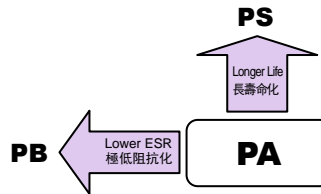


PA Series

RADIAL LEAD TYPE, STANDARD 插件式，標準品



- Operating with wide temperature range -55~+105°C
適用於 -55~+105°C 的寬溫範圍
- Low ESR, high ripple current
低阻抗，高紋波電流
- Load life of 2000 hours
負荷壽命 2000 小時
- RoHS & REACH compliant, Halogen-free
符合 RoHS 與 REACH，無鹵



□ SPECIFICATIONS 特性表

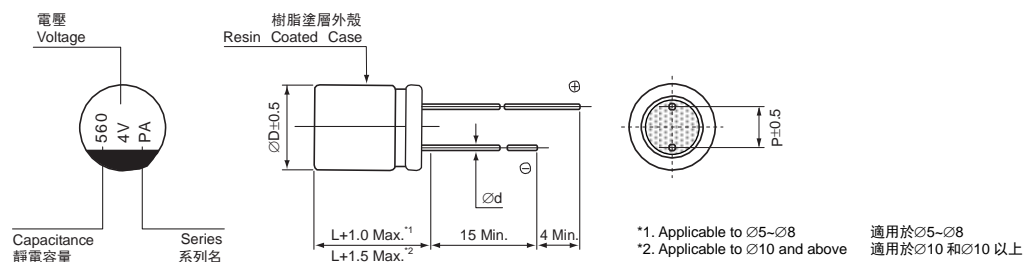
| Items 項目 | Characteristics 主要特性 | | | | | | | | |
|--|--|--|---|--------------------------|--|--------------|--|---------------------|--|
| Operation Temperature Range 使用溫度範圍 | -55 ~ +105°C | | | | | | | | |
| Voltage Range 額定工作電壓範圍 | 2.5 ~ 25V | | | | | | | | |
| Capacitance Range 靜電容量範圍 | 6.8 ~ 1500µF | | | | | | | | |
| Capacitance Tolerance 靜電容量允許偏差 | ±20% at 120Hz, 20°C | | | | | | | | |
| Leakage Current 漏電流 (*1) | ≤Specified value (after 2 minutes application of rated voltage at 20°C). ≤規範值(在 20°C 環境中施加額定工作電壓 2 分鐘後)。 | | | | | | | | |
| Dissipation Factor (tan δ) 損耗角正切 | ≤Specified value at 120Hz, 20°C. ≤規範值(在 20°C 120Hz 環境下)。 | | | | | | | | |
| ESR 阻抗值 (*2) | ≤Specified value at 100KHz, 20°C. ≤規範值(在 20°C 100KHz 環境下)。 | | | | | | | | |
| Stability at Low Temperature 低溫特性 | Measurement frequency 測試頻率: 100KHz <table border="1"> <tr> <td>Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C)</td> <td>≤1.25</td> </tr> <tr> <td>ZT/Z20 (max.)</td> <td>≤1.25</td> </tr> </table> | Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C) | ≤1.25 | ZT/Z20 (max.) | ≤1.25 | | | | |
| Impedance Ratio 阻抗比 Z(+105°C)/Z(20°C) | ≤1.25 | | | | | | | | |
| ZT/Z20 (max.) | ≤1.25 | | | | | | | | |
| Damp Heat (Steady State) 穩態濕熱 | When the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 60°C, 90% RH, they meet the characteristics listed below. 在 60°C 和相對濕度 90% 環境下施加額定工作電壓 1000 小時並冷卻至 20°C 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 為初始值的±20%以內 (*3)</td> </tr> <tr> <td>Dissipation Factor 損耗角正切</td> <td>150% or less of initial specified value 不大於規範值的 150%</td> </tr> <tr> <td>ESR 阻抗值 (*2)</td> <td>150% or less of initial specified value 不大於規範值的 150%</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 為初始值的±20%以內 (*3) | Dissipation Factor 損耗角正切 | 150% or less of initial specified value 不大於規範值的 150% | ESR 阻抗值 (*2) | 150% or less of initial specified value 不大於規範值的 150% | 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 為初始值的±20%以內 (*3) | | | | | | | | |
