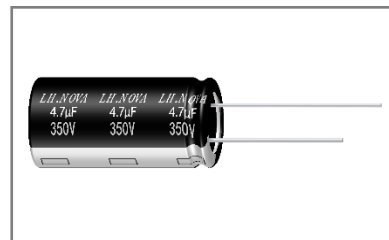


## LE 系列铝电解电容器

### LE Series Aluminum Electrolytic Capacitor

#### ◆特征 Features

- \* 寿命: 105℃ 2000~5000 小时  
Load life: 105℃ 2000~5000 hours.
- \* 低阻抗  
Low impedance.
- \* 符合 RoHS  
Compliant to the RoHS Directive.



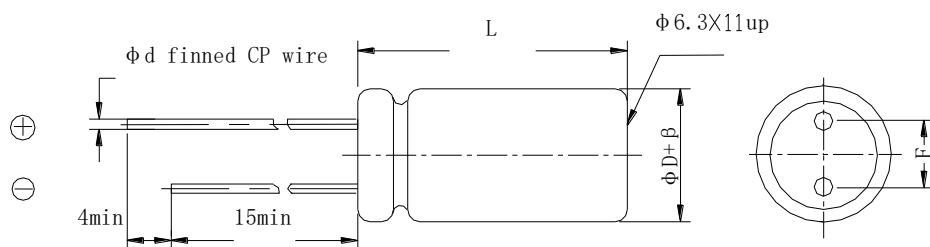
#### ◆应用 Application

- \* 适用于各类照明电源、通信设备、开关电源等电子产品  
Ideally designed for all kinds of Lighting power supply、communication equipment、switching power supply and other electronic products.

#### ◆型号表示法 Part Number

8		220		LF		M		0511		LE		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		LA		6.3		0511		Φ5x11		N		LH.NOVA		1		105℃		0		散装品 Bulk	
				LB		10		AA12		Φ6.3x12										P		直脚方式 编带品 original type(vertic al) tape	
				LC		16		0812		Φ8x12													
				LD		25		1020		Φ10x20													
				LE		35		AB20		Φ12.5x20													
				LF		50																	
				VA		400																	
				VB		450																	

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	
1R0		1uF		K		±10%		LE		LE		0		黑色 Black		1		普通品 regular	
220		22uF		V		± <sup>20</sup> <sub>10</sub> %						1		深蓝色 Deep-blue		E		PET胶管 平台胶粒	
501		500uF		M		±20%						7		棕色 Brow n		F		PET胶管 凸台胶粒	
183		18000uF		Q		± <sup>30</sup> <sub>10</sub> %						9		绿色 Green					

**◆产品结构 Product Structure**


β(mm)	±0.5			±1.0				
ΦD(mm)	5	6.3	8	10	12.5	16	18	22
F±0.5(mm)	2.	2.5	3.5	5.0		7.5		10.0
Φd±0.1(mm)	0.5		0.6			0.8		
L(mm)	11,12		12,16	12,16,	16,20,25	16,20,25,30,35	20,25,30,35,40	25,30,35,40
	L±2.0							

**◆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	6.3~100V.DC					160~450V.DC				
使用温度范围 Operating Temperature Range	-55℃~+105℃					-40℃~+105℃				
标称静电容量范围 Nominal Capacitance Range	1~18000 μF									
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	6.3~100				160~450				
	漏电流 Leakage current	2 分钟后 ≤0.01CV 或 3(μA),取 最大值 After 2 min. ≤0.01CV or 3(μA), Whichever is greater.				2 分钟后 ≤0.03CV+25(μA) After 2 min . ≤0.03CV+25(μA)				
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	6.3	10	16	25	35	50	63	80~100	160~450
	DF(MAX) (20℃,120Hz)	0.18	0.16	0.14	0.12	0.12	0.10	0.09	0.08	0.10
当容量值大于 1000μF 时, 每增加 1000μF, DF 值加 0.02 For capacitance of more than 1000μF,add 0.02 foreveryincrease of 1000μF.										

浪涌电压 Surge Voltage Test	额定工作电压(V) Rated working voltage		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	浪涌电压(V) Surge voltage		8	13	20	32	44	63	79	125	200	250	300	400	450	500
	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。测试温度: 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.															
	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															
温度特性 Temperature Stability	额定工作电压(V) Rated working voltage		6.3	10	16	25	35	50	63	100	160~250		350~450			
	阻抗比(120Hz) Impedance Ratio	z-25℃/z+20℃	4	3	2	2	2	2	2	2	3		6			
		z-40℃/z+20℃	8	6	4	3	3	3	3	3	4		8			
		z-55℃/z+20℃	10	8	6	4	4	4	4	4						
高温负荷特性 Load life	在+105℃ 环境中施加额定工作电压和最大允许纹波电流 2000~5000 小时后,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℃ for 2000~5000 hours, capacitors meet the characteristics requirements measured at +20℃ listed at below: 1、电容量变化率:±25%初始测量值以内 Capacitance change: ±25% initial measured value 2、漏电流: ≤初始规定值 Leakage current: ≤initial specified value 3、损耗角正切值≤200%倍初始规定值 Dissipation factor: ≤200% initial specified value															
高温贮存特性 Shelf life	在+105℃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 小时后测试, 电容器的性能符合下面要求:															
	After leaving capacitors under no load at +105℃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:±20%初始测量值以内 Capacitance change : ±20% initial measured value 2、漏电流: ≤200%倍初始规定值 Leakage current: ≤200% initial specified value 3、损耗角正切值≤200%倍初始规定值 Dissipation factor: ≤200% initial specified value															

