

## E1 Series

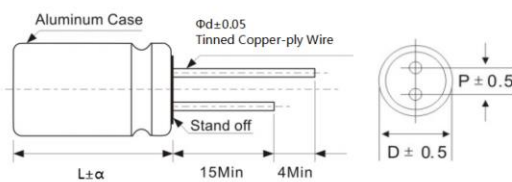
- Super low ESR, high ripple current
- Load life of 2000 hours at 105°C
- RoHS Compliant



### 规格表 Specifications

| 项目Items                                                             | 特性参数Characteristics                                                                                                                                                                                                                                                                                                                                   |                              |   |     |     |     |          |    |    |    |    |                |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---|-----|-----|-----|----------|----|----|----|----|----------------|
| 使用温度范围<br>Category<br>Temperature Range                             | -55 ~ +105℃                                                                                                                                                                                                                                                                                                                                           |                              |   |     |     |     |          |    |    |    |    |                |
| 额定工作电压范围<br>Rated Voltage Range                                     | 2.5 ~ 25V                                                                                                                                                                                                                                                                                                                                             |                              |   |     |     |     |          |    |    |    |    |                |
| 静电容量允许偏差<br>Capacitance tolerance                                   | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                                                                                |                              |   |     |     |     |          |    |    |    |    |                |
| 漏电流<br>Leakage Current                                              | 施加额定工作电压2分钟后读数, 小于或等于规格值 (at 20℃)<br>≤0.2CV 或500μA (取大值)<br>Less than or equal to the specified value. After 2 minutes application of rated Voltage at 20℃                                                                                                                                                                                            |                              |   |     |     |     |          |    |    |    |    |                |
| 损耗角正切值tanδ<br>Dissipation Factor                                    | Rated voltage (V)                                                                                                                                                                                                                                                                                                                                     | 2.5                          | 4 | 6.3 | 6.8 | 7.5 | 10       | 12 | 16 | 20 | 25 | (at 20℃,120Hz) |
|                                                                     | tanδ (Max.)                                                                                                                                                                                                                                                                                                                                           | 0.08                         |   |     |     |     | 0.12     |    |    |    |    |                |
| 温度特性<br>Low Temperature<br>Characteristics<br>(Max.Impedance Ratio) | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                       | ≤1.25                        |   |     |     |     | (100KHz) |    |    |    |    |                |
|                                                                     | Z(-55℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                       | ≤1.25                        |   |     |     |     |          |    |    |    |    |                |
| 耐久性<br>Endurance                                                    | 105℃施加额定工作电压2000小时, 恢复到20℃后, 产品性能应满足以下要求<br>The specifications listed below shall be satisfied when the capacitors are restored to 20℃ after application of rated voltage for 2000 hours at 105℃.                                                                                                                                                     |                              |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Appearance                                                                                                                                                                                                                                                                                                                                            | No significant damage        |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Capacitance change                                                                                                                                                                                                                                                                                                                                    | ≤±20% of the initial value   |   |     |     |     |          |    |    |    |    |                |
|                                                                     | D.F.(tanδ)                                                                                                                                                                                                                                                                                                                                            | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | ESR                                                                                                                                                                                                                                                                                                                                                   | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Leakage current                                                                                                                                                                                                                                                                                                                                       | ≤The specified value         |   |     |     |     |          |    |    |    |    |                |
| 耐湿负荷特性<br>Damp Heat<br>(Steady State)                               | 在60℃ 湿度90%~95%RH的环境中, 施加额定电压1000小时后, 恢复到20℃后, 产品性能应满足以下要求<br>The specifications listed below shall be satisfied when the capacitors are restored to 20℃after application of rated voltage for 1000 hours at 60℃,90%~ 95% RH.                                                                                                                          |                              |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Appearance                                                                                                                                                                                                                                                                                                                                            | No significant damage        |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Capacitance change                                                                                                                                                                                                                                                                                                                                    | ≤±20% of the initial value   |   |     |     |     |          |    |    |    |    |                |
|                                                                     | D.F.(tanδ)                                                                                                                                                                                                                                                                                                                                            | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | ESR                                                                                                                                                                                                                                                                                                                                                   | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Leakage current                                                                                                                                                                                                                                                                                                                                       | ≤The specified value         |   |     |     |     |          |    |    |    |    |                |
| 浪涌电压特性<br>(Surge Voltage)                                           | 浪涌电压=额定电压× 1.15(V)<br>Surge Voltage=Rated voltage × 1.15(V)<br>在105℃环境中, 按充电30秒; 放电5分30秒, 连续施加浪涌电压1000次(Rc=1kΩ), 待恢复后测试, 应满足以下要求<br>The capacitors shall be subjected to 1000 cycles each consisting of charge with the surge voltages specified at 105℃ for 30 seconds through a protective resistor (Rc=1kΩ) and discharge for 5 minutes 30 seconds |                              |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Appearance                                                                                                                                                                                                                                                                                                                                            | No significant damage        |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Capacitance change                                                                                                                                                                                                                                                                                                                                    | ≤±20% of the initial value   |   |     |     |     |          |    |    |    |    |                |
|                                                                     | D.F.(tanδ)                                                                                                                                                                                                                                                                                                                                            | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | ESR                                                                                                                                                                                                                                                                                                                                                   | ≤150% of the specified value |   |     |     |     |          |    |    |    |    |                |
|                                                                     | Leakage current                                                                                                                                                                                                                                                                                                                                       | ≤The specified value         |   |     |     |     |          |    |    |    |    |                |

