

LOW IMPEDANCE

低阻抗品

Low impedance with temperature range -55~+105°C

低阻抗和適用於 -55~+105°C 的溫度範圍

Load life of 2000 hours

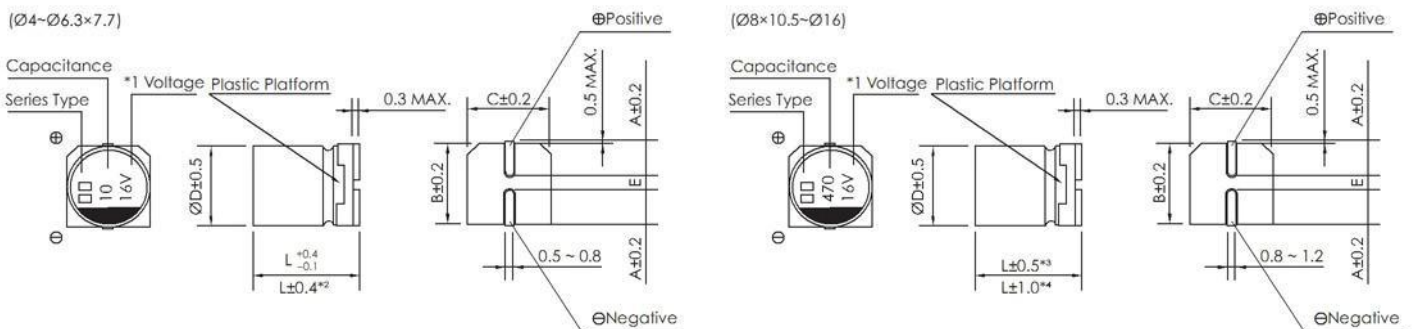
負荷壽命 2000 小時

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 | -55 ~ +105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage Range 額定工作電壓範圍 | 6.3 ~ 50V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Range 靜電容量範圍 | 1 ~ 4700μF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance 靜電容量允許偏差 | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current 漏電流 | Leakage current (4~ 10) ≤0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (12.5~ 16) ≤0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (4~ 10) ≤0.01CV 或 3μA, 取較大值 (施加額定工作電壓 2 分鐘後) 漏電流 (12.5~ 16) ≤0.03CV 或 4μA, 取較大值 (施加額定工作電壓 1 分鐘後) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (tan δ) 損耗角正切 | Measurement frequency 測試頻率: 120Hz, Temperature 溫度: 20°C <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>tan δ (max.)</td> <td>4~ 10</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> </tr> <tr> <td>最大損耗角正切</td> <td>12.5~ 16</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table> | Rated Voltage (V) 額定工作電壓 | 6.3 | 10 | 16 | 25 | 35 | 50 | tan δ (max.) | 4~ 10 | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.12 | 最大損耗角正切 | 12.5~ 16 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 | | | | | | | | | | | | | | | | |
| Rated Voltage (V) 額定工作電壓 | 6.3 | 10 | 16 | 25 | 35 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ (max.) | 4~ 10 | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 最大損耗角正切 | 12.5~ 16 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stability at Low Temperature 低溫特性 | Measurement frequency 測試頻率: 120Hz <table border="1"> <tr> <td colspan="2">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 rowspan="2">Impedance Ratio 阻抗比</td> <td rowspan="2">4~ 10</td> <td>Z(-25°C) / Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C) / Z(20°C)</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td rowspan="2">ZT/Z20 (max.)</td> <td rowspan="2">12.5~ 16</td> <td>Z(-25°C) / Z(20°C)</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C) / Z(20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table> | Rated Voltage (V) 額定工作電壓 | | 6.3 | 10 | 16 | 25 | 35 | 50 | Impedance Ratio 阻抗比 | 4~ 10 | Z(-25°C) / Z(20°C) | 2 | 2 | 2 | 2 | 2 | Z(-55°C) / Z(20°C) | 5 | 4 | 4 | 3 | 3 | 3 | ZT/Z20 (max.) | 12.5~ 16 | Z(-25°C) / Z(20°C) | 3 | 3 | 2 | 2 | 2 | 2 | Z(-55°C) / Z(20°C) | 10 | 8 | 6 | 4 | 3 | 3 |
| Rated Voltage (V) 額定工作電壓 | | 6.3 | 10 | 16 | 25 | 35 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impedance Ratio 阻抗比 | 4~ 10 | Z(-25°C) / Z(20°C) | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Z(-55°C) / Z(20°C) | 5 | 4 | 4 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZT/Z20 (max.) | 12.5~ 16 | Z(-25°C) / Z(20°C) | 3 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Z(-55°C) / Z(20°C) | 10 | 8 | 6 | 4 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Load Life 高溫負荷特性 | After 2000 hrs. application of the rated voltage at 105°C, they meet the characteristics listed below. 在 105°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。 <table border="1"> <tr> <td>Capacitance Change 靜電容量變化率</td> <td>Within ±20% of initial value 初始值的±20%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 ±20% of initial value 初始值的±20%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 ±20% of initial value 初始值的±20%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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life 高溫貯存特性 | After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 105°C 環境中無負荷放置 1000 小時後, 電容器的特性符合高溫負荷特性中所列的規定值。 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat 耐焊接熱特性 | After reflow soldering and restored at room temperature, they meet the characteristics listed below. 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。 <table border="1"> <tr> <td>Capacitance Change 靜電容量變化率</td> <td>Within ±10% of initial value 初始值的±10%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 ±10% of initial value 初始值的±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 ±10% of initial value 初始值的±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 標識 | Black print on the case top. 鋁殼頂部黑字印刷。 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