| Dissipation Factor 損耗角正切 | 150% or less of initial specified value 不大於規範值的 150% | | | | | | | | |
| ESR 阻抗值 (*2) | 150% or less of initial specified value 不大於規範值的 150% | | | | | | | | |
| Leakage Current 漏電流 | Initial specified value or less 不大於規範值 | | | | | | | | |
| Endurance 耐久性 | After 2000 hours 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 為初始值的±20%以內 (*3)</td> </tr> <tr> <td>Dissipation Factor 損耗角正切</td> <td>150% or less of initial specified value 不大於規範值的 150%</td> </tr> <tr> <td>ESR 阻抗值 (*2)</td> <td>150% or less of initial specified value 不大於規範值的 150%</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 為初始值的±20%以內 (*3) | Dissipation Factor 損耗角正切 | 150% or less of initial specified value 不大於規範值的 150% | ESR 阻抗值 (*2) | 150% or less of initial specified value 不大於規範值的 150% | 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 為初始值的±20%以內 (*3) | | | | | | | | |
| Dissipation Factor 損耗角正切 | 150% or less of initial specified value 不大於規範值的 150% | | | | | | | | |
| ESR 阻抗值 (*2) | 150% or less of initial specified value 不大於規範值的 150% | | | | | | | | |
| Leakage Current 漏電流 | Initial specified value or less 不大於規範值 | | | | | | | | |
| Resistance to Soldering Heat 耐焊接熱特性 <small>(Please refer page 9 for soldering conditions) (焊接條件請查閱第 12 頁)</small> | 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 (*3)</td> </tr> <tr> <td>Dissipation Factor 損耗角正切</td> <td>130% or less of initial specified value 不大於規範值的 130%</td> </tr> <tr> <td>ESR 阻抗值 (*2)</td> <td>130% or less of initial specified value 不大於規範值的 130%</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 (*3) | Dissipation Factor 損耗角正切 | 130% or less of initial specified value 不大於規範值的 130% | ESR 阻抗值 (*2) | 130% or less of initial specified value 不大於規範值的 130% | 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 (*3) | | | | | | | | |
| Dissipation Factor 損耗角正切 | 130% or less of initial specified value 不大於規範值的 130% | | | | | | | | |
| ESR 阻抗值 (*2) | 130% or less of initial specified value 不大於規範值的 130% | | | | | | | | |
| Leakage Current 漏電流 | Initial specified value or less 不大於規範值 | | | | | | | | |
| Marking 標識 | Red print on the case top. 鋁殼頂部紅色字體印刷。 | | | | | | | | |

