

发行日期 Date:	2019年12月31日 DEC. 31, 2019
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# 产 品 规 格 书

## Product specification

产品名称： 铝电解电容器

Products Name: Aluminum Electrolytic capacitor

产品系列： CD281L 系列

Products Series: CD281L Series

南通江海电容器股份有限公司

Nantong Jianghai Capacitor Co.,Ltd

制 作 Designed	审 核 Checked	批 准 Approved
沙雪飞	丰 骏	丁继华

客户承认栏 User Recognition Bar	
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ELECTROLYTIC ALUMINUM CAPACITOR	APPROVAL NO:
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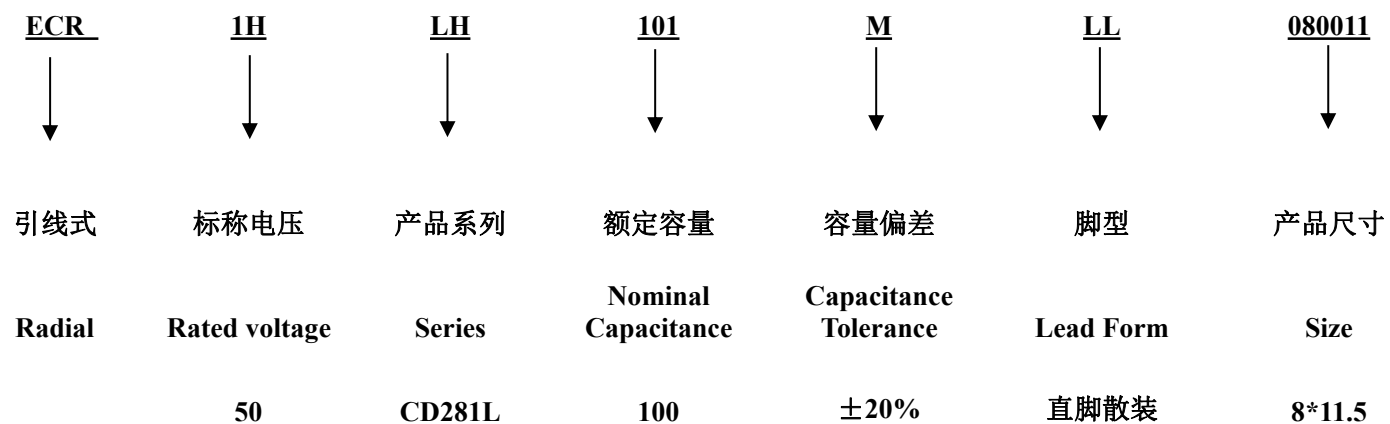
修改履历 RECORD OF REVISION

G/S PART NO:			MAKER SPEC:		
REV. NO.	REASON	CONTENTS	DATE OF APPROVAL	CHECKED	REMARKS
A 版	初版		2019-12-31	丰骏	

## 规格表 SPEC LIST FOR CD281L SERIES

客户部品号 Customer P/N	江海部品号 Jianghai P/N	电压 WV (V)	容量 CAP (uF) 120Hz	漏电流 LC (uA) 20℃ 2min	损耗 tan δ (%) 120Hz	阻抗 Impedance (Ω) 100KHz 20℃	纹波电流 Ripple current at 105℃100KHz (mArms)	负载寿命 Load Life (hrs)	尺寸 DxL mmxmm
	<b>ECR1HLH101MLL080011</b>	<b>50</b>	<b>100</b>	<b>100</b>	<b>10</b>	<b>0.2</b>	<b>360</b>	<b>7000</b>	<b>8*11.5</b>

部品号说明 Explanation of part number:



1. 适用范围 Adapt Range

本产品规格书适用于南通江海电容器有限公司 CD281L 型铝电解电容器产品。

This product specification is adapted to CD281L series Aluminum Electrolytic Capacitors produced by Nantong jianghai Capacitor Co.,Ltd

2. 使用温度范围 Operating Temperature Range:

-55~+105 °C

-55°C:最低下限温度 +105°C:最高上限温度

3. 浪涌电压 Surge voltage

工作电压 (V) Rated voltage	6.3	10	16	25	35	50	63	100
浪涌电压 (V) Surge voltage	7.2	13	20	32	44	63	79	125

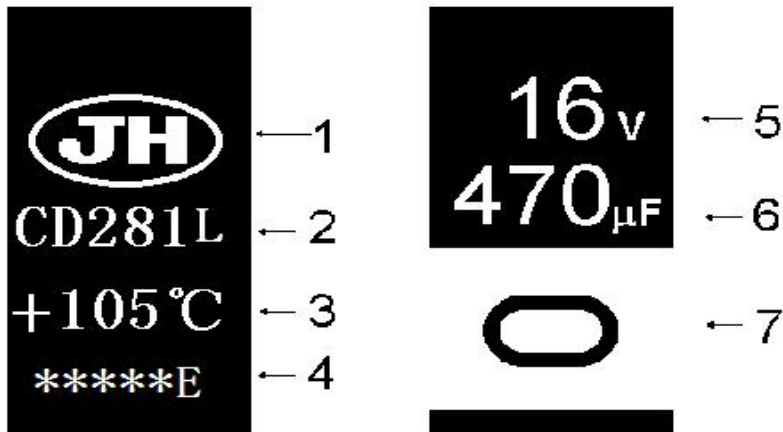
4.1 损耗 Dissipation Factor (20°C, 120HZ)

工作电压 (V) Rated voltage	6.3	10	16	25	35	50	63	100
损耗角正切值 Tan (%) MAX	22	19	16	14	12	10	9	8

