

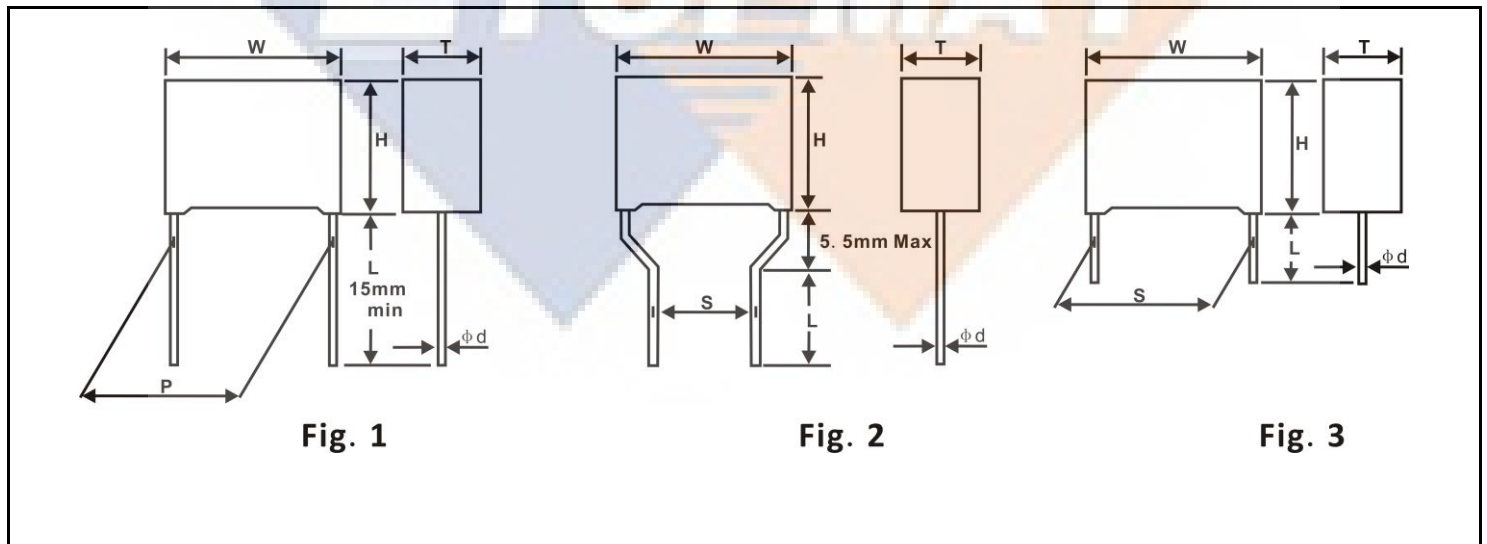


規格承認書

SPECIFICATIONS FOR APPROVAL

客戶名稱 CUSTOMER	
規格敘述 DESCRIPTION	EMI Capacitors Class Y1, 500VAC
億普料號 TOPMAY P/N	TMCF30-222M500VP15B
客戶料號 CUSTOMER P/N	
承認編號 APPROVAL NO	TM20260303003
發行日期 ISSUED DATE	2026.3.3
版 次 VERSION	1.0

產品尺寸圖 PRODUCT DIMENSIONS



P/N	容值 CAP.(nF)	標志 Symbol	公差 Tol.±%	電壓 R.V. (VAC)	尺寸毫米為單位 Dimensions in mm							圖示 Fig.	備 注 Note
					寬 W ±0.5	高 H ±0.5	厚 T ±0.5	腳距 P ±0.5	腳距 S ±0.5	線徑φd ±0.05	腳長 L Min		
TMCF30-222M500VP15B	2.2	222	20	500	18	12	6	15	-	0.8	18	1	灰色



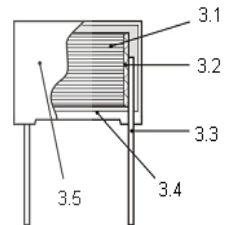
TMCF30 Metallized Polypropylene Film Y1 Capacitor