<p>稳态湿热 Resistance to damp heat (steady state)</p>	<p>试验温湿度: <math>40 \pm 2^{\circ}\text{C}</math>, 90~95%RH          试验时间: <math>500 \pm 10\text{h}</math>          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: <math>40 \pm 2^{\circ}\text{C}</math>, 90~95%RH          Test time: <math>500 \pm 10\text{h}</math>          After completion of test, the capacitor shall be subjected to standard atmospheric conditions for 2 hours, after which measurements shall be made.</p> <p>外观: 无异状          Appearance: No remarkable abnormality          容量变化: 在初始值<math>\pm 10\%</math>范围内          Capacitance change: Within <math>\pm 10\%</math> of the initial value.          损耗角正切值: 不大于初始规定值          Dissipation factor: <math>\leq</math> initial specified value          漏电流: 不大于初始规定值          Leakage current: <math>\leq</math> initial specified value</p>
<p>耐焊接热 Resistance to soldering heat</p>	<p>焊锡温度: <math>260 \pm 5^{\circ}\text{C}</math>, 浸入时间: <math>10 \pm 1</math> 秒, 浸入深度: 1.6mm          Solder bath temperature: <math>260 \pm 5^{\circ}\text{C}</math>, Immersion time: <math>10 \pm 1\text{sec}</math>.          Immersion depth: 1.6mm</p> <p>外观: 无异状          Appearance: No remarkable abnormality          容量变化: 在初始值<math>\pm 10\%</math>范围内          Capacitance change: Within <math>\pm 10\%</math> of the initial value.          损耗角正切值: 不大于初始规定值          Dissipation factor: <math>\leq</math> initial specified value          漏电流: 不大于初始规定值          Leakage current: <math>\leq</math> initial specified value</p>
<p>防爆试验 Safety vent</p>	<p>以下试验只适用于铝壳直径<math>\geq \Phi 8</math> 产品。          The following tests only apply to those products with vent products at diameter <math>\geq \Phi 8</math> with vent.          在电容器两极施加反向直流电压, 其中通过的电流为 1A, 在测试时防爆装置应能在 30 分钟内动作。          DC Application test: The capacitor shall be subjected to a reverse DC voltage. The current flowing through the capacitor shall be 1A. If the vent does work with the voltage applied for 30 minutes, the test is considered to be passed.</p> <p>应无引线、铝箔等散射, 无火花产生          The safety vent is actuated under the test conditions, thereby preventing terminals, metal pieces, etc, of the capacitor from scattering due to burst, the case from separating from the seal packing, or the capacitor from producing flame.</p>

端子强度 Terminal strength	端子抗拉强度：沿电容器端子引线方向施加拉力(如下表)，10±1 秒。												
	<table><tr><td>引线直径 Φ</td><td>0.45</td><td>0.50</td><td>0.60</td><td>0.80</td><td>1.00</td></tr><tr><td>拉力 N</td><td>5</td><td>5</td><td>10</td><td>10</td><td>20</td></tr></table>	引线直径 Φ	0.45	0.50	0.60	0.80	1.00	拉力 N	5	5	10	10	20
	引线直径 Φ	0.45	0.50	0.60	0.80	1.00							
	拉力 N	5	5	10	10	20							
	Tensile strength of terminal: Astatic load shall be applied to the terminal in the axial direction and acting in a direction away from the body for 10±1 sec.												
端子抗弯强度：在电容器引线施加固定重力（如下表），然后 5 秒内完成将电容体弯折 90° 后回到原位，再向相反方向弯折 90° 后回到原位。													
<table><tr><td>引线直径 Φ</td><td>0.45</td><td>0.50</td><td>0.60</td><td>0.80</td><td>1.00</td></tr><tr><td>拉力 N</td><td>2.5</td><td>2.5</td><td>5</td><td>5</td><td>10</td></tr></table>	引线直径 Φ	0.45	0.50	0.60	0.80	1.00	拉力 N	2.5	2.5	5	5	10	
引线直径 Φ	0.45	0.50	0.60	0.80	1.00								
拉力 N	2.5	2.5	5	5	10								
	Bending strength of terminal: Hang the specified dead weight, in about 5 sec then bend the body through 90°, return to the original position. Next bend it in opposite direction through 90° with the same speed, again return to the original position												
	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 Solder ability	焊锡温度：235±5℃ 浸入时间：2±0.5 秒 Temperature of solder: 235±5℃ Dippingtime: 2±0.5sec. This specification shall be met after the capacitors are stored under standard atmospheric conditions for 6 months.  浸入焊锡的引线表面积约 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.												
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												

