

NON-POLARIZED, LONG LIFE

无极性长寿命品

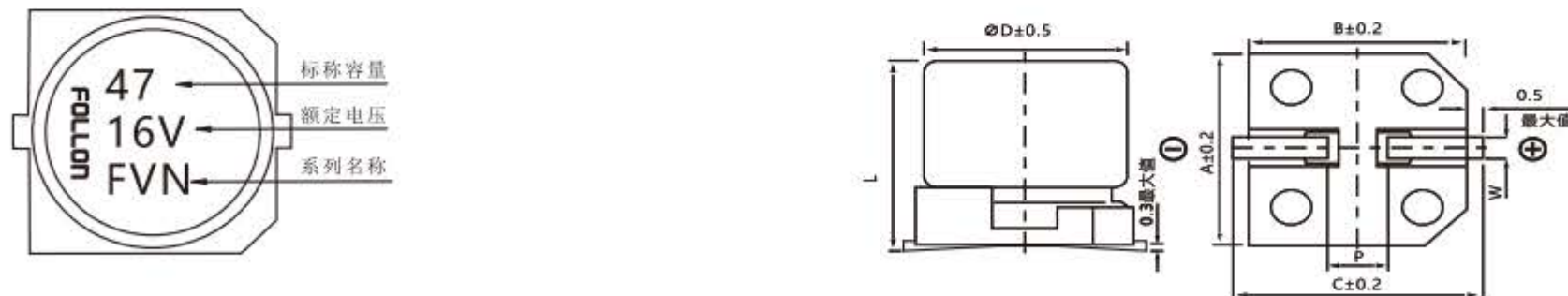
- Non-polarized with wide temperature range $-55^{\circ}\text{C} \sim +105^{\circ}\text{C}$
无极性和适用于 $-55^{\circ}\text{C} \sim +105^{\circ}\text{C}$ 的宽温范围
- Load life of 2000 hours
负荷寿命2000小时
- Comply with the RoHS directive
符合 RoHS 指令



