

## 产品承认书

## APPROVAL SHEET

客户料号:

Part Number

客户:

CUSTOMERS

品名:

DESCRIPTION

铝电解电容

规格:

SERIES

KM 4.7UF400V 8X11

供应商料号

Supplier PN:

4.7UF400VF110KM2

日期:

DATE

2025/3/17

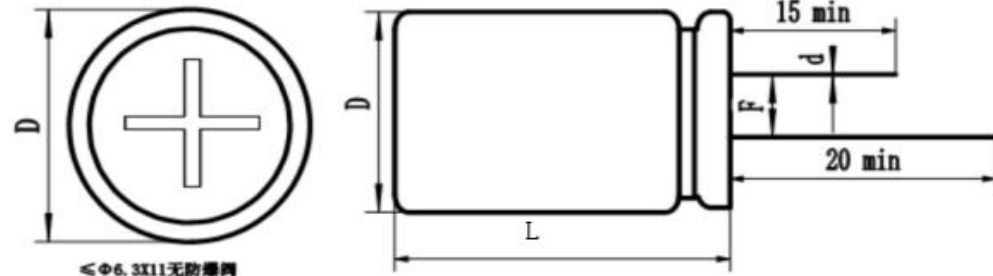
发行单位 ISSUE DEPARTMENT	
 工程部的	
制作 PREPARED BY	侯业刚 HOU YEGANG
批准 APPROVED	胡俊波 HU JUNBO

客户承认栏 APPROVED COLUMN	
合格 <input type="checkbox"/>	
不合格 <input type="checkbox"/>	
审核 CHECKED	
批准 APPROVED	

贵司确认后, 敬请回签一份 (After your confirmation, please sign back)

工厂地址: 湖北省荆门市京山市京源东路45号

### 1. 外形尺寸图 (Dimensions) : 单位: mm



D	8.0	± 0.5
L	11.0	± 1.5
F	2.5	± 0.5
d	0.5	± 0.05

### 2. 部品规格特性表 (电容测试条件: 25±5℃ 湿度65%±5%, 容量\损失测试频率120HZ)

客户料号	系列	标准容量	额定电压	尺寸	容差	损失角	漏电流	阻抗	寿命	纹波电流	浪涌电压	套管	加工形式	工作温度
Part Number	Series	CAP. (uF)	WV (V)	SIZE	Tolerance/120HZ	D. F/120HZ	LC (uA) 60s	100KHz (Ω)	life (Hrs)	R. C. mA120Hz z105℃	surge voltage	Sleeve	B	working temperature (℃)
	KM	4.7	400	8 X 11	- 20 % ~ 20 %	15	56.4	/	2000	48	450	黑底白字PET	长脚	-25~+105
备注														

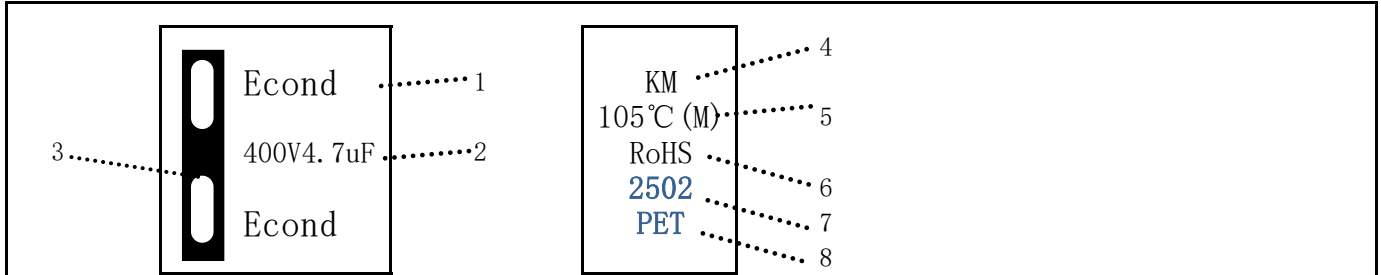
#### 纹波电流系数 (Multiplier for ripple current) :

Freq	50Hz/60Hz	120Hz	1KHz	10KHz	50~100KHz
CAP≤10	0.80	1.00	1.45	1.65	1.70
10<CAP≤100	0.80	1.00	1.36	1.48	1.53
100<CAP≤1000	0.80	1.00	1.25	1.35	1.38
CAP>1000	0.80	1.00	1.17	1.25	1.28

