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导电高分子型固态铝电解电容器规格书

Specification of Conductive Polymer Solid Aluminum Capacitors

Halogen Free & RoHS Compliant

序号 No.	客户料号 Customer P/N	柏瑞凯料号 PolyCap P/N	规格描述 Spec.
1		PRN101M016E05RR0C5H	RN 16V100μF Φ6.3mm×5mm
2			
3			

柏瑞凯 PolyCap		
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导电高分子型固态铝电解电容器

Conductive Polymer Solid Aluminum Capacitors

1. 概述 Scope

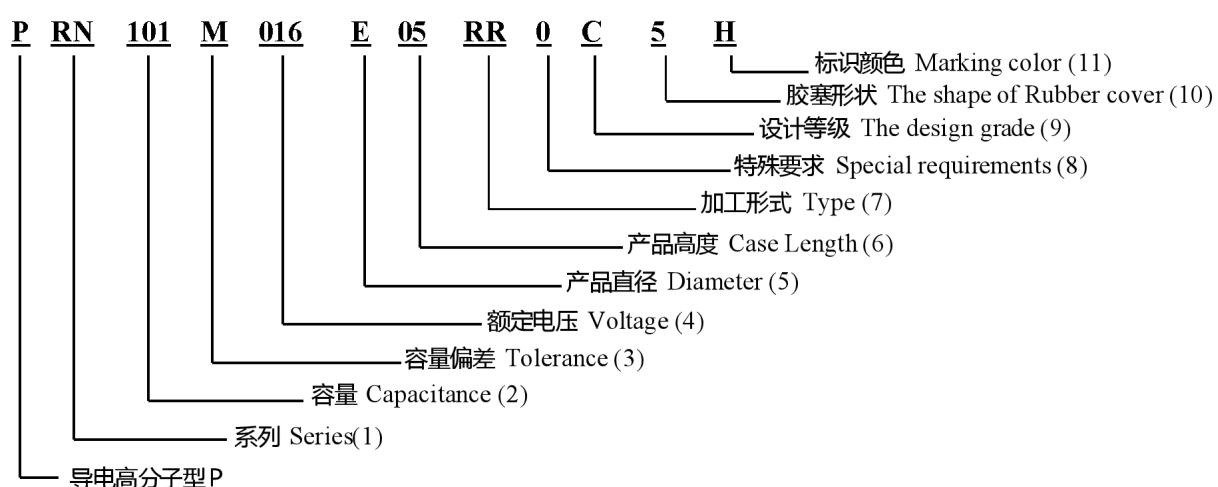
本规格书适用于电子设备用 **RN** 系列导电高分子型固态铝电解电容器。

This specification applies to Conductive Polymer Solid Aluminum Capacitors, type **RN** series for use electronic equipment.

2. 工作温度范围 Operating temperature range:

-55°C to +105°C

3. 编码规则 Explanation of Part numbers



(1) 系列 Series

Series	RL	RF	RQ	RS	RA	RN	RT	RK
Code	RL	RF	RQ	RS	RA	RN	RT	RK

(2) 容量代码 Capacitance code

Capacitance (μF)	0.1	1	4.7	10	22	100	470	560	1000	2000
Code	R10	1R0	4R7	100	220	101	471	561	102	202

(3) 容量偏差 Capacitance tolerance

Tolerance %	±5	±10	±20	-10~+20	-10~+30	0~+20	-5~+20	+5~+20	+10~+20
Code	H	K	M	V	Q	R	G	J	Y

(4) 额定电压代码 Rated voltage code

Voltage(W.V.)	6.3	10	16	25	35	50	63	80	100	160	200	250
Code	6R3	010	016	025	035	050	063	080	100	160	200	250

(5)尺寸 Diameter(Φ)

Diameter	3	4	5	6.3	8	10	12.5	16	18	20
Code	A	B	C	E	F	G	H	K	L	M

(6)产品高度 Case length(L:mm)

Diameter	5	8	10	11.5	12	12.7	15	17	20	25
Code	05	08	10	1A	12	1D	15	17	20	25

(7)加工形式 Type

Processing type	Radial bulk	Taping				Lead Cutting & Forming					
		2.0mm Pitch	2.5mm Pitch	5.0mm Pitch	Reel	A-Type	B-Type	D-Type	E-Type	L-Type	N-Type
Code	RR	TA	TB	TD	TR	A *	B *	D *	E *	L *	N *

