1□EE4DD2A□	Y1		Y5U	4700PF	±20%		10.0mm	14.5mm	4.4mm
CY1102ME1□EF45W2A□	Y1		Y5V	1000PF	±20%		10.0mm	6.5mm	4.4mm
CY1152ME1□EF46L2A□	Y1		Y5V	1500PF	±20%		10.0mm	7.5mm	4.4mm
CY1222ME1□EF46X2A□	Y1		Y5V	2200PF	±20%		10.0mm	8.0mm	4.4mm
CY1272ME1□EF48O2A□	Y1		Y5V	2700PF	±20%		10.0mm	10.0mm	4.4mm
CY1332ME1□EF48O2A□	Y1		Y5V	3300PF	±20%		10.0mm	10.0mm	4.4mm
CY1392ME1□EF48X2A□	Y1		Y5V	3900PF	±20%		10.0mm	10.5mm	4.4mm
CY1472ME1□EF49H2A□	Y1		Y5V	4700PF	±20%		10.0mm	11.0mm	4.4mm

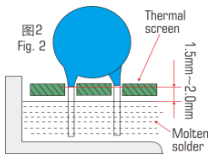
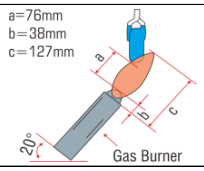
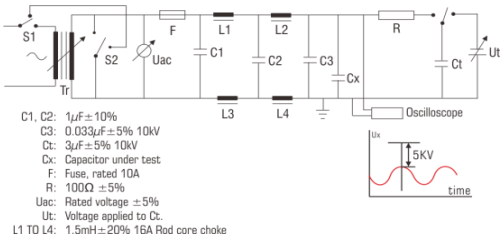
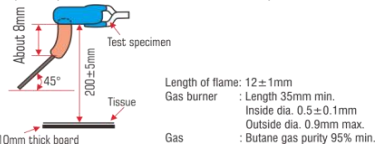
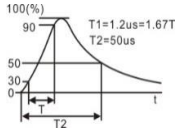
當上述產品尺寸規格與規格表規定有差異時，以規格表爲準。

When there is a discrepancy between the dimensions of the above products and the Data sheet, the Data sheet shall prevail.

5. 標準與試驗方法
Specifications and Testing Method

<table>
<tr><th>No.</th><th colspan="2">項目
Item</th><th>標準
Specifications</th><th>試驗方法
Testing Method</th></tr>
<tr><td>1</td><td colspan="2">外觀與尺寸
Appearance (APP)
and Dimension</td><td>外觀形狀沒有明顯的缺點，尺寸在標準範圍內。
No marked defect on appearance form and dimensions are within specified range.</td><td>電容必須用目視檢查其明顯的缺點。
The capacitor should be visually inspected for evidence of defect.
尺寸用遊標卡尺測量。
Dimensions should be measured with slide calipers.</td></tr>
<tr><td>2</td><td colspan="2">標誌
Marking</td><td>清晰易於識別
To be easily legible</td><td>目視檢查。
The capacitor should be visually inspected.</td></tr>
<tr><td>3</td><td colspan="2">容量
Capacitance (C_R)</td><td>在誤差範圍內
Within specified tolerance</td><td rowspan="2">容量與損耗角正切(Q值)在25±1ºC下，使用1kHz(SL使用1MHz或100kHz)和1Vrms下測量。
The capacitance, tanδ (Q value) should be measured at 25ºC ± 1ºC with 1kHz (SL: 1MHz or 100kHz) and AC1.0V (r.m.s.).</td></tr>
<tr><td>4</td><td colspan="2">損耗角正切
Tangent of loss angle (tanδ)</td><td>0.025 max</td></tr>
<tr><td>5</td><td colspan="2">絕緣電阻
Insulation Resistance
(IR)</td><td>10 000MΩ min</td><td>在兩導線間施加500VDC進行測量，時間不超過1分鐘（如果絕緣電阻達到要求值時，試驗可以在更短的時間內結束）。
The insulation resistance should be measured with a DC 500V at normal temperature and humidity and less than 1 min. of charging (The test may be terminated in a shorter time, if the required value of insulation resistance is reached).</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">耐電壓
Voltage proof
(TV)</td><td>導線間
Between Lead Wires</td><td>無失效。
No failure</td><td>在電容器兩導線間施加下表電壓60s後不被破壞（充/放電流不大於50mA）
The capacitor should not be damaged when test voltages of following table are applied between the lead wires for 60 sec. (Charge/Discharge current ≤50mA)
<table><tr><td>Type</td><td>Y2</td><td>Y1</td></tr><tr><td>Voltage proof</td><td>2500Vac</td><td>4000Vac</td></tr></table></td></tr>
<tr><td>本體絕緣
Body insulation</td><td>無失效。
No failure</td><td>首先，將電容器的端子擰在一起，如右圖所示，將金屬箔包住電容器離端子3-4mm的本體，接着將電容器插入盛着直徑爲1mm的金屬球的容器中，最後施加下表所示的電壓60秒種
First, the terminals of the capacitor should be connected together. Then, as shown in figure at right, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal. Then, the capacitor should be inserted into a container filled with metal balls of about 1mm diameter. Finally, AC voltage of following table is applied for 60 sec. between the capacitor lead wires and metal balls.
 