### 外形图Dimensions (mm)



|    |     |     |     |     |
|----|-----|-----|-----|-----|
| ΦD | 5   | 6.3 | 8   | 10  |
| P  | 2.0 | 2.5 | 3.5 | 5.0 |
| Φd | 0.5 | 0.6 | 0.6 | 0.6 |

|   |                  |
|---|------------------|
| α | (L < 16)1.0      |
|   | (16 ≤ L < 22)1.5 |
|   | (L ≥ 22)2.0      |

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### ◆ 纹波电流修正系数 Rated Ripple Current Coefficient

| 频率Frequency(Hz) | 120Hz $\cong f < 1\text{kHz}$ | 1kHz $\cong f < 10\text{kHz}$ | 10kHz $\cong f < 100\text{kHz}$ | 100kHz $\cong f < 500\text{kHz}$ |
|-----------------|-------------------------------|-------------------------------|---------------------------------|----------------------------------|
| 系数 Coefficient  | 0.05                          | 0.30                          | 0.70                            | 1.00                             |

### ◆ 尺寸与个技术参数一览表Standard Ratings

| Rated voltage<br>(V) | Rated capacitance<br>( $\mu\text{F}$ ) | Case size<br>$\Phi\text{D}\times\text{L}(\text{mm})$ | ESR( $\text{m}\Omega$ )<br>at 20°C, 100 KHz | Leakage Current<br>( $\mu\text{A}$ ) | Rated ripple current<br>( $\text{mA}_{\text{rms}}/105^\circ\text{C}/100\text{kHz}$ ) |
|----------------------|----------------------------------------|------------------------------------------------------|---------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------|
| 2.5                  | 560                                    | 5*8                                                  | 12                                          | 500                                  | 4100                                                                                 |
|                      | 560                                    | 6.3*8                                                | 8                                           | 500                                  | 5100                                                                                 |
|                      | 680                                    | 6.3*8                                                | 8                                           | 500                                  | 5100                                                                                 |
|                      | 680                                    | 8*9                                                  | 8                                           | 500                                  | 5900                                                                                 |
|                      | 820                                    | 6.3*8                                                | 8                                           | 500                                  | 5200                                                                                 |
|                      | 820                                    | 8*9                                                  | 8                                           | 500                                  | 5900                                                                                 |
|                      | 1000                                   | 8*9                                                  | 8                                           | 500                                  | 5900                                                                                 |
|                      | 1000                                   | 8*12                                                 | 8                                           | 500                                  | 6100                                                                                 |
|                      | 1200                                   | 8*9                                                  | 8                                           | 600                                  | 5900                                                                                 |
|                      | 1200                                   | 8*12                                                 | 8                                           | 600                                  | 6100                                                                                 |
| 4                    | 1500                                   | 8*12                                                 | 8                                           | 750                                  | 6100                                                                                 |
|                      | 560                                    | 6.3*8                                                | 8                                           | 500                                  | 5100                                                                                 |
|                      | 560                                    | 8*9                                                  | 8                                           | 500                                  | 5900                                                                                 |
|                      | 680                                    | 6.3*8                                                | 8                                           | 544                                  | 5100                                                                                 |
|                      | 680                                    | 8*9                                                  | 8                                           | 544                                  | 5900                                                                                 |
|                      | 820                                    | 6.3*9                                                | 8                                           | 656                                  | 5200                                                                                 |
|                      | 820                                    | 8*9                                                  | 8                                           | 656                                  | 5900                                                                                 |
|                      | 1000                                   | 6.3*12                                               | 8                                           | 800                                  | 5500                                                                                 |
|                      | 1000                                   | 8*9                                                  | 8                                           | 800                                  | 5900                                                                                 |
|                      | 1200                                   | 6.3*12                                               | 8                                           | 960                                  | 5500                                                                                 |
| 6.3                  | 1200                                   | 8*9                                                  | 8                                           | 960                                  | 5900                                                                                 |
|                      | 220                                    | 5*8                                                  | 12                                          | 500                                  | 3900                                                                                 |
|                      | 270                                    | 5*7                                                  | 12                                          | 500                                  | 3700                                                                                 |
|                      | 270                                    | 5*8                                                  | 12                                          | 500                                  | 3900                                                                                 |
|                      | 330                                    | 5*7                                                  | 12                                          | 500                                  | 3700                                                                                 |
|                      | 330                                    | 5*8                                                  | 12                                          | 500                                  | 4100                                                                                 |
|                      | 330                                    | 6.3*8                                                | 10                                          | 500                                  | 4450                                                                                 |
|                      | 390                                    | 5*9                                                  | 12                                          | 500                                  | 4510                                                                                 |
|                      | 470                                    | 5*9                                                  | 12                                          | 592                                  | 4510                                                                                 |
|                      | 470                                    | 6.3*8                                                | 8                                           | 592                                  | 4900                                                                                 |
|                      | 560                                    | 5*11                                                 | 10                                          | 706                                  | 4100                                                                                 |
|                      | 560                                    | 6.3*8                                                | 8                                           | 706                                  | 5100                                                                                 |
|                      | 680                                    | 5*11                                                 | 10                                          | 857                                  | 4100                                                                                 |
|                      | 680                                    | 6.3*8                                                | 8                                           | 857                                  | 5100                                                                                 |

