



# 久亦電子有限公司

JOEY ELECTRONICS CO., LTD.

## 塑膠薄膜電容器規格承認書

SPECIFICATION OF PLASTIC FILM CAPACITOR FOR APPROVAL

客 戶 名 稱 :

( Customer )

項 目 :

( Item )

MEF系列

客 戶 料 號 :

( Customer Part No )

久 亦 料 號 :

( Joey Parts No )

送 樣 日 期 :

( Date )

22.06.29

備 注 :

( Remark )

CUSTOMER APPROVAL 廠商認可

請確認後簽回，若不簽回，視同默認。

PLEASE SIGNATURE AFTER CHECKING , NO SIGNATURE IS EQUAL PRETERMIT.

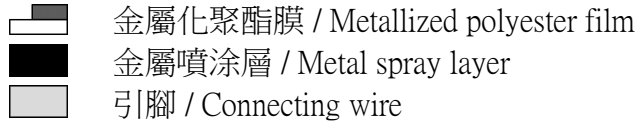
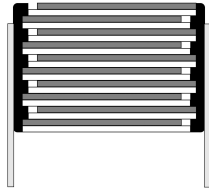
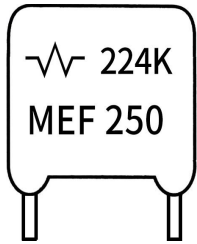
承認章 ( Approved By )

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TEL : 0769 - 83729966 FAX : 0769 - 83729969

金屬化聚酯膜電容器 (浸漬型)  
Metallized polyester film capacitor (dipped-type)



**特點：**

- # 金屬化聚酯膜
- # 良好的自愈性，壽命長
- # 阻燃環氧粉末包封 (UL94/V-0)
- # 容量範圍寬，體積小，重量輕

**Features :**

- # Metallized polyester film
- # Long life due to self- healing effect
- # Flame retardant epoxy resin powder coating ( UL94/V- 0)
- # Wide capacitance range and small size , and light weight

**主要用途：**

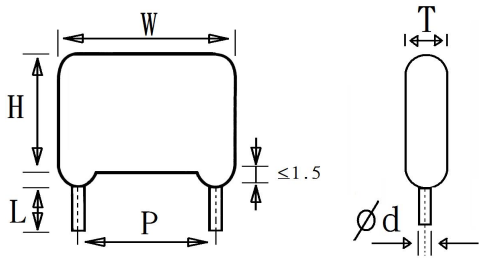
- # 廣泛用於濾波，低脈衝電路
- # 適用於直流和VHF級信號的隔直流，旁路和耦合

**Typical Application :**

- # Widely used in filter and low pulse circuits
- # Suitable for blocking , by-pass and coupling of DC and signals to VHF range

**技術要求 Specifications**

引用標準 / Reference Standard	GB/T 7332 ( IEC 60384-2 )					
額定溫度 / Rated Temperature	85°C					
工作溫度範圍 Operating Temperature Range	- 40°C ~ +105°C ( + 85°C ~ +105°C : decreasing factor 1.25% per °C for UR)					
額定電壓 / Rated Voltage	( 100 / 250 / 400 / 630 ) VDC					
容量範圍 / Capacitance Range	0.01uF ~ 2.2uF					
電容量偏差 / Capacitance Tolerance	±5% (J) , ±10% (K)					
耐電壓 / Voltage proof	1.6UR ( 2S )					
損耗角正切 / Dissipation Factor	≤ 1% (1KHz , 20°C)					
絕緣阻抗 / Insulation Resistance	9 000MΩ for C < 0.33uF 3 000MΩ for 105 > C > 0.33uF 1 000MΩ for C > 1.0uF (20°C , 100V , 1min)					
最大脈衝爬升速率 Maximum Pulse Rise Time (dV / dt) : 若實際工作電壓U比額定電壓 $U_R$ 低，電容器可工作在更高的dV / dt場合。這樣dV / dt允許值應為右表值 $U_R/U$ 。 If the working voltage (U) is lower than the rated voltage ( $U_R$ ),the capacitor can beworked at a higher dV / dt . In thiscase , the maximum allowed dV / dt is obtain by multiplyingthe right value with $U_R/U$ .	$U_R$ (V)	dv/dt (V/us)				
		P=7.5	P=10	P=15	P=22.5	P=27.5
	100	15	9	5	3	2
	250	30	20	12	8	5
	400	40	30	20	10	7
630	---	40	25	12	10	