图1
Fig. 1
About 3mm~4mm
Metal foil
Metal bails
<table><tr><td>Type</td><td>Y2</td><td>Y1</td></tr><tr><td>Voltage proof</td><td>2500Vac</td><td>4000Vac</td></tr></table></td></tr>
<tr><td>7</td><td colspan="2">導線抗張強度
Terminal Tensile Strength</td><td>導線無折斷，電容無破損。
Lead wire should not be cut off. Capacitor should not be broken.</td><td>固定電容器的本體，使電容器每支導線均承受10N垂直力，保持10±1秒鐘。
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.</td></tr>
<tr><td>8</td><td colspan="2">導線抗折強度
Terminal Bending Strength</td><td>導線無折斷，電容無破損。
Lead wire should not be cut off. Capacitor should not be broken.</td><td>電容器導線應承受5N重量，然後嚮外彎折成90º，然後回復到原來位置；接着往反方嚮彎折90º，再復原；彎折一次2-3秒鐘。
Each lead wire should be subjected to 5N weight and then a 90º bend, at the point of egress, in one direction, return to original position, and then apply a 90º bend in the opposite direction at the rate of one bend in 2 to 3 sec.</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">振動
Vibration
Resistance</td><td>APP</td><td>沒有可見損傷
No marked defect</td><td rowspan="3">將電容器導線焊穩和調整振動頻率範圍爲10-55Hz、總振幅爲1.5mm，振動從10Hz到55Hz，然後再回到10Hz，大約一分鐘。
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.
總時間六個小時，每兩小時在相互垂直方嚮來回三次。
Apply for a total of 6 hrs., 2 hrs each in 3 mutually perpendicular directions.</td></tr>
<tr><td>C_R</td><td>在允許誤差範圍風
Within the specified tolerance</td></tr>
<tr><td>tanδ</td><td>Per Item 4</td></tr>
<tr><td>10</td><td colspan="2">可焊性
Solderability of Lead</td><td>導線必須有3/4以上的面積均勻附着焊錫
Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.</td><td>將電容導線浸入焊料中2±0.5秒鐘，浸入深度離導線根部1.5-2.0mm。
The lead wire of a capacitor should be dipped into molten solder for 2±0.5 sec. The depth of immersion is up to about 1.5 to 2.0mm from the root of lead wires.
焊錫溫度 ： 245±5ºC
Solder temp.: 245±5ºC</td></tr>
</table>

