上海永铭电子股份有限公司

规 格 书

Specification For Approval

客户 Customer :	
日期 Date:	

品名 Item:	导电性高分子固体钽电解电容 Conductive Polymer Solid Tantalum electrolytic Capacitor
型号 Series:	TQD
版本 Version :	00
物料号 Customer P/N :	TQD680M1VD19100RN

客户确认 Client Confirmed	
批准 Approved by	审核 Checked by

批准 Approved by		
批准 Approved by	审核 Checked by	拟制 Prepared by
张庆涛	成琳	张中央

承认书请寄回一份

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上海永铭电子股份有限公司

Shanghai Yongming Electronic Co., Ltd.

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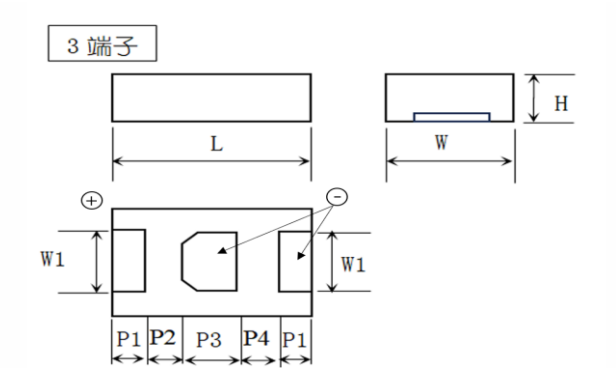
修改日期 Date	修订内容 Content	修订原因 Reason for Revision	版本 Version	修订人 Revised By

客户 Customer	

产品尺寸示意图:



产品外观及丝印示意图:

TQD/ TQE/TQW 系列

产品尺寸表:

编号 Case Code	L	W	H	W1	P1	P2	P3	P4
公差	±0.3	±0.2	±0.1	±0.1	±0.2	±0.2	±0.2	±0.2
D	7.3	4.3	按产品规格	2.4	1.3	1.6	2.0	1.6
E	9.1	4.3	按产品规格	2.4	1.3	2.1	2.8	2.1
W	7.3	6.0	按产品规格	4.1	1.3	1.6	2.0	1.6

TABLE-1

No	客户 物料编码 Customer Part No	永铭 物料编码 Ymin Part No	额定 电压 Rated Voltage (V.DC)	额定温度范围 Rated Temp. Range (℃)	类别 电压 Category Voltage (V.DC)	类别温度范围 Category Temp. Range (℃)	标称 容量 Cap (μF)	浪涌电压 Surge Voltage (V.DC)	容量范围 Capacitance Tolerance (%)	损耗 Tanδ 20±3℃ 120Hz (% max)	等效串联电阻 ESR(Ω) 20±3℃ 100KHz (Ω max)	纹波电流 Ripple Current 45℃ 100KHz (mA)	漏电流 Leakage Current 20±3℃ UR，5mins (μA max)	寿命 Load Life 105℃ (Hours)	尺寸编号 Case Code
1		**TQD680M1VD19100RN**	**35**	**-55~+105**	**35**	**-55~+105**	**68**	**40.3**	**±20%**	**0.10**	**0.100**	**1400**	**238**	**2000**	**D19**
2															
3															

1．概述 SCOPE

本承认书规定了高分子钽电解电容器的技术规范。

This recognition specifies the technical specifications for polymer tantalum electrolytic capacitors.

2．参考标准 APPLICABLE SPECIFICATION

本承认书参考 IEC 60384-24 制定。

This approval sheet consulted the institute of IEC 60384-24。

3．工作温度范围 OPERATING TEMPERATURE RANGE

工作温度范围是电容器在施加额定工作电压和额定纹波电流的条件下，电容器可以长期可靠工作的环境温度范围。-55~+85℃/+105℃（有关最高额定温度，请参见料号规格表）

Operating temperature range is the range of ambient temperature at which the capacitors can be operated continuously at rated voltage.

-55~+85℃/+105℃（refer to part number spec sheet for maximum temperature rating）

4．测试环境 CHARACTERISTICS

如果没有其他规定，标准的测试、检验环境条件如下所示：

环境温度：18℃~28℃

相对湿度：≤80% ；大气压力：86kpa~106kpa

如果对测试结果有异议，可以在以下条件测试：

环境温度：20℃±3℃

相对湿度：60%~70%　大气压力86kpa~106kpa

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows.

