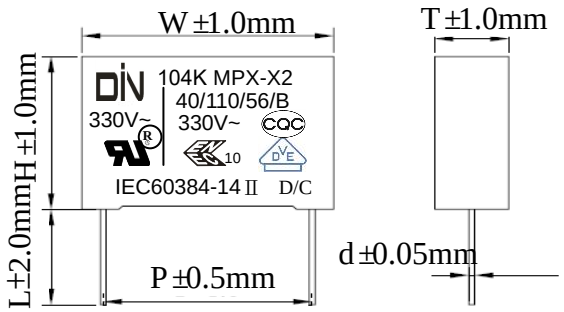
承　认　书
(APPROVE　SHEET)

TO: Platan

主要材料 **Main Materials**	
组　件 Components	材料名称 Name of Material
薄　膜 Film	金属化聚丙稀薄膜 Metalized Polypropylene film
导　线 Wire	镀锡铜包钢线（CP） CP WireΦ0.8mm
外　壳 CASE	PBT UL94V-0 阻燃灰色塑胶外壳 PBT CASE (UL94V-0)-GREY
灌封料 Sealing	UL94V-0 阻燃灰色环氧树脂 GREY Epoxy resin coating（ UL94V-0）

印字及成品图（mm）**Marking**



料　号 Part No.	规　格 TYPE	成品尺寸 Dimension（mm）						备注 NOTE
		W	H	T	P	L	D	
C6210470EDKT2CAA00	**X2/104K330VAC**	**18**	**12**	**6**	**15**	**15**	**0.8**	
	精度 Tolerance：±10%							

客户签承栏 **CUSTOMER CONFIRM**			创仕鼎承办栏 **CSD OFFER**		
核准 APPOVED BY	检验 CHECKED BY	承认签章 STAMP	核准 APPOVED BY	审核 MADE BY	工程签章 STAMP
					Zhou
日期 DATE			日期 DATE	2023-03-10	

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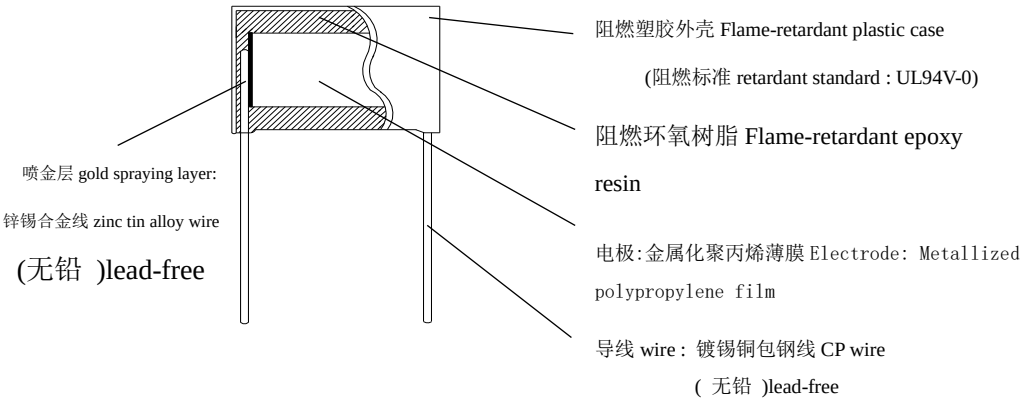
TYPE: MPX-X2	金属化聚丙烯电容器 Metallized Polypropylene Film Capacitor	Page:02

1.范围 Range	本规范适用于金属化聚丙烯薄膜电容器通过了 UL, ENEC,和 CQC. 典型应用：抑制干扰 This specification is applicable to metallized polypropylene film capacitors which have passed UL, ENEC, and CQC Typical application: EMI suppression	
2.产品名称 Name	金属化聚丙烯薄膜 MPX 类。metallized polypropylene film MPX-X2 class	
3.产品范围 Range	工作温度 Operating temperature	-40 to +110℃ (VDE/ENEC,IEC60384-14) -40 to +110℃ (UL,UL60384-14) -40 to +110℃ (CQC,GB/T14472-1998) （包括产品表面温度上升）(including the surface temperature rise)
	额定电压 Rated voltage	330V.AC max. (IEC60384-14) 275V.AC~330V.AC max. (UL,UL60384-14) 275VAC/330V.AC (CQC,GB/T14472-1998)
	容量范围 Range of capacitance	依据不同需求 according to different demands
	容量偏差 Tolerance of capacitance	依据不同需求 according to different demands
4.外观 Appearance	1. 标志正确、清晰；Marking is correct and clear 2. 引线光滑、无油污、氧化等；The lead shall be smooth, free of oil stain, oxidization, etc 3. 环氧光泽、无气泡、针孔等。Epoxy is gloss, no bubbles and pinholes, etc	
5.结构 Structure	MPX-X2 电容器为无感卷绕结构，金属化聚丙烯薄膜介质，电容器使用阻燃塑料外壳，填充阻燃环氧树脂，并引出两根导线。The capacitor is non-inductive winding structure and dielectric is metallized polypropylene film. The capacitor uses a flame-retardant plastic case, filled with flame-retardant epoxy resin, and leads out two wires.	
6.使用寿命等级 Service Life class	标准范围内大于 100000H ＞100000H within the standard ranges	
7.尺寸 Dimension	依据不同需求 according to different demand	
8. 标准测试条件 Standard Test Condition	测试温度 Test temperature：15℃-35℃ ； 湿度 Test humidity：45%-75% （如果判定结果有异议时，应于温度 20±5℃,湿度 65±5%测试数据为准。）（If you have doubt on the judgement result, the test data should take the temperature of 20 ±5℃ and humidity of 65±5% as standard.）	



