

承 認 書
SPECIFICATION FOR APPROVAL

客户名称: 深圳市立创电子商务有限公司
Customer:

产品型号: M/C 224J/450V P10mm
Product Type:

产品编码: C2913466
Product Code:

客户料号: HMEF450P22J4F030
Customer Code:

日期: 2021年11月20日

Approval signature:

AUTHORIZED BY	CHECK BY	VALIDATED BY

承认后请寄回一份 (Please return one copy after approved)

东莞市弘源电子有限公司

Dongguan City Hongyuan Electronic Co., Ltd

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确 认		制 作	刘玲
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HMEF系列承认

NO	客户料号	规格	料号
1		224J/450V P10mm	HMEF450P22J4F030
2		以下空白	
3			
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PRODUCT SPECIFICATIONS

ISSUED DATE :20 1-11-20

产品规格

签发日期 :

CUSTOMER: 立创 客户 :	
DESCRIPTIONS: Metallized POLYESTER Film CAPACITOR 描述 : 金属化聚酯薄膜电容器	
TYPE: MEF 系列 : MEF	SERIES 系列
Rated temperature : 额定温度 : 85°C	
Operating temperature : -40°C~125°C(Derate DC voltage 1.25%/. above 85° C to 125° C) 操作温度范围 : -40°C~125°C (+85°C~+125°C, 直流电压降额系数1.25% /°C)	

PRODUCT DIMENSIONS :

产品尺寸

CUSTOMER'S PART NO. 客户料号	CAP 容量 (uF)	Tol. 误差 ± %	R.V. 电压 VDC	T.V. 耐压 VDC	W 长度 (mm)	H 高度 (mm)	T 厚度 (mm)	P 脚距 ±1.0	S 脚距 ±1.0	dφ ±0.05	L0 (mm)	Fig.	CASE	HONGFARAD PART NO. 我司料号		
	0.22	5	450	675	12.0	10.0	6.0		10.0	0.6	3.0±0.5	2		HMEF450P22J4F030		
APPROVED BY: 批准:			CHECKED BY: 审核:								PREPARED BY: 制作:					

16 位产品代码如下:

The 16 digits part number is formed as follow:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
H	M	K	P	3	A	1	W	4	7	K	0	Q	2	0	0	

H: 商标代码 、

1. 1~3 TYPE OF CAPACITOR:
电容器系列

TYPE	MKP	MKB	MPP	MPB	PPS	MPS	PPN	MPA	MPB	M61	MKD	APA	APT
CODE	MKP	MKB	MPP	MPB	PPS	MPS	PPN	MPA	MPB	M61	MKD	APA	APT
TYPE	MEK	PEI	MEA	MET	MEF	MEB	AHI						
CODE	MEK	PEI	MEA	MET	MEF	MEB	AHI						

2. 4~6 RATED VOLTAGE:

额定电压

063: 63VDC/JIS 1J. 400: 400VDC/JIS 2G. 1K6: 1,600VDC/JIS 3C.
 100: 100VDC/JIS 2A. 630: 630VDC/JIS 2J. 1N0: 10,000VDC/JIS 4A.
 250: 250VDC/JIS2E. 1K0: 1,000VDC/JIS 3A. 2A7: 275VAC 3A1:310VAC.

3. 7~9 Symbols of capacitance in uF:
电容器容量代码

A: Indicates tens. EX: 12uF=A12, 10uF=A10.

W(Word): Indicates unit. EX: 1.5uF=W15

P(Point): Digits following the decimal point. EX: 0.22uF=P22

S(Single Zero): Digits following the decimal point followed by one zero. EX: 0.015uF=S15
















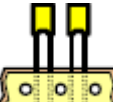
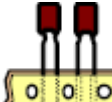

D(Double Zeroes): Digits following the decimal point followed by two zeroes. EX: 0.0047uF=D47

T(Triple Zeroes): Digits following the decimal point followed by three zeroes. EX: 0.00068uF=T68


4. 10 Symbols of capacitance Tolerance:
容量公差代码

TOLERANCE	±1%	±2%	±3%	±5%	±10%	±20%	+80%-20%	+100%-0%
CODE	F	G	H	J	K	M	Z	P

5. 11 Lead Style Code:
引脚方式

CODE	0(不加工)		1(内弯)		2(外弯)		3(内外弯)		4(切脚)	
LEAD TYPE										
CODE	5(内弯切脚)		6(内弯切脚)		7(内外弯切脚)		A(直角编带)		B(弯脚编带)	
LEAD TYPE										

