

■ LV 系列铝电解电容器

LV Series Aluminum Electrolytic Capacitor

◆特征

Feature

- * 寿命: 105℃ 2000 小时
Load life: 105℃ 2000 hours.
- * 耐高电压产品
High voltage resistant products.
- * 符合 RoHS
Compliant to the RoHS Directive.



◆应用

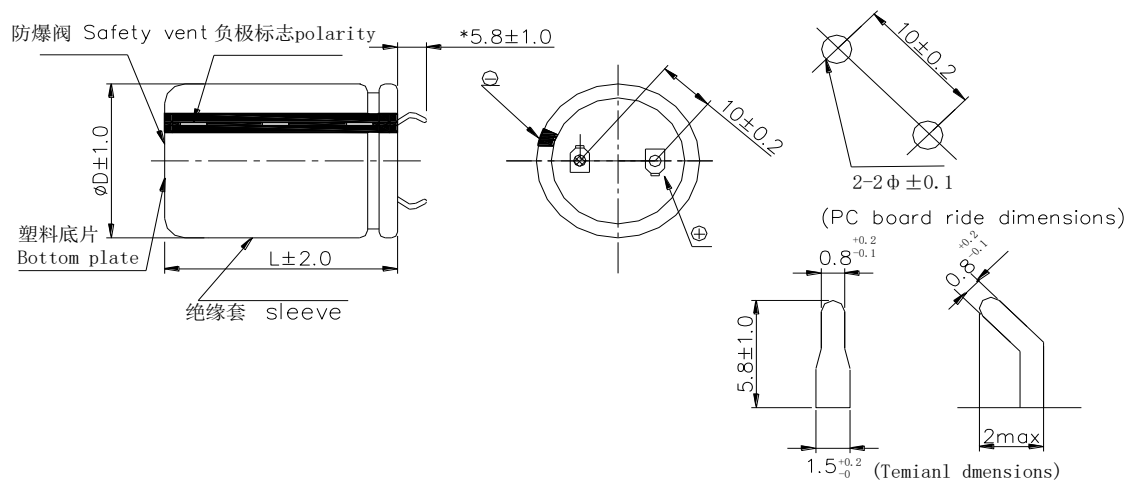
Application

- * 适用于转换电源及通用变频器等各种电子产品
Ideally suited for smooth use in power conversion and general frequency converters

◆型号表示法

Part Number

8	221	VC	M	2225	LV	N	0	1	1	0	
代码 Code	产品类别 Type	代码 Code	电压 Voltage	代码 Code	尺寸 Dimensions ΦDxL(mm)	代码 Code	商标 Trademark	代码 Code	内码 Internal Code	代码 Code	产品脚型 Lead Forming Type
8	成品 Product	VC	500	2225	Φ22x25	N	LH.NOVA	1	105℃	0	散装品 Bulk
		VD	525	3030	Φ30x30			2	125℃		
		VF	550	3050	Φ30x50			8	85℃		
		VG	600	A050	Φ35x50						
				A070	Φ35x70						
代码 Code	标称容量 Nominal Capacitance	代码 Code	误差 Tolerance	代码 Code	型号 Series	代码 Code	胶管颜色 Sleeve Color	代码 Code	内码 Internal Code		
101	100uF	K	±10%	LV	LV	0	黑色 Black	1	正常品		
471	470uF	V	± ²⁰ ₁₀ %			1	深蓝色 Deep-blue	E	长焊针品		
821	820uF	M	±20%			7	棕色 Brown	F	短焊针品		
		Q	± ³⁰ ₁₀ %			9	绿色 Green				

