

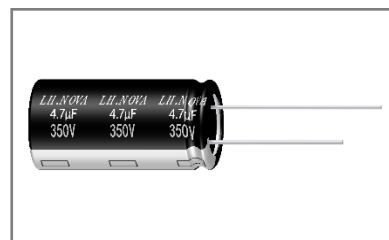
LE 系列铝电解电容器

LE Series Aluminum Electrolytic Capacitor

◆特征

Feature

- * 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

VB

M

0511

LE

N

0

1

1

0

代码 Code	产品类别 Type
8	成品 Product

代码 Code	电压 Voltage
LA	6.3
LB	10
LC	16
LD	25
LE	35
LF	50
VA	400
VB	450

代码 Code	尺寸 Dimensions ΦDxL(mm)
0511	Φ5x11
AA12	Φ6.3x12
0812	Φ8x12
1020	Φ10x20
AB20	Φ12.5x20
2240	Φ22x40

代码 Code	商标 Trademark
N	LH.NOVA

代码 Code	内码 Internal Code
1	105℃

代码 Code	产品脚型 Lead Forming Type
0	散装品 Bulk
P	直脚方式编带品 original type(vertical) tape

代码 Code	标称容量 Nominal Capacitance
1R0	1uF
220	22uF
501	500uF
183	18000uF

代码 Code	误差 Tolerance
K	±10%
V	± ²⁰ ₁₀ %
M	±20%
Q	± ³⁰ ₁₀ %

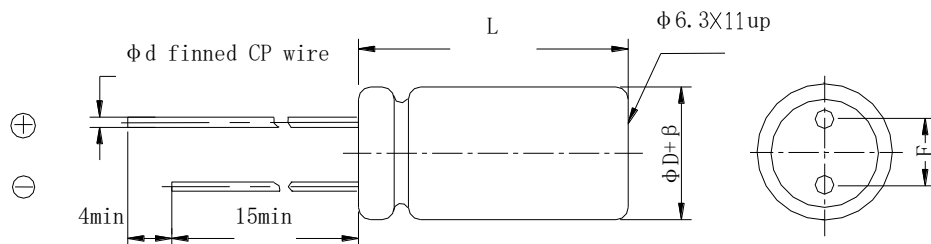
代码 Code	型号 Series
LE	LE

代码 Code	胶管颜色 Sleeve Color
0	黑色 Black
1	深蓝色 Deep-blue
7	棕色 Brown
9	绿色 Green

代码 Code	内码 Internal Code
1	普通品 regular
E	PET 胶管 平台胶粒
F	PET 胶管 凹台胶粒

◆产品结构

Product Structure



$\beta(\text{mm})$	± 0.5			± 1.0				
$\Phi D(\text{mm})$	5	6.3	8	10	12.5	16	18	22
$F \pm 0.5(\text{mm})$	2.	2.5	3.5	5.0		7.5		10.0
$\Phi d \pm 0.1(\text{mm})$	0.5		0.6			0.8		
$L(\text{mm})$	11,12		12,16	12,16,	16,20,25	16,20,25,30,35	20,25,30,35,40	25,30,35,40
	$L \pm 2.0$							

◆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 μ F									
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 for every increase 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										
	施加表中所列浪涌电压, 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										<table><tr><td>外径</td><td>时间 (hrs)</td></tr><tr><td>Case Dia</td><td>Life Time</td></tr><tr><td>φD≤6.3</td><td>2000</td></tr><tr><td>φD=8;10</td><td>3000</td></tr><tr><td>φD≥12.5</td><td>5000</td></tr></table>						外径	时间 (hrs)	Case Dia	Life Time	φD≤6.3	2000	φD=8;10	3000	φD≥12.5	5000
	外径	时间 (hrs)																								
	Case Dia	Life Time																								
φD≤6.3	2000																									
φD=8;10	3000																									
φD≥12.5	5000																									
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																									