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### ◆ 尺寸与个技术参数一览表Standard Ratings

| Rated voltage<br>(V) | Rated capacitance<br>(uF) | Case size<br>ΦD×L(mm) | ESR(mΩ)<br>at 20℃,100 KHz | Leakage Current<br>(μA) | Rated ripple current<br>(mA <sub>rms</sub> /105℃/100kHz) |
|----------------------|---------------------------|-----------------------|---------------------------|-------------------------|----------------------------------------------------------|
| 6.3                  | 820                       | 6.3*8                 | 8                         | 1033                    | 5200                                                     |
|                      | 820                       | 6.3*9                 | 8                         | 1033                    | 5200                                                     |
|                      | 820                       | 8*9                   | 8                         | 1033                    | 5900                                                     |
|                      | 1000                      | 6.3*12                | 8                         | 1260                    | 5500                                                     |
|                      | 1000                      | 8*9                   | 8                         | 1260                    | 5900                                                     |
|                      | 1000                      | 8*12                  | 8                         | 1260                    | 6100                                                     |
|                      | 1200                      | 6.3*12                | 8                         | 1512                    | 5500                                                     |
|                      | 1200                      | 8*12                  | 8                         | 1512                    | 6100                                                     |
|                      | 1500                      | 8*12                  | 8                         | 1890                    | 6100                                                     |
|                      | 1500                      | 10*12.5               | 8                         | 1890                    | 6200                                                     |
| 7.5                  | 2200                      | 10*12.5               | 8                         | 2772                    | 6200                                                     |
|                      | 270                       | 5*8                   | 12                        | 500                     | 3630                                                     |
|                      | 330                       | 6.3*8                 | 10                        | 500                     | 4100                                                     |
|                      | 390                       | 6.3*8                 | 10                        | 585                     | 4100                                                     |
|                      | 470                       | 6.3*8                 | 10                        | 705                     | 4100                                                     |
|                      | 560                       | 6.3*8                 | 10                        | 840                     | 4500                                                     |
|                      | 680                       | 6.3*12                | 10                        | 1020                    | 4500                                                     |
|                      | 680                       | 8*9                   | 8                         | 1020                    | 4800                                                     |
|                      | 820                       | 6.3*12                | 10                        | 1230                    | 4500                                                     |
|                      | 820                       | 8*9                   | 8                         | 1230                    | 4800                                                     |
|                      | 1000                      | 8*9                   | 8                         | 1500                    | 4800                                                     |
|                      | 1000                      | 8*12                  | 8                         | 1500                    | 5100                                                     |
|                      | 1200                      | 8*12                  | 8                         | 1800                    | 5100                                                     |
|                      | 1200                      | 10*12.5               | 8                         | 1800                    | 5500                                                     |
| 10                   | 1500                      | 10*12.5               | 8                         | 2250                    | 5500                                                     |
|                      | 220                       | 5*8                   | 15                        | 500                     | 3100                                                     |
|                      | 220                       | 6.3*8                 | 12                        | 500                     | 3500                                                     |
|                      | 270                       | 6.3*8                 | 12                        | 540                     | 3500                                                     |
|                      | 330                       | 6.3*8                 | 12                        | 660                     | 3750                                                     |
|                      | 330                       | 8*9                   | 10                        | 660                     | 3800                                                     |
|                      | 390                       | 6.3*8                 | 12                        | 780                     | 3750                                                     |
|                      | 390                       | 6.3*12                | 12                        | 780                     | 3900                                                     |
|                      | 470                       | 6.3*8                 | 12                        | 940                     | 3850                                                     |
|                      | 470                       | 8*9                   | 10                        | 940                     | 3950                                                     |
|                      | 560                       | 6.3*12                | 12                        | 1120                    | 3900                                                     |
|                      | 560                       | 8*9                   | 10                        | 1120                    | 3950                                                     |