Ambient temperature ： 18℃ to 28℃

Relative humidity ： ≤80%

Air pressure ： 86kpa to 106kpa

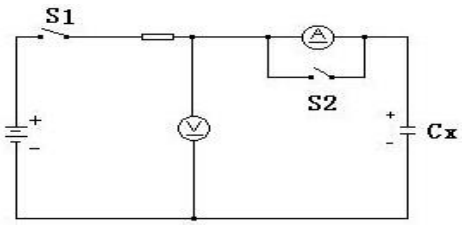
If there may be doubt on the results, measurements shall be made within the following limits

Ambient temperature ： 20±3℃

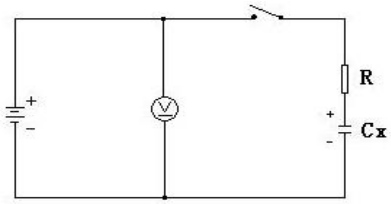
Relative humidity： 60% to 70% ； Air pressure ： 86kpa to 106kpa

5 产品特性 PRODUCT CHARACTERISTICS

5.1 电气特性 ELECTRICAL CHARACTERISTICS

序号 NO	**项目** **Item**	**测试方法** **Test method**	**性能** **Performance**
5.1.1	电容量 Capacitance	测试频率：120Hz±20% 测试电路：串联等效电路 测试电压：0.5Vrms Measuring frequency: 120Hz±20% Measuring circuit: Series equivalent circuit Measuring voltage: 0.5Vms	见表 1 Refer to table 1
5.1.2	损失角正切值 Dissipation Factor	测试条件与 5.1.1 电容量测试相同 Testing condition are the same as 5.1.1 for capacitance	见表 1 Refer to table 1
5.1.3	漏电流 Leakage current	在电容器两端施加额定工作电压，并串联 1000±100Ω电阻，在施加电压 5 分钟后，测量漏电流。 测试电路如下图： The rated voltage shall be applied across the capacitors and its protective resistor which shall be 1000 ± 100 Ω. The leakage current shall then be measured after an electrification period of 5 min. Measurement circuit  Rs: 保护电阻（1000±100Ω） Protective resistor (1000±100Ω) : 直流电压表 DC voltage meter :直流电流表 DC AM meter S_1: 开关 Switch S_2: 电流表保护开关 Protective switch for an ammeter	见表 1 Refer to table 1

<table>
<tr><td>5.1.4</td><td>等效串联电阻
ESR</td><td>测试频率：100KHz±10%
测试电路：串联等效电路
测试电压：0.5Vrms
Measuring frequency: 100KHz±10%
Measuring circuit: Series equivalent circuit
Measuring voltage: 0.5Vrms</td><td>见表 1
Refer to table 1</td></tr>
<tr><td>5.1.5</td><td>温度特性
Temperature
Characteristic</td><td>
<table>
<tr><td>阶段</td><td>温度</td><td>时间</td></tr>
<tr><td>1</td><td>20±2℃</td><td>--</td></tr>
<tr><td>2</td><td>-55+0 -3℃</td><td>2h</td></tr>
<tr><td>3</td><td>20±2℃</td><td>15min</td></tr>
<tr><td>4</td><td>85+3 -0℃（额定电压 85℃品）
105+3 -0℃</td><td>2h</td></tr>
</table>
阶段 1：测量容量和 ESR
阶段 2：电容器恒温贮存 2 小时，在热平衡状态测容量和 DF
阶段 4：电容器恒温贮存 2 小时，在热平衡状态测容量和 DF，漏电流。
Step 1: Capacitance and ESR shall be measured.
Step 2: After the capacitors being stored for 2 hours, Capacitance and DF shall be made at thermal stability.
Step 4: After the capacitors being stored for 2 hours at 105℃, capacitance，DF and leakage current shall be measured. The measurement shall be made at thermal stability.</td><td>阶段 2：
容量变化应在阶段 1 的±20%范围内。
DF 在初始规格以内。
阶段 4：
容量变化应在阶段 1 的±30%范围内
DF 在初始规格 1.5 倍以内
LC 在初始规格 10 倍以内
Step 2: capacitance
Within ±20% of the value at Step 1.
DF value Within initial limit
Step4: Variation of capacitance Within ±30% of the value at Step 1.
DF value Within 1.5×initial limit
Leakage current Within 10×initial limit</td></tr>
</table>

5.1.6	耐浪涌电压 Surge Test	串联 33Ω电阻，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：85±2℃ 然后在标准大气条件下放置达到热稳定，测试各参数 Series resistance : 33 ohm，1000 times of charging for 30±5 sec., with a period of 5.5±0.5 min. Test temperature: 85±2℃ And the capacitors shall be stored under standard atmospheric conditions to obtain thermal stability, after which measurements shall be made. 测试回路 Test circuit  instantaneous over voltage which may be applied to terminals of capacitors, therefore, not applicable to such over voltages as often applied. 浪涌电压设定	容量：在初始值的±5%以内。 损耗角正切值：不大于规格值。 漏电流：不大于规格值。 Capacitance:Within ±5% of the initial value Dissipation factor: Not more than the specified value Leakage current: No more than the specified value

RV(V)	2.0	2.5	4.0	6.3	10	16	20
S.V(V)	2.3	2.9	4.6	7.2	11.5	18.4	23
RV(V)	25	35	50	63	75	80	100
S.V(V)	28.8	40.3	57.5	72.5	86.3	92	115

