

# KS Series

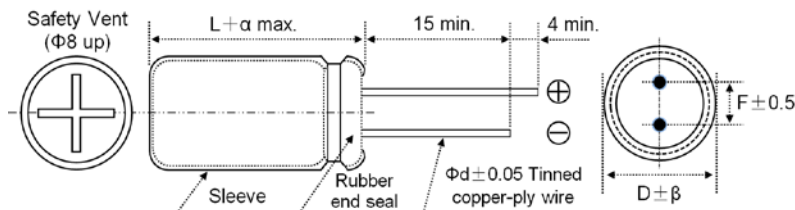
## 特征 FEATURES

- 105°C
- 寿命 (Life Time): 1000 Hours
- 7mm 高(High) 、标准品(Standard)

## 主要技术性能 Specifications

项目 Item	特性 (Performance Characteristics)																								
使用温度范围 Operating Temperature Range	-40 ~ +105°C																								
额定电压范围 Rated Working Voltage Range	6.3 ~ 50V																								
标称电容量范围 Nominal Capacitance Range	0.1 ~ 220μF																								
标称电容量允许偏差 Capacitance Tolerance	±20%(120Hz,+20°C)																								
漏电流 Leakage Current	$L \leq 0.01CV$ or $3(\mu A)$ 测试时间 2 分钟取最大值, 测试温度 20°C; Whichever is greater measured after 2 minutes application of rated working voltage at +20°C																								
损失角正切值 $\tan \delta(120\text{Hz}, +20^\circ\text{C})$	<table border="1"> <tr> <td>工作电压 (Voltage)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td><math>\tan \delta(\text{max})</math></td> <td>0.24</td> <td>0.21</td> <td>0.18</td> <td>0.15</td> <td>0.13</td> <td>0.12</td> </tr> </table>	工作电压 (Voltage)	6.3	10	16	25	35	50	$\tan \delta(\text{max})$	0.24	0.21	0.18	0.15	0.13	0.12										
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纹波电流与频率修正系数 Ripple Current & Frequency Multipliers	<table border="1"> <tr> <td></td> <td colspan="5">Freq(Hz)</td> </tr> <tr> <td>Cap(μF)</td> <td>50</td> <td>120</td> <td>300</td> <td>1k</td> <td>10k~</td> </tr> <tr> <td><math>\leq 47</math></td> <td>0.75</td> <td>1.00</td> <td>1.35</td> <td>1.57</td> <td>2.00</td> </tr> <tr> <td><math>68 \leq \text{CAP} \leq 470</math></td> <td>0.80</td> <td>1.00</td> <td>1.23</td> <td>1.34</td> <td>1.50</td> </tr> </table>		Freq(Hz)					Cap(μF)	50	120	300	1k	10k~	$\leq 47$	0.75	1.00	1.35	1.57	2.00	$68 \leq \text{CAP} \leq 470$	0.80	1.00	1.23	1.34	1.50
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其它 Others	JIS C-5101 (IEC 60384)																								

## 尺寸图 (Diagram of Dimensions) :



## 尺寸 (Diameter):

单位 (Unit):mm

D	4	5	6.3	8
F	1.5	2.0	2.5	3.5
d	0.45			
$\alpha$	(L≤7) 1		(L≤9) 1.5	
$\beta$	0.5			

额定标准值(Standard Rating) :

D x L(mm): Ripple Current: mA/rms at 120Hz,105°C

Voltage(Code)	6.3		10		16		25	
	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
10					4*7	29	4*7	29
22	4*7	34	4*7	34	4*7	38	5*7	45
33	4*7	37	4*7	40	5*7	50	5*7	55
47	4*7	44	5*7	50	5*7	60	6.3*7	67
100	5*7	67	6.3*7	83	6.3*7	92	6.3*7	95
220	6.3*7	112	8*7	140	8*7	135	8*7	158

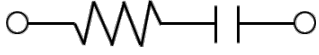
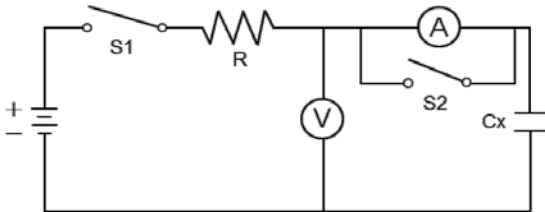
Voltage(Code)	35		50	
	Case Size	Ripple Current	Case Size	Ripple Current
0.1			4*7	1.0
0.22			4*7	2.3
0.33			4*7	3.5
0.47			4*7	5.0
1			4*7	10
2.2			4*7	19
3.3			4*7	24
4.7	4*7	24	5*7	29
10	5*7	36	6.3*7	44
22	6.3*7	57	8*7	65
33	6.3*7	62		
47	6.3*7	78		
100	8*7	95		

1. Scope 适用范围:

This specification applies to aluminum electrolytic capacitor , used in electronic equipment .