6. 12 Lead Space (mm)
引线脚距

SPACE	3.5	4.0	5.0	6.0	7.5	10.0	12.5	15.0	20.0	22.5	27.5	30.0	31.5	32.0	37.5	42.5	
CODE	A	B	C	E	D	F	V	I	M	N	R	U	S	T	Q	W	O
SPACE	47.5	52.5															
CODE	P	Y															

7. 13~14 引线脚长 Lead Length 3A=3.5 4A=4.5 05=5mm 5A=5.5 20=20mm

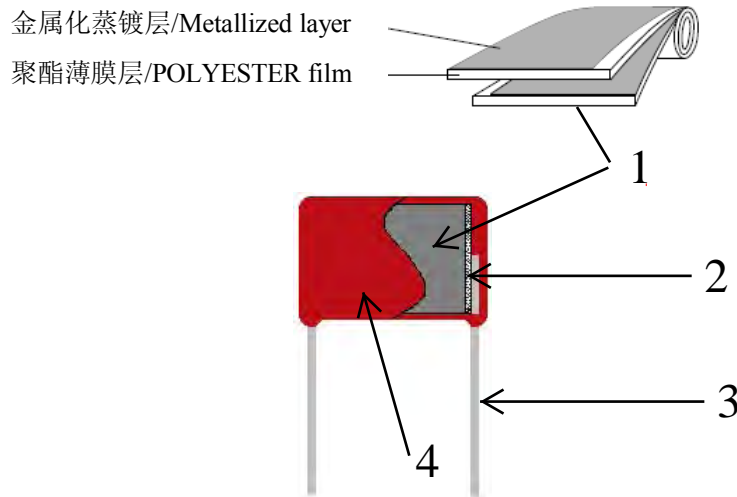
8. 15 特征码 Feature Codes ROHS: 0 Halogen Free: A capacitive divider: B

9. 16 内部码 Internal Codes

金属化聚酯薄膜电容器MEF 系列

1. 结构及材料(Construction and Component)

a. 产品结构图&印字(Construction&Mark)



b. 材料构成清单(Component List)

项次 Item	构成部位 Component	材料名称/材质 Material	环保要求 RoHS Requirements
1	素子 Element	金属化聚酯薄膜 Metallized PET film	符合 RoHS 要求 Compliant with RoHS
2	喷金层 Metal spray layer	锌线和锌锡合金线 Zn and Zn-Tin alloy wire	符合 RoHS 要求 Compliant with RoHS
3	导针 Leads	镀锡铜包钢线 Tinned copper-base alloy wire	符合 RoHS 要求 Compliant with RoHS
4	外包封 COATING	UL94V0 级阻燃环氧树脂 Flame retardant epoxy resin(UL940V)	符合 RoHS 要求 Compliant with RoHS
5	本体印字 Marking	油墨 Inks	符合 RoHS 要求 Compliant with RoHS
		激光刻印 Laser	