安規陶瓷電容器規格承認書
APPROVAL SPECIFICATION FOR SAFETY CERAMIC CAPACITORS

序 No.	項目 Item		標準 Specifications	試驗方法 Testing Method
11	耐焊接熱 Soldering Effect	APP	沒有可見損傷 No marked defect	如圖所示，導線浸入離根部1.5-2.0mm處、錫溫爲260±5ºC錫槽中10±1秒。 As shown in figure, the lead wires should be immersed in solder of 260±5ºC up to 1.5 to 2.0mm from the root of terminal for 10±1.0s  預處理：電容器必須先貯存在85±2ºC條件下1小時，然後在室溫下存放24±2小時，再進行初始測量。 Pre-treatment: Capacitor should be stored at 85±2ºC for 1h, and then placed at room condition for 24±2h. before initial measurements. 試驗後處理：電容必須存放在室溫下1-2小時。 Post-treatment: Capacitor should be stored for 1～2h. at room condition.
		ΔC/C	Y5P: ±10% Y5U, Y5V: ±20%	
		IR	2 000MΩ min	
		TV	Per Item 6	
12	針焰試驗 Flame Test		電容離開火焰後自動熄滅。 The capacitor flame discontinues as follows.	電容應放在火焰中15秒鐘，然後離開15秒種，如此重復5次。 The capacitor should be subjected to applied flame for 15 sec. and then removed for 15 sec. until 5 cycles are completed. 
13	自燃性 Active Flammability		紗布不着火 The cheese-cloth should not be on fire.	This test is not applicable to Y1 capacitors. 單個電容器應用紗布全部包住至少一層，但不多於兩層。電容應承受放電20次，每次放電間隔5秒鐘。AC電源應維持兩分鐘，最後放電。 The capacitor should be individually wrapped in at least one but not more than two complete layers of cheese-cloth. The capacitor should be subjected to 20 discharges. The interval between successive discharges should be 5 sec. The UAC should be maintained for 2 min. after the last discharge. 
14	阻燃性 Passive Flammability		燃燒時間不超過30秒，棉紙不被點燃。 The burning time should not exceed 30 sec. The tissue paper should not ignite.	電容器在下面試驗中，火焰在適當的位置被最大燃燒，各個試驗樣品應只承受一次燃燒，燃燒時間：30秒鐘。 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. 
15	耐濕負荷 Humidity Loading	APP	沒有可見損傷 No marked defect	電容保持在溫度爲40±2ºC、相對濕度爲90-95%條件下施加額定電壓500±12小時。 Apply the rated voltage for 500±12 hrs. at 40±2ºC in 90 to 95% relative humidity. 試驗後處理：電容必須貯存在室溫條件下一至二小時。 Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.
		ΔC/C	Y5P: ±10% Y5U, Y5V: ±15%	
		tanδ	Y5P, Y5U: 0.050 max Y5V: 0.075 max	
		IR	5 000MΩ min	
		TV	Per Item 6	
16	壽命試驗 Life Test	APP	沒有可見損傷 No marked defect	每個供試驗電容必須承受5kV（Y1爲8kV）脈沖電壓三次，然後再進行壽命試驗。 Each individual capacitor should be subjected to a 5kV (8kV for Y1) impulses for three times. After the capacitors are applied to life test.  在125+2/-0ºC的條件下使用下表所要求的電壓進行1000小時。 Apply a voltage of following table for 1000 hrs. at 125+2/-0ºC
		IR	5 000MΩ min	
		ΔC/C	Y5P: ±10% Y5U, Y5V: ±15%	
		TV	如第6項 Per Item 6	試驗後處理：電容必須貯存在室溫條件下一至二小時。 Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.

