

# APPROVAL SHEET

Customer:

Customer Part NO.

Part NO.

VP016M221E7DPC97V00A

Item:

220uF/16V

Catalog Series:

VP Series

Date of Issue:

SEP.18.2026

Approved NO. :

SD20260900579

| BUYER'S STAMP | Approved by |  |  |  |
|---------------|-------------|--|--|--|
|               |             |  |  |  |

| Su' scon                                                                            | Submitted by                                                                        |                                                                                     |                                                                                      |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                     | Approval                                                                            | Check                                                                               | Affirm                                                                               | Design                                                                                |
|  |  |  |  |  |

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Halogen  
Free  
RoHS COMPLIANT  
Environmental-Benefit Products

# RECORD OF REVISION

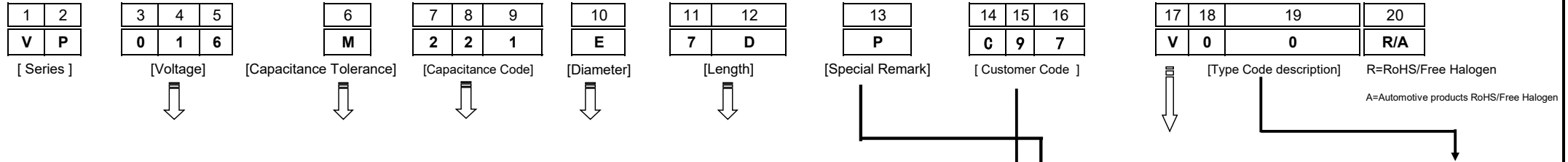
| NO. | VERSION | REASON        | DATE       | CHECKED | REMARKS |
|-----|---------|---------------|------------|---------|---------|
| 1   | A00     | First Release | 2026.09.18 | 劉冬冬     |         |
| 2   |         |               |            |         |         |
| 3   |         |               |            |         |         |
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| 30  |         |               |            |         |         |

# VP Series For Approval

| NO. | Customer Part No. | Specification | Part No.             |
|-----|-------------------|---------------|----------------------|
| 1   |                   | PC,220uF/16V  | VP016M221E7DPC97V00A |
| 2   |                   |               |                      |
| 3   |                   |               |                      |
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| 26  |                   |               |                      |
| 27  |                   |               |                      |

## Explanation of Parts Numbers (ERP System)

### Explanation of Parts Numbers



|          |                |              |         |
|----------|----------------|--------------|---------|
| 004=4V   | J= ±5 %        | 0R1=0.1uF    | C=4Φ    |
| 006=6.3V | K= ±10%        | 1R0=1uF      | D=5Φ    |
| 010=10V  | M= ±20 %       | 100=10 uF    | 5=5.5Φ  |
| 016=16V  | A= 0 %~+20 %   | 101=100 uF   | E=6.3Φ  |
| 025=25V  | S= 0 %~+40 %   | 102=1000 uF  | V=6.5Φ  |
| 035=35V  | R= 0 %~+50 %   | 103=10000 uF | F=8Φ    |
| 050=50V  | D= -5 %~+20 %  | 223=22000 uF | G=10Φ   |
| 063=63V  | V= -10 %~+20 % | G52=1650 uF  | H=12Φ   |
| 080=80V  | Q= -10 %~+30 % |              | X=12.5Φ |
| 100=100V | T= -10 %~+50 % |              | I=13Φ   |
| 160=160V | E= -15 %~+20 % | P=35Φ        | Y=14.5Φ |
| 350=350V | I= -30 %~+20 % | Q=40Φ        | J=16Φ   |
| 400=400V | B= +10 %~+30 % | W=42Φ        | K=18Φ   |
| 420=420V | N= +10 %~+25 % | 8=45Φ        | L=20Φ   |
| 450=450V | C= -5 %~+15 %  | R=51Φ        | M=22Φ   |
| 500=500V | Z= -0 %~+30 %  | S=64Φ        | N=25Φ   |
|          |                | T=76Φ        | Z=25.4Φ |
|          |                | U=90Φ        | O=30Φ   |

|                                                                                                  |
|--------------------------------------------------------------------------------------------------|
| 1) Length < 100mm Integer, Input it direct.                                                      |
| 2) Length < 100mm Decimal, Please refer the code as below: Ex: 11.5 is BB; 5.4 is 5A;            |
| 3. Length ≥ 100mm, First digit input No.0~9 · 2nd · 3rd refer as below Code11 Ex: 115, Input B5. |

| Code 11 · 18 | Meaning |
|--------------|---------|
| A            | 10      |
| B            | 11      |
| C            | 12      |
| D            | 13      |
| E            | 14      |
| F            | 15      |
| G            | 16      |
| H            | 17      |
| I            | 18      |
| J            | 19      |
| K            | 20      |
| Q            | 21      |

| Code 12 · 19 | Meaning |
|--------------|---------|
| A            | 0.4     |
| B            | 0.5     |
| C            | 0.6     |
| D            | 0.7     |
| E            | 0.8     |
| F            | 0.9     |
| G            | 0.1     |
| H            | 0.2     |
| I            | 0.3     |

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                         |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RADIAL | <p>B=Forming Only<br/>C=Lead Cut<br/>D=Lead Cut and Crimp<br/>N=Lead spacing expand to 2.0 mm then Cut<br/>E=Lead spacing expand to 2.5 mm then Cut<br/>F=Lead Forming spacing 5.0 mm then Cut<br/>H=Lead Forming Cut and Crimp<br/>S=Long Lead<br/>L=Facing cathode:Lead Cut and Bending (turn right)<br/>Z=Facing cathode:Lead Cut and Bending (turn left)<br/>P=Taping (Ammo pack)<br/>R=Tape and Reel<br/>V=V-chip Type (SMD)</p> | <p>&lt;1&gt;Code No.17 is "P", "R" Code No.18 · 19 is stand for Lead pitch.</p> <p>&lt;2&gt;Code No.17 is C, N, E, F, D, H, W, K, L, Z, Code No.18 · 19 is stand for Lead length.</p> <p>&lt;3&gt;Code No.17 is S, Code No.18 · 19 be filled in "00" is stand for General Long Lead</p> |
| LUG    | <p>G= LG Type Terminal<br/>PCS= PC board pin-out Straight Terminal<br/>PCY= PC board pin-out LUG Terminal<br/>PCU= PC board pin-out U-Insert Terminal<br/>PCB= PC board pin-out Bend Terminal<br/>ST= Straight Type Terminal<br/>U= 5 Pin Straight Terminal<br/>W= Screw Terminal<br/>YL= Snap</p>                                                                                                                                    | <p>&lt;4&gt;Code No.17 is "B", Code No.18 · 19 be filled in "00" is stand for Forming Long Lead</p> <p>&lt;5&gt;Code No.17 is "V", Code No.18 · 19 be filled in "00" is Fill code number, does not mean other significance</p>                                                          |

| Code 13 | Meaning                                                                    |
|---------|----------------------------------------------------------------------------|
| T       | Convex Rubber seal {Standard : Lead Type 12.5Φ ≤ D ≤ 18Φ (Breathe freely)} |
| P       | Flat Rubber seal {Standard : Lead Type 4Φ ≤ D ≤ 12Φ : 20Φ · 22Φ · 25Φ}     |
| 0       | Snap-in, U-LUG Type                                                        |

|     |              |
|-----|--------------|
| C97 | Customer No. |
|-----|--------------|