- (1) 可依照客戶需求設計.產品詳細型號及尺寸可聯系業務部門或技術部門
- (2) 引腳腳型可進行加工編帶，切腳和彎切

外型尺寸 Dimensions (mm)

CAP	CAP (uF)	50Vdc / 100Vdc				
		W max	H max	T max	P	d
103	0.01	13	9	6	10	0.6
223	0.022	13	9	6	10	0.6
333	0.033	13	10	6	10	0.6
473	0.047	13	11	7	10	0.6
683	0.068	13	9	6	10	0.6
104	0.1	13	10	6	10	0.6
224	0.22	13	10.5	6	10	0.6
334	0.33	13	11	7	10	0.6
474	0.47	13	11.5	7.5	10	0.6
684	0.68	18	12	7	15	0.8
105	1.0	18	14	7.7	15	0.8
225	2.2	24	16.5	10.5	20	0.8
335	3.3	24	18	11.5	20	0.8
475	4.7	26	20	13	22.5	0.8

CAP	CAP (uF)	250Vdc				
		W max	H max	T max	P	d
103	0.01	13	9	6	10	0.6
223	0.022	13	9	6	10	0.6
333	0.033	13	9	6	10	0.6
473	0.047	13	10	6	10	0.6
683	0.068	13	11	6	10	0.6
104	0.1	13	11	6.5	10	0.6
224	0.22	13	11	7	10	0.6
334	0.33	18	12	7.5	15	0.8
474	0.47	18	13	9	15	0.8
684	0.68	18	13	9	15	0.8
105	1.0	18	15	9	15	0.8
225	2.2	24	20	10	20	0.8
335	3.3	32	24	11	27.5	0.8
475	4.7	32	24	12	27.5	0.8

CAP	CAP (uF)	400Vdc / 450Vdc				
		W max	H max	T max	P	d
103	0.01	13	9	6	10	0.6
153	0.015	13	9	6	10	0.6
223	0.022	13	9	6	10	0.6
333	0.033	13	10	6	10	0.6
473	0.047	13	11	7	10	0.6
683	0.068	13	11	8	10	0.6
104	0.1	13	12	6.5	10	0.6
154	0.15	18	13	7	15	0.8
224	0.22	18	14	8	15	0.8
334	0.33	18	17	10	15	0.8
474	0.47	18	15	8.5	15	0.8
474	0.47	24	18	12	20	0.8
564	0.56	24	17.5	11	20	0.8
684	0.68	24	19	13	20	0.8
824	0.82	24	20	13	20	0.8
105	1.0	24	19	9.5	20	0.8
225	2.2	26	24	12	22.5	0.8
335	3.3	32	25	15	27.5	0.8
475	4.7	32	29	19	27.5	0.8

