

# SC Series

## LOW LEAKAGE CURRENT

### 低漏電品

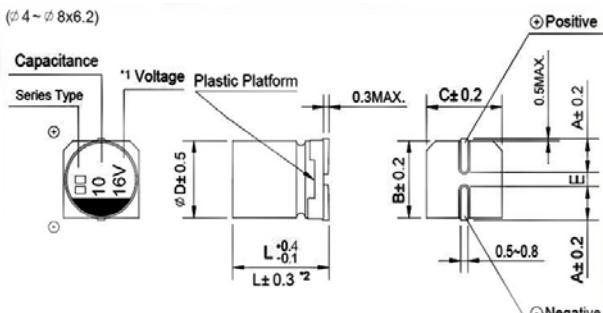
- Low leakage current (0.5 ~ 3.3 $\mu$ A max.)  
低漏電流 (0.5 ~ 3.3 $\mu$ A 最大值)
- Low cost for replacement of some tantalum applications  
可替換價格較高的鉭電容器
- Comply with the RoHS directive  
符合 RoHS 指令



### SPECIFICATIONS 特性表

| Items 項目   | Characteristics 主要特性   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
|--|--|------|--------|--------|------|------|----------------------------|---|--------------------------|--|---------------------|--|----|--|-----|----|----|----|----|----|--|------|------|------|------|------|------|
| Operation Temperature Range 使用溫度範圍                                 | -40 ~ +85°C  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Voltage Range 額定工作電壓範圍   | 6.3 ~ 50V  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Capacitance Range 靜電容量範圍   | 0.1 ~ 220 $\mu$ F  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Capacitance Tolerance 靜電容量允許偏差                                     | $\pm 20\%$ at 120Hz, 20°C  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Leakage Current 漏電流  | Leakage current $\leq 0.002CV$ or 0.5 $\mu$ A, whichever is greater (after 2 minutes application of rated voltage)<br>漏電流 $\leq 0.002CV$ 或 0.5 $\mu$ A, 取較大值 (施加額定工作電壓 2 分鐘後)  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Surge Voltage & Dissipation Factor ( $\tan \delta$ )<br>浪湧電壓和損耗角正切 | Measurement frequency 測試頻率: 120Hz, Temperature 測試溫度: 20°C<br><table border="1"> <tr> <td>Rated Voltage (V) 額定工作電壓</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr> <tr> <td>Surge voltage 浪湧電壓</td><td>8.0</td><td>13</td><td>20</td><td>32</td><td>44</td><td>63</td></tr> <tr> <td><math>\tan \delta</math> (max.) 最大損耗角正切</td><td>0.24</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td></tr> </table>  |      |        |        |      |      | Rated Voltage (V) 額定工作電壓   | 6.3   | 10                       | 16   | 25                  | 35                                     | 50 | Surge voltage 浪湧電壓                                   | 8.0 | 13 | 20 | 32 | 44 | 63 | $\tan \delta$ (max.) 最大損耗角正切                     | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 |
| Rated Voltage (V) 額定工作電壓   | 6.3  | 10   | 16     | 25     | 35   | 50   |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Surge voltage 浪湧電壓   | 8.0  | 13   | 20     | 32     | 44   | 63   |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| $\tan \delta$ (max.) 最大損耗角正切                                       | 0.24   | 0.20 | 0.16   | 0.14   | 0.12 | 0.10 |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Stability at Low Temperature<br>低溫特性                               | Measurement frequency 測試頻率: 120Hz<br><table border="1"> <tr> <td>Rated Voltage (V) 額定工作電壓</td><td>6.3</td><td>10</td><td>16, 25</td><td>35, 50</td><td></td><td></td></tr> <tr> <td>Impedance Ratio 阻抗比 <math>Z(-25^\circ C) / Z(20^\circ C)</math></td><td>4</td><td>3</td><td>2</td><td>2</td><td></td><td></td></tr> <tr> <td><math>ZT/Z20</math> (max.) <math>Z(-40^\circ C) / Z(20^\circ C)</math></td><td>8</td><td>6</td><td>4</td><td>3</td><td></td><td></td></tr> </table>                                 |      |        |        |      |      | Rated Voltage (V) 額定工作電壓   | 6.3   | 10                       | 16, 25   | 35, 50              |  |    | Impedance Ratio 阻抗比 $Z(-25^\circ C) / Z(20^\circ C)$ | 4   | 3  | 2  | 2  |    |    | $ZT/Z20$ (max.) $Z(-40^\circ C) / Z(20^\circ C)$ | 8    | 6    | 4    | 3    |      |      |