產品規格說明

PRODUCT SPECIFICATIONS

型號:

TYPE:

NO.	項目 ITEM		說明 DESCRIPTIONS		
1	承認範圍 SCOPE		本規格適用於亿普之要求 This specifications cover the requirements of ETOPMAY 金屬化聚丙烯薄膜 Metallized Polypropylene Film 交流電容器 (抑制電源電磁干擾用固定電容器/等級-Y1) AC Capacitor (Interference Suppressors Class-Y1).		
2	各測量皆於標準大氣下進行 STANDARD ATMOSPHERIC CONDITIONS FOR MAKING MEASUREMENTS				
2.1	環境溫度 AMBIENT TEMPERATURE		15℃ 至 35℃ (如對結果有任何疑問, 該測量環境溫度應為+20 ± 5℃之間) 15℃ to 35℃ (If there is any doubt on the results, the measurements shall be made at +20 ± 5℃)		
2.2	相對溼度 RELATIVE HUMIDITY(R.H.)		45%至 75% (如對結果有任何疑問, 該測量相對溼度應為 60% to 70%之間) 45%to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70%)		
2.3	大氣壓力 AIR PRESSURE		86 千帕至 106 千帕之 86 kpa to 106 kpa		
2.4	工作溫度範圍 OPERATING TEMPERATURE RANGE		於-40℃至+110℃間, 電容可在額定電壓下持續運作 -40℃ to +110℃ for which the capacitor can be operated continuously at rated voltage.		
3	結構 CONSTRUCTION				
3.1	電介質	DIELECTRIC	金屬化聚丙烯薄膜 Metallized Polypropylene Film		
3.2	噴金屬	METAL SPRAY	特殊焊料 Special Solder		
3.3	導線	LEAD WIRE	鍍錫銅包鋼線 Copper-clad Steel Wire		
3.4	環氧樹脂	EPOXY RESIN	UL 94V-0 耐燃等級		
3.5	塑料外殼	PLASTIC CASE	UL 94V-0 耐燃等級		
4	電氣特性 ELECTRICAL CHARACTERISTICS				
NO.	項目 ITEM		說明 DESCRIPTIONS		
4.1	耐壓 (TV) Withstand Voltage	端子之間 Between Terminals	應無異常 Shall be no abnormality		施加電壓 2,000VAC/ 2 秒或是 4,800VDC/ 2 秒. Apply 2,000V (AC) for 2 sec or 4,800V (DC) for 2 sec.
		端子與外殼之間 Between Terminals &Enclosure	應無異常 Shall be no abnormality		2 倍額定電壓+1,500VAC, 測試 2 到 5 秒 最小值 2,000VAC Apply 2*Ur+1,500VAC for 2 to 5 sec. Min. 2,000VAC