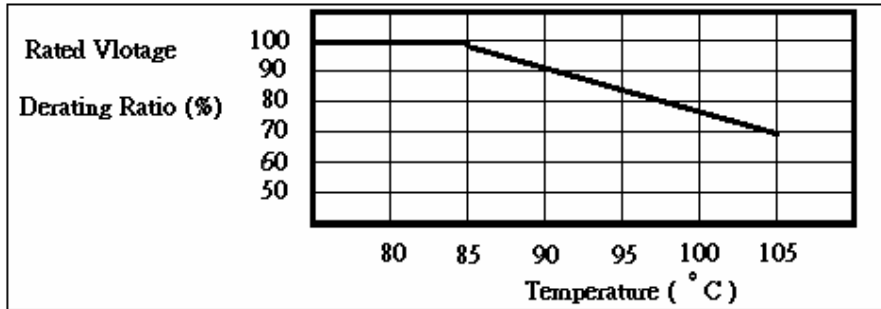
CAP	CAP (uF)	630Vdc				
		W max	H max	T max	P	d
472	0.047	13	9	6	10	0.6
682	0.068	13	9	6	10	0.6
103	0.01	13	9	6	10	0.6
153	0.015	13	9	6	10	0.6
223	0.022	13	10	6.5	10	0.6
333	0.033	13	12	8	10	0.6
473	0.047	18	12	8	15	0.8
683	0.068	18	13	8.5	15	0.8
104	0.1	18	16	9	15	0.8
154	0.15	24	13.5	9	20	0.8
224	0.22	24	16	10	20	0.8
334	0.33	24	21	12	20	0.8
474	0.47	32	20	13	27.5	0.8
684	0.68	32	23	15	27.5	0.8
105	1.0	32	26	17	27.5	0.8
155	1.5	41	29	18	37.5	0.8
225	2.2	45	32	20	37.5	0.8

一. SCOPE: THIS SPECIFICATION APPLIED TO CAPACITOR FOR TYPE "MEF"  
(METALLIZED POLYESTER FILM CAPACITOR).

二. OPERATING TEMPERATURE: - 40°C ~ + 105°C

(Derating ratio of rated voltage to + 85°C ~ + 105°C : 1.5% per °C for Rated Voltage)

Rated Voltage: Rated voltage is defined the voltage which shall be capable of applying to capacitors continuously in the operating temperature range. However, rated voltage shall be derated 1.5% at each 1°C in the range of + 85°C ~ + 105°C as shown in the Fig. below.



三. WORKING VOLTAGE: MEF ( 50 ~ 1000VDC )

四. CAPACITANCE RANGE : MEF (0.001uF~10.0uF ).

五. CAPACITANCE TOLERANCE : ±1% (F), ±2%(G),±3%(H),±5%(J),±10%(K),±20%(M).

六. CONSTRUCTIONS & SHOW

(一) CONSTRUCTIONS.

A : ELEMENT (METALLIZED POLYESTER FILM. )

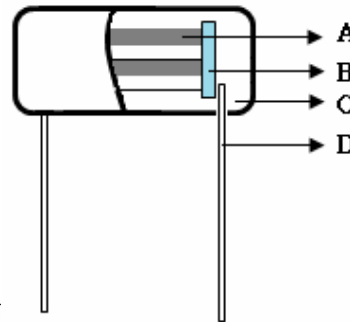
B : METALS(SN.ZN.SB.CU).

C : EPOXY RESIN & WAX

D : WIRE .

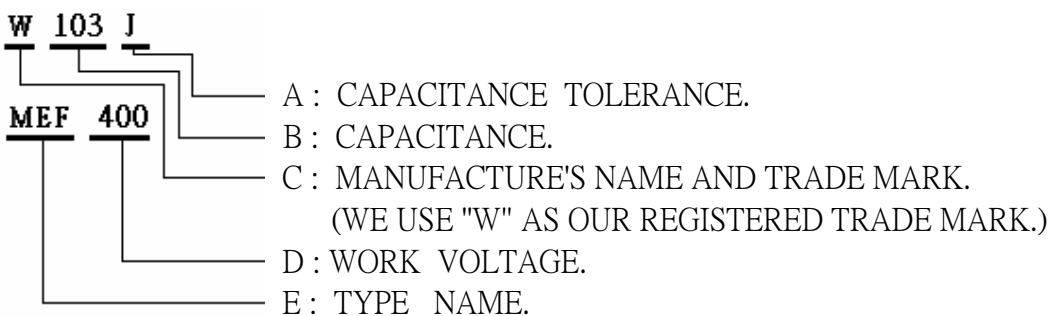
(二) SHOWS:

CAPACITOR'S SHOWS, IT'S SHOWN. ATTACHED DRAWIN



七. MARKING:

CAPACITOR IS MARKING ON BODY FOR FOLLOWING ITEMS.



