

承认书

APPROVAL SHEET

客户
CUSTOMER

立创商城

客户料号
CUSTOMER P/N

规格描述
DESCRIPTION

1KV/47NF/J/F15/直脚/L16/18*13.5*7.5/ZNRC/灰殼

产品编码
PART NUMBER

CF13A473JG1E1813A200

日期
DATE

2026-06-10

德尔创承认栏 APPROVED BY DERSONIC			客户承认栏 APPROVED BY CUSTOMER	
批准 APPROVED BY	审核 CHECK BY	制订 FORMULATE BY	批准 APPROVED BY	审核 CHECK BY
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產品尺寸圖 PRODUCT DIMENSIONS

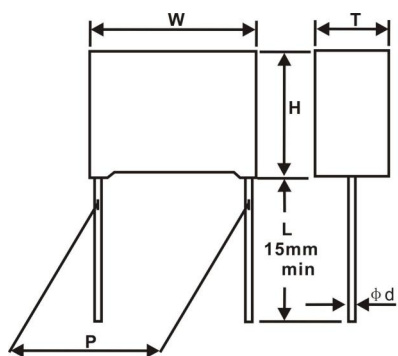


Fig. 1

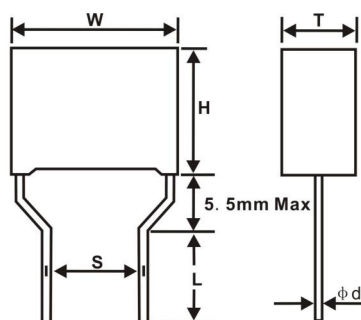


Fig. 2

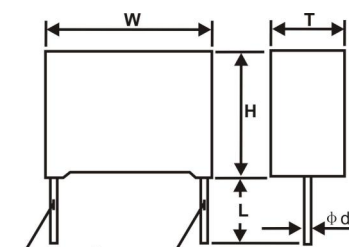


Fig. 3

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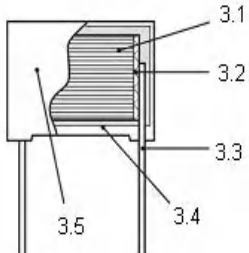
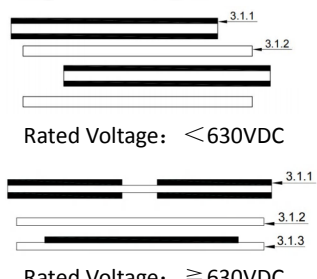
*電性數據均為理論值以實測為準