TYPE: MPX-X2 Film Capacitor 金属化聚丙烯电容器 Metallized Polypropylene	Page:03

8.特性 CHARACTERISTICS

No.	项目 items	性 能 Performance			测试方法 test method
1	耐电压 withstanding voltage	[端子之间]:between terminals 4.3*U_R(DC) 持续 60 秒，测试期间应无永久性击穿或飞弧。4.3*U_R(DC) lasts for 60 seconds and there shall be no permanent breakdown or flashover during the test. 1.放电电流设定 Discharging current setting AC: 2A DC:10mA 2. 测试电路连接 1Ω/V 限流电阻 Test circuit connects 1Ω/V limiting current resistance 3. 电压上升速度 Voltage rise speed: 100V/sec [端子与外壳间] :between terminals and enclosure 施加电压Applied voltage： 2.0*U_R+1500V(AC)持续60秒，测试期间应无永久性击穿或飞弧 2.0*U_R+1500V(AC) lasts for 60 seconds and there shall be no permanent breakdown or flashover during the test.			IEC60384-14-4.2.1 (IEC 60384-1-4.6)
2	绝缘电阻 insulation resistance	[端子之间] :between terminals IR≥15000MΩ C ≤0.33 μF(100V.DC) IR≥5000MΩ.μF C ＞0.33 μF(100V.DC) [端子与外壳间] :between terminals and enclosure IR≥30000MΩ (100V.DC) 测试条件 test condition：直流 100±15V， 1 分钟±5 秒，20℃ 环境温度，环境湿度 45～75%。DC 100±15V DC 100±15V 1 minute±5seconds, 20℃ ambient temperature, humidity of environment 45～75%			IEC 60384-14-4.2.5 (IEC 60384-1-4.5)
3	容 量 capacitance	规定容量偏差范围 specified range of capacitance tolerance (测试条件 test condition: 1 ±0.2 KHZ、20 ℃、 1Vrms)			IEC 60384-14-4.2.2 (IEC 60384-1-4.7)
4	损耗角正切 dissipation factor tan δ	0.001 uF≤Cn＜0.01 uF	≤20×10^{-4} (20℃;1kHz)	≤20×10^{-4} (20℃;10kHz)	IEC 60384-14-4.2.3 (IEC 60384-1-4.8) (测试条件 test condition: 10 ±0.2 KHZ、20 ℃、 1Vrms)
		0.01 uF≤Cn＜0.47 uF	≤10×10^{-4} (20℃;1kHz)	≤20×10^{-4} (20℃;10kHz)	
		0.47uF≤Cn＜1.0 uF	≤20×10^{-4} (20℃;1kHz)	≤40×10^{-4} (20℃;10kHz)	
		1.0 uF≤Cn＜10.0 uF	≤30×10^{-4} (20℃;1kHz)	--------	