八. STANDARD TESTING CONDITION:

CAPACITORS MAY BE MEASURED AT TEMPERATURE 20±5°C

AND HUMIDITY:65±5%RH

九. CHARACTERISTICS				
NO.	TEST ITEMS		CHARACTERISTICS	TEST METHOD
(一)	TESTING VOLTAGE (TV)	BETWEEN TERMINALS	NO BREAKDOWN OR FLASHOVER	150% RATED VOLTAGE FOR 2 SEC NOT EXCEED 15 mA FOR CHANGE 150% WORKING VOLTAGE FOR 60 SEC
		BETWEEN & ENCLOSURE TERMINALS	NO BREAKDOWN OR FLASHOVER	
(二)	INSULATION RESISTANCE (IR)	BETWEEN TERMINALS	$C \leq 0.33\mu F \geq 15000M\Omega$ or more	CHARGING TIME : $60 \pm 5$ SEC CHARGING VOLTAGE : 100VDC
		BETWEEN & ENCLOSURE TERMINALS	$1.0\mu F \geq C > 0.33\mu F > 5000M\Omega$ or more $C > 1.0\mu F > 1000M\Omega$ or more	
(三)	CAPACITANCE		PLEASE CONSULT PAGE THREE	FREQUENCY AT 1KHZ TEST VOLTAGE 1 V AT $20 \pm 5^\circ C$
(四)	DISSIPATION FACTOR (DF)		1.0%(MAX) AT 1KHZ	TEST VOLTAGE 1V AT $20 \pm 5^\circ C$
(五)	LOAD STRENGTH	PULL TEST	ELECTRICAL AND MECHANICAL CHARACTERISTICS NO CHANGE.	WIRE 0.5mm LOAD 0.5KG 10SEC WIRE 0.6mm LOAD 0.5KG 10SEC WIRE 0.8mm LOAD 0.5KG 10SEC WIRE 1.0mm LOAD 1.0KG 20SEC ACC.TO IEC 68-2-21,TEST UA.
		BENDING TEST	ELECTRICAL AND MECHANICAL CHARACTERISTICS NO CHANGE.	WIRE 0.5mm LOAD 5N : $4 \times 90^\circ$ WIRE 0.6&0.8mm LOAD 5N : $4 \times 90^\circ$ WIRE 1.0mm LOAD 5N : $4 \times 90^\circ$ ACC.TO IEC 68-2-21,TEST UB
(六)	VIBRATION		ELECTRICAL AND MECHANICAL CHARACTERISTICS NO CHANGE.	FREQUENCY RANGE 10-55-10HZ 2HRS FOR DIRECTION * 3 DIRECTIONS ACC.TO IEC 68-2-6, TEST FC&FD B4
(七)	SOLDERABILITY		AFTER THE IMMERSION COVER SOLDER OF 95% AROUND LEAD SURFACE DIPPING POINT.	SOLDERABILITY TEMP. FOR $245 \pm 5^\circ C$ TIME FOR $2 \pm 0.5$ SEC ACC. TO IEC68-2-20, TEST TA METHOD
(八)	RESISTANCE TO SOLDERING HEAT	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 3\%$	SOLDER TEMP. AT $260 \pm 5^\circ C$ DIPPING TIME FOR $5 \pm 1$ SEC HAND SOLDER TEMP. AT $350 \pm 10^\circ C$ TIME . AT $3 \pm 1$ SEC
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ	
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE	
		INSULATION RESISTANCE	$C \leq 0.33\mu F > 15G\Omega$ $1.0\mu F \geq C > 0.33\mu F > 5G\Omega$ $C > 1.0\mu F > 1G\Omega$	
		APPEARANCE	NO VISIBLE	