5.2 机械特性 MECHANICAL PERFORMANCE

序号 NO	项目 Item	测试方法 Test method	特性 Performance
5.2.2	机械冲击和振动 Mechanical Shock/Vibration	依据 MIL–STD–202，方法 213，条件 I，峰值 100G。 频率 10-55Hz(1 分钟 /10-55-10Hz)，振幅 0.75mm，X，Y，Z(3 轴)各 2 小时(共 6 小时) MIL–STD–202, Method 213, Condition I, 100 G Peak 10-55Hz(1mins interval/10-55-10Hz), 0.75mm, X,Y,Z(3axis),2hours/axial(total 6hours)	容量：在初始值的±10%以内。 损耗角正切值：不大于规格值。 漏电流：不大于规格值。 Capacitance: Within ±10% of the initial value Dissipation factor: Not more than the specified value Leakage current: No more than the specified value
5.2.3	可焊性 Solder ability	焊锡温度：250±5℃ 浸入时间：2.0±0.5 秒 Temperature or solder: 250±5℃ Dipping time: 2±0.5sec.	浸入焊锡的引脚表面积约 90%以上应附着新锡 At least 90% of circumferential surface of the dipping portion of termination shall be covered with new solder.

5.3 耐久性测试 ENDURANCE PERFORMANCE

序号 NO	项目 Item	测试方法 Test method	特性 Performance
5.3.1	耐焊接热 Resistance to soldering heat	电容器通过回流焊测试 回流焊条件： 请参考第 9 点 The capacitor is held on heating for reflow soldering. Reflow soldering profile: Please refer to Item 9	容量变化：在初始值±10%范围内 损失角正切值：不大于规格值 漏电流：满足 5.1.3 要求 外观：无异状 Variation of capacitance: Within ±10% of the initial value before test. Dissipation factor: Not more than the specified value Leakage current: To satisfy No.5.1.3 Appearance: No remarkable abnormality.

5.3.2	稳态湿热 Resistance to damp heat (steady state)	试验温度：60±2℃ 试验时间：500±8h 相对湿度：90~95% 试验后，电容器在 20℃下放置 16 小时，然后测试参数 Test temperature : 60±2℃ Test time : 500±8h Relative humidity: 90~95% After completion of test, the capacitors shall be placed at 20℃ for 16 hours, after which measurements shall be made.	容量变化：在初始值-20%~+40%范围内 损失角正切值：不大于规格值 150% 漏电流：不大于规格值 300% 外观：无异状 Variation of capacitance: Within initial value of -20%~+40% Dissipation factor: Not more than150% of the specified value Leakage current: Not more than300% of the specified value Appearance:No remarkable abnormality.
5.3.3	高温负荷试验 Load life test	试验温度：105±2℃，额定温度 85℃品则按 85±2℃ 施加额定电压 2000 小时 试验后，电容器在 20℃下放置 16 小时，然后测试参数 Application of the rated voltage at a temperature of 105±2℃/ 85±2℃ (Rated temperature 85℃ Product) for 2000 hours After completion of test, the capacitors shall be placed at 20℃ for 16 hours, after which measurements shall be made.	容量变化：在初始值±20%范围内 损耗角正切值：不超过规格值的 150% 漏电流：在规格值以内 外观：无异状 Variation of capacitance: Within ±20% of the initial value before test. Dissipation factor: Within 150% of the specified value Leakage current: Within the specified value Appearance: No remarkable abnormality.

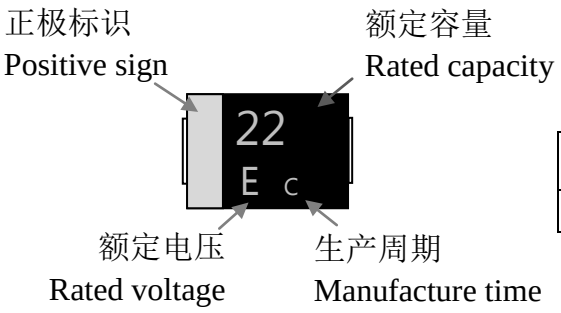
5.3.4	高温贮存试验 Shelf life test	在 105±2℃环境下无负荷贮存 2000 h，至少恢复 16 小时后，施加额定电压 30 分钟。 The capacitors are then stored with no voltage applied at a temperature of 105±2℃for 1000 hours and then resumed 16 hours, applied the rated voltage for 30 minutes.	容量变化：在初始值±20%范围内 损耗角正切值：在规格值以内 漏电流：不超过规格值的 125% 外观：无异状 Variation of capacitance: Within ±20% of the initial value before test. Dissipation factor: Within the specified value Leakage current: Within 125% of the specified value Appearance: No remarkable abnormality.

6. 标记 MARKING

6.1 在电容器体上注明有如下内容:

The following items shall be marked indelibly on the capacitors.