(8)特殊要求 Special requirements: 0 -无

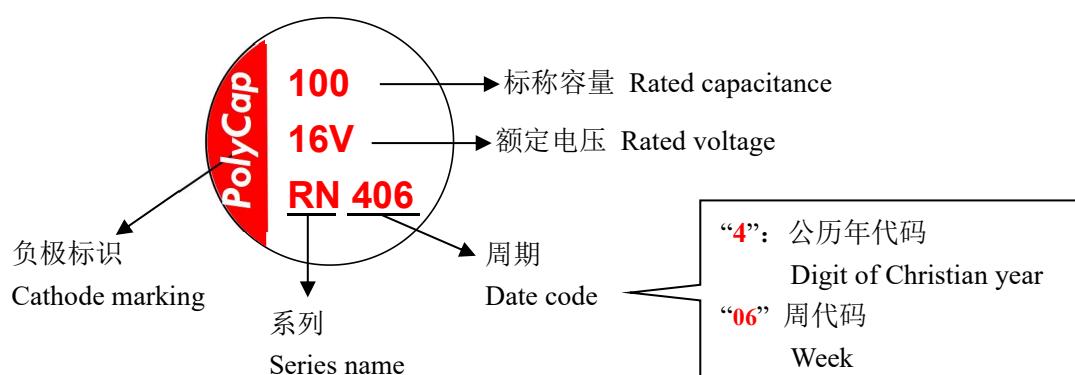
(9)设计等级 The design grade: C -消费级

(10)胶塞形状 The shape of Rubber: 5 -平台胶塞,线径 0.5mm

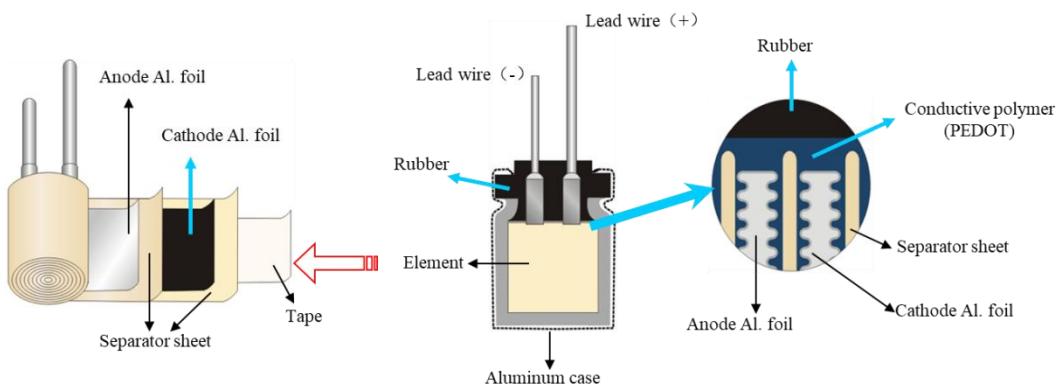
(11)标识颜色 Marking color: H -红色

4. 尺寸 Dimensions(mm)

尺寸 Dimensions		代码 Code	$\Phi D \pm 0.5$	L ± 1.0	F ± 0.5	$\Phi d \pm 0.05$
Plastic coating Aluminum. Case		E05	6.3	5	2.5	0.5

5. 标识 Marking

6. 内部结构 Internal Construction



7. 规格参数 Specification

W.V. (V)	Capacitance (μ F)	Capacitance tolerance	L.C. (μ A,2min)	$\text{tg}\delta$ (120Hz,20°C)	ESR ($\text{m}\Omega$,100kHz)	Rated Ripple Current(mA,r.m.s) 100KHz/105°C	Load Life (105°C,Hours)	Size $\Phi D \times L$ (mm)
16	100	$\pm 20\%$	320	0.10	25	2690	2000	6.3×5

纹波电流频率系数 Frequency Coefficient for Ripple Current

频率 Frequency	120Hz≤freq.<1KHz	1KHz≤freq.<10KHz	10KHz≤freq.<50KHz	50KHz≤freq.<100KHz	100KHz≤freq.<300KHz
系数 Coefficient ($C \leq 1000\mu\text{F}$)	0.05	0.3	0.7	0.85	1
系数 Coefficient ($3000\mu\text{F} \geq C > 1000\mu\text{F}$)	0.1	0.33	0.85	1	1
系数 Coefficient ($C > 3000\mu\text{F}$)	0.12	0.35	1	1	1

8. 性能及测试方法 Performance and test method

8.1 电气性能 Electrical performance

序号 No.	项目 Item	测试方法 Test method	性能 Performance
8.1.1	电容量 Capacitance	测试频率 Measuring frequency: 120Hz±10% 测试电路 Measuring circuit: Equivalent series circuit	参考规格参数 Refer to Specification
8.1.2	损失角正切值 Dissipation Factor	测试电压 Measuring voltage: +0V.DC≤0.5Vrms 测试温度 Measuring temperature: 20°C	≤规格值 ≤the value in specification
8.1.3	漏电流 Leakage current	直流漏电流在 20°C, 有串联 1000Ω 电阻的情况下以直流工作电压且 充电 2min 后测试。 DC leakage current shall be measured after 2 minutes application of the DC rated working voltage through the 1000Ω resistor at 20°C. 如对测试值有争议, 请对争议产品进行电压处理, 方法为: 串联一个 1kΩ 的保护电阻, 在 105±5°C 下施加额定直流电压 1 个小时, 电容器 放电后应在室温和低湿度条件下储存 16 小时后进行测试。 If the value is doubtful, please performed the voltage treatment: A protective resistor of approximately 1 kΩ shall be connected to the capacitor in series, a DC voltage equal to the rated voltage shall be applied for 1 hour at 105±5°C, The tests shall be made after discharging the capacitors have been stored for a period of 16h at room temperature and low humidity.	≤规格值 ≤the value in specification

