

## HIGH TEMPERATURE

### 高温品

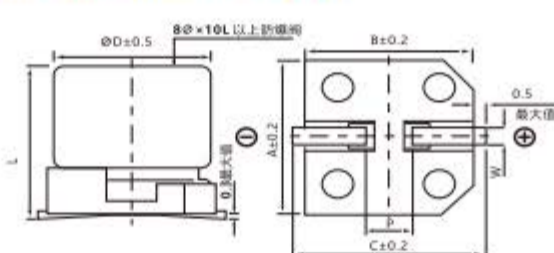
- High temperature range up to  $-40\sim+125^{\circ}\text{C}$   
适用于  $-40\sim+125^{\circ}\text{C}$  的高温范围
- Suitable for automotive equipment  
适用于汽车电子装备
- Load life of 1000~3000 hours  
负荷寿命1000~3000 小时
- Comply with the RoHS directive  
符合 RoHS 指令



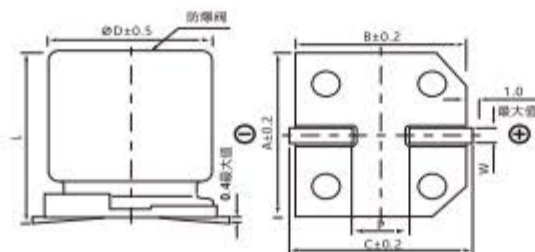
### SPECIFICATIONS 特性表

| Items 项目                                 | Characteristics 主要特性  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
|--|---|--|---|--------------------------|---|---------------------|--|---------|---------------------|--------------------------|--|---------------------|--------------------------|------|------|--|------|------|------|------|---------------|-----------------------------|--|------|------|------|------|--|------|------|------|---|
| Operation Temperature Range 使用温度范围       | $-40\sim+125^{\circ}\text{C}$   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Voltage Range 额定工作电压范围                   | 10~450V   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Capacitance Range 静电容量范围                 | 3.3~2200 $\mu\text{F}$  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Capacitance Tolerance 静电容量允许偏差           | $\pm 20\%$ at 120Hz, $20^{\circ}\text{C}$   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Leakage Current 漏电流                      | Leakage current (10V~100V) $\leq 0.03\text{CV}$ or $4\mu\text{A}$ , whichever is greater (after 2 minutes application of rated voltage)<br>Leakage current (160V~450V) $\leq 0.04\text{CV} + 100\mu\text{A}$ , whichever is greater (after 2 minutes application of rated voltage)<br>漏电流 (10V~100V) $\leq 0.03\text{CV}$ 或 $4\mu\text{A}$ , 取较大值 (施加额定工作电压2分钟后)<br>漏电流 (160V~450V) $\leq 0.04\text{CV} + 100\mu\text{A}$ , 取较大值 (施加额定工作电压2分钟后)   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Dissipation Factor (tan $\delta$ ) 损耗角正切 | Measurement frequency 测试频率: 120Hz, Temperature 温度: $20^{\circ}\text{C}$<br><table border="1"> <thead> <tr> <th>Rated Voltage (V) 额定工作电压</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160~250</th> <th>400,450</th> </tr> </thead> <tbody> <tr> <td>tan <math>\delta</math>(max.)</td> <td><math>\phi 4\text{--}\phi 10</math></td> <td>0.24</td> <td>0.20</td> <td>0.18</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> <td></td> </tr> <tr> <td>最大损耗角正切</td> <td><math>\phi 12.5\text{--}\phi 16</math></td> <td>0.26</td> <td>0.22</td> <td>0.20</td> <td>0.18</td> <td>0.18</td> <td>0.16</td> <td>0.16</td> <td>0.20</td> </tr> </tbody> </table>   | Rated Voltage (V) 额定工作电压                               | 10  | 16                       | 25  | 35                  | 50                                     | 63      | 100                 | 160~250                  | 400,450  | tan $\delta$ (max.) | $\phi 4\text{--}\phi 10$ | 0.24 | 0.20 | 0.18   | 0.16 | 0.16 | 0.14 | 0.14 |               | 最大损耗角正切                     | $\phi 12.5\text{--}\phi 16$                            | 0.26 | 0.22 | 0.20 | 0.18 | 0.18   | 0.16 | 0.16 | 0.20 |   |
| Rated Voltage (V) 额定工作电压                 | 10  | 16   | 25  | 35                       | 50  | 63                  | 100                                    | 160~250 | 400,450             |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| tan $\delta$ (max.)                      | $\phi 4\text{--}\phi 10$  | 0.24   | 0.20  | 0.18                     | 0.16  | 0.16                | 0.14                                   | 0.14    |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| 最大损耗角正切                                  | $\phi 12.5\text{--}\phi 16$   | 0.26   | 0.22  | 0.20                     | 0.18  | 0.18                | 0.16                                   | 0.16    | 0.20                |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Stability at Low Temperature 低温特性        | Measurement frequency 测试频率: 120Hz<br><table border="1"> <thead> <tr> <th>Rated Voltage (V) 额定工作电压</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100</th> <th>160~250</th> <th>400,450</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance Ratio 阻抗比</td> <td rowspan="2"><math>\phi 4\text{--}\phi 10</math></td> <td>Z(<math>-25^{\circ}\text{C}</math>) / Z(<math>20^{\circ}\text{C}</math>)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(<math>-40^{\circ}\text{C}</math>) / Z(<math>20^{\circ}\text{C}</math>)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> </tr> <tr> <td rowspan="2">ZT/Z20 (max.)</td> <td rowspan="2"><math>\phi 12.5\text{--}\phi 16</math></td> <td>Z(<math>-25^{\circ}\text{C}</math>) / Z(<math>20^{\circ}\text{C}</math>)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(<math>-40^{\circ}\text{C}</math>) / Z(<math>20^{\circ}\text{C}</math>)</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </tbody> </table> | Rated Voltage (V) 额定工作电压                               | 10  | 16                       | 25  | 35~100              | 160~250                                | 400,450 | Impedance Ratio 阻抗比 | $\phi 4\text{--}\phi 10$ | Z( $-25^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 4                   | 3                        | 2    | 2    | Z( $-40^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 10   | 8    | 6    | 4    | ZT/Z20 (max.) | $\phi 12.5\text{--}\phi 16$ | Z( $-25^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 4    | 3    | 2    | 2    | Z( $-40^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 8    | 6    | 4    | 3 |