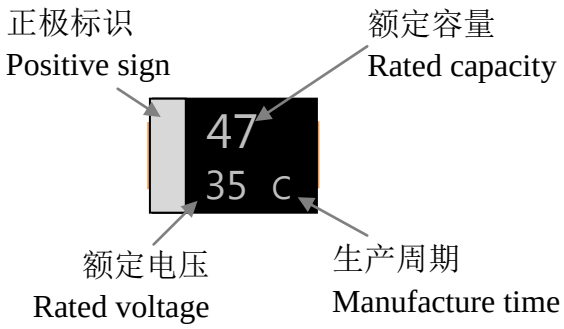
6.1.1 TPB /TQB 系列



电压标识 Voltage Code

电压	10	16	20	25	35	50	63	75	100
标识	A	C	D	E	V	H	J	K	L

6.1.2 TQD/ TQE/TQW 系列



7. 纹波电流补偿系数 Ripple Current Correction Factor

7.1 频率修正系数 Frequency correction factor

频率（Hz）	120Hz	1KHz	10KHz	100~300KHz
修正因子	0.10	0.45	0.50	1.00

7.2 温度修正系数 Temperature correction factor

温度	T≦45℃	45℃ < T≦85℃	85℃ < T≦105℃
额定 85℃品系数	1.0	0.7	-
额定 105℃品系数	1.0	0.7	0.25

8．包装 PACKING

8.1 包装标签 PACKING LABEL

内标签样本 inner label sample

上海永铭电子股份有限公司 RoHS			
规格	220 uF 6.3 V	产品编码	660195
尺寸	3.5*2.8*1.9	容差	- 20 % 、 + 20 %
数量	3000PCS	料号	TPB2210JB19035RD
日期	2022/11/5	ESR	35mΩ

外箱标签样本 outer label sample

上海永铭电子股份有限公司 RoHS			
规格	220 uF 6.3 V	产品编码	660195
尺寸	3.5*2.8*1.9	容差	- 20 % 、 + 20 %
数量	12000PCS	料号	TPB2210JB19035RD
日期	2022/11/5	ESR	35mΩ

包装标签内容 Packing Label Marked (the following items shall be marked on the label)

(Inside box or bag, outer box)

1)产品名称 Product name

2)生产批号 Lot No

3)数量 quantity

4)生产日期 Production date

5)产品编号 Part No

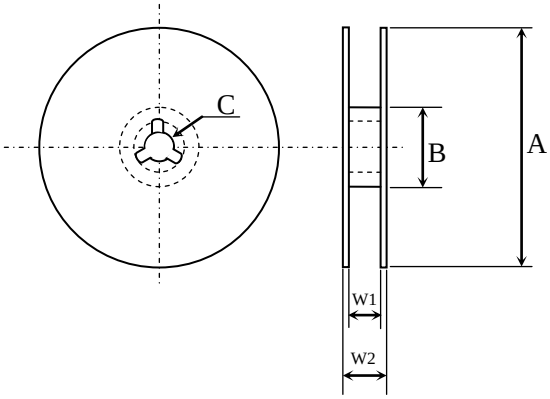
6)客户物料描述 Customer item code

8.2 批号 Lot number:

1 2	3 4	5 6	7	8 9 10 11	12 13
商标	年	月	材料标识	生产序号	分箱号
YM	year	moth	material code	production number	serial number

