

HV series Low Leakage Current

Features (特点)

- ★Designed for surface mounting on high density PC board , Applicable to automatic mounting machine using emboss carrier tape
用于高密度表面贴装，吸塑载带封装成盘后用于自动机贴装
- ★Low ESR at high frequency range & Large permissible ripple current
(在高频范围内的低ESR，允许大纹波电流)



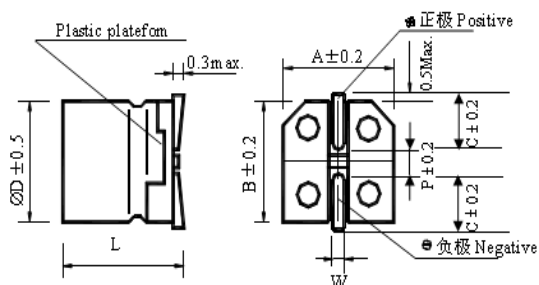
Specifications (产品规格)

item 项目	Performance Characteristics 性能 特点	
Operating Temperature Range 工作温度范围	-55~+105° C	
Rated Voltage Range 额定电压范围	2.5~80vdc	
Capacitance Tolerance (容量公差)	±20% (120Hz, +20° C)	
Leakage Current (+20° C max) 漏电流	≤0.2cv (uA. After 2 minutes) 充电2分钟后漏电≤0.2vc	
Dissipation Factor (损耗系数) tan δ at 20° C, 120Hz	Not to exceed the value specified 不超过指定值	
ESR(100KHz)	Not to exceed the value specified 不超过指定值	
Endurance (耐久性) 105° C, 2000H at rated voltage 105° C 2000h 不超过额定电压	Capacitance Change	Within ±20% of the value before test 测试前的值的±20%以内
	Leakage Current	Not to exceed the value specified 不超过指定值
	ESR	Not to exceed 150% of the value specified 不超过指定值的150%
	Dissipation Factor	Not to exceed 150% of the value specified 不超过指定值的150%
Moisture Resistance (耐湿性) Stored at 60° C, RH90~95% 2000H 存放在60° C, RH90~95% 2000h	Capacitance Change	Within ±20% of the value before test 测试前的值的±20%以内
	Leakage Current	Not to exceed the value specified 不超过指定值
	ESR	Not to exceed 150% of the value specified 不超过指定值的150%
	Dissipation Factor	Not to exceed 150% of the value specified 不超过指定值的150%

Srequency Coefficient For Ripple Current (纹波电流的频率系数)

Frequency	120Hz≤freq. <10KHz	1KHz≤freq. <10KHz	10KHz≤freq. <100KHz	100KHz≤freq. <300KHz
Coefficient	0.05	0.3	0.7	1

▲尺寸图



MM

	6.3×5.8	6.3×7.7	8×10.5	10×10.5
A	6.6	6.6	8.3	10.3
B	6.6	6.6	8.3	10.3
C	2.4	2.4	2.9	3.2
P	2.2	2.2	3.1	4.5
L	5.8	7.7	10.5	10.5
W	0.5-0.8		0.8-1.1	

HV 系列 HV series

.105℃、2,000 小时寿命保证 105℃, 2,000 hours life guarantee

. 极低等效串联电阻(ESR) Very low equivalent Series Resistance (ESR)

符合 RoHS 和 REACH 指令 Comply with the RoHS and REACH directives

◆特性参数表 Characteristic parameter list

WV	Cap (μ F)	尺寸 Φ DxL (mm)	损失角正切值 ($\tan\delta$) (20℃, 120Hz)	漏电流 (μ A) (max)	等效串联电阻 (ESR) (m Ω max./20℃, 100kHz)	额定纹波电流 (mA _{rms} /105℃, 100kHz)	产品代码
2.5V	330	6.3*5.8	0.10	500	28	2400	HV0E337M0605PZ
	330	6.3*7.7	0.10	500	25	2550	HV0E337M0607PZ
	390	6.3*7.7	0.10	500	25	2650	HV0E397M0607PZ
	470	6.3*5.8	0.10	500	25	2450	HV0E477M0605PZ
		6.3*7.7			22	2750	HV0E477M0607PZ
	560	6.3*5.8	0.10	500	25	2600	HV0E567M0605PZ
6.3	100	6.3X5.8	0.12	500	38	1300	HV0J107M0605PZ
	220	5X5.8	0.12	500	42	1450	HV0J227M0505PZ
		6.3X5.8			38	1600	HV0J227M0605PZ
	330	6.3X5.8	0.12	500	28	1900	HV0J337M0605PZ
		6.3X7.7			28	2250	HV0J337M0607PZ
	470	6.3X7.7	0.12	592	25	2750	HV0J477M0607PZ
	560	6.3X7.7	0.12	705	25	3100	HV0J567M0607PZ
	680	6.3X7.7	0.12	857	25	3500	HV0J687M0607PZ
	820	6.3X7.7	0.12	1033	22	3750	HV0J827M0607PZ
		8X10.5			20	4100	HV0J827M0810PZ
	1000	8X10.5	0.12	1260	20	4350	HV0J108M0810PZ
		10X10.5			20	4500	HV0J108M1010PZ
	1500	8X10.5	0.12	1890	20	4550	HV0J158M0810PZ
	2200	10X10.5	0.12	2772	20	4800	HV0J228M1010PZ
10V	100	6.3X5.8	0.12	500	48	1250	HV1A107M0605PZ
	150	6.3X5.8	0.12	500	48	1450	HV1A157M0605PZ
	220	6.3X5.8	0.12	500	38	1650	HV1A227M0605PZ
		6.3X7.7			35	2150	HV1A227M0607PZ
	330	6.3X7.7	0.12	660	32	2350	HV1A337M0607PZ
		8X10.5			28	2950	HV1A337M0810PZ
	470	6.3X7.7	0.12	940	32	2600	HV1A477M0607PZ
		8X10.5			28	3100	HV1A477M0810PZ
	560	8X10.5	0.12	1120	28	3350	HV1A567M0810PZ
	680	8X10.5	0.12	1360	28	3450	HV1A687M0810PZ
	820	8X10.5	0.12	1640	28	3600	HV1A827M0810PZ
	1000	8X10.5	0.12	2000	25	3950	HV1A108M0810PZ
		10X10.5	0.12	2000	25	4050	HV1A108M0110PZ
	1500	10X10.5	0.12	3000	25	4100	HV1A158M1010PZ