<table>
<tr><td colspan="2">TYPE: MPX-X2
Film Capacitor</td><td>金属化聚丙烯电容器 Metallized Polypropylene</td><td>Page:04</td></tr>
<tr><td>No.</td><td>项目 item</td><td>性　能 performance</td><td>测试方法 test method</td></tr>
<tr><td>5</td><td>端子强度
terminal strength</td><td>[拉伸强度]tensile strength
在端子引出方向，施加相对应的拉力，逐步向指定的值，持续 10 秒；测试结束后，接线端子无松动或断开。It exerts the according pull on the terminal outgoing direction. It gradually tends to the designated value after lasting for 10 seconds. After the test, the wiring terminal is not loose or disconnected.
<table>
<tr><td>引出端截面积直径 diameter of sectional area of outlet end mm</td><td>拉力 pull [N]</td></tr>
<tr><td>0. 50＜d≤0. 80</td><td>10.0</td></tr>
<tr><td>0. 80＜d≤1. 25</td><td>20.0</td></tr>
</table></td><td>IEC 60384-14-4.3
(IEC 60384-1-4.13)
IEC 60068-2-21
Test Ua1</td></tr>
<tr><td></td><td></td><td>[弯曲强度]bending strength
在以下指定负载条件下，电容器端子弯曲 90° 并回复到原始位置，以同样的速度在相反的方向重复一次，测试结束后，接线端子无松动或断开。Under the following designated load conditions, the capacitor terminal bends 90° and returns to the original position and repeats the test at the same speed in the opposite direction. After the test, the terminals are not loose or disconnected.
<table>
<tr><td>引出端截面积直径 diameter of sectional area of outlet end mm</td><td>弯曲力 bending force[N]</td></tr>
<tr><td>0. 50＜d≤0. 80</td><td>5.0</td></tr>
<tr><td>0. 80＜d≤1. 25</td><td>10.0</td></tr>
</table></td><td>IEC 60384-14-4.3
(IEC 60384-1-4.13)
IEC 60068-2-21
Test Ua1</td></tr>
<tr><td>6</td><td>耐振性
resistance to vibration</td><td>频率 frequency：10～500Hz
方向和时间 direction and time：三个方向各2小时，总持续时间6 小时
It tests two hours on the three directions respectively and the total lasting time is 6 hours
振幅0.75mm 或加速度98m/s2 （取严酷度较低者）amplitude is 0.75mm or the acceleration is 98m/s2(It adopts the lower severity)
性能要求:performance requirements
产品外观无可见损伤及松动drawing of products has no visible damage and looseness</td><td>IEC 60384-14-4.7
(IEC 60384-1-4.17)
IEC 60068-2-6
Test Fc</td></tr>
<tr><td>7</td><td>可焊性
weldability</td><td>1.焊槽温度temperature of solder bath：235℃±5℃
2.浸入时间immersion time：2.0 S±0.5 S
3.浸入深度immersion depth（里安装面或电容器本体the inside installing side or the capacitor body）：1.5～2.5mm，应采用厚度为1.5mm±0.5mm 的绝热屏蔽板It should adopt hot-resistance shield board of the thickness of 1.5mm±0.5mm
性能要求 performance requirements:
焊锡覆盖面积达到浸占面积的 95%以上。The covering area of soldering reaches to over 95% area of dipping area</td><td>IEC 60384-14-4.5
(IEC 60384-1-4.15)
IEC 60068-2-20
Test Ta</td></tr>
</table>

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TYPE: MPX-X2 Film Capacitor 金属化聚丙烯电容器 Metallized Polypropylene			Page:05
No.	项目 item	性　能 performance	测试方法 test method
8	焊接耐热性 Soldering heat-resistance property	1.焊槽温度Temperature of solder bath：260℃±5℃ 2.浸入深度为离安装面1.5～2.5mm 的焊锡槽时，应采用厚度为1.5mm±0.5mm的绝热屏蔽板When the immersion depth of solder bath is 1.5～2.5mm, it should adopt 1.5mm±0.5mm thickness heat-absorbing board. 3.焊接时间soldering time：≤5S 性能要求performance requirements：在测试条件中放置1～2h 后在进行测试，电容器外观检查，并应无可见性破坏；标志清晰 。It tests after laying 1～2h in the test condition . The drawing of capacitor is inspected and there is no visible damage and the marking is clear 耐电压 withstanding voltage: 耐电压应符合项目 8.1。Withstanding voltage should be in compliance with item 8.1. 绝缘电阻 insulation resistance： 绝缘电阻应符合项目 8.2。Insulation resistance should be in compliance with item 8.2. 容量变化率：capacitance change rate $\frac{\Delta C}{C} \leq \pm 3\%$	IEC 60384-14-4.4 (IEC 60384-1-4.14) IEC 60068-2-20 Test Tb
9	抗寒性 cold resistance	1. 环境温度 ambient temperature：-40±2ºC 2. 测试持续时间 duration of test：2 小时 在室温环境中放置 1.5±0.5 小时，按 8.3 项目测试容量，并应满足以下性能。It lies 1.5±0.5h in the indoor environment and tests its capacitance according to the item 8.3, meeting the requirements of the following performances. 容量变化率 capacitance change rate：$\frac{\Delta C}{C} \leq \pm 5\%$	IEC 60384-14-4.11.4 (IEC 60384-1-4.21.4) IEC 6068-2-1 Test Aa