本说明适用于用电子仪器设备进行检测之铝电解电容器.

2. Electrical characteristics 电气特性:

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格															
2.1	Rated voltage 额定电压																	
2.2	Capacitance 静电容量	1.Measuring frequency :120 ±12Hz 测试频率 2.Measuring voltage : ≤0.5Vrms + 0.5~2.0VDC 测试电压	Voltage range 、Capacitance range, see specification of this series. 电压、容量范围请看该系列之规格说明.															
2.3	Dissipation factor 散逸因素 (损失角)	3.Measurement circuit :  测试电路																
2.4	Leakage current 泄漏电流	DC Leakage current shall be measured after 1~2 minutes application of the DC rated working voltage through the 1000 Ω resistor at 20°C. 在20 °C通过1000Ω的电阻施加直流工作电压1~2分钟后测定直流泄漏电流.  R :1000 ±100Ω                      S1 :Swich 开关 A :DC Current meter                S2 :Swich for protect of 直流电流计                            Current meter V :DC Voltage meter                直流电流计的保护开关 直流电压计                            CX :Testing Capacitor 测试电容	Dissipation factor 、Leakage current, see specification of this series. 损失角、泄漏电流请看该系列之规格说明.															
2.5	Temperature characteristics 高低温特性	<table border="1"> <thead> <tr> <th>STEP 步骤</th> <th>TEMPERATURE 温度(°C)</th> <th>STORAGE TIME 放置时间(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20 ±2</td> <td>30</td> </tr> <tr> <td>2</td> <td>下限温度(0/-3)</td> <td>120</td> </tr> <tr> <td>3</td> <td>20 ±2</td> <td>15</td> </tr> <tr> <td>4</td> <td>上限温度 ±2</td> <td>120</td> </tr> </tbody> </table> <p>Step 1. Measure the capacitance and impedance. 测试静电容量及阻抗(<math>Z_{20°C}</math>) . (   Z   ,120Hz ±10%)</p> <p>Step 2. Measure the impedance at thermal balance after 2 hours. 达到热平衡2小时后测试阻抗(<math>Z_r</math>) . (   Z   ,120Hz ±10%)</p> <p>Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours. 达到热平衡2小时后测试静电容量及漏电流 .</p>	STEP 步骤	TEMPERATURE 温度(°C)	STORAGE TIME 放置时间(min)	1	20 ±2	30	2	下限温度(0/-3)	120	3	20 ±2	15	4	上限温度 ±2	120	<p>Step 2. Impedance ratio (<math>Z_r/Z_{20°C}</math>) less than specified value. 阻抗比 :低于规定值 .</p> <p>Step 4 Capacitance change : within ± 20% of the initial measured value. 容量变化 : 初测值的±20%以内.</p> <p>Leakage current : Under 125 °C for 10 times specification values,105 °C for 8 times the specification values, 85 °C for 5 times the specification values 泄漏电漏: 125°C為規格值10倍以下, 105°C為為規格值8倍以下, 85°C為規格值5倍以下</p>
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4	上限温度 ±2	120																