◆产品结构
Product Structure

◆主要特性表
Main specifications

项目 Item	主要特性 Performance Characteristics		
额定工作电压范围 Rated Voltage Range	500~600V.DC		
使用温度范围 Operating Temperature Range	-25℃~+105℃		
标称静电容量范围 Nominal Capacitance Range	100~820μF		
静电容量允许偏差 Capacitance Tolerance	±20%（M，+20℃，120Hz）		
漏电流 Leakage Current (20℃)			
	额定工作电压(V) Rated working voltage	500~600	
	漏电流 Leakage current	5 分钟后 $I \leq 3 \sqrt{CV} (\mu A)$ After 5 min. $I \leq 3 \sqrt{CV} (\mu A)$	
	C：标称静电容量（μF）Nominal Capacitance in μF V：额定工作电压（V）Rated working voltage in V		
损耗角正切 DF Dissipation Factor			
	额定工作电压(V) Rated working voltage	500~550	600
	DF(MAX) (20℃,120Hz)	0.15	0.20

浪涌电压 Surge Voltage	施加表中所示浪涌电压，充电 30± 5 秒，放电 5.5± 0.5 分钟作为一个周期，共进行 1000 次。温度：15℃-35℃。然后在标准大气条件下放置达到热稳定，测试各参数。 Application of DC surge Voltage stated at table,1000 times of charging for 30 ± 5 sec., discharging with a period of 5.5± 0.5 min. Test temperature: 15℃ -35℃. And the capacitor shall be stored under standard atmospheric conditions to obtain thermal stability, after which measurements shall be made. <table><tr><td>额定工作电压(V) Rated working voltage</td><td>500</td><td>550</td><td>600</td></tr><tr><td>浪涌电压(V) Surge voltage</td><td>550</td><td>600</td><td>650</td></tr></table> 容量变化：在初始值的± 20%以内。损耗角正切值不大于规定值的 200%。漏电流：不大于初始规定值 Capacitance change: Within ± 20% of the initial value Dissipation factor: Not more than 200% of the specified value. Leakage current: more than the initial specified value.	额定工作电压(V) Rated working voltage	500	550	600	浪涌电压(V) Surge voltage	550	600	650																		
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高低温特性 Characteristic at high and low temperature	电容器根据下表的次序处理 The capacitor shall be subjected in turn to the procedures specified below. <table><tr><td>阶段 Step</td><td>温度 Temperature</td><td>时间 Time</td></tr><tr><td>1</td><td>20±2℃</td><td>热平衡状态</td></tr><tr><td>2</td><td>-25℃</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℃</td><td>*2 hours</td></tr><tr><td>5</td><td>20±2℃</td><td>热平衡状态</td></tr></table> * 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 . <table><tr><td>阶段 2 Step 2</td><td>阻抗比（对阶段 2） Impedance ratio</td><td>见阻抗特性 refer to Impedance Stability</td></tr><tr><td rowspan="2">阶段 4 Step 4</td><td>静电容量变化率（对阶段 4） Change in capacitance</td><td>-20~+20% within -20~+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></table> 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.	阶段 Step	温度 Temperature	时间 Time	1	20±2℃	热平衡状态	2	-25℃	*2 hours	3	20±2℃	热平衡状态	4	105℃	*2 hours	5	20±2℃	热平衡状态	阶段 2 Step 2	阻抗比（对阶段 2） Impedance ratio	见阻抗特性 refer to Impedance Stability	阶段 4 Step 4	静电容量变化率（对阶段 4） Change in capacitance	-20~+20% within -20~+20% of step 1	漏电流 Leakage Current	规定值 5 倍以下 Less than 500% of the specified value
阶段 Step	温度 Temperature	时间 Time																									
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2	-25℃	*2 hours																									
3	20±2℃	热平衡状态																									
4	105℃	*2 hours																									
5	20±2℃	热平衡状态																									
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阻抗特性 Impedance Stability	额定工作电压(V) Rated working voltage		500~600
	阻抗比(120Hz) Impedance Ratio	$z-25^{\circ}\text{C}/z+20^{\circ}\text{C}$	10
高温负荷特性 Load life	在 $105\pm 2^{\circ}\text{C}$ 环境中施加额定工作电压和最大允许纹波电流 2000 小时后, 在标准大气条件下放置 16 小时后测试, 然后测试参数电容器的性能符合下面要求:		
	After application of rated working voltage with max permissible ripple current specified at $105\pm 2^{\circ}\text{C}$ for 2000 hours, It shall be subjected to standard atmospheric for 16 hours, after which measurement shall be made.		
	1、电容量变化率: $\pm 20\%$ 初始测量值以内 Capacitance change : $\pm 20\%$ initial measured value		
	2、漏电流: $\leq$ 初始规定值 Leakage current: $\leq$ initial specified value		
	3、损耗角正切值 $\leq 200\%$ 初始规定值 Dissipation factor: $\leq 200\%$ initial specified value		
高温贮存特性 Shelf life	4.外观: (1) 无可见损伤和无电解质漏出 No remarkable damage and electrolyte leakage		
	(2) 底部允许轻微鼓起 Bottom allowed slightly plumped		
	壳号 Size	判定基准 Criterion	
	$< \phi 25$	$\leq 1.0\text{mm}$	
	$\phi 25\sim 30$	$\leq 1.5\text{mm}$	
	$\geq \phi 35$	$\leq 2.0\text{mm}$	
	在 $105\pm 2^{\circ}\text{C}$ 环境无负荷放置 1000 小时后, 根据 JIS-C-5101-4, 加额定电压 30min,常温放置 24~48 后测试, 电容器的性能符合下面要求:		
After leaving capacitors under no load at $+105^{\circ}\text{C}$ for 1000 hours, According to JIS-C-5101-4, apply the rated DC voltage for 30 minutes and store the capacitors under room temperature for 24-48 hours. The capacitors meet the characteristics listed as below:			
1、电容量变化率: $\pm 20\%$ 初始测量值以内 Capacitance change : $\pm 20\%$ initial measured value			
2、漏电流: $\leq 200\%$ 初始规定值 Leakage current: $\leq 200\%$ initial specified value			
3、损耗角正切值 $\leq 200\%$ 初始规定值 Dissipation factor: $\leq 200\%$ initial specified value			