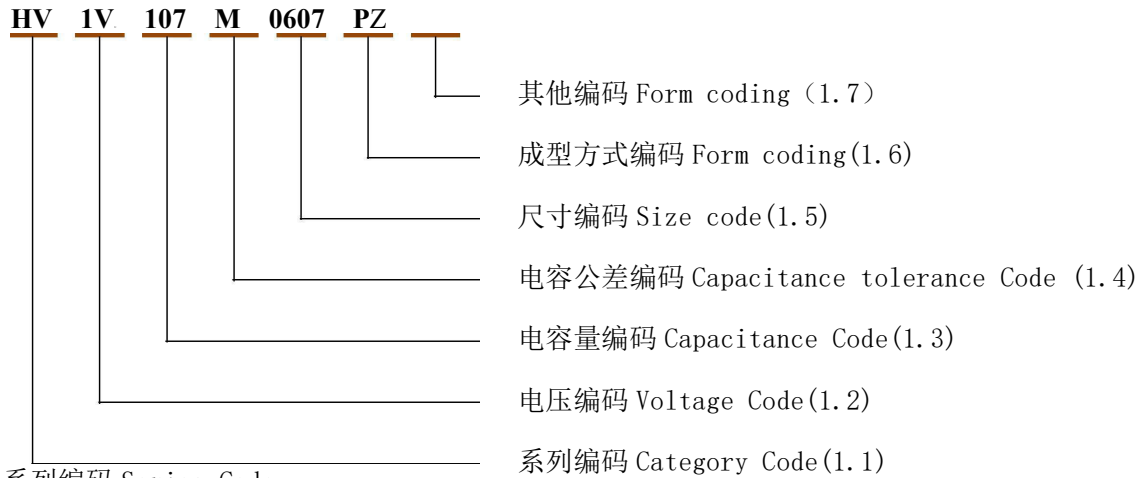
WV	Cap (μ F)	尺寸 Φ DxL(mm)	损失角正切值($\tan\delta$) (20℃, 120Hz)	漏电流 (μ A)(max)	等效串联电阻(ESR) (m Ω max./20℃, 100kHz)	额定纹波电流 (mA _{rms} /105℃, 100kHz)	产品代码
16V	10	6.3X5.8	0.12	500	75	650	HV1C106M0605PZ
	47	5X5.8	0.12	500	65	650	HV1C476M0505PZ
		6.3X5.8	0.12	500	58	950	HV1C476M0605PZ
	100	5X5.8	0.12	500	68	780	HV1C107M0505PZ
		6.3X5.8	0.12	500	55	1150	HV1C107M0605PZ
		6.3X7.7	0.12	500	38	1550	HV1C107M0607PZ
	150	6.3X5.8	0.12	500	48	1500	HV1C157M0605PZ
		6.3X7.7	0.12	500	38	2100	HV1C157M0607PZ
	220	6.3X7.7	0.12	704	35	2450	HV1C227M0607PZ
	270	6.3X7.7	0.12	864	35	2500	HV1C277M0607PZ
		8*10.5			32	2720	HV1C277M0810PZ
	330	6.3X7.7	0.12	1056	35	2550	HV1C337M0607PZ
		8X10.5			32	2800	HV1C337M0810PZ
		10X10.5			30	3350	HV1C337M1010PZ
	470	6.3X7.7	0.12	1504	28	2650	HV1C477M0607PZ
		8X10.5			28	2900	HV1C477M0810PZ
		10X10.5			25	3500	HV1C477M1010PZ
	560	8X10.5	0.12	1792	28	3050	HV1C567M0810PZ
		10X10.5			25	3750	HV1C567M1010PZ
	680	8X10.5	0.12	2176	28	3200	HV1C687M0810PZ
		10X10.5			25	3850	HV1C687M1010PZ
	820	8X10.5	0.12	2624	28	3350	HV1C827M0810PZ
		10X10.5			25	4100	HV1C827M1010PZ
	1000	10X10.5	0.12	3200	25	4350	HV1C108M1010PZ
20V	1000	8X10.5	0.12	3200	28	3350	HV1E106M0605PZ
25V	10	6.3X5.8	0.12	500	78	550	HV1E106M0605PZ
	22	5X5.8	0.12	500	65	650	HV1E226M0505PZ
	33	6.3X5.8	0.12	500	58	680	HV1E336M0605PZ
	47	5X5.8	0.12	500	65	680	HV1E476M0505PZ
		6.3X5.8	0.12	500	48	850	HV1E476M0605PZ
	56	6.3X5.8	0.12	500	58	900	HV1E566M0605PZ
	68	5X5.8	0.12	500	78	680	HV1E686M0505PZ
		6.3X5.8	0.12	500	68	950	HV1E686M0605PZ
	100	6.3X5.8	0.12	500	48	950	HV1E107M0605PZ
		6.3X7.7			45	1650	HV1E107M0607PZ
	150	6.3X5.8	0.12	500	45	1650	HV1E157M0605PZ
	220	6.3X7.7	0.12	1100	35	1950	HV1E227M0607PZ
		8X10.5			32	2550	HV1E227M0810PZ
	330	8X10.5	0.12	1650	32	2650	HV1E337M0810PZ
	390	8X10.5	0.12	1650	32	2750	HV1E397M0810PZ
	470	8X10.5	0.12	2350	30	2800	HV1E477M0810PZ
		10X10.5			28	3150	HV1E477M1010PZ
	560	8X10.5	0.12	2800	28	3050	HV1E567M0810PZ
	680	8X10.5	0.12	3400	28	3200	HV1E687M0810PZ
		10X10.5			25	3350	HV1E687M1010PZ
	820	10X10.5	0.12	4100	25	3650	HV1E827M1010PZ
	1000	10X10.5	0.12	5000	25	3800	HV1E108M1010PZ