## 九. CHARACTERISTICS

NO.	TEST ITEMS	CHARACTERISTICS	TEST METHOD
(九)	LOW TEMPERATURE TEST	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 3\%$
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE
		INSULATION RESISTANCE	$C \leq 0.33\mu\text{F} > 15\text{G}\Omega$ $1.0\mu\text{F} \geq C > 0.33\mu\text{F} > 5\text{G}\Omega$ $C > 1.0\mu\text{F} > 1\text{G}\Omega$
		APPEARANCE	NO VISIBLE
(十)	HIGH TEMPERATURE TEST	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 5\%$
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE
		INSULATION RESISTANCE	$C \leq 0.33\mu\text{F} > 15\text{G}\Omega$ $1.0\mu\text{F} \geq C > 0.33\mu\text{F} > 5\text{G}\Omega$ $C > 1.0\mu\text{F} > 1\text{G}\Omega$
		APPEARANCE	NO VISIBLE
(十一)	TEMPERATURE CYCLE	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 10\%$
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE
		INSULATION RESISTANCE	$C \leq 0.33\mu\text{F} > 15\text{G}\Omega$ $1.0\mu\text{F} \geq C > 0.33\mu\text{F} > 5\text{G}\Omega$ $C > 1.0\mu\text{F} > 1\text{G}\Omega$
		APPEARANCE	NO VISIBLE
(十二)	HUMIDITY RESISTANCE LOADING TEST	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 10\%$
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE
		INSULATION RESISTANCE	$\Delta IR / IR \leq 50\%$
		APPEARANCE	NO VISIBLE
(十三)	HIGH TEMPERATURE LOADING	CHANGE IN CAPACITANCE	CHANGE IN (max) $< \pm 3\%$
		TANGENT OF THE LOSS ANGLE	1.0%(MAX) AT 1KHZ
		DIELECTRIC STRENGTH	150% WORKING VOLTAGE
		INSULATION RESISTANCE	$C \leq 0.33\mu\text{F} > 15\text{G}\Omega$ $1.0\mu\text{F} \geq C > 0.33\mu\text{F} > 5\text{G}\Omega$ $C > 1.0\mu\text{F} > 1\text{G}\Omega$
		APPEARANCE	NO VISIBLE
			ACC.TO IEC 68-2-1,TEST. Bb MEASURING CONDITION TEMP : $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ DURATION : $2 + 1/ - 0$ HOURS THEN RECOVERY AT ORDINARY CONDITION 1~2 HORUS
			ACC.TO IEC 68-2-2,TEST. Bb MEASURING CONDITION TEMP : $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ DURATION : $2 + 1/ - 0$ HOURS THEN RECOVERY AT ORDINARY CONDITION $16 \pm 1$ HORUS
			ACC TO IEC 68-2-14 METHOD TESTCYCLES NO            TEMP            TIME 1 $+ 20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 30m 2 $- 40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 30m 3 $+ 20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 30m 4 $+ 85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 30m 5 $+ 20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 30m THEN RECOVERY AT ORDINARY CONDITION 2 HORUS
			ACC TO IEC 68-2-14 METHOD HUMIDITY OF 90~95% RH TEMP : $40 \pm 2^{\circ}\text{C}$ APPLIED VOLTAGE : R.V DURATION : $500 + 24/ - 0$ HOURS THEN RECOVERY AT ORDINARY CONDITION 16 HORUS
			VOLTAGE OF 125% OF RATED VOLTAGE 50 TO 60Hz SHALL BE APPLIED TO THE CAPACITOR FOR $1000 + 48/0$ H THROUGH SERIAL RESISTOR OF 20 TO 1000 $\Omega$ PER 1V AT THE TEST TEMPERATURE OF $85 \pm 2^{\circ}\text{C}$ THEN RECOVERY AT ORDINARY CONDITION 16 HORUS

十. TESTING EQUIPMENT 檢測設備:

(一) CAPACITANCE AND 容量和損耗角 (CAP& DF) :

1. UAD TECH 1689 LCR METER.
2. TAI WAN ZENTECH 1062 LCR METER.
3. TAI WAN ZENTECH 1063 LCR METER.
4. TAI WAN ZENTECH 1075 LCR METER.