**◆尺寸表、允许纹波电流、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) Cap(μF)	50 (60)	100 (120)	1K	10K	≥100K
6.8~33	0.30	0.42	0.70	0.90	1.00
39~270	0.35	0.50	0.73	0.92	1.00
330~680	0.40	0.55	0.77	0.94	1.00
820~1800	0.45	0.60	0.80	0.96	1.00
2200~18000	0.50	0.70	0.85	0.98	1.00

\*尺寸表与允许纹波电流

Dimensions and ripple current

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
6.3	100	5×7	1	150
	150	5×11	0.58	210
	220	5×7	0.5	100
	220	5×11	0.45	300
	220	6.3×12	0.32	340
	270	6.3×12	0.32	340
	330	6.3×12	0.28	340
	390	8×12	0.26	400
	470	8×12	0.25	480
	560	8×12	0.2	560
	680	6.3×12	0.13	640
	820	8×12	0.14	700
	1000	8×12	0.13	900
	1000	8×16	0.087	840
	1200	8×14	0.08	1210
	1200	10×16	0.06	1210
	1500	10×20	0.058	1400
	1800	12.5×16	0.058	1450
	2200	8×20	0.08	1550
	2200	10×16	0.08	1550
	2200	10×20	0.055	1650
	2700	10×30	0.055	1910
	3300	10×20	0.055	1500
	3300	10×25	0.052	1800
	3300	12.5×20	0.056	1900
	3900	12.5×25	0.05	2230
	4700	12.5×30	0.045	2650

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	5600	12.5×35	0.04	2880
	6800	16×25	0.03	2930
	8200	16×30	0.025	3450
	10000	16×35	0.023	3610
	12000	18×35	0.02	4170
	15000	18×35	0.018	4220
	18000	18×40	0.015	4280
10	100	5×11	0.58	210
	220	5×11	0.6	250
	220	6.3×12	0.22	340
	270	8×12	0.15	340
	330	8×12	0.19	480
	390	8×12	0.15	410
	470	6.3×12	0.15	550
	470	8×12	0.14	640
	560	8×12	0.098	760
	560	10×12	0.093	700
	680	6.3×14	0.25	550
	680	8×12	0.098	760
	680	8×16	0.087	840
	820	10×12	0.085	860
	1000	8×12	0.1	900
	1000	8×16	0.09	1000
	1000	10×12	0.09	1210
	1000	10×16	0.06	1210
	1200	10×20	0.06	1400
	1500	10×16	0.07	1650
	1500	10×20	0.058	1650
	1800	10×20	0.058	1750
	2200	10×16	0.065	1800
	2200	10×20	0.058	1900
	2200	12.5×20	0.053	1900
	2700	12.5×25	0.045	2210
	2700	16×20	0.043	2220
	3300	10×25	0.09	2180
	3300	12.5×20	0.07	2100
	3300	12.5×25	0.035	2230
	3900	12.5×30	0.03	2650
	4700	10×30	0.07	1600

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	4700	16×25	0.028	1800
	5600	16×25	0.025	2930
	6800	12.5×25	0.038	1800
	6800	16×25	0.023	3450
	6800	16×30	0.023	3450
	8200	16×35	0.017	3610
	10000	18×35	0.014	4220
16	10	5×11	1.5	100
	15	5×11	1.4	103
	22	5×11	1.2	150
	33	5×11	0.65	210
	47	5×11	0.65	180
	47	6.3×7	0.7	180
	47	6.3×12	0.65	190
	56	5×11	0.63	180
	68	5×11	0.58	190
	82	5×11	0.55	200
	100	6.3×7	0.67	130
	100	5×11	0.5	200
	100	6.3×12	0.4	215
	120	6.3×12	0.22	280
	150	6.3×12	0.22	300
	220	6.3×7	0.55	300
	220	6.3×12	0.19	320
	220	8×12	0.19	480
	270	8×12	0.16	550
	270	8×12	0.18	555
	390	8×12	0.12	700
	470	8×12	0.1	750
	470	8×16	0.11	865
	470	10×12	0.08	865
	560	8×16	0.08	900
	680	8×16	0.087	900
	680	10×12	0.087	900
	680	10×16	0.06	1210
	820	10×20	0.06	1210
	1000	8×16	0.1	1100
	1000	10×12	0.11	1100
	1000	10×16	0.06	1210



Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	1000	10×20	0.055	1400
	1200	10×20	0.05	1650
	1500	10×16	0.065	1210
	1500	10×20	0.05	1750
	1500	12.5×20	0.045	1900
	1800	12.5×20	0.055	2000
	1800	12.5×25	0.045	2005
	2200	10×30	0.065	2100
	2200	12.5×20	0.053	1900
	2200	12.5×25	0.045	2230
	2200	12.5×30	0.046	2230
	2700	16×20	0.027	2530
	2700	16×25	0.043	2535
	3300	12.5×25	0.045	2350
	3300	16×25	0.035	2500
	3900	16×25	0.028	2930
	4700	12.5×30	0.058	3000
	4700	16×25	0.03	3250
	4700	16×30	0.025	3450
	5600	16×35	0.02	3610
	6800	16×30	0.055	3500
	6800	18×25	0.028	3800
	6800	18×35	0.018	4080
	8200	18×35	0.016	4220
	10000	18×40	0.014	4280
	15000	18×35	0.038	4100
25	10	5×11	1.5	100
	15	5×11	1.3	120
	22	5×11	0.93	150
	33	5×7	0.68	180
	33	5×11	0.58	210
	47	5×11	0.58	210
	47	6.3×11	0.58	210
	47	6.3×12	0.45	210
	56	5×11	0.55	230
	68	5×11	0.45	240
	82	5×11	0.38	250
	82	6.3×11	0.24	300
	100	5×11	0.38	250

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	100	6.3×12	0.22	280
	100	6.3×14	0.4	380
	120	8×12	0.2	350
	150	6.3×12	0.22	440
	150	8×12	0.19	480
	220	6.3×11	0.17	500
	220	8×12	0.13	640
	220	10×12	0.08	865
	270	10×12	0.11	700
	330	8×12	0.11	750
	330	8×16	0.095	865
	330	10×12	0.08	865
	390	8×16	0.11	865
	390	10×12	0.08	900
	470	8×12	0.11	850
	470	8×14	0.08	865
	470	10×16	0.06	1210
	560	10×16	0.07	1300
	560	10×20	0.075	1350
	680	8×20	0.085	1200
	680	10×14	0.075	1200
	680	10×16	0.065	1400
	680	10×20	0.056	1400
	820	8×20	0.08	1300
	820	10×16	0.08	1550
	820	10×20	0.05	1650
	1000	10×16	0.055	1500
	1000	10×20	0.048	1650
	1000	12.5×20	0.043	1900
	1000	12.5×25	0.043	1900
	1200	12.5×25	0.043	2210
	1500	12.5×20	0.05	2000
	1500	12.5×25	0.043	2230
	1800	12.5×25	0.038	2530
	1800	16×20	0.027	2535
	2200	10×30	0.055	2600
	2200	12.5×20	0.045	2500
	2200	12.5×25	0.027	2600
	2200	16×25	0.033	2600

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	2700	16×25	0.03	2930
	3300	12.5×25	0.045	2650
	3300	16×30	0.025	3450
	3900	16×25	0.028	2930
	4700	16×25	0.043	4000
	4700	16×30	0.035	4000
	4700	18×35	0.023	4220
	5600	18×25	0.03	2500
	5600	18×40	0.018	4280
	6800	18×25	0.025	5000
	6800	18×30	0.026	5010
35	10	5×11	1.4	100
	15	5×11	1.2	150
	22	5×11	0.7	180
	33	5×11	0.58	210
	47	5×11	0.45	210
	47	6.3×12	0.35	240
	56	6.3×12	0.32	215
	68	6.3×12	0.32	280
	82	6.3×12	0.32	300
	100	6.3×11	0.3	555
	100	8×12	0.17	560
	120	8×12	0.15	730
	150	8×12	0.12	750
	150	10×12	0.12	760
	220	8×12	0.12	760
	220	10×12	0.1	865
	220	10×16	0.084	1050
	270	8×12	0.11	865
	270	8×20	0.069	1050
	330	8×12	0.07	865
	330	8×20	0.11	1080
	330	10×12	0.11	1210
	390	10×16	0.09	1280
	470	8×20	0.07	1200
	470	10×16	0.06	1300
	470	10×20	0.06	1400
	560	10×20	0.058	1650
	680	10×20	0.05	1800

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	680	12.5×16	0.058	1800
	680	12.5×20	0.045	1900
	820	12.5×20	0.043	1900
	1000	10×20	0.06	1650
	1000	10×30	0.075	1900
	1000	12.5×20	0.04	1900
	1000	12.5×25	0.035	2230
	1200	16×20	0.027	2530
	1200	16×25	0.032	2530
	1500	10×30	0.035	2800
	1500	12.5×25	0.043	2880
	1500	12.5×35	0.031	2880
	1800	16×25	0.03	2930
	2200	16×25	0.05	2500
	2200	18×20	0.05	2500
	2200	16×30	0.028	3450
	2700	18×30	0.023	4170
	2700	16×35	0.023	3450
	3300	18×25	0.018	4220
	3900	18×40	0.016	4280
	4700	18×30	0.04	4280
	4700	18×35	0.018	4280
50	1	5×11	5	22
	2.2	5×11	2.5	43
	3.3	5×11	2.3	47
	4.7	5×11	2	110
	6.8	5×11	1.8	115
	10	5×7	3	110
	10	5×11	1.4	124
	10	6.3×12	2	124
	22	5×11	0.7	180
	22	6.3×12	0.71	185
	33	6.3×12	0.58	210
	47	6.3×9	0.38	250
	47	8×12	0.5	300
	56	6.3×11	0.3	295
	56	6.3×12	0.35	295
	56	8×12	0.43	350
	68	8×12	0.33	400