金属化聚酯薄膜电容器MEF 系列

2.技术规范/Technical specification

项次 No.	检测项目 Test item	性能 Performance	检测方法(参照 IEC60384-2) Test method (refer to IEC60384-2)
1	耐压测试 Withstand Voltage		参照 4.2.1 节 Ref 4.2.1 clause
	端子与端子间(T-T)	应无永久性击穿及飞弧	Apply 150% of rated voltage / 60sec
	端子与外壳间 Terminal-Case	No permanent breakdown or flashover	Apply 200% of rated voltage for 2 to 5 sec.
2	绝缘电阻	$C_R \leq 0.33 \mu f$; $IR > 9000 M \Omega$	参照 4.2.4 节 Ref 4.2.4 clause
	Insulation Resistance	$C_R > 0.33 \mu f$; $IR > 3000 S$	充电电压 100vdc, charge voltage 100v 充电时间 60 秒 charge time 60sec
3	容量 Capacitance	$J \pm 5\%$; $K \pm 10\%$; $M \pm 20\%$	参照 4.2.2 节 :Ref 4.2.2 clause 测式条件: 1V, 1KHZ (25°C ±5°C)
4	损失角 Dissipation factor	≤ 0.01 (1.00%) at 1 KHz.	参照 4.2.3 节 : Ref 4.2.3 clause 测式条件: 1V, 1KHZ (25°C ±5°C)
5	可焊性 Solderability	被测导线 90%以上上锡率 At least 90% immersed lead wire should be covered new solder.	参照 4.5 节 : Ref 4.5 clause 锡槽法 Ta,方法 1 Test Ta 温度:235 ±5°C; 时间:2 ±0.5 秒 Solder temperature :235 ±5°C Immersion time: 2 ±0.5 sec
6	端子强度测试 Terminal strength	端子脚无可见的破损 There shall be no visible damage	参照 4.3 节 :Ref 4.3 clause 拉力: $0.5 < d \leq 0.8$, 10N $0.8 < d \leq 1.25$, 20N 弯曲试验 Ub: 弯力 $0.5 < d \leq 0.8$, 5N $0.8 < d \leq 1.25$, 10N 端子在两个方向进行两次弯曲 Tense: $0.5 < d \leq 0.8$, 5N $0.8 < d \leq 1.25$, 10N Bend: $0.5 < d \leq 0.8$, 5N $0.8 < d \leq 1.25$, 10N Bent 2 times each direction

金属化聚酯薄膜电容器MEF 系列

项次 No.	检测项目 Test item	性能 Performance	检测方法(参照 IEC60384-4) Test method (refer to IEC60384-4)
7	耐焊接热 Resistance to Solder heat	外观无可见的损伤,标志清晰,容量变化率 $\Delta C/C < \pm 3\%$ There should be no visible damage, $\Delta C/C < \pm 3\%$	参照 4.4 节 :Ref 4.4 clause 锡槽法 Tb,方法 1A Tb , method 1A 温度:260±5℃; 时间 10±1 秒 Solder temperature 260±5℃ Immersion time: 10±1sec
8	初始测量 Initial measurement	容量,损耗角 Capacitance, Tan δ	
	温度快速变化 Rapid change of temperature	外观无可见的损伤 There should be no visible damage,	参照 4.6 节 : Ref 4.6 clause $\theta_A = -40^\circ\text{C}$, $\theta_B = +85^\circ\text{C}$ 循环周期:5 次, 5 cycles 周期时间:30 分钟 Duration=30min
	振动 Vibration	外观无可见的损伤 There should be no visible damage,	参照 4.7 节 Ref 4.7 clause 位移 0.75mm 或加速度 0.98m/s ² Amplitude 0.75mm or acceleration 0.98m/s ² (两者取较小者), (whichever is the smaller values) 振动频率:10~500HZ, 三个方向,每 2 小时/方向,共 6 个小时 2h each direction, total 6h
	碰撞 Bump	外观无可见的损伤,容量变化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, $\Delta C/C < \pm 5\%$	参照 4.8 节 Ref 4.8 clause 4000 次,加速度 390m/s ² , 4000 times ,acceleration 390m/s ² , 脉冲持续时间: 6ms. Pulse duration 6ms.
	最后测量 Final measurement	外观无可见的损伤,标志清晰,容量变化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, $\Delta C/C < \pm 5\%$	

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项次 No.	检测项目 Test item	性能 Performance	检测方法(参照 IEC60384-4) Test method (refer to IEC60384-4)
8	最后测量 Final measurement	损耗角增加: Increase of Tan δ CR \leq 1uf: \leq 0.003 缘电阻(IR): >50%的额定值 IR>50% *Rate value	
	气候 顺序	初始测量 Initial measurement	参照 4.10 节 Ref 4.10clause
		干热 Dry heat	+85°C, 16h
		寒冷 Cold	-40°C, 2h
		循环湿热 Damp heat, cyclic	试验 Db,其余循环 Test Db, remaining cycles
9	最后检测及要求 Final measurement	应无可见损坏,印章清晰 There should be no visible damage, legible marking. 容量变化率 $\Delta C/C < \pm 5\%$ Capacitance change $\Delta C/C < \pm 5\%$ 损耗角增加: Increase of Tan δ C _R \leq 1uf: \leq 0.003 绝缘电阻(IR): >50%的额定值 IR>50% *Rate value	
10	稳态湿热 Damp heat steady state	应无可见损坏,印章清晰 容量变化率 $\Delta C/C < \pm 5\%$ There should be no visible damage, legible marking. Capacitance change $\Delta C/C < \pm 5\%$ 损耗角增加: Increase of Tan δ : CR \leq 1uf: \leq 0.005 绝缘电阻(IR): >50%的额定值 IR>50% *Rate value	参照 4.11 节 Ref 4.11clause 温度: 40 \pm 2% Temperature: 40 \pm 2% 湿度: 93 \pm $\frac{2}{3}$ %RH Humidity: 93 \pm $\frac{2}{3}$ %RH 持续时间: 21 天 Duration: 21 days