(二) INSULATION RESISTANCE 絕緣阻抗 (IR) :

1. DAN BRIDGE 602 METER
2. ZENTECH 705 IR METER.

(三) DIELECTRIC STRENGTH 耐電壓 (TV) :

1. ZENTECH 902
2. TAI WAN EXTECH 7450

(四) AUTO SORTING MACHINES 自動分選機(選別機)

1. TAI WAN URANUS SORTING AUTOMATIC
2. TAI WAN WELL DELL SORTING AUTOMATIC

(五) CHARACTERISTICS OF PERMISSIBLE CURRENT TO FREQUENCY

許容電流與頻率特性

1. CHROMA PROGRAMMABLE HF AC TESTER MODEL 11805  
可程式高頻交流測試器11805
2. CHROMA DIGIT MULTIMETER 12061  
六位半數位多功能電表
3. CHROMD CAPACITOR LEAKAGE CURRENT / IR METER MODEL 11200  
電容漏電流/絕緣電阻表11200

(六) RoHS & WITHOUT HALOGEN

RoHS和無鹵產品

1. SHIMADZU EDX-LE

十一. ACCEPTABLE QUALITY LEVEL 允收標準 (AQL):

AQL IS ACCORDING TO MIL-STD-105E-II, BY LOT GOING INSPECTION.

允收標準(AQL)是根據MIL-STD-105E-II抽樣方試檢驗

(一) APPEARANCE AQL : 1.0 AC

外觀不良低於1.0為允收

(二) DIMENSIONS AQL: 1.0 AC

尺寸不良低於1.0為允收

(三) MECHANICAL CHARACTERISTICS AQL: 1.0 AC

機械特性不良低於1.0為允收

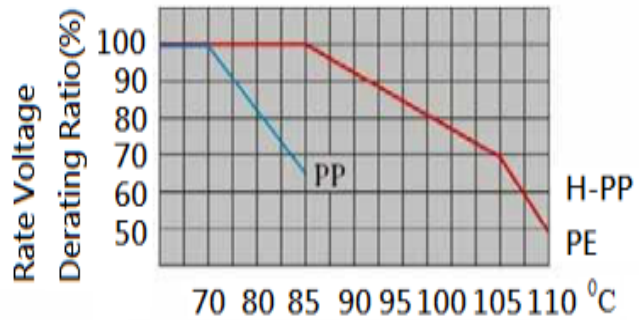
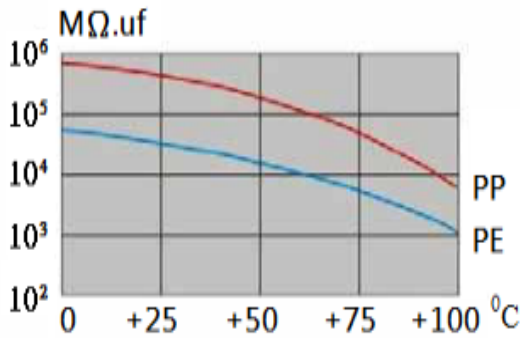
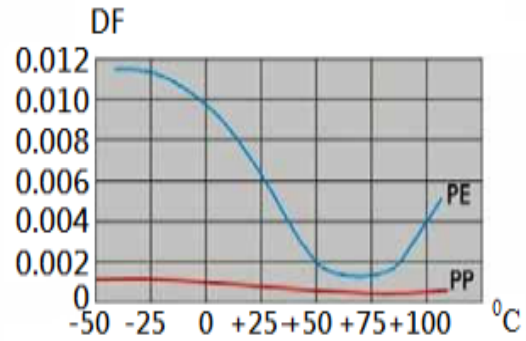
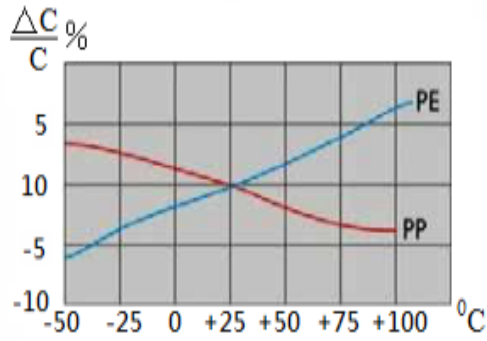
(四) ELECTRICAL CHARACTERISTICS AQL: 0.065 (INCLUDE CAP,DF,TV,IR)