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4.2	介質損耗 (DF) Dissipation Factor	於 1KHz 時 $\leq 0.001(0.1\%)$ $\leq 0.001(0.1\%)$ at 1 KHz	測量頻率: $\pm 2\%$; 測量電壓: ≤ 1 rms Measuring Frequency: $\pm 2\%$ Measuring Voltage: ≤ 1 Vrms..
4.3	容量 (CAP) Capacitance	偏差值如標示(於 $+20 \pm 5^\circ\text{C}$)。 Within the tolerance specified (at $+20 \pm 5^\circ\text{C}$).	測量頻率: $\pm 2\%$; 測量電壓: ≤ 1 rms Measuring Frequency: $\pm 2\%$ Measuring Voltage: ≤ 1 Vrms..
4.4	絕緣電阻 (I.R.) Insulation Resistance	容值 $\leq 0.33\mu\text{F}$ 時, 絕緣電阻 $\geq 15,000\text{M}\Omega$ $\text{IR} \geq 15,000 \text{ Mohm } (C \leq 0.33\mu\text{F})$ 容值 $> 0.33\mu\text{F}$ 時, 絕緣電阻 $\geq 5,000\text{M}\Omega \cdot \mu\text{F} / \text{C}$ $\text{IR} \geq 5,000 \text{ Mohm} \cdot \mu\text{F/C } (C > 0.33\mu\text{F})$	VR=500VAC, 施加電壓: $500 \pm 50\text{VDC}$ $250\text{VAC} \leq \text{VR} < 500\text{VAC}$, 施加電壓 $100 \pm 15\text{VDC}$ 充電時間 60 ± 5 秒。 VR=500VAC, $V_t = 500 \text{ VDC}$ $250\text{VAC} \leq \text{VR} < 500\text{VAC}$, $V_t = 500 \text{ VDC}$ Charge Time: 60 ± 5 sec.
4.5	焊料附著性 Soldering Property	焊料覆蓋面積應超過導線表面 圓周 90%。 More than 90% of circumferential surface of lead wire shall be covered with new solder.	焊接溫度為: $+235 \pm 5^\circ\text{C}$ 浸焊時間為: 2 ± 0.5 秒 Soldering temperature: $+235 \pm 5^\circ\text{C}$ Immersion duration: 2 ± 0.5 sec.
5	機械特性 MECHANICAL CHARACTERISTICS		
5.1	端子強度 Terminal Strength	引張強度 Tensile Strength	應無異常。 Shall be no abnormality
		彎曲強度 Bending Strength	應無異常。 Shall be no abnormality
			沿著軸向和引出方向, 施加 1 公斤力量, 保持 10 ± 1 秒。 Apply 1.0Kg for 10 ± 1 sec. to the terminal in the axial direction and acting in a direction away from the body.
			在引線末端施加 0.5 公斤, 把引線彎曲 90 度, 回復到起始點, 再往反方向彎曲 90 度, 在回復到起始點, 每次需維持 2-3 秒。 Apply 0.5Kg for 2 cycles. Each cycle includes: 90° once, return to its initial position for 2-3 sec. and then to the opposite direction once.
6	耐久特性 ENDURANCE CHARACTERISTICS		
NO.	項目 ITEM		說明 DESCRIPTIONS
6.1	溫度變化循環 Temperature Cycle	外觀 Appearance	應當無顯著變化 Shall be no remarkable change
		耐壓 Withstand Voltage	應滿足 NO.5.1 shall satisfy NO.5.1
			共 5 次溫度循環測試, 循環條件: 1. $+20 \pm 2^\circ\text{C}$ 持續 3 分鐘 2. $-40 \pm 3^\circ\text{C}$ 持續 30 分鐘 3. $+20 \pm 2^\circ\text{C}$ 持續 3 分鐘 4. $+110 \pm 3^\circ\text{C}$ 持續 30 分鐘 5. $+20 \pm 2^\circ\text{C}$ 持續 3 分鐘 試驗後放置於室內 1.5 ± 0.5 小時後再進行量測。 Test Temperature Cycle: Total 5 cycles. Each cycle includes 1. $20 \pm 2^\circ\text{C}$ for 3 min. 2. $-40 \pm 3^\circ\text{C}$ for 30 min. 3. $+20 \pm 2^\circ\text{C}$ for 3 min.