### 2.ERP P/N System compare with NCC's Description

- (1) "Finished Products" ----20 Codes ·
- (2) Snap in Type---- "Semi-finished products P/N" has not demand · It's also 20 Codes
- (3) Lead Type---- 16 codes for "Semi-finished products" · It's 16 codes (If Specially enquire and 16 codes can not be reached, It will be 20 code for that)
- (4) Codes No.13 : Specially Code · It's difference between clients enquire and same Spec multiple enquired.
- (5) Codes No.14~16 which is for clients Code.
- (6) Length of Lead Cut and Forming bigger than 10.0mm or appendix digit · Letters Description ·

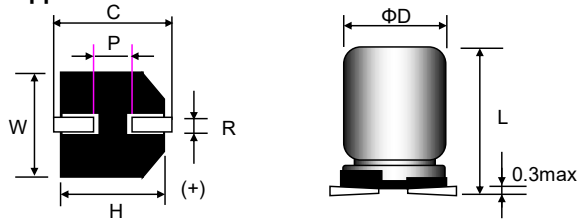
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## FOR APPROVAL

### 1. Product Dimensions,ESR,maximum permissible ripple current

#### 1.1 Product Dimensions(mm):



| ΦD×L    | ΦD±0.5 | L        | W±0.2 | H±0.2 | C±0.2 | R       | P±0.2 |
|---------|--------|----------|-------|-------|-------|---------|-------|
| 6.3*7.7 | 6.3    | 7.7±0.3  | 6.6   | 6.6   | 7.3   | 0.6~0.9 | 2.1   |
| 8*9.5   | 8      | 9.5±0.5  | 8.3   | 8.3   | 9.3   | 0.8~1.1 | 3.2   |
| 10*10.5 | 10     | 10.5±0.5 | 10.3  | 10.3  | 11.0  | 0.8~1.1 | 4.6   |

#### 1.2 Product Impedance & Maximum Permissible Ripple Current

|                           |                      |              |                                              |                 |               |                      |                               |                     |            |                                 |                                 |              |  |
|---------------------------|----------------------|--------------|----------------------------------------------|-----------------|---------------|----------------------|-------------------------------|---------------------|------------|---------------------------------|---------------------------------|--------------|--|
| Customer:                 |                      |              | Conductive Polymer Aluminum Solid Capacitors |                 |               |                      |                               |                     |            |                                 | Su'scon                         |              |  |
|                           |                      |              | VP Series                                    |                 |               |                      |                               |                     |            |                                 | Code                            |              |  |
| Electric Characteristics: |                      |              |                                              |                 |               |                      |                               |                     |            |                                 |                                 |              |  |
| P/N                       | P/N                  | Cap.<br>(uF) | Cap.                                         | Rate            | Oper.         | Nominal              | E.S.R                         | Leakage             | D.F.       | R.C                             | R.C                             | Load<br>Life |  |
|                           |                      |              | Tol.<br>(%)                                  | Volt.<br>(V-DC) | Temp.<br>(°C) | Case Size<br>D*L(mm) | 100k Hz<br>at 25°C<br>Max(mΩ) | Current<br>Max (uA) | Max<br>(%) | 100k Hz<br>(mA rms)<br>at 105°C | 100k Hz<br>(mA rms)<br>at 125°C |              |  |
|                           | VP016M221E7DPC97V00A | 220          | ±20                                          | 16              | 125           | 6.3*7.7              | 24                            | 704                 | 12         | 3200                            | 1066                            | 2000         |  |

#### REMARKS:

- Capacitance Test: at 20°C, 120 Hz.
- Operating temperature: -55°C~ +125°C
- Leakage Current Test: at 20°C for 2 minutes.
- Dissipation Factor Test: at 20°C, 120 Hz.
- Ripple Current Test: at 125°C, 100 k Hz ;
- Load Life: The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 125°C.  
 Capacitance Change:  $\leq \pm 20\%$  of the initial value;  
 $\tan \delta$ :  $\leq 150\%$  of the initial specified value;  
 ESR:  $\leq 150\%$  of the initial specified value;  
 Leakage Current:  $\leq$  The initial specified value;
- Moisture Resistance: The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to store 60 °C, 90 to 95% RH for 1000 hours, without DC applied.  
 Capacitance Change :  $\leq \pm 20\%$  of the initial value;  
 $\tan \delta$ :  $\leq 150\%$  of the initial specified value;  
 ESR:  $\leq 150\%$  of the initial specified value;  
 Leakage Current:  $\leq$  The initial specified value;
- when have characteristic requested: Load life & shelf life test and etc. , judgment standard reference to our catalogue.

#### ●SPECIFICATION

|                    |                                                                      |
|--------------------|----------------------------------------------------------------------|
| Voltage Range      | 6.3V~50V                                                             |
| Leakage Current    | See characteristic table (After rated voltage applied for 2 minutes) |
| Dissipation Factor | Measurement Frequency: 120Hz. Temperature: 20°C                      |

#### ●FREQUENCY COEFFICIENT FOR RIPPLE CURRENT

| Frequency   | 120Hz≤ f < 1kHz | 1KHz≤ f < 10kHz | 10KHz≤ f < 100kHz | 100kHz≤ f < 500kHz |
|-------------|-----------------|-----------------|-------------------|--------------------|
| Coefficient | 0.05            | 0.3             | 0.7               | 1.00               |

Rated Rippling Current (100kHz /125°C): Including self-heating caused by ripple current,the surface temperature at the top of the aluminum shell shall not exceed 125°C.

2. Application ( 應用 )

These specifications specifyVP series of the Aluminum Solid Capacitors with Conductive Polymer electrolyte.