SPECIFICATIONS 特性表

| Items 项目 | Characteristics 主要特性 | | | | | | | | | | | | | | | |
|---|--|---|---|--------------------------|---|---------------------|--|--|------|------|------|---|--|---|---|---|
| Operation Temperature Range 使用温度范围 | $-55 \sim +105^{\circ}\text{C}$ | | | | | | | | | | | | | | | |
| Voltage Range 额定工作电压范围 | 6.3 ~ 50V | | | | | | | | | | | | | | | |
| Capacitance Range 静电容量范围 | 0.1 ~ 100 μF | | | | | | | | | | | | | | | |
| Capacitance Tolerance 静电容量允许偏差 | $\pm 20\%$ at 120Hz, 20°C | | | | | | | | | | | | | | | |
| Leakage Current 漏电流 | Leakage current $\leq 0.05\text{CV}$ or $10\mu\text{A}$, whichever is greater (after 2 minutes application of rated voltage) 漏电流 $\leq 0.05\text{CV}$ 或 $10\mu\text{A}$, 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°C | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Rated Voltage (V) 额定工作电压</td> <td>6.3</td> <td>10</td> <td>16, 25</td> <td>35, 50</td> </tr> <tr> <td>$\tan\delta$ (max.) 最大损耗角正切</td> <td>0.24</td> <td>0.20</td> <td>0.18</td> <td>0.16</td> </tr> </table> | Rated Voltage (V) 额定工作电压 | 6.3 | 10 | 16, 25 | 35, 50 | $\tan\delta$ (max.) 最大损耗角正切 | 0.24 | 0.20 | 0.18 | 0.16 | | | | | |
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| $\tan\delta$ (max.) 最大损耗角正切 | 0.24 | 0.20 | 0.18 | 0.16 | | | | | | | | | | | | |
| Stability at Low Temperature 低温特性 | Measurement frequency 测试频率: 120Hz | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Rated Voltage (V) 额定工作电压</td> <td>6.3</td> <td>10</td> <td>16, 25</td> <td>35, 50</td> </tr> <tr> <td rowspan="2">Impedance Ratio 阻抗比</td> <td>$Z(-25^{\circ}\text{C}) / Z(20^{\circ}\text{C})$</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>$Z(-55^{\circ}\text{C}) / Z(20^{\circ}\text{C})$</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </table> | Rated Voltage (V) 额定工作电压 | 6.3 | 10 | 16, 25 | 35, 50 | Impedance Ratio 阻抗比 | $Z(-25^{\circ}\text{C}) / Z(20^{\circ}\text{C})$ | 4 | 3 | 2 | 2 | $Z(-55^{\circ}\text{C}) / Z(20^{\circ}\text{C})$ | 8 | 6 | 4 |
| Rated Voltage (V) 额定工作电压 | 6.3 | 10 | 16, 25 | 35, 50 | | | | | | | | | | | | |
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| | $Z(-55^{\circ}\text{C}) / Z(20^{\circ}\text{C})$ | 8 | 6 | 4 | 3 | | | | | | | | | | | |
| Load Life 高温负荷特性 | After 2000 hours application of the rated voltage at 105°C (the polarity needs to exchange every 250 hours), they meet the characteristics listed below. 在 105°C 环境中施加额定工作电压2000小时 (每250小时必须转换一次极性) 后, 电容器的特性符合下表的要求。 | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within $\pm 30\%$ of initial value 初始值的 $\pm 30\%$ 内</td> </tr> <tr> <td>Dissipation Factor 损耗角正切</td> <td>200% or less of initial specified value 不大于规范值的200%</td> </tr> <tr> <td>Leakage Current 漏电流</td> <td>initial specified value or less 不大于规范值</td> </tr> </table> | Capacitance Change 静电容量变化率 | Within $\pm 30\%$ of initial value 初始值的 $\pm 30\%$ 内 | Dissipation Factor 损耗角正切 | 200% or less of initial specified value 不大于规范值的200% | Leakage Current 漏电流 | initial specified value or less 不大于规范值 | | | | | | | | | |
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| 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 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 105°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。 | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within $\pm 10\%$ of initial value 初始值的 $\pm 10\%$ 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> </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 | | | | | | | | | |
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| 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。 | | | | | | | | | | | | | | | |

DRAWING (Unit: mm) 外形图



DIMENSIONS (Unit: mm) 尺寸表

| $\varnothing D \times L$ | 4x5.4 | 5x5.4 | 6.3x5.4 | 6.3x7.7 |
|--------------------------|---------------|---------------|---------------|---------------|
| A | 4.3 | 5.3 | 6.6 | 6.6 |
| B | 4.3 | 5.3 | 6.6 | 6.6 |
| C | 5.1 | 5.9 | 7.2 | 7.2 |
| $P \pm 0.2$ | 1.0 | 1.3 | 2.2 | 2.2 |
| L | 5.4 ± 0.3 | 5.4 ± 0.3 | 5.4 ± 0.3 | 7.7 ± 0.3 |

