# VD

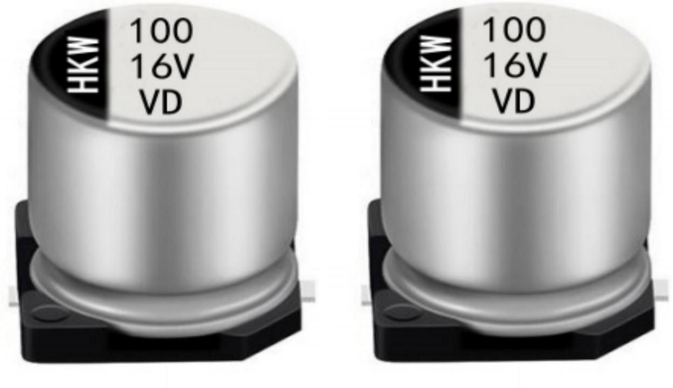
## 特点 Features

保证105℃ 3000~5000小时：Endurance 3000~5000h at 105℃

额定电压范围：6.3~100V。Rated Voltage Range:6.3~100V

低阻抗、长寿命品：Low ESR ,Long life Type

满足RoHS：RoHS Compliant




## 主要技术性能 Specifications

| 项目 Items | 特性 Performance Characteristics | |
|---|---|---|
| 类别温度范围<br>Category Temperature Range | -55℃ ~+105℃ | |
| 额定电压范围<br>Rated Voltage($U_R$) | 6.3 ~ 100V | |
| 标称电容量范围<br>Nominal Capacitance Range($C_R$) | 4.7 ~ 8200μF | 120Hz，+20℃ |
| 标称电容量允许偏差<br>Allowed Capacitance Tolerance($C_T$) | ±20%(M) | 120Hz，+20℃ |
| 漏电流<br>Leakage Current($I_L$) | ≤0.01$C_RU_R$ 或者 3μA<br>取较大值（Whichever is greater） | +20℃<br>after 2<br>minutes |
| 损耗角正切值<br>Tangent of loss angle(Tanδ) | | Max.<br>120Hz,+20℃ |

| $U_R$ | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| Tanδ | 0.26 | 0.20 | 0.16 | 0.14 | 0.12 | 0.12 | 0.10 | 0.08 | 0.07 |

| 低温特性<br>Characteristics at Low Temperature | | |
|---|---|---|
| | $U_R$(V) | 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 80 / 100 |
| | $Z_{(-25℃)}$ / $Z_{(+20℃)}$ | 4 / 3 / 2 / 2 / 2 / 2 / 2 / 2 / 2 |
| | $Z_{(-55℃)}$ / $Z_{(+20℃)}$ | 8 / 5 / 4 / 3 / 3 / 3 / 3 / 3 / 3 |
| | | Max.<br>120Hz |

| 耐久性<br>Load life | +105℃施加额定电压 5000 小时后（ΦD=4，5 和 6.3 为 3000 小时），恢复 16 小时后：<br>After applying rated voltage for 5000 hours(3000 hours for ϕD = 4, 5 and 6.3) at 105℃ and then recovery 16 hours: | |
|---|---|---|
| | 电容量变化率<br>Capacitance change | ±30%初始值以内<br>Within ±30% of initial value |
| | 损耗角正切值 Tanδ | ≤ 300%初始规定值<br>Not more than 300% of specified value |
| | 漏电流<br>Leakage current | ≤ 初始规定值<br>Not more than specified value |

| 高温贮存<br>Shelf life | +105℃,1000 小时贮存后,恢复 16 小时后：<br>After storage for 1000 hours at +105℃ and then recovery 16 hours: | |
|---|---|---|
| | 电容量变化率<br>Capacitance change | ±30%初始值以内<br>Within ±30% of initial value |
| | 损耗角正切值 Tanδ | ≤ 300%初始规定值<br>Not more than 300% of specified value |
| | 漏电流<br>Leakage current | ≤ 初始规定值<br>Not more than specified value |

| 耐焊接热<br>Resistance to Soldering Heat | 在 250℃的条件下，电容器在热板上保持 30 秒，然后从热板上取出电容器，让其在室温下恢复，电容器应满足以下要求：<br>The capacitors shall be kept on the hot plate maintained at 250℃ for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the following requirement. | |
|---|---|---|
| | 电容量变化率<br>Capacitance change | ±10%初始值以内<br>Within ±10% of initial value |
| | 损耗角正切值 Tanδ | ≤初始规定值<br>Not more than specified value |
| | 漏电流<br>Leakage current | ≤ 初始规定值<br>Not more than specified value |