8.1.4	等效串联电阻 (ESR) Equivalent series resistance	<p>测试频率 Measuring frequency: 100kHz 测试温度 Measuring temperature: $20 \pm 2^\circ\text{C}$ 测量位置: 测试点距离电容器本体 1mm 以内 Measurement point: point of lead wire within 1mm from the body 试验前必须进行短开路校正, 短路片与测试夹具电极的接触面应为光滑面。 Short and open compensation must be required before test. Contact surface of both shorting plate and the electrodes of the test fixtures must be polished.</p>			≤规格值 ≤the value in specification
8.1.5	高温、低温特性 High and low temperature characteristics	步骤 Step	测试温度 Test Temp.	测试项目 Items	性能要求 Electrical Characteristic
		1	$20 \pm 2^\circ\text{C}$	Capacitance, $\tan\delta$, ESR	符合规格值 Meet the value in specification.
		2	$-55 \pm 3^\circ\text{C}$	Capacitance	步骤 1 测试值 $\pm 20\%$ 以内 $\pm 20\%$ of the value in step 1.
				ESR	≤ 2 倍规格值 $\leq 200\%$ times of the value in specification .
		3	$20 \pm 2^\circ\text{C}$	-----	-----
		4	$105 \pm 2^\circ\text{C}$	Capacitance	步骤 1 测试值 $\pm 20\%$ 以内 $\pm 20\%$ of the value in step 1.
		5	$20 \pm 2^\circ\text{C}$	Capacitance	步骤 1 测试值 $\pm 5\%$ 以内 $\pm 5\%$ of the value in step 1.
				$\tan\delta$	\leq 规格值 \leq the value in specification.
				Leakage current	\leq 规格值 \leq the value in specification.
		电容器应在测试温度下保持 30 分钟以上 The capacitor shall be kept above 30min in the test temperature.			

8.2 力学性能 Mechanical performance

序号 No.	项目 Item	测试方法 Test method	性能 Performance	
8.2.1	可焊性 Solder ability	<p>引线端子应在乙醇或异丙醇松香溶液的助熔剂中浸泡 2 ± 0.5 秒。然后将引线端子浸在 $245 \pm 3^\circ\text{C}$ 的焊料中, 直至离本体 $1.5 \sim 2\text{mm}$ 的位置, 并保持 3 ± 0.3 秒, 然后将其拉出。</p> <p>A lead wire termination shall be dipped for 2 ± 0.5 second in the flux of ethanol or isopropyl alcohol solution of colophonium. Then the lead wire terminations shall be immersed to a solder of $245 \pm 3^\circ\text{C}$ and up to the point $1.5 \sim 2\text{mm}$ from the body and kept for 3 ± 0.3 second, and pulling it out.</p>	<p>引线端子浸渍部分至少 95% 的表面应覆盖新焊料。</p> <p>At least 95% of circumferential surface of the dipped portion of termination shall be covered with new solder.</p>	
8.2.2	耐焊接热 Resistance to soldering heat	<p>测试条件 Test condition:</p> <p>(1) 浸渍焊接法 Soldering bath method 助焊剂: 乙醇或异丙醇松香溶液。</p>	容量变化 Capacitance change	初始测量值 $\pm 5\%$ 以内 Within $\pm 5\%$ of initial measured value.