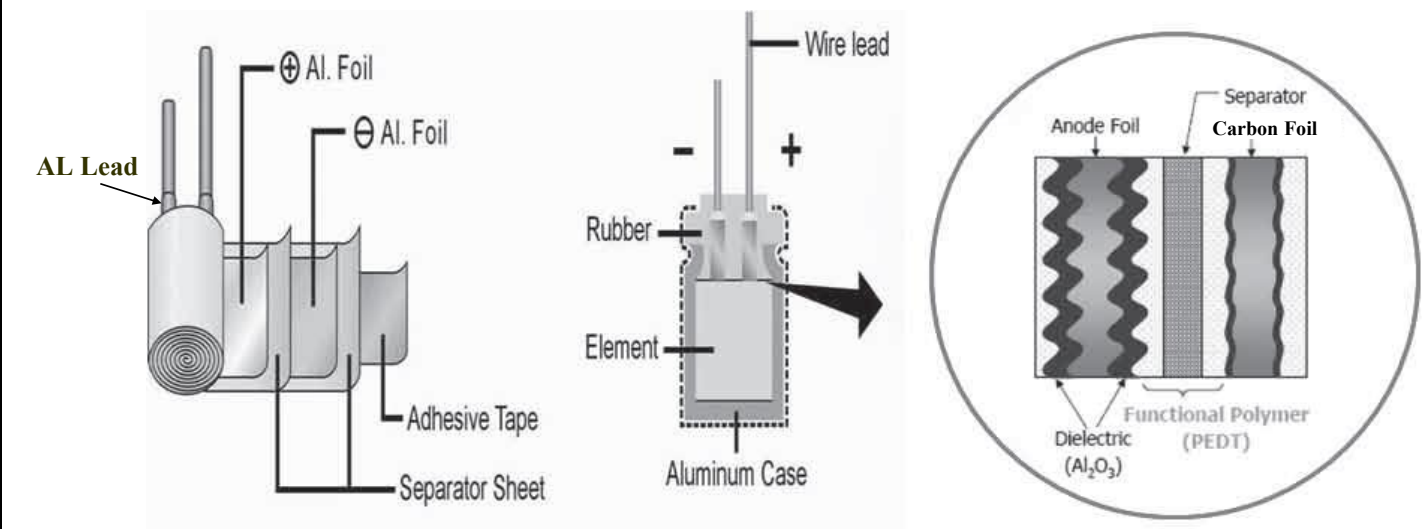
此規格書適用於VP系列導電性高分子固態電解電容器

3. Part Number System(料號系統)

See explanation of parts numbers table

參見『料號詮釋』列表

4. Basic struture (內部結構)



| Part name (零件名称)     | Materials                            |
|----------------------|--------------------------------------|
| Lead Wire(引線)        | Tin Coated Copper Covered Steel Wire |
| AL Lead(鋁線)          | High Pure Aluminum                   |
| Rubber(膠蓋)           | Synthetic Rubber                     |
| Anode Foil(正箔)       | High Pure Aluminum                   |
| Carbon Foil(碳箔)      | Carbon Coated Foil                   |
| Separator Sheet(電解紙) | Insulation Paper                     |
| Adhesive Tape(膠帶)    | PP Film                              |
| AL-Case(鋁殼)          | Aluminum 98%+PU Coating              |

## 5. Characteristics ( 特性 )

### Test environment (測試環境)

Standard atmospheric conditions ( 標準大氣條件 )

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

除特別要求外，標準的大氣條件範圍進行測量和測試如下：

Ambient temperature: 15°C to 35°C

環境溫度：15°C to 35°C

Relative humidity: 45% to 75%

環境濕度：45% to 75%

Air Pressure : 86kPa to 106kPa

空氣壓力:86 kpa to 106 kpa

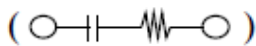
The test conditions shall comply with JIS C 5102

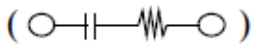
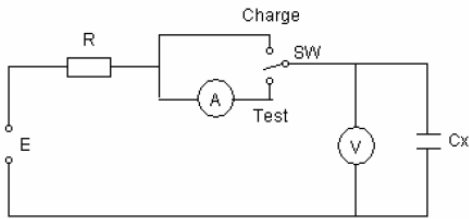
測試條件应符合JIS C 5102 1994

### Operating temperature range (操作溫度範圍)

The ambient temperature range at which the capacitor can be operated continuously at rated voltage is -55°C to 125°C.

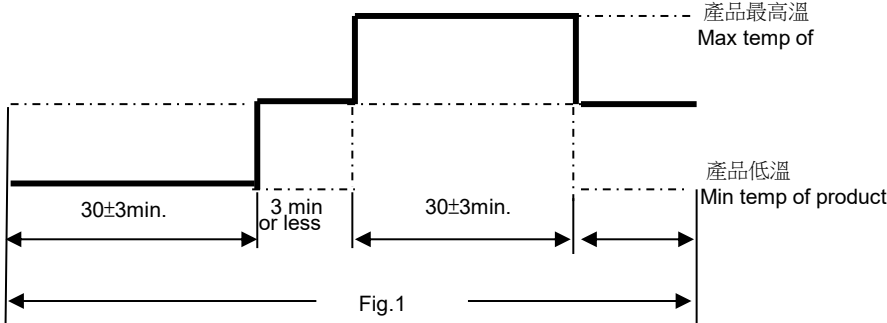
此規格電容可以在額定電壓連續操作溫度範圍 -55°C to 125°C：

| ITEM(項目 ) |                          | PERFORMANCE ( 電氣性能 )  |                                                                                       |  |
|-----------|--------------------------|-----------------------|---------------------------------------------------------------------------------------|--|
| 5.1       | Capacitance(Cap.)<br>電容量 | CONDITION ( 條件 ) :    |                                                                                       |  |
|           |                          | Measuring frequency : | 120Hz                                                                                 |  |
|           |                          | 測試頻率 :                | 120Hz                                                                                 |  |
|           |                          | Measuring voltage :   | 0.5V rms max                                                                          |  |
|           |                          | 測量電壓 :                | 0.5V rms max                                                                          |  |
|           |                          | Measuring circuit :   | Series equivalent circuit                                                             |  |
|           |                          | 電量電路                  |  |  |
|           |                          | Criteria :            | Shall be within the specified capacitance tolerance.                                  |  |
|           |                          | 標 准:                  | 在規定的电容公差值範圍內。                                                                         |  |

| ITEM(項目) |                                              | PERFORMANCE (電氣性能)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.2      | Tangent of loss angle( $\tan\delta$ )<br>損失角 | <p>CONDITION (條件) :</p> <p>Measuring frequency : 120Hz<br/>測試頻率 : 120Hz</p> <p>Measuring voltage : 0.5V rms max<br/>測量電壓 : 0.5V rms max</p> <p>Measuring circuit : Series equivalent circuit<br/>電量電路</p>  <p>Criteria :</p> <p>Shall not exceed the values specified for item 1.2</p> <p>Less than the initial limit(See item 1.2).低於『第1.2項』規格值</p>                                                                                                                                                                                                                                     |
| 5.3      | Leakage current(LC.)<br>漏電流                  | <p>CONDITION (條件) :</p> <p>at 20°C for 2 minutes. 在20°C條件下充電2分鐘。</p> <p>Criteria :</p> <p>Leakage Current : <math>I \leq 0.2CV</math> or 300(<math>\mu A</math>) Whichever is greater measured, after 2minutes application of rated working voltage at +20°C.<br/>C= Nominal Capacitance (<math>\mu F</math>) , V= Rated Voltage (V)</p>  <p>NOTE:</p> <p>If any doubt arises,measure the leakage current after following voltage treatment. DC rated voltage are applied to the capacitors for 120 minutes at 125°C.</p> <p>當產生疑問的時候，用以下電壓處理後測定。電壓處理：125°C，連續加載120分鐘的電壓。加載電壓為額定電壓。</p> |
| 5.4      | Equivalent series resistance(ESR.)<br>等效串聯電阻 | <p>CONDITION (條件) :</p> <p>Measuring frequency : 100kHz<br/>測試頻率 : 100kHz</p> <p>Measuring temperature: 25<math>\pm</math>2°C<br/>測試環境 : 25<math>\pm</math>2°C</p> <p>Measuring point : 2mm max from the surface of a sealing resin on the lead wire.<br/>測量點：電容器在測量的時候，插入導針底部2mm處。</p> <p>Criteria (標準)</p> <p>Less than the initial limit(See item 1.2).低於『第1.2項』規格值</p>                                                                                                                                                                                                                                                                                                  |