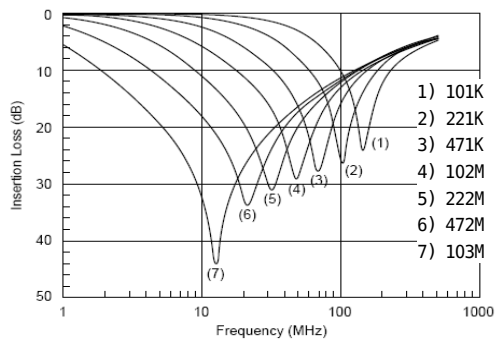
Applied Voltage
1.7 times rated voltage, except that once each hour the voltage is increased to AC1000V(rms) for 0.1s.

安規陶瓷電容器規格承認書
APPROVAL SPECIFICATION FOR SAFETY CERAMIC CAPACITORS

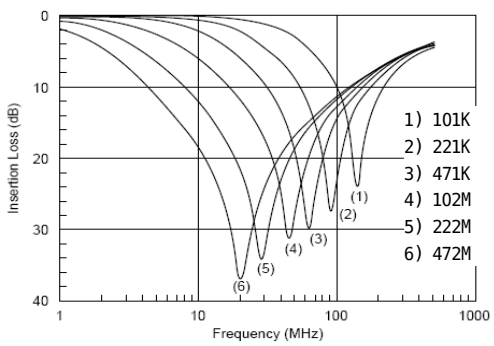
序 No.	項目 Item		標準 Specifications	試驗方法 Testing Method
17	溫度循環 Temp. and Immersion Cycle	APP	沒有可見損傷 No marked defect	電容器應承受五次溫度循環，然後連續交替循環兩次。 The capacitor should be subjected to 5 temperature cycles, then consecutively to 2 immersion cycles. 溫度循環 Temperature Cycle Step Temperature(ºC) Time 1 -40+0/-3 30 min. 2 Room temperature 3 min. 3 125+3/-0 30 min. 4 Room temperature 3 min. 交替循環 Immersion Cycle Step Temperature(ºC) Time Immersion water 1 65+5/-0ºC 0±3 min. Clean water 2 15ºC 15 min. Salt water 預處理: 電容器必須先貯存在85±2ºC條件下1小時，然後在室溫下存放24±2小時，再進行初始測量。 Pre-treatment: Capacitor should be stored at 85±2ºC for 1 hr., then placed at room condition for 24±2 hrs. 試驗後處理：電容必須貯存在室溫條件下24±2小時。 Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.
		ΔC/C	Y5P: ±10% Y5U, Y5V: ±15%	
		tanδ	Per Item 4	
		IR	5 000MΩ min	
		TV	Per Item 6	

■ 插入損耗與頻率特性
Insertion loss-frequency characteristics

Y2 (CS)



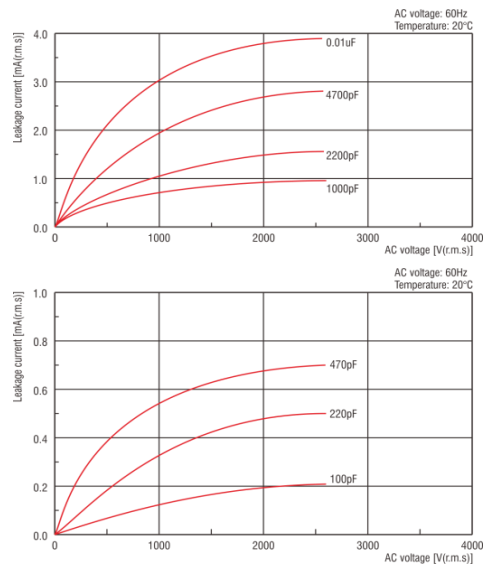
Y1 (CD)