8.3 卷盘和编带尺寸 Reel & Carrier tape Dimension

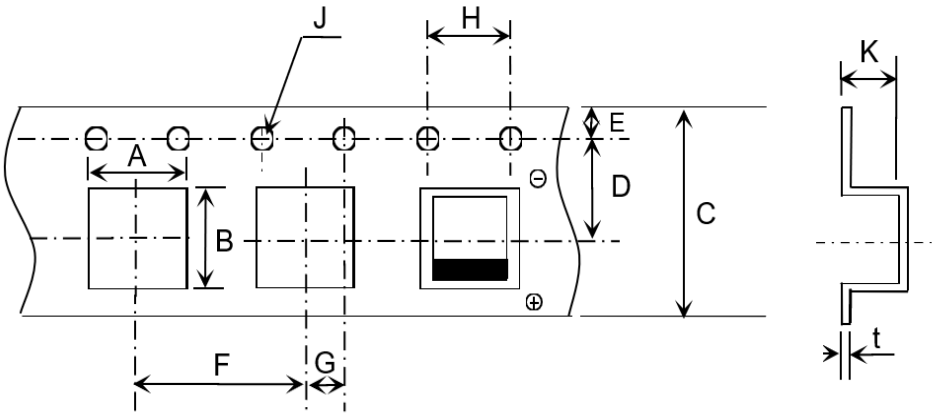
8.3.1 卷盘尺寸示意图 Coil size diagram



8.3.2 卷盘尺寸表 Reel size chart

产品型号	卷盘类别	A ±2	B ±2	C ±0.2	W1 ±0.5	W2 ±1.0
TQB	7 英寸	Φ180	Φ60	Φ13.0	9.0	11.4
TQB	13 英寸	Φ330	Φ60	Φ13.0	9.0	11.4
TQD	7 英寸	Φ180	Φ60	Φ13.0	14.0	20.0
TQD	13 英寸	Φ330	Φ60	Φ13.0	14.0	20.0
TQE	7 英寸	Φ180	Φ60	Φ13.0	14.0	20.0
TQE	13 英寸	Φ330	Φ60	Φ13.0	14.0	20.0
TQW	7 英寸	Φ180	Φ60	Φ13.0	14.0	20.0
TQW	13 英寸	Φ330	Φ60	Φ13.0	14.0	20.0

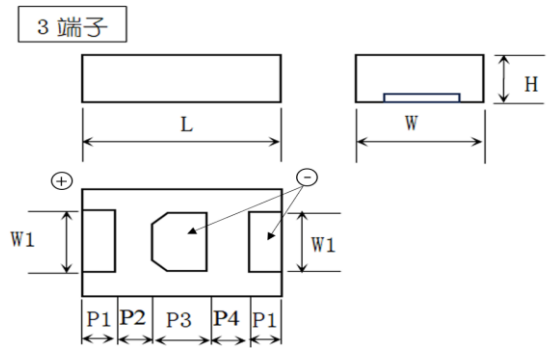
8.3.3 编带尺寸示意图 Schematic diagram of tape width



8.3.4 编带尺寸表 Webbing size chart

系列	A±0.1	B±0.1	C±0.3	D±0.5	E±0.1	F±0.1	G±0.05	H±0.1	J+0.1 -0	K±0.1	t±0.05
TQB14	3.3	3.8	8.0	3.5	1.75	4.0	2.0	4.0	Φ1.5	1.7	0.25
TQB19	3.3	3.8	8.0	3.5	1.75	4.0	2.0	4.0	Φ1.5	2.1	0.25
TQB26	3.3	3.8	8.0	3.5	1.75	4.0	2.0	4.0	Φ1.5	3.0	0.25
TQD15	4.5	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	1.7	0.30
TQD19	4.5	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	2.4	0.30
TQD28	4.5	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	3.2	0.30
TQD42	4.5	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	4.6	0.30
TQE15	4.5	9.3	16.0	7.6	1.75	8.0	2.0	4.0	Φ1.5	1.7	0.30
TQE19	4.5	9.3	16.0	7.6	1.75	8.0	2.0	4.0	Φ1.5	2.4	0.30
TQE28	4.5	9.3	16.0	7.6	1.75	8.0	2.0	4.0	Φ1.5	3.2	0.30
TQE42	4.5	9.3	16.0	7.6	1.75	8.0	2.0	4.0	Φ1.5	4.6	0.30
TQW15	6.4	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	1.7	0.30
TQW19	6.4	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	2.4	0.30
TQW28	6.4	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	3.2	0.30
TQW42	6.4	7.5	12.0	5.5	1.75	8.0	2.0	4.0	Φ1.5	4.6	0.30

8.3.5 产品尺寸示意图 Product dimension diagram



8.3.6 产品尺寸表 Product size chart

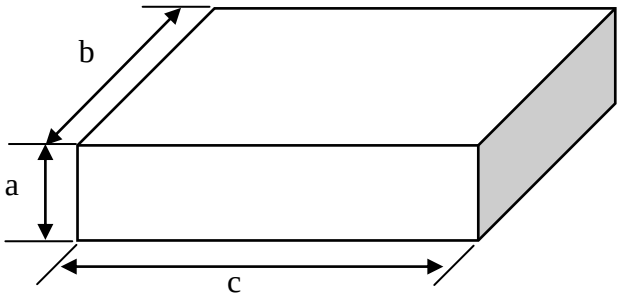
编号 Case Code	L	W	H	W1	P1	P2	P3	P4
公差	±0.3	±0.2	±0.1	±0.1	±0.2	±0.2	±0.2	±0.2
D	7.3	4.3	按产品规格	2.4	1.3	1.6	2.0	1.6
E	9.1	4.3	按产品规格	2.4	1.3	2.1	2.8	2.1
W	7.3	6.0	按产品规格	4.1	1.3	1.6	2.0	1.6

8.4 外包装箱尺寸 Dimensions of outer carton box

外箱尺寸可能变更，以适应卷盘尺寸，恕不另行通知，。

Dimensions of the carton box are subject to change without notice for adjustment to roll size.