| Rated Voltage (V) 額定工作電壓   | 6.3  | 10   | 16, 25 | 35, 50 |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Impedance Ratio 阻抗比 $Z(-25^\circ C) / Z(20^\circ C)$               | 4  | 3    | 2      | 2      |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| $ZT/Z20$ (max.) $Z(-40^\circ C) / Z(20^\circ C)$                   | 8  | 6    | 4      | 3      |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Load Life<br>高溫負荷特性  | After 2000 hours application of the rated voltage at 85°C, they meet the characteristics listed below.<br>在 85°C 環境中施加額定工作電壓 2000 小時後，電容器的特性符合下表的要求。<br><table border="1"> <tr> <td>Capacitance Change 靜電容量變化率</td><td>Within <math>\pm 25\%</math> of initial value 初始值的 <math>\pm 25\%</math> 以內</td></tr> <tr> <td>Dissipation Factor 損耗角正切</td><td>200% or less of initial specified value 不大於規範值的 200%</td></tr> <tr> <td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr> </table> |      |        |        |      |      | Capacitance Change 靜電容量變化率 | Within $\pm 25\%$ of initial value 初始值的 $\pm 25\%$ 以內 | Dissipation Factor 損耗角正切 | 200% or less of initial specified value 不大於規範值的 200% | Leakage Current 漏電流 | initial specified value or less 不大於規範值 |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Capacitance Change 靜電容量變化率   | Within $\pm 25\%$ of initial value 初始值的 $\pm 25\%$ 以內  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Dissipation Factor 損耗角正切   | 200% or less of initial specified value 不大於規範值的 200%   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Leakage Current 漏電流  | initial specified value or less 不大於規範值   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Resistance to Soldering Heat<br>耐焊接熱特性                             | After reflow soldering and restored at room temperature, they meet the characteristics listed below.<br>經過回流焊並冷卻至室溫後，電容器的特性符合下表的要求。<br><table border="1"> <tr> <td>Capacitance Change 靜電容量變化率</td><td>Within <math>\pm 10\%</math> of initial value 初始值的 <math>\pm 10\%</math> 以內</td></tr> <tr> <td>Dissipation Factor 損耗角正切</td><td>initial specified value or less 不大於規範值</td></tr> <tr> <td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr> </table>                                |      |        |        |      |      | Capacitance Change 靜電容量變化率 | Within $\pm 10\%$ of initial value 初始值的 $\pm 10\%$ 以內 | Dissipation Factor 損耗角正切 | initial specified value or less 不大於規範值               | Leakage Current 漏電流 | initial specified value or less 不大於規範值 |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Capacitance Change 靜電容量變化率   | Within $\pm 10\%$ of initial value 初始值的 $\pm 10\%$ 以內  |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Dissipation Factor 損耗角正切   | initial specified value or less 不大於規範值   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Leakage Current 漏電流  | initial specified value or less 不大於規範值   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |
| Marking 標示   | Black print on the case top. 鋁殼頂部黑字印刷。   |      |        |        |      |      |                            |   |                          |  |                     |  |    |  |     |    |    |    |    |    |  |      |      |      |      |      |      |

### DRAWING (Unit: mm) 外形圖



### DIMENSIONS (Unit: mm) 尺寸表

| $\varnothing D \times L$ | 4 x 5.4 | 5 x 5.4 | 6.3 x 5.4 | 6.3 x 7.7 |
|--------------------------|---------|---------|-----------|-----------|
| A                        | 2.0     | 2.2     | 2.6       | 2.6       |
| B                        | 4.3     | 5.3     | 6.6       | 6.6       |
| C                        | 4.3     | 5.3     | 6.6       | 6.6       |
| E $\pm 0.2$              | 1.0     | 1.5     | 2.1       | 2.1       |
| L                        | 5.4     | 5.4     | 5.4       | 7.7       |