4.2 静电容量范围 Capacitance Range

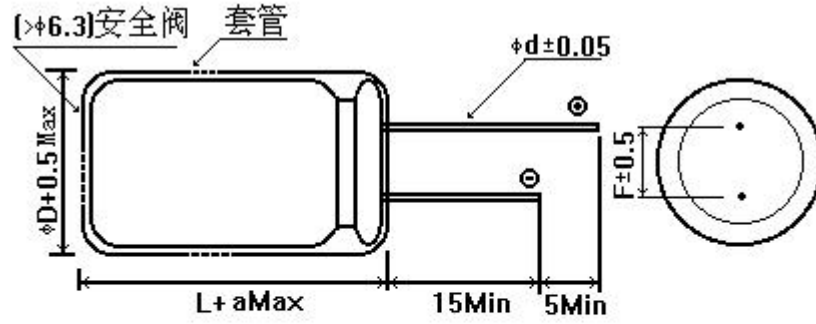
0.47uF - 15000uF

5. 表示 Marking



NO.	项 目 Item	NO.	项目 Item
1	商 标 Brand	5	额定电压 Rated voltage
2	产品系列 Products series	6	静电容量 Capacitance
3	上限温度: Max temperature	7	极 性 Polarity
4	年度标记 Year code		

6. 外形图 Dimensions



$\phi D$	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0		7.5	
$\phi d$	0.5		0.6			0.8	
a	1.5			2.0			

7. 纹波电流系数 Multiplier for ripple current

7.1 频率系数 Frequency Coefficients

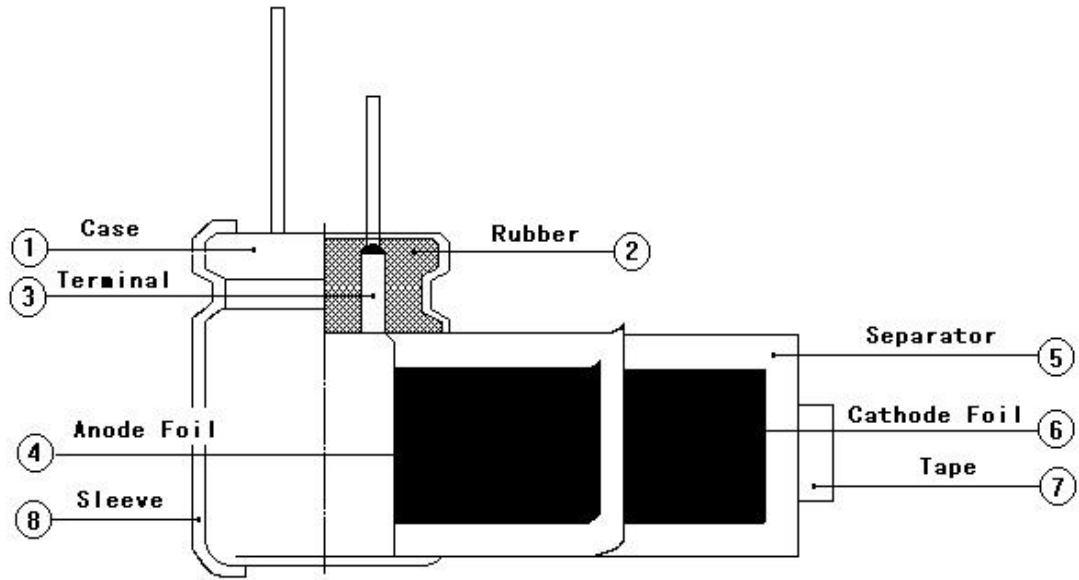
Rated Voltage (v)	Freq(Hz)	50.60	120	1K	10K	100K
	6.3~100	CV(uF.vv)				
0.47~4.7		--	0.4	0.68	0.78	1.0
5.6~47		--	0.5	0.76	0.87	1.0
56~270		--	0.7	0.85	0.93	1.0
330~1000		--	0.8	0.93	0.98	1.0
1200~15000	--	0.9	0.95	1.0	1.0	

7.2 温度系数 Temperature Coefficients

Temperature (°C)	+70	+85	+105
Factor	1.96	1.68	1.0

## 8. 构造图及材料表 (Frame drawing and Material list)

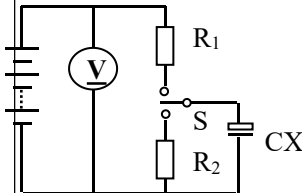
### 8.1 构造图

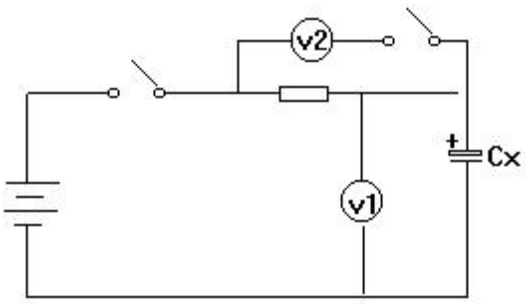


### 8.2 材料表 (Material table)

NO	构成部件 parts	材质 Material	供应商 Supply Factory	NO	构成部件 parts	材质 Material	供应商 Supply Factory
1	铝壳 Case	铝 Aluminum	临安奥星 通州新联	6	负极箔 Cathode Foil	铝 Aluminum	K-JCC, 佳信电子 吴江飞乐
2	橡皮塞 Rubber	合成橡胶 Synthetic rubber	浙江天台祥和 苏州毅丰 玉环鑫庄 上海小里机材	7	胶带 Tape	聚丙烯 Polypropylene	日东电工 湖州润科 杭州和联
3	引出线 Terminal	铝+CP线 Aluminum + CPwire	南通全用电子 南通南鑫电子	8	PET套管 Sleeve	聚对苯二甲酸 乙二醇酯 polyethylene terephthalate	苏州启联 顺鹏塑胶 嘉宾发
4	正极箔 Anode Foil	铝 Aluminum	JCC、KDK 海星电子, 华锋电子, 吴江飞乐	9	电解液 Electrolyte	有机溶剂 Organic Solvent	南通江海电 容器股份有 限公司
5	隔离纸 Separator	电解电容器纸 Electrolytic Capacitors paper	NKK 日本大福造纸 浙江凯恩				