* Electrical data shall be subject to actual measurement

PRODUCT SPECIFICATIONS

產品規格說明

TYPE:
型號: **PMD(BOX)**

NO.	ITEM 項目	DESCRIPTIONS 說明	
1	SCOPE 範圍	Double sided metallized polypropylene film capacitor,Type :PMD 雙面金屬化聚丙烯膜電容器，型號: PMD	
2	STANDARD ATMOSPHERIC CONDITIONS FOR MAKING MEASUREMENTS 各測量於標準大氣下進行		
2.1	AMBIENT TEMPERATURE 環境溫度	15℃ to 35℃ (If there is any doubt on the results, the measurements shall be made at +20 ± 5℃) (如對結果有任何疑問，該測量環境溫度應為+20 ± 5℃之間)	
2.2	RELATIVE HUMIDITY(R.H.) 相對溼度	45%to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70%) (如對結果有任何疑問，該測量相對溼度應為 60% to 70%之間)	
2.3	AIR PRESSURE 大氣壓力	86 kpa (千帕) to 106 kpa (千帕)	
2.4	OPERATING TEMPERATURE RANGE 工作溫度範圍	-40℃ to +110℃. (+85℃ to +110℃ : Decreasing factor 1.25% per ℃ for Ur) (於+85℃ to +110℃間，溫度每上升一度℃，耐電壓會下降 1.25%)	
3	CONSTRUCTION 結構		
3.1	DIELECTRIC 電介質	 	
3.1.1	Double-sided Metallized Polyester Carrier Film 雙面金屬化聚酯膜		
3.1.2	Polypropylene Film Dielectric 聚丙烯薄膜介質		
3.1.3	Single-sided Metallized Polypropylene Film 單面金屬化聚丙烯薄膜		
3.2	METAL SPRAY 噴金層		Special Solder 特殊焊料
3.3	LEAD WIRE 導線		LEAD WIRE DIAMETER 0.6/0.8mm 線徑 0.6/0.8mm
3.4	EPOXY RESIN 環氧樹脂		UL 94V-0 耐燃等級
3.5	PLASTIC CASE 塑料外殼		UL 94V-0 耐燃等級
4	MARKING 打印		
4.1	TYPE OR MATERIAL 型號或材料		“PMD” stands for “PMD” type. “PMD” 代表 “PMD” 型號
4.2	NOMINAL CAPACITANCE 額定電容量	In EIA 3-digit code. (Reference Product code comparative table) 用 EIA 三碼表示(參考產品編碼對照表)	
4.3	CAPACITANCE TOLERANCE 電容量偏差	In EIA 1- letter code. (Reference Product code comparative table) 用 EIA 一碼表示(參考產品編碼對照表)	
4.4	RATED VOLTAGE 額定電壓	in VDC rating, unless otherwise indicated. 直流電壓表示，除非另有說明	
4.5	DATE CODE 日期代碼	T	

範例 example	
ZNRC PMD 2 103J1000 T	

PRODUCT SPECIFICATIONS

產品規格說明

TYPE:

型號: **PMD(BOX)**

5	ELECTRICAL CHARACTERISTICS 電氣特性				
NO.	ITEM 項目		PERFORMANCE 性能		TEST CONDITIONS 測試條件
5.1	Capacitance(CAP) 容量		Within the tolerance specified. 偏差值如標示		Measuring Frequency : 1KHz +/-10% Measuring Voltage : <=1 Vrms. 測量頻率 : 1KHz +/-10%; 測量電壓 : <=1Vrms
5.2	Voltage Proof (Ur) 耐電壓	Between Terminals 引線之間	Shall be no abnormality 應無異常		1.6 times of Ur for 2 sec. 1.6 倍的額定電壓,2 秒.
		Between Terminals & Enclosure 極殼之間	Shall be no abnormality 應無異常		Apply 2000VAC for 2 to 5 sec. 印加 2000VAC, 2-5 秒
5.3	Insulation Resistance (I.R.) 絕緣電阻		$\geq 100,000 \text{ M}\Omega \quad C \leq 0.33 \text{ }\mu\text{F}$ $\geq 30,000 \text{ M}\Omega * \mu\text{F} \quad C > 0.33 \text{ }\mu\text{F}$ (25°C±5°C)		DC voltage specified below shall be applied for 60 sec., after which measurement shall be made. 下記的電壓印加約 60 秒後, 測定 R.V. of 100 to 400V: 100+/-15V, R.V. of >= 630V : 500+/-50V
5.4	Dissipation Factor (DF) 介質損耗因素		1K	$C \leq 0.1 \text{ }\mu\text{F} \leq 0.05\%$ $0.1 \text{ }\mu\text{F} < C \leq 1.0 \text{ }\mu\text{F} \leq 0.05\%$ $C > 1\mu\text{F} \leq 0.05\%$	Measuring Frequency : +/-2% Measuring Voltage : <=1 Vrms. 測量頻率: +/-2%; 測量電壓: <=1 Vrms
			10K	$C \leq 0.1 \text{ }\mu\text{F} \leq 0.06\%$ $0.1 \text{ }\mu\text{F} < C \leq 1.0 \text{ }\mu\text{F} \leq 0.07\%$ $C > 1\mu\text{F} \leq 0.1\%$	
			100K	$C \leq 0.1 \text{ }\mu\text{F} \leq 0.15\%$ $0.1 \text{ }\mu\text{F} < C \leq 1.0 \text{ }\mu\text{F} \leq 0.25\%$ $C > 1\mu\text{F} \leq 0.5\%$	
5.5	Solderability 可焊性		More than 90% of circumferential surface of lead wire shall be covered with new solder. 焊料覆蓋超過引線表面圓周 90%		Soldering temperature : +260+/-5°C Immersion duration : 2+/-0.5sec. 焊錫槽溫度為: +260+/-5°C 浸泡時間為: 2+/-0.5 秒
6	MECHANICAL CHARACTERISTICS 機械特性				
6.1	Terminal strength 端子強度	Tensile 引張強度	Shall be no abnormality 應無異常		Apply 1.0Kg (10N) for 10+/-2 sec to the terminal in the axial direction and acting in a direction away from the body. 被測電容需要固定, 在引線末端以 1 公斤的垂直力量, 維持 10+/-2 秒
		Bending 彎曲強度	Shall be no abnormality 應無異常		Apply 0.5Kg (5N) for 2 cycles Each cycle includes: 90° once, return to its initial position for 2-3 sec, and then to the opposite direction once. 在引線端子末端施加 500 公克的力 把引線彎曲 90 度, 在回復到起始點, 再往反向彎曲 90 度, 再回復到起始 點, 每次測試引線彎曲到 90 度時, 需要維持 2 至 3 秒。