| ITEM(項目) |                                          | PERFORMANCE (電氣性能)                                                                                                                                            |                                                                           |                      |                                                                                                               |                                                                     |
|----------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 5.5      | Ripple Current Coefficients<br>紋波係數      | Frequency coefficient for ripple current list:<br>紋波頻率係數表：                                                                                                    |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | Frequency(頻率)                                                                                                                                                 | 120Hz ≤ f < 1kHz                                                          | 1kHz ≤ f < 10kHz     | 10kHz ≤ f < 100kHz                                                                                            | 100kHz ≤ f < 500kHz                                                 |
|          |                                          | Coefficient(係數)                                                                                                                                               | 0.05                                                                      | 0.30                 | 0.70                                                                                                          | 1.00                                                                |
| 5.6      | Temperature characteristics test<br>溫度特性 | CONDITION (條件)：                                                                                                                                               |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | STEP<br>步驟                                                                                                                                                    | TEMP.<br>溫度                                                               | STORAGE TIME<br>放置時間 | TEST ITEM                                                                                                     | 測試項目                                                                |
|          |                                          | 1                                                                                                                                                             | 20 ± 2 °C                                                                 | 30 minutes           | Measure the electrical characteristics as below:<br>(1) LC ; (2) CX1 ; (3) DF ; (4)Z                          | 測量(1)漏電 ; (2)靜電容量 1; (3)損失角 (4) 電容阻抗比 ( Z )                         |
|          |                                          | 2                                                                                                                                                             | -55 ± 3 °C                                                                | 2 hours              | Measure the impedance at thermal balance after 2 hours                                                        | 達到熱平衡2小時後測定阻抗 (Zr)                                                  |
|          |                                          | 3                                                                                                                                                             | 20 ± 2 °C                                                                 | 30 minutes           | -----                                                                                                         | -----                                                               |
|          |                                          | 4                                                                                                                                                             | 125± 2°C                                                                  | 2 hours              | Measure the electrical characteristics as below:<br>(1) LC ; (2) CX2 ; (3)DF ;<br>(4)ΔC/C=(CX2-CX1)/CX1*100%. | 測量(1)漏電 ; (2)靜電容量 2; (3)損失角 ; (4)Δ靜電容量變化率(ΔC/C)=(CX2-CX1)/CX1*100%. |
|          |                                          | 5                                                                                                                                                             | 20 ± 2 °C                                                                 | 30 minutes           | -----                                                                                                         | -----                                                               |
|          |                                          | Criteria :                                                                                                                                                    |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | STEP2: Impedance ratio $Z_{r(-55)} / Z_{(+20)} \leq 1.25$                                                                                                     |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | 步驟二：阻抗比 = $Z_{r(-55)} / Z_{(+20)} \leq 1.25$                                                                                                                  |                                                                           |                      |                                                                                                               |                                                                     |
| 5.7      | Hight load life test<br>高溫負荷實驗           | CONDITION (條件)：                                                                                                                                               |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | After 2000 hours continuous application of DC rated working voltage at 125±2°C ,the measurements shall be performed after 2 hours exposed at room temperature |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | 在 125±2°C 環境當中連續施加直流定格電壓 2000小時后 , 特性需於靜置室溫2小時後量測.                                                                                                            |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | Criteria(判定標準)：                                                                                                                                               |                                                                           |                      |                                                                                                               |                                                                     |
|          |                                          | Item (項目)                                                                                                                                                     | Performance (性能)                                                          |                      |                                                                                                               |                                                                     |
|          |                                          | Capacitance Change<br>容量變化率                                                                                                                                   | Within ±20% of initial capacitance<br>電容初期測試值的 ± 20%以內                    |                      |                                                                                                               |                                                                     |
|          |                                          | tanδ<br>損失角                                                                                                                                                   | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                      |                                                                                                               |                                                                     |
|          |                                          | ESR<br>等效串聯電阻                                                                                                                                                 | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                      |                                                                                                               |                                                                     |
| 5.7      | Hight load life test<br>高溫負荷實驗           | Leakage current<br>漏電流                                                                                                                                        | Less than or equal to the value of table3.<br>小於或等於列表3中LC值                |                      |                                                                                                               |                                                                     |
|          |                                          | Appearance<br>外觀                                                                                                                                              | NO significant damage.<br>沒有明顯的損傷                                         |                      |                                                                                                               |                                                                     |

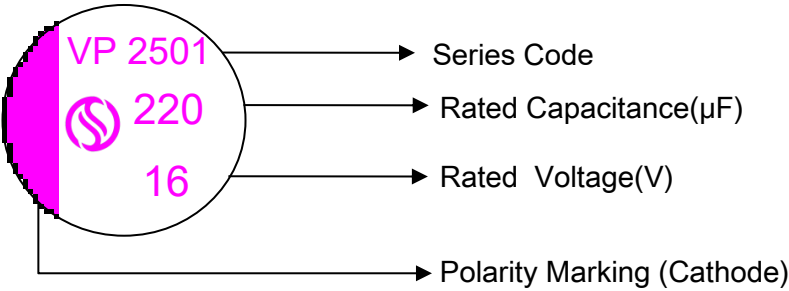
| ITEM(項目 )                   |                                                                           | PERFORMANCE ( 電氣性能 )                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|-----------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------|---------------|---------|---------------|-----|-----|----|------|----|------|----|------|----|------|----|------|----|------|--|--|
| 5.8                         | Damp heat test<br>耐濕性試驗                                                   | CONDITION ( 條件 ) :<br>The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to subjecting them to store at 60°C, 90 to 95% RH for 1,000 hours ,without DC applied.<br>將電容放置在60°C · 90~95%RH環境下至1000小時。待溫度恢復到20°C進行測量時特性<br>Criteria(判定標準) :                                                                                                                               |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | Item ( 項目 )                                                                                                                                                                                                                                                                                                                                                                                                                        | Performance ( 性能 )                                                        |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | Capacitance Change<br>容量變化率                                                                                                                                                                                                                                                                                                                                                                                                        | Within ±20% of initial capacitance<br>電容初期測試值的 ± 20%以內                    |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | tanδ<br>損失角                                                                                                                                                                                                                                                                                                                                                                                                                        | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | ESR<br>等效串联电阻                                                                                                                                                                                                                                                                                                                                                                                                                      | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | Leakage current<br>漏電流                                                                                                                                                                                                                                                                                                                                                                                                             | Less than or equal to the value of table3.<br>小於或等於列表3中LC值                |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | Appearance<br>外觀                                                                                                                                                                                                                                                                                                                                                                                                                   | NO significant damage.<br>沒有明顯的損傷                                         |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| 5.9                         | Surge voltage test<br>突波試驗                                                | Surge voltage=Rated voltage*1.15 or See about follow list:<br>突波電壓 = 額定電壓 X 1.15,或者查詢下表 : <table><tr><td>Rated voltage</td><td>Surge voltage</td><td>voltage</td><td>Surge voltage</td></tr><tr><td>6.3</td><td>7.2</td><td>25</td><td>28.8</td></tr><tr><td>10</td><td>11.5</td><td>35</td><td>40.3</td></tr><tr><td>16</td><td>18.4</td><td>50</td><td>57.5</td></tr><tr><td>20</td><td>23.0</td><td></td><td></td></tr></table> |                                                                           | Rated voltage | Surge voltage | voltage | Surge voltage | 6.3 | 7.2 | 25 | 28.8 | 10 | 11.5 | 35 | 40.3 | 16 | 18.4 | 50 | 57.5 | 20 | 23.0 |  |  |
|                             |                                                                           | Rated voltage                                                                                                                                                                                                                                                                                                                                                                                                                      | Surge voltage                                                             | voltage       | Surge voltage |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                | 7.2                                                                       | 25            | 28.8          |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | 10                                                                                                                                                                                                                                                                                                                                                                                                                                 | 11.5                                                                      | 35            | 40.3          |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | 16                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.4                                                                      | 50            | 57.5          |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | 20                                                                                                                                                                                                                                                                                                                                                                                                                                 | 23.0                                                                      |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
|                             |                                                                           | CONDITION ( 條件 ) :<br>Applied a surge voltage to the capacitor connected with a 1000 (Ω) resistor. The capacitor shall be submitted to 1000 cycles, each consisting of charge with the surge voltage at 105°C for 30 ±5s, followed discharge of 5 min 30s. 在 105 °C 環境下按照充電30秒,放電330秒 ( 一個循環 ) · 連續加載突波電壓1000次,待溫度恢復20°C · 進行測量電氣特性。<br>Criteria(判定標準) :                                                                           |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| Item ( 項目 )                 | Performance ( 性能 )                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| Capacitance Change<br>容量變化率 | Within ±20% of initial capacitance<br>電容初期測試值的 ± 20%以內                    |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| tanδ<br>損失角                 | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| ESR<br>等效串联电阻               | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| Leakage current<br>漏電流      | Less than or equal to the value of table3.<br>小於或等於列表3中LC值                |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |
| Appearance<br>外觀            | NO significant damage.<br>沒有明顯的損傷                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |               |               |         |               |     |     |    |      |    |      |    |      |    |      |    |      |    |      |  |  |