8.4.1 外箱尺寸示意图 Outer box dimension diagram



8.4.2 外箱尺寸表 Outer box dimension table

卷盘尺寸 ProductSize	**a** **mm**	**b** **mm**	**c** **mm**
Φ180(7 英寸)	90max	240max	240max
Φ330（13 英寸）	135max	400max	400max

8.5 包装数量 Packaging quantity

产品系列 Product Series	产品尺寸 Product Size	7 英寸卷盘 7'' Reel	13 英寸卷盘 13'' Reel	产品系列 Product Series	产品尺寸 Product Size	7 英寸卷盘 7'' Reel	13 英寸卷盘 13'' Reel
TQB14	3.5*2.8*1.4	2500	N/A	TQE15	9.1*4.3*1.5	1000	4000
TQB19	3.5*2.8*1.9	2000	N/A	TQE19	9.1*4.3*1.9	1000	3000
TQB26	3.5*2.8*2.6	1500	N/A	TQE28	9.1*4.3*2.8	500	2500
/	/	/	/	TQE42	9.1*4.3*4.2	500	2000
TQD15	7.3*4.3*1.5	1000	4000	TQW15	7.3*6.0*1.5	1000	3000
TQD19	7.3*4.3*1.9	1000	3000	TQW19	7.3*6.0*1.9	1000	3000
TQD28	7.3*4.3*2.8	500	2500	TQW28	7.3*6.0*2.8	500	2500
TQD42	7.3*4.3*4.2	500	2000	TQW42	7.3*6.0*4.2	250	1000

9．高分子钽电解电容器在回流焊时应满足以下条件：

9.1 回流焊温度设定：

The following conditions should be met when using polymer tantalum electrolytic capacitors

无铅型回流焊允许条件 Lead free ty pe reflow soldering condition :

电容器表面温度在 T℃以下；Temperature at surface of capacitor should below T ℃.

电容器表面温度在 200℃以上的时间不能超过 t 秒。T_1 ℃以上的时间不可超过 t_1；

The time of the surface temperature of the capacitors above 200 ℃ cannot exceed t second.

The time of the surface temperature of capacitors above T_1 ℃ can not exceed t_l.

预热控制在 100℃～200℃ 180 秒以内。

Preheat should be made between 100 ℃～ 200 ℃ and for maximum 180 seconds.

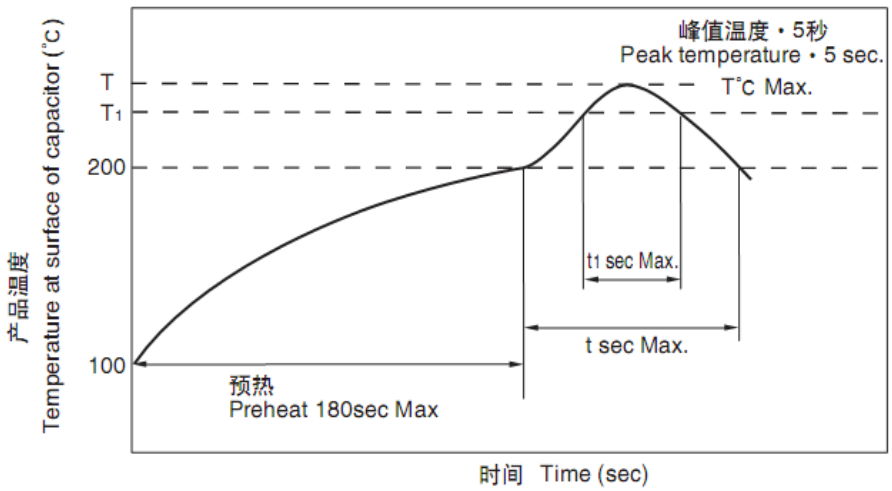
T (℃) ①	T_1 (℃)	t (sec) ②	t_1 (sec) ③	回流焊次数 Reflow cycle
260	217	120	90	2 max

①峰值温度 peak temperature

②超过 200℃的时间（MAX） Max time above 200 ℃

③超过 T_1 的时间为（MAX） Max time above T1

出现超过允许条件的情况，请联系我们。If other condition over maximum, please contact us.



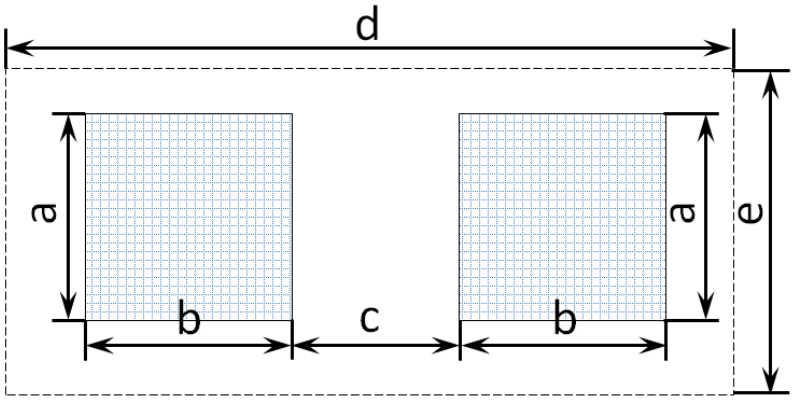
9.2 手动焊接设定：

当出现错焊时可以手动重焊，此时，可设定烙铁尖端温度为 350±10℃，对电容器进行 5±1 秒的焊接。

When there is mistake during soldering, please re-solder manually, the temperature of soldering iron should be set at 350±10℃, and the soldering time on capacitor is 5±1 seconds.