| Rated Voltage (V) 额定工作电压                 | 10  | 16   | 25  | 35~100                   | 160~250   | 400,450             |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Impedance Ratio 阻抗比                      | $\phi 4\text{--}\phi 10$  | Z( $-25^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 4   | 3                        | 2   | 2                   |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
|  |   | Z( $-40^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 10  | 8                        | 6   | 4                   |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| ZT/Z20 (max.)                            | $\phi 12.5\text{--}\phi 16$   | Z( $-25^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 4   | 3                        | 2   | 2                   |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
|  |   | Z( $-40^{\circ}\text{C}$ ) / Z( $20^{\circ}\text{C}$ ) | 8   | 6                        | 4   | 3                   |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Load Life 高温负荷特性                         | After 3000 hrs. application of the rated voltage for $\phi 12.5\text{--}16$ (10~100V), and 2000 hrs. for $\phi 8 \times 10.5\text{--}\phi 10$ (10~100V), and 1000 hrs. for $\phi 6.3$ , as well as 3000 hrs. application of rated voltage for $\phi 12.5\text{--}16$ (160~450V) at $125^{\circ}\text{C}$ , they meet the characteristics listed below. 在 $125^{\circ}\text{C}$ 环境中施加额定工作电压3000 小时于 $\phi 12.5\text{--}16$ (10~100V), 2000 小时于 $\phi 8 \times 10.5\text{--}\phi 10$ (10~100V), 1000 小时于 $\phi 6.3$ , 以及施加 额定工作电压3000 小时于 $\phi 12.5\text{--}16$ (160~450V)后, 电容器的特性符合下表的要求。<br><table border="1"> <tbody> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within <math>\pm 30\%</math> of initial value 初始值的 <math>\pm 30\%</math>以内</td> </tr> <tr> <td>Dissipation Factor 损耗角正切</td> <td>300% or less of initial specified value 不大于规范值的300%</td> </tr> <tr> <td>Leakage Current 漏电流</td> <td>initial specified value or less 不大于规范值</td> </tr> </tbody> </table>                             | Capacitance Change 静电容量变化率                             | Within $\pm 30\%$ of initial value 初始值的 $\pm 30\%$ 以内 | Dissipation Factor 损耗角正切 | 300% or less of initial specified value 不大于规范值的300% | Leakage Current 漏电流 | initial specified value or less 不大于规范值 |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Capacitance Change 静电容量变化率               | Within $\pm 30\%$ of initial value 初始值的 $\pm 30\%$ 以内   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Dissipation Factor 损耗角正切                 | 300% or less of initial specified value 不大于规范值的300%   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Leakage Current 漏电流                      | initial specified value or less 不大于规范值  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Shelf Life 高温贮存特性                        | After leaving capacitors under no load at $125^{\circ}\text{C}$ for 1000 hours, they meet the specified value for load life characteristics listed above. 在 $125^{\circ}\text{C}$ 环境中无负荷放置1000 小时后, 电容器的特性符合高温负荷特性中所列的规定值。  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Resistance to Soldering Heat 耐焊接热特性      | After reflow soldering and restored at room temperature, they meet the characteristics listed below. 经过回流焊并冷却至室温后, 电容器的特性符合下表的要求。<br><table border="1"> <tbody> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within <math>\pm 10\%</math> of initial value 初始值的 <math>\pm 10\%</math>以内</td> </tr> <tr> <td>Dissipation Factor 损耗角正切</td> <td>initial specified value or less 不大于规范值</td> </tr> <tr> <td>Leakage Current 漏电流</td> <td>initial specified value or less 不大于规范值</td> </tr> </tbody> </table>   | Capacitance Change 静电容量变化率                             | Within $\pm 10\%$ of initial value 初始值的 $\pm 10\%$ 以内 | Dissipation Factor 损耗角正切 | initial specified value or less 不大于规范值              | Leakage Current 漏电流 | initial specified value or less 不大于规范值 |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Capacitance Change 静电容量变化率               | Within $\pm 10\%$ of initial value 初始值的 $\pm 10\%$ 以内   |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Dissipation Factor 损耗角正切                 | initial specified value or less 不大于规范值  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Leakage Current 漏电流                      | initial specified value or less 不大于规范值  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |
| Marking 标识                               | Black print on the case top. 铝壳顶部黑字印刷。  |  |   |                          |   |                     |  |         |                     |                          |  |                     |                          |      |      |  |      |      |      |      |               |                             |  |      |      |      |      |  |      |      |      |   |