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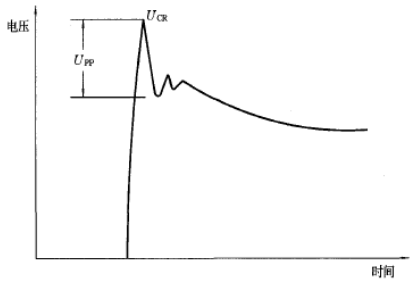
TYPE: MPX-X2 Film Capacitor		金属化聚丙烯电容器 Metallized Polypropylene	Page:06
No.	项目 item	性　能 performance	测试方法 test method
10	耐热性 heat-resistance property	1. 环境温度 ambient temperature：110±2℃ 2. 测试持续时间 duration of test：16 小时 16h 在室温环境中放置 1.5±0.5 小时，按 8.3 项目测试容量，并应满足以下性能。It lies in the indoor environment for 1.5±0.5h and tests capacitance according to item 8.3, meeting the following performances. 容量变化率 capacitance change rate：$\frac{\Delta C}{C} \leq \pm 5\%$ 绝缘电阻insulation resistance: 大于相对应极限的50％. >according 50% of limit values	IEC 60384-14-4.11.2 (IEC 60384-1-4.21.2) IEC 60068-2-2 Test Ba
11	稳态湿热 Steady-state damp heat	1. 环境温度 ambient temperature：40℃ 2. 相对湿度 relative humidity：95%RH 3. 测试持续时间 duration of test：56 天 56 days 4. 测试期间不施加电压 It doesn't apply voltage in the testing time 在室温放置 1～2 小时后 after lying 1～2 hours in the indoor temperature 性能要求 performance requirements： 外　观 drawing：无显著变化 It has no significant change 耐电压 withstanding voltage: 耐电压应符合项目 8.1withstanding voltage should be in accordance with the item 8.1 绝缘电阻 insulation resistance： 大于相对应极限的50％ > 50% of according limit value 容量变化率 capacitance change rate： $\frac{\Delta C}{C} \leq \pm 5\%$ 介质损耗角 dielectric component of dissipation factor : △DF≤0.008　CR≤1μF　1KHZ △DF≤0.005　CR＞1μF　1KHZ	IEC 60384-14-4.12 (IEC 60384-1-4.22) IEC 60068-2-3 Test Ca
12	温度快速变化 rapid change of temperature	测试温度变化 change of testing temperature：温度 temperature:θA ＝ -40℃；θB ＝ +110℃ 持续时间 duration：30min 循环次数 cycle times：5 次 性能要求 performance requirements： 外　观 drawing：无显著变化 there is no significant change 耐电压 withstanding voltage: 耐电压应符合项目 8.1withstanding voltage should be in compliance with item 8.1 绝缘电阻 insulation resistance： 大于相对应极限的50％ >50% of according limit value 容量变化率 capacitance change rate： $\frac{\Delta C}{C} \leq \pm 5\%$ 介质损耗角 dielectric component of dissipation factor: △DF≤0.008 CR≤1μF　1KHZ △DF≤0.005　CR＞1μF　1KHZ	IEC 60384-14-4.6 (IEC 60384-1-4.16) IEC 60068-2-14 Test Na

TYPE: MPX-X2 Film Capacitor 金属化聚丙烯电容器 Metallized Polypropylene			Page:07
No.	项目 item	性　能 performance	测试方法 test method
13	脉冲电压 pulse voltage	1.　全波形脉冲电压测试 full-wave pulse voltage test 2.　施加24 次相同极性的脉冲 It exerts same polarity pulse of 24 timea 3.　脉冲间隔时间不小于10s The interval time of pulse is not less than 10s： 在测试过程中，In the testing process: 1）如果显示器有3 次连续脉冲波形表示电容器未发生自愈性击穿，则可以停止施加脉冲，认为电容器合格。If the display has 3 times continuous pulse wave,it signifies the capacitor has no self-healing breakdown. And it can stop to exert the pulse and think that the capacitor is qualified. 2）若电容器施加全部24 次脉冲后，有3 次或更多次的波形表示未发生自愈性击穿，则认为电容器合格。If the capacitor exerts total 24 times pulse, there is 3 times or more times of waves.It signifies that there has no self-healing breakdown and thinks the capacitor is qualified.  3）若规定波形的脉冲少于3 次，则认为电容器失败如果波形出现阻尼振荡，振荡的峰-峰值UPP 应不大于峰值脉冲电压的10％。If the pulse of specified wave is less than 3 times. It signifies the capacitor is failed. If the waveform has damping oscillation. And the peak of oscillation should be not larger than the 10% of peak pulse voltage. 电压设定voltage setting：C≤1μF，2.5kV；C＞1μF，2.5/√C kV 性能要求 performance requirements： 外　观 drawing：无显著变化，无永久性击穿或闪络 There is no significant change and no permanent breakdown or flashover. 脉冲电压后，电容器应经受高温负荷（项目 13）After the pulse voltage,the capacitor should withstand high temperature load(item 13) 测试电路及施加电压参照 IEC 60384-14.4.13 附录 A Test circuit and applied voltage refers to IEC 60384-14.4.13 Appendix A	IEC 60384-14-4.13 (IEC 60384-1-4.26)