#### 纹波温度系数 Multiplier for ripple current vs temperature

Temperatrue (℃)	45	60	70	85	105
Multiplier	2.10	1.90	1.40	1.25	1.00

### 3. 胶管标识示意图(Marking):



NO. 代表内容 Item

1. 公司商标(Logo)
2. 电容器规格(额定电压和容量) Capacitance and Rated Voltage
3. 负极表示带 Polarity bar
4. 产品系列(Series)
5. 工作最高温度与容量范围(Operating Temperature Range and Capacitance Tolerance)
6. 环保标识(RoHS)
7. 生产周期:如"2502"其中25代表2025年;02代表02月份生产.
8. 胶管材质

5.1 试验项目 Test item

NO	项目 Items	条件 Conditions	规格 Specifications																																				
1	最大允许纹波电流 Maximum permissible ripple current	Temperature: $105 \pm 2^\circ\text{C}$ Voltage :DC.Voltage+peak ripple voltage $\leq$ Rated voltage. Ripple frequency: 120Hz	Refer to table																																				
2	浪涌 Surge	Temperature: $105 \pm 2^\circ\text{C}$ Applied voltage: see specification "ON" position : 30 seconds "OFF" position :5 minutes 30 seconds. Duration : 1000 cycles	1.No electrical or mechanical damage. 2.Capacitance change within $\pm 15\%$ . 3.D.F.smaller than specification volue. 4.Leakage current smaller than specification volue.																																				
3	温度循环 Temperature Cycle	<table border="1"> <thead> <tr> <th rowspan="5">One Cycle</th> <th>Temperature(<math>^\circ\text{C}</math>)</th> <th>Time (minutes)</th> </tr> </thead> <tbody> <tr> <td>Rated low category temperature <math>\pm 3</math></td> <td><math>30 \pm 3</math></td> </tr> <tr> <td><math>25^\circ\text{C}</math></td> <td>3MAX</td> </tr> <tr> <td>Rated low category temperature <math>\pm 3</math></td> <td><math>30 \pm 3</math></td> </tr> <tr> <td><math>25^\circ\text{C}</math></td> <td>3MAX</td> </tr> <tr> <td colspan="3">Total number of cycles: 5</td> </tr> </tbody> </table>	One Cycle	Temperature( $^\circ\text{C}$ )	Time (minutes)	Rated low category temperature $\pm 3$	$30 \pm 3$	$25^\circ\text{C}$	3MAX	Rated low category temperature $\pm 3$	$30 \pm 3$	$25^\circ\text{C}$	3MAX	Total number of cycles: 5			1.No appearance defect. 2.Capacitance change within $\pm 5\%$ 3.D.F.smaller than specification value. 4.Leakage current smaller than specification value.																						
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4	耐焊接热 Resistance to Soldering Heat	Warm up time : $120 \pm 2$ seconds to reach $120 \pm 2^\circ\text{C}$ Solder bath temperature: $260 \pm 5^\circ\text{C}$ . Solder bath composition: Sn-96.5%. Ag-3.0% Cu-0.5% Immersion depth: 1.5 to 2.0mm Immersion duration: $10 \pm 1$ seconds	1.No appearance defect. 2.Capacitance change within $\pm 5\%$ 3.D.F.smaller than specification value. 4.Leakage current smaller than specification value.																																				
5	可焊性 Solder Ability	Solder bath temperature: $235 \pm 5^\circ\text{C}$ . Solder bath composition: Sn-96.5%. Immersion depth: 1.5 to 2.0mm Immersion duration: $10 \pm 1$ seconds	A minimum of 95% the immersed surface is to be coated with the new solder																																				
6	低温特性 (最大阻抗比) Low Temperature Charceristics(Max.Impedance Ratio)	<table border="1"> <tbody> <tr> <td>working Voltage (v)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Impedance Z(<math>-40^\circ\text{C}</math>)/Z(<math>+20^\circ\text{C}</math>)</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td>working Voltage (v)</td> <td>160</td> <td>200</td> <td>250</td> <td>350</td> <td>400</td> <td>420</td> <td>450</td> <td></td> </tr> <tr> <td>Impedance Z(<math>-25^\circ\text{C}</math>)/Z(<math>+20^\circ\text{C}</math>)</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>6</td> <td>6</td> <td>8</td> <td></td> </tr> </tbody> </table>	working Voltage (v)	6.3	10	16	25	35	50	63	100	Impedance Z( $-40^\circ\text{C}$ )/Z( $+20^\circ\text{C}$ )	8	6	4	3	3	3	3	3	working Voltage (v)	160	200	250	350	400	420	450		Impedance Z( $-25^\circ\text{C}$ )/Z( $+20^\circ\text{C}$ )	3	3	4	4	6	6	8		
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**5.2 试验项目 Test item**