稳态湿热 Resistance to damp heat (steady state)	试验温湿度: $40 \pm 2^{\circ}\text{C}$, 90~95%RH 试验时间: $500 \pm 10\text{h}$ 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: $40 \pm 2^{\circ}\text{C}$, 90~95%RH Test time: $500 \pm 10\text{h}$ 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$\pm 10\%$范围内 Capacitance change: Within $\pm 10\%$ of the initial value. 损失角正切值: 不大于初始规定值 Dissipation factor: $\leq$ initial specified value 漏电流: 不大于初始规定值 Leakage current: $\leq$ initial specified value
耐焊接热 Resistance to soldering heat	焊锡温度: $260 \pm 5^{\circ}\text{C}$, 浸入时间: 10 ± 1 秒, 浸入深度: 1.6mm Solder bath temperature: $260 \pm 5^{\circ}\text{C}$, Immersion time: $10 \pm 1\text{sec}$. Immersion depth: 1.6mm 外观: 无异状 Appearance: No remarkable abnormality 容量变化: 在初始值$\pm 10\%$范围内 Capacitance change: Within $\pm 10\%$ of the initial value. 损失角正切值: 不大于初始规定值 Dissipation factor: $\leq$ initial specified value 漏电流: 不大于初始规定值 Leakage current: $\leq$ initial specified value
防爆试验 Safety vent	以下试验只适用于铝壳直径$\geq \Phi 8$ 产品。 The following tests only apply to those products with vent products at diameter $\geq \Phi 8$ 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. 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.

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 bodyfor 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 frequencyrange :10-55Hz.												
	Peak to peakamplitude: 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

WV/V Cap/μF	6.3 (LO)			10(LB)			16(LC)			25(LD)			35(LE)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
10							5×11	1.5	100	5×11	1.5	100	5×11	1.4	100
15							5×11	1.4	103	5×11	1.3	120	5×11	1.2	150
22							5×11	1.2	150	5×11	0.93	150	5×11	0.7	180
33							5×11	0.65	210	5×7 5×11	0.68 0.58	180 210	5×11	0.58	210
47							5×11 6.3×7 6.3×12	0.65 0.70 0.65	180 180 190	5×11 6.3×11 6.3×12	0.58 0.58 0.45	210 210 210	5×11 6.3×12	0.45 0.35	210 240
56							5×11	0.63	180	5×11	0.55	230	6.3×12	0.32	215
68							5×11	0.58	190	5×11	0.45	240	6.3×12	0.32	280
82							5×11	0.55	200	5×11 6.3×11	0.38 0.24	250 300	6.3×12	0.32	300
100	5×7	1.0	150	5×11	0.58	210	6.3×7 5×11 6.3×12	0.67 0.5 0.4	130 200 215	5×11 6.3×12 6.3×14	0.38 0.22 0.40	250 280 380	6.3×11 8×12	0.3 0.17	555
120							6.3×12	0.22	280	8×12	0.20	350	8×12	0.15	730
150	5×11	0.58	210				6.3×12	0.22	300	6.3×12 8×12	0.22 0.19	440 480	8×12 10×12	0.12 0.12	750 760
220	5×7 5×11 6.3×12	0.5 0.45 0.32	100 300 340	5×11 6.3×12	0.6 0.22	250 340	6.3×7 6.3×12 8×12	0.55 0.19 0.19	300 320 480	6.3×11 8×12 10×12	0.17 0.13 0.08	500 640 865	8×12 10×12 10×16	0.12 0.1 0.084	760 865 1050
270	6.3×12	0.32	340	8×12	0.15	340	8×12	0.16	550	10×12	0.11	700	8×12 8×20	0.11 0.069	865 1050
330	6.3×12	0.28	340	8×12	0.19	480	8×12	0.13	640	8×12 8×16 10×12	0.11 0.095 0.080	750 865 865	8×12 8×20 10×12	0.07 0.11 0.11	865 1080 1210
390	8×12	0.26	400	8×12	0.15	410	8×12	0.12	700	8×16 10×12	0.11 0.08	865 900	10×16	0.09	1280
470	8×12	0.25	480	6.3×12 8×12	0.15 0.14	550 640	8×12 8×16 10×12	0.10 0.11 0.080	750 865 865	8×12 8×14 10×16	0.11 0.080 0.060	850 865 1210	8×20 10×16 10×20	0.07 0.06 0.06	1200 1300 1400
560	8×12	0.20	560	8×12 10×12	0.098 0.093	760 700	8×16	0.08	900	10×16 10×20	0.07 0.075	1300 1350	10×20	0.058	1650
680	6.3×12	0.13	640	6.3×14 8×12 8×16	0.25 0.098 0.087	550 760 840	8×16 10×12 10×16	0.087 0.087 0.060	900 900 1210	8×20 10×14 10×16 10×20	0.085 0.075 0.065 0.056	1200 1200 1400 1400	10×20 12.5×16 12.5×20	0.05 0.058 0.045	1800 1800 1900
820	8×12	0.14	700	10×12	0.085	860	10×20	0.06	1210	8×20 10×16 10×20	0.08 0.08 0.050	1300 1550 1650	12.5×20	0.043	1900