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		容值變化率 ($\Delta C/C$) Capacitance Change Rate	變化率小於 $\pm 5\%$ Within $\pm 5\%$ of the value before test	4. $+110 \pm 3^\circ\text{C}$ for 30min. 5. $+20 \pm 2^\circ\text{C}$ for 3 min. After test, allow it stay alone for 1.5 ± 0.5 Hrs. at ordinary condition before making measurements.
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	$\geq 50\%$ 的限制值在 NO.5.4 $\geq 50\%$ of the limit value of NO.5.4	
6.2	耐乾熱試驗 Dry Heat Resistance	外觀 Appearance	應當無顯著變化 Shall be no remarkable change	試驗溫度: $+110 \pm 2^\circ\text{C}$ 測試時間: $16 + 1/-0$ 小時 Test Temperature: $+110 \pm 2^\circ\text{C}$ Test Duration: $16 + 1/-0$ hrs.
		耐壓 Withstand Voltage	應滿足 NO.5.1 Shall satisfy NO.5.1	
		容值變化率 ($\Delta C/C$) Capacitance Change Rate	變化率小於 $\pm 5\%$ Within $\pm 5\%$ of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	$\geq 50\%$ 的限制值在 NO.5.4 $\geq 50\%$ of the limit value of NO.5.4	
6.3	耐乾寒試驗 Cold Resistance	外觀 Appearance	應當無顯著變化 Shall be no remarkable change	試驗溫度: $-40 \pm 3^\circ\text{C}$ 測試時間: 2 ± 1 小時 Test Temperature: $-40 \pm 3^\circ\text{C}$ Test Duration: 2 ± 1 hrs.
		耐壓 Withstand Voltage	應滿足 NO.5.1 Shall satisfy NO.5.1	
		容值變化率 ($\Delta C/C$) Capacitance Change Rate	變化率小於 $\pm 5\%$ Within $\pm 5\%$ of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	$\geq 50\%$ 的限制值在 NO.5.4 $\geq 50\%$ of the limit value of NO.5.4	



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NO.	項目 ITEM		說明 DESCRIPTIONS	
6.4	耐濕絕緣 Damp Heat	外觀 Appearance	應當無顯著變化 Shall be no remarkable change	試驗溫度: $+40 \pm 2^{\circ}\text{C}$ 試驗濕度: 90%至 95%相對濕度 試驗時間: 56 天 試驗後放置於室內 1.5 ± 0.5 小時後再進行量測。 Test Temperature: $+40 \pm 2^{\circ}\text{C}$. Test Humidity: 90% to 95% R.H. Test Duration: 56 days. After test, allow it stay alone for 1.5 ± 0.5 Hrs. at ordinary condition before making measurements.
		耐壓 Withstand Voltage	應滿足 NO.5.1 Shall satisfy NO.5.1	
		容值變化率 ($\Delta C/C$) Capacitance Change Rate	變化率小於 $\pm 5\%$ Within $\pm 5\%$ of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	$\geq 50\%$ 的限制值在 NO.5.4 $\geq 50\%$ of the limit value of NO.5.4	
6.5	振動試驗 Vibration Resistance	外觀 Appearance	應無機械性損傷 Shall be no mechanical damage.	頻率變化: 10-55-10Hz 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 Frequency Change : 10-55-10 Hz Vibration Distance:1.5 mm. Test Direction : X,Y,Z Test Duration : $2+1/-0$ hrs each direction
		連接強度 Connection strength	不得為短路或開路連接。 連接點應穩定。 Shall be no short-circuiting or open. The connection shall be stable.	
6.6	焊接耐熱 Soldering Heat Resistance	外觀 Appearance	應當無顯著變化 印字標誌應清晰 Shall be no remarkable change. The marking shall be legible.	預熱溫度: $100 \sim 120^{\circ}\text{C}$ 預熱時間:最大為 60 秒 溫度升高:最大為 $3^{\circ}\text{C}/\text{秒}$ 錫爐溫度: $+260 \pm 5^{\circ}\text{C}$ 浸焊時間: 5 ± 1 秒 浸焊深度:導線根部 4 ± 0.8 毫米 試驗後放置於室內 1.5 ± 0.5 小時後再進行量測。 Preheat Temp. : $100 \sim 120^{\circ}\text{C}$ Preheat Duration : 60 sec. max. Temperature Increase by $3^{\circ}\text{C}/\text{sec.}$ max. Soldering Temperature : $+260 \pm 5^{\circ}\text{C}$ Immersion Duration : 5 ± 1 sec. Immersion Depth : $4 \pm 0.8\text{mm}$ from roots. After test, allow it stay alone for 1.5 ± 0.5 Hrs. at ordinary condition before making measurements.
		端子間的耐電壓值 Withstand Voltage Between Terminals	應滿足 NO.5.1 Shall satisfy NO.5.1	
		容值變化率 ($\Delta C/C$) Capacitance Change Rate	變化率小於 $\pm 3\%$ Within $\pm 3\%$ of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	$\geq 50\%$ 的限制值在 NO.5.4 $\geq 50\%$ of the limit value of NO.5.4	
		連接元件 Connection of Element	應穩定 Shall be stable	
NO.	項目 ITEM		性能 PERFORMANCE	測試條件 TEST CONDITIONS
6.7	耐久壽命 Endurance	外觀 Appearance	應當無顯著變化 Shall be no remarkable change	試驗溫度: $+110 \pm 2^{\circ}\text{C}$ 測試電壓: 1.7 倍的額定電壓