WV	Cap (μF)	尺寸 $\Phi\text{D}\times\text{L}(\text{mm})$	损失角正切值($\tan\delta$) (20℃, 120Hz)	漏电流 (μA) (max)	等效串联电阻 (ESR) ($\text{m}\Omega$ max./20℃, 100kHz)	额定纹波电流 (mA_{rms} /105℃, 100kHz)	产品代码
35V	10	6.3X5.8	0.12	500	78	480	HV1V106M0605PZ
	22	5X5.8	0.12	500	85	410	HV1V226M0505PZ
		6.3X5.8	0.12	500	58	550	HV1V226M0605PZ
	47	6.3X5.8	0.12	500	58	750	HV1V476M0605PZ
		6.3X7.7			52	1150	HV1V476M0607PZ
	68	6.3X7.7	0.12	500	48	1300	HV1V686M0607PZ
	100	6.3X5.8	0.12	700	52	1350	HV1V107M0605PZ
		6.3X7.7			48	1500	HV1V107M0607PZ
		8X10.5			38	1950	HV1V107M0810PZ
	150	8X10.5	0.12	1050	38	2100	HV1V157M0810PZ
	220	8X10.5	0.12	1540	38	2300	HV1V227M0810PZ
	270	10X10.5	0.12	1540	35	2600	HV1V277M1010PZ
	330	8X10.5	0.12	2310	35	2450	HV1V337M0810PZ
		10X10.5			32	2700	HV1V337M1010PZ
	470	8X10.5	0.12	3290	35	2650	HV1V477M0810PZ
		10X10.5			28	2950	HV1V477M1010PZ
	560	10X10.5	0.12	3920	28	3350	HV1V567M1010PZ
50V	2.2	5X5.8	0.12	500	85	290	HV1H225M0505PZ
	10	6.3X5.8	0.12	500	78	350	HV1H106M0605PZ
	22	6.3X5.8	0.12	500	58	460	HV1H226M0605PZ
	47	6.3X7.7	0.12	500	45	950	HV1H476M0607PZ
	68	8X10.5	0.12	680	38	1500	HV1H686M0810PZ
	100	8X10.5	0.12	1000	38	1650	HV1H107M0810PZ
		10X10.5			35	1800	HV1H107M1010PZ
	150	8X10.5	0.12	1500	35	1900	HV1H157M0810PZ
		10X10.5			30	2150	HV1H157M1010PZ
	220	10X10.5	0.12	2200	28	2350	HV1H227M1010PZ
	720	10X10.5	0.12	2200	28	2350	HV1H277M1010PZ
63V	5.6	6.3*5.8	0.12	500	68	310	HV1J566M0810PZ
	8.2	5X5.8	0.12	500	68	310	HV1J825M0505PZ
	10	6.3X5.8	0.12	500	68	310	HV1J106M0605PZ
	22	6.3X7.7	0.12	500	58	420	HV1J226M0607PZ
	47	8X10.5	0.12	592	48	1100	HV1J476M0810PZ
	56	8X10.5	0.12	705	45	1250	HV1J566M0810PZ
		10X10.5			32	1500	HV1J566M1010PZ
	100	8X10.5	0.12	1260	38	1500	HV1J107M0810PZ
		10X10.5			32	1600	HV1J107M1010PZ
	150	10X10.5	0.12	1890	28	1950	HV1J157M1010PZ
	220	10X10.5	0.12	1890	35	2350	HV1J157M1010PZ
80V	10	6.3X7.7	0.12	500	68	290	HV1K106M0607PZ
	47	8X10.5	0.12	752	58	980	HV1K476M0810PZ
		10X10.5			55	1250	HV1K476M1010PZ
	100	10X10.5	0.12	1600	48	1500	HV1K107M1010PZ
100V	4.7	5X5.8	0.12	500	98	118	HV2A475M0505PZ
	10	6.3X5.8	0.12	500	82	225	HV2A106M0605PZ
		6.3X7.7			68	270	HV2A106M0607PZ

WV	Cap (μ F)	尺寸 Φ DxL (mm)	损失角正切值($\tan\delta$) (20℃, 120Hz)	漏电流 (μ A) (max)	等效串联电阻 (ESR) (m Ω max. /20℃, 100kHz)	额定纹波电流 (mA _{rms} /105℃, 100kHz)	产品代码
100V	22	6.3X7.7	0.12	500	48	320	HV2A226M0607PZ
		8X10.5			45	660	HV2A226M0810PZ
	47	10X10.5	0.12	940	45	1050	HV2A476M1010PZ

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11>	振动试验 Vibration test
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1> 物料编码 material code



1.1 系列编码 Series Code

编码 Code	HV
系列编码 Series Code	HV

1.2 电压编码 Voltage Code

编码 Code	0E	0G	0J	1A	1C	1E	1V	1H	1J	1K	2A
电压编码 VoltageCode(W.V)	2.5	4	6.3	10	16	25	35	50	63	80	100

1.3 容量编码 Capacitance Code

编码 Code	476	107	227	337	477	567	687	827	108
容量 Capacitance (uF)	47	100	220	330	470	560	680	820	1000

1.4 电容公差编码 Capacitance tolerance coding

“M” 代表-20%~+20% “ M” stands for -20%~+20%

1.5 尺寸编码 Size code

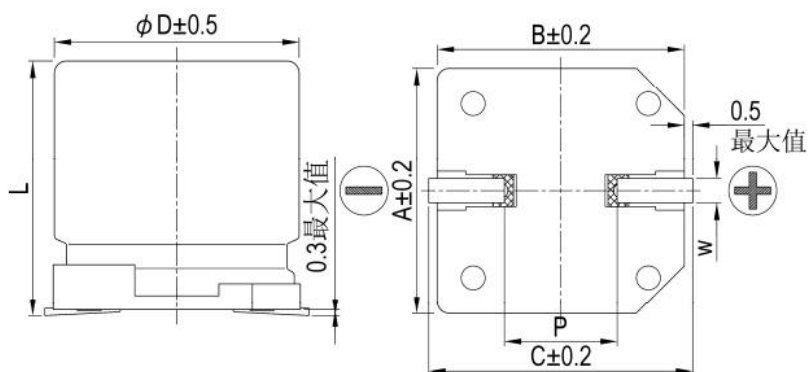
编码 Code	5*5	6*5	6*7	8*10	10*10
直径 D (Φ)	5	6.3	6.3	8	10
高度 H (mm)	5.8	5.8	7.7	10.5	10.5