		<p>Flux: ethanol or isopropyl alcohol solution of colophonium. 焊料类型 Kind of solder: H60A,H60S,H63A 焊接温度 Temperature of solder: $260 \pm 5^\circ\text{C}$ 焊接时间 Duration of immersion into solder: $10 \pm 1\text{S}$ 浸渍次数 Times of dip: 两次 twice 浸没深度: 浸没位置距离本体 1.5~2.0 毫米 Depth of immersion: A point 1.5~2.0mm from the body 浸没速度 Speed of immersion: $25 \pm 2.5\text{mm/S}$ (2) 烙铁焊法 Soldering iron method 焊接温度 Temperature of solder: $400 \pm 10^\circ\text{C}$ 焊接时间 Duration of immersion into solder: $5 \pm 1\text{S}$ max. 热保护器: 1.6 毫米环氧树指玻璃板 Heat protector: $t=1.6\text{mm}$ glass-epoxy board </p>	<p>损失角正切值 $\text{Tan}\delta$</p> <p>漏电流 Leakage current</p> <p>外观 Appearance</p>	<p>≤规格值 \leq the value in specification.</p> <p>≤规格值 \leq the value in specification.</p> <p>无明显异常变化 No remarkable abnormal change shall be occurred.</p>
8.2.3	耐溶剂性 Resistance to solvent	<p>溶剂类型 Kind of solvent: 异丙醇 isopropyl alcohol 温度 Temperature: 20 to 25°C 浸渍时间 Immersion time: $30 \pm 5\text{second}$</p>	<p>标识 Marking</p> <p>外观 Appearance</p>	<p>便于识别 To be easily readable</p> <p>无显著异常 No remarkable abnormality</p>
8.2.4	端子强度 Terminal strength	<p>(1) 拉伸强度 Pull strength 电容引线应承受 5N (引线 $\Phi 0.45\text{~}0.5$)或 10N (引线 $\Phi 0.6$) 轴向拉力 10 ± 1 秒。 Capacitor leads shall withstand a steady pull of 5N (Lead $\Phi 0.45\text{~}0.5$) or 10N (Lead $\Phi 0.6$) applied axially to the leads for 10 ± 1 seconds.</p> <p>(2) 折弯强度 Bending strength 在引线端部悬挂负载 5N, 将电容器本体弯曲 90°, 恢复到初始位置。 该操作需在 2~3 秒内完成。 然后以相反的方向弯曲 90°, 以相同的速度回到原来的位置。 Load 5N shall be hung at the end of the lead wire termination, and the body of a capacitor shall be bent 90° and return to its original position. This operation shall be performed around 2 to 3seconds. Then the body shall be bent 90° at the opposite direction and return to its original position at same speed </p>		<p>测试完成后, 电容器在使用中不应出现任何有缺陷的变化。 After this test, that capacitor shall no appear any change defective in use.</p>
8.2.5	振动 Vibration	<p>振动频率范围:10~55Hz, 总振幅 1.5mm, 频率变化率从 10~55Hz 变化, 约 1 分钟后恢复到 10Hz, 并重复。 X、Y、Z 三个方向每 2 小时施加振动(共 6 小时)。 Vibration frequency range: 10 to 55Hz, total amplitude 1.5mm, rate of frequency variation to be such as to vary from 10 to 55Hz and return to 10Hz in about 1 minute, and thus repeated. Vibration to be applied in 3 directions of X, Y and Z for each 2 hours(total 6 hours).</p>	<p>容量变化 $\text{Capacitance change}$</p> <p>损失角正切值 $\text{Tan}\delta$</p> <p>等效串联电阻 ESR</p> <p>漏电流 Leakage current</p> <p>外观 Appearance</p>	<p>初始测量值 $\pm 10\%$ 以内 Within $\pm 10\%$ of initial measured value.</p> <p>≤规格值 \leq the value in specification.</p> <p>≤规格值 \leq the value in specification.</p> <p>≤规格值 \leq the value in specification.</p> <p>无明显异常变化 No remarkable abnormal change shall be occurred.</p>

8.2.6	稳态湿热 Damp heat (steady state)	温度 Temperature : 60±2°C 相对湿度 Relative humidity : 90% ~ 95% 持续时间 Duration : 1000 (-0/+48) hrs 使用电压: 额定电压 Applied voltage : Rated voltage	容量变化 Capacitance change	初始测量值±20%以内 Within ±20% of initial measured value.
			损失角正切值 Tanδ	≤150% 规格值 ≤150% the value in specification.
			等效串联电阻 ESR	≤150% 规格值 ≤150% the value in specification.
			漏电流 Leakage current	≤ 规格值 ≤ the value in specification.
			外观 Appearance	无明显异常变化 No remarkable abnormal change shall be occurred.

8.3 可靠性 Reliability

序号 No.	项目 Item	测试方法 Test method	性能 Performance	
			容量变化 Capacitance change	初始测量值±20%以内 Within ±20% of initial measured value.
8.3.1	负荷寿命 Load Life	电容在 105±3°C, 加载直流电 2000 小时后, 需在室温下放置 2 小时才可进行测试 After 2000 hours continuous application of DC rated working voltage at 105±3°C, the measurements shall be measured after 2 hours exposed at room temperature	损失角正切值 Tanδ	≤150% 规格值 ≤150% the value in specification.
			等效串联电阻 ESR	≤150% 规格值 ≤150% the value in specification.
			漏电流 Leakage current	≤ 规格值 ≤ the value in specification.
			外观 Appearance	无明显异常变化 No remarkable abnormal change shall be occurred.
8.3.2	存储寿命 Shelf life	不施加额定工作电压的情况下, 在+105°C 下测试 1000 小时 A capacitor after 1000 hours test at +105°C without rated working voltage applied	容量变化 Capacitance change	初始测量值±20%以内 Within ±20% of initial measured value.
			损失角正切值 Tanδ	≤150% 规格值 ≤150% the value in specification.
			等效串联电阻 ESR	≤150% 规格值 ≤150% the value in specification.
			漏电流 Leakage current	≤ 规格值 ≤ the value in specification.
			外观 Appearance	无明显异常变化 No remarkable abnormal change shall be occurred.
8.3.3	浪涌电压 Surge voltage	循环次数 Cycles: 1000 温度 Test temperature: 15~35°C 电压 Test voltage: 1.15×W.V. 保护电阻 Series resister: R=1K Ω	容量变化 Capacitance change	初始测量值±15%以内 Within ±15% of initial measured value.
			损失角正切值 Tanδ	≤150% 规格值