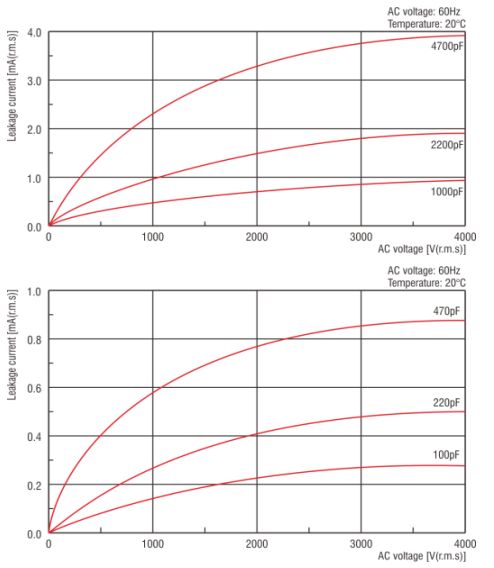
Signal power: 1mW
AC240v (r.m.s.) / 60Hz is applied on the capacitor

■ 漏電流特性
Leakage current characteristics

Y2 (CS)



Y1 (CD)



6. 測量和使用注意事項
Measuring and Application Notice

6.1. 測量注意事項
Measurement notice

請在以下條件下測量。
Please measure under the following conditions.

6.1.1. 標準大氣條件
Standard atmospheric conditions

除非另有規定，所有試驗和測量應按在IEC 60068-1的5.3中規定的試驗用標準大氣條件下表進行。
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.

溫度 Temperature	相對濕度 Relative humidity	氣壓 Air pressure
15ºC～35ºC	25%～75%	86kPa～106kPa

在進行測量之前，電容器應在測量溫度下存放足夠時間，以使整個電容器都達到這一溫度。爲此目的，規定與試驗後恢復時間同樣的時間，通常是足夠的。
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.

在標準大氣條件下進行測量，其測量結果存在爭議時應采用仲裁溫度（見6.1.3）重復測量。
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 6.1.3).

當按某一順序進行試驗時，一個試驗的最後測量可以作爲下一試驗的初始測量。
When tests are conducted in a sequence, the final measurements of one test may be taken as the initial measurements for the succeeding test.

在測量期間，不應使電容器受到氣流、陽光直射或可能引起誤差的其他影響。
During measurements the capacitor shall not be exposed to draughts, direct sunlight or other influences likely to cause error.

6.1.2. 恢復條件
Recovery conditions

除非另有規定，恢復應在試驗用標準大氣條件（見6.1.1）下進行。
Unless otherwise specified recovery shall take place under the standard atmospheric conditions for testing (6.1.1).

如果恢復必須在嚴格控制的條件下進行，應采用IEC 60068-1中5.4.1的控制條件。
If recovery under closely controlled conditions is necessary, the controlled recovery conditions of 5.4.1 of IEC 60068-1 shall be used.

除非有關規範另有規定，恢復時間應爲1h～2h。
Unless otherwise specified in the relevant specification, a duration of 1 h to 2 h shall be used.

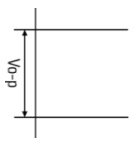
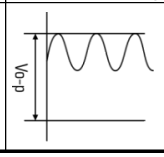
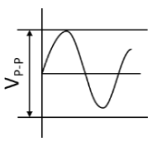
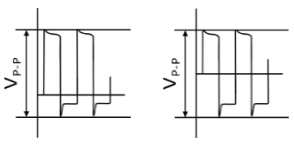
6.1.3. 仲裁條件
Referee conditions

在仲裁情況下，應選用IEC 60068-1中5.2中規定的仲裁試驗用標準大氣條件。
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:

溫度 Temperature	相對濕度 Relative humidity	氣壓 Air pressure
25ºC±1ºC	48%～52%	86kPa～106kPa

6.2. 工作電壓
Operating voltage

嚮電容器施加的電壓切勿超過額定電壓。
The voltage applied to the capacitor must not exceed the rated voltage.