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2.6	Surge test 浪涌(突波)试验	Rated surge voltage shall be applied (switch on) for 30±5 seconds and then shall be applied (switch off) with discharge for 5±0.5 min at room temperature .This cycle shall be repeated for 1000 cycles .Duration of one cycle is 6±0.5 minutes . 在常温下施加(合上开关)额定涌浪电压30±5秒,然后停止施加(断开开关)涌浪电压并且放电5±0.5分钟.这个循环要重复1000次.以6±0.5分钟为一个循环周期.	Capacitance change : Within ± 15% of the initial measured value. 容量变化: 初测值的 ±15%以内. Dissipation factor: Within initial specified value. 损失角:规定值以内. Leakage current: Within initial specified value. 泄漏电流:规定值以内.
2.7	MAXIMUM APPLICABLE RIPPLE CURRENT 高温纹波负荷试验	The maximum A.C.current having frequency of 120Hz (or 100KHz) The capacitors shall apply with rated DC voltage and maximum ripple current at Max. temperature ±2°C for X load life time.(The sum of the DC voltage plus the AC ripple voltage must not exceed the rated DC voltage) 在120Hz(or 100KHz)频率条件下,在额定最高温度寿命X小时下.电容器施加额定DC电压与最大纹波电流.(DC电压叠加AC纹波电压,不得超过DC额定电压) ( X : see specification of this series. 见该系列规格说明 . )	Standard of judgement is according to requirement of this series. 判定标准依该系列要求 .

### 3.Mechanical characteristics 机械特性:

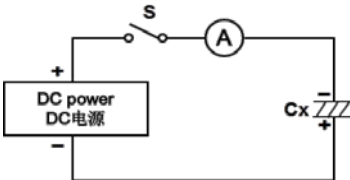
No.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格																				
3.1	Lead strength 端子强度	<p>(A).Tensile strength 拉伸强度:</p> <p>1).wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d(mm)</td> <td>0.35&lt;d≤0.5</td> <td>0.5&lt;d≤0.8</td> <td>0.8&lt;d≤1.25</td> </tr> <tr> <td>Load (Kgf)</td> <td>0.51</td> <td>1.0</td> <td>2.0</td> </tr> </table> <p>2).snap-in terminal 尖脚型 :</p> <table border="1"> <tr> <td>d (mm)</td> <td>snap-in terminal 尖脚端子</td> </tr> <tr> <td>load (Kg)</td> <td>2.0</td> </tr> </table> <p>The capacitor terminals to bear the load 10 seconds of the above-mentioned provisions, there can be no electrical or mechanical properties on the damage. 电容器各端子要承受上表规定的荷重10秒,不能有电气或机械特性上的损伤.</p> <p>(B).Bending strength 弯曲强度:</p> <p>wire lead terminal 导针型 :</p> <table border="1"> <tr> <td>d(mm)</td> <td>0.35&lt;d≤0.5</td> <td>0.5&lt;d≤0.8</td> <td>0.8&lt;d≤1.25</td> </tr> <tr> <td>Load (Kgf)</td> <td>0.25</td> <td>0.51</td> <td>1.0</td> </tr> </table> <p>Will test capacitance vertical fixed, applying the above-mentioned provisions to each terminal axial load, slowly turn capacitor by the vertical position to horizontal position, then rotate 180 ° in the opposite direction, back to the initial vertical position (about 5 s) the whole process.The capacitor performance cannot change and loss of the terminal can't have. 将测试电容垂直固定,给每一端子轴向施加上表规定荷重后,慢慢将电容器由竖直位置转至水平位置,然后反方向旋转180°后,再回到初始的垂直位置(整个过程约5S). 电容器性能不能有变化及端子不能有损伤.</p>	d(mm)	0.35<d≤0.5	0.5<d≤0.8	0.8<d≤1.25	Load (Kgf)	0.51	1.0	2.0	d (mm)	snap-in terminal 尖脚端子	load (Kg)	2.0	d(mm)	0.35<d≤0.5	0.5<d≤0.8	0.8<d≤1.25	Load (Kgf)	0.25	0.51	1.0	<p>When the capacitance is measured, there shall be no intermittent contacts,or open or short circuiting. 测试静电容量时,不能有接触不良,开路或短路。</p> <p>There shall be no such mechanical damage as terminal damage etc. 不能有如端子受损之类的机械特性上的损伤。</p>
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3.2	Vibration resistance 振动	Vibration frequency to evenly, cover a wide range of 10 Hz ~ 55 Hz, amplitude is 1.5 mm, in 1 minute to complete the cycle. The capacitor by terminal firmly fixed. The capacitors should be in three mutually perpendicular direction vibration, vibration for 2 hours in each direction. 振动频率要均匀,范围为10Hz~55 Hz,振幅为1.5mm,在1分钟内完成该循环. 电容器由端子牢固地固定. 电容器应在三个互相垂直的方向振动,每个方向振动 2 小时 .	Capacitance :no unsteady. 静电容量:稳定. Appearance: no abnormal. 外观:无异常 . Capacitance change : Within $\pm 5\%$ of the initial measured value. 容量变化:初测值的 $\pm 5\%$ 以内. Dissipation factor: Within initial specified value. 损失角:规定值以内. Leakage current: Within initial specified value. 泄漏电流:规定值以内.
3.3	Solderability 可焊性	The leads are dipped in the solder bath of Sn at $235 \pm 5$ °C for $2 \pm 0.5$ seconds . The dipping depth should be set at 1.5 ~ 2.0 mm. 端子浸没在 $245 \pm 5$ °C的锡焊液中 $2 \pm 0.5$ 秒,浸没深度设定为1.5~2.0mm .	The solder alloy shall cover the 90% or more of the dipped lead's area . 锡液要覆盖导针浸入表面积 的90% 以上 .