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

| μF | WV Code 代码 | 6.3 | | 10 | | 16 | | 25 | | 35 | | 50 | |
|------|------------------|-----------|----|-----------|----|-----------|----|-----------|----|-----------|-----|-----------------|---------------------------|
| | | 0J | | 1A | | 1C | | 1E | | 1V | | 1H | |
| 0.1 | 0R1 | | | | | | | | | | | 4 × 5.4 | 1.0 |
| 0.22 | R22 | | | | | | | | | | | 4 × 5.4 | 2.0 |
| 0.33 | R33 | | | | | | | | | | | 4 × 5.4 | 2.8 |
| 0.47 | R47 | | | | | | | | | | | 4 × 5.4 | 4.0 |
| 1 | 010 | | | | | | | | | | | 4 × 5.4 | 8.4 |
| 2.2 | 2R2 | | | | | | | | | 4 × 5.4 | 8.4 | 5 × 5.4 | 13 |
| 3.3 | 3R3 | | | | | | | 5 × 5.4 | 12 | 5 × 5.4 | 16 | 5 × 5.4 | 17 |
| 4.7 | 4R7 | | | | | 4 × 5.4 | 12 | 5 × 5.4 | 16 | 5 × 5.4 | 18 | 6.3 × 5.4 | 20 |
| 10 | 100 | | | 4 × 5.4 | 17 | 5 × 5.4 | 23 | 6.3 × 5.4 | 27 | 6.3 × 5.4 | 29 | 6.3 × 7.7 | 36 |
| 22 | 220 | 5 × 5.4 | 28 | 6.3 × 5.4 | 33 | 6.3 × 5.4 | 37 | 6.3 × 7.7 | 50 | 6.3 × 7.7 | 54 | | |
| 33 | 330 | 6.3 × 5.4 | 37 | 6.3 × 5.4 | 41 | 6.3 × 5.4 | 49 | 6.3 × 7.7 | 61 | | | | |
| 47 | 470 | 6.3 × 5.4 | 45 | 6.3 × 5.4 | 61 | 6.3 × 7.7 | 75 | | | | | Case size 尺寸 | Ripple current 纹波电流 |
| 100 | 101 | 6.3 × 7.7 | 82 | 6.3 × 7.7 | 85 | | | | | | | | |

•Case size ∅D×L(mm), ripple current (mA rms) at 105°C, 120Hz •尺寸∅D×L(mm), 纹波电流(mA rms)于105°C, 120Hz

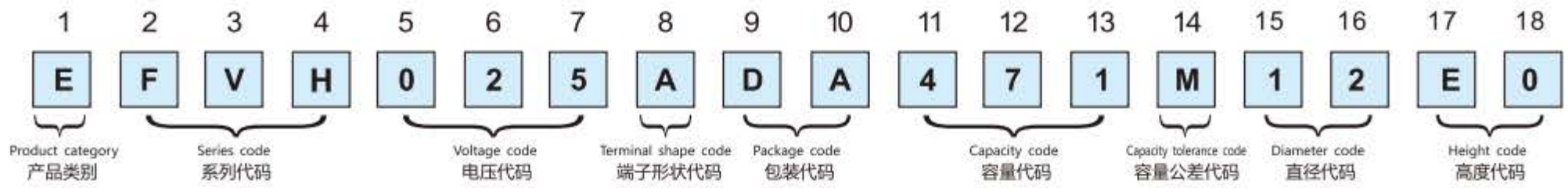
□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 纹波电流频率补偿系数

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

- 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"。

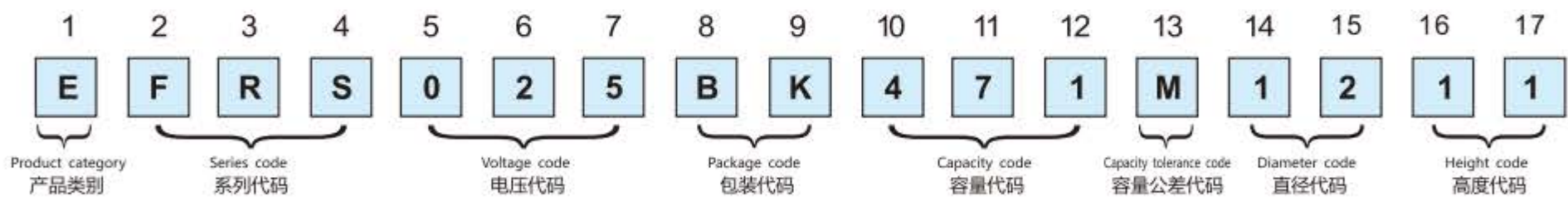
SMD EXPLANATION OF PART NUMBERS 贴片产品编码规则



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