9.性能特征:Specifications

NO	项 目 Items	条 件 Conditions	规 格 Specifications
9.1	最大允许纹波电流 Maximum permissible ripple current	温度 Temperature : 105±2℃ 电压: 直流电压值+交流电压峰值≤标称电压 . Voltage : DC. Voltage + peak ripple voltage ≤ Rated voltage	见规格表 Refer to spec. list
9.2	浪涌电压 Surge Voltage	<p>在下面规定的温度下,通过指定的浪涌电压,6.0分钟(充电30秒,放电5分30秒)为一周,往返1000回合,常温常湿下放置1-2小时达到热平衡状态测定满足</p> <p>The capacitor shall be subjected to 1000 cycles at a temperature specified below, each consisting of a charge period of 30±5s, followed by a discharge period of approx 5min. 30 s. And the capacitor shall be stored 1-2 hours under standard atmospheric conditions to obtain thermal stability , after which measurement shall be made</p> <p>应加电压: 见3项 Test voltage: see 3 温度: 15~30℃ Test Temperature : 15~30℃ 测试回路 Measurement circuit</p>  <p>R1: 串联保护电阻 (1KΩ) Protective series resistor (1KΩ) V: 直流电压表 DC Voltage R2: 放电电阻 Discharge resistor (1KΩ) S: 切换开关 Switch Cx: 待测电容器 Test Capacitor</p>	<p>漏电流: 不超过规定值 Leakage Current: Not more than the specified value</p> <p>容量变化: 初始值的±15%以内 Capacitance change: Within ± 15% of the initial value</p> <p>损耗角正切: 不超过规定值 Dissipation Factor : Not more than the specified value κ</p>
9.3	静电容量 (允许偏差) Capacitance (Tolerance)	<p>测试频率: 120 HZ , Measuring frequency : 120 HZ 测试电压: 0.5 Vrms or less Measuring voltage : 0.5Vrms or less DC bias voltage : +1.5~ 2.0 V DC</p>	<p>静电容量允许偏差 ±20% Capacitance Tolerance ±20%</p>
9.4	损耗角正切(tg δ) Tangant of angle	<p>测试条件与静电容量相同 Measurement shall be made under the same conditions as those given for the measurement of capacitance</p>	<p>见4项 Refer to table 4.</p>