		充电持续时间 Charging time: 30 ± 5 s 放电持续时间 Discharging time: 330 ± 30 s:	Tanδ	$\leq 150\%$ the value in specification.
			等效串联电阻 ESR	$\leq 150\%$ 规格值 $\leq 150\%$ the value in specification.
			漏电流 Leakage current	\leq 规格值 \leq the value in specification.
			外观 Appearance	无明显异常变化 No remarkable abnormal change shall be occurred.
8.3.4 温度急变 Rapid change of temperature		<p>使用电压: 无负荷 Applied voltage : without load 循环次数: 5 次 Cycles : 5 Cycles</p>	容量变化 Capacitance change	初始测量值 $\pm 10\%$ 以内 Within $\pm 10\%$ of initial measured value.
			Tanδ	\leq 规格值 \leq the value in specification.
			等效串联电阻 ESR	\leq 规格值 \leq the value in specification.
			漏电流 Leakage current	\leq 规格值 \leq the value in specification.
			外观 Appearance	无明显异常变化 No remarkable abnormal change shall be occurred.

9.使用指导 Application Guidelines

导电高分子型固态铝电解电容器的使用应遵循以下指南。

Conductive Polymer Solid Aluminum Electrolytic Capacitors should be used in compliance with the following guidelines.

9.1 电路设计 Circuit design

9.1.1 极性 Polarity

RN 系列固态铝电容器具有正负极之分, 不要反接固态铝电容器, 反接固态铝电容器可以导致漏电流的急剧增加或者使用寿命的降低。

The **RN** series is a polarized aluminum electrolytic capacitor. Do not apply either reverse voltages or AC voltages to the polarized capacitors, using reverse polarity may cause a short circuit. Refer to the catalog, product specifications or capacitor body to confirm the polarity prior to use.

9.1.2 应用电压 Applied voltage

不要施加超过额定电压的直流电压。直流电压上叠加的交流电压(纹波电压)的峰值电压不得超过满额定电压。虽然有定义超过额定电压的浪涌电压, 但适用的使用条件并不能保证在这种条件下长时间持续运行。确保关闭电源或开关电源的瞬态现象中可能引起的反向电压在额定电压的20%以内。

Do not apply DC voltages exceeding the full rated voltage. The peak voltage of superimposed AC voltages (ripple voltages) on DC voltages must not exceed the full rated voltage. While there are specifications for surge voltages exceeding the rated voltage, usage conditions apply, and continued operation for extended periods of time under such conditions cannot be guaranteed. Use the within 20% of the rated voltage for applications which may cause the reverse voltage during the transient phenomena when the power is turned off or the source is switched.

9.1.3 纹波电流 Ripple current

不要施加超过额定纹波电流的电流，叠加一个大纹波电流会增加电容器内部的发热速率。
Do not apply currents in excess of the rated ripple current. The superimposition of a large ripple current increases the rate of heating within the capacitor.

----这可能会降低电容器的使用寿命或损坏电容器。This may reduce the service life of the capacitor or damage the capacitor.

----可能导致短路故障。This may cause a short circuit fault.

9.1.4 工作温度 Operating temperature

请勿在高温环境下使用**RN**系列电容(超过电容最高类别温度)。如果超出电容最高类别温度，可能会降低电容的使用寿命。

Do not use the **RN** series capacitor at high temperatures (temperatures exceeding the maximum temperature for the capacitor category) Use of the capacitor outside of the maximum temperature for the capacitor category may decrease the service life of the capacitor.

9.1.5 急速充放电 Sudden charge and discharge

请勿在反复急速充放电的电路中使用**RN**系列电容。反复急速充放电可能导致电容降低或内部发热造成损坏。如有相应要求，请与我们的工程师联系。

Do not use the **RN** series capacitor in circuits where the capacitor is repetitively charged and discharged rapidly. Repetitively charging and discharging the capacitor rapidly may reduce the capacitance or may cause damage due to internal heating. If you have corresponding requirements, please contact our engineers

当冲击电流超过20A或冲击电流超过**RN**系列允许纹波电流的10倍以上时，建议采用保护电路以确保可靠性。

Use of a protective circuit to ensure reliability is recommended when rush currents exceed 20A or the rush current is over 10 times of permissible ripple current of **RN** series.