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	82	8×12	0.28	480
	100	6.3×14	0.23	480
	100	8×12	0.17	555
	120	8×16	0.17	630
	150	8×12	0.15	680
	150	8×16	0.13	680
	150	10×12	0.12	760
	180	10×12	0.091	810
	180	8×20	0.091	810
	220	8×16	0.09	865
	220	10×12	0.09	865
	220	10×16	0.09	865
	220	10×20	0.084	1050
	270	10×20	0.082	1200
	330	10×12	0.08	1200
	330	10×14	0.08	1200
	330	10×16	0.075	1250
	390	10×20	0.064	1500
	470	12.5×16	0.062	1500
	470	12.5×20	0.061	1660
	560	10×20	0.055	1800
	560	12.5×20	0.053	1850
	680	12.5×20	0.052	1900
	680	12.5×25	0.04	2010
	680	10×30	0.04	2010
	820	12.5×25	0.038	2210
	820	16×20	0.038	2210
	1000	12.5×35	0.035	2300
	1000	16×20	0.035	2300
	1000	16×25	0.035	2550
	1200	16×30	0.035	3010
	1200	16×35	0.035	3010
	1500	16×30	0.034	3050
	1500	16×35	0.029	3150
	1800	12.5×35	0.031	3180
	1800	12.5×40	0.031	3180
	1800	18×30	0.027	3200
	2200	16×30,35	0.03	3250
	2200	18×30	0.03	3280

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	2200	18×35	0.026	3680
	2700	18×40	0.026	3800
	3300	18×40	0.024	3950
	3300	22×25	0.03	3800
63	1	5×11	5	22
	2.2	5×11	2.5	43
	3.3	5×11	2.3	47
	4.7	5×11	2	110
	6.8	5×11	1.8	115
	10	5×11	1.8	110
	22	6.3×12	1.3	150
	33	6.3×12	1.2	115
	47	8×12	0.85	165
	56	8×12	0.63	232
	68	8×16	0.3	420
	82	8×16	0.25	500
	100	8×16	0.4	510
	100	10×16	0.38	560
	120	8×20	0.16	650
	120	10×14	0.15	680
	150	10×12	0.14	690
	150	10×16	0.13	700
	180	10×20	0.01	820
	220	8×20	0.09	865
	220	10×16	0.09	865
	220	10×20	0.09	950
	270	12.5×20	0.09	1205
	330	12.5×25	0.089	1220
	390	12.5×25	0.089	1550
	390	16×20	0.088	1580
	470	12.5×20	0.061	1660
	470	16×20	0.06	1670
	560	16×25	0.06	1885
	680	12.5×25	0.058	1950
	680	12.5×25	0.055	2060
	820	16×25	0.038	2210
	820	16×30	0.038	2210
	1000	16×30	0.037	2550
	1200	18×25	0.032	3050

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	1200	18×35	0.032	3050
	1500	16×30	0.035	3180
	1500	18×40	0.036	3200
	1800	18×40	0.035	3280
	2200	18×35	0.03	3400
	2200	18×40	0.035	3750
	3300	18×40	0.024	3860
80	1	5×11	5	22
	2.2	5×11	2.5	43
	3.3	5×11	2.3	47
	4.7	5×11	2	110
	6.8	5×11	1.8	115
	10	5×11	1.8	110
	22	6.3×12	0.45	180
	33	6.3×12	1.2	117
	47	8×12	0.65	200
	56	8×12	0.63	232
	68	8×12	0.31	350
	82	8×16	0.45	300
	100	8×16	0.4	450
	100	10×12	0.4	450
	100	10×16	0.38	530
	120	8×20	0.35	540
	120	10×14	0.35	560
	150	10×16	0.22	580
	180	10×20	0.21	620
	220	10×20	0.17	660
	220	12.5×20	0.15	680
	270	12.5×20	0.15	765
	330	12.5×20	0.11	980
	330	12.5×25	0.11	980
	390	12.5×20	0.12	1230
	390	12.5×25	0.12	1280
	390	16×20	0.12	1320
	470	16×25	0.078	1570
	560	16×25	0.073	1590
	680	16×25	0.075	1800
	680	18×25	0.07	1820
	820	16×25	0.06	1850

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	820	16×30	0.054	1870
	1000	16×30	0.05	2000
	1000	18×25	0.045	2000
	1000	18×35	0.045	2300
	1200	18×25	0.043	2450
	1500	18×40	0.043	2500
	1800	18×40	0.025	3680
	2200	18×45	0.025	3680
100	1	5×11	6	22
	2.2	5×11	3.5	43
	3.3	5×11	3.5	47
	4.7	5×11	2.8	110
	6.8	5×11	2.3	55
	10	5×11	2	100
	10	6.3×12	1.6	110
	10	8×12	2	110
	22	6.3×12	1.3	115
	22	8×12	1	150
	33	8×12	0.55	200
	33	8×16	0.47	250
	47	8×12	0.45	200
	47	8×14,16	0.47	250
	47	10×12	0.48	288
	56	8×20	0.33	362
	68	10×12	0.35	350
	68	10×16	0.31	400
	82	10×20	0.23	466
	100	10×14	0.23	500
	100	10×16	0.22	580
	100	10×20	0.22	620
	120	12.5×16	0.2	620
	120	10×25	0.22	650
	120	12.5×20	0.16	690
	150	10×20	0.18	600
	150	12.5×20	0.16	650
	150	12.5×25	0.14	650
	180	12.5×25	0.12	780
	220	10×30	0.091	1050
	220	12.5×20	0.091	1040



Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	220	12.5×25	0.091	1040
	270	12.5×25	0.09	1150
	330	12.5×25	0.09	1200
	330	16×20	0.09	1250
	330	18×20	0.08	1240
	390	16×25	0.075	1570
	390	16×30	0.073	1570
	470	18×20	0.06	1650
	470	18×30	0.06	1630
	560	16×25	0.055	1800
	560	18×30	0.055	2020
	560	18×35	0.06	2020
	680	18×30	0.055	1790
	680	18×35	0.05	1790
	820	16×40	0.032	2500
	820	18×40	0.045	2330
	1000	18×35	0.03	2700
	1000	18×40	0.035	2750
	1200	18×40	0.036	3150
	1500	22×35	0.025	3180
	1800	18×40	0.02	3680
	2200	22×45	0.018	3700
160	10	6.3×12	4	80
	10	10×16	1.5	200
	15	10×20	1.3	250
	22	8×12	3	200
	22	10×16	1.3	250
	22	10×20	1	300
	33	10×16	0.9	400
	33	12.5×20	0.71	450
	47	10×16	0.7	500
	47	12.5×20	0.6	500
	68	12.5×20	0.68	450
	82	12.5×20	0.5	600
	82	12.5×25	0.45	610
	100	12.5×20	0.45	700
	100	16×25	0.4	950
	150	16×30	0.35	1250
	220	16×25, 30	0.27	1300

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	220	18×30	0.32	1400
	220	18×35	0.32	1400
	330	16×40	0.42	1600
	330	18×30	0.22	1600
	470	18×35	0.2	1800
	560	18×40	0.14	1800
	1000	18×45	0.08	2000
200	2.2	6.3×12	8	65
	3.3	6.3×12	8	65
	4.7	6.3×12	7	80
	5.6	8×12	2	80
	6.8	10×12	2.5	110
	8.2	10×12	2.5	110
	10	8×12	4	180
	10	10×16	1.8	280
	15	10×16	1.8	300
	22	8×14	2.5	300
	22	10×12	2.8	350
	22	10×16	1.2	350
	33	10×16	1.5	400
	33	10×20	1	400
	33	12.5×20	0.98	400
	33	12.5×25	0.55	550
	47	10×20	0.8	550
	47	12.5×16	0.95	550
	47	12.5×20	0.6	600
	47	12.5×25	0.6	600
	68	12.5×20	0.65	700
	68	12.5×25	0.58	705
	82	12.5×25	0.5	800
	100	12.5×20	0.75	750
	100	12.5×25	0.33	900
	100	16×25	0.4	950
	150	16×25	0.35	1100
	150	16×30	0.38	1105
	220	12.5×40	0.3	1200
	220	16×30	0.25	1200
	220	18×25,30	0.32	1300
	220	18×35	0.2	1300

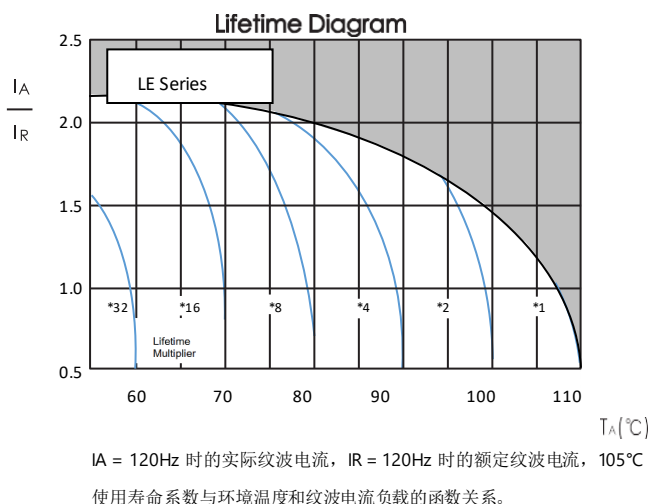
Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	330	18×30,35	0.22	1300
	470	18×40	0.22	1300
	470	22×35	0.25	1305
250	1	5×11	18	60
	1.2	6.3×12	12	45
	1.5	6.3×12	10	50
	2.2	6.3×12	8.5	80
	3.3	6.3×12	9	75
	4.7	6.3×12	7	80
	4.7	8×12	5.5	80
	4.7	10×16	2.5	110
	5.6	8×16	2.3	120
	6.8	8×12	4.5	130
	6.8	10×12	4.5	130
	6.8	10×16	2	130
	8.2	8×12	4.5	130
	8.2	10×12	4.5	130
	8.2	10×16	2	130
	10	8×12	2.5	150
	10	10×16	1.5	200
	10	10×20	1.5	200
	15	10×20	1.5	250
	22	10×16	1.8	250
	22	10×20	1.4	300
	22	12.5×20	1.3	300
	33	12.5×20	1	450
	33	12.5×25	1	455
	47	12.5×20	0.9	250
	47	12.5×25	0.85	250
	47	16×25	0.7	850
	68	16×25	0.45	850
	82	16×25	0.45	1000
	100	16×25	0.45	1100
	100	18×35	0.8	1210
	150	18×35	0.35	1350
	220	18×40	0.14	1400
400	1	6.3×12	6.5	60
	1	8×12	9.5	70
	1.2	6.3×12	12	45