<p>9.5</p>	<p>漏电流 Leakage Current</p>	<p>电容器接 <math>1000 \pm 10 \Omega</math> 的保护电阻施加电压 1 或 2 分钟后的测试电流。 The rated voltage shall be applied across the capacitor and its protective resistor which shall be <math>1000 \pm 10 \Omega</math>. The leakage Current shall then be measured after an electrocution period of 2min. The leakage current shall be calculated by the following equation. 漏电流: <math>(I) = E/R_s</math> Leakage current: E: 直流电压表的电压值 Voltage measured with DC voltmeter <math>R_s</math>: 标准电阻的电阻值 Resistance of the protective resistor 测定电路 measurement circuit</p>  <p>电压将下法 voltage drop method) <math>R_s</math>: 标准电阻的电阻值 (<math>1000 \pm 10 \Omega</math>) protective resistor 直流电压表或电子电压表 DC voltmeter or electronic voltmeter S1: 开关 switch S2: 电压表保护用变换开关 Protective switch for a voltmeter CX: 待测电容器 test capacitor</p>	<p>6.3--100WV: 0.02CV 或 3uA 以下 (2 分钟取大值) Less than 0.02CV or 3uA whichever larger (2min)</p> <p>C: 标称静容量 (uF ) Capacitance V: 额定电压 (V) Rated voltage</p>
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NO.	项目 Items	条 件 Conditions																													
9.6	高低温特性 Characteristic at High and low temperature	<p>电容器根据下表的次序处理            The capacitor shall be subjected in turn to the procedures specified below.</p> <table border="1" data-bbox="651 488 1398 815"> <thead> <tr> <th>阶段 Step</th> <th>温 度 Temperature</th> <th>时 间 Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20±2℃</td> <td>热平衡状态</td> </tr> <tr> <td>2</td> <td>-55(-40)±3℃</td> <td>*2 hours</td> </tr> <tr> <td>3</td> <td>20±2℃</td> <td>热平衡状态</td> </tr> <tr> <td>4</td> <td>105±2℃</td> <td>2* hours</td> </tr> <tr> <td>5</td> <td>20±2℃</td> <td>热平衡状态</td> </tr> </tbody> </table> <p>* 电容器放置在每一温度下，待阻抗或电容量稳定后方可测试。            * The capacitor should be stored at each temperature until measured impedance or capacitance are stabilized.</p> <table border="1" data-bbox="651 972 1398 1366"> <thead> <tr> <th>阶段 Step</th> <th>阻抗比 (对阶段 1) Impedance ratio</th> <th>见 9.10 项 refer to No 9.10</th> </tr> </thead> <tbody> <tr> <td>阶段 2 Step 2</td> <td>静电容量变化率 (对阶段 1) Change in capacitance</td> <td>静电 -20~0% within -20~0%</td> </tr> <tr> <td rowspan="2">阶段 4 Step 4</td> <td>静电容量变化率 (对阶段 1) Change in capacitance</td> <td>静电 0~+20% within 0~+20% of step 1</td> </tr> <tr> <td>漏电流 Leakage Current</td> <td>规定值 5 倍以下 Less than 500% of the specified value</td> </tr> </tbody> </table> <p>阶段 1: 测定容量, 损耗和阻抗值。            Step 1: Capacitance, Dissipation Factor and impedance shall be measured.            阶段 2: 放置 2 小时后, 达到热平衡状态再测。            Step 2: After the capacitor being stored for 2 hours, Capacitance, Dissipation Factor and impedance shall be Measured. The measurement shall be made at thermal stability.            阶段 4: 放置 2 小时后, 达到热平衡状态再测。            Step 4: After the capacitor being stored for 2 hours, Capacitance, Dissipation Factor and impedance shall be Measured. The measurement shall be made at thermal stability.</p>	阶段 Step	温 度 Temperature	时 间 Time	1	20±2℃	热平衡状态	2	-55(-40)±3℃	*2 hours	3	20±2℃	热平衡状态	4	105±2℃	2* hours	5	20±2℃	热平衡状态	阶段 Step	阻抗比 (对阶段 1) Impedance ratio	见 9.10 项 refer to No 9.10	阶段 2 Step 2	静电容量变化率 (对阶段 1) Change in capacitance	静电 -20~0% within -20~0%	阶段 4 Step 4	静电容量变化率 (对阶段 1) Change in capacitance	静电 0~+20% within 0~+20% of step 1	漏电流 Leakage Current	规定值 5 倍以下 Less than 500% of the specified value
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No.	项目 Items	条件 Conditions	规格 Specifications														
9.7	压力释放 Pressure relief	<p>一. 交流试验 A.C. test            施加电压值: Applied voltage            交流电压不超过 0.7 倍的额定直流电压或 250V 交流电压, 两者取小值。            A.C. voltage not exceeding 0.7 times the rated Direct voltage or 250V AC whichever is the lower.            频率 Frequency : 50 HZ 或 60 HZ            串联电阻参照下表 Series resistor refer to the table below.</p> <table border="1" data-bbox="592 645 1099 927"> <thead> <tr> <th>Capacitance</th> <th>Series resistor</th> </tr> </thead> <tbody> <tr> <td>C ≤ 1 uF</td> <td>1000±100Ω</td> </tr> <tr> <td>1 uF &lt; C ≤ 10 uF</td> <td>100±10Ω</td> </tr> <tr> <td>10 uF &lt; C ≤ 100 uF</td> <td>10±1Ω</td> </tr> <tr> <td>100 uF &lt; C ≤ 1000 uF</td> <td>1±0.1Ω</td> </tr> <tr> <td>1000 uF &lt; C ≤ 10000 uF</td> <td>0.1±0.01Ω</td> </tr> <tr> <td>10000 uF &lt; C</td> <td>*</td> </tr> </tbody> </table> <p>* 电阻相当于试验频率阻抗的 1/2            Resistance is equivalent to a half of Impedance by test frequency.</p> <p>二. 直流试验 D.C. test            施加同额定电压相等的反电压, 限制电流为 1A。            Reversed polarity D.C. rated voltage shall be applied to the capacitor, the DC current shall be limited to be 1A..</p> <p>注: 1、该规定适用于铝壳直径 6mm 以上的电容器。            2、试验开始 30 Min 后, 防爆装置不动作时, 停止试验。            3、上述两种试验方法选其中一种进行试验。</p> <p>Note:            1. This requirement applies to capacitors with a diameter of 6mm or more.            2. When the pressure relief device does not open even 30 minutes after commencement of this test, the test may be ended.            3. Either of the above test method could be selected in the test.</p>	Capacitance	Series resistor	C ≤ 1 uF	1000±100Ω	1 uF < C ≤ 10 uF	100±10Ω	10 uF < C ≤ 100 uF	10±1Ω	100 uF < C ≤ 1000 uF	1±0.1Ω	1000 uF < C ≤ 10000 uF	0.1±0.01Ω	10000 uF < C	*	<p>防爆装置释放时, 无燃烧、无爆炸或铝壳和封口材料的分离。            The pressure relief device shall open in such a way as to avoid any danger of fire or explosion of Capacitor elements .</p>
Capacitance	Series resistor																
C ≤ 1 uF	1000±100Ω																
1 uF < C ≤ 10 uF	100±10Ω																
10 uF < C ≤ 100 uF	10±1Ω																
100 uF < C ≤ 1000 uF	1±0.1Ω																
1000 uF < C ≤ 10000 uF	0.1±0.01Ω																
10000 uF < C	*																