(*1) If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C.
如未能確定，在 105°C 環境下連續施加額定工作電壓 120 分鐘後測量漏電流。

(*2) Should be measured at both of the terminal ends closest to the capacitor body.
測試應為靠近兩個端子的末端。

(*3) The value before test of examination of resistance to soldering.
焊接測試前的值。

□ DRAWING 外形圖 (Unit: mm)



Dimension table in next page.
尺寸表見下一頁。

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PA Series

□ DIMENSIONS 尺寸表 (Unit: mm)

| ∅D × L | 5 × 7/9/11 | 6.3 × 6/7 | 6.3 × 8/9 | 6.3 × 10.5/11/12 | 8 × 7/8/9 | 8 × 11/12 | 10 × 8/10/13 |
|--------|--------------|-----------|-----------|------------------|-------------|-----------|---------------|
| P | 2.0 | 2.5 | 2.5 | 2.5 | 3.5 | 3.5 | 5.0 |
| ∅d | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| L | 7.0/9.0/11.0 | 6.0/7.0 | 8.0/9.0 | 10.5/11.0/12.0 | 7.0/8.0/9.0 | 11.0/12.0 | 8.0/10.0/13.0 |

□ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

| WV (V) | | 2.5 (0E) | | | | | 4 (0G) | | | | |
|--------------|--------------|------------------------|----------------------------------|--------------------------|--------------------------------|--|------------------------|----------------------------------|--------------------------|--------------------------------|--|
| Cap. 容量 (μF) | Parameter 參數 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 |
| | | 270 | 271 | | | | | | 6.3 × 9 (6.3 × 10.5) | 0.08 (0.08) | 216 (216) |
| 330 | 331 | 6.3 × 9 | 0.08 | 165 | 7 | 5600 | | | | | |
| 390 | 391 | 6.3 × 10.5 | 0.08 | 195 | 20 | 3200 | 6.3 × 10.5 | 0.08 | 312 | 24 | 3300 |
| 560 | 561 | 6.3 × 9 | 0.08 | 280 | 7 | 5600 | 8 × 9 (8 × 12) | 0.08 (0.08) | 448 (448) | 7 (7) | 5200 (5500) |
| 680 | 681 | 8 × 9 | 0.08 | 340 | 7 | 4800 | 8 × 12 | 0.08 | 544 | 6 | 6200 |
| 820 | 821 | 6.3 × 9 | 0.08 | 410 | 7 | 5600 | 10 × 13 | 0.08 | 656 | 6 | 6500 |
| 1000 | 102 | 10 × 13 | 0.08 | 500 | 6 | 6500 | 10 × 13 | 0.08 | 800 | 6 | 6640 |
| 1200 | 122 | 10 × 13 | 0.08 | 600 | 8 | 5300 | 10 × 13 | 0.08 | 960 | 8 | 5600 |
| 1500 | 152 | 8 × 12 | 0.08 | 750 | 7 | 6100 | | | | | |

| WV (V) | | 6.3 (0J) | | | | | 10 (1A) | | | | |
|--------------|--------------|------------------------|----------------------------------|--------------------------|--------------------------------|--|--------------------------|----------------------------------|--------------------------|--------------------------------|--|
| Cap. 容量 (μF) | Parameter 參數 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 |
| | | 47 | 470 | | | | | | 6.3 × 10.5 | 0.08 | 94 |
| 68 | 680 | | | | | | 6.3 × 10.5 | 0.08 | 136 | 25 | 2900 |
| 100 | 101 | | | | | | 6.3 × 8 (6.3 × 10.5) | 0.08 (0.08) | 200 (200) | 25 (25) | 2900 (2900) |
| 150 | 151 | | | | | | 6.3 × 10.5 | 0.08 | 300 | 25 | 2900 |
| 220 | 221 | 5 × 7 (6.3 × 10.5) | 0.08 (0.08) | 277 (277) | 20 (20) | 3000 (3200) | 6.3 × 7 | 0.08 | 440 | 12 | 3150 |
| 270 | 271 | | | | | | 8 × 12 | 0.08 | 540 | 8 | 4900 |
| 330 | 331 | 6.3×10.5 | 0.08 | 416 | 24 | 3300 | | | | | |
| 470 | 471 | 8 × 9 (8 × 12) | 0.08 (0.08) | 592 (592) | 7 (7) | 5200 (5500) | 5 × 11 (8 × 8) (10 × 13) | 0.08 (0.08) (0.08) | 940 (940) (940) | 16 (12) (7) | 3000 (5300) (5700) |
| 560 | 561 | | | | | | 10 × 13 | 0.08 | 1120 | 7 | 5900 |
| 680 | 681 | 10 × 13 | 0.08 | 857 | 6 | 6300 | 10 × 13 | 0.08 | 1360 | 7 | 6100 |