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### ◆ 尺寸与个技术参数一览表Standard Ratings

| Rated voltage<br>(V) | Rated capacitance<br>(uF) | Case size<br>ΦD×L(mm) | ESR(mΩ)<br>at 20℃,100 KHz | Leakage Current<br>(μA) | Rated ripple current<br>(mA <sub>rms</sub> /105℃/100kHz) |
|----------------------|---------------------------|-----------------------|---------------------------|-------------------------|----------------------------------------------------------|
| 10                   | 680                       | 6.3*12                | 12                        | 1360                    | 4100                                                     |
|                      | 680                       | 8*9                   | 10                        | 1360                    | 4200                                                     |
|                      | 820                       | 8*9                   | 10                        | 1640                    | 4200                                                     |
|                      | 820                       | 8*12                  | 8                         | 1640                    | 4500                                                     |
|                      | 1000                      | 8*12                  | 8                         | 2000                    | 4500                                                     |
|                      | 1000                      | 10*12.5               | 8                         | 2000                    | 5200                                                     |
|                      | 1200                      | 10*12.5               | 8                         | 2400                    | 5200                                                     |
| 12                   | 1500                      | 10*12.5               | 8                         | 3000                    | 5200                                                     |
|                      | 220                       | 5*9                   | 12                        | 528                     | 2690                                                     |
|                      | 220                       | 6.3*8                 | 12                        | 528                     | 2900                                                     |
|                      | 270                       | 6.3*8                 | 12                        | 648                     | 2900                                                     |
|                      | 330                       | 6.3*8                 | 12                        | 792                     | 2900                                                     |
|                      | 390                       | 6.3*8                 | 12                        | 936                     | 2900                                                     |
|                      | 470                       | 6.3*12                | 10                        | 1128                    | 3500                                                     |
|                      | 470                       | 8*9                   | 10                        | 1128                    | 3800                                                     |
|                      | 560                       | 6.3*12                | 10                        | 1344                    | 3500                                                     |
|                      | 560                       | 8*9                   | 10                        | 1344                    | 3800                                                     |
|                      | 680                       | 8*9                   | 10                        | 1632                    | 3800                                                     |
|                      | 820                       | 8*12                  | 10                        | 1968                    | 4100                                                     |
|                      | 1000                      | 8*12                  | 10                        | 2400                    | 4100                                                     |
|                      | 1000                      | 10*12.5               | 8                         | 2400                    | 4800                                                     |
|                      | 1200                      | 10*12.5               | 8                         | 2880                    | 4800                                                     |
|                      | 1500                      | 10*12.5               | 8                         | 3600                    | 4800                                                     |
| 16                   | 100                       | 5*8                   | 15                        | 500                     | 2500                                                     |
|                      | 150                       | 5*8                   | 15                        | 500                     | 2500                                                     |
|                      | 150                       | 6.3*8                 | 12                        | 500                     | 2900                                                     |
|                      | 180                       | 5*9                   | 15                        | 576                     | 2900                                                     |
|                      | 220                       | 5*9                   | 15                        | 704                     | 2900                                                     |
|                      | 220                       | 6.3*8                 | 12                        | 704                     | 3500                                                     |
|                      | 220                       | 8*9                   | 11                        | 704                     | 3900                                                     |
|                      | 270                       | 5*11                  | 12                        | 864                     | 3500                                                     |
|                      | 270                       | 6.3*8                 | 12                        | 864                     | 3500                                                     |
|                      | 270                       | 8*9                   | 11                        | 864                     | 3900                                                     |
|                      | 330                       | 6.3*8                 | 12                        | 1056                    | 3500                                                     |
|                      | 330                       | 6.3*12                | 12                        | 1056                    | 3900                                                     |
|                      | 470                       | 6.3*12                | 12                        | 1504                    | 3900                                                     |
|                      | 470                       | 8*9                   | 11                        | 1504                    | 4100                                                     |