#### 4.Reliability 信赖性:



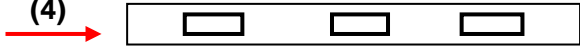
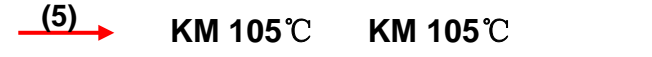

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4.1	Soldering heat resistance 耐焊接热	The leads immerse in the solder bath of Sn at $260 \pm 5$ °C for $10 \pm 1$ seconds until a distance of 1.5 ~ 2mm from the case . 导针在 $260 \pm 5$ °C 的锡 焊液中浸没至离本体 1.5 ~ 2 mm 的地方 $10 \pm 1$ 秒钟 .	No damage or leakage of electrolyte. 无损伤或电解液漏出. Capacitance change : Within $\pm 5\%$ of the initial measured value. 容量变化:初测值的 $\pm 5\%$ 以内. Dissipation factor: Within initial specified value. 损失角:规定值以内. Leakage current: Within initial specified value. 泄漏电流:规定值以内.
4.2	Damp heat ( steady state ) 稳态湿热	Subject the capacitors to $40 \pm 2$ °C and 90% to 95% relative humidity for 500+24/0 hours 电容器在 $40 \pm 2$ °C及相对湿度90%到95%的条件下贮存500(-0~+24)小时.	Capacitance change : Within $\pm 10\%$ of the initial measured value. 容量变化:初测值的 $\pm 10\%$ 以内. Dissipation factor: less than 120% of the initial specified 损失角:低于规定值的120% . Leakage current: Within initial specified value. 泄漏电流:规定值以内.

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.3	Load life 高温负荷	<p>After X hours continuous application of DC rated working voltage at Max. temperature <math>\pm 5^{\circ}\text{C}</math>. Measurements shall be performed after 8 hours exposed at room temperature . 在最高使用温度<math>\pm 5^{\circ}\text{C}</math>环境下,连续施加额定的DC工作电压 X 小时. 室温暴露8小时以上进行测试.</p> <p>(X:see specification of this series.见该系列规格说明.)</p>	<p>Standard of judgement is according to requirement of this series. 判定标准依该系列要求 .</p>
4.4	Shelf life 高温储存	<p>After storage for Y hours at temperature <math>\pm 5^{\circ}\text{C}</math> (See specification of this series) without voltage application, the measurements shall meet the following limits . Measurements shall be performed after exposed for 8 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes . 在目录书规定的温度环境中,不施加电压放置 Y 小时后按以下条件测试. 室温暴露8 小时以上,施加DC额定电压 Z 分钟后进行.</p> <p>(Y,Z :See specification of this series.见该系列规格说明)</p>	
4.5	Storage at low temperature 低温储存	<p>The capacitor shall be stored at <math>-40\pm 3^{\circ}\text{C}</math> temperature for 16 hours ,during which time no voltage shall be applied.And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more ,after which measurements shall be made . 电容器在<math>-40\pm 3^{\circ}\text{C}</math> 环境当中贮存16小时,其间不施加电压;之后,在标准大气压中露置16小时以上,然后进行测试.</p>	<p>Capacitance change : Within <math>\pm 10\%</math> of the initial measured value. 容量变化:初测值<math>\pm 10\%</math>以内. Dissipation factor: Within initial specified value. 损失角:规定值以内. Leakage current: Within initial specified value. 泄漏电流:规定值以内. Appearance :no abnormal. 外观: 无异常.</p>