No.	项目 Items	条 件 Conditions	规 格 Specifications																				
9.8	高温负荷 Load life	<p>在 105±2℃ 的恒温箱内，电容器施加最大允许纹波电流，施加直流电压和交流电压的峰值的和要等于额定电压，按照下表规定的时间进行试验，试验结束后，在标准状态下放置 16 小时后进行测试。</p> <p>The capacitor shall be placed in a circulating air oven at an ambient temperature of 105±2℃。 It must not be subjected to direct radiation from heating elements. DC voltage and the rated ripple current shown in table shall be applied for a period of time shown as below. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitor. It shall be subjected to standard atmospheric for 16 hours, after which measurement shall be made.</p> <table border="1" data-bbox="512 880 1011 1021"> <tr> <td></td> <td>6.3~10V</td> <td>16~100V</td> </tr> <tr> <td>φ 5~6.3</td> <td>4000h</td> <td>5000 h</td> </tr> <tr> <td>φ 8~10</td> <td>6000h</td> <td>7000h</td> </tr> <tr> <td>φ 12.5~18</td> <td>8000h</td> <td>10000h</td> </tr> </table>		6.3~10V	16~100V	φ 5~6.3	4000h	5000 h	φ 8~10	6000h	7000h	φ 12.5~18	8000h	10000h	<p>漏电流：不超过规定值 容量变化：初测值的±25 % 以内 损耗角正切：不超过规定值的 2 倍</p> <p>Leakage current : ≤ Initial specified value Capacitance change : Within ±25 % of initial value dissipation factor : ≤ 200% of initial specified value</p>								
	6.3~10V	16~100V																					
φ 5~6.3	4000h	5000 h																					
φ 8~10	6000h	7000h																					
φ 12.5~18	8000h	10000h																					
9.9	高温存储 Shelf life	<p>温度 Temp : 105±2℃ 时间 Time : 1000+36 小时 电压处理：在常温下电容器串联保护电阻（1KΩ），加额定电压 30 分钟，放电，常温放置 24- 48 小时后测量。</p> <p>Condition : The DC rated voltage shall be applied across the capacitor and its protective resistor (1KΩ) for 30 minutes, The capacitor shall then be stored under standard Atmospheric conditions for 24 - 48 hours.</p>	<p>漏电流：不超过规定值 容量变化：初测值的±20 % 以内 损耗角正切：不超过规定值的 2 倍</p> <p>Leakage current : ≤ Initial specified value Capacitance change : Within ±20 % of initial value dissipation factor : ≤ 200% of initial specified value</p>																				
9.10	阻抗特性 Impedance stability	<table border="1" data-bbox="528 1648 1339 1785"> <tr> <td colspan="2">Rated 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 (120Hz)</td> <td>Z -55℃/+20℃</td> <td colspan="8">3</td> </tr> </table>	Rated voltage ( V )		6.3	10	16	25	35	50	63	100	Impedance (120Hz)	Z -55℃/+20℃	3								
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No.	项目 Items	条 件 Conditions	规 格 Specifications
9.11	可焊性 Solder ability	浸渍时间 Solder press time: $2 \pm 0.5$ s 焊接温度 Solder temperature: $245 \pm 5$ °C	浸渍面积 90%以上附着 At least 90% of Circumferential surface of the dipped portion of termination shall be covered with new solder
9.12	耐焊接热 Resistance to soldering heat	温度: $260 \pm 5$ °C Test Temperature: $260 \pm 5$ °C 时间: $10 \pm 1$ s Test time: $10 \pm 1$ s	漏电流: 不超过规定值 Leakage Current :Not more than the specified value 电容量变化: 初测值的 $\pm 10\%$ 以内 Capacitance Change :within $\pm 10\%$ of the initial value 损耗角正切: 不超过规定值 Dissipation Factor :Not More than the specified value 外观 Appearance :无明
9.13	耐湿性 Resistance of damp heat	温度: $40 \pm 2$ °C Test Temperature : $40 \pm 2$ °C 湿度: 90-95% Rh Relative Humidity: 90-95%Rh 时间: $240 \pm 8$ hrs 试验后常温放置 24-48 小时 To expose in the atmospheric condition for 24to 48 hours after completion of test	漏电流: 不超过规定值 Leakage Current :Not more than the specified value 电容量变化: 初测值的 $\pm 10\%$ 以内 Capacitance Change :within $\pm 10\%$ of the initial value 损耗角正切; 不超过规定值 DISSIPATION Factor :Not more than the specified value 外观 Appearance :无明显异常 No remarkable abnormality

No.	项目 Items		条 件 Conditions			规 格 Specifications
9.14	耐振性 Resistance to vibration		频率: 10-55-10 HZ/分 Frequency :From 10 to 55 HZ and return to 10 HZ, shall be transferred in 1 Min Total Amplitude: 1.5 mm 条件: X. Y. Z 方向各 2 小时 Direction and duration of vibration :3 orthogonal directions mutually each for 2 hours Total 6 hours .			静电容量测试时无接触不良, 断线及短路, 端子无机械损伤 Capacitance :During the test ,measured value to be stabilized (when measured several times within 30 min before completion of test )Appearance :No remarkable abnormality 静电容量变化: 初始值的±5%以内 Capacitance change: Within ± 5% of the initial value 外观无明显异常 No remarkable abnormality
9.15	耐溶剂性 Resisting Solvent		溶剂: 异丙醇 Solvent :Isopropyl alcohol 温度: 20-25℃ Temperature: 20-25℃ 时间: 30±5s Time : 30±5s			外观: 无显著异常 Appearance :No remarkable abnormality
9.16	端子强度 Terminal Strength	拉伸度 Tensile test intensity	线径 Diameter of terminal (mm)	拉伸力 Tensile Strength (N)	维持时间 continued time	测定静电容量时, 无接触不良, 开路和短路现象, 另外无机械损伤和端子损伤。 When the capacitance is measured ,there shall be no intermittent contacts or open –or short –ciruiting . There shall be no such mechanical damage as terminal damage etc.
			0.3<d≤0.5	5	10±1 sec	
			0.5<d≤0.8	10		
		0.8<d≤1.25	20			
弯曲强度 winding intensity	2 回合 2 bends					
	线径 Diameter of terminal (mm)	弯曲力 Tensile Strength (N)	锥质量 Awl quality			
	0.3<d≤0.5	2.5	0.25 kg			
0.5<d≤0.8	5	0.51 kg				
0.8<d≤1.25	10	1.0 kg				