测量漏电流时，在充放电过程中必须在电路上安装保护电阻(1k Ω)。

A protection resistor(1 k Ω) must be inserted to the circuit during the charge and discharge when measuring the leakage current.

9.1.6 寿命 Life-span

$$L_x = L_0 \times 10^{\frac{T_0 - T_x}{20}}$$

式中 Where:

L: 实际使用温度下的预期寿命[小时]

Estimation of actual lifetime [hour]

Lo: 最高额定工作温度下的额定寿命[小时]

Specified lifetime with the rated voltage at the upper limit of the category temperature [hour]

To: 最高额定工作温度[$^{\circ}$ C]

Max Operating Temperature [$^{\circ}$ C]

Tx: 电容器本体实际温度[$^{\circ}$ C]

Body Temperature[$^{\circ}$ C]

在导电高分子型固态铝电解电容器中，不需要对纹波电流施加温度补偿系数。

There is no need to apply a temperature-compensating coefficient for the ripple current in the Conductive Polymer Solid Aluminum capacitors.

基于上述公式的结果是估算值，不是保证值，如果估算寿命超过15年则以15年为准。

The result based on above formula is estimated one but not guaranteed. And the estimated life-span is limited up to 15 years.

9.1.7 电路设计 Circuit design

请在确认以下内容的基础上进行电路设计。

Verify the following before designing the circuit:

a) 随着温度及频率的变化，电容器的电气性能会随之变化，进行电路的设计前请确认这些变化。

The electrical characteristics of the capacitor will vary depending on differences in temperature and frequency. Only design your circuit after verifying the scope of these factors.

b) 当 2 个以上电容器并联使用时，请在设计电路时考虑电流的平衡；

When connecting two or more capacitors in parallel, ensure that the design takes current balancing into account.

c) 当 2 个以上电容器串联使用时，因加载电压存在差异，有可能导致电压超标，请使用时咨询我们；

When two or more capacitors are connected in series, variability in applied voltage may cause over-voltage conditions. Contact PolyCap before using capacitors connected in series.

d) 请勿在电容器的周围以及印刷线路板的背面安装发热部件。

Avoid putting heat generating parts either around the capacitor or on the reverse of the circuit board.

9.2 电容器使用环境及焊接 Environments and Soldering for Using Capacitors

9.2.1 工作环境限制 Capacitor Usage Environment

请不要在以下环境中使用固态铝电容器：

a) 水、盐水、油可以直接滴落的地方，以及容易发生收缩的电路板；

b) 有害气体 (H₂S、硫酸、硝酸、氨气、盐酸等) 聚集的场合；

c) 紫外线、放射性射线、臭氧等辐射的场合。

Do not use/expose capacitors to the following conditions.

a) Oil, water, salty water, take care to avoid storage in damp locations.

b) Toxic gases such as hydrogen, sulfide, sulfurous acids, nitrous acids, chlorine and chlorine compounds, bromine and bromine compounds, ammonia, etc.

c) Ozone, ultraviolet rays and radiation.

9.2.2 漏电流 Leakage current

焊接产生的热应力和运输产生的机械应力可能会导致漏电流变大。在这种情况下，通过施加不超过额定电压的电压，在上限温度范围内，漏电流会逐渐减小。在接近上限温度的条件下，当施加电压接近电容额定电压时，漏电流值会迅速下降。

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 decrease by applying voltage less than or equal to the rated voltage at a temperature within the upper category temperature. In close conditions to the upper category temperature, The leakage current value

will decrease rapidly when the applied voltage is closed to the capacitor rate voltage.

9.2.3 安装注意事项 Mounting precautions

a) 对于表面贴装型电容器，按照目录或产品规范设计 PCB 板。

For the surface mount capacitor, design the copper pads on the PC board in accordance with the catalog or the product specification.

b) 对于插件型电容器，PCB 板上的端子孔应与电容的端子间距相匹配。

For radial capacitors, design the terminal holes on the PC board to fit the terminal pitch of the capacitor.

c) 检查电容量和额定电压后安装。

Mount after checking the capacitance and the rated voltage.

d) 检查极性后安装。

Mount after checking the polarity.

e) 不要对引线端子和电容器本身施加过大的外力。

Do not apply excessive external force to the lead terminal and the capacitor itself.

f) 确保焊接条件符合 PolyCap 推荐的条件。由于焊接等过程中产生的热应力，漏电流可能会增加，漏电流在施加电压时逐渐减小。

Ensure that the soldering conditions meet the specifications recommended by PolyCap. The leakage current may increase due to thermal stresses that occur during soldering, etc. Increased leakage currents gradually decrease when voltage is applied.

9.2.4 烙铁焊接 Soldering using a soldering iron:

a) 焊接条件(温度和时间)在目录或产品规格书规定的范围内。

The soldering conditions (temperature and time) are within the ranges specified in the catalog or product specifications.

b) 不要将电烙铁的头部接触到固态铝电容器。

The tip of the soldering iron does not come into contact with the capacitor itself.