電器特性不良低於 0.065 (包括 CAP,DF,TV,IR)

十二. Product electrical characteristic graph 產品電氣特性圖

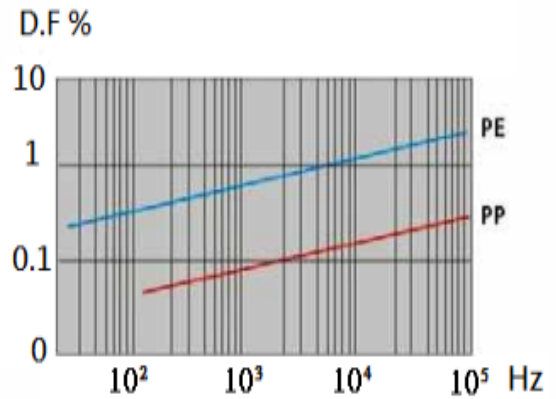
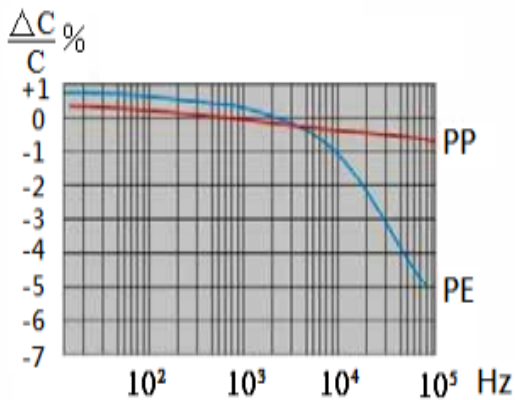
溫度性能

Temperature Characteristics



頻率性能

Frequency Characteristics





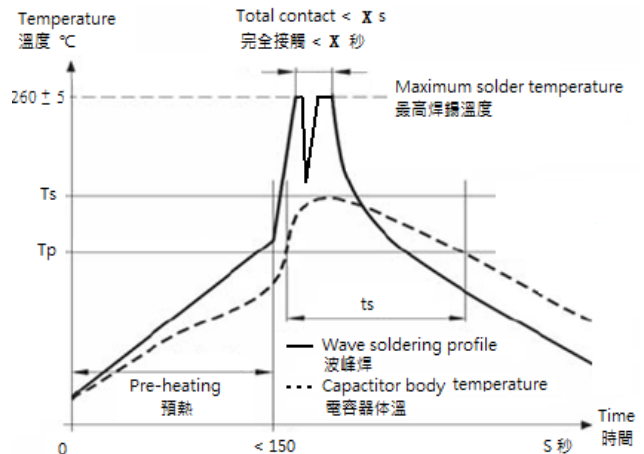
十三. Soldering suggestions - 焊接建議

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.