金属化聚酯薄膜电容器MEF 系列

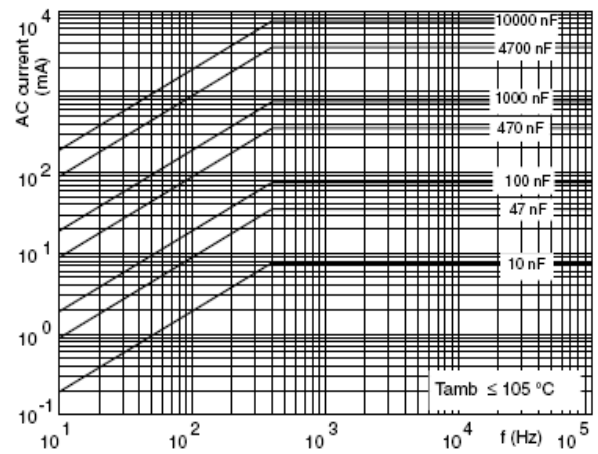
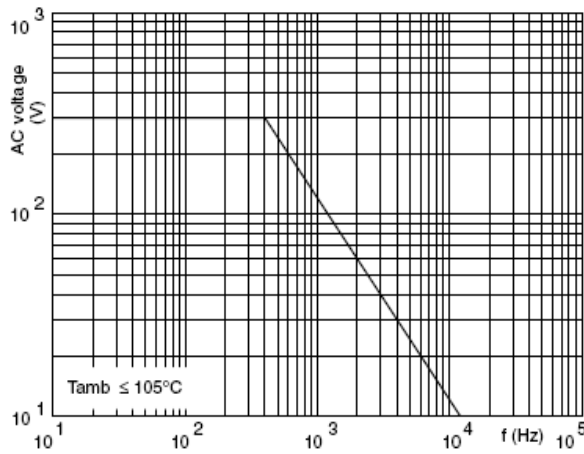
项次 No.	检测项目 Test item	性能 Performance	检测方法(参照 IEC60384-4) Test method (refer to IEC60384-4)
11	耐久性 Endurance	应无可见损坏,印章清晰 容量变化率 $\Delta C/C \leq \pm 5\%$ There should be no visible damage, legible marking. Capacitance change $\Delta C/C \leq 5\%$ 损耗角增加: Increase of Tan δ : $C_R \leq 1\mu\text{f}$: ≤ 0.003 绝缘电阻(IR):>50%的额定值 IR>50% *Rate value	参照 4.12 节 Ref 4.14 clause 在最高允许温度下85℃,施加 试验电压 $1.25*U_R$, 试验周期 1000 小时. ($1.25*U_R$) at 105℃, 1000h
12	充电和放电 Charge and Discharge	容量变化率 $\Delta C/C < \pm 5\%$ Capacitance change $\Delta C/C \leq 5\%$ 损耗角增加: Increase of Tan δ : $C_R \leq 1\mu\text{f}$: ≤ 0.003 绝缘电阻(IR):>50%的额定值 IR>50% *Rate value	参照 4.13 节 Ref 4.13 clause 试验次数:10,000 次 充电时间:0.5 秒 放电时间:0.5 秒 $C \leq 1 \mu\text{F}$ 频率: 10KHz $C > 1 \mu\text{F}$ 频率: 1KHz 充电电阻: $\frac{10 \times 10^{-6}}{C_R} \Omega$ 放电电阻: $R = \frac{U}{C \frac{dU}{dt}}$ Times: 10,000 Duration of charge:0.5sec Duration of discharge:0.5sec
13	内部温度上升 Inherent Temperature Rise	温度上升 10℃ Temperature rise (T) $\leq 10 \text{ } ^\circ\text{C}$	测试温度:正常的室温。 测量应由焊接电容器印刷的 另一侧电路板等的影响周围 的热组件。 Test temperature : normal room temperature