### Diagram of Dimensions 尺寸图



$\phi D=4\sim 10$  适用



$\phi 12.5$  以上适用

### DIMENSIONS (Unit: mm) 尺寸表

| DXL         | 6.3X5.8       | 6.3X7.7       | 8X10.5         | 10X10.5        | 10X13.5        | 12.5X13.5      | 12.5X16      | 16X16.5        |
|-------------|---------------|---------------|----------------|----------------|----------------|----------------|--------------|----------------|
| A           | 6.6           | 6.6           | 8.3            | 10.3           | 10.3           | 13.0           | 13.0         | 17.0           |
| B           | 6.6           | 6.6           | 8.3            | 10.3           | 10.3           | 13.0           | 13.0         | 17.0           |
| C           | 7.2           | 7.2           | 9.2            | 11.2           | 11.2           | 13.7           | 13.7         | 18.0           |
| P $\pm 0.2$ | 2.0           | 2.0           | 3.1            | 4.4            | 4.4            | 4.4            | 4.4          | 6.4            |
| L           | 5.8 $\pm 0.3$ | 7.7 $\pm 0.3$ | 10.5 $\pm 0.5$ | 10.5 $\pm 0.5$ | 13.5 $\pm 0.5$ | 13.5 $\pm 0.5$ | 16 $\pm 0.5$ | 16.5 $\pm 0.5$ |