電壓 Voltage	直流電壓 DC Voltage	直流+交流電壓 DC+AC Voltage	交流電壓 AC Voltage	脈沖電壓 Pulse Voltage
測量位置 Positional Measurement				

在交流電路或紋波電流電路中使用直流額定電壓電容器時，請務必將外加電壓的Vp-p值或包含直流偏置電壓的Vo-p值維持在額定電壓範圍內。
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.

若嚮電路施加電壓，開始或停止時可能會因諧振或切換產生暫時的異常電壓。請務必使用額定電壓範圍包含這些異常電壓的電容器。
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.

6.3. 工作溫度與自生熱
Operating temperature and self-generated heat

適用於Y5P、Y5U、Y5V特性。
Apply to Y5P, Y5U, Y5V char.

電容器的表面溫度應保持在其額定工作溫度範圍的上限以下。務必考慮到電容器的自生熱。電容器在高頻電流、脈沖電流等中使用時可能會因介電損耗發出自生熱。外加電壓應使自生熱等負荷在25ºC周圍溫度條件下不超過20ºC範圍。測量時應使用ø0.1mm小熱容量（K）的熱電偶，而且電容器不應受到其它元件的散熱或環境溫度波動影響。過熱可能會導致電容器特性及可靠性下降。
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 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˚C under the condition where the capacitor is subjected at an atmosphere temperature of 25˚C. 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. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.

（切勿在冷卻風扇運轉時進行測量。否則無法確保測量數據的精確性。）
(never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

6.4. 耐電壓的測試條件
Test condition for withstanding voltage

6.4.1. 測試設備
Test equipment

交流耐壓的測試設備應具有能夠產生類似於50/60Hz正弦波的性能。如果施加變形的正弦波或超過規定電壓值的過載電壓後，則可能會導致故障。
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.

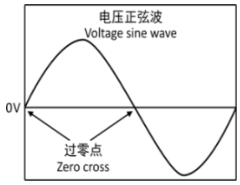
6.4.2. 電壓外加方法
Voltage applied method

測試耐電壓時，電容器的引線或端子應與耐電壓測試設備的輸出端連接牢固；然後再將電壓從近零增加到測試電壓(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).

如果測試電壓不從近零逐漸提高而是直接施加在電容器上，則施加時應包含過零點。測試結束時，測試電壓應降到近零；然後再將電容器引線或端子從耐電壓測試設備的輸出端取下。
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.

如果測試電壓不從近零逐漸提高而是直接施加在電容器上，則可能會出現浪湧電壓，從而導致故障。
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.

過零點是指電壓正弦通過0V的位置。參見右圖。
Zero cross is the point where voltage sine wave passes 0V.
See figure at right.



6.5. 失效安全性
Fail-safe

電容器損壞時，失效可能會導致短路。爲了避免在短路時引起觸電、冒煙、火災等危險情況，請在電路中使用熔絲等元件來設置自動防故障功能。
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.

6.6. 電容器容量變化
Capacitance change of capacitors

6.6.1. SL特性
SL char.

電容量可能會因環境溫度或外加電壓而發生輕微變化。若要將本產品用於嚴格的時間常數電路，請與我公司聯系
Capacitance might change a little depending on a surrounding temperature or an applied voltage. Please contact us if you use for the strict constant time circuit.

6.6.2. Y5P、Y5U、Y5V特性
Y5P, Y5U, Y5V char.

電容器具有老化特性；因此，電容器若長時間使用，其靜電容量會逐漸降低。而且，靜電容量還可能會因環境溫度或外加電壓而發生巨大變化。所以不適合用於時間常數電路。
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.

若需詳情，請與我公司聯系。
Please contact us if you need detailed information.

6.7. 使用設備檢查
Performance check by equipment

使用電容器之前，請先檢查設備的性能和特性沒有問題。
Before using a capacitor, check that there is no problem in the equipment's performance and the specifications.