TYPE: MPX-X2 Film Capacitor	金属化聚丙烯电容器 Metallized Polypropylene		Page:08
No.	项目 item	性　能 performance	测试方法 test method
14	耐久性 durability	1. 本测试在脉冲电压测试完成后一周内进行The test is operating within a week after the pulse voltage test 2. 电容器在测试箱内的放置间距不小于25mm The place spacing in the test box should be wider than 25mm 3. 测试温度test temperature：110℃±3℃ 4. 测试电压test voltage：U_R*1.25 5. 持续时间 duration：1000 小时,每隔 1 小时将电压升高到 1000V（有效值），持续时间 0.1S，该电压应分别通过一个 47Ω±5%电阻施加到每个电容器上。1000 hours, It rises the voltage to 1000v(Urms) every 1 hour.The duration is 0.1s.This voltage should pass the 47Ω±5% resistance respectively and exerts on every capacitor. 性能要求 performance requirements： 外　观 drawing：无显著变化 There is no significant change 耐电压 withstanding voltage: 耐电压应符合项目 8.1withstanding voltage should be compatible with the item 8.1 绝缘电阻 insulation resistance： 大于相对应极限的50％ >50% of the according limit value 容量变化率 capacitance change rate： $\frac{\Delta C}{C} \leq \pm 10\%$ 介质损耗角 dielectric component of dissipation factor: △ DF≤0.008　　CR≤1μF 1KHZ △DF≤0.005　　CR＞1μF 1KHZ	IEC 60384-14-4.14 (IEC 60384-1-4.23)

TYPE: MPX-X2 Film Capacitor	金属化聚丙烯电容器 Metallized Polypropylene	Page:09
No. 项目 item	性 能 performance	测试方法 test method
15 充电和放电 charge and discharge	充放电次数charging and discharging times：10000 次 1000times 充电时间charging time：0.5s 放电时间discharging time：0.5s 充电电压charging voltage：√2URV.DC 充电电阻charging resistance：220/C（Ω）或将充电电流限制到1A，取其较大者；220/C（Ω）or limit the charging current to 1A and take its larger one. 放电discharging：每个电容器分别通过一个电阻器放电，电阻器的阻值必须使放电时候的电压变化率（dU/dt）的最大值约为100V/μs Every capacitor passes a resistance to discharge. And the resistance value has to be maximum value of dU/dt, about 100V/μs,in the discharge. 性能要求 performance requirements： 外 观drawing：无显著变化there is no significant change 电容量capacitance：变化率≤10% change rate≤10% DF：C≤1μF DF≤0.008 ，C＞1μF DF≤0.005 耐电压withstanding voltage：无击穿或飞弧 There is no breakdown or flashover 绝缘电阻insulation resistance：大于相对应极限的50% >50% of according limit value	IEC 60384-14-4.18 (IEC 60384-1-4.38)

TYPE: MPX-X2 Film Capacitor	金属化聚丙烯电容器 Metallized Polypropylene	Page:10

<table>
<tr><th>No.</th><th>项目 item</th><th>性　能 performance</th><th>测试方法 test method</th></tr>
<tr><td>16</td><td>阻燃性测试
test of flame-retardant</td><td>1. 被试电容器应固定在最有助于燃烧的火焰位置处，每一样本单位仅应在火焰中暴露一次The capacitor tested should be fixed in the fire place that is most conducive to the burning. And every sample unit should be in the fire one time.
2. 应对最小壳号，中间壳号和最大壳号进行测试，对于被试壳号，应选三只最大容量和三只最小容量的样本单位进行测试，每一壳号得到6只样本单位测试结果It should test the minimum case, medium case and maximum case. For the tested case, it should choose sample unit of three maximum capacitance and three minimum capacitance to test. Every case gets the 6 sample unit testing results.
3. 暴露在火焰中的时间和燃烧的时间按下表规定：The exposure in fire and burning duration should be the following regulations
<table>
<tr><th rowspan="2">有焰燃烧等级
Flame burning grade</th><th colspan="4">严酷等级 severity grade
针对电容器体积范围（mm²）施加火焰时间（S）the applied flame duration according to the volume range of capacitor</th><th rowspan="2">最大燃烧时间
Maximum burning duration</th></tr>
<tr><th>体积≤250
Volume ≤250</th><th>250＜体积≤500
250＜volume≤500</th><th>500＜体积≤1750
500＜volume≤1750</th><th>1750＜体积
1750＜volume</th></tr>
<tr><td>A</td><td>15</td><td>30</td><td>60</td><td>120</td><td>3</td></tr>
<tr><td>B</td><td>10</td><td>20</td><td>30</td><td>60</td><td>10</td></tr>
<tr><td>C</td><td>5</td><td>10</td><td>20</td><td>30</td><td>30</td></tr>
</table>
</td><td>IEC 60384-14-4.18
(IEC 60384-1-4.38)</td></tr>
</table>