□ DRAWING (Unit: mm) 外形图



□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & ESR 规格尺寸及最大允许纹波电流及ESR值

| Parameter<br>参数 | WV  | 10 (1A)   |                                       |  |   | 16 (1C)   |                                       |  |   | 25 (1E)   |                                       |  |   |
|-----------------|-----|---|---------------------------------------|--|---|---|---------------------------------------|--|---|---|---------------------------------------|--|---|
|                 |     | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms)<br>at 125°C,<br>100KHz<br>纹波电流 | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms)<br>at 125°C,<br>100KHz<br>纹波电流 | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms)<br>at 125°C,<br>100KHz<br>纹波电流 |
| 33              | 330 |   |                                       |  |   |   |                                       |  |   | 6.3 × 5.8   | 3.3                                   | 66                                     | 45  |
| 47              | 470 |   |                                       |  | 6.3 × 5.8   | 3.3   | 66                                    | 43                                     | 6.3 × 7.7   | 2.3   | 46                                    | 68                                     |   |
| 100             | 101 | 6.3 × 7.7   | 2.3                                   | 46                                     | 72  | 8 × 10.5  | 1.0                                   | 20                                     | 115   | 8 × 10.5  | 1.0                                   | 20                                     | 126   |
| 220             | 221 | 8 × 10.5  | 1.0                                   | 20                                     | 136   | 10 × 10.5   | 0.7                                   | 13.4                                   | 175   | 10 × 10.5   | 0.7                                   | 13.4                                   | 211   |
| 330             | 331 | 10 × 10.5   | 0.7                                   | 13.4                                   | 188   | 10 × 13.5   | 0.5                                   | 9.5                                    | 280   | 12.5 × 13.5<br>(10 × 13.5)                          | 0.14<br>(0.5)                         | 2.1<br>(9.5)                           | 750<br>(270)  |
| 470             | 471 | 10 × 13.5   | 0.5                                   | 9.5                                    | 300   | 12.5 × 13.5   | 0.14                                  | 2.1                                    | 750   | 12.5 × 13.5   | 0.14                                  | 2.1                                    | 750   |
| 680             | 681 | 12.5 × 13.5   | 0.14                                  | 2.1                                    | 750   | 16 × 16.5<br>(12.5 × 13.5)                          | 0.10<br>(0.14)                        | 1.5<br>(2.1)                           | 1000<br>(750)   | 16 × 16.5   | 0.10                                  | 1.5                                    | 1000  |
| 1000            | 102 | 12.5 × 16<br>(12.5 × 13.5)                          | 0.11<br>(0.14)                        | 1.5<br>(2.1)                           | 900<br>(750)  |   |                                       |  |   |   |                                       |  |   |
| 2200            | 222 | 16 × 16.5   | 0.10                                  | 1.5                                    | 1000  |   |                                       |  |   |   |                                       |  |   |

| Parameter<br>参数 | WV  | 35 (1V)   |                                       |  |   | 50 (1H)   |                                       |  |   |
|-----------------|-----|---|---------------------------------------|--|---|---|---------------------------------------|--|---|
|                 |     | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms) at<br>125°C,<br>100KHz<br>纹波电流 | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms) at<br>125°C,<br>100KHz<br>纹波电流 |
| 10              | 100 | 6.3 × 5.8   | 3.3                                   | 66                                     | 38  | 6.3 × 7.7<br>(6.3 × 5.8)                            | 2.3<br>(3.3)                          | 46<br>(66)                             | 50<br>(38)  |
| 22              | 220 | 6.3 × 5.8   | 3.3                                   | 66                                     | 39  | 6.3 × 7.7   | 2.3                                   | 46                                     | 50  |
| 33              | 330 | 6.3 × 7.7   | 2.3                                   | 46                                     | 62  | 8 × 10.5  | 1.0                                   | 20                                     | 83  |
| 47              | 470 | 8 × 10.5  | 1.0                                   | 20                                     | 92  | 10 × 10.5   | 0.7                                   | 13.4                                   | 111   |
| 100             | 101 | 10 × 10.5   | 0.7                                   | 13.4                                   | 151   | 12.5 × 13.5   | 0.23                                  | 3.5                                    | 550   |
| 220             | 221 | 12.5 × 13.5<br>(10 × 13.5)                          | 0.14<br>(0.5)                         | 2.1<br>(9.5)                           | 750<br>(260)  | 16 × 16.5<br>(12.5 × 13.5)                          | 0.15<br>(0.23)                        | 2.3<br>(3.5)                           | 850<br>(550)  |
| 330             | 331 | 12.5 × 13.5   | 0.14                                  | 2.1                                    | 750   | 16 × 16.5<br>(12.5 × 16)                            | 0.15<br>(0.18)                        | 2.3<br>(2.7)                           | 850<br>(700)  |
| 470             | 471 | 16 × 16.5<br>(12.5 × 16)                            | 0.10<br>(0.11)                        | 1.5<br>(1.5)                           | 1000<br>(900)   |   |                                       |  |   |