9.3 焊盘尺寸推荐 Recommended pad size

9.3.1 焊盘尺寸示意图 Pad size schematic diagram



图示：表面贴装引脚

9.3.2 推荐焊盘尺寸表 Recommended pad size table

单位：mm

产品系列 Product series	大焊盘焊接推荐尺寸 Recommended dimensions for large pad soldering					小焊盘焊接推荐尺寸 Recommended dimensions for small pad soldering				
项目 item	a	b	c	d	e	a	b	c	d	e
TQB14	2.35	2.21	0.92	6.32	4.00	2.13	1.42	1.28	4.36	3.24
TQB19	2.35	2.21	0.92	6.32	4.00	2.13	1.42	1.28	4.36	3.24
TQB26	2.35	2.21	0.92	6.32	4.00	2.13	1.42	1.28	4.36	3.24
TQD15	2.55	2.77	3.67	10.22	5.60	2.33	1.99	4.03	8.26	4.84
TQD19	2.55	2.77	3.67	10.22	5.60	2.33	1.99	4.03	8.26	4.84
TQD28	2.55	2.77	3.67	10.22	5.60	2.33	1.99	4.03	8.26	4.84
TQD42	2.55	2.77	3.67	10.22	5.60	2.33	1.99	4.03	8.26	4.84
TQE15	2.55	2.77	3.67	12.02	5.60	2.33	1.99	4.03	10.06	4.84
TQE19	2.55	2.77	3.67	12.02	5.60	2.33	1.99	4.03	10.06	4.84
TQE28	2.55	2.77	3.67	12.02	5.60	2.33	1.99	4.03	10.06	4.84
TQE42	2.55	2.77	3.67	12.02	5.60	2.33	1.99	4.03	10.06	4.84
TQW15	4.25	2.77	3.67	10.22	7.30	4.03	1.99	4.03	8.26	6.54
TQW19	4.25	2.77	3.67	10.22	7.30	4.03	1.99	4.03	8.26	6.54
TQW28	4.25	2.77	3.67	10.22	7.30	4.03	1.99	4.03	8.26	6.54
TQW42	4.25	2.77	3.67	10.22	7.30	4.03	1.99	4.03	8.26	6.54

10. 高分子钽电解电容产品编码规则 Product Code Rules

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
产品系列			额定容量			容量范围	额定电压		外形尺寸代码			ESR 标注代码				额定温度

产品系列	
系列	编码
TQB14	TQB
TQB19	TQB
TQB26	TQB
TQD15	TQD
TQD19	TQD
TQD28	TQD
TQD42	TQD
TQE15	TQE
TQE19	TQE
TQE28	TQE
TQE42	TQE
TQW15	TQW
TQW19	TQW
TQW28	TQW
TQW42	TQW

额定工作电压	
电压	编码
16V	1C
20V	1D
25V	1E
35V	1V
50V	1H
63V	1J
75V	1K
100V	2A

额定容量			
容量	编码	容量	编码
1uf	1R0	56uf	560
1.5uf	1R5	68uf	680
2.2uf	2R2	82uf	820
2.7uf	2R7	100uf	101
3.3uf	3R3	120uf	121
3.9uf	3R9	150uf	151
4.7uf	4R7	180uf	181
5.6uf	5R6	220uf	221
6.8uf	6R8	270uf	271
8.2uf	8R2	330uf	331
10uf	100	390uf	391
12uf	120	470uf	471
15uf	150	560uf	561
22uf	220	680uf	681
27uf	270	820uf	821
33uf	330	1000uf	102
39uf	390	1200uf	122
47uf	470	1500uf	152

容量范围	
级别	编码
±10%	K
±20%	M

外形尺寸	
尺寸(mm)	代码
3.5*2.8*1.4	B14
3.5*2.8*1.9	B19
3.5*2.8*2.6	B26
7.3*4.3*1.5	D15
7.3*4.3*1.9	D19
7.3*4.3*2.8	D28
7.3*4.3*4.2	D42
9.1*6.0*1.5	E15
9.1*6.0*1.9	E19
9.1*6.0*2.8	E28
9.1*6.0*4.2	E42
7.3*6.0*1.5	W15
7.3*6.0*1.9	W19
7.3*6.0*2.8	W28
7.3*6.0*4.2	W42

ESR 标注代码	
9mΩ	009R
11mΩ	011R
15mΩ	015R
20mΩ	020R
21mΩ	021R
35mΩ	035R
45mΩ	045R
70mΩ	070R
80mΩ	080R
90mΩ	090R
100mΩ	100R
150mΩ	150R
200mΩ	200R
300mΩ	300R