WV/V Cap/μF	6.3 (LO)			10(LB)			16(LC)			25(LD)			35(LE)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1000	8×12	0.13	900	8×12	0.10	900	8×16	0.10	1100	10×16	0.055	1500	10×20	0.06	1650
	8×16	0.087	840	8×16	0.09	1000	10×12	0.11	1100	10×20	0.048	1650	10×30	0.075	1900
				10×12	0.090	1210	10×16	0.060	1210	12.5×20	0.043	1900	12.5×20	0.040	1900
				10×16	0.060	1210	10×20	0.055	1400	12.5×25	0.043	1900	12.5×25	0.035	2230
1200	8×14 10×16	0.08 0.06	1210	10×20	0.060	1400	10×20	0.050	1650	12.5×25	0.043	2210	16×20 16×25	0.027 0.032	2530 2530
1500				10×16	0.07	1650	10×16	0.065	1210	12.5×20	0.05	2000	10×30	0.035	2800
				10×20	0.058	1650	10×20	0.05	1750	12.5×20	0.043	2230	12.5×25	0.043	2880
							12.5×20	0.045	1900	12.5×25	0.043	2230	12.5×35	0.031	2880
1800	12.5×16	0.058	1450	10×20	0.058	1750	12.5×20 12.5×25	0.055 0.045	2000	12.5×25 16×20	0.038 0.027	2530	16×25	0.030	2930
2200	8×20	0.08	1550	10×16	0.065	1800	10×30	0.065	2100	10×30	0.055	2600	16×25	0.05	2500
	10×16	0.08	1550	10×20	0.058	1900	12.5×20	0.053	1900	12.5×20	0.045	2500	18×20	0.05	2500
	10×20	0.055	1650	12.5×20	0.053	1900	12.5×25	0.045	2230	12.5×25	0.027	2600	16×30	0.028	3450
							12.5×30	0.046	2230	16×25	0.033	2600			
2700	10×30	0.055	1910	12.5×25 16×20	0.045 0.043	2210	16×20 16×25	0.027 0.043	2530	16×25	0.03	2930	18×30 16×35	0.023 0.023	4170 3450
3300	10×20	0.055	1500	10×25	0.09	2180	12.5×25	0.045	2350	12.5×25	0.045	2650	18×25	0.018	4220
	10×25	0.07	1800	12.5×20	0.07	2100	16×25	0.035	2500	16×30	0.025	3450			
	12.5×20	0.052	1900	12.5×25	0.035	2230									
3900	12.5×25	0.050	2230	12.5×30	0.03	2650	16×25	0.028	2930	16×25	0.028	2930	18×40	0.016	4280
4700				10×30	0.07	1600	12.5×30	0.058	3000	16×25	0.043	4000	18×30	0.04	4280
				16×25	0.028	1800	16×25	0.03	3250	16×30	0.035	4000	18×35	0.018	4280
							16×30	0.025	3450	18×35	0.023	4220			
5600	12.5×35	0.040	2880	16×25	0.025	2930	16×35	0.02	3610	18×25 18×40	0.03 0.018	2500 4280			
6800				12.5×25	0.038	1800	16×30	0.055	3500	18×25	0.025	5000			
				16×25	0.023	3450	18×25	0.028	3800						
				16×30	0.023	3450	18×35	0.018	4080						
8200	16×30	0.025	3450	16×35	0.017	3610	18×35	0.016	4220						
10000	16×35	0.023	3610	18×35	0.014	4220	18×40	0.014	4280						
12000	18×35	0.020	4170												
15000	18×35	0.018	4220				18×35	0.038	4100						
18000	18×40	0.015	4280												

(1) 外形尺寸 Case Size D×L(mm)

(2) 100KHz 阻抗值 Impedance at 100KHz +20℃ (Ω)

(3) 最大允许纹波电流 Max allowable ripple current (mA rms, +105 °C, 100KHz)