| ITEM(項目 )                                            |                                                             | PERFORMANCE ( 電氣性能 )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------|------------------------|------------------------------------------------------------|------------------|-----------------------------------|
| 5.10                                                 | Temperature<br>Cyclic Test<br>溫度循環試驗                        | SET CONDITION ( 設定條件 ) :<br><div></div><br>Test diagram: Fig.1 測試條件圖:圖1<br>Cycle number: 5 Cycles 循環次數 : 5次<br>Criteria(判定標準) : <table><tr><th>Item ( 項目 )</th><th>Performance ( 性能 )</th></tr><tr><td>Capacitance Change<br/>容量變化率</td><td>Within ±20% of initial capacitance<br/>電容初期測試值的 ±20%以內</td></tr><tr><td>tanδ<br/>損失角</td><td>Less than or equal 150% of the initial specified value<br/>小於或等於1.5倍的初期規格值</td></tr><tr><td>ESR<br/>等效串聯電阻</td><td>Less than or equal 150% of the initial specified value<br/>小於或等於1.5倍的初期規格值</td></tr><tr><td>Leakage current<br/>漏電流</td><td>Less than or equal to the value of table3.<br/>小於或等於列表3中LC值</td></tr><tr><td>Appearance<br/>外觀</td><td>NO significant damage.<br/>沒有明顯的損傷</td></tr></table> | Item ( 項目 )                                                               | Performance ( 性能 )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Capacitance Change<br>容量變化率 | Within ±20% of initial capacitance<br>電容初期測試值的 ±20%以內 | tanδ<br>損失角                                          | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 | ESR<br>等效串聯電阻    | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 | Leakage current<br>漏電流 | Less than or equal to the value of table3.<br>小於或等於列表3中LC值 | Appearance<br>外觀 | NO significant damage.<br>沒有明顯的損傷 |
|                                                      |                                                             | Item ( 項目 )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Performance ( 性能 )                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | Capacitance Change<br>容量變化率                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Within ±20% of initial capacitance<br>電容初期測試值的 ±20%以內                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | tanδ<br>損失角                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | ESR<br>等效串聯電阻                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Less than or equal 150% of the initial specified value<br>小於或等於1.5倍的初期規格值 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | Leakage current<br>漏電流                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Less than or equal to the value of table3.<br>小於或等於列表3中LC值                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | Appearance<br>外觀                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NO significant damage.<br>沒有明顯的損傷                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
|                                                      |                                                             | 5.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Vibration test<br>振動試驗                                                    | CONDITION ( 條件 ) :<br>Frequency : 10 to 55Hz(1 minute interval / 10 → 55→ 10Hz)<br>頻率 : 10~55赫茲 ( 記錄區間/10 → 55→ 10赫茲 )<br>Amplitude : 0.75mm ( Total excursion 1.5mm)<br>振幅 : 0.75mm(全距1.5mm)<br>Direction : X, Y, Z (3 axes) 方向 : X, Y, Z(軸)<br>方向 : X,Y,Z ( 3種方向 )<br>Duration : 2 hours / axial (Total 6 hours)<br>時間 : 2小時/每軸(共6小時)<br>Criteria(判定標準) : <table><tr><th>Item ( 項目 )</th><th>Performance ( 性能 )</th></tr><tr><td>Capacitance Change<br/>and don't short<br/>容量變化率並且不得短路</td><td>Within ±5% of initial capacitance<br/>電容初期測試值的 ± 5%以內.並且不得短路</td></tr><tr><td>Appearance<br/>外觀</td><td>Don't lead wire broken<br/>導針不得斷裂</td></tr></table> | Item ( 項目 )                 | Performance ( 性能 )                                    | Capacitance Change<br>and don't short<br>容量變化率並且不得短路 | Within ±5% of initial capacitance<br>電容初期測試值的 ± 5%以內.並且不得短路               | Appearance<br>外觀 | Don't lead wire broken<br>導針不得斷裂                                          |                        |                                                            |                  |                                   |
| Item ( 項目 )                                          | Performance ( 性能 )                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
| Capacitance Change<br>and don't short<br>容量變化率並且不得短路 | Within ±5% of initial capacitance<br>電容初期測試值的 ± 5%以內.並且不得短路 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |
| Appearance<br>外觀                                     | Don't lead wire broken<br>導針不得斷裂                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |                                                       |                                                      |                                                                           |                  |                                                                           |                        |                                                            |                  |                                   |