9.2.5 波峰焊 Wave soldering

a) 不要将电容器本体浸入焊锡槽中，只将端子浸入，焊接必须在PC板背面进行。

Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board.

b) 焊接条件(预热、焊接温度和浸渍时间)应在目录或产品规格书规定的范围内。

Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.

关于波峰焊，请确保在以下条件下进行焊接。

In regards to wave soldering, be sure to solder within the following conditions.

	温度 Temperature	持续时间 Duration	过炉次数 Flow times
预热 Preheating	120°C or less(ambient temperature)	120 sec. or less	1 time
焊接条件 Soldering conditions	260+5°C or less	10+1 sec. or less	Twice or less

c) 除端子外，不要对电容器的任何部分施加磁通。

Do not apply flux to any part of capacitors other than their terminals.

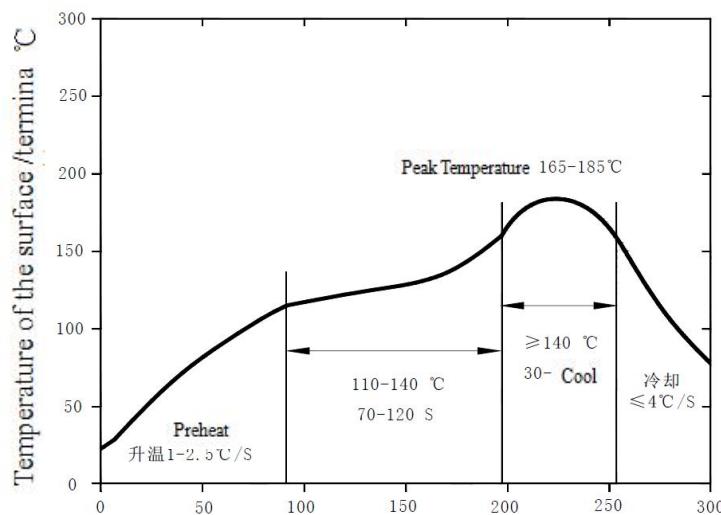
d) 焊接时，确保电容器不接触任何其他部件。

Make sure the capacitors do not come into contact with any other components while soldering.

9.2.6 回流焊 Reflow soldering

对于 DIP 型固态铝电容器产品，推荐的回流焊条件为：

Recommended reflow condition for the DIP:



使用 Sn42-Bi58 锡膏的推荐回流焊曲线

Recommended reflow condition for Sn42-Bi58

9.2.7 焊接后的处理 Handling after soldering

a) 当固态铝电容器完成焊接后，请不要使用外力倾斜、弯曲、扭曲它；

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.

b) 请不要抓住固态铝电容器来移动 PCB 板；

Do not use the capacitors for lifting or carrying the assembly board.

c) 当堆放焊接有固态铝电容器的 PCB 板时，请不要将固态铝电容器互相接触或接触到其他组件；

Do not hit or poke the capacitor after soldering to PC board. When stacking the assembly board, be careful that other components do not touch the solid aluminum electrolytic capacitors.

d) 不要让焊接在 PCB 板上的固态铝电容器承受外力。

Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board.

9.2.8 PCB 板的清洗 Washing the PC boards

请选用乙醇类清洗剂，并注意以下条件：

Please use ethanol cleaning agent, and note the following conditions:

a) 使用浸没方式和超声波清洗时，请不要超过 2 分钟；

please do not exceed 2 minutes when using immersion and ultrasonic cleaning.

b) 清洗温度须低于 60°C；

The cleaning temperature must be below 60°C.

c) 请注意清洗剂带来的污染问题；

Please pay attention to the pollution caused by cleaning agent.

d) 清洗结束后, 请用低于额定工作温度以下的热空气进行干燥。

After cleaning, please set the temperature is lower than the rated working temperature to drying.

9.3 存储与处理 Storage and disposal

9.3.1 存储 Storage

推荐以下存储条件:

The following conditions for storage are recommended:

a) 将固态铝电容器储存在阴凉干燥环境中, 建议储存温度为5~35°C, 湿度为75%以下; Store capacitors in a cool, dry place. Store at a temperature between 5 and 35°C, with a humidity of 75% or less.

b) 要使固态铝电容器保持好的可焊性, 请不要开启出厂包装, 仅仅在安装前打开包装, 并一次性安装完全部产品, 如果有产品剩余, 则请放回包装袋并封好袋口。

Be sure to follow our recommendations for reflow soldering. It is recommended to store capacitors in their original packaging wherever possible. Use all capacitors once the bag is opened. Return un- used capacitors to the bag, and seal it with a zipper.

各类型产品的存储期限请参考下表:

Please refer to following for storage conditions.