稳态湿热 Resistance to damp heat (steady state)	试验温湿度：40±2℃，90~95%RH 试验时间：500±8h 试验后，电容器在标准大气条件下 2 小时，然后测试参数 Test temperature and humidity : 40±2℃, 90~95%RH Test time : 500±8h After completion of test, the capacitor shall be subjected to standard atmospheric conditions for 2 hours, after which measurements shall be made. 外观：无异状 Appearance: No remarkable abnormality 容量变化：在初始值±10%范围内 Variation of capacitance: Within ±10% of the initial value. 损失角正切值：不大于规定值 Dissipation factor: ≤specified value 漏电流：不大于规定值 Leakage current: ≤specified value
耐焊接热 Resistance to soldering heat	焊槽法： 焊锡温度：260±5℃；浸入时间：10±1 秒；浸入深度：1.6mm Solder bath method Solder bath temperature : 260±5℃ Immersion time: 10±1sec. Immersion depth: 1.6mm 外观：无异状 Appearance: No remarkable abnormality 容量变化：在初始值±10%范围内 Variation of capacitance: Within ±10% of the initial value. 损失角正切值：不大于规定值 Dissipation factor: ≤specified value 漏电流：不大于规定值 Leakage current: ≤specified value
防爆试验 Safety vent	在电容器两极施加反向直流电压，其中通过的电流为：≤φ 22 逆向电流 1A，> φ 22 逆向电流 10A Apply a reverse DC voltage to the two poles of the capacitor, where the current passing through is: ≤φ 22 Inverse current 1A, > φ 22 Inverse current 10A 如果防爆阀 30 分钟内动作，则认为产品合格。当防爆阀动作时，电容器应无打火、击穿、燃烧等现象。 If the vent does operate within 30 minutes, the test is considered to be passed. When the vent operated, the capacitor shall not flame although gas discharge or expulsion of a part of the inside element is allowable.