| ITEM(項目 )                            |                                                                           | PERFORMANCE ( 電氣性能 )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
|--------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|-----------------------------|------------------------------------------------------|---------------|--------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------|---------------|----|----------------|----|
| 5.12                                 | Solder-ability test<br>沾錫試驗                                               | CONDITION ( 條件 ) :<br>Temperature: 235 ± 5 °C 溫度 : 235 ± 5°C<br>Duration: 2 ± 0.5 seconds 時間 : 2 ± 0.5秒<br>Flux: Rosin (JIS K 5902) // Ethanol (JIS K 8101); About 25 wt.%<br>助焊劑:松香水(JIS K 5902)/乙醇 (JIS K 8101); 約25wt.%<br>Criteria(判定標準) :<br>At least 95% of surface area of the dipped portion of the terminal shall be covered with new solder.<br>判定標準：電極含浸部份至少95%以上表面積須覆蓋錫膏.                                                                                                                                                                                                                                                                                                                                                                                |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 5.13                                 | Resistance to soldering heat test<br>焊錫耐熱性試驗                              | CONDITION ( 條件 ) :<br>(A) Solder bath method 浸錫爐試驗方法<br>Soldering temperature : 260 ± 5°C<br>Immersing time : 10 ± 1s<br>Heat protector: t=1.6mm glass –epoxy board<br>將样品插入厚度为1.5~2.0mm 的PCB板中浸入260 ± 5°C焊爐中時間10秒。<br>(B) Soldering iron method 電烙鐵焊接法<br>Temperature: 400 ±10 °C 溫度 : 400 ±10 °C<br>Duration: 3+1/-0seconds 時間 : 3+1/-0秒<br><table><tr><td>Item ( 項目 )</td><td>Performance ( 性能 )</td></tr><tr><td>Capacitance Change<br/>容量變化率</td><td>Within ±5% of initial capacitance<br/>電容初期測試值的 ± 5%以內</td></tr><tr><td>tanδ<br/>損失角</td><td>Less than or equal 130% of the value of item1.2<br/>小於或等於1.2項中DF的1.3倍的規格值</td></tr><tr><td>ESR<br/>等效串联电阻</td><td>Less than or equal 130% of the value of item1.2<br/>小於或等於1.2項中ESR的1.3倍的規格值</td></tr></table> | Item ( 項目 )                          | Performance ( 性能 )     | Capacitance Change<br>容量變化率 | Within ±5% of initial capacitance<br>電容初期測試值的 ± 5%以內 | tanδ<br>損失角   | Less than or equal 130% of the value of item1.2<br>小於或等於1.2項中DF的1.3倍的規格值 | ESR<br>等效串联电阻 | Less than or equal 130% of the value of item1.2<br>小於或等於1.2項中ESR的1.3倍的規格值 |               |    |                |    |
| Item ( 項目 )                          | Performance ( 性能 )                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| Capacitance Change<br>容量變化率          | Within ±5% of initial capacitance<br>電容初期測試值的 ± 5%以內                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| tanδ<br>損失角                          | Less than or equal 130% of the value of item1.2<br>小於或等於1.2項中DF的1.3倍的規格值  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| ESR<br>等效串联电阻                        | Less than or equal 130% of the value of item1.2<br>小於或等於1.2項中ESR的1.3倍的規格值 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 5.14                                 | Lead strength test<br>端子強度<br>(此項目僅適用於導針型)                                | CONDITION ( 條件 ) :<br><u>a) Lead pull strength</u> ( 強度拉力 )<br><br>A static load force shall be applied to the terminal in the axial direction and acting in a direction away from the body for 10±1 s.<br><br>將產品本體垂直向下吊掛 10±1 s.根據導針直徑大小施加吊掛拉力。<br><table><tr><td>Lead wire diameter (mm)<br/>導針直徑(CP )</td><td>Load force (N)<br/>吊掛拉力</td></tr><tr><td>d≤0.25</td><td>1</td></tr><tr><td>0.25 &lt; d ≤0.3</td><td>2.5</td></tr><tr><td>0.30 &lt; d ≤0.5</td><td>5.0</td></tr><tr><td>0.50 &lt; d ≤0.8</td><td>10</td></tr><tr><td>0.80 &lt; d ≤1.25</td><td>20</td></tr></table>                                                                                                                                                                                 | Lead wire diameter (mm)<br>導針直徑(CP ) | Load force (N)<br>吊掛拉力 | d≤0.25                      | 1                                                    | 0.25 < d ≤0.3 | 2.5                                                                      | 0.30 < d ≤0.5 | 5.0                                                                       | 0.50 < d ≤0.8 | 10 | 0.80 < d ≤1.25 | 20 |
| Lead wire diameter (mm)<br>導針直徑(CP ) | Load force (N)<br>吊掛拉力                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| d≤0.25                               | 1                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 0.25 < d ≤0.3                        | 2.5                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 0.30 < d ≤0.5                        | 5.0                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 0.50 < d ≤0.8                        | 10                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |
| 0.80 < d ≤1.25                       | 20                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                        |                             |                                                      |               |                                                                          |               |                                                                           |               |    |                |    |

| ITEM(項目 )                            |                                            | PERFORMANCE ( 電氣性能 )                                                                                                                                                                                                                                                                                                              |                                      |                        |        |     |               |      |               |     |               |   |
|--------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|--------|-----|---------------|------|---------------|-----|---------------|---|
| 5.14                                 | Lead strength test<br>端子強度<br>(此項目僅適用於導針型) | <u>b) Lead bending</u> ( 端子折彎 )<br>Folding angle: 90±5°; Folding speed: 2-3S/times) ; Folding times: 2 times (Folding 90° for 1 times ) and lead bending load force for as folow list:<br><br>端子折彎90±5°，折彎速度：2~3秒每次，折彎次數2次 ( 90°一次 )，在折彎的過程中同時對導針施加拉力，如下表：                                                                        |                                      |                        |        |     |               |      |               |     |               |   |
|                                      |                                            | <table><tr><th>Lead wire diameter (mm)<br/>導針直徑(CP )</th><th>Load force (N)<br/>吊掛拉力</th></tr><tr><td>d≤0.25</td><td>0.5</td></tr><tr><td>0.25 &lt; d ≤0.3</td><td>1.25</td></tr><tr><td>0.30 &lt; d ≤0.5</td><td>2.5</td></tr><tr><td>0.50 &lt; d ≤0.8</td><td>5</td></tr><tr><td>0.80 &lt; d ≤1.25</td><td>10</td></tr></table> | Lead wire diameter (mm)<br>導針直徑(CP ) | Load force (N)<br>吊掛拉力 | d≤0.25 | 0.5 | 0.25 < d ≤0.3 | 1.25 | 0.30 < d ≤0.5 | 2.5 | 0.50 < d ≤0.8 | 5 |
| Lead wire diameter (mm)<br>導針直徑(CP ) | Load force (N)<br>吊掛拉力                     |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |
| d≤0.25                               | 0.5                                        |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |
| 0.25 < d ≤0.3                        | 1.25                                       |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |
| 0.30 < d ≤0.5                        | 2.5                                        |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |
| 0.50 < d ≤0.8                        | 5                                          |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |
| 0.80 < d ≤1.25                       | 10                                         |                                                                                                                                                                                                                                                                                                                                   |                                      |                        |        |     |               |      |               |     |               |   |

6. Product Marking (產品標識)



**Note:**  
VP2501:  
VP: Series  
2501 : Date Code

**Table**

| Date Code | Production Date        |
|-----------|------------------------|
| 2501      | The 1 th week of 2025Y |

## 7. Instructions of Capacitors 電容器說明

### 7.1 Cautions on use of Capacitor 電容器的使用注意事項

#### 7.1.1. Polarity 極性

Solid electrolytic capacitors are polarized capacitors. Use capacitors after verifying their positive and negative polarities. If these capacitors are installed in the reverse polarity, its life may shorten because of increasing leakage current or short circuit.

固態電容器是一種有極性電容器。在使用電容器之前必須驗證正負級。如果在使用過程中將正負級的位置弄反，則有可能大大縮短電容器的使用壽命甚至發生短路。

#### 7.1.2. Prohibited circuits 禁止使用的回路

Conductive Polymer Aluminum Solid Capacitors leakage current may become larger as the following conditions.

高分子固態電容的漏電流在以下條件有可能會增大。

(a) Soldering

(a) 鍍焊錫時

(b) High temperature no-load test, high temperature and high humidity no-load test, rapidly changing temperature test, etc.

(b) 經過無外加電壓的高溫無負荷、高溫高濕無負荷、冷熱沖擊試驗等，漏電流也有增大的可能。

Avoid the use of Conductive Polymer Aluminum Solid Capacitors in the following type of circuits because leakage current may increase.

以下回路有可能出現故障，請禁止使用

(a) High-impedance circuits

(a) 高阻抗回路

(b) Coupling circuits

(b) 藕合回路

(c) Time constant circuits

(c) 時間恒定回路

(d) Other circuits that are significantly affected by LC

(d) 有關漏電流變而影響回路工作的情況

If you plan to use 2 or more Conductive Polymer Aluminum Solid Capacitors in a series connection, please contact us before use.

為提高耐壓性而將兩個以上的高分子固態電容串聯連接使用時，請與我們聯絡。

Overvoltage exceeding the rated voltage may not be applied even for an instant as it may cause a short circuit.

超過額定電壓易引起立即短路

Sudden charge and discharge restricted

快速充放電的限制

An excessive surge current by sudden charge or discharge may result in a short circuit or increase LC.