當焊接電容時，焊錫熱會通過引線端子高溫和封裝層傳遞到電容素子，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。

Ts : Capacitor body maximum temperature at wave soldering  
電容器本體最高波峰焊溫度

Tp : 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：

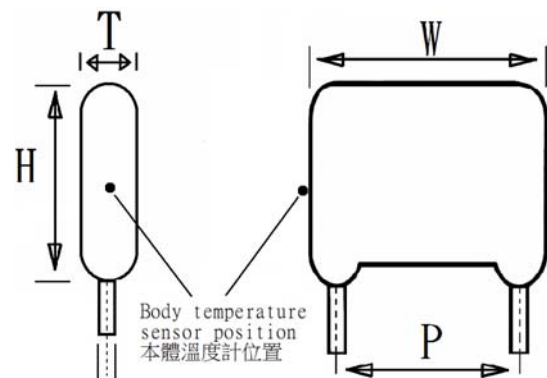
PP 聚丙烯電容器

During pre-heating :  $T_p \leq 115^\circ\text{C}$

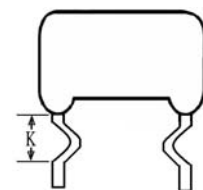
During soldering :  $T_s \leq 120^\circ\text{C}$  ,  $t_s \leq 45\text{ s}$

預熱期間溫度 :  $T_p \leq 115^\circ\text{C}$

焊接期間溫度 :  $T_s \leq 120^\circ\text{C}$  ,  $t_s \leq 45\text{ 秒}$



	X s	X s
T 產品厚度 $\geq 6\text{mm}$	10 s	
$6\text{mm} > T$ 產品厚度 $\geq 5\text{mm}$ 且 K $3.5\text{mm}$	10 s	
$6\text{mm} > T$ 產品厚度 $\geq 5\text{mm}$		5 s
$5\text{mm} > T$ 產品厚度 $\geq 4.5\text{mm}$ 且 K $3.5\text{mm}$		5 s
<b>OPP P &lt; 7.5mm 或 T 產品厚度 &lt; 4.5 mm</b>	<b>3 s</b>	



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

十五. Leaded film capacitors are not suitable for reflow soldering.

引腳式薄膜電容器不適合回流焊。

十六. In order to ensure proper conditions for manual or selective soldering, the body temperature of the capacitor (Ts) 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 (Ts) 的本體溫度必須是  $\leq 120^\circ\text{C}$

十七. 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。

十八. Manufacturers製造商：JOEY ELECTRONICS CO,LTD. 久亦電子有限公司。  
Origin , including 產地：CHINA P .R .C 中國

十九. The compliance with enviroment requirement 環保要求符合性

- 19.1 Compliance with the requirement of RoHS.符合RoHS要求。
- 19.2 Compliance with the requirement of REACH.符合REACH要求。
- 19.3 Without Halogen ( as required ) 符合無鹵 ( 如要求 ) 。

二十. Storage conditions 存儲條件：

- 20.1 It should be noted that the solderability of the terminals may be deteriorated when Stored bardly in an atmosphere for a long periods.  
請注意，長時間暴露在空氣中會導致引線焊接性能衰減。
- 20.2 It shouldn't be located in particularly high temperature and high humidity , it must Submit to the following conditions ( keeping in the original package) :  
不能放置在高溫和高濕環境中，請遵循以下存儲條件 ( 原包裝下保存 )  
Temperature 溫度：35°C MAX.  
Relative humidity 相對濕度：80% MAX.
- 20.3 Storage period : (from the manufacturing date marked on the label in package bag )  
Loose : 12months MAX.  
存儲時間：( 包裝袋上標注的生產日期為準 ) 最長12個月。

二一. Characteristics and test conditions 電氣特性和測試條件：

Test condition : Unless otherwise specified , the standard range of atmospheric Conditions for marking measurements and test is as follows Ambient  
Temperature 環境溫度：15~35°C  
Relaive humidity 相對濕度：25~75%  
If there may be any doubt on the results , measurements shall be made within the Following limits.  
如對測試結果有任何疑問，則按以下限制測試：  
Ambient temperature 環境溫度：20 ~ 25 °C  
Relative humidity 環境濕度：60 ~ 70% .