WV/V Cap/μF	50(LF)			63(LG)			80(LH)			100(MA)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1	5×11	5.0	22	5×11	5.0	22	5×11	5.0	22	5×11	6.0	22
2.2	5×11	2.5	43	5×11	2.5	43	5×11	2.5	43	5×11	3.5	43
3.3	5×11	2.3	47	5×11	2.3	47	5×11	2.3	47	5×11	3.5	47
4.7	5×11	2.0	110	5×11	2.0	110	5×11	2.0	110	5×11	2.8	110
6.8	5×11	1.8	115	5×11	1.8	115	5×11	1.8	115	5×11	2.3	55
10	5×7	3.0	110	5×11	1.8	110	5×11	1.8	110	5×11	2.0	100
	5×11	1.4	124							6.3×12	1.6	110
	6.3×12	2.0	124							8×12	2.0	110
22	5×11	0.70	180	6.3×12	1.3	150	6.3×12	0.45	180	6.3×12	1.3	115
	6.3×12									8×12	1.0	150
33	6.3×12	0.58	210	6.3×12	1.20	115	6.3×12	1.20	117	8×12 8×16	0.55 0.47	200 250
47	6.3×9 8×12	0.38	250	8×12	0.85	165	8×12	0.65	200	8×12	0.45	200
		0.50	300							8×14,16 10×12	0.47 0.48	250 288
56	6.3×11	0.30	295	8×12	0.63	232	8×12	0.63	232	8×20	0.33	362
	6.3×12	0.35	295									
	8×12	0.43	350									

WV/V Cap/μF	50(LF)			63(LG)			80(LH)			100(MA)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
68	8×12	0.33	400	8×16	0.30	420	8×12	0.31	350	10×12 10×16	0.35 0.31	350 400
82	8×12	0.28	480	8×16	0.25	500	8×16	0.45	300	10×20	0.23	466
100	6.3×14 8×12	0.23 0.17	480 555	8×16 10×16	0.40 0.38	510 560	8×16 10×12 10×16	0.40 0.40 0.38	450 450 530	10×14 10×16 10×20	0.23 0.22 0.22	500 580 620
120	8×16	0.17	630	8×20 10×14	0.16 0.15	650 680	8×20 10×14	0.35 0.35	540 560	12.5×16 10×25 12.5×20	0.20 0.22 0.16	620 650 690
150	8×12 8×16 10×12	0.15 0.13 0.12	680 680 760	10×12 10×16	0.14 0.13	690 700	10×16	0.22	580	10×20 12.5×20 12.5×25	0.18 0.16 0.14	600 650 650
180	10×12 8×20	0.091 0.091	810 810	10×20	0.010	820	10×20	0.21	620	12.5×25	0.12	780
220	8×16 10×12 10×16 10×20	0.09 0.090 0.090 0.084	865 865 865 1050	8×20 10×16 10×20	0.09 0.090 0.090	865 865 950	10×20 12.5×20	0.17 0.15	660 680	10×30 12.5×20 12.5×25	0.091 0.091 0.091	1050 1040 1040
270	10×20	0.082	1200	12.5×20	0.09	1205	12.5×20	0.15	765	12.5×25	0.090	1150
330	10×12 10×14 10×16	0.080 0.080 0.075	1200 1200 1250	12.5×25	0.089	1220	12.5×20 12.5×25	0.11 0.11	980 980	12.5×25 16×20 18×20	0.09 0.090 0.080	1200 1250 1240
390	10×20	0.064	1500	12.5×25 16×20	0.089 0.088	1550 1580	12.5×20 12.5×25 16×20	0.12 0.12 0.12	1230 1280 1320	16×25 16×30	0.075 0.073	1570 1570
470	12.5×16 12.5×20	0.062 0.061	1500 1660	12.5×20 16×20	0.061 0.060	1660 1670	16×25	0.078	1570	18×20 18×30	0.06 0.06	1650 1630
560	10×20 12.5×20	0.055 0.053	1800 1850	16×25	0.060	1885	16×25	0.073	1590	16×25 18×30 18×35	0.055 0.055 0.060	1800 2020 2020
680	12.5×20 12.5×25 10×30	0.052 0.040 0.04	1900 2010 2010	12.5×25 12.5×25	0.058 0.055	1950 2060	16×25 18×25	0.075 0.070	1800 1820	18×30 18×35	0.055 0.050	1790 1790
820	12.5×25 16×20	0.038 0.038	2210 2210	16×25 16×30	0.038 0.038	2210 2210	16×25 16×30	0.06 0.054	1850 1870	16×40 18×40	0.032 0.045	2500 2330
1000	12.5×35 16×20 16×25	0.035 0.035 0.035	2300 2300 2550	16×30	0.037	2550	16×30 18×25 18×35	0.05 0.045 0.045	2000 2000 2300	18×35 18×40	0.030 0.035	2700
1200	16×30 16×35	0.035 0.035	3010 3010	18×25 18×35	0.032 0.032	3050 3050	18×25	0.043	2450	18×40	0.036	3150
1500	16×30 16×35	0.034 0.029	3050 3150	16×30 18×40	0.035 0.036	3180 3200	18×40	0.043	2500	22×35	0.025	3180
1800	12.5×35 12.5×40 18×30	0.031 0.031 0.027	3180 3180 3200	18×40	0.035	3280	18×40	0.025	3680	18×40	0.02	3680
2200	16×30,35 18×30 18×35	0.03 0.03 0.026	3250 3280 3680	18×35 18×40	0.03 0.035	3400 3750	18×45	0.025	3680	22×45	0.018	3700
2700	18×40	0.026	3800									
3300	18×40 22×25	0.024 0.03	3950 3800	18×40	0.024	3860						