1.6 成型方式编码 Form coding

编码 Code	PC	PJ	PB	PZ
其他 Other	平豆散装 Platform rubber& In bulk	平豆剪脚 Platform rubber &Lead Cut3.5±0.3mm	平豆编带 Platform rubber& Taping Pitch=3.5mm	座板 Right lying Bending 2.2±0.5mm

1.7 其他编码 Form coding

2> 产品尺寸图 Product size drawing

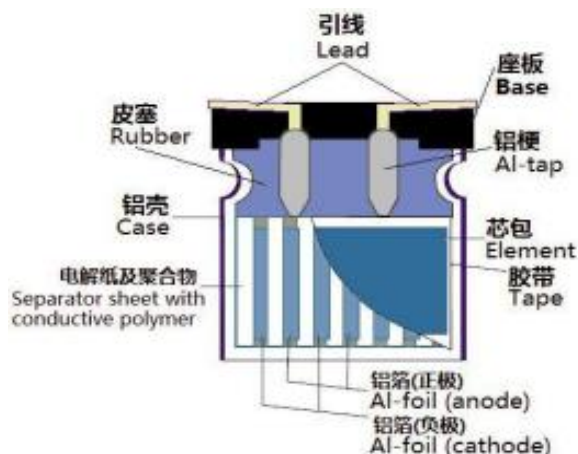


尺寸编码 Size Code	ΦD	L	P	W	A	B	C
0505	5.0	5.8±0.3	1.5	0.5~0.8	5.3	5.3	5.7
0605	6.3	5.8±0.3	2.2	0.5~0.8	6.6	6.6	7.2
0607	6.3	7.7±0.3	2.2	0.5~0.8	6.6	6.6	7.2
0810	8.0	10.5±0.5	3.1	0.8~1.1	8.3	8.3	9.0
1010	10	10.5±0.5	4.5	0.8~1.1	10.3	10.3	11.0

3> 印字标识 Print identification



4> 产品结构图 Product Structure Diagram



No.	成分 Compositions	
1	芯包 Element	正极箔 Anode foil
2		负极箔 Cathode foil
3		电解纸 Separator
4		胶带 Tape
5		聚合物 Polymer
6	皮塞 Rubber	
7	铝梗 Al-tap	
8	引线 Lead wires	
9	铝壳 Case	
10	座板 Base	

5> 产品特性 Characteristics

1.标准测试条件

Standard test conditions

除非另有规定，所有测试环境应当在以下条件下进行：

Unless otherwise specified, all tests shall be performed at following conditions:

环境温度： 15-35 °C

Ambient temperature: 15-35 °C

相对湿度： 45-75% RH

Relative humidity: 45-75% RH

气压： 86-106 Kpa

Air pressure 86-106 Kpa

测试疑虑时，在以下条件下确认测量结果：

Any testing doubt, confirm the measurement results under the following conditions:

环境温度： 20±2 °C

Ambient temperature: 20±2 °C

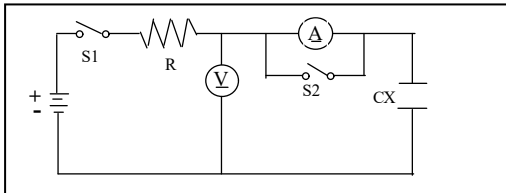
相对湿度： 60-70% RH

Relative humidity: 60-70% RH

气压： 86-106 Kpa

Air pressure 86-106 Kpa

3.特性参数说明 Description

NO.	特性 Characteristics	单位 unit	说明 Description				
1	容量 capacitance	uF	产品标称容量，测试频率： 120HZ ，在规定容量公差内 Product nominal capacity, test frequency: 120HZ, within the specified capacity tolerance				
2	电压 working voltage	V	产品额定电压 Rated working voltage				
3	损失角 Dissipation Factor	%	也称损耗，测试频率： 120HZ Also calls dissipation, test frequency: 120HZ				
4	阻抗 ESR Impedance	mΩ	等效串联电阻，测试频率 100KHZ Equivalentent series resistance, test frequency 100KHZ				
5	纹波电流 RC Ripple Current	mA rms	最大许可纹波电流为 100KHZ 下最大 A.C 电流 The maximum allowable ripple current is 100KHZ, the largest A.C current				
			DC 电压和峰值 AC 电压总和不可超出额定电压，不可反向充电 The DC voltage plus the peak AC voltage must not exceed the rated voltage,and non-reverse charging				
			频率 HZ Frequency	120≤f<1k	1K≤f<10K	10K≤f<100K	100K≤f<500K
			系数 coefficient	0.05	0.3	0.7	1
6	漏电流 LC Leak Current	uA	泄漏电流，产品施加额定电压，充电 2 分钟后测试漏电信 Leakage current, after charging for 2 minutes, test the leakage current value of product				
							
7	外形尺寸 Φ DXL Dimensions	mm	产品外径、高度 Diameter、Height				

6> 高温负荷寿命试验 High temperature load life test

电容器在额定最高温度下施加额定电压，持续储存至规定寿命时间后，符合以下要求：

The capacitor applies the rated voltage at the rated maximum temperature and is continuously stored to the specified life time, meeting the following requirements:

项目 item	要求 requirements
寿命时间 life time	2000 ±48 小时 hours
容量变化 change of capacitance	在容量初始值±20%内 Within ±20% of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

7> 浪涌电压试验 Surge voltage test

在任何情况下，浪涌直流电压是电容器所应承受的最大电压，这包括瞬变和峰值纹波最高的线路电压。

The surge DC rating is the maximum voltage to which the capacitor should be subjected under any conditions. This includes transients and peak ripple at the highest line voltage.