| Parameter<br>参数 | WV  | 63 (1J)   |                                       |  |   | 100 (2A)  |                                       |  |   |
|-----------------|-----|---|---------------------------------------|--|---|---|---------------------------------------|--|---|
|                 |     | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms) at<br>125°C,<br>100KHz<br>纹波电流 | Case size<br>$\varnothing D \times L$<br>(mm)<br>尺寸 | E.S.R.( $\Omega$ )<br>20°C<br>E.S.R.值 | E.S.R.( $\Omega$ )<br>-40°C<br>E.S.R.值 | Ripple current<br>(mA rms) at<br>125°C,<br>100KHz<br>纹波电流 |
| 10              | 100 | 6.3 × 7.7   | 2.3                                   | 115                                    | 42  | 8 × 10.5  | 1.00                                  | 50                                     | 53  |
| 22              | 220 | 8 × 10.5  | 1.0                                   | 50                                     | 56  | 10 × 10.5   | 0.70                                  | 35                                     | 63  |
| 33              | 330 | 10 × 10.5   | 0.7                                   | 35                                     | 77  | 10 × 13.5   | 0.45                                  | 22.5                                   | 130   |
| 47              | 470 | 10 × 13.5   | 0.45                                  | 22.5                                   | 150   | 12.5 × 13.5   | 0.33                                  | 16.5                                   | 450   |
| 68              | 680 |   |                                       |  |   | 12.5 × 16   | 0.26                                  | 13                                     | 550   |
| 100             | 101 | 12.5 × 13.5   | 0.25                                  | 12.5                                   | 500   | 16 × 16.5   | 0.24                                  | 12                                     | 650   |
| 220             | 221 | 12.5 × 16   | 0.20                                  | 10                                     | 600   |   |                                       |  |   |
| 330             | 331 | 16 × 16.5   | 0.18                                  | 9                                      | 820   |   |                                       |  |   |

□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT 规格尺寸及最大允许纹波电流

| μF  | VV Code 代码 | 160         |     | 200         |     | 250       |     | 400         |     | 450          |                     |
|-----|------------|-------------|-----|-------------|-----|-----------|-----|-------------|-----|--------------|---------------------|
|     |            | 2C          |     | 2D          |     | 2E        |     | 2G          |     | 2W           |                     |
| 3.3 | 3R3        |             |     |             |     |           |     |             |     | 12.5 × 16    | 65                  |
| 4.7 | 4R7        |             |     |             |     |           |     | 12.5 × 13.5 | 70  | 16 × 16.5    | 85                  |
| 6.8 | 6R8        |             |     |             |     |           |     | 16 × 16.5   | 100 |              |                     |
| 10  | 100        | 12.5 × 13.5 | 100 | 12.5 × 13.5 | 100 | 12.5 × 16 | 110 |             |     | Case size 尺寸 | Ripple current 纹波电流 |
| 22  | 220        | 16 × 16.5   | 180 | 16 × 16.5   | 180 |           |     |             |     |              |                     |

•Case size ∅D×L(mm), ripple current (mA rms) at 125°C, 120Hz •尺寸∅D×L(mm), 纹波电流(mA rms)于125°C, 120Hz

□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 纹波电流频率补偿系数

| Frequency 频率   |         | 50Hz         | 120Hz | 1KHz | 10KHz~ | 100KHz~ |
|----------------|---------|--------------|-------|------|--------|---------|
| Coefficient 系数 | 10~100V | 10 ~ 100μF   | 0.35  | 0.40 | 0.75   | 1.00    |
|                |         | 220 ~ 470μF  | 0.35  | 0.50 | 0.85   | 1.00    |
|                |         | 680 ~ 2200μF | 0.40  | 0.60 | 0.85   | 0.95    |

| Frequency 频率   |          | 50Hz | 120Hz | 300Hz | 1KHz | 10KHz | 100KHz~ |
|----------------|----------|------|-------|-------|------|-------|---------|
| Coefficient 系数 | 160~450V | 0.75 | 1.00  | 1.25  | 1.50 | 1.75  | 1.80    |