急速充電和放電而產生過大的突波電流，會造成短路或漏電流上升

#### 7.1.3 Operating temperature, voltages and ripple current

確認使用環境溫度、電壓和紋波電流

(a) Operating temperature must be under the category temperature range of specification.

(a) 使用溫度應控制在出廠規格書規定的使用溫度範圍內。

(b) Do not apply voltages exceeding the full rated voltage.

(b) 超過額定電壓的過電壓將會發生短路，因此，即使是瞬間也不得外加過電壓。

(c) Do not apply currents that exceed the rated ripple current. When excessive ripple current is applied, the Conductive Polymer Aluminum Solid Capacitors may result in shorter life due to the internal heat increase.

(c) 不得接通超過額定的紋波電流。

若接通過大的紋波電流,將會增高內部發熱,減少使用壽命。

#### 7.1.4 Cleaning PCB 清洗基板

Check the following items before washing PC board with these detergents: high quality alcohol-based cleaning fluid such as Pine-α ST-100S, clean thru 750H, 750L, 710M, 750K or Techno Care FRW 14 through 17 or detergents including substitute freon as AK-225AES or IPA.

可使用Pine-α ST-00S, Clean thru 750H, 750L, 710M, 750K, Techno Care FRW14~17等高級乙醇類清洗劑或AK-225ES等氟利昂代替品, IPA等清洗劑清洗, 清洗時, 應確認以下內容。

(a) Use immersion or ultrasonic waves to clean within 2 minutes on polymer conductive type.

(b) The temperature of the cleaning fluid should be less than 60°C.

(c) Watch the contamination of the detergent as conductivity, pH, specific gravity, water content, etc.

(d) Do not store the Conductive Polymer Aluminum Solid Capacitors in a location subject to gases from the cleaning fluid or in an airtight container after cleaning.

(e) Dry the PCB or Conductive Polymer Aluminum Solid Capacitors with hot air that should be less than the maximum operating temperature. Please note that Indication may disappear when rubbing print side after washing as a cleaner.

(f) Please contact us for details about detergents, cleaning methods and about detergents other than those listed above.

(a) 採用浸漬, 超聲波等清洗方式時, 清洗時間合計應控制在2分以內。

(b) 清洗液溫度請控制在60°C以下。

(c) 要進行清洗液的防污染管理(導電度, Ph值, 比重, 含水量等)。

(d) 清洗後, 不要在清洗液環境中或密封容器中保管。

(e) 用熱風(請在使用溫度範圍以下進行)烘乾基板和高分子固態電容時, 些許的清洗劑其液附在電容器表面上, 若擦拭可抹去電容器上的標記, 應予以注意。

(f) 關於清洗劑和清洗方法等詳細情況以及使用其他種類的清洗劑時, 請事先與本公司洽詢。

#### 7.1.5 Fixatives and coating materials 固定劑和塗層劑

(a) Select the appropriate covering and sealant materials for conductive Conductive Polymer Aluminum Solid Capacitors. In particular, make sure the fixative, coating and thinner do not contain acetone.

(a) 選擇適合於高分子固態電容外裝材質和封裝材質的材料。特別是固定劑和塗層劑或稀釋劑中不得含有丙酮。

(b) Before applying a fixative or coating, completely remove any flux residue and foreign matter from the area where the board and Conductive Polymer Aluminum Solid Capacitors will be joined together.

(b) 使用固定劑和塗層劑前, 清除基板和高分子固態電容封裝部之間的焊裝劑殘渣和污垢。

(c) Allow any detergent to dry before applying the fixative or coating.

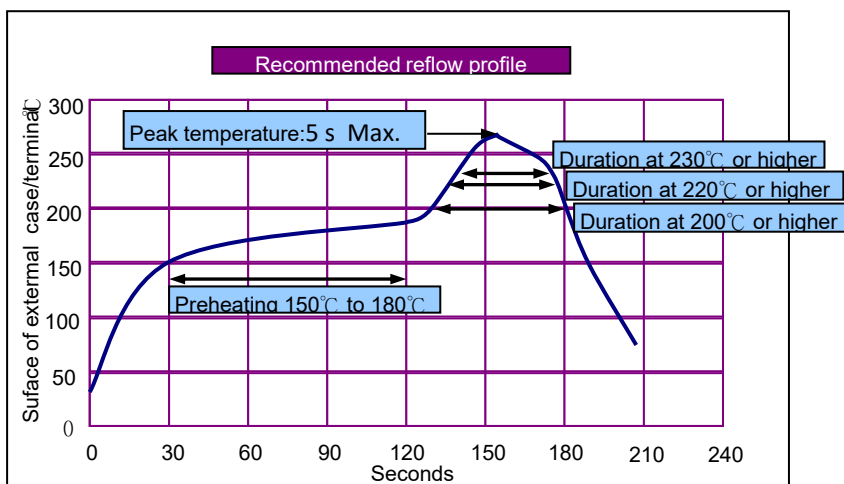
(c) 使用固定劑和塗層劑前, 烘乾清洗劑等。

#### 7.1.6 Fixatives and coating materials

- (a) Mount after checking the capacitance and the rated voltage.
- (a) 先確認額定靜電容量和額定電壓後,再進行安裝。
- (b) Do not drop Conductive Polymer Aluminum Solid Capacitors on the floor and do not use it that is dropped.
- (b) 小心操作,不要摔落。摔落的高分子固態電容不得使用。
- (c) Do not mount Conductive Polymer Aluminum Solid Capacitors that is deformed.
- (c) 安裝時不要使其變形。
- (d) Do not break aluminum case surface Nylon in mounting
- (d) 安裝時不要破壞鋁壳表面皮膜。

#### 7.1.7 Reflow soldering 回流焊

- (a) Soldering condition should be under the following ranges.
- (a) 請在以下焊接條件(溫度.時間)範圍內使用。



※All temperatures are measured on the topside of the Al-can and terminal surface.

※峰值溫度:電容器頂部及電極端子部的溫度。

| Item                        | Polymer series      | Polymer series |
|-----------------------------|---------------------|----------------|
| Peak Temperature            | 250°C or less       | 260°C or less  |
| Preheating Temperature      | 150°C~180°C 90±3sec |                |
| Duration at 200°C or higher | 60 sec.max          | 60 sec.max     |
| Duration at 220°C or higher | 50 sec.max          | 50 sec.max     |
| Duration at 230°C or higher | 40 sec.max          | 40 sec.max     |
| Reflow number               | only 2 time         | only 1 time    |

- (b) Do not apply reflow soldering to Radial Lead type.
- (b) 插裝(DIP)型高分子固態電容不適用於回流焊。

#### 7.1.8 Handling after soldering(焊接後注意事項)

- (a) Do not tilt, bend or twist the after it conductive polymer aluminum solid capacitors.  
不得傾斜，扳倒，扭曲高分子固態電容
- (b) Do not move the PCB with catching conductive polymer aluminum solid capacitors itself.  
不得直接抓取高分子固態電容來移動基板
- (c) When stacking PCBs, make sure that the conductive polymer aluminum solid capacitors.  
Does not touch other PCBs or components.  
堆放基板時, 注意不要讓高分子固態電容接觸基板或其他元件
- (d) Do not dump the conductive polymer aluminum solid capacitors with objects.  
不得用力擺放以焊好高分子固態電容之線路板