额定电压 (V) rated working voltage	额定温度 (°C) upper temperature	浪涌电压 (V) surge voltage
2.5	105	2.9
6.3	105	7.2
10	105	11.5
16	105	18.4
25	105	28.8
35	105	40.3
50	105	57.5
63	105	72.5
100	105	115.0

浪涌电压=1.15*额定电压

在常温条件下，电容串联 1000Ω电阻后，应用浪涌直流电压进行测试。

充电 30±5 秒，放电 5±0.5 分钟，充电放电过程重复 1000 次，符合以下要求：

At room temperature, after the capacitor is connected to 1000Ω resistor, the surge DC voltage is used for testing. Charge 30±5 seconds, discharge 5±0.5 minutes, the charging and discharge process is repeated 1000 times, meeting the following requirements:

项目 item	要求 requirements
容量变化 change of capacitance	在容量初始值±20%内 Within ±20% of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

8> 稳态湿热试验 Damp heat(steady state) test

于环境温度 $60\pm 2^{\circ}\text{C}$ ，湿度 90-95% RH 条件下，储存 1000 ± 48 小时，符合以下要求：

The following requirements shall be satisfied after the capacitors are stored at $60\pm 2^{\circ}\text{C}$, 90 to 95%RH for 1000 ± 48 hours

项目 item	要求 requirements
容量变化 change of capacitance	在容量初始值 $\pm 20\%$ 内 Within $\pm 20\%$ of the initial value
损失角 dissipation factor	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
ESR	不超过规定值的 1.5 倍 Not to exceed 150% of the value specified
LC	不超过规定值 Not to exceed the value specified

9> 温度特性试验 characteristics at High and low Temperature

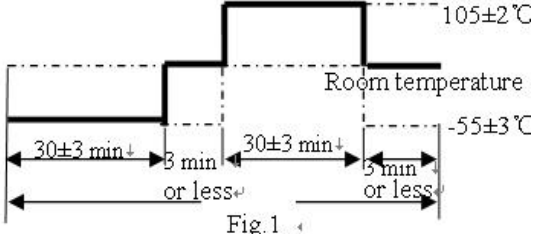
于以下环境步骤按规定时间储存，符合以下要求：

The following requirements shall be satisfied after the capacitors are stored at following conditions and specified time

步骤 Step	温度 Temperature	存储时间 Storage Time	测试项目 Test item	要求 requirements
1	$20^{\circ}\text{C} \pm 2^{\circ}\text{C}$	30minutes	电容量 Capacitance 损耗角正切 Tangent of loss angle ESR	不超过规定值 Not to exceed the value specified
2	$-55^{\circ}\text{C} \pm 3^{\circ}\text{C}$	2 hours	ESR	$Z(-55^{\circ}\text{C})/Z(20^{\circ}\text{C}) \leq 2.5$
3	$105^{\circ}\text{C} \pm 3^{\circ}\text{C}$	2 hours	LC	$LC(105^{\circ}\text{C})/LC(\text{SPEC}) \leq 12.5$ LC (SPEC): 初始规定值 LC (SPEC): indicates the initial specified value
			ESR	$Z(+105^{\circ}\text{C})/Z(20^{\circ}\text{C}) \leq 1.25$

10> 快速变温试验 Rapid change of temperature

要求 requirement	
容量变化在初始值 $\pm 20\%$ 内 Within $\pm 20\%$ of the initial value	
损失角不超过规定值 Dissipation factor: not to exceed the value specified	
ESR 不超过规定值 ESR: not to exceed the value specified	
LC 不超过规定值 LC: not to exceed the value specified	



使用电压：无负荷 Applied voltage : without load

循环次数：5 次 Cycle number : 5 Cycles

测试图: Fig. 1 Test diagram: Fig. 1

11> 振动试验 Vibration test

振动频率： 10-55HZ （间隔 1 分钟 / 10HZ-->55HZ-->10HZ）

Vibration frequency: 10-55HZ （Spaced one minute apart/ 10HZ-->55HZ-->10HZ） 振幅： 0.75mm （总偏移 1.5mm）

Amplitude: 0.75mm （total migration 1.5mm）

方向： X、Y、Z （3 向）

Direction: X、Y、Z axis(three directions)

持续时间： 2 小时/向

Duration: 2 hours/direction

安装图示如下：

Installation diagram as below:



30 分钟内，容量值相比初始值不应有明显变化

Within 30 minutes, capacitance has no significant change comparison with initial value

项目 item	要求 requirement
容量变化 change of capacitance	在容量初始值±5%内 Within ±5% of the initial value
外观 appearance	端子无断裂、松动 pins have no broken and loose

12> 可焊性试验 Solderability test

焊料： 约 25%松香/乙醇溶液，焊料 Sn-Ag-Cu

Solder: about 25% rosin/ethanol solution, solder Sn - Ag - Cu

温度： 245±5℃

Temperature: 245±5℃

时间： 2±0.5 秒

Time: 2±0.5 seconds

试验后端子浸渍位置至少 95%面积包盖了新锡。

After testing, more than 95% of the terminal surface shall be covered with new solder

13> 焊锡耐热试验

Solder Heat Resistance Test

1. 焊锡槽法 Tin groove method:

温度： 260±5℃ 时间： 10±1 秒

Temperature: 260±5℃ Time: 10±1 seconds

2. 烙铁焊接方法 Soldering iron welding method:

温度： 400±10℃ 时间： 3+1/-0 秒

Temperature: 400±10℃ Time: 3+1/-0 seconds

以上两种方法，在电容器热量趋于稳定后，符合以下要求：

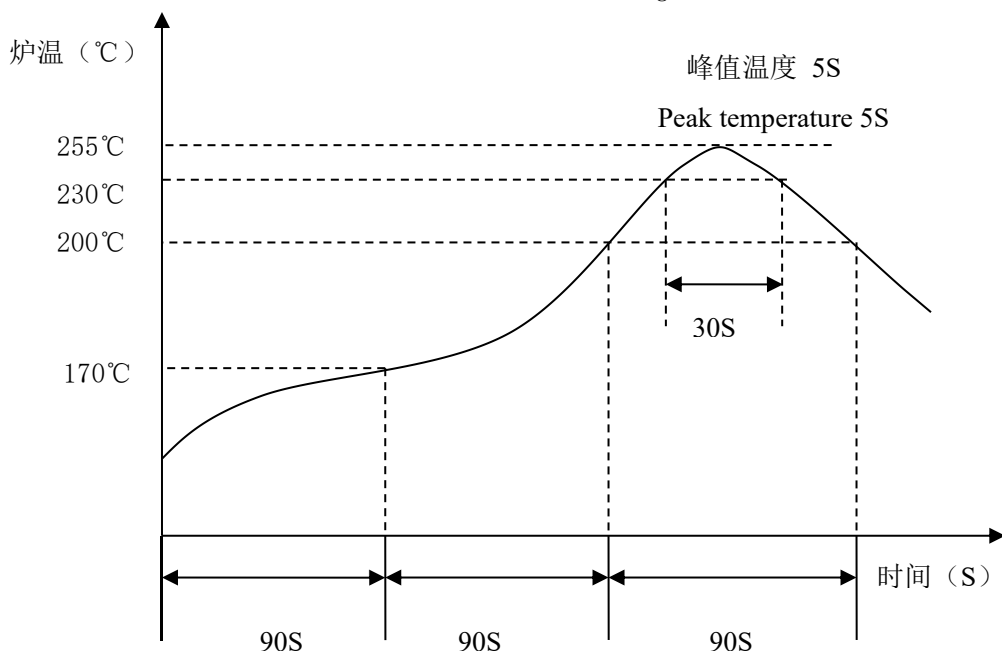
For above two methods, after the capacitor heat is stabilized, the following requirements should be met

项目 item	要求 requirement
容量变化 change of capacitance	在容量初始值±5%内 Within ±5% of the initial value
损失角 dissipation factor	不超过规定值 Not to exceed the value specified
ESR	不超过规定值 Not to exceed the value specified
LC	不超过规定值 Not to exceed the value specified

14> 回流焊条件 Reflow soldering condition

无铅回流焊温度与时间曲线

Temperature and time curve of lead-free reflow welding



阶段 stage	条 件 piece		
	最高温度 maximum temperature	时间 time	温度范围 temperature range
预热 preheat	170℃	≤90sec	≤170℃
预热 preheat	200℃	≤90sec	170℃—200℃
回流焊 reflow soldering	255℃	≤30sec	230℃—255℃

注：出现超过条件超过允许的情况，请联系我们；If conditions are exceeded, please contact us;

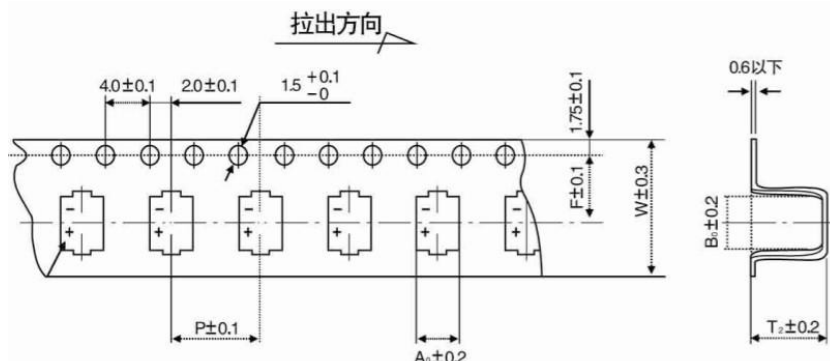
避免二次回流焊，如不可避免，请确认电容器温度已冷却至 5℃-35℃；

Avoid secondary reflow welding, if unavoidable, please confirm that the capacitor temperature has been

cooled to 5°C-35°C;

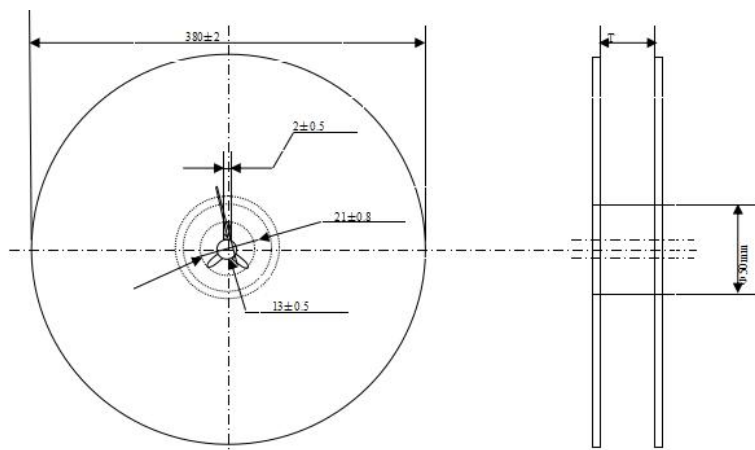
15> 包装规范 package specification

载带尺寸 (mm) Belt size (mm)



尺寸 Size	W (MM)	P (MM)	F (MM)	A0 (MM)	B0 (MM)	T2 (MM)	S	形状 Applicable
Φ5*5.8	12	12	5.5	5.7	5.7	5.8	—	
Φ6.3*5.8	16	12	7.5	7.0	7.0	5.8	—	
Φ6.3*7.7	16	12	7.5	7.0	7.0	8.3	—	
Φ8*10.5	24	16	11.5	8.7	8.7	11.0	—	
Φ10*10.5	24	16	11.5	10.7	10.7	11.0	—	

编带包装盘 (mm) Braid packing tray (mm)



ΦD	5	6.3	8、10
T	14	18	26

尺寸 size	数量/每盘 Quantity/per plate	数量/每箱 Quantity/per box
5	1000pcs	10Kpcs
6.3	1000pcs	10Kpcs
8	500pcs	5Kpcs
10	500pcs	5Kpcs

16>使用安装注意事项 Precautions for use and installation

固体铝电解电容器具有不同于一般电解液作为阴极的铝电解电容器，为使导电性高分子铝电解电容器在电路中发挥其优越的性能，在使用中请特别注意以下内容。

Solid aluminum electrolytic capacitors are different from the general electrolyte as the cathode of aluminum electrolytic capacitors. In order to make conductive polymer aluminum electrolytic capacitors play their superior performance in the circuit, please pay special attention to the following contents in use.