TYPE: MPX-X2 Capacitor	金属化聚丙烯电容器 Metallized Polypropylene Film	Page:11

10. 认证标准

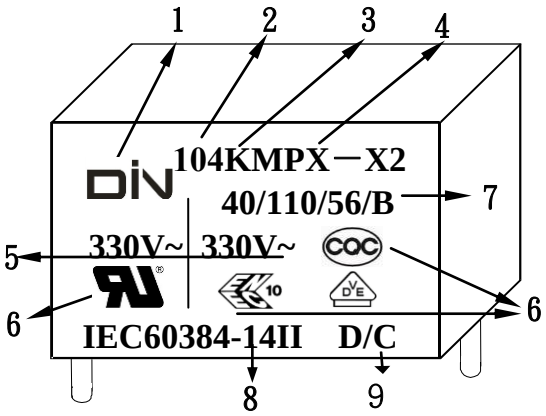
认证 certificate	国家 country	详述 description	认证号 Certificate No.
UL	美国 America	UL 1414 MKX-X2 0.001μF~10.0μF 275V.AC~330V.AC, 110ºC.	E2472972
ENEC	欧洲 Europe	IEC 60384-14:2005 MPX-X2 0.001μF ~10.0 μF 275V.AC ~330V.AC, 40/110/56/B	40043081
CQC	中国 China	GB/T14472 -1998 MPX-X2 0.001~10.0μF 330V.AC, 40/110/56/B	CQC15001121222

注：ENEC 在欧洲等同于 ENEC is equal to SEV , SEMKO , DEMKO , NEMKO , FIMKO and etc. in Europe.
SEV , SEMKO , DEMKO , NEMKO , FIMKO 等。

11. 电压爬升速度 dv/dt (V/μs) voltage climbing speed dv/dt (V/μs)

脚距 pitch / 额定电压 rated voltage	10 mm	15 mm	22.5 mm	27.5 mm	32.5mm	
330VAC	500	500	400	200	150	100

12.电容器标识 marking of capacitor



(1) LOGO 制造商标示 LOGO marking of manufacturer

(2) 标称容量 rated capacitance

(3) 容量偏差 capacitance tolerance

(4) 产品名称 product name(Capacitor ClassMPX- X2)