10. 编带 Lead Taping



Part Number System

Taping Dimensions and Code

Fig 1

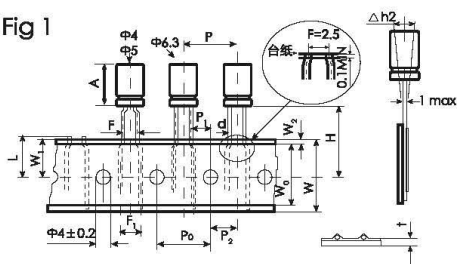


Fig 2

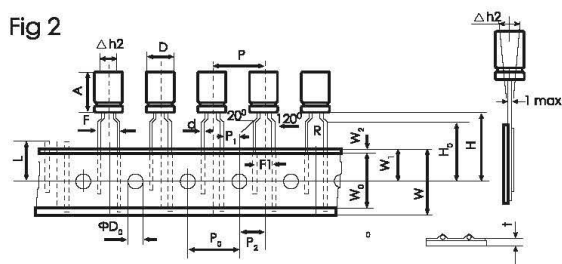


Fig 3

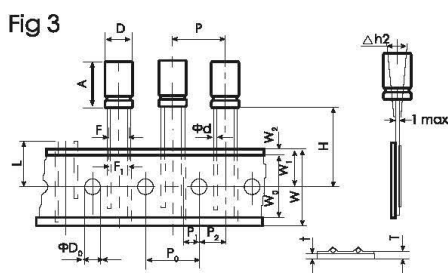


Fig 4

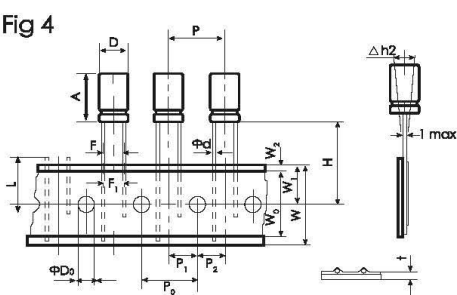
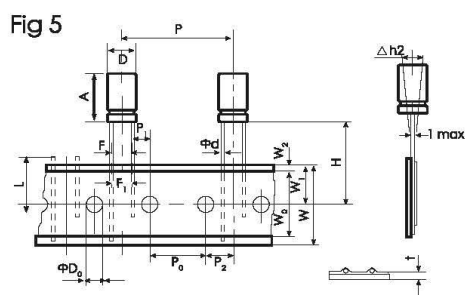


Fig 5



Unit: mm

Item	ΦD	A	Φd	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	H0	L	ΦD0	Δh2	t	Fig.	Taping Code
tol.	+0.5 max		± 0.05	± 1.0	± 0.2	± 0.5	± 1.0	+0.8 -0.2	± 1.0	± 0.5	min	± 0.5	max	+0.75 -0.5	± 0.5	max	± 0.5	max	± 0.2		
Nominal	4	7 (+1.0)	0.45	12.7	12.7	5.1	6.35	2.5	3.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85	5	5	17.5					16.0	2					FB	
	5	7 (+1.0)	0.45	12.7	12.7	5.1	6.35	2.5	3.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85	5	5	17.5					16.0	2					FB	
	6.3	11.5 (+1.5)	0.5	12.7	12.7	5.1	6.35	2.5	3.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85	5	5	-					16.0	2					FB	
	8	14 (+1.5)	0.6	12.7	12.7	4.6	6.35	3.5	3.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	3	FA
						3.85	5	5	20.0					16.0	2					FB	
	10	20-25 (+2.0)	0.6	15	15	5.0	7.5	5	5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	4	FA
						3.85	6.35	5	20.0					16.0	2					FB	
	12.5	20-25 (+2.0)	0.6	25.4	12.7	3.85	6.35	7.5	7.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	4	FA
						3.85	6.35	7.5	7.5					18.5	-					5	FD
16	20-25.5 (+2.0)	0.8	30	15	3.75	7.5	7.5	7.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	5	FD	

11. 成型 Lead Forming (unit: mm)