1. 极性	1. Polarity
导电性高分子型固体铝电解电容器的引出端子有正负极之分。 在电路中使用切勿将正负极接反，否则将导致电容器漏电流增加并将严重影响电容器的使用寿命。	The solid aluminum electrolytic capacitor with positive and negative electrodes. Do not reverse the polarity when using. If happened, increased leakage current or a decreased life span may result.
2. 不推荐使用的电路	2. Prohibited circuits
导电性高分子型固体铝电解电容器在电路使用中由于焊接等原因会导致漏电流增大，因此不推荐应用于以下电路。 a) 高阻抗电路 b) 耦合电路 c) 时间常数电路 d) 受漏电流影响较大的电路	Conductive polymer solid aluminum electrolytic capacitors in the circuit use due to welding and other reasons will lead to increased leakage current, so it is not recommended for use in the following circuits. a) High impedance circuits b) Coupling circuits c) Time constant circuits d) A circuit heavily affected by leakage current
3. 禁止在过电压状态下使用	3. Compliance with rated performance
导电性高分子型固体铝电解电容器必须在低于额定工作电压下使用。 瞬间的超过额定电压的过电压可能会导致电容器的短路。	The aluminum solid capacitor with conductive polymer must be used under the rated voltage. Over-voltage exceeding the rated voltage should not be applied since it may cause a short circuit.
4. 电容器焊接时的注意事项	4. Considerations when soldering
电容器的焊接条件请在本公司所规定的范围内进行。 强烈的焊接条件，可能会造成电容器电气性能的劣化甚至外观不良，严重时更会导致电容器漏电流的急剧增加和容量急剧下降。	The soldering conditions are to be within the range prescribed in specifications. If the specifications are not followed, there is a possibility of the cosmetic deflection, the intensive increase of leakage current, and the capacitance reduction.
5. 线路板焊接时的注意事项	5. Things to be noted before mounting
导电性高分子型固体铝电解电容器的封口皮塞具有较好的密封效果，由于封口的原因皮塞可能会有一定程度的鼓起，电路设计时请考虑本公司规格书的L尺寸和引线的位置公差范围。	The aluminum solid capacitors with conductive polymer is sealed well, because of sealing the rubble may protrude, please conform to the dimensional tolerance stipulated in the specifications.

1. 电路设计的注意事项	1. Considerations when circuit design
(a) 额定电性能的使用确认	(a) Service confirmation of rated electrical properties
在电路设计前, 请先确认电容器的使用及安 装环境, 请在本公司的技术手册或者规格书的规 定条件范围内正确使用。	Before the circuit design, please confirm the use and installation environment of the capacitor, and please use it correctly within the range of conditions specified in the company's technical manual or specifications.
(b) 使用温度和纹波电流	(b) Use temperature and ripple current
使用温度请设定在规格书规定的范围之内。使用电容器过程中切勿施加超过额定纹波电流的电流。如有此现象的发生将会导致电容器内部急剧发热而严重缩短电容器的使用寿命。	The operating temperature should be set within the range specified in the specification. Do not apply more current than the rated ripple current when using the capacitor. If this phenomenon occurs, it will lead to acute heating inside the capacitor and seriously shorten the service life of the capacitor.
(c) 漏电流	(c) leakage current
对于高温无负荷、高温高湿无负荷及温度急 剧变化等试验也会导致漏电流的增大。 这种情况下, 在最高使用温度范围内施加额定使用电压, 漏电流会有一定程度的降低。	Heat pressure from soldering and mechanical stress from transportation may cause the leakage current to become large. In such a case, leakage current will gradually decreased by applying voltage less than or to the rated voltage at a temperature within the upper category temperature.
(d) 电路设计时的施加电压	(d) The applied voltage at the time of circuit design
可以施加 100%的额定电压。请在直流电压与纹波电压的最大值不超过额定电压的范围内使用。直流电压偏低时, 纹波电压的负的最大值不能超过额定电压的10%的反向电压。在切断电 源等造成的过渡现象中产生的反电压, 应在额定电压的 20%以内使用。	100% of the rated voltage can be applied. Please use in the range where the maximum DC voltage and ripple voltage do not exceed the rated voltage. When the DC voltage is low, the maximum negative ripple voltage cannot exceed 10% of the rated voltage reverse voltage. The reverse voltage generated in the transition phenomenon caused by cutting off the power source should be used within 20% of the rated voltage.
(e) 电容器的绝缘性	(e) Insulation of capacitors
电容器的表面喷塑涂层不保证完全绝缘。使用电容器时请将外壳、负极引线、正极引线及周围组件之间的线路完全分开。	The sprayed coating on the surface of the capacitor does not guarantee complete insulation. When using the capacitor, completely separate the circuit between the housing, negative leads, positive leads and the perimeter assembly.
(f) 工作环境限制	(f) Working environment limitation
电容器在下列环境中禁止使用: (1)在有水、卤水、油的地方 (2)充满有害气体的地方, 如硫化氢、亚硫酸、氯气、氨气等 (3)容易受臭氧氧化、紫外线及放射线辐射的地方	Capacitors are prohibited in the following environments: (1) where there is water, brine, oil (2) where there are harmful gases, such as hydrogen sulfide, sulfite, chlorine, ammonia, etc. (3) Areas susceptible to ozone oxidation, ultraviolet radiation and radiation
(g) 其它	(g) others
设计电路前请先确认以下内容: 电容器的电性能会受到温度和频率的影响, 在设计前请先确认波动量。	Please confirm the following before designing the circuit: The electrical performance of the capacitor will be affected by temperature and frequency, please confirm the fluctuation before designing.