(5) 额定电压 rated voltage

(6) 安全标准 safety standard

ENEC 标志 ENEC marking

ENEC 是“欧洲标准电器认证”的缩写

ENEC is the abbreviation of European standard electrical certification

ENEC标志在欧洲等价于如下标志：ENEC is equal to the following marki ng in Europe

(7) 应用种类由字母和数字表示：Applied types are expressed by letter and number

1st. （40）： 使用温度最低气温-40℃ the lowest usage temperature is -40℃

2nd. (110): 使 用 温 度 最高气温 110℃ the highest usage temperature is 110 ℃

3rd. (56): 稳态湿热测试天数 testing days of steady state damp heat

4th. (B) : 阻燃性为 B 类. flame-retardant type is B

(8) **IEC 行业标准 IEC Industry standards**

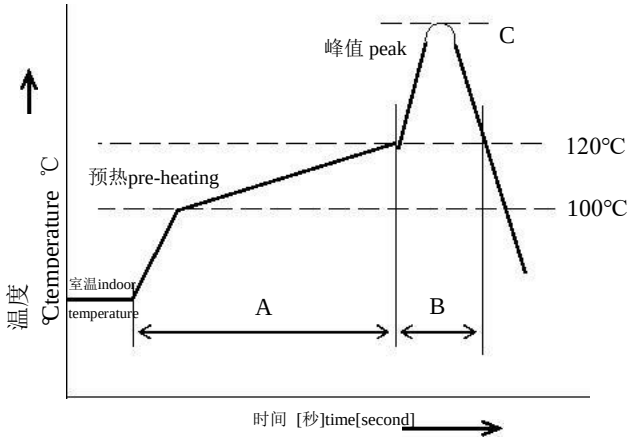
(9) **生产日期码 production date code**

（一）金属化薄膜电容器----无铅波峰焊条件

Metallized Film Capacitor-Lead-free wave soldering conditions

- **波峰焊温度曲线　Wave soldering temperature curve**

温度变化曲线



焊接条件
Soldering conditions

	项 目 Item	数 值 Value	单位 Unit
A	加热时间 Heating time	50 - 100	秒 second
	加热温度 Heating temperature	100 - 120	℃
	温度上升速度 Temperature rise rate	1 - 2	℃/秒 。C/sec
B	浸渍时间 Dipping time	2 - 4	秒 second
C	峰值温度 Peak temperature	260	℃
	峰值温度持续时间 Peak temperature duration	瞬间 Moment	秒 second

- **波峰焊要求 Wave Soldering Requirements**
- 聚丙烯薄膜电容器的本体温度低于120℃，持续时间小于60秒。

  The body temperature of the polypropylene film capacitor is below 120℃ for less than 60 seconds.

  聚酯薄膜电容器的本体温度低于150℃，持续时间小于60秒。

  The body temperature of polyester film capacitors is below 150℃ for less than 60 seconds.

- **波峰焊浸渍要求 Wave soldering dipping requirements**

峰值温度 Peak temperature	260℃
浸渍时间 dipping time	4 秒
焊接次数 Soldering times	1次

插入组件：焊接引脚与组件接触点

Inserting component: Solder the pin to component contact point

- **手工焊接　Hand soldering**

焊头温度 Temperature of solder head	350℃
焊接时间 Soldering time	3秒 3 seconds

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（二）工作电压 Operating voltage

- 薄膜电容器的选取取决于施加的最高电压，并受施加的电压波形、电流波形、频率、环境温度（电容器表面温度）、电容量等因素的影响。使用前请先检查电容器两端的电压波形、电流波形和频率是否在额定值内。

  The selection of film capacitors depends on the applied maximum voltage and is influenced by factors such as the applied voltage waveform, current waveform, frequency, ambient temperature (surface temperature of capacitor), capacitance. Before use, please check whether the voltage waveform, current waveform and frequency at both ends of the capacitor are within the rated value.

（三）工作电流 Operating current

- 通过电容器的脉冲（或交流）电流等于电容量 C 与电压上升速率的乘积，即 I=C×dt/dt。

  由于电容器存在损耗，在高频或高脉冲条件下使用时，通过电容器的脉冲（或交流）电流会使电容器自身发热而有温升，将会有热击穿的危险。因此，电容器安全使用条件不仅受额定电压的限制，而且受额定电流的限制。

  当实际工作电流波形与给出的波形不同时，一般情况下聚酯薄膜电容器在内部温升为 10℃或更小的情况下使用；聚丙烯薄膜电容器在内部温升为 5℃或更小的情况下使用，电容器表面温度不允许超过额定上限温度。

- The pulsed (or AC) current through the capacitor is equal to the product of the capacitance C and the rate of voltage rise, i.e. I=C×dt/dt.

  Because of the loss of capacitors, when used under high frequency or high pulse conditions, the pulse (or AC) current through the capacitor will make the capacitor itself heat up and have a temperature rise, and there will be a risk of thermal breakdown. Therefore, conditions for safe use of capacitors are not only limited by the rated voltage, but also by the rated current.

  When the actual working current waveform is different from the given waveform, generally polyester film capacitors are used when the internal temperature rise is 10℃ or less; polypropylene film capacitors are used when the internal temperature rise is 5℃ or less, and the surface temperature of the capacitor is not allowed to exceed the rated upper limit temperature.

- 金属化薄膜电容器内部温升公式如下：
- $\triangle T=I^2rms*DF*\omega/(\beta*S)$

  △T：电容器内部温升　　Irms：通过电容器的有效电流值

  DF：损耗角正切　　ω：容抗（1/2πfc）

  β：薄膜传热系数　　S:电容器表面积

- The equation for the internal temperature rise of a metallized film capacitor is as follows
- $\triangle T=I2\ rms*DF*\omega/(\beta*S)$

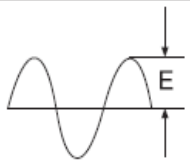
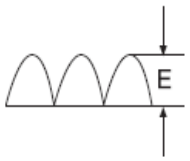
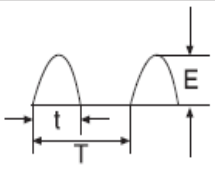
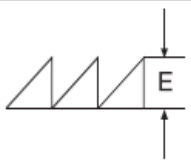
  △T: Temperature rise inside the capacitor　　Irms: Effective current value passing through the capacitor