(1) 外形尺寸 Case Size D×L(mm)

(2) 100KHz 阻抗值 Impedance at 100KHz +20℃ (Ω)

(3) 最大允许纹波电流 Max allowable ripple current(mArms, +105℃,100KHz)

WV/V Cap/μF	160(MB)			200(MC)			250(MD)			400(VA)			450(VB)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1							5×11	18.0	60	6.3×12 8×12	6.5 9.5	60 70	8×12	7.0	62
1.2							6.3×12	12.0	45	6.3×12	12.0	45	6.3×12	12.0	45
1.5							6.3×12	10.0	50	8×12	9.0	60	8×12	9.0	60
2.2				6.3×12	8.0	65	6.3×12	8.5	80	6.3×11 6.3×12 8×12 10×12	10.0 9.5 8.5 6.5	50 50 60 78	8×12 10×12	9.5 6.5	68 71
3.3				6.3×12	8.0	65	6.3×12	9.0	75	8×10 8×12 10×12	10.0 6.5 4.0	90 80 90	8×12 10×16	11 4.0	80 90
4.7				6.3×12	7.0	80	6.3×12 8×12 10×16	7.0 5.5 2.5	80 80 110	8×12 10×16 10×20	5.0 4.0 4.0	90	10×12 10×16 10×20	3.5 4.5 3.5	110
5.6				8×12	2.0	80	8×16	2.3	120	8×14 8×16	6.0 4.5	80	10×20	3.5	120
6.8				10×12	2.5	110	8×12 10×12 10×16	4.5 4.5 2.0	130 130 130	10×12 10×16 10×20	4.5 3.8 3.2	80 90 110	10×16 10×20	3.5 3.0	130 130
8.2				10×12	2.5	110	8×12 10×12 10×16	4.5 4.5 2.0	130 130 130	8×12 8×16 10×16	4.0 2.0 3.8	90 120 120	10×16 10×20	3.5 3.0	130 130
10	6.3×12 10×16	4.0 1.5	80 200	8×12 10×16	4.0 1.8	180 280	8×12 10×16 10×20	2.5 1.5 1.5	150 200 200	8×12 8×14 10×12	4.5 3.0 4.5	120 120 150	10×16 10×20 10×30	4.0 3.0 3.0	130 130 130
15	10×20	1.3	250	10×16	1.8	300	10×20	1.5	250	10×12 10×16 12.5×20	3.8 3.5 2.6	150 180 180	10×16 2.5×20 2.5×25 16×20	4.0 1.6 1.6 1.6	130 180 180 180
22	8×12 10×16 10×20	3.0 1.3 1.0	200 250 300	8×14 10×12 10×16	2.5 2.8 1.2	300 350 350	10×16 10×20 12.5×20	1.8 1.4 1.3	250 300 300	12.5×16 12.5×20 12.5×25	2.5 2.5 1.3	210	2.5×20 2.5×25 16×20	1.0 1.7 1.0	150 180 210
33	10×16 12.5×20	0.9 0.71	400 450	10×16 10×20 12.5×20 12.5×25	1.5 1.0 0.98 0.55	400 400 400 550	12.5×20 12.5×25	1.0	450	12.5×20 12.5×25 16×30	2.5 1.3 0.65	350 350 410	2.5×25 16×20 16×25 16×30	1.2 0.95 0.95 0.90	400 400 400 410
47	10×16 12.5×20	0.7 0.60	500 500	10×20 12.5×16 12.5×20 12.5×25	0.8 0.95 0.6 0.60	550 550 600 600	12.5×20 12.5×25 16×25	0.90 0.85 0.70	250 250 850	16×20 18×20 16×25 18×30	1.2 1.0 0.75 0.80	650 650 400 750	16×30 18×20 18×25 18×30	0.90 1.0 1.0 0.85	680 600 650 750
68	12.5×20	0.68	450	12.5×20 12.5×25	0.65 0.58	700	16×25	0.45	850	16×25 18×25 18×30	0.95 0.75 0.75	750 780 780	16×35 18×25 18×35	0.71	810
82	12.5×20 12.5×25	0.50 0.45	600	12.5×25	0.50	800	16×25	0.45	1000	16×25 16×30 18×35	0.5 0.65 0.65	810 810 810	18×30 18×40	0.50 0.65	830 880
100	12.5×20 16×25	0.45 0.40	700 950	12.5×20 12.5×25 16×25	0.75 0.33 0.40	750 900 950	16×25 18×35	0.45 0.8	1100 1210	18×25 18×30 18×35 22×25	0.5 0.6 0.60 0.50	950 950 950 950	18×30 18×40	0.34 0.56	950
150	16×30	0.35	1250	16×25 16×30	0.35	1100	18×35	0.35	1350	18×40 22×40	0.71 0.55	1000 1100	18×30 18×40	0.34 0.80	950
220	16×25, 30 18×30 18×35	0.27 0.32 0.32	1300 1400 1400	12.5×40 16×30 18×25,30 18×35	0.30 0.25 0.32 0.20	1200 1200 1300 1300	18×40	0.14	1400						
330	16×40 18×30	0.42 0.22	1600 1600	18×30,35	0.22	1300									
470	18×35	0.20	1800	18×40 22×35	0.22	1300									