2. 安装注意事项	2. Installation precautions
(a) 安装前的注意事项	(a) Precautions before installation
使用过的电容器不能再使用。 长期保存的电容器其漏电流会有不同程度的升高，此情况下请通过 1k Ω 的电阻进行施加额定电压处理。 处理方法：在 60~70℃ 温度下施加额定电压 1h。	Used capacitors cannot be used again. The leakage current of the capacitor stored for a long time will increase to varying degrees, in this case, please apply the rated voltage treatment through the resistance of 1k Ω . Treatment method: Apply the rated voltage for 1h at a temperature of 60 ~ 70℃.
(b) 安装时的注意事项	(b) Precautions during installation
安装时注意电容器的标称容量和额定电压，并确认极性。 安装过程中切勿将电容器掉落地面，此电容器不能再使用，安装过程中防止电容器变形。 安装前请确认电容器的引线间距是否与线路板孔间隔吻合。	Pay attention to the nominal capacity and rated voltage of the capacitor when installing, and confirm the polarity. Do not drop the capacitor to the ground during installation. The capacitor cannot be used again. Prevent deformation of the capacitor during installation. Before installation, ensure that the lead spacing of the capacitor is consistent with the hole spacing of the circuit board.
(c) 电烙铁焊接	(c) Soldering with electric iron
焊接温度、时间等请保持在本公司规格书规定的范围内。 焊接时不要给电容器施加过度的应力，通电的电烙铁不要触及电容器本身。 焊接后电容器的漏电流因焊接预热条件、焊接温度、时间、线路板的材质及材质不同而发生很大的变化，几十甚至几百微安，但是在施加额定电压后处于稳定状态时电容器由于自愈能力而会使其漏电流逐渐减小。	Welding temperature, time, etc. should be kept within the range specified in the company's specifications. Do not apply excessive stress to the capacitor when welding, and do not touch the capacitor itself with the energized electric soldering iron. After welding, the leakage current of the capacitor changes greatly due to the welding preheating conditions, welding temperature, time, the material and material of the circuit board, tens or even hundreds of microamps, but when the rated electrical voltage is applied in a stable state, the capacitor will gradually reduce its leakage current due to its self-healing ability.
(d) 焊接后注意事项	(d) Precautions after welding
电容器焊接在线路板后，请不要施加外力。禁止将电容器倾斜、弯折、扭曲。	After the capacitor is welded to the circuit board, do not apply external force. Do not tilt, bend or twist the capacitor.
3. 电容器在设备中安装时的注意事项	3. Precautions with completed board
(1) 安装过程中切勿直接接触电容器的引线端子。 (2) 禁止将电容器的正负极之间用导线短路，不要将导电性的酸性或碱性溶液洒落在电容器表面。 (3) 安装前确认电容器在设备中的安装环境。 (4) 设备的试验温度要在电容器的额定范围内使用。	(1) Do not directly touch the lead terminal of the capacitor during installation. (2) It is forbidden to use a wire short circuit between the positive and negative electrodes of the capacitor, and do not sprinkle the conductive acid or alkaline solution on the surface of the capacitor. (3) Confirm the installation environment of the capacitor in the equipment before installation. (4) The test temperature of the equipment should be made within the rated range of the capacitor

4. 意外情况的处理	4. Handling of unexpected situations
导电性高分子型固体铝电解电容器组成材料包括电解质、电解纸、皮塞和套管属于可燃性物质，电容器短路后电流值急剧增加，导致引线端子和电容器内部短路部分会产生电火花，情况严重时会引起皮塞和套管燃烧，所以在电路设计中应对电容器的安装方法和安装位置谨慎对待。	The conductive polymer solid aluminum electrolytic capacitor consists of electrolytes, electrolytic paper, plugs and bushings, which are inflammable substances. After the capacitor is short-circuited, the current value increases sharply, resulting in electrical sparks generated by the lead terminals and the internal short-circuited part of the capacitor. In serious cases, the plugs and bushings will burn. Therefore, in the circuit design, the installation method and installation position of the capacitor should be carefully treated
5. 电容器的保管条件	5. Storage conditions of capacitors
(1) 导电性高分子型固体铝电解电容器的保存要避免高温、高湿的环境，并避免阳光直射。 常温常湿（一般情况温度为 35℃ 以下，湿度保持在 75%RH 以下） (2) 为保持电容器具有良好的可焊性，应在产品出厂状态下（塑料袋包装）保管。 为防止吸潮而导致焊接性劣化，产品出厂时密封在专用的包装袋内。 (3) 为保持良好的焊接性，引线式产品保管期限为（购入后）一年，SMD 型的保管期限为（购入后）一年，SMD 型产品打开包装后，需在 4 周内使用完。 (4) 使用时，应在即刻安装前开封，开封后尽量全部用完。出现剩余时，散装产品重新放入原包装袋内，并用胶带封好开口部分。 (5) 不要将电容器直接保管在有水、卤素及有油等有机物的环境中。 (6) 不要将电容器保存在充满有害气体的环境中，如硫化氢、亚硫酸、氯气、氨气等。 (7) 不要将电容器保存在易受臭氧氧化、紫外线及放射线辐射的环境中。	(1) The storage of conductive polymer solid aluminum electrolytic capacitors should avoid high temperature and high humidity environment, and avoid direct sunlight. Normal temperature and humidity (generally, the temperature is below 35 ° C, and the humidity is kept below 75%RH) (2) In order to maintain the good weldability of the capacitor, it should be kept in the factory state of the product (plastic bag packaging). In order to prevent weldability deterioration caused by moisture absorption, the product is sealed in a special packaging bag when leaving the factory. (3) In order to maintain good weldability, the storage period of lead type products is one year (after purchase), and the storage period of SMD type products is one year (after purchase), and SMD type products should be used within 4 weeks after opening the packaging. (4) When used, it should be opened before immediate installation, and used up as much as possible after opening. When there is surplus, the bulk product is put back into the original packaging bag, and the open part is sealed with tape. (5) Do not store capacitors directly in an environment with organic matter such as water, halogen and oil. (6) Do not store the capacitor in an environment full of harmful gases, such as hydrogen sulfide, sulfite, chlorine, ammonia, etc. (7) Do not store the capacitor in an environment susceptible to ozone oxidation, ultraviolet and radioactive radiation.

18>环保 Environmental protection

本公司每年一次，将电容主要材料及电容成品送第三方权威检测机构检测。

Once a year, the company will send the main materials and finished capacitors to third-party authoritative testing institutions for testing.

检测时，根据当年欧盟最新要求检测 **ROHS**、**SVHC** 管理物质。

At the time of testing, ROHS and SVHC management substances were tested according to the latest requirements of the European Union that year.

检测报告，本公司会在检测完成后上发给客户。

The test report will be sent to the customer after the test is completed

为倡导环保，节能减排，本公司一律提供 **pdf** 电子档承认书给客户。

In order to advocate environmental protection, energy saving and emission reduction, the company will provide pdf electronic documents to customers.

有特殊要求，请再联络本公司业务人员，谢谢！

For special requirements, please contact our business personnel. Thanks!