7	高湿度储存 High Humidity storage	Temperature: $40 \pm 2^{\circ}\text{C}$ Relative humidity :90 to 95% Duration : 240 $\pm$ 8 hours	1.No electrical or mechanical damage. 2.Capacitance change within $\pm 15\%$ . 3.D.F.smaller than specification value. 4.Leakage current smaller than specification value.										
8	防爆 Vent	Conduct under normal lighting for lab work <table border="1" style="margin: 5px auto;"> <thead> <tr> <th>Capacitor diameter</th> <th>Applied current(A)</th> <th>Minutes</th> </tr> </thead> <tbody> <tr> <td>Less than 22.4mm</td> <td>1</td> <td rowspan="2" style="text-align: center;">within 30</td> </tr> <tr> <td>More than 22.5mm</td> <td>10</td> </tr> </tbody> </table>	Capacitor diameter	Applied current(A)	Minutes	Less than 22.4mm	1	within 30	More than 22.5mm	10	There shall be no explosion,flash,flame,spark or fire from the capacitor during or after the test,nor shall there be expulsion of any metal from the casing		
Capacitor diameter	Applied current(A)	Minutes											
Less than 22.4mm	1	within 30											
More than 22.5mm	10												
9	端子强度: 拉伸度/弯曲强度 Terminal strength: Tensile test intensity/winding intensity	拉伸度 Tensile test intensity <table border="1" style="margin: 5px auto;"> <thead> <tr> <th>Diameter of terminal (mm)</th> <th>Tensile Strength(n)</th> <th>continued time</th> </tr> </thead> <tbody> <tr> <td><math>0.5 \leq d \leq 0.8</math></td> <td>10</td> <td rowspan="2" style="text-align: center;">10<math>\pm</math>1sec</td> </tr> <tr> <td><math>0.8 &lt; d \leq 1.25</math></td> <td>20</td> </tr> </tbody> </table>	Diameter of terminal (mm)	Tensile Strength(n)	continued time	$0.5 \leq d \leq 0.8$	10	10 $\pm$ 1sec	$0.8 < d \leq 1.25$	20	1.No electrical or mechanical damage 2.No appearance damage		
Diameter of terminal (mm)	Tensile Strength(n)	continued time											
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	弯曲强度 winding intensity <table border="1" style="margin: 5px auto;"> <thead> <tr> <th colspan="3">2bends (Bend 180 degrees for a round)</th> </tr> <tr> <th>Diameter of terminal (mm)</th> <th>winding Strength(n)</th> <th>Awl quality</th> </tr> </thead> <tbody> <tr> <td><math>0.5 \leq d \leq 0.8</math></td> <td>5</td> <td>0.51kg</td> </tr> <tr> <td><math>0.8 &lt; d \leq 1.25</math></td> <td>10</td> <td>1.02kg</td> </tr> </tbody> </table>	2bends (Bend 180 degrees for a round)			Diameter of terminal (mm)	winding Strength(n)	Awl quality	$0.5 \leq d \leq 0.8$	5	0.51kg	$0.8 < d \leq 1.25$	10	1.02kg
2bends (Bend 180 degrees for a round)													
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$0.5 \leq d \leq 0.8$	5	0.51kg											
$0.8 < d \leq 1.25$	10	1.02kg											
10	振动 Vibration	Frequency range : 10 Hz to 55 Hz Amplitude :1.5 mm Cycle definition:10Hz to 55 Hz and back to 10Hz Cycle duration :1 minute. Duration :2 hours per direction (3directions)	1.No electrical or mechanical damage 2.No appearance damage										
11	高温负荷 Endurance	Capacitors are placed in an oven and applied voltage for 2000 hours at 105 $^{\circ}\text{C}$ .After being restored to 25 $^{\circ}\text{C}$ , capacitors shall meet the specifications	1.Capacitance change within $\pm 20\%$ of the initial value. 2.D.F.change within $\pm 200\%$ of the specified value. 3.Leakage current smaller than specification value.										
12	高温储存 Shelf Life	Capacitors are placed in an oven for 1000 hours at 105 $^{\circ}\text{C}$ without applying rated working voltage.After being restored to 25 $^{\circ}\text{C}$ ,capacitors shall meet the specifications	1.Capacitance change within $\pm 20\%$ of the initial value. 2.D.F.change within $\pm 200\%$ of the specified value. 3.Leakage current within $\pm 200\%$ of the specification value.										