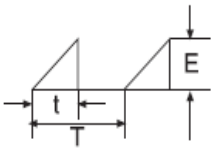
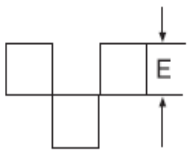
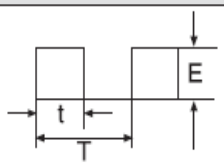
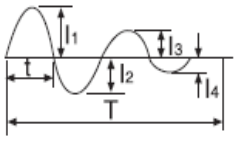
  DF: Loss angle tangent　　ω: Capacitive resistance (1/2πfc)

  β: Heat transfer coefficient of the film　　S: Surface area of the capacitor

（四）各种波形的有效值换算关系 The RMS conversion relationship of various waveforms

- 不同的波形有效值按下面的公式计算
  The RMS values of the different waveforms are calculated according to the following formula

种类(type)	1	2	3	4
波形 (waveform)				
有效值(rms)	$E/\sqrt{2}$	$E/\sqrt{2}$	$E\sqrt{t/(2T)}$	$E/\sqrt{3}$

种类(type)	5	6	7	8
波形 (waveform)				
有效值(rms)	$E\sqrt{t/(3T)}$	E	$E\sqrt{t/T}$	$\sqrt{\frac{1}{2T}(I_1^2+I_2^2+I_3^2+I_4^2)}$

（四）电容器充放电 Capacitor charging and discharging

- 由于电容器充放电电流取决于电容量和电压上升速率的乘积，即使是低电压充放电，也可能产生大的瞬间充放电电流，这可能会导致电容器性能的损害。当进行充放电时，请串联一个 20Ω/V~1000Ω/V 或更高的限流电阻，将充放电电流限制在规定范围内。如有发生电容器短路充放电现象，
- 请将其列入不良品范围，不得使用。
- Since the charging and discharging current of a capacitor depends on the product of the capacitance and the rate of voltage rise, even low-voltage charging and discharging may generate a large instantaneous charging and discharging current, which may cause damage to the performance of the capacitor. When charging and discharging, please connect a 20Ω/V~1000Ω/V or higher current-limiting resistor in series to limit the charging and discharging current within the specified range. If there is a phenomenon of short-circuit charging and discharging of the capacitor,
- Please include it in the scope of defective products and do not use it.

（五）阻燃性 Flame retardancy

- 尽管在薄膜电容器外封装中使用了耐火阻燃材料—助燃环氧树脂或外壳，但外部的持续高温或火焰仍可使电容器芯子变形而产生封装破裂，导致电容器芯子融化或燃烧。
- Despite the use of fire retardant materials - flame-assisted epoxy resin or case - in the outer packaging of film capacitors, continuous external heat or flame can still deform the capacitor core and cause the packaging to rupture, resulting in melting or burning of the capacitor core.

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（六）环境温度 Ambient temperature

- 电容器额定使用温度标准为 85℃。当电容器实际使用温度超过额定使用温度（在最高使用温度范围内）时，电容器额定电压将随温度的升高而降低。电容器额定电压降低标准公式：
- $V_C=V_R*(165-T_A)/80$

  V_C:电容器降低额定电压后电压　　V_R:电容器额定电压

  T_A:电容器表面温升
- The rated operating temperature of capacitors is 85℃ as standard. When the actual operating temperature of the capacitor exceeds the rated operating temperature (within the range of maximum operating temperature), the rated voltage of the capacitor will be reduced with the increase of temperature. The standard formula for the reduction of capacitor rated voltage is
- VC =VR *(165-TA)/80

  VC :Capacitor voltage after reducing rated voltage　VR :Capacitor rated voltage

  TA :Capacitor surface heating

（七）保管方法及保管条件 Storage methods and storage conditions

- 湿度、灰尘、酸化性瓦斯（盐化水素，酸化水素，亚硫酸瓦斯），将对电容器外部电极之焊接端子产生劣化影响。
- 特别要避开高温多湿之场所，保存在-10~40℃，湿度 85%以下，不可直接暴露于水或水气，以免水气侵入而破坏电容器。
- 如电容器保存时间超过一年，需重新进行电气性能检测后，方可使用，保存期限三年。
- Humidity, dust, acidified gas (saline water element, acidified water element, sulfite gas) will have a bade effect on the solder terminal of the external electrode of the capacitor.
- Especially avoid high temperature and humid places, store at -10~40℃ and 85% humidity or less. Do not expose directly to water or water vapor, so as not to damage the capacitors by water vapor intrusion.
- If the capacitor is kept for more than one year, it should be re-tested for electrical performance before use. The storage period is three years.