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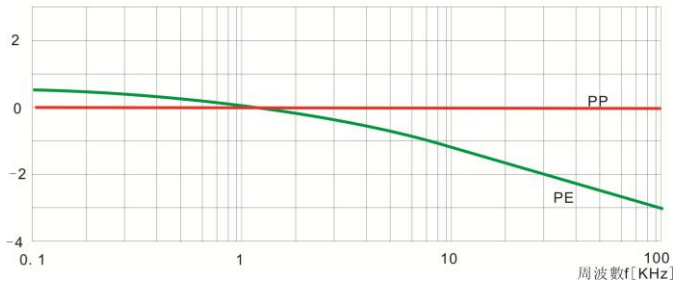
		耐壓 Withstand Voltage	應滿足 NO.5.1 Shall satisfy NO.5.1	試驗時間: 1,000 小時 每小時將電壓升至 1,000VAC · 持續 0.1 秒 每個電容分別通過一個 47Ω±5 % 電阻。 Test Temperature: +110 ± 2℃ Test Voltage: 1.7times * rated voltage. Test Duration: 1,000 Hrs. Once every hour the voltage is increased to 1000 V rms. For 0.1 sec. The test voltage is applied to each capacitor individually through a resistor of 47Ω±5 %.
		容值變化率 (ΔC/C) Capacitance Change Rate	變化率小於 ±10% Within±10% of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.008 (0.8%) @ 1KHz : 0.008 (0.8%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	≥50%的限制值在 NO.5.4 ≥50% of the limit value of NO.5.4	
6.8	耐濕負荷 Moisture Resistant Loading	外觀 Appearance	應當無顯著變化 Shall be no remarkable change	試驗溫度: +40 ± 2℃. 試驗濕度: 87%至 93%相對濕度 測試電壓: 額定電壓 試驗時間: 500 小時 試驗後放置於室內 1.5 ± 0.5 小時後再進行量測。 Test Temperature: +40 ± 2℃. Test Humidity: 87% to 93% R.H. Test Voltage: rated voltage. Test Duration: 500 Hrs. After test, allow it stay alone for 1.5 ± 0.5 Hrs. at ordinary condition before making measurements.
		耐壓 Withstand Voltage	應滿足 NO.5.1 Shall satisfy NO.5.1	
		容值變化率 (ΔC/C) Capacitance Change Rate	變化率小於 ±5% Within ±5% of the value before test	
		介質損耗 Dissipation Factor	於 1KHz 時: 最大值為 0.002 (0.2%) @ 1KHz: 0.002 (0.2%) max.	
		絕緣電阻 (I.R.) Insulation Resistance	≥50%的限制值在 NO.5.4 ≥50% of the limit value of NO.5.4	