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	1.5	8×12	9	60
	2.2	6.3×11	10	50
	2.2	6.3×12	9.5	50
	2.2	8×12	8.5	60
	2.2	10×12	6.5	78
	3.3	8×10	10	90
	3.3	8×12	6.5	80
	3.3	10×12	4	90
	4.7	8×12	5	90
	4.7	10×16	4.1	95
	4.7	10×20	4.2	96
	5.6	8×14	6	80
	5.6	8×16	4.5	82
	6.8	10×12	4.5	80
	6.8	10×16	3.8	90
	6.8	10×20	3.2	110
	8.2	8×12	4	90
	8.2	8×16	2	240
	8.2	10×16	3.8	120
	10	8×12	4.5	120
	10	8×14	3	120
	10	10×12	4.5	150
	15	10×12	3.8	150
	15	10×16	3.5	180
	15	12.5×20	2.6	180
	22	12.5×16	2.5	210
	22	12.5×20	2.5	212
	22	12.5×25	1.3	215
	33	12.5×20	2.5	350
	33	12.5×25	1.3	350
	33	16×30	0.65	410
	47	16×20	1.2	650
	47	18×20	1	650
	47	16×25	0.75	400
	47	18×30	0.8	750
	68	16×25	0.95	750
	68	18×25	0.75	780
	68	18×30	0.75	780
	82	16×25	0.5	810

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	82	16×30	0.65	810
	82	18×35	0.65	810
	100	18×25	0.5	950
	100	18×30	0.6	950
	100	18×35	0.6	950
	100	22×25	0.5	950
	150	18×40	0.71	1000
	150	22×40	0.55	1100
450	1	8×12	7	62
	1.2	6.3×12	12	45
	1.5	8×12	9	60
	2.2	8×12	9.5	68
	2.2	10×12	6.5	71
	3.3	8×12	11	80
	3.3	10×16	4	90
	4.7	10×12	3.5	110
	4.7	10×16	4.5	115
	4.7	10×20	3.5	118
	5.6	10×20	3.5	120
	6.8	10×16	3.5	130
	6.8	10×20	3	130
	8.2	10×16	3.5	130
	8.2	10×20	3	130
	10	10×16	4	130
	10	10×20	3	130
	10	10×30	3	130
	15	10×16	4	130
	15	12.5×20	1.6	180
	15	12.5×25	1.6	180
	15	16×20	1.6	180
	22	12.5×20	1	150
	22	12.5×25	1.7	180
	22	16×20	1	210
	33	12.5×25	1.2	400
	33	16×20	0.95	400
	33	16×25	0.95	400
	33	16×30	0.9	410
	47	16×30	0.9	680
	47	18×20	1	600

Rated voltage	Rated capacitance	Case size	ESR(mΩ)	Rated ripple current
额定电压(V)	标称容量(μF)	尺寸 D×L(mm)	等效串联电阻	额定纹波电流
			at 20°C, 100 kHz	(mA <sub>rms</sub> /105°C/100kHz)
	47	18×25	1	650
	47	18×30	0.85	750
	68	16×35	0.71	810
	68	18×25	0.75	815
	68	18×35	0.76	818
	82	18×30	0.5	830
	82	18×40	0.65	880
	100	18×30	0.34	950
	100	18×40	0.56	956
	150	18×30	0.34	950
	150	18×40	0.8	962

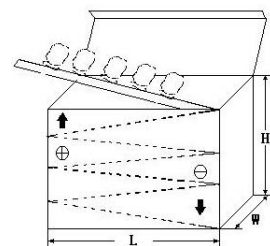
### ◆ 产品特征曲线 Product Characteristic Curve



### ◆ 包装 Packaging

\* 编带产品包装规范与数量 Taped packaging quantity

直径 ΦD(mm)	数量 (只) Qty. (Pcs)	L(电容高度)≤22mm	L(电容高度)= 25±2mm
		L×W×H(mm)	L×W×H(mm)
Φ5	2000	328×235×50	328×235×57
Φ6.3	1500		
Φ8	1000		
Φ10	600		
Φ12.5	400		
Φ16	250		
Φ18	200		