# Part Number System



## Lead Cutting and Forming Code

Unit: mm

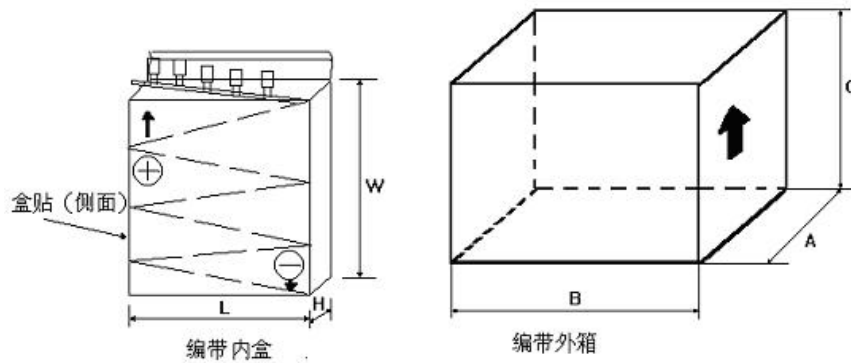
<p><b>FM(<math>\Phi 4\sim\Phi 8</math>)</b></p>	<p><b>FC(<math>\Phi 4\sim\Phi 8</math>)</b></p>
<p><b>MC(<math>\Phi 10\sim\Phi 20</math>)</b></p>	<p><b>CC(<math>\Phi 4\sim\Phi 20</math>)</b></p> <p>L: 4.5±0.5</p>
<p><b>WS(<math>\Phi 10\sim\Phi 20</math>)</b></p> <p>L: 3.7±0.3 h: 3.0±0.5 P: Lead Pitch</p>	<p><b>WX(<math>\Phi 10\sim\Phi 20</math>)</b></p> <p>L: 3.7±0.3 h: 3.0±0.5 P: Lead Pitch</p>
<p><b>KS(<math>\Phi 18\sim\Phi 20</math>)</b></p> <p>A: 3.7±0.5 E: 2.7±0.5 C: 2.2±0.5 F: Lead Pitch H: 3.0±0.5</p>	<p><b>KX(<math>\Phi 18\sim\Phi 20</math>)</b></p> <p>A: 3.7±0.5 E: 2.7±0.5 C: 2.2±0.5 F: Lead Pitch H: 3.0±0.5</p>
<p><b>ES(<math>\Phi 10\sim\Phi 12.5</math>)</b></p> <p>h1: 11±0.5 h2: 6±0.5 L: 0.4±0.3 P: Lead Pitch</p>	<p><b>EX(<math>\Phi 10\sim\Phi 12.5</math>)</b></p> <p>h1: 11±0.5 h2: 6±0.5 L: 0.4±0.3 P: Lead Pitch</p>

12.包装 packing

12.1 编带包装 Taping packing

12.1.1 内外盒尺寸及数量 Size and Quantity of inner box and outer box

$\phi D \times L$	内盒 inner box				外盒 outer box			
	$W \pm 5$	$L \pm 5$	$H \pm 3$	Quantity (PCS)	$A \pm 5$	$B \pm 5$	$C \pm 3$	Quantity (PCS)
4×7	230	330	45	2500	345	500	250	25000
5×7	230	330	45	2000	345	500	250	20000
6.3×7	230	330	45	1500	345	500	250	15000
8×7	245	330	44	1000	350	520	270	10000
8×9	245	330	44	1000	350	520	270	10000
5×11.5	230	330	45	2000	345	500	250	20000
5×15	175	340	55	1500	360	615	200	15000
6.3×11.5	230	330	45	1500	345	500	250	15000
6.3×14	220	330	50	1500	350	480	270	15000
6.3×15	220	330	50	1500	350	480	270	15000
8×11.5	245	330	50	1000	345	540	270	10000
8×12	245	330	50	1000	345	540	270	10000
8×14	245	330	50	1000	345	540	270	10000
8×15	190	340	58	800	356	408	260	6400
8×16	190	340	58	800	356	408	260	6400
8×20	190	340	58	800	356	408	260	6400
10×12.5	190	340	50	500	356	408	225	4000
10×16	190	340	50	500	356	408	225	4000
10×20	190	340	58	500	356	408	260	4000
10×25	190	340	58	500	356	408	260	4000
10×30	190	340	68	500	356	408	295	4000
12.5×20	220	325	62	400	235	340	335	2000
12.5×25	220	325	62	400	235	340	335	2000
12.5×30	225	345	63	500	240	358	270	2000
16×20	225	345	63	250	240	358	270	1000
16×25	225	345	63	250	240	358	270	1000
16×30	218	345	68	250	230	358	295	1000
16×31.5	218	345	68	250	230	358	295	1000
18×35.5	275	345	73	250	290	358	330	1000
18×36	275	345	73	250	290	358	330	1000
18×40	275	345	78	250	290	358	330	1000