PRODUCT SPECIFICATIONS

產品規格說明

TYPE:

型號:

PMD(BOX)

NO.	ITEM 項目		PERFORMANCE 性能	TEST CONDITIONS 測試條件
6.2	Vibration Resistance 振動試驗	Connection strength 連接強度	Shall be no open or short-circuiting. The connection shall be stable 不得打開或短路連接 連接應穩定	Frequency Change: 10-55-10Hz Vibration Distance: 1.5 mm. Test Direction: X, Y, Z Test Duration: 2 +1/-0 hrs each direction 頻率變化: 10-55-10Hz
		Appearance 外觀	Shall be no mechanical damage 應無機械損傷	振動距離: 1.5 毫米. 試驗方向: X, Y, Z 試驗時間: 每個方向 2+1/-0 小時
7	ENDURANCE CHARACTERISTICS 耐久特性			
7.1	Temperature cycle 溫度循環試驗	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature Cycle : Total 5 cycles. Each cycle includes : 1. +20 +/-2℃ for 3 min. 2. -40 +0/-3℃ for 30 min. 3. +20 +/-2℃ for 3 min. 4. +110 +3/-0℃ for 30min. 5. +20 +/-2℃ for 3 min. 測試循環: 共 5 次 · 每個循環包括: 1. +20 +/-2℃ 持續 3 分鐘. 2. -40 +0/-3℃ 持續 30 分鐘. 3. +20 +/-2℃ 持續 3 分鐘. 4. +110 +3/-0℃ 持續 30 分鐘. 5. +20 +/-2℃ 持續 3 分鐘.
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate (ΔC/C) 容量變化率	Within ±5% of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	>=50% of the limit value of NO.5.3 NO.5.3 數據的>=50%	
7.2	Dry Heat Resistance 耐乾熱試驗	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature: +110 +/-2℃ Test Duration: 16 +1/-0 hrs. 試驗溫度: +110 +/-2℃ 測試時間: 16 +1/-0 小時.
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate (ΔC/C) 容量變化率	Within ±5% of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	>=50% of the limit value of NO.5.3 NO.5.3 數據的>=50%	

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產品規格說明

TYPE: **PMD(BOX)**
型號:

NO.	ITEM 項目		PERFORMANCE 性能	TEST CONDITIONS 測試條件
7.3	Cold Resistance 耐乾寒試驗	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature: -40 +/- 3℃ Test Duration: 2 +1/- 0 hrs. 試驗溫度: -40 +/- 3℃ 測試時間: 2 +1/- 0 小時.
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate (△C/C) 容量變化率	Within ±5% of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	>=50% of the limit value of NO.5.3 NO.5.3 數據的>=50%	
7.4	Humidity Resistance 耐濕性	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature: +40 +/- 2℃. Test Humidity: 90% to 95% R.H. Test Duration: 500 + 24/-0 Hrs After test, allow it stay alone for 4 Hrs at standard temperature and humidity before making measurements. 試驗溫度: +40 +/-2℃. 試驗濕度: 90%至 95%相對濕度下. 試驗時間: 500 +24/-0 小時 實驗後 ,電容必須在室溫下靜置 4 小時 ,才能進行測試。
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate (△C/C) 容量變化率	Within ±5% of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	>=50% of the limit value of NO.5.3 NO.5.3 數據的>=50%	
7.5	High Temperature Loading 高溫負荷	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature: +110 +/- 2℃ Apply 1.25times of rated voltage for 1,000 + 24/-0 hrs After test, allow it stay alone for 4hrs at standard temperature and humidity before making measurements. 試驗溫度: +110 +/-2℃ 適用 1.25 倍的額定電壓為 1000+24/-0 小時 實驗後 ,電容必須在室溫下靜置 4 小時 ,才能進行測試。
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate (△C/C) 容量變化率	Within ±5% of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	>=50% of the limit value of NO.5.3 NO.5.3 數據的>=50%	

