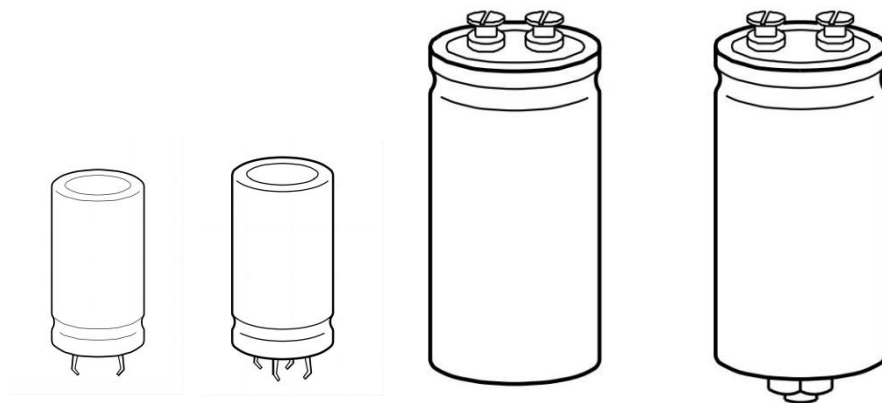


铝电解电容器

Aluminum Electrolytic Capacitors



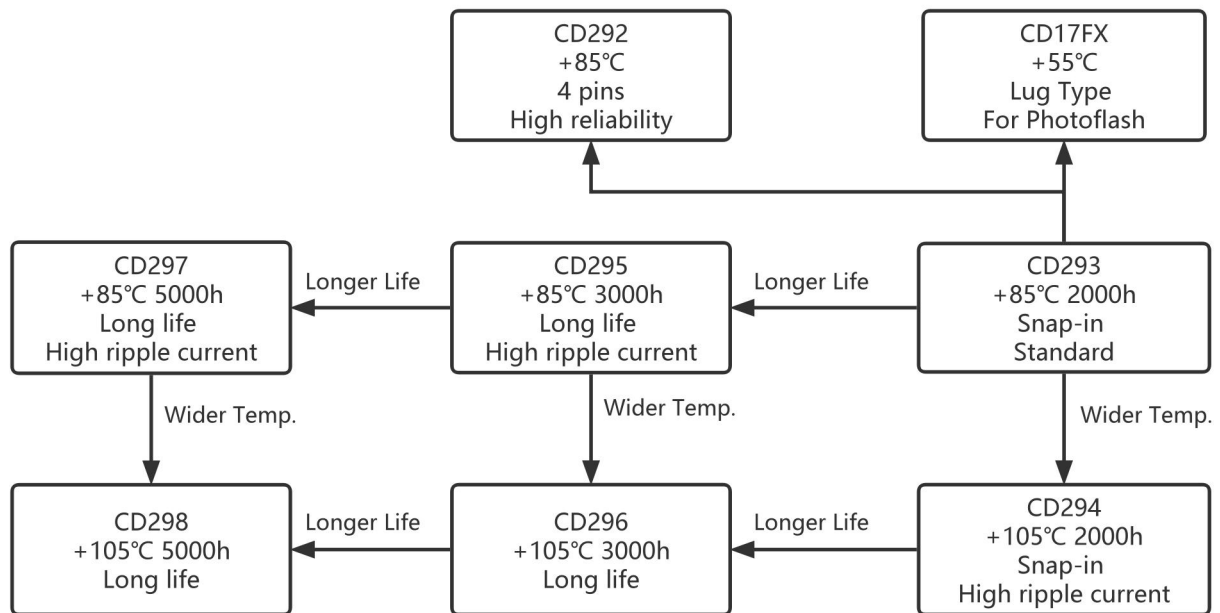
南通华裕电子有限公司

NANTONG HUAYU ELECTRONICS CO.,LTD.

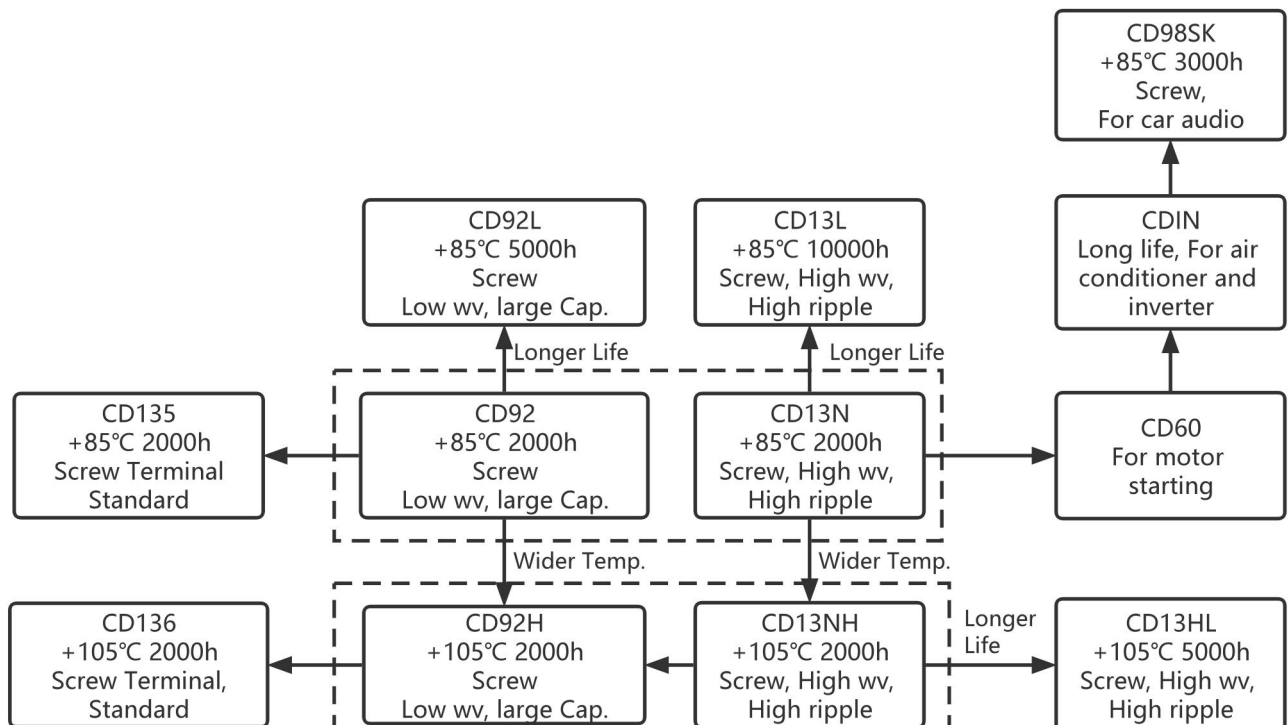
Terminal 引脚	Series 型号	Feature 特性	Load Life 寿命/H	Temp.°C 温度范围	Capacitance 容量范围/μF	Voltage/V 电压范围	Page 页码
Snap-in Lug 焊针型 焊片型	CD292	High Reliability, 4 pins 高可靠性, 四脚焊针	2000	-40 ~ +85	220 - 100,000	10 - 450	12
	CD293	Standard, 85°C 85 度标准品	2000	-40 - +85	100 - 100,000	10 - 500	14
	CD294	High Ripple Current, Wide Temp. 高纹波电流, 宽温度	2000	-40 ~ +105	100 - 100,000	16 - 500	17
	CD295	Long Life 长寿命	3000	-40 ~ +85	39 - 22,000	16 - 450	20
	CD296	Long Life, Wide Temp. 长寿命, 宽温度	3000	-40 ~ +105	68 - 47,000	16 - 450	22
	CD297	High Ripple Current, Long Life 高纹波电压, 长寿命	5000	-40 ~ +85	68 - 22,000	16 - 450	25
	CD298	Long Life ,Wide Temp. 长寿命, 宽温度	5000	-40 ~ +105	68 - 56,000	16 - 450	28
	CD17FX	For photo flash 闪光灯用	5000 times	-20 ~ +55	150 - 1500	330360	31
Screw 螺栓型	CD135	Standard, Wide voltage 标准品, 电压范围广	2000	-25 ~ +85	1000uF - 2.5F	10 - 500	33
	CD136	Wide Temp. Wide voltage 宽温度, 电压范围广	2000	-25 ~ +105	1000uF - 0.68F	25 - 500	36
	CD92	Low Voltage, Large Capacity, Low Loss, High Ripple Current 低电压,大容量,低损 耗,高纹波电流	2000	-40 ~ +85	2200 - 470,000	10 - 100	39
	CD92H	Low WV, Large Capacity, Low Loss, High ripple, Wide Temp.低压大容量,低损耗,高 纹波,宽温度	2000	-40 ~ +105	2200~470,000	10 - 100	39
	CD92L	Long Life, High Ripple Current, Extremely Low Impedance. 长寿命, 高纹波, 极低阻 抗	5000	-40 ~ +85	1000~220,000	10 - 100	41
	CD13N	Medium and High Voltage, Large Capacitance, High Ripple Current 中高 压, 大容量, 高纹波	2000	-25 ~ +85	220~18,000	160 - 500	43
	CD13NH	High Ripple Current, Wide Temp. 高纹波电流, 宽温度	2000	-25 ~ +105	270 - 39,000	160 - 500	45
	CD13HL	Long Life, Wide Temp. 长寿命, 宽温度	5000	-25 ~ +105	1000 - 15,000	350 - 500	47
	CD13L	Long Life, High Ripple Current 长寿命, 高纹波	10000	-25 ~ +85	100 - 18,000	350 - 500	49
	CD98SK	For Car Audio 汽车音响用	3000	-40 ~ +85	0.5F - 2F	16,20,25	51

The specific capacitance and case size are available on request.特殊容量和尺寸可按需定制

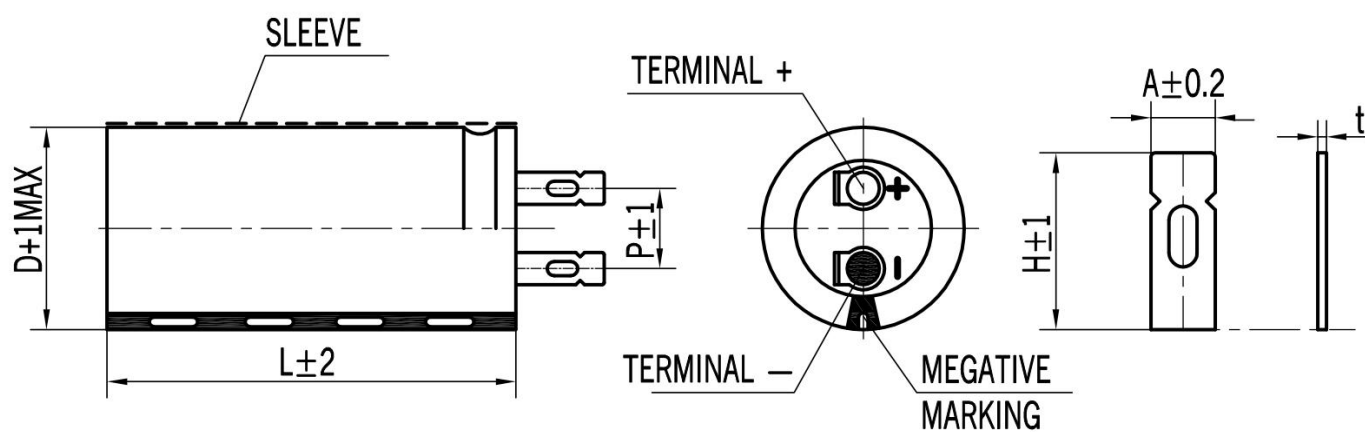
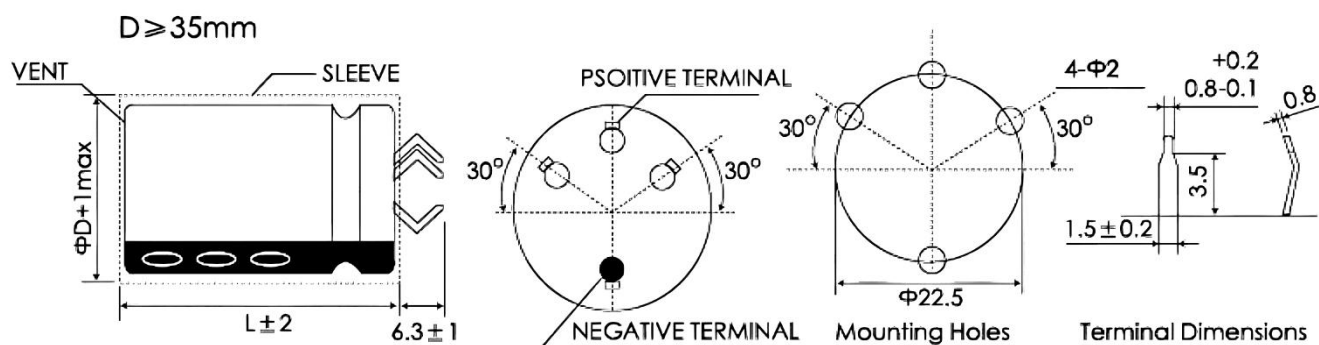
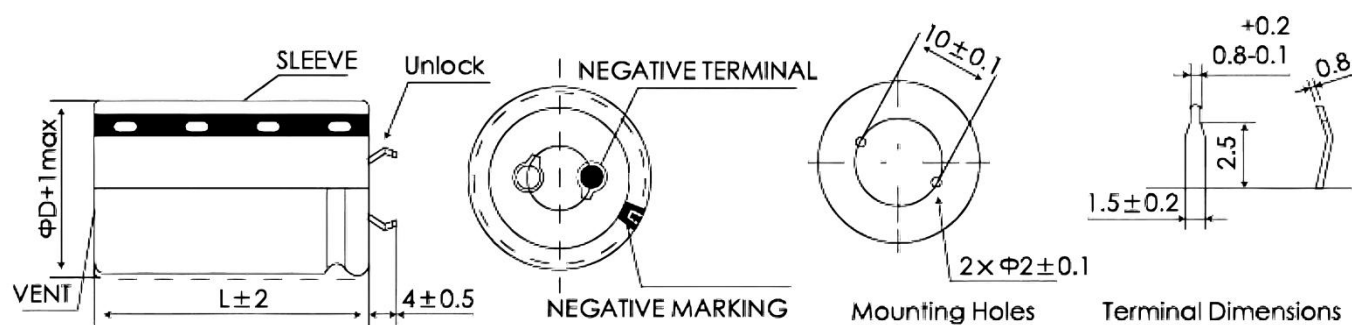
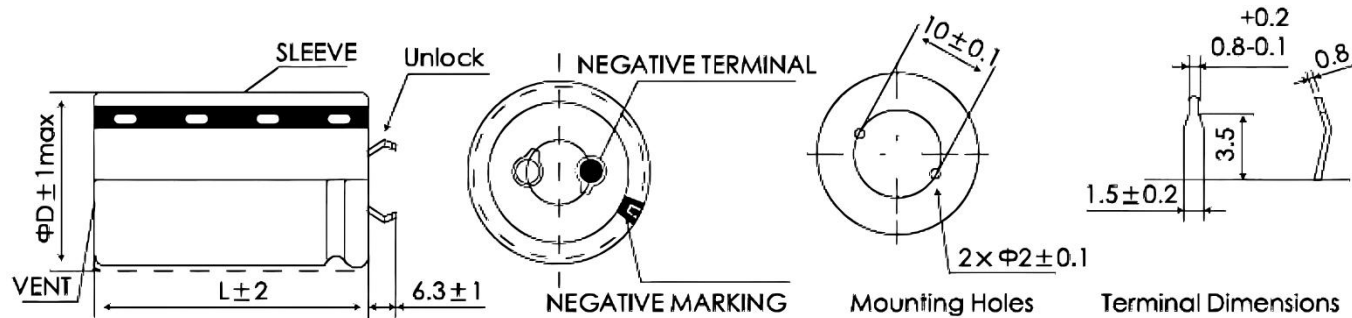
Snap-in Type



Screw Type



BP		2G	682	M	077155		S	
Series code		Rated voltage code	Capacitance Code(μF)	Capacitance Tolerance	Diameter Code		Special Code	
Snap-in / Lug	CD292=LC	10=1A	100=101	±20%=M	22x30	022030	With stud	S
	CD293=LD	16=1C	470=471	±15%=L	35x50	035050	With Bracket	B
	CD294=LE	20=1D	1000=102	±10%=K	51x80	051080		
	CD295=LF	25=1E	2200=222	-0+20%=R	77x155	077155		
	CD296=LG	35=1V	3300=332	-0+30%=F	90x235	090235		
	CD297=LH	50=1H	6800=682	-10+20%=V	101x235	101235		
	CD298=LI	63=1J	8200=822	-10+30%=Q				
	CD17FX=FX	80=1K	10000=103	-10+50%=T				
Screw	CD135=BP	100=2A	12000=123	-10+75%=U				
	CD136=PK	160=2C	470000=474					
	CD92=GA	200=2D	1000000=105					
	CD92H=GB	250=2E						
	CD13N=GC	300=2L						
	CD92L=GD	315=2F						
	CD13NH=GE	330=2U						
	CD13L=GF	350=2V						
	CD13HL=GG	360=2N						
	CD98SK=GK	400=2G						
		420=2X	Ex1: PN: LE1H103M030050 CD294 50V10000μF 30x50MM ±20% Ex2: PN: BP2G682M077155S CD135 400V6800μF 77x155MM ±20% with stud					
		450=2W						
		500=2H						



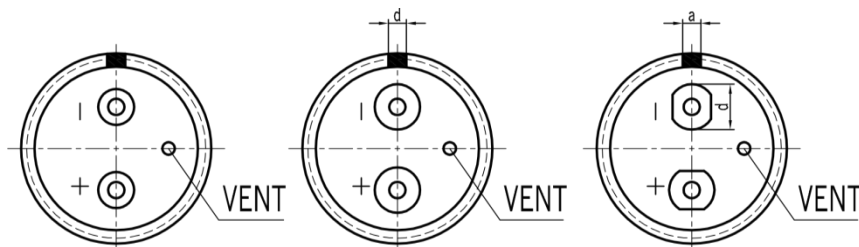
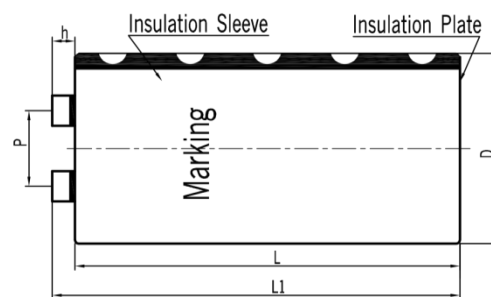


Fig.1-Terminal A

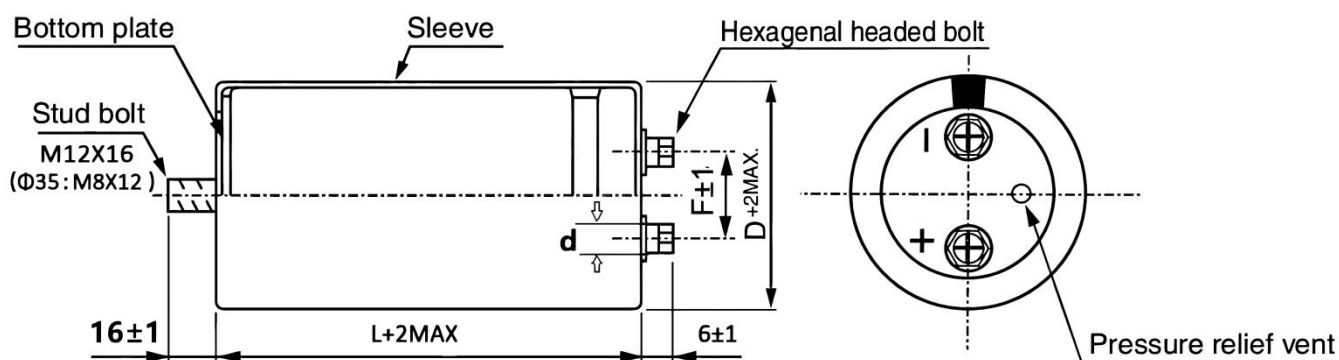
Fig.2-Terminal B,C

Fig.3-Terminal D

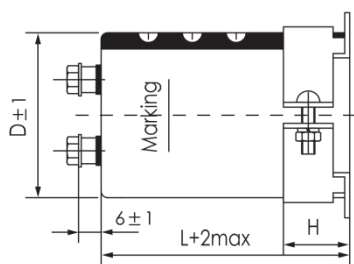
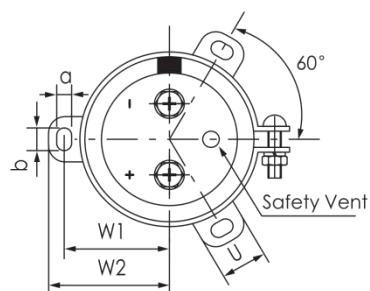


Code	$\Phi D \pm 1$	Thread	$\Phi d \pm 0.3$	$h \pm 0.5$
A	36~90	M5	10	6
B	77~90	M6	17.2	
C	64	M5	13	
	77~90		17.2	
D	51	M5	13(a=10)	5
	64		15(a=13)	6
	77	M6	15(a=13)	

D	F
36	12.7
51	22
65	28.2
77	31.4
90	31.4
101	41.5

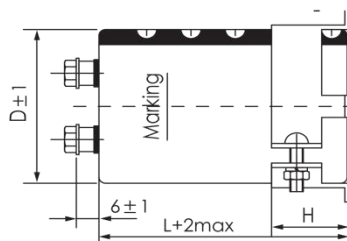
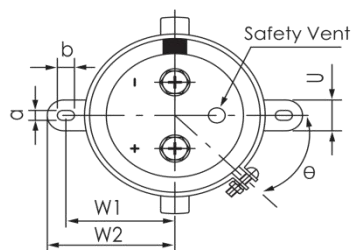


3-legs Bracket (Type Y)

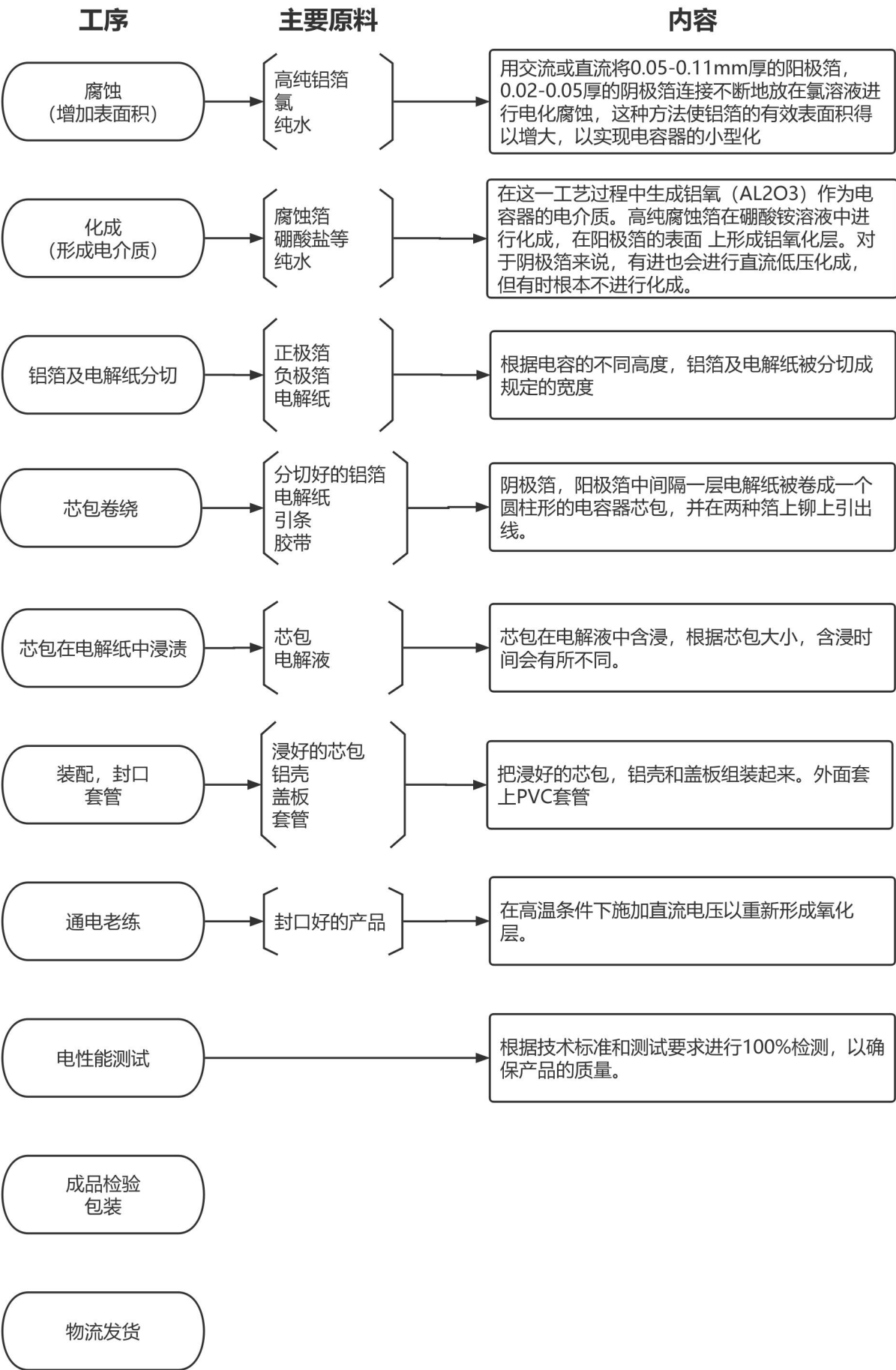


D	W1	W2	a	b	U
51	31.8	36.5	5	7	14
64	38.1	42.6	5	7	14
77	44.5	49.2	5	7	14
90	50.8	55.6	5	7	14
101	57.5	63.5	5.5	8	20

2-legs Bracket (Type I)

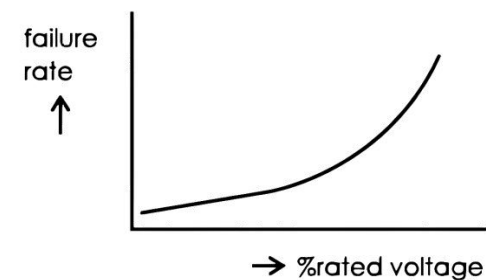
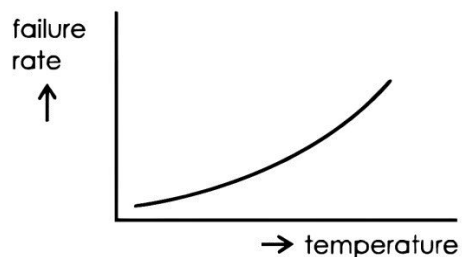
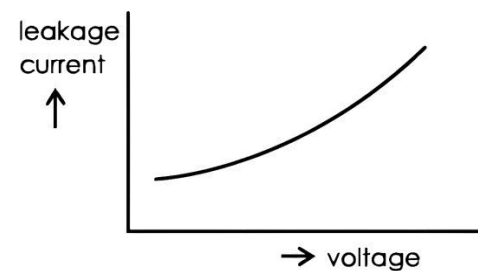
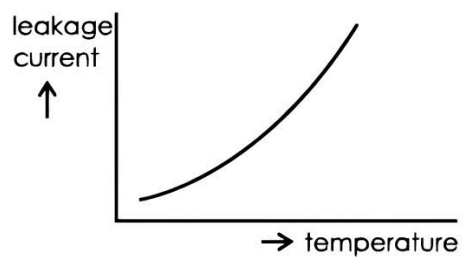
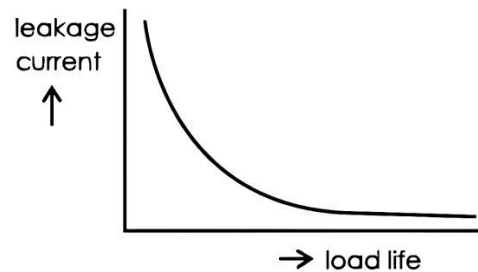
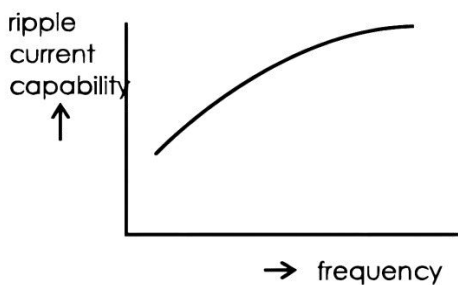
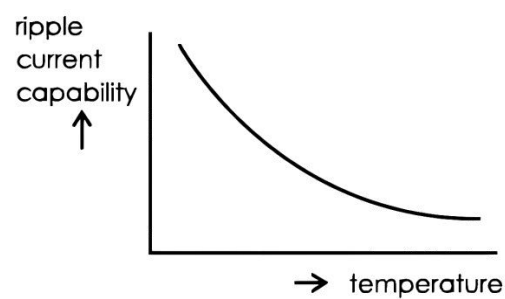
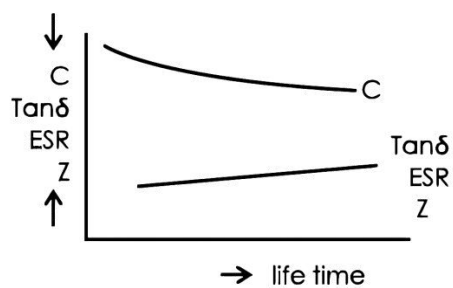
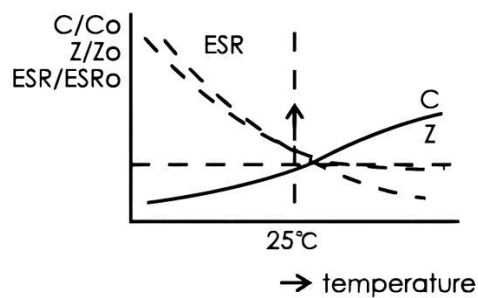
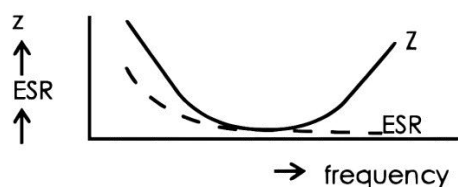
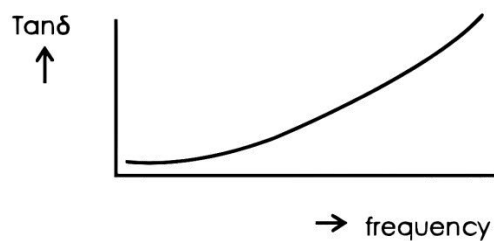
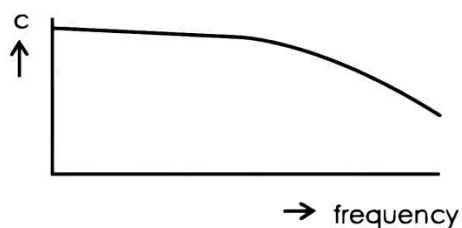


D	W1	W2	a	b	U
36	24	29	3.8	7	10
51	34	40	5	7	14
64	40.5	46.5	5	7	14
77	46.8	53	5	7	14
90	54	60.3	5	7	14

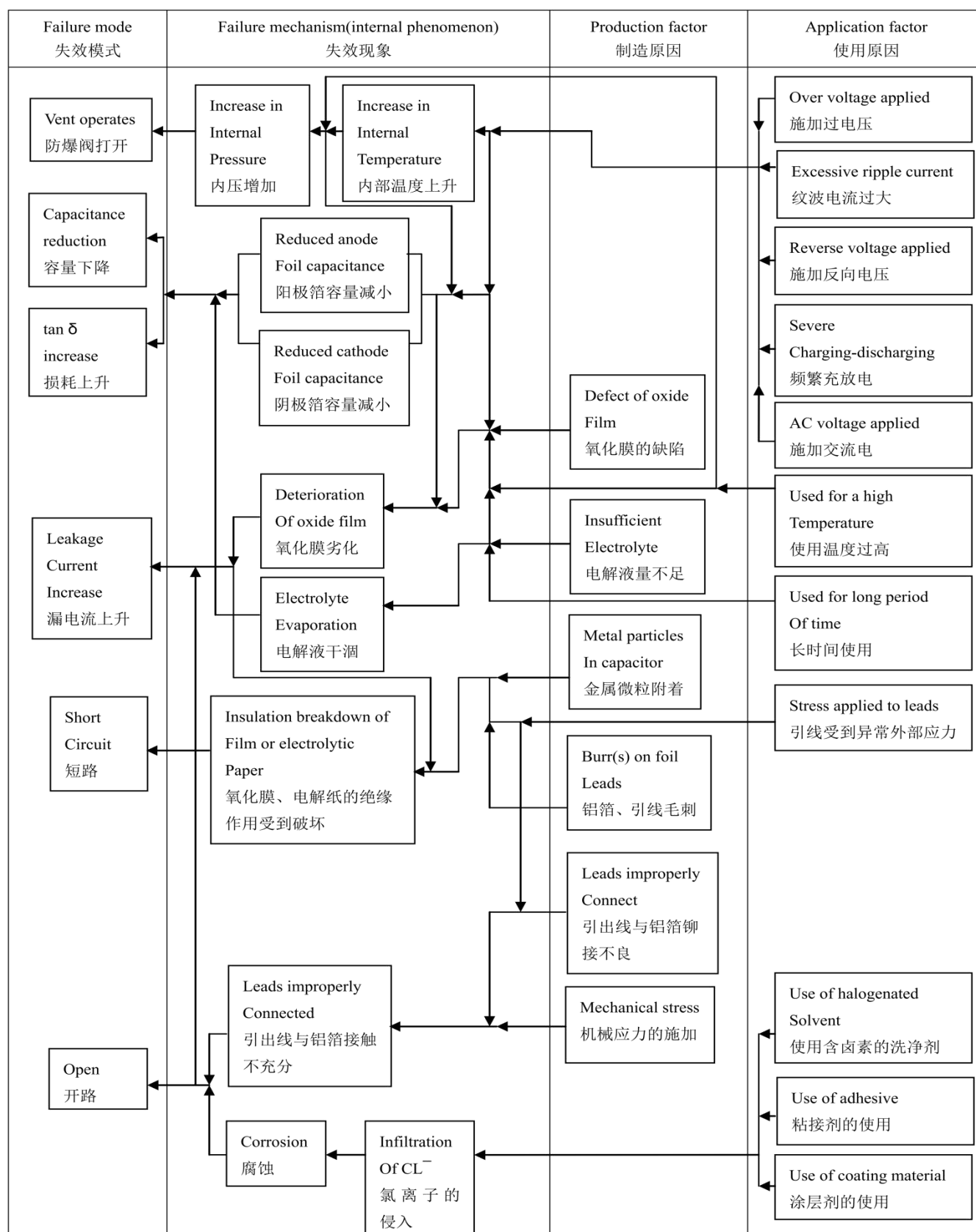


Characteristics of electrical capacitors vary with temperature, time, and applied voltage.

电容器的电气特性与温度，时间，以及施加电压的关系



项目 Item	试验条件 Test conditions	性能要求 Requirements	
浪涌电压 Surge voltage	温度+15~+35℃，施加规定的浪涌电压，充电 30 秒，放电 5 分 30 秒，共循环 1000 次 At +15~+35℃， applying the Us 1000 cycles of 30s on and 330s off	无可见损伤 No visible damage	
		ΔC/C	≤±15%
		tgδ	≤初始规定值 Initial specified value
		I	≤初始规定值 Initial specified value
耐久性 Load life	+105℃施加额定电压 2000 小时,恢复 16 小时后 After applying rated voltage for 2000 hours at +105℃ and then resumed 16 hours	ΔC/C	≤±20%
		tgδ	≤200%初始规定值 Initial specified value
		I	≤初始规定值 Initial specified value
高温贮存 Shelf life	+105℃， 500 小时,恢复 16 小时后 +105℃， 500 hours then resumed 16 hours	ΔC/C	≤±20%
		tgδ	≤200%初始规定值 Initial specified value
		I	≤200%初始规定值 Initial specified value
引出端强度 Tension strength	IEC 68-2 试验 Ua: 拉力 10N, 10 秒 IEC 68-2 Test Ua: Loading force 10N for 10s	无可见损伤且标志清晰 No visible damage; marking legible.	
可焊性 Solder ability	IEC 68-2 试验 Ta: 焊料槽温度为 235±5℃，浸渍深度占整个引出线的 90%，浸渍持续时间为 5±1 秒 IEC 68-2 Test Ta: Tank temperature: 235 ± 5 °C ; Impregnating depth: ≥90% of the total lead wire; Impregnating time:5±1s	引出端的良好镀层，焊料自由流动，引出端湿润。 The lead wire is coated by tin and wet	
耐焊接热 Resistance to soldering heat	IEC 68-2 试验 Tb 方法 1A: 焊料槽温度为 230±5℃，浸渍深度 6mm，浸渍持续时间为 10 秒 IEC 68-2 Test Tb means 1A: Tank temperature: 230 ± 5 °C ; Impregnating depth: 6mm; Impregnating time: 10s	无可见损伤，标志清晰，电容量变化率≤±5%。 No visible damage; marking legible; ΔC/C≤±5%	
稳态湿热 Stable humidity	IEC 68-2 试验 Ca: +40℃，湿度 90~95%，不施加电压 21 天 IEC 68-2 Test Ca: 21 days at 40℃， RH 90 to 95%， no voltage applied	无可见损伤和电解液漏出，且标志清晰。 No visible damage, no leakage of electrolyte, marking legible.	
		ΔC/C	≤±10%
		tgδ	≤120%初始规定值 Initial specified value
		I	≤120%初始规定值 Initial specified value
		无可见损伤和电解液漏出，且标志清晰，电容量变化率≤±5%。 No visible damage, no leakage of electrolyte, marking legible, ΔC/C≤±5%。	
振动 Resistance to vibration	IEC 68-2 试验 Fc: 频率范围 10~55Hz，振幅为 0.75mm，持续时间为 3×2 小时。 IEC 68-2 Test Fc; Frequency: 10 ~ 55Hz; Amplitude: 0.75mm; 3 direction, 2 hours per direction.		



为使您获得电解电容器的最佳性能和延长电解电容器的使用寿命，在使用电解电容器前，请务必阅读本注意事项。

Upon using Aluminum Electrolytic Capacitors, please proper handling and observing to following important points will insure optimum capacitor performance and long life.

1.直流电解电容器是有极性的 DC electrolytic capacitors are polarized.

确定极性，极性标志在电容器的基体上。以免因极性反可能引起电路短路或电容器损坏，当极性不固定或不确定的，使用双极性电容器。注意直流电解电容器不能使用于交流。

Make sure of the polarity .The polarity is marked on the body of the capacitor. Application of the reversed voltage may cause a short circuit or damage to the capacitor. Use bipolar capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors can not be used for AC application.

2.双极性电容器 Bipolar capacitors

只适用于脉动电路和极性反转电路中，不适用于纯交流和高纹波电路中。

They are used only in pulse circuits as well as polarity reverse circuits but not applicable in pure AC or high ripple current.

3.使用电压不要大于额定电压 DO not apply voltage greater than rated voltage .

使用电压大于额定电压，漏电流会增大，可能损坏电容器。建议工作电压为额定电压的百分之七十~八十，电容器在建议的工作电压下使用可延长电容器的寿命。

If a voltage exceeding the rated voltage is applied, the leakage current will increase, which damage the capacitor. Recommended working voltage is 70 to 80 percent of rated voltage. Using capacitors at recommended working voltage prolong capacitor life.

4.不要使过量的纹波电流通过电容器 Do not allow excessive ripple current through the capacitor.

流过电容器的纹波电流超过许可值，将会引起电容器发热，电容量减少，损害电容器。通过电容器的纹波电流不要大于允许值，一般不超过额定值的 80%。

The flow of ripple current over permissible ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Ripple current on the capacitor must be at or bellow allowable level, generally not more than 80% of the rated current.

5.快速的充放电电路中，使用专门设计的电容器 Use specially designed capacitors for the circuits where charge and discharge are frequency repeated.

在经受快速的周期性充放电电路中，电容器可能受损害，它的寿命因容量下降、温升等原因而缩短，在这种电路中，一定要使用专门设计的电容器。

In the circuit subjected to rapid charge and discharge cycles, capacitors may be damaged, its life may be shortened by capacitance decrease, heat rise, etc. Be sure and use special capacitors in these applications.

6.工作温度范围 Operating temperature range.

电容器的特性随工作温度而变化，在温度较高的情况下，容量、漏电流增大，tgδ减少；在低温情况下，容量和漏电流下降，tgδ增大。电容器在较低的温度下使用会确保延长寿命。

The characteristics of capacitors change with the operating temperature. The capacitance and leakage current increase and tgδ decrease at higher temperatures. The capacitance and leakage current decrease and tgδ increase at lower temperature. Usage at lower temperature will ensure longer life.

7.使用温度与寿命的关系 Relationship between temperature and life.

电容器的寿命与其使用的温度有关，一般来说，使用温度降低 10℃，其寿命是额定温度下的 2 倍，计算公式如下：

Life of capacitors has relationship with its used temperature .Generally, if the used temperature is reduced 10℃,life is prolonged twice at rated temperature. Here is calculating format:

$$L_2 = L_1 \times 2^{\frac{T_1 - T_2}{10}}$$

L1—额定温度下的寿命	L2—实际温度下的寿命
Life at rated temperature	Life at actual temperature
T1—额定使用温度	T2—实际使用温度
Rated used temperature	Actual used temperature

8.核对工作频率 Check operating frequency.

电解电容器的电容量通常是在 100Hz 或 120Hz 下测得的。然而要记住容量随频率的升高而下降， $\text{tg}\delta$ 随频率的升高而增大，并使周围温度升高。

The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance decrease and $\text{tg}\delta$ increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.

9.长时间存放的电容器，在使用前加额定直流电压处理 Apply rated DC voltage treatment to the capacitors which have been stored for a long time.

长时间的存放，实际对电容器的容量和 $\text{tg}\delta$ 没有多大的影响，然而往往会使漏电流增大，耐压降低。

长时间存放后的电容器处理，首先逐渐施加直流电压至额定电压，然后再使用。

Long periods of storage have virtually no effect on a capacitor's capacitance and $\text{tg}\delta$. Such periods tend, however, to increase leakage current and decrease withstand voltage.

After removing capacitors from long-duration storage, First apply a gradually increasing DC voltage to rated voltage and then use them.

10.电容器外壳与阴极端是不绝缘的 The capacitor case is not insulated from the cathode terminal.

电容器的外壳与阴极端是通过电解液连接的，如果电容器的外壳必须与线路绝缘，则电容器的安装位置处，一定要采取绝缘措施。

The capacitor's case and cathode terminal connect through the electrolyte. If the case is to be completely insulated, that insulation must be at the capacitor's mounting point.

11.电容器的端子或引线不要施加过大的力 Do not apply excessive force to the terminals and leads.

过大的力施加到端子或引线上，可能引起引线的断裂或端子分裂，转而会引起内部连接的破坏。

The excessive strong force applied to the terminals and lead wires may cause leads to break or terminals to separate and, in turn, cause the internal contact to fail.

12.浸焊料后，线路板的清洗 Cleaning of the circuit board after solder dipping.

清洗线路板以去除焊剂或其它附着物。为了保护塑料套管，印刷标志以及封口材料不被破坏，电容器不能用卤化物或类似溶剂作为电容器清洗用，如三氯乙烯，二甲苯或酮类等。

建议使用的清洗溶剂为：甲醇，异丙醇，乙醇，异丁醇，石油醚，丙醇和一般的洗涤剂。

Cleaning circuit boards to remove flux or other extraneous matter. To ensure protection for sleeve, marking and sealing materials on capacitor body, capacitor should never be washed or cleaned by halogen agents or solvents such as trichlorethylene, xylene or acetone etc.

Recommended cleaning solvents. Methanol, isopropanol ethanol, isobutanol, petroleum ether, propane and/or commercial detergents.

13.焊接时注意温度和持续的时间 Be cautious of the temperature and duration when soldering.

烙铁应与电容器的塑料绝缘套管保持一定的距离。当电容器浸于焊料槽时，建议温度在 260℃ 以内，时间不要超过 10 秒钟，以避免电容器元件受损。

Soldering irons should be kept away from the vinyl-insulated sleeves of capacitor. When the capacitor dipped in solder bath, recommendable within 260°C and 10 seconds to avoid damage of capacitor unit.

14.印刷线路板上孔的布局 Hole positions on the circuit board.

设计印刷线路板时，安装孔距应等于引线间距，当孔距大于或小于引线间距时，安装电容器时，将有应力作用到引线上，可能引起短路，电路损坏，漏电流增大。另外，焊料可能通过所打的孔及后加工零件的引线孔溅落到塑料套管上，造成损伤，所以要认真考虑孔的布局。

When designing a circuit board, space the position holes equally to the space between lead wires. When the spacing is either greater than or less than the capacitor's leads, mounting the capacitor will apply to the leads, causing short circuits, broken circuits, and increased current.

Otherwise, through-holes on the circuit board as well as lead holes of post-process parts can result in solder splashing onto the vinyl sleeve, causing damage. Consider hole position.