低温放置 Low-temperature storage test	在-25±2℃环境下无负荷贮存 16h, 至少恢复 16 小时,试验后检查外观, 测量电容器的性能。 The capacitors are stored with no voltage applied at a temperature of -25±2℃ for 16 hours. Then it resumed 16 hours and measurements shall be made. 外观: 无异状 Appearance: No remarkable abnormality 容量变化: 在初始值±10%范围内 Variation of capacitance: Within ±10% of the initial value. 损失角正切值: 不大于规定值 Dissipation factor: ≤specified value 漏电流: 不大于规定值 Leakage current: ≤specified value
耐溶剂性 Resisting Solvent	溶剂: 异丙醇 温度: 20℃~25℃; 时间: 30±5S Solvent: Isopropyl alcohol Temperature: 20℃~25℃ Time: 30±5S 外观: 无异状 Appearance: No remarkable abnormality
端子强度 Terminal strength	端子抗拉强度: 沿电容器端子引出方向慢慢施加 20N 拉力 10±1 秒钟。 Tensile strength of terminal: A tensile force of 20N shall be applied to the terminals in the axial direction and acting in a direction away from the body for 10±1 sec. 端子抗弯强度: 在在端子承受力最弱处(距端子引出方向 1.6mm 处), 沿垂直方向逐渐施加 25N 拉力, 并保持 30±5 秒钟然后用力一次性将端子扳回到原位。 Apply tensile force of 25N on terminals in the weakest direction gradually, after reached to the specified tensile force ,keep it for 30±5 sec. Apply tensile force in the opposite direction with the same way. Carry out this operation once. 外观: 无可见机械损伤 Appearance: no visible mechanical damage 电容器应无接触不良开路或短路 The capacitor shall be no intermittent contacts, or open or short circuiting
振动试验 Resistance to vibration	在 3 个互相垂直的方向分别施加 2 小时振动, 共 6 小时。 频率: 10-55Hz 振幅峰-峰值: 1.5mm. 振速: 1 分钟内振速 10~55~10Hz Direction and duration of vibration: 3 orthogonal directions mutually each for 2h, Total 6h. Vibration frequency range: 10-55Hz. Peak to peak amplitude: 1.5mm Sweep rate: 10 to 55 to 10Hz in about 1 min.

	外观：无可见机械损伤 Appearance: no visible mechanical damage 电容器应无接触不良开路或短路 The capacitor shall be no intermittent contacts, or open or short circuiting
可焊性 Solderability	焊锡温度：245±5℃ 浸入时间：2±0.5 秒 Temperature of solder: 245±5℃ Dipping time: 2±0.5sec. This specification shall be met after the capacitors are stored under standard atmospheric conditions for 6 months. 浸入焊锡的引线面积约 90%以上应附着新锡。 At least 90% of circumferential surface of the dipping portion of terminal shall be covered with new solder.

◆尺寸表、允许纹波、纹波电流频率因子

Dimensions and ripple current and frequency coefficient

纹波电流频率因子

Ripple current frequency coefficient

Freq(Hz) WV(V)	50	60	120	1K	≥10K
500~550	0.78	0.80	1.00	1.32	1.45
600	0.78	0.80	1.00	1.30	1.41

温度因子

Temperature Coefficients

温度 Temperature (°C)	+40	+55	+70	+85	+105
系数 Factor	2.7	2.5	2.1	1.7	1.0

尺寸表与允许纹波电流

Dimensions and ripple current

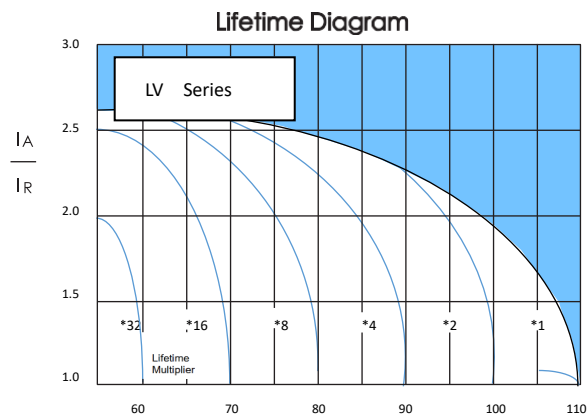
WV/V Cap/μF	500(VC)		550(VF)		600(VG)	
	(1)	(2)	(1)	(2)	(1)	(2)
100(101)	25×40	0.53	25×40	0.63	30×40	0.78
150(151)	30×35	0.86	30×35	0.96	35×40	0.98
180(181)	30×45	1.00	30×50	1.03	30×55	1.04
	35×35	1.00	35×35	1.03	35×40	1.04
220(221)	30×55	1.18	30×40	1.03	30×60	1.24
	35×40	1.18	30×55, 35×40	1.18	35×45	1.24
270(271)	35×45	1.21	35×45	1.31	35×50	1.40
330(331)	35×45	1.35	35×40	1.3	35×60	1.52
			35×50	1.43		
390(391)	35×60	1.45	35×40	1.4	35×65	1.65
			35×60	1.56		
470(471)	35×60	1.50	35×50	1.7		
			35×60, 35×65	1.67		
820(821)			35×90	2.95		