PRODUCT SPECIFICATIONS

產品規格說明

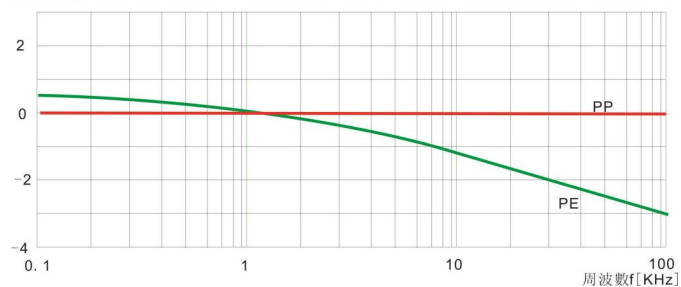
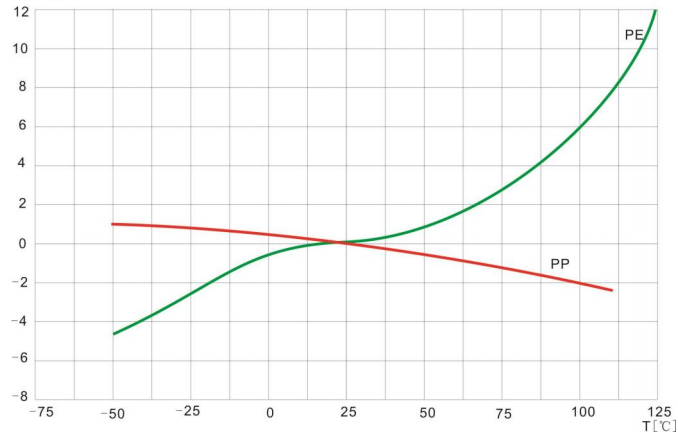
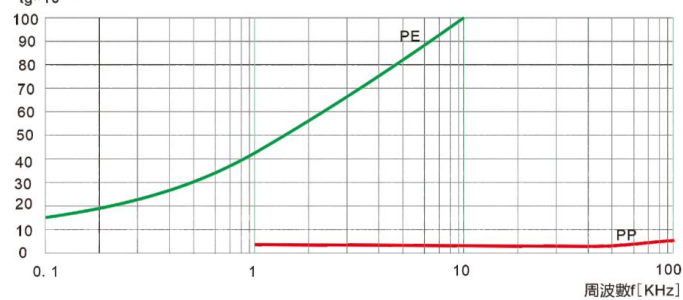
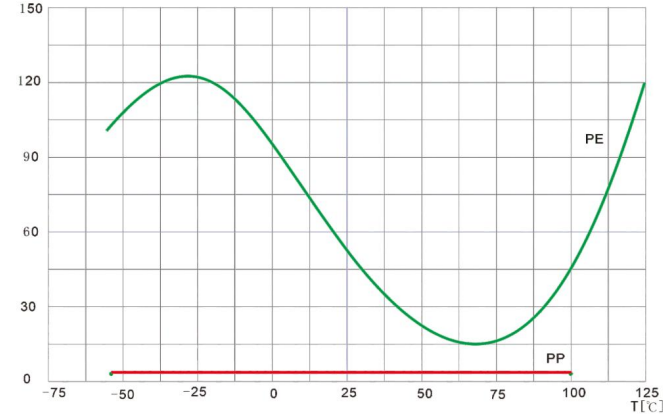
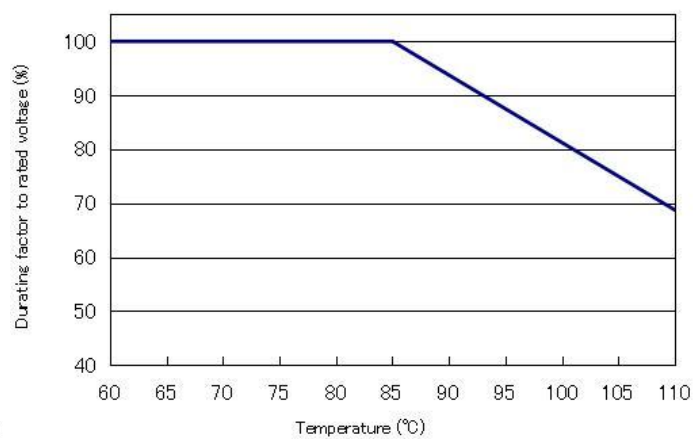
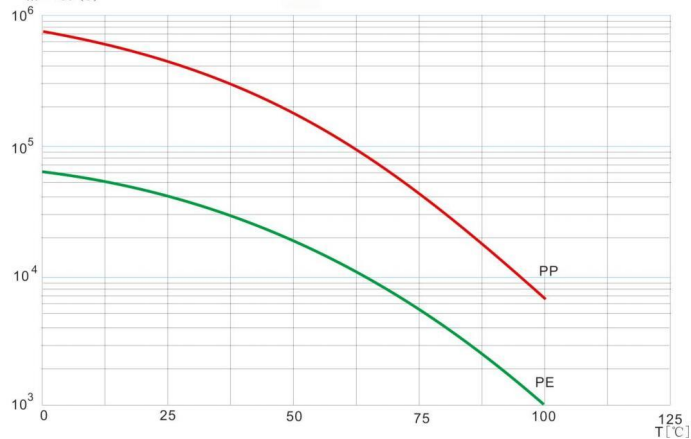
TYPE:

型號:

PMD(BOX)