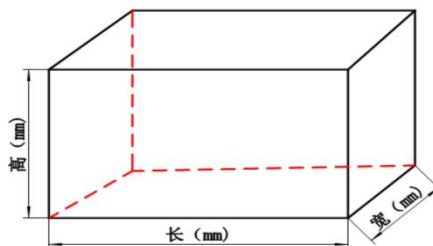
## 6. 包装方式 (Packing)

### 6.1 散料包装：散料包装包含长脚和短脚包装，具体如下：

电容尺寸 DXL (mm)	长脚		短脚	
	包装袋尺寸(长x宽): 220*200mm		包装袋尺寸(长x宽): 200*180mm	
	每袋数量 (pcs)	每箱数量 (K)	每袋数量 (pcs)	每箱数量 (K)
3X5-4X7	2000	96	2000	96
5X7	1000	40	1000	40
5X9-11	1000	40	1000	32
6. 3X7	1000	40	1000	40
6. 3X9-15	1000	32	1000	24
8X7-9	1000	40	1000	24
8X10-13	500	20	500	16
8X13. 5-15	500	16	500	16
8X15. 5-16. 5	500	16	500	12
8X20-10X13	500	12	500	12
10X14-17	400	9.6	400	9.6
10X20-26	300	7.2	300	7.2
13X14-22	200	4.8	200	4.8
13X24-26	100	3.2	100	4
13X30-31	100	2	100	3.2
16X18-22	100	2.4	100	3.2
16X25-28	100	3.2	100	3.2
16X30-18X26	100	2.4	100	2.4
18X28-36	50	1.6	50	1.6
18X40	50	1.2	50	1.2
22X24-38	25	0.8	25	0.8



散料尺寸示意图 (上)

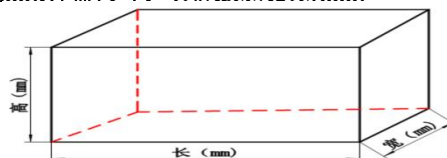


外箱尺寸示意图 (上)

散料包装外箱尺寸 (长X宽X高) :  
420X327X270mm

### 6.2 编带包装：编带为统一包装方式：每箱固定装10盒，内盒尺寸345X235X55 (mm);外盒尺寸：490X355X295(mm)

电容拍别	每盒数量 (pcs)	每箱盒数	每箱数量 (K)	备注
4	2500	10	25	
5	2000	10	20	
6. 3	1500	10	15	
8	1000	10	10	
10	600	10	6	每行空一
13	400	10	4	编一隔一



内盒尺寸 (长X宽X高) : 345X235X55 外  
盒尺寸 (长X宽X高) : 490X355X295

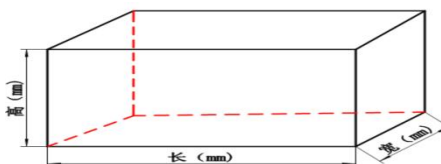
### 6.3 排盒包装：

#### 1. 排盒包装标准：

拍别 (mm)	内盒选择	内盒品种	每排数量	每盒排数	每盒数量	每箱盒数	每箱数量	内盒隔板数
13Φ	内盒选择寸 依据产品尺 寸而定	高盒	22	14	308	6	1848	单条/2排
		中盒						单条/2排
		低盒						单条/2排
16Φ	内盒选择寸 依据产品尺 寸而定	高盒	18	12	216	6	1296	单条/2排
		中盒						单条/2排
		低盒						单条/2排
18Φ	内盒选择寸 依据产品尺 寸而定	高盒	16	10	160	6	960	单条/2排
		中盒						单条/2排
		低盒						单条/2排
22Φ	内盒选择寸 依据产品尺 寸而定	高盒	13	9	117	6	702	双条/3排
		中盒						双条/3排
		低盒						双条/3排

#### 2. 内盒、隔条、外箱 {长X宽X高 (mm)}

内盒型号	内盒尺寸 (mm)	隔条尺寸 (mm)	每大箱装盒数 (盒)	外箱尺寸 (mm)
高盒	305*200*65	300*62	6	420*310*215
中盒	305*200*45	300*42	8	
低盒	305*200*30	300*30	12	



## 7. 铝电解电容器仓储条件：

- ① 仓储温度：≤35℃      ② 仓储湿度：≤75RH%      ③ 电容存储有效期：一年 (超过一年需要重新充电)