NO.	ITEM 项目	TEST METHOD 测试方法	SPECIFICATION 规格
4.6	Pressure relief 防爆	<p>Reverse the following rules are applied electric current of DC working voltage 反向施加以下电流的DC工作电压.</p> <p>Where case size 外壳尺寸 ( D 直径 ) :  <math>D \leq 22.4\text{mm}</math> : 1 A max.  <math>D &gt; 22.4\text{mm}</math> : 10 A max.</p> <p>Note 注意:</p> <ol style="list-style-type: none"> <li>This requirement applies to capacitors with a diameter of 8 mm or more . 此要求适用于直径8mm或以上之电容器.</li> <li>When the pressure relief device does not open even 30 minutes after commencement of test ,the test may be ended . 测试30分钟后防爆装置仍不动作的,试验终止.</li> <li>The pressure relief device shall open in such a way as to avoid any danger of fire or explosion of capacitor elements ( terminal and metal foil etc ) or cover . 防爆装置必须动作,以防止发生火灾、爆炸或金属片飞溅.</li> </ol>	<p>DC test circuit 直流测试电路</p>  <p>S :Switch 开关  A :DC current meter  DC电流表  Cx :Testing capacitor  测试电容</p>

### 5. 外观Marking :

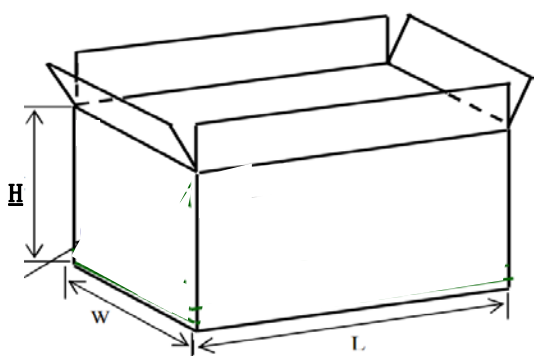
产品外套管印刷内容如下

序号	项目内容说明	图示
(1)	商标	
(2)	标称静电容量	
(3)	额定工作电压	
(4)	负极线标示	
(5)	系列和温度	
(6)	年份+周期(套管材质)	

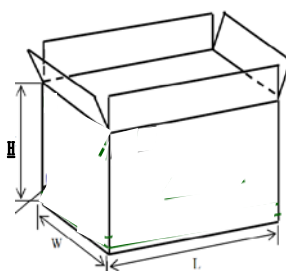
6.包装数量标准:

产品外形尺寸 D×L (mm)	小袋数量 (只/袋)	散装/切脚 (袋/内箱)	散装/切脚内箱 (KPCS)	散装/切脚大箱 (KPCS) ( KPCS )	备注
φ3*5	2000+3	25	50	100	
φ4*5-7、φ5*5	1000+2	50	50	100	
φ6.3*5、φ5*7	1000+2	30	30	60	
φ6.3*7、φ5*11/12	1000+2	25	25	50	
φ6.3*11、φ8*5	1000+1	20	20	40	
φ6.3*12	1000+1	16	16	32	
φ8*7	1000+1	18	18	36	
φ8*9	500+1	30	15	30	
φ8*11/12	500+1	25/25	12.5/12.5	25/25	
φ8*14	500+1	20	10	20	
φ8*16-20	500+1	16	8	16	
φ10*13	500+1	15	7.5	15	
φ10*15	400	15	6	12	
φ10*17-20	200	25	5	10	
φ10*25	200	20	4	8	
φ10*30	100	30	3	6	
φ13*17-21	200	15	3	6	
φ13*25	200	12	2.4	4.8	
φ13*30	100	20	2	4	
φ16*18-22	100	20	2	4	
φ16*25	100	15	1.5	3	
φ16*30	100	12	1.2	2.4	
φ16*35	50	20	1	2	
φ18*27	100	10	1	2	
φ18*30	50	15	0.75	1.5	
φ18*36	50	15	0.75	1.5	
φ18*40	50	10	0.5	1.5	
φ18*50	25	15	0.375	0.75	
φ22*30	50	10	0.5	1	
φ22*35	50	10	0.5	1	
φ22*40	50	10	0.5	1	
φ25*25	50	10	0.5	1	
φ25*30	50	10	0.5	1	

备注: 包装外箱L480mm\*W320mm\*H320mm  
内箱L300mm\*W230mm\*H300mm



外箱



内箱