DRAWING (Unit: mm) 外形圖



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DIMENSIONS (Unit: mm) 尺寸表

| D x L | 4 x 5.4 | 5 x 5.4 | 6.3 x 5.4 | 6.3 x 7.7 | 8 x 10.5 | 10 x 10.5 | 10 x 13.5 | 12.5 x 13.5 | 12.5 x 16 | 16 x 16.5 |
|---------|---------|---------|-----------|-----------|----------|-----------|-----------|-------------|-----------|-----------|
| A | 2.0 | 2.2 | 2.6 | 2.6 | 3.0 | 3.3 | 3.3 | 4.9 | 4.9 | 5.8 |
| B | 4.3 | 5.3 | 6.6 | 6.6 | 8.4 | 10.4 | 10.4 | 13.0 | 13.0 | 17.0 |
| C | 4.3 | 5.3 | 6.6 | 6.6 | 8.4 | 10.4 | 10.4 | 13.0 | 13.0 | 17.0 |
| E ± 0.2 | 1.0 | 1.4 | 1.9 | 1.9 | 3.1 | 4.7 | 4.7 | 4.7 | 4.7 | 6.4 |
| L | 5.4 | 5.4 | 5.4 | 7.7 | 10.5 | 10.5 | 13.5 | 13.5 | 16.0 | 16.5 |

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE 規格尺寸及最大允許紋波電流及阻抗值

| μF | WV Code 代碼 | 6.3 | | | 10 | | | 16 | | |
|------|------------------|----------------------------|----------------|--------------|----------------------------|----------------|--------------|--------------------------|----------------|---------------|
| | | | 0J | | | 1A | | | 1C | |
| 10 | 100 | | | | | | | 4 x 5.4 | 3.0 | 60 |
| 15 | 150 | | | | | | | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) |
| 22 | 220 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) |
| 33 | 330 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) |
| 47 | 470 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) |
| 68 | 680 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 | 1.0 | 140 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) |
| 100 | 101 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) |
| 150 | 151 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 0.6 | 230 |
| 220 | 221 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 (6.3 x 7.7) | 0.30 (0.6) | 450 (230) |
| 330 | 331 | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 | 0.30 | 450 | 10 x 10.5 (8 x 10.5) | 0.15 (0.30) | 670 (450) |
| 470 | 471 | 8 x 10.5 (6.3 x 7.7) | 0.30 (0.60) | 450 (230) | 8 x 10.5 | 0.30 | 450 | 10 x 10.5 (8 x 10.5) | 0.15 (0.30) | 670 (450) |
| 680 | 681 | 8 x 10.5 | 0.30 | 450 | 10 x 10.5 | 0.15 | 670 | 10 x 10.5 | 0.15 | 670 |
| 1000 | 102 | 10 x 10.5 (8 x 10.5) | 0.15 (0.30) | 670 (450) | 10 x 10.5 | 0.15 | 670 | 10 x 10.5 | 0.15 | 670 |
| 1500 | 152 | 10 x 13.5 (10 x 10.5) | 0.13 (0.15) | 750 (670) | 12.5 x 13.5 (10 x 13.5) | 0.11 (0.13) | 820 (750) | 12.5 x 13.5 | 0.11 | 820 |
| 2200 | 222 | 12.5 x 13.5 (10 x 13.5) | 0.11 (0.13) | 820 (750) | 12.5 x 16 | 0.09 | 950 | 16 x 16.5 (12.5 x 16) | 0.08 (0.09) | 1260 (950) |
| 3300 | 332 | 12.5 x 16 (12.5 x 13.5) | 0.09 (0.11) | 950 (820) | 16 x 16.5 | 0.08 | 1260 | 16 x 16.5 | 0.08 | 1260 |
| 4700 | 472 | 16 x 16.5 | 0.08 | 1260 | 16 x 16.5 | 0.08 | 1260 | | | |