#### 7.1.9 Storage condition(儲存條件)

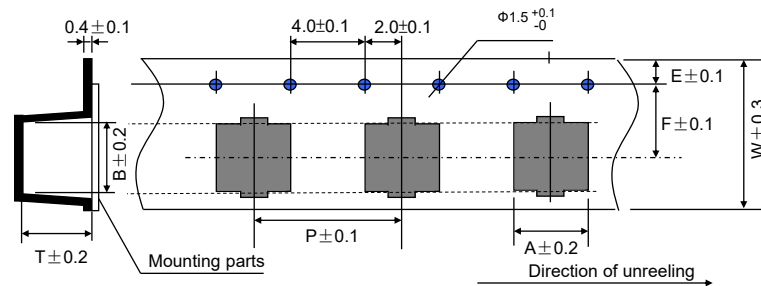
- (1) Store conductive polymer aluminum solid capacitors in a location free from direct contact salt spray or oil spray.  
高分子固態電容勿直接暴露於鹽霧或油霧之環境
- (2) Store in a location where the conductive polymer aluminum solid capacitors is not exposed to noxious gas as hydrogen sulfide,  
高分子固態電容儲存環境需避免有毒氣體
- (3) Store at a temperature between 5 to 35°C , with humidity of 75%RH or less.  
儲存溫度5至35°C , 相對濕度低於75%
- (4) Store conductive polymer aluminum solid capacitors in a location that is not subject to direct sunlight, vibration or contact with water.  
高分子固態電容儲存環境須避免直接照光, 振動及水氣接觸
- (5) Conductive polymer aluminum solid capacitors sets the storage period to prevent the increase of leakage current through the long-term storage before opening. When make a long-term storage, please storage its as follows. Open the bags just before mounting and use up all products once opened .For keeping a good solderability, store the Su'scon as follows.  
高分子固態電容為確保產品開封前長時間放置仍維持良好特性, 因此設定了保存期限, 產品開封後請盡快用完, 為使產品焊錫性良好請遵照以下保存期限使用.

※

|                                |                                |     |           |
|--------------------------------|--------------------------------|-----|-----------|
| Before unseal                  | : within 1 year after delivery | 未開封 | : 收到後一年內  |
| After unseal                   | : within 7 days from opening   | 開封後 | : 去開封後七天內 |
| When unpacking the carton box: | within 1 month from            | 開箱後 | : 一個月內    |

# Conductive Polymer Aluminum Electrolytic Capacitors

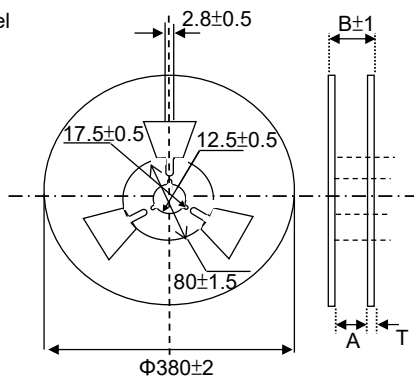
## Carrier Tape



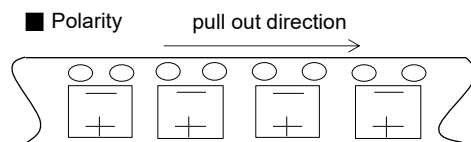
單位：mm

| Size<br>(ΦxL)            | Item |      |    |      |      |      |         |
|--------------------------|------|------|----|------|------|------|---------|
|                          | A    | B    | W  | F    | E    | P    | T       |
| 5 x 6.0                  | 6.0  | 6.0  | 12 | 5.5  | 1.75 | 12.0 | 6.3     |
| 5 x 7.0                  | 6.0  | 6.0  | 12 | 5.5  | 1.75 | 12.0 | 7.6     |
| 6.3 x 4.5                | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 4.8     |
| 6.3 x 5.7~6.0            | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 6.5     |
| 6.3 x 6.0<br>(鋁殼L=6.8mm) | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 8.2     |
| 6.3 x 7.0                | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 8.2     |
| 6.3 x 7.7                | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 8.2     |
| 6.3 x 8.0                | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 8.2     |
| 6.3 x 8.0<br>(鋁殼L=9.3mm) | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 9.3     |
| 6.3 x 9~10               | 7.0  | 7.0  | 16 | 7.5  | 1.75 | 12.0 | 10.0    |
| 6.3 x 14                 | 7.0  | 7.0  | 24 | 11.5 | 1.75 | 20.0 | 16.0    |
| 8 x 7.0                  | 8.7  | 8.7  | 24 | 11.5 | 1.75 | 16.0 | 8.8     |
| 8 x 9~10                 | 8.7  | 8.7  | 24 | 11.5 | 1.75 | 16.0 | 11.0    |
| 8 x 12~12.5              | 8.7  | 8.7  | 24 | 11.5 | 1.75 | 16.0 | 13.0    |
| 10 x 8                   | 10.7 | 10.7 | 24 | 11.5 | 1.75 | 16.0 | 8.5     |
| 10 x 10~10.5             | 10.7 | 10.7 | 24 | 11.5 | 1.75 | 16.0 | 11.0    |
| 10 x 12~12.5             | 10.7 | 10.7 | 24 | 11.5 | 1.75 | 16.0 | 13或13.5 |
| 10 x 16~17               | 10.7 | 10.7 | 24 | 11.5 | 1.75 | 16.0 | 17.5    |

## Reel



## Polarity



| Sizecode<br>(ΦxL) | A±1 | B±1 | T±0.5 |
|-------------------|-----|-----|-------|
| 5x6~7             | 14  | 18  | 2.0   |
| 6.3x4.5~14        | 18  | 22  |       |
| 8x7~12.5          | 26  | 30  |       |
| 10x8~17           | 26  | 30  |       |

## PACKAGE BOX

### INNER BOX



Inner Box Size:

(L) X (W) X (H)

| Size Code<br>ΦDxL | A        | B        | Q'ty / Reel | Size of<br>Inner Box<br>(L)x(W)x(H) | Size of<br>Outer Box<br>(L)x(W)x(H) |
|-------------------|----------|----------|-------------|-------------------------------------|-------------------------------------|
| 5x6~7             | 14.0±1.0 | 18.0±1.0 | 1000pcs     | 385x385x106                         | 412x403x255                         |
| 6.3x(4.5~8)       | 18.0±1.0 | 22.0±1.0 | 1000pcs     | 385x385x125                         | 412x403x293                         |
| 6.3x(9~10)        | 18.0±1.0 | 22.0±1.0 | 800pcs      | 385x385x125                         | 412x403x293                         |
| 6.3x14            | 18.0±1.0 | 22.0±1.0 | 300pcs      | 385x385x106                         | 412x403x255                         |
| 8x(7~10)          | 26.0±1.0 | 30.0±1.0 | 500pcs      | 385x385x106                         | 412x403x255                         |
| (8~12)x12.5       | 26.0±1.0 | 30.0±1.0 | 400pcs      | 385x385x106                         | 412x403x255                         |
| 10x(8~10.5)       | 26.0±1.0 | 30.0±1.0 | 500pcs      | 385x385x106                         | 412x403x255                         |
| 10x(12~12.5)      | 26.0±1.0 | 30.0±1.0 | 400pcs      | 385x385x106                         | 412x403x255                         |
| 10x16~17          | 26.0±1.0 | 30.0±1.0 | 300pcs      | 385x385x106                         | 412x403x255                         |

使用時注意事項:Precautions for users:

1.輕拿輕放 handle gently

2.取出托盤時,請用手托住紙盤底部,以免電容鬆散.

When take the tray out, pls support the bottom of the paper plate with your hands to avoid loose capacitors.