\* 散装品包装数量 Bulk packaging quantity

直径 ΦD(mm) Diameter	高度 L(mm) Length	数量 (只/袋) Quantity (pcs/bag)	袋/盒 bag/box	内箱/外箱 Inner box/outer box	(只/箱) psc/box
Φ4	7-8	1000	15	4	60000
Φ5	5-7	1000	12	4	48000
Φ6	11	1000	10	4	40000
Φ6.3	5-7	1000	10	4	40000
Φ6.3	8-15	1000	8	4	32000
Φ6.3	15-20	1000	6	4	24000
Φ8	5-12	500	8	4	16000
Φ8	14-16	500	8	4	16000
Φ8	20	500	6	4	12000
Φ10	9-13	500	6	4	12000
Φ10	14-16	250	8	4	8000
Φ10	17-20	250	8	4	8000
Φ10	25-30	200	8	4	6400
Φ10	31-35	200	6	4	4800
Φ12-Φ13	16-28	200	6	4	4800
Φ12-Φ13	30-40	100	8	4	3200
Φ12-Φ13	45-55	100	6	4	2400
Φ16	15-20	100	8	4	3200
Φ16	21-30	100	6	4	2400
Φ16	31-40	50	10	4	2000
Φ18	15-20	100	6	2	1200
Φ18	25-30	50	8	2	800
Φ18	35-40	50	6	2	600
Φ18	41-50	25	10	2	500
Φ20	25-40	50	10	2	1000
Φ22	25-35	50	5	2	500
Φ22	≥40	25	10	2	500

### ◆贮存方法 Storage Methods

- \* 请保管在室温 5℃~35℃，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 faster leakage current rises. Please take caution when selecting the storage location. The leakage current decreases gradually as voltage is applied to the capacitor. If the rising leakage current may cause problems in the circuit, please charge the capacitor before using.

\* (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内劣化直至损坏。注意电压峰值请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) DC aluminum electrolytic capacitors should be used according to the correct polarity

When a DC aluminum electrolytic capacitor is connected to a circuit with reverse polarity, the capacitor will cause a short circuit in the electronic circuit, and the resulting current will cause damage to the capacitor. If it is possible to apply positive voltage to the negative lead in the circuit, please choose a non-polar product.

(2) Function below rated operating voltage

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) Conventional capacitors are prohibited from being used for fast charging and discharging

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) The applied ripple current should be less than the rated value

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.

(5) Operating ambient temperature

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.

(6) Terminal Strength

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.

(7) Heat resistance during welding process

In the dip soldering process of PCB board with aluminum electrolytic capacitors mounted, secondary shrinkage or crack of PVC sleeve may be observed when solder temperature is too high or dipping time is too long.

(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

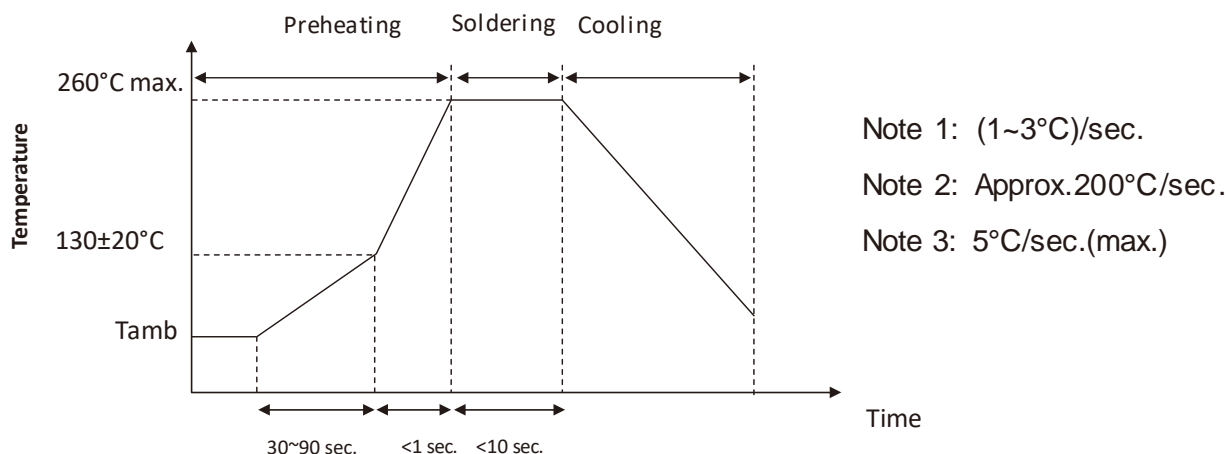
预热：105°C

波峰焊：260±5°C 10±1 秒以下（或 380±10°C 3±0.5 秒以下：手焊）

\*Wave Soldering Conditions

Preheating: 105°C

Wave Soldering: 260±5°C for ≤10±1 seconds (or 380±10°C for ≤3±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.

[illegible]

Note: The content provided above is the product specification. Fenghua reserves the right to modify this content without prior notice when the product remains unchanged. Any product changes will be notified to customers via PCN.