| μF | WV Code 代碼 | 25 | | | 35 | | | 50 | | |
|-----|------------------|--------------------------|---------------|--------------|--------------------------|----------------|--------------|----------------------------|--|--|
| | | | 1E | | | 1V | | | 1H | |
| 1 | 010 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 1.5 | 1R5 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 2.2 | 2R2 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 3.3 | 3R3 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 4.7 | 4R7 | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 | 3.0 | 50 |
| 6.8 | 6R8 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 | 1.8 | 95 | 6.3 x 5.4 | 2.0 | 70 |
| 10 | 100 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 | 2.0 | 70 |
| 15 | 150 | 6.3 x 5.4 | 1.8 | 95 | 5 x 5.4 | 1.8 | 95 | 6.3 x 5.4 | 2.0 | 70 |
| 22 | 220 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 1.0 (2.0) | 120 (70) |
| 33 | 330 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 0.60 (1.0) | 230 (140) | 6.3 x 7.7 | 1.0 | 120 |
| 47 | 470 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.60 (1.0) | 230 (140) | 6.3 x 7.7 | 1.0 | 120 |
| 68 | 680 | 6.3 x 7.7 | 0.6 | 230 | 6.3 x 7.7 | 0.60 | 230 | 8 x 10.5 | 0.60 | 300 |
| 100 | 101 | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 (6.3 x 7.7) | 0.30 (0.60) | 450 (230) | 8 x 10.5 | 0.60 | 300 |
| 150 | 151 | 8 x 10.5 (6.3 x 7.7) | 0.30 (0.6) | 450 (230) | 8 x 10.5 | 0.30 | 450 | 10 x 10.5 | 0.30 | 500 |
| | | | | | | | | Case size D·L(mm) 尺寸 | Impedance (Ω) at 20°C, 100KHz 阻抗值 | Ripple current (mA rms) at 105°C, 100KHz 紋波電流 |

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DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE 規格尺寸及最大允許紋波電流及阻抗值

| μF | WV Code 代碼 | 25 | | | 35 | | | 50 | | |
|------|------------------|----------------------------|----------------|---------------|----------------------------|----------------|---------------|---|--|--|
| | | 1E | | | 1V | | | 1H | | |
| 220 | 221 | 8 × 10.5 | 0.30 | 450 | 10 × 10.5 (8 × 10.5) | 0.15 (0.30) | 670 (450) | 10 × 10.5 | 0.30 | 500 |
| 330 | 331 | 10 × 10.5 (8 × 10.5) | 0.15 (0.30) | 670 (450) | 10 × 10.5 | 0.15 | 670 | 16 × 16.5 (12.5 × 13.5) (10 × 13.5) | 0.12 (0.20) (0.25) | 1060 (650) (580) |
| 470 | 471 | 10 × 10.5 | 0.15 | 670 | 10 × 13.5 (10 × 10.5) | 0.13 (0.15) | 750 (670) | 16 × 16.5 (12.5 × 16) | 0.12 (0.15) | 1060 (700) |
| 680 | 681 | 10 × 13.5 | 0.13 | 750 | 12.5 × 13.5 (10 × 13.5) | 0.11 (0.13) | 820 (750) | 16 × 16.5 | 0.12 | 1060 |
| 1000 | 102 | 16 × 16.5 (12.5 × 13.5) | 0.08 (0.11) | 1260 (820) | 16 × 16.5 (12.5 × 16) | 0.08 (0.09) | 1260 (950) | | | |
| 1500 | 152 | 12.5 × 16 | 0.09 | 950 | 16 × 16.5 | 0.08 | 1260 | Case size D-L(mm) 尺寸 | Impedance (Ω) at 20°C, 100KHz 阻抗值 | Ripple current (mA rms) at 105°C, 100KHz 紋波電流 |
| 2200 | 222 | 16 × 16.5 | 0.08 | 1260 | | | | | | |

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紋波電流頻率補償系數

| Coefficient 系數 | Frequency 頻率 | | 50Hz | 120Hz | 300Hz | 1KHz | 10KHz~ |
|-------------------|--------------|---------------|----------|-------|-------|------|--------|
| | | 4 ~ 10 | 1 ~ 68μF | 0.35 | 0.50 | 0.64 | 0.83 |
| 100 ~ 2200μF | | | 0.40 | 0.55 | 0.70 | 0.85 | 1.00 |
| 12.5 ~ 16 | | ~ 680μF | 0.45 | 0.65 | 0.80 | 0.90 | 1.00 |
| | | 1000 ~ 4700μF | 0.65 | 0.85 | 0.95 | 1.00 | 1.00 |

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