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### ◆ 尺寸与个技术参数一览表Standard Ratings

| Rated voltage<br>(V) | Rated capacitance<br>(uF) | Case size<br>ΦD×L(mm) | ESR(mΩ)<br>at 20℃,100 KHz | Leakage Current<br>(μA) | Rated ripple current<br>(mA <sub>rms</sub> /105℃/100kHz) |
|----------------------|---------------------------|-----------------------|---------------------------|-------------------------|----------------------------------------------------------|
| 16                   | 470                       | 8*12                  | 10                        | 1504                    | 4300                                                     |
|                      | 560                       | 6.3*12                | 12                        | 1792                    | 3900                                                     |
|                      | 680                       | 6.3*12                | 12                        | 2176                    | 3900                                                     |
|                      | 680                       | 6.3*14                | 10                        | 2176                    | 4300                                                     |
|                      | 680                       | 8*12                  | 10                        | 2176                    | 4300                                                     |
|                      | 820                       | 6.3*14                | 10                        | 2624                    | 4300                                                     |
|                      | 820                       | 8*12                  | 10                        | 2624                    | 4430                                                     |
|                      | 1000                      | 8*12                  | 10                        | 3200                    | 4430                                                     |
|                      | 1000                      | 10*12.5               | 8                         | 3200                    | 5200                                                     |
|                      | 1500                      | 10*12.5               | 8                         | 4800                    | 5200                                                     |
| 25                   | 47                        | 5*8                   | 20                        | 500                     | 1300                                                     |
|                      | 68                        | 5*8                   | 20                        | 500                     | 1300                                                     |
|                      | 100                       | 5*8                   | 20                        | 500                     | 1300                                                     |
|                      | 100                       | 5*9                   | 20                        | 500                     | 1350                                                     |
|                      | 100                       | 6.3*8                 | 15                        | 500                     | 2500                                                     |
|                      | 150                       | 5*11                  | 15                        | 500                     | 2350                                                     |
|                      | 150                       | 6.3*7                 | 15                        | 750                     | 2100                                                     |
|                      | 220                       | 5*11                  | 15                        | 750                     | 2350                                                     |
|                      | 220                       | 6.3*7                 | 15                        | 1100                    | 2100                                                     |
|                      | 220                       | 6.3*8                 | 15                        | 1100                    | 2500                                                     |
|                      | 220                       | 6.3*12                | 15                        | 1100                    | 3100                                                     |
|                      | 330                       | 6.3*12                | 15                        | 1650                    | 3900                                                     |
|                      | 330                       | 8*9                   | 12                        | 1650                    | 3900                                                     |
|                      | 330                       | 8*12                  | 12                        | 1650                    | 4450                                                     |
|                      | 470                       | 6.3*14                | 12                        | 2350                    | 4320                                                     |
|                      | 470                       | 8*12                  | 12                        | 2350                    | 4450                                                     |
|                      | 470                       | 10*12.5               | 10                        | 2350                    | 5050                                                     |
|                      | 560                       | 6.3*14                | 12                        | 2800                    | 4320                                                     |
|                      | 560                       | 8*12                  | 12                        | 2800                    | 4450                                                     |
|                      | 680                       | 6.3*16                | 12                        | 3400                    | 4450                                                     |
|                      | 680                       | 8*12                  | 12                        | 3400                    | 4450                                                     |
|                      | 820                       | 8*14                  | 12                        | 4100                    | 4800                                                     |
|                      | 820                       | 10*12.5               | 10                        | 4100                    | 5050                                                     |
|                      | 1000                      | 8*14                  | 12                        | 5000                    | 4800                                                     |
|                      | 1000                      | 10*12.5               | 10                        | 5000                    | 5050                                                     |
|                      | 1200                      | 10*12.5               | 10                        | 6000                    | 5050                                                     |
|                      | 1500                      | 10*15                 | 10                        | 7500                    | 5200                                                     |