一般而言，二類瓷（Y5P、Y5U、Y5V特性）陶瓷電容器的靜電容量具有電壓相關特性和溫度相關特性。所以，其電容值可能會隨設備的工作條件而發生變化。因此，一定要確認儀器接收性能對電容器的靜電容量值變化的影響，如漏電流和靜噪特性。
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，必要時還要檢查電容器在設備中的防電湧性能，因爲通過電路的感應，浪湧電壓可能會超過規定值。
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.

6.8. 貯存與使用條件
Operating and storage environment

電容器絕緣包封層不是完美的密封形式，因此，請勿將電容器存放在腐蝕性氣體中，尤其是存在氯氣、硫氣、酸、堿、鹽等場所，同時應防潮。
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.

在對本產品進行清洗、焊接或成型前，請先在指定設備上測試經清洗、焊接或成型的產品的性能，以確定上述過程不會影響產品質量。
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.

電容器應存放在溫度及相對濕度分別不超出5～40ºC及15～70%範圍的場所。請在6個月內使用電容器。
Store the capacitors where the temperature and relative humidity do not exceed 5 to 40 degrees centigrade and 15 to 70%. Use capacitors within 6 months after delivered.

6.9. 焊錫和安裝
Soldering and mounting

6.9.1. 振動與碰撞
Vibration and impact

使用時請勿使電容器受到過度沖擊或振動。
Do not expose a capacitor or its lead to excessive shock or vibration during use.

6.9.2. 焊錫
Soldering

當在PCB/PWB焊錫這個產品時，不要超過電容器的焊錫耐熱性標準（260ºC，5s）。過度的熱量會使電容器內部焊錫熔化，可能導致熱沖擊而使陶瓷介質出現暗裂。
When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specifications (260ºC，5s) 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.

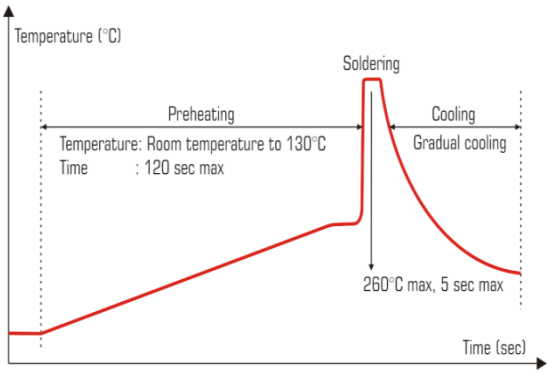


Fig.: Wave-soldering temperature-time profile to recommend

當使用烙鐵進行手工焊錫時，應該遵照下列條件：
When soldering capacitor with a soldering iron, it should be performed in the following conditions.

焊錫溫度：320ºC最大
Temperature of iron-tip: 320 degrees C. Max.
烙鐵頭：不超過40W
Soldering iron wattage: 40W max.
焊錫時間：不超過3.0秒
Soldering time: 3.0 sec. Max.

6.9.3. 壓焊、樹脂塗層與包封
Bonding, resin molding and coating

在壓焊、樹脂塗層和封膜之前，請先使用指定設備確認對產品沒有影響，然後再進行使用。
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、樹脂塗層、封膜的幹燥、硬化條件使用到有機溶劑（乙酸乙酯、甲基乙酮、甲苯等），可能會破壞電容器的包封樹脂，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.