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# SC Series

## □ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & ESR 規格尺寸及最大允許紋波電流及ESR值

| WV                               |     | 6.3 (0J)   |  |  | 10 (1A)  |  |  | 16 (1C)  |  |  |
|----------------------------------|-----|--|--|--|--|--|--|--|--|--|
| Parameter<br>參數<br>$\mu\text{F}$ |     | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紋波電流 | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紋波電流 | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紋波電流 |
| 10                               | 100 |  |  |  |  |  |  | 4 x 5.4  | 34.5   | 25   |
| 22                               | 220 | 4 x 5.4  | 23.5   | 31   | 5 x 5.4  | 19.6   | 35   | 5 x 5.4  | 15.7   | 39   |
| 33                               | 330 | 5 x 5.4  | 15.7   | 39   | 5 x 5.4  | 13.1   | 43   | 6.3 x 5.4  | 10.5   | 57   |
| 47                               | 470 | 5 x 5.4  | 11.0   | 47   | 6.3 x 5.4  | 9.2  | 59   | 6.3 x 5.4  | 7.3  | 68   |
| 100                              | 101 | 6.3 x 5.4  | 5.2  | 75   | 6.3 x 5.4  | 4.3  | 76   | 6.3 x 7.7  | 3.5  | 96   |
| 220                              | 221 | 6.3 x 7.7  | 2.4  | 85   |  |  |  |  |  |  |

| WV                               |     | 25 (1E)  |  |  | 35 (1V)  |  |  | 50 (1H)  |  |  |
|----------------------------------|-----|--|--|--|--|--|--|--|--|--|
| Parameter<br>參數<br>$\mu\text{F}$ |     | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紹波電流 | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紹波電流 | Case size<br>$\varnothing\text{D} \times \text{L}$<br>(mm)<br>尺寸 | E.S.R. ( $\Omega$ )<br>20°C 120Hz<br>E.S.R.值 | Ripple current (mA rms) at 85°C 120Hz 紹波電流 |
| 0.1                              | 0R1 |  |  |  |  |  |  | 4 x 5.4  | 2156   | 1.0  |
| 0.22                             | R22 |  |  |  |  |  |  | 4 x 5.4  | 980  | 2.3  |
| 0.33                             | R33 |  |  |  |  |  |  | 4 x 5.4  | 653  | 3.5  |
| 0.47                             | R47 |  |  |  |  |  |  | 4 x 5.4  | 459  | 5  |
| 1                                | 010 |  |  |  |  |  |  | 4 x 5.4  | 216  | 10   |
| 2.2                              | 2R2 |  |  |  |  |  |  | 4 x 5.4  | 98   | 15   |
| 3.3                              | 3R3 |  |  |  |  |  |  | 4 x 5.4  | 65   | 18   |
| 4.7                              | 4R7 | 4 x 5.4  | 64.2   | 19   | 4 x 5.4  | 55.1   | 20   | 5 x 5.4  | 46   | 23   |
| 10                               | 100 | 5 x 5.4  | 30.2   | 28   | 5 x 5.4  | 25.9   | 30   | 6.3 x 5.4  | 22   | 34   |
| 22                               | 220 | 6.3 x 5.4  | 13.7   | 52   | 6.3 x 5.4  | 11.8   | 54   | 6.3 x 7.7  | 9.8  | 85   |
| 33                               | 330 | 6.3 x 5.4  | 9.1  | 63   | 6.3 x 7.7  | 7.8  | 105  |  |  |  |
| 47                               | 470 | 6.3 x 7.7  | 6.4  | 100  | 6.3 x 7.7  | 5.5  | 110  |  |  |  |

## □ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紹波電流頻率補償系數

| Frequency 頻率   | ~50Hz | 120Hz | 300Hz | 1KHz | 10KHz~ |
|----------------|-------|-------|-------|------|--------|
| Coefficient 系數 | 0.70  | 1.00  | 1.17  | 1.36 | 1.50   |

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