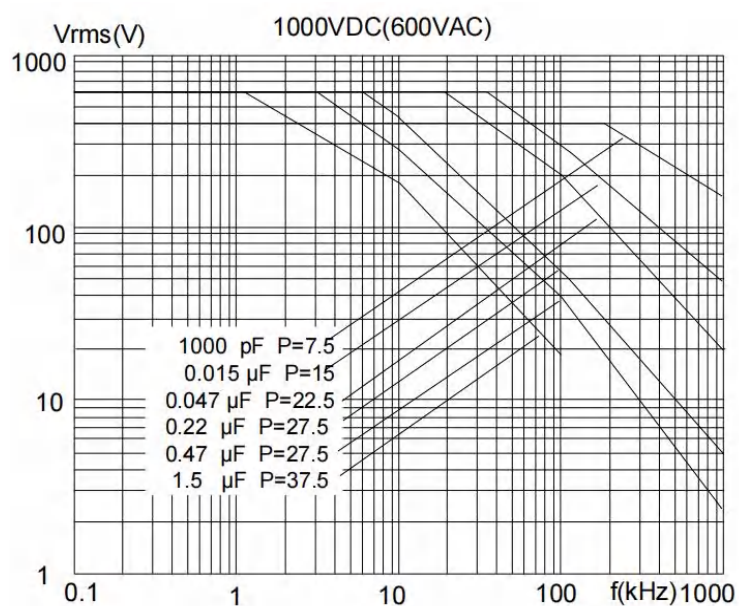
NO.	ITEM 項目		PERFORMANCE 性能	TEST CONDITIONS 測試條件
7.6	Rapid Temperature Change 溫度急劇變化	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Temperature Cycle: Total 5 cycles High Temperature: +110 +/-5℃ Low Temperature: -25 +/-5℃ 30 min +/-10% for each temperature 測試溫度循環: 共 5 次 高溫: +110 +/-5℃ 低溫: -25 +/-5℃ 每個溫度為 30 分鐘+/- 10%
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate ($\Delta C/C$) 容量變化率	Within $\pm 5\%$ of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	$\geq 50\%$ of the limit value of NO.5.3 NO.5.3 數據的 $\geq 50\%$	
7.7	Damp Heat Loading 穩態濕熱試驗	Appearance 外觀	Shall be no remarkable change 應當無顯著變化	Test Temperature: +40 +/-2℃. Test Humidity: 90% to 95% R.H. Test voltage: Rated Voltage. Test Duration: 500 + 24/-0 Hrs After test, allow it stay alone for 4 Hrs at standard temperature and humidity before making measurements. 試驗溫度: +40 +/-2℃. 試驗濕度: 90%至 95%相對濕度下 測試電壓: 額定電壓 測試時間: 500 + 24/-0 小時 實驗後 ,電容必須在室溫下靜置 4 小時 ,才能進行測試。
		Withstand Voltage 耐電壓	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate ($\Delta C/C$) 容量變化率	Within $\pm 5\%$ of the value before test 變化率小於+/-5%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	$\geq 50\%$ of the limit value of NO.5.3 NO.5.3 數據的 $\geq 50\%$	
7.8	Soldering Heat Resistance 焊接耐熱試驗	Appearance 外觀	Shall be no remarkable change. The marking shall be legible. 印字應清晰, 無顯著變化	Preheat temp. 100~120℃ Preheat Duration: 60 sec. max Temperature increase by 3℃/sec. max. Soldering Temperature: +260 +/-5℃ Immersion Duration: 5 +/-1sec. Immersion Depth: 4 +/-0.8mm from roots. After test, allow it stay alone for 1.5+/-0.5 hrs. at standard temperature and humidity before making measurements. 預熱溫度 100~120℃ 預熱時間: 最大為 60 秒 溫度升高最大為 3℃/秒 焊接溫度: +260 +/-5℃ 浸泡時間: 5 +/-1 秒 浸入深度: 從電容底部開始 4+/-0.8 毫米實驗後, 電容必須在室溫下靜置 1.5+/-0.5 小時, 才能進行測試。
		Withstand Voltage Between Terminals 端子間的耐壓值	Shall satisfy NO.5.2 應滿足 NO.5.2	
		Capacitance Change Rate ($\Delta C/C$) 容量變化率	Within $\pm 3\%$ of the value before test 變化率小於+/-3%	
		Dissipation Factor 介質損耗 (DF)	Tan: 0.11% max. (1KHz) 最大值不得超過	
		Insulation Resistance 絕緣電阻 (I.R.)	$\geq 50\%$ of the limit value of NO.5.3 NO.5.3 數據的 $\geq 50\%$	
		Connection of Element 元件連接處	Shall be stable 應穩定	