(1)外形尺寸 Case Size D×L(mm)

(2)最大允许纹波电流 Max allowable ripple current (A rms +105℃,120Hz)

◆包装
Packaging

产品尺寸	纸盒	隔条	数量只/盒	外箱	盒/箱	数量/箱
Φ22*25-30	D25-43:0BZD2543-H6H	F204:0BZF204-H8H	108	B-8	10	1080
Φ22*35-40	D25-53:0BZD2553-H6H	F205:0BZF205-H8H		B-8	8	864
Φ22*45-50	D25-63:0BZD2563-H6H	F206:0BZF206-H8H		B-9	6	648
Φ25*25-30	D25-43:0BZD2543-H6H	F204:0BZF204-H8H	88	B-8	10	880
Φ25*35-40	D25-53:0BZD2553-H6H	F205:0BZF205-H8H		B-8	8	704
Φ25*45-50	D25-63:0BZD2563-H6H	F206:0BZF206-H8H		B-9	6	528
Φ25*55-60	D25-76:0BZD2576-H6H	F207:0BZF207-H8H		B-8	6	528
Φ25*65-70	D25-83:0BZD2583-H6H	F208:0BZF208-H8H		B-9	4	352
Φ25*75-80	D25-93:0BZD2593-H6H	F209:0BZF209-H8H		B-9	4	352
Φ25*85-90	D25-03:0BZD2503-H6H	F210:0BZF210-H8H	63	B-8	4	352
Φ30*25-30	D35-43:0BZD3543-H6H	F214:0BZF214-H8H		B-6	10	630
Φ30*35-40	D35-53:0BZD3553-H6H	F215:0BZF215-H8H		B-6	8	504
Φ30*45-50	D35-63:0BZD3563-H6H	F216:0BZF216-H8H		B-7	6	378
Φ30*55-60	D35-76:0BZD3576-H6H	F217:0BZF217-H8H		B-6	6	378
Φ30*65-70	D35-83:0BZD3583-H6H	F218:0BZF218-H8H		B-7	4	252
Φ30*75-80	D35-93:0BZD3593-H6H	F219:0BZF219-H8H		B-7	4	252
Φ30*85-90	D35-03:0BZD3503-H6H	F220:0BZF220-H8H		B-6	4	252
Φ35*25-30	D35-43:0BZD3543-H6H	F214:0BZF214-H8H	48	B-6	10	480
Φ35*35-40	D35-53:0BZD3553-H6H	F215:0BZF215-H8H		B-6	8	384
Φ35*45-50	D35-63:0BZD3563-H6H	F216:0BZF216-H8H		B-7	6	288
Φ35*55-60	D35-76:0BZD3576-H6H	F217:0BZF217-H8H		B-6	6	288
Φ35*65-70	D35-83:0BZD3583-H6H	F218:0BZF218-H8H		B-7	4	192
Φ35*75-80	D35-93:0BZD3593-H6H	F219:0BZF219-H8H		B-7	4	192
Φ35*85-90	D35-03:0BZD3503-H6H	F220:0BZF220-H8H		B-6	4	192