Inner box for taping products

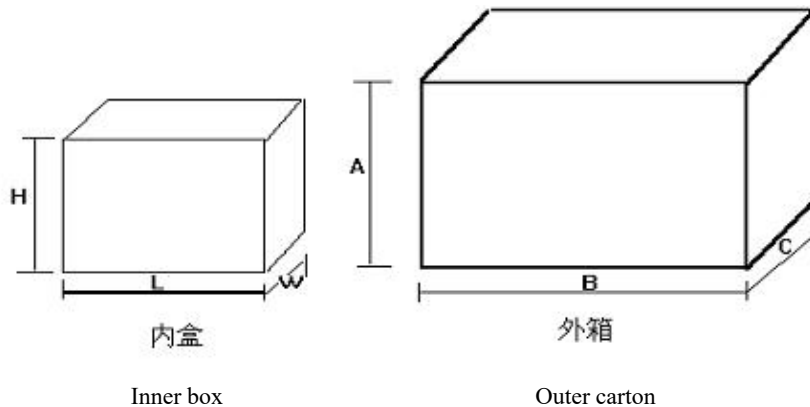
outer box



12.2 引线式长脚及成型产品散式包装 long Lead and forming products Packing

12.2.1 内外盒尺寸及数量 Size and Quantity of inbox and outbox

φD×L	内盒 inbox				外盒 outbox			
	L±5	W±5	H±3	Quantity (PCS)	A±5	B±5	C±3	Quantity (PCS)
4×7	280	210	145	Long lead:5000 Lead Cut and forming :10000	310	445	295	Long lead:20000 Lead Cut and forming :40000
5×7	280	210	145		310	445	295	
6.3×7	280	210	145		310	445	295	
5×11.5	280	210	145		310	445	295	
5×15	280	210	145					
8×7	280	210	145	5000	310	445	295	20000
8×9	280	210	145		310	445	295	
6.3×11.5	280	210	145		310	445	295	
6.3×15	280	210	145		310	445	295	
8×11.5	280	210	145	2500	310	445	295	10000
8×12	280	210	145		310	445	295	
8×14	280	210	145		310	445	295	
8×16	280	210	145		310	445	295	
8×20	280	210	145		310	445	295	
10×12.5	280	210	145		310	445	295	
10×16	280	210	145	2000	310	445	295	8000
10×20	280	210	145	1000	310	445	295	4000
10×30	280	210	145		310	445	295	
12.5×20	280	210	145		310	445	295	
12.5×25	280	210	145		310	445	295	
12.5×30	280	210	145	500	310	445	295	2000
12.5×35	280	210	145		310	445	295	
16×20	280	210	145		310	445	295	
16×25	280	210	145		310	445	295	
16×30	280	210	145		310	445	295	
18×18	280	210	145		310	445	295	
18×20	280	210	145		310	445	295	
18×25	280	210	145		310	445	295	
16×31.5	280	210	145	500	310	445	295	2000
16×35	280	210	145	Long lead:400 Lead Cut and forming :500	310	445	295	Long lead:1600 Lead Cut and forming :2000
16×40	280	210	145		310	445	295	
18×31.5	280	210	145	250	310	445	295	1000
18×35.5/36	280	210	145		310	445	295	
18×40	280	210	145		310	445	295	
18×45	280	210	145		310	445	295	
20×41	280	210	145	250	310	445	295	1000
22×40	280	210	145	150	310	445	295	600
22×35	280	210	145		310	445	295	
25×40	280	210	145		310	445	295	



12.3 引线式出口长脚产品排放式包装 long Lead export product packing

12.3.1 内外盒尺寸及数量 Size and Quantity of inner box and outer box

φD×L	内盒 inbox				外盒 outbox			
	L±5	W±5	H±3	Quantity	B±5	C±5	A±3	Quantity

### 13 保管 Storage

#### 13.1 保管条件 Storage condition

温度范围： 5~35℃， Temp range: 5~35℃

湿度范围： 相对湿度 75%以下 Humidity range: Under relative humidity 75%.

#### 13.2 保管期限 Storage Term

我司出库后 2 年。 2years after delivered.

#### 13.1 超期处理 (The handling method for products exceeding the term of validity)

超期后一般漏电流会上升，在使用前进行电压处理。Leakage current of the parts that have been stored for more than 2 year may increase. If leakage current has increased, please perform a voltage treatment using 1 k resistor.

## 满足欧盟 RoHS 指令规定标准 RoHS Statement

一. 我公司目前生产的产品已经满足欧盟 RoHS 指令规定的标准，具体江海禁用限用物质标准如下：

Jianghai products can meet standards of RoHS directive for each substance, the details are as below:

序号	禁用物质名称	最大含量 标准 PPM 或 mg/kg	备注
1	Cadmium and -compounds (镉及其化合物)	5	
2	Mercury and -compounds (汞及其化合物)	2	
3	Pb and compounds (铅及其化合物)	90	
4	Cr VI (六价铬)	75	
5	PBBEs, poly brominated biphenyl ethers (聚溴化苯醚) /PBDE	10	
6	PBBs, poly brominated biphenyl (聚溴化苯)	10	
7	PCBs, poly chlorinated biphenyl (聚氯化苯)	10	
8	PCTs, poly chlorinated terphenyls (聚氯烃)	10	
9	PCP, Pentachlorophenol (五氯酚)	10	
10	All types Asbestos (所有类型石棉)	10	
11	CFCS, Chlorofluorocarbons (氟氯化碳)	0	
12	HCFCs, Hydrogenated chlorofluorocarbons (加氢氟氯化碳)	0	
13	CHCs, Chlorinated hydrocarbons (氯烃化合物)	0	
对于所供产品的包装材料还需满足下列标准：			
14	Cadmium, Mercury, Lead and Chromium VI (镉、汞、铅和铬的总和)	100	参考 94/62/EC
15	PVC and PVC blends (PVC 和 PVC 混合物)	1000	
补充要求： 此标准未列明的其它重金属和化学物质含量标准以各个国家为准；			

\* 欧盟 Rohs 指令规定的豁免不在上面标准之内。Substances exempted from RoHS instruction are not concluded in the requirements listed above.

\* 环保物料定义：满足上述标准，并且已经无铅化；Definition of environment protective material: the material shall meet the standard listed above, and no lead contained.

\* 参考文件：94/62/EC(包装材料与包装废气物指令)、2002/95/EC(Rohs 指令)  
91/157/EEC(电池及蓄电池标准)、91/338/EEC(镉含量指令)  
EN71-3(欧盟玩具重金属标准)

Reference document: 94/62/EC, 2002/95/EC, 91/157/EEC, 91/338/EEC, EN71-3

二. 本公司符合欧盟 ROHS 指令的产品在电性能、尺寸方面没有任何改变，在焊接工艺方面没有任何要求，贵公司可以继续采用原有含铅焊接工艺，Jianghai product complied with RoHS directives have

no change in electric performances and dimension, no additional requirements are needed for soldering technology, and the previous soldering technology are applicable for the lead free products.

三. 对于无铅焊接工艺, 耐焊接温度为:  $260\pm 5^{\circ}\text{C}$  、 焊接时间为10秒。Technology for lead free product:soldering temperature:  $260\pm 5^{\circ}\text{C}$ ,soldering duration:10s.