类型 Type	开启包装前 Before unseal	开启包装后 After unseal
插件型 Radial lead type 胶带包装 Bag packing product	30个月 Within 30 months after manufacturing	7天 Within 7 days after the bag is opened
插件型 Radial lead type 编带包装 Taping product	24个月 Within 24 months after manufacturing	7天 Within 7 days after the bag is opened
表面贴装型 SMD type	24个月 Within 24 months after manufacturing	30天 Within 30 days after the bag is opened

c) 不要将固态铝电容器储存于有害气体环境, 例如硫化氢、亚硫酸、亚硝酸、氯或氯化合物、溴或其他卤素气体、甲基溴或其他卤素化合物、氨或类似物。

Store in a location where the capacitor is not exposed to toxic gas, such as hydrogen sulfide, sulfuric acid, nitrous acid, chlorine or chlorine compounds, bromine or other halogen gases, methyl bromide or other halogen compounds, ammonia, or similar.

d) 不要将电容器储存在直接溅水、盐水及油的环境下。

Do not store capacitors in direct splash, brine or oil.

9.3.2 废弃品处置 Disposal

因为固态铝电容器包含有一些固体有机物、一些金属物质以及树脂材料等, 因此请当做工业废料处置废弃的固态铝电容器。

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

10. 有害物质限用指令 RoHS compliant

10.1 **RN**系列符合欧盟有害物质限制(RoHS)指令，我们在此保证我们的产品中不含有以下物质超过RoHS指令规定的内容。

The **RN** series is committed to comply with the European Union Restriction of Hazardous Substance (RoHS) Directive. We hereby guarantee that our products do not contain the following materials exceeding the content regulated in RoHS Directive.

铅 Lead(Pb)	≤1000ppm
汞 Mercury(Hg)	≤1000ppm
镉 Cadmium(Cd)	≤100ppm
六价铬 Hexavalent Chromium,Cr ⁶⁺	≤1000ppm
多溴联苯 (PBBs)	≤1000ppm
多溴联苯醚 Polybrominated Diphenyl Ethers(PBDEs)	≤1000ppm
邻苯二甲酸二辛酯 Diethylhexyl phthalate (DEHP)	≤1000ppm
邻苯二甲酸二丁酯 Dibutyl phthalate (DBP)	≤1000ppm
邻苯二甲酸丁基苄酯 Butyl benzyl phthalate (BBP)	≤1000ppm
邻苯二甲酸二异丁酯 Diisobutyl phthalate (DIBP)	≤1000ppm

10.2 无卤申明 Halogen free compliant

本规格书所列产品及其组成成分不含下列任何物质，其浓度不超过所列最高限量。

The products identified in the specification, and their homogeneous subcomponents, do not contain any of the following substances in concentrations greater than the listed maximum limits.

物质名称 Substance	限制含量 Maximum Limit
溴 Bromine(Br)	900 ppm
氯 Chlorine(Cl)	900 ppm
卤素总量 Total concentration of Chlorine(Cl) + Bromine(Br)	1500 ppm

10.3 关于化学品注册、评估、许可和限制规定的符合性 REACH complies

本规格书产品符合最新REACH法规。

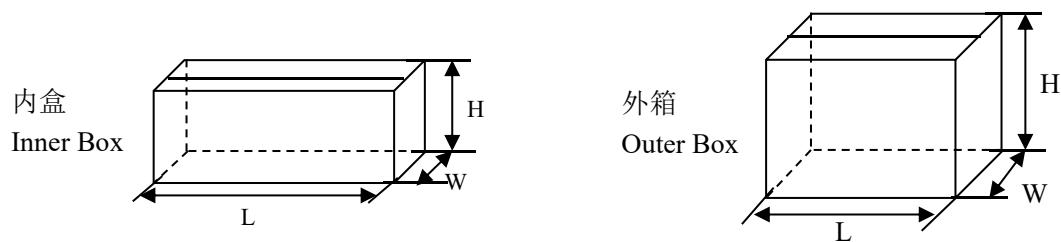
The products identified in the specification complies with the latest REACH regulations.

11. 包装 Package

11.1 包装数量 Package quantity

尺寸 Case Size (mm)	盒装 Ammo Package		
	胶袋 Bag/PCS	内盒 Inner box/PCS	外箱 Outer box/PCS
Φ6.3×5	600	6000	24000

11.2 标准包装及尺寸 Standard package form and dimensions



箱盒 Box	L(mm)	W(mm)	H(mm)
内盒 Inner box	340	245	110
外箱 Outer box	510	350	250

12. 重要说明 Notice

对本规格书的任何修改，都必须得到本规格书制定部门的批准。

Any modification to this specification must be approved by the department that created this specification.

本规格书的解释权归本规格书的制定部门。

The right of interpretation of this specification belongs to the formulation department of this specification.
供求双方有技术上的分歧时，以本规格书作为仲裁。

In case of any technical differences between the supply and demand parties, this specification shall be used for arbitration.