HKWDZ

## 尺寸图 Dimensional drawings

Fig.1

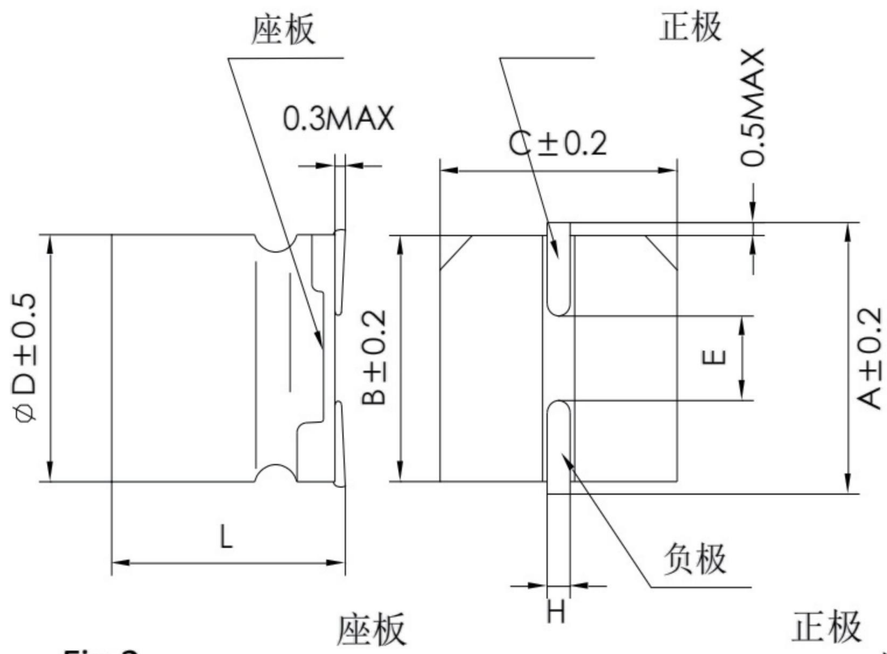
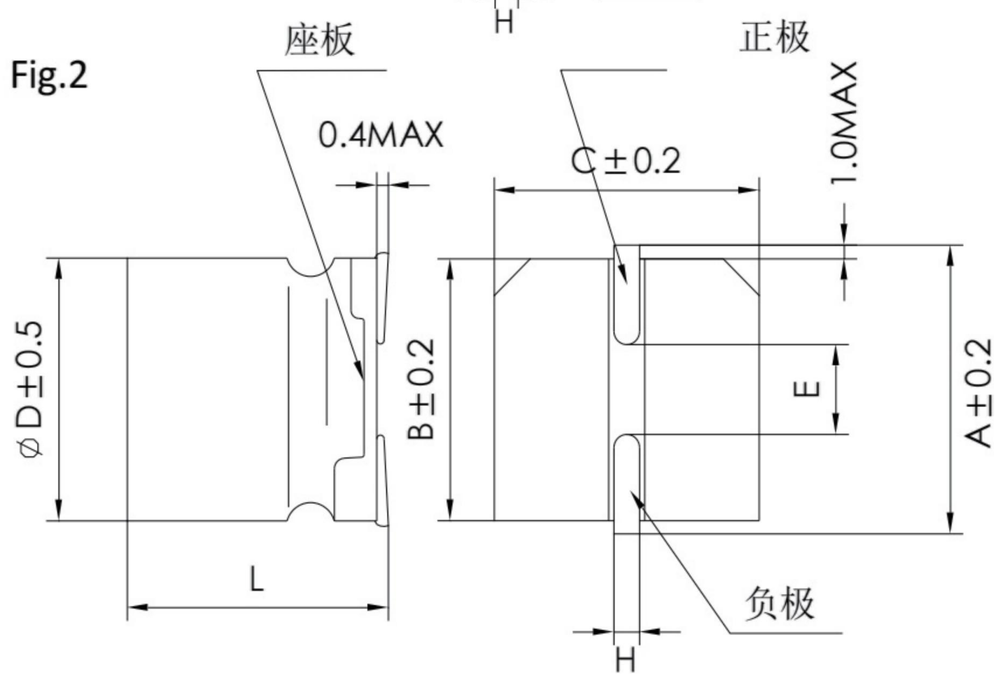