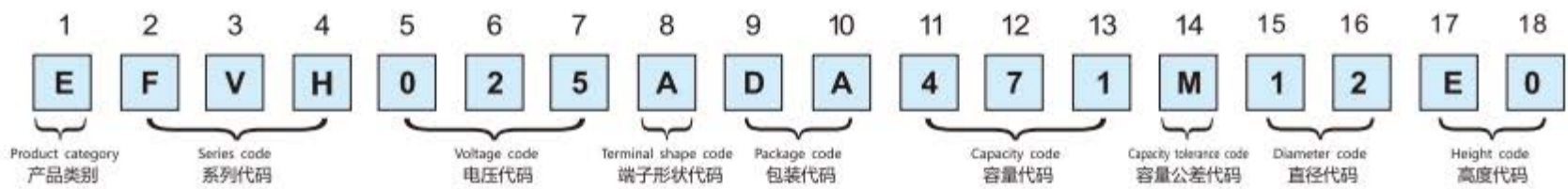
● The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

● 铝电解电容器由于在纹波电流叠加时自我发热，温度上升而老化，每升温10°C寿命减少一半；要想保持长寿命请在使用过程中降低纹波电流。

● Taping specifications are given in page 17 "Taping Specifications". 编带标准请参阅第 17 页“编带标准”。

● Please refer to page 18 "Package Quantity" for the minimum package quantity. 最小包装数量请参阅第 18 页“包装数量”。

## SMD EXPLANATION OF PART NUMBERS 贴片产品编码规则

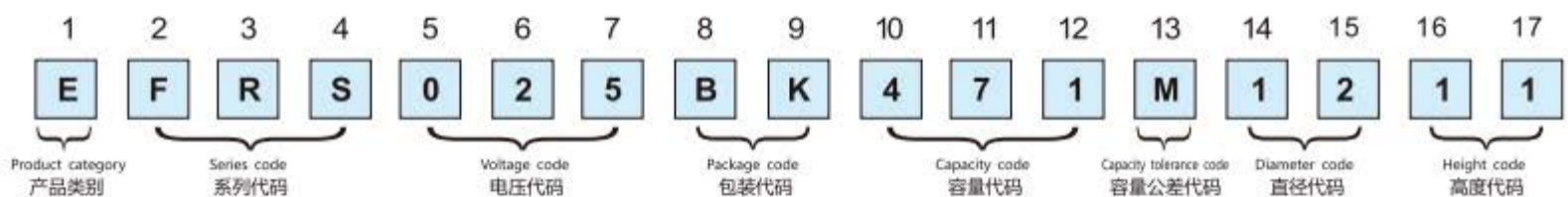


| (2, 3, 4) |                  |         | (5, 6, 7)             |         | (11, 12, 13)            |         | (14)                      | (8) |         | (15, 16)        |         | (17, 18)       |         |
|-----------|------------------|---------|-----------------------|---------|-------------------------|---------|---------------------------|-----|---------|-----------------|---------|----------------|---------|
| Series 系列 | Voltage (w.v) 电压 | Code 代码 | Capacitance (uF) 静电容量 | Code 代码 | Cap. Tolerance (%) 容量允许 | Code 代码 | Tape 端子类型                 |     | Code 代码 | Diameter (∅) 直径 | Code 代码 | Length (mm) 高度 | Code 代码 |
| FVE       | 4                | 4R0     | 0.1                   | 0R1     | ±10                     | K       | No dummy terminal 无辅助端子   |     | A       | 4               | 04      | 4.5            | 45      |
| FVH       | 6.3              | 6R3     | 0.22                  | R22     | ±20                     | M       | With dummy terminal 有辅助端子 |     | G       | 5               | 05      | 5.4            | 54      |
| FVA       | 10               | 010     | 1                     | 010     |                         |         |                           |     |         | 6.3             | 06      | 5.8            | 58      |
| FVZ       | 16               | 016     | 4.7                   | 4R7     |                         |         |                           |     |         | 8               | 08      | 6.5            | 65      |
| FVR       | 25               | 025     | 10                    | 100     |                         |         |                           |     |         | 10              | 10      | 7.7            | 77      |
| FVL       | 35               | 035     | 47                    | 470     |                         |         |                           |     |         | 12.5            | 12      | 10.2           | A0      |
| FVM       | 50               | 050     | 100                   | 101     |                         |         |                           |     |         | 16              | 16      | 10.5           | B0      |
| FVU       | 63               | 063     | 470                   | 471     |                         |         |                           |     |         | 18              | 18      | 13.5           | E0      |
| FVG       | 100              | 100     | 1000                  | 102     |                         |         |                           |     |         |                 |         | 16             | G5      |
| FVB       | 160              | 160     | 4700                  | 472     |                         |         |                           |     |         |                 |         | 16.5           | H0      |
| FVN       | 250              | 250     | 10000                 | 103     |                         |         |                           |     |         |                 |         | 21.5           | N0      |
| FVD       | 350              | 350     |                       |         |                         |         |                           |     |         |                 |         |                |         |
| FVC       | 400              | 400     |                       |         |                         |         |                           |     |         |                 |         |                |         |