8.1 PP, PE Material Comparison Diagram

容量變化
Capacitance change $\Delta C/C(\%)$ 容量變化
Capacitance change $\Delta C/C(\%)$ 誘電正切
Dissipation Factor $\lg \cdot 10^{-4}$ 誘電正切
Dissipation Factor $\lg \cdot 10^{-4}$ 絕緣阻抗
Insulation Resistance $M\Omega \cdot \mu F(s)$ 

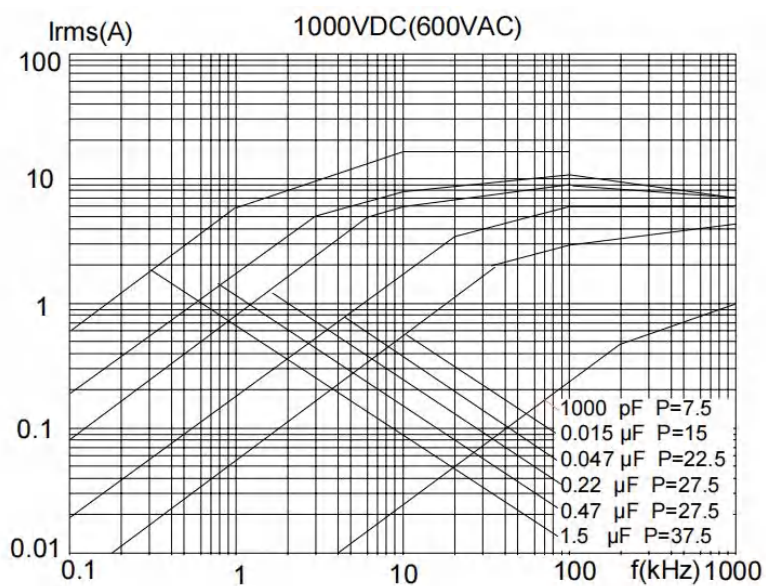
8.2 Maximum Voltage (Vrms) Versus Frequency

(Temperature of capacitor surface $\leq 85^{\circ}\text{C}$, Temperature rise: $\Delta T \leq 20^{\circ}\text{C}$)



8.3 Maximum Current (Irms) Versus Frequency

(Temperature of capacitor surface $\leq 85^{\circ}\text{C}$, Temperature rise: $\Delta T \leq 20^{\circ}\text{C}$)



1 Soldering suggestions - 焊接的建議

When soldering a capacitor, heat in soldering is conducted to the element of the capacitor from wire lead and an enclosure, and hence it should be noted that soldering under high temperature and a long period may cause deterioration of breakdown of capacitors. characteristic or Be sure to solder within the following temperature condition range.

當焊接電容器時, 焊錫熱會通過引線端子高溫 and 封裝層傳遞到電容器素子, 因此必須注意高溫和長時間焊接引起的電容器特性衰減或損壞, 請確認焊錫在以下溫度範圍內。

T_S : Capacitor body maximum temperature at wave soldering

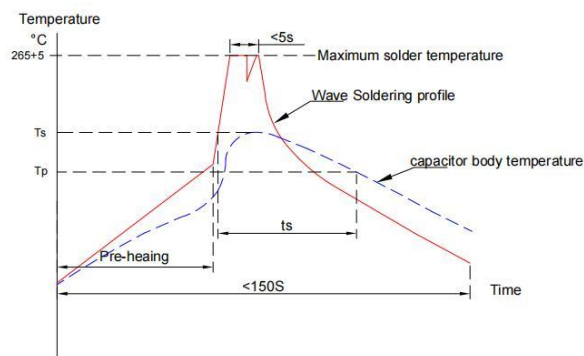
電容器本體最高波峰焊溫度

T_P : Capacitor body maximum temperature at pre-heating

電容器本體最高預熱溫度

Body temperature should follow the description below:

電容器本體溫度應該符合以下描述



Polypropylene film capacitor 聚丙烯薄膜電容器

During pre-heating: $T_P \leq 110^\circ\text{C}$

During soldering: $T_S \leq 120^\circ\text{C}$, $t_s \leq 45\text{s}$

加熱溫度: $T_P \leq 110^\circ\text{C}$

焊接溫度: $T_S \leq 120^\circ\text{C}$, $t_s \leq 45\text{s}$

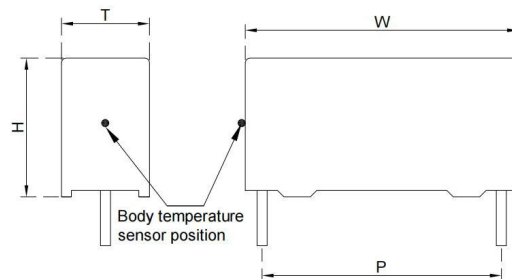
Polyester film capacitor 聚酯薄膜電容器

During pre-heating: $T_P \leq 125^\circ\text{C}$

During soldering: $T_S \leq 160^\circ\text{C}$, $t_s \leq 45\text{s}$

加熱溫度: $T_P \leq 125^\circ\text{C}$

焊接溫度: $T_S \leq 160^\circ\text{C}$, $t_s \leq 45\text{s}$



■ Remark: When the thickness of the finished capacitor $T \leq 5\text{mm}$, please appropriately increase the chain speed, reduce the preheating time and lower the preheating temperature to avoid damage to the capacitor core by heat conduction.

備註: 當電容器成品厚度 $T \leq 5\text{mm}$ 時, 請適當加快鏈速和預熱時間, 降低預熱溫度, 以避免熱傳導致電容芯子受損。

■ When SMD components are used together with leaded ones, the film capacitors should not pass into the SMD adhesive curing oven.

The leaded components should be assembled after the SMD curing step.

當SMD元件與引腳式元件一起使用時, 薄膜電容器不應進入SMD粘合劑固化爐。引腳式部件應在SMD固化步驟之後組裝。

■ Leaded film capacitors are not suitable for reflow soldering.

引腳式薄膜電容器不適合回流焊

■ In order to ensure proper conditions for manual or selective soldering, the body temperature of the capacitor (T_S) must be $\leq 120^\circ\text{C}$.

為了確保手動或選擇性焊接的適當條件, 電容器 (T_S) 的本體溫度必須是 $\leq 120^\circ\text{C}$ 。

■ One recommended condition for manual soldering is that the tip of the soldering iron should be $< 360^\circ\text{C}$ and the soldering contact time should be no longer than 3 seconds.

手工焊接的一個推薦條件是烙鐵的頂端應該是 $< 360^\circ\text{C}$, 焊接接觸時間不應超過3秒。

■ For uncoated MPE capacitors with lead spacings $\leq 10\text{mm}$ the following measures are recommended:

未塗覆的MPE電容器引線間隔為 $\leq 10\text{mm}$, 建議採取以下措施

1. pre-heating to not more than 110°C in the preheater phase 預熱階段預熱溫度不超過 110°C

2. rapid cooling after soldering 焊後快速冷卻

■ If re-work or dipping twice in necessary, it should be done after the capacitor returned to the normal temperature. Suggestion time is 24 hours.

如果需要焊接兩次, 第二次焊接必須等到電容器恢復到常溫。建議時間24小時。

■ The body temperature sensor position is define as the highest temperature point around the capacitor body.

If there is 90 degree bending product, the sensor position shall be between product and PCB.

本體溫度測試點定義為, 電容器本體四周最高溫度點。如有90度折彎平躺產品

本體溫度測試點應在產品與PCB交接處量測, 如圖所示。