560	18×40	0.14	1800												
1000	18×45	0.08	2000												

(1) 外形尺寸 Case Size D×L(mm)

(2) 100KHz 阻抗值 Impedance at 100KHz +20℃ (Ω)

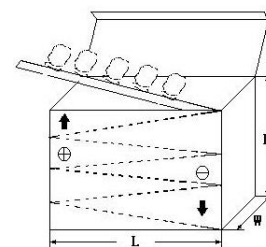
(3) 最大允许纹波电流 Max allowable ripple current (mA_{rms}, +105℃, 100KHz)

◆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
Φ5	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
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
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℃~35℃, 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:
 - ①Environment of water splashing, high temperature, high humidity and dewing;
 - ②The environment that splashes oil, or is filled with gas oil;
 - ③With 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。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℃ 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

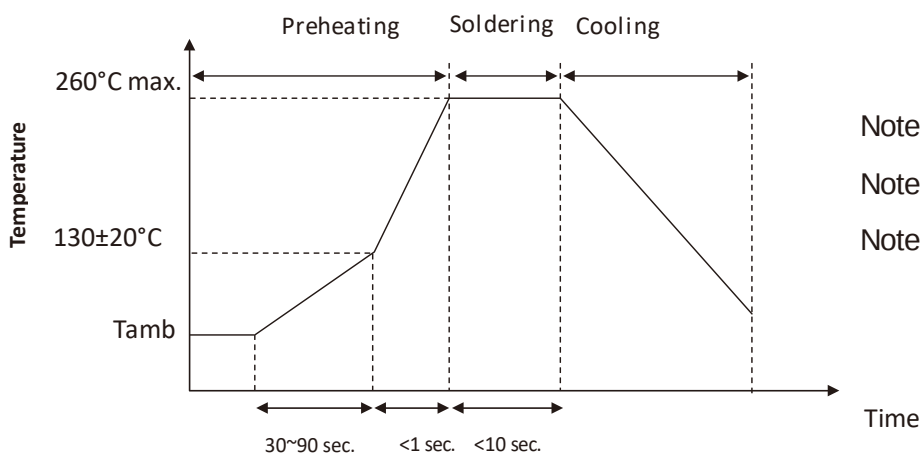
预热：105°C

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.

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