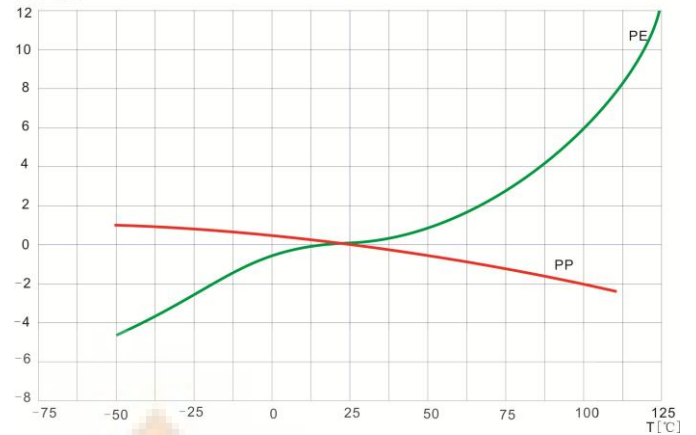
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7 CHARACTERISTICS REFERENCE 特性曲線參考

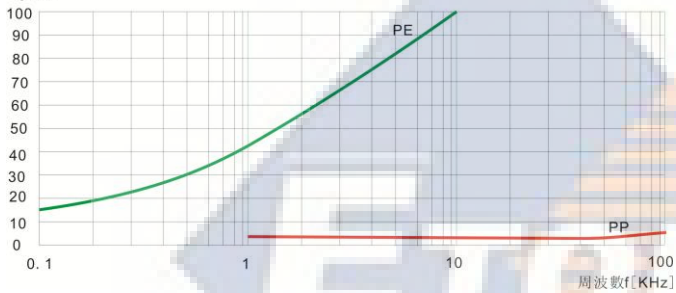
容量變化
Capacitance change
 $\Delta C/C(\%)$



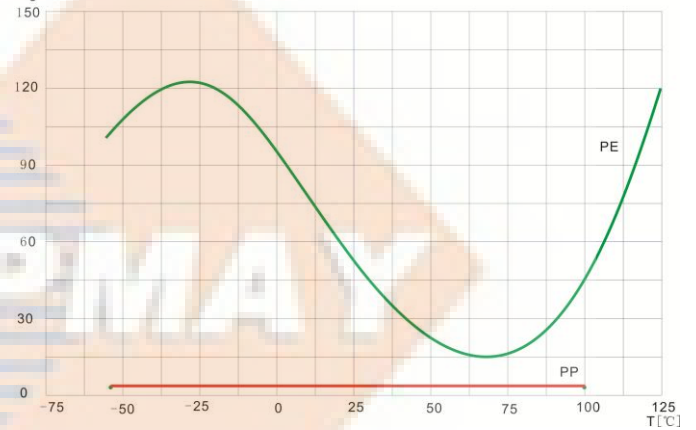
容量變化
Capacitance change
 $\Delta C/C(\%)$



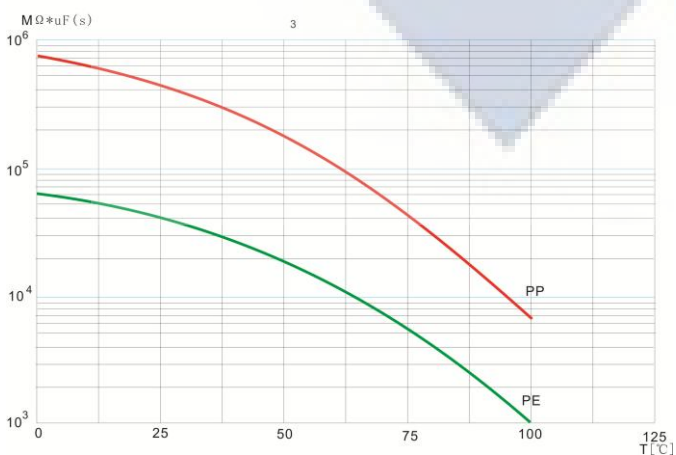
誘電正切
Dissipation Factor
 $\text{tg} \cdot 10^{-4}$



誘電正切
Dissipation Factor
 $\text{tg} \cdot 10^{-4}$



絕緣阻抗
Insulation Resistance



額定電壓
Rated Voltage
 $V_r \%$