额定温度	
温度	编码
85℃	D
105℃	N
125℃	H

11．其他 The others

11.1 高分子钽电解电容器的应用上的重要信息

Important information on the application of polymer s tantalum electrolytic capacitor

11.1.1. 电解电容是有极性的 DC electrolytic capacitors are polarized

当施加反向直流电压时，电容器将变为短路，电路中使用没有极化电容会被损坏，因为可施加到正电压的阴极端子的电路中流过异常电流。 When reverse voltage is applied on DC electrolytic capacitors, the capacitors will become short-circuited please use no polarized capacitors in the circuit be damage due to abnormal current flows through the capacitors since the circuit where the positive voltage may be applied to the cathode terminal.

11.1.2. 使用电容器额定电压 Use capacitors within rated voltage

当电容器用比额定电压更高的电压时，漏电流增加，特性显著恶化，并在很短的时间内发生损坏的结果。请特别小心的峰值电压不应超过额定电压。 When capacitors 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.

11.1.3. 充电和放电应用 Charge and discharge application.

当钽电解电容器用于快速充放电应用时，其预期寿命可能会因热量上升等而缩短。

When tantalum electrolytic capacitors are used for rapid charge and discharge applications, their life expectancy may be shortened due to heat rise, etc.

11.1.4. 存储电容器 Store the capacitors.

在已经存储了长时间的钽电解电容器其漏电流上升是常见的。存储温度越高，漏电流增大，因此，请采取预防措施，如存储位置。有电压被施加到电容器上时其漏电流逐渐减小。漏电流增加，会造成问题，因此，使用前在电路中施加电压（老化）。I creased leakage current is common in aluminum capacitors which have been stored for long period of time. The Higher the storage temperature, the higher the leakage current increase, therefore please take precautions concerning the storage location. The leakage current decreases gradually as voltage are applied to the capacitor. In cases where increased leakage current causes problems in the circuit, apply voltage (aging) before using.

11.1.5 适用于电容器的纹波电流不应超过额定的值

Ripple current applied to capacitors should not exceed the rated value.

如果纹波电流超过指定值，过多的热量会减少容量和缩短电容寿命。因此纹波电压的峰值该小于额定电压。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.

11.1.6 在焊接过程中的热应力 Heat stress at the soldering process

必须严格遵守规定的回流条件。在其他条件下焊接可能会导致产品短路和ESR增加

Specified re-flow conditions must be strictly observed. Soldering under other conditions can cause short circuits and increases in ESR.

11.1.7 保管 **preservation**

本产品必须实施防湿保管管理，关于防湿包装开封前后的保管状态，请按照下列的规定进行管理。

（如果超过以下条件时，则会因封装的吸湿引起贴装时的热应力破坏外包装及内部的元件。

This product must carry out the anti-moisture storage management, regarding the condition of the storage before and after the anti-moisture packaging is opened, please carry on the management According to the following regulations. (If the following conditions are exceeded, the thermal stress caused by the encapsulation will damage the external packaging and the internal components.)

保管环境 Custody environment

防湿包装开封前的保管期限：制造后 2 年

Maintenance period before the wet-proof package is opened: 2 years after manufacture

防湿包装开封前保存条件：常温常湿

Storage conditions before the wet-proof package is opened: Room temperature and humidity

防湿包装开封后的保管期限：7 天 （MSL：3）

Maintenance period after opening of wet-proof package: 7 days

防湿包装开封后保存条件：温度：≤30℃，湿度：≤60%

Storage conditions after opening of wet-proof package ： Temperature: ≤30°C, humidity: less than ≤60 %

11.1.8 如在上述存储环境中，电容真空包装贮存期超一年，建议按照如下方式进行烘干除潮，并取少量产品进行回流焊测试，测试合格后再行批量回流焊。

如贵司无合适设备对产品进行烘烤，可电话联系我司协助处理。

If the vacuum packaging storage period exceeds one year, it is recommended to perform drying treatment in accordance with the baking process shown in the table below, and conduct soldering by reflow only after passing the relevant tests.

If your company does not have suitable equipment to bake the products, please contact us by phone for assistance.

烘烤方式:

聚合物钽电容厚度 Thickness mm	湿敏等级 MSL	钽电容在卷盘中烘烤 Baking with Capacitors Remaining on the Reel	仅烘烤钽电容 Bake tantalum capacitors only
1.0~1.6	3	72h@（55°C；≤10%RH）	12h@105°C +12h@125°C
1.6~2.0	3	96h@（55°C；≤10%RH）	18h@105℃+12h@125°C
2.1~4.5	3	144h@（55°C；≤10%RH）	24h@105℃+12h@125°C

11.2 该产品为环保产品，符合 RoHs, SVHC, HF 环保要求。

This product is environmentally friendly and compliant with RoHS, SVHC, and HF requirements.