| (9, 10)         |             | External diameter 纸盘外径 | Fit size 适合尺寸 | Code 代码 |
|-----------------|-------------|------------------------|---------------|---------|
| Packaging 包装要求  | Branding 编带 | □(mm)                  | □D(mm)        |         |
|                 |             | Paper tray 纸盘          | 380           | ∅D4~18  |
| Glue tray 胶盘    |             | 330                    | ∅D4~18        | DB      |
| Blister box 吸塑盒 |             | 380                    | ∅D4~10        | RA      |
|                 |             | -                      | ∅D12.5~18     | TR      |

## Radial EXPLANATION OF PART NUMBERS 插件产品编码规则



| (2, 3, 4) |                  |         | (5, 6, 7)             |         | (10, 11, 12)            | (13)    | (8, 9)                  |  | (14, 15) |                 | (16, 17) |                |         |
|-----------|------------------|---------|-----------------------|---------|-------------------------|---------|-------------------------|--|----------|-----------------|----------|----------------|---------|
| Series 系列 | Voltage (w.v) 电压 | Code 代码 | Capacitance (uF) 静电容量 | Code 代码 | Cap. Tolerance (%) 容量允许 | Code 代码 | Packaging 包装形式          |  | Code 代码  | Diameter (∅) 直径 | Code 代码  | Length (mm) 高度 | Code 代码 |
| FRA       | 4                | 4R0     | 0.1                   | 0R1     | ±10                     | K       | Long-legged bulk 长脚散装   |  | BK       | 4               | 04       | 4.5            | 04      |
| FRS       | 6.3              | 6R3     | 0.22                  | R22     | ±20                     | M       | Long-legged taping 长脚编带 |  | BA       | 5               | 05       | 5.5            | 05      |
| FRU       | 10               | 010     | 1                     | 010     |                         |         |                         |  |          | 6.3             | 06       | 6.0            | 06      |
| FRK       | 16               | 016     | 4.7                   | 4R7     |                         |         |                         |  |          | 8               | 08       | 6.5            | 06      |
| FBR       | 25               | 025     | 10                    | 100     |                         |         |                         |  |          | 10              | 10       | 7.0            | 07      |
| FBU       | 35               | 035     | 47                    | 470     |                         |         |                         |  |          | 12.5            | 12       | 8.0            | 08      |
|           | 50               | 050     | 100                   | 101     |                         |         |                         |  |          | 16              | 16       | 10             | 10      |
|           | 63               | 063     | 470                   | 471     |                         |         |                         |  |          | 18              | 18       | 11             | 11      |
|           | 100              | 100     | 1000                  | 102     |                         |         |                         |  |          |                 |          | 11.5           | 11      |
|           | 160              | 160     | 4700                  | 472     |                         |         |                         |  |          |                 |          | 12             | 12      |
|           | 250              | 250     | 10000                 | 103     |                         |         |                         |  |          |                 |          | 16             | 16      |
|           | 350              | 350     |                       |         |                         |         |                         |  |          |                 |          |                |         |
|           | 400              | 400     |                       |         |                         |         |                         |  |          |                 |          |                |         |

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