金属化聚酯薄膜电容器MEF 系列

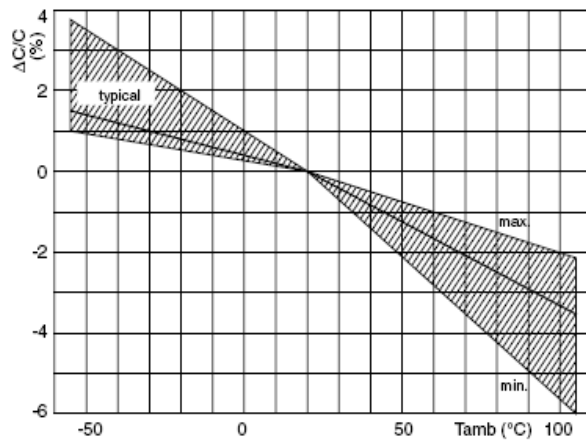
7.特性曲线图 CHARACTERISTIC CURVE

最大有效值流额定交流电压及电流对比工作频率曲线图

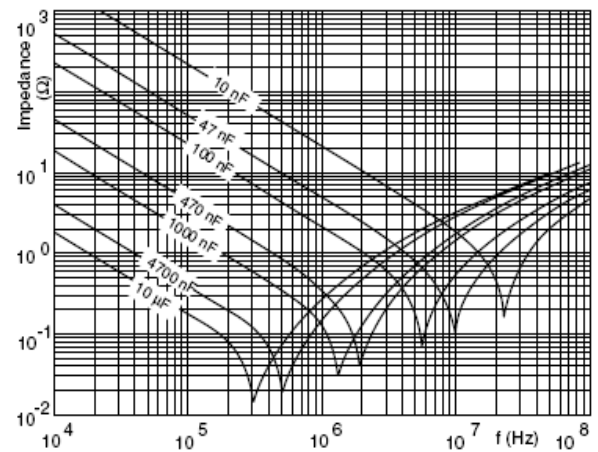
MAXIMUM RMS VOLTAGE AND AC CURRENT (SENEWAVE) AS A FUNCTION OF FREQUENCY



容量变化率对比工作温度曲线图
CAPACITANCE



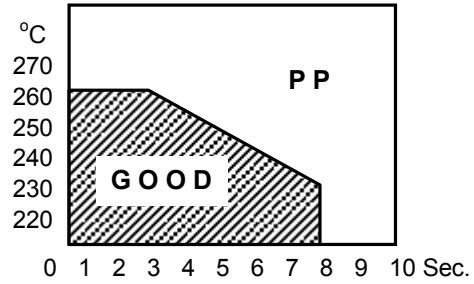
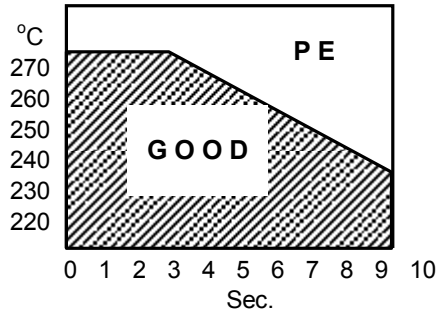
电容阻抗对比工作频率曲线图
IMPEDANCE



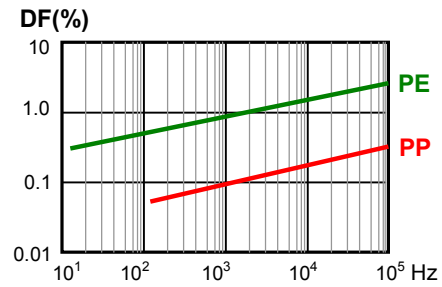
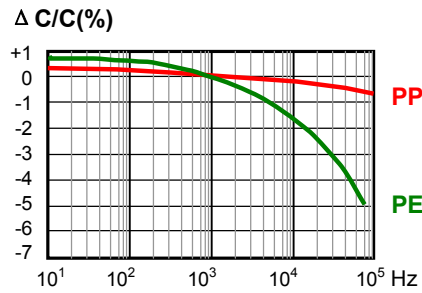
金属化聚酯薄膜电容器MEF 系列

CHARACTERISTICS REFERENCE

Soldering Temperature VS Time 焊接温度VS时间



Frequency Characteristics 频率特性



Temperature Characteristics 温度特性