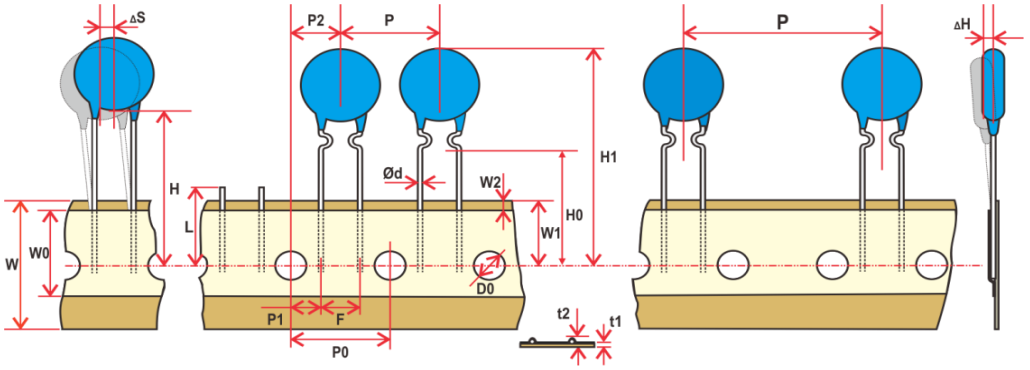
粘合、樹脂塗層、封膜厚度的偏差可能會在冷卻與加熱過程中使電容器的包封樹脂和/或陶瓷介質破裂。
The variation in thickness of adhesive, molding resin or coating may cause outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

6.9.4. 清洗（超聲波清洗）
Cleaning (ultrasonic cleaning)

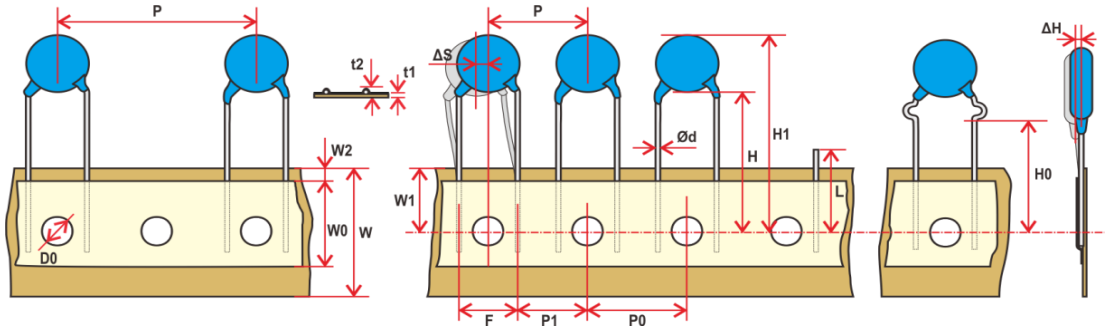
要進行超聲波清洗，應遵守下列條件。
To perform ultrasonic cleaning, observe the following conditions.
清洗槽容量：每升輸出功率20瓦特或以下。
Rinse bath capacity: output of 20 watts per liter or less.
清洗時間：最多5分鐘。
Rinsing time: 5 min. Maximum.
不得直接振動 pcb/pwb。
Do not vibrate the pcb/pwb directly.
過度的超聲波清洗會導致導線的過載損壞。
Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

7 編帶尺寸規格
Taping specifications

■ Method 1 : sprocket hole between parts



■ Method 2: sprocket hole between leads



Item		Symbol	Specification (mm)	Remarks
Lead-wire diameter		Ød	0.6±0.1	
Pitch of component		P		
Feed hole pitch		P0		Cumulative pitch error: 1.0mm/20 pitch
Feed hole center to lead		P1		
Hole center to component center		P2		
Lead-to-lead distance		F	7.5±1.0	
Component alignment		Δh	≤2.0	
Deviation along tape, Left or right		ΔS	≤1.3	
Tape width		W	18.0+1.0/-0.5	
Hold-down tape width		W0	≥7.0	
Hole position		W1	9.0+0.75/-0.5	
Hole-down tape position		W2	≤3.0	
Height of component from tape center	Straight lead	H	18.0+2/-0	
	Kinked lead	H0	16.0±0.5	
Component height		H1	≤40	
Feed hole diameter		D0	4.0±0.3	
Total tape thickness		t1	≤0.9	Ground paper: 0.5±0.1mm
Total thickness, tape and lead wire		t2	≤1.5	
Length of snipped		L	≤11.0	

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