◆产品特征曲线 Product Characteristic Curve


IA = 120Hz 时的实际纹波电流，IR = 120Hz 时的额定纹波电流，105℃

使用寿命系数与环境温度和纹波电流负载的函数关系。

◆贮存方法 Storage Methods

- * 请保管在室温 5°C~35°C, 湿度 75%RH 以下的环境
- * (1) 产品储存期限: ≤12 个月; Storage life: ≤12 months
- * (2) 产品储存期限超 12 个月时, 需充电后再使用
- * (3) 产品储存时间超过 3 年的应报废处理
- * (4) 库存有效期以套管上印刷的时间开始计算
- * (5) 请尽量以包装状态保管
- * (6) 当电容器长期储存后, 漏电流会升高, 温度越高, 漏电流上升越快, 因此应注意储存环境。如铝电解电容器的漏电流上升对电路有不良影响, 请在使用前充电处理
- * (7) 请避免在以下环境中保管
 - ① 溅水、高温高湿及结露的环境;
 - ② 溅油、或者充满气体油成分的环境;
 - ③ 充满酸性有毒气体 (硫化氢、亚硫酸、亚硝酸、氯、溴、溴化甲烷等) 的环境;

*We recommend the following conditions for storage: Ambient temperature: 5°C~35°C, Ambient humidity: Less than 75% RH.

- * (1) Storage life: ≤12 months;
- * (2) If storage life time is over 12 months, the products need to be recharged;
- * (3) If storage life time is over three years, the product need to be discarded;
- * (4) Expiry date: calculating from the date marked on the sleeve;
- * (5) Please keep capacitors in the original package;
- * (6) Leakage current tends to increase when capacitors have been stored for long period of time. The higher temperature, the higher leakage current increase. Please take caution when selecting the storage location. The leakage decrease gradually as voltage is applied to the capacitor. The capacitor is subjected to aging before using, leakage may cause problems in the circuit.
- * (7) Avoid storing the capacitors under such circumstances:
 - ① Environment of water splashing, high temperature, high humidity and dewing;
 - ② The environment that splashes oil, or is filled with gas oil;
 - ③ With full of acid toxic gases environment such as (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, etc.

◆铝电解电容器使用注意事项

Important information on the application of aluminum electrolytic capacitors

- * (1) 直流铝电解电容器应按正确的极性使用
当直流铝电解电容器被反极性接入电路时, 电容器会导致电子线路短路, 由此产生的电流会引致电容器损坏。若电路中有可能在负引线施加正极电压, 请选用无极性产品
- * (2) 在额定工作电压以下作用
当电容器上所施加电压高于额定工作电压时, 电容器的漏电流将上升, 其电气特性将在短时期内劣化直至损坏。请注意电压峰值勿超出额定工作电压

* (3) 常规产品禁止作快速充放电使用

当常规电容器被用作快速充电用途。其使用寿命可能会因为容量下降，温度急剧上升等而缩减。

* (4) 施加纹波电流应小于额定值

施加纹波电流超过额定值后，会导致电容器体过热，容量下降，寿命缩短。所施加纹波电压的峰值应小于额定工作电压。

* (5) 使用环境温度

铝电解电容器的使用寿命会受到环境温度的影响。据科学统计，使用环境温度下降 10°C 其使用寿命增加 1 倍。

* (6) 引出线强度

当拉力施加到电容器引出线，该拉力将作用于电容器内部，这将导致电容器内部短路，开路或漏电流上升。在电容器焊装到电路板，请勿强烈摇动电容器。

* (7) 焊接过程耐热性

铝电解电容器装至电路板进行浸焊或波峰焊时，其塑料套管可能因焊接时间过长、温度过高而发生破裂或二次收缩。

* (8) 电路板的安装孔距及安装位置

电路板安装孔的设计应与产品说明书的引线脚距相一致，如果将电容器强行插入孔距不配套的电路板，那么会有应力作用于引出线，这将导致短路或漏电流上升。

* (9) 铝电解电容可能会有残留电压，请在使用前对电容器进行放电。

(1) When reverse voltage is applied on DC electrolytic capacitor, the capacitor will become short-circuited please use non-polarized capacitors in the circuit or the capacitor will be damage due to abnormal current flows through the capacitors since the circuit where the positive voltage may be applied to the cathode terminal.