| WV (V) | | 16 (1C) | | | | | 20 (1D) | | | | |
|--------------|--------------|------------------------------|----------------------------------|--------------------------|--------------------------------|--|------------------------|----------------------------------|--------------------------|--------------------------------|--|
| Cap. 容量 (μF) | Parameter 參數 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 | Case size ∅D×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 |
| | | 22 | 220 | | | | | | 6.3 × 6 | 0.12 | 88 |
| 39 | 390 | | | | | | 8 × 7 | 0.12 | 156 | 45 | 2000 |
| 47 | 470 | | | | | | 8 × 7 | 0.12 | 188 | 45 | 2000 |
| 56 | 560 | | | | | | 10 × 8 | 0.12 | 224 | 40 | 2400 |
| 68 | 680 | | | | | | 10 × 8 | 0.12 | 272 | 40 | 2600 |
| 82 | 820 | | | | | | 10 × 8 | 0.12 | 328 | 40 | 2600 |
| 100 | 101 | 5 × 8 (6.3 × 7) (6.3 × 10.5) | 0.08 (0.08) (0.08) | 320 (320) (320) | 25 (25) (24) | 2350 (2600) (2900) | 8 × 12 | 0.12 | 400 | 22 | 3320 |
| 120 | 121 | | | | | | 10 × 10 | 0.12 | 480 | 35 | 2800 |
| 150 | 151 | | | | | | 10 × 13 | 0.12 | 600 | 20 | 4320 |
| 180 | 181 | 5 × 9 (8 × 8) (8 × 12) | 0.08 (0.08) (0.08) | 576 (576) (576) | 12 (10) (9) | 2750 (4200) (5000) | | | | | |
| 220 | 221 | 6.3 × 8 (6.3 × 12) | 0.08 (0.08) | 704 (704) | 12 (12) | 3800 (4400) | | | | | |
| 270 | 271 | 8 × 8 (8 × 12) | 0.08 (0.08) | 864 (864) | 10 (9) | 4600 (5100) | | | | | |
| 330 | 331 | 10 × 13 | 0.08 | 1056 | 9 | 6100 | | | | | |
| 470 | 471 | 10 × 13 | 0.08 | 1504 | 9 | 6100 | | | | | |

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PA Series

□ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

| WV (V) | | 25 (1E) | | | | |
|--------------|--------------|-----------------------------|----------------------------------|--------------------------|--------------------------------|--|
| Cap. 容量 (μF) | Parameter 參數 | Case size ØD×L (mm) 尺寸 | Dissipation factor (tan δ) 損耗角正切 | Leakage current (μA) 漏電流 | ESR (mΩ) max. 20°C, 100KHz 阻抗值 | Ripple current (mA rms) 105°C, 100KHz 紋波電流 |
| 6.8 | 6R8 | 6.3 × 6 | 0.12 | 34 | 80 | 1200 |
| 10 | 100 | 6.3 × 6 | 0.12 | 50 | 65 | 1500 |
| 22 | 220 | 8 × 7 | 0.12 | 110 | 60 | 1500 |
| 33 | 330 | 8 × 7 | 0.12 | 165 | 50 | 1800 |
| 47 | 470 | 6.3 × 7 (10 × 13) | 0.12 (0.12) | 235 (235) | 49 (30) | 1300 (3000) |
| 56 | 560 | 10 × 13 | 0.12 | 280 | 28 | 3800 |
| 100 | 101 | 5 × 11 (6.3 × 8) (6.3 × 11) | 0.12 (0.12) (0.12) | 500 (500) (500) | 30 (30) (30) | 2500 (2500) (3000) |
| 220 | 221 | 6.3 × 12 (8 × 11) | 0.12 (0.12) | 1100 (1100) | 20 (18) | 4000 (4300) |

- Please refer to page 14 about the taped or cutting product spec. 編帶與剪腳標準請查閱第 14 頁。
- Please refer to page 13 for the minimum package quantity. 最小包裝數量請查閱第 13 頁。
- Please refer to page 10 for the Part Number System. 產品編碼規則請查閱第 10 頁。

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