(2) When capacitor is used at higher voltage than the rated voltage, leakage current increases, characteristics drastically deteriorate and damage in a short period may occur as a result. Please take extra caution that the peak voltage should not exceed the rated voltage.

(3) When aluminum electrolytic capacitors for general purpose are employed in rapid charge and discharge application, its life may be shorted by capacitance decreasing, heat rising, etc.

(4) Increased leakage current is common in aluminum capacitors which have been stored for long period of time. The Higher the storage temperature, the higher the leakage current increase, therefore please take precautions concerning the storage location. The leakage current decreases gradually as voltage is applied to the capacitor. In cases where increased leakage current causes problems in the circuit, apply voltage (aging) before using.

(5) Excessive heat will reduce capacitance and result in shortened life of capacitor if ripple currents exceeding the specified rated value are applied. The peak value of the ripple voltage should be less than the rated voltage.

(6) Its ambient temperature closely affects the life of an aluminum electrolytic capacitor. It is generally stated, that life doubles for each 10°C decrease in temperature.

(7) When a strong force is applied to the lead wires or terminals, stress is put on the internal connections. This may result in short circuit, open circuit or increased leakage current. It is not advisable to bend or handle a capacitor after it has been soldered to the PCB board.

(8) Installation pitch-row and installation position of circuit boards

PCB board must be designed so its hole coincides with the lead pitch (lead spacing) of the capacitor specified by the catalog or specifications. When a capacitor is forcibly inserted into an unmatched hole, a stress is put on the leads. This could result in a short circuit or increased leakage current.

(9) Aluminum electrolytic capacitors may have residual voltage, please discharge the capacitor before use.

◆推荐安装/焊接方法 Recommended Installation/Welding Methods

*波峰焊接条件

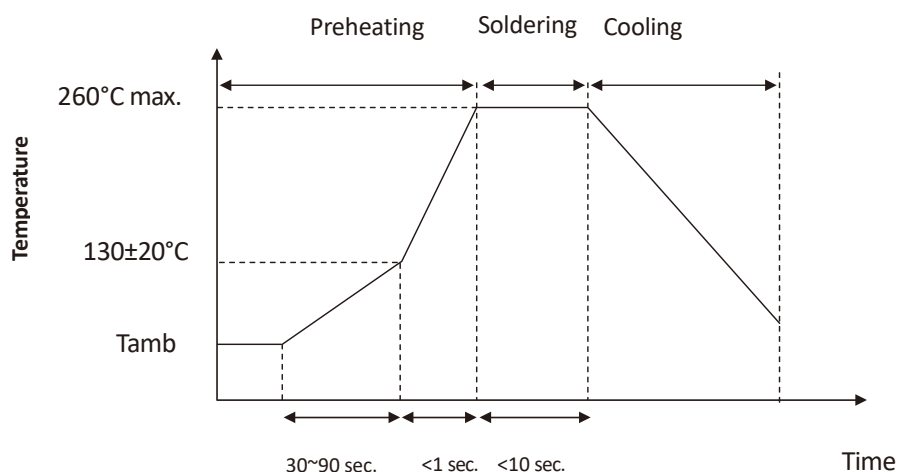
预热: 105°C

波峰焊: $260 \pm 5^{\circ}\text{C}$ 10 ± 1 秒以下 (或 $380 \pm 10^{\circ}\text{C}$ 3 ± 0.5 秒以下: 手焊)

*Wave Soldering Conditions

Preheating: 105°C

Wave Soldering: $260 \pm 5^{\circ}\text{C}$ for $\leq 10 \pm 1$ seconds (or $380 \pm 10^{\circ}\text{C}$ for $\leq 3 \pm 0.5$ seconds for manual soldering)



◆其它说明 OTHERS

*本产品不含铅、镉等元素

This product does not include Plumbum or Cadmium.

注：上述所提供之内容为产品规格说明。在产品未变更时，风华保有修改此内容不另行通知之所有权利，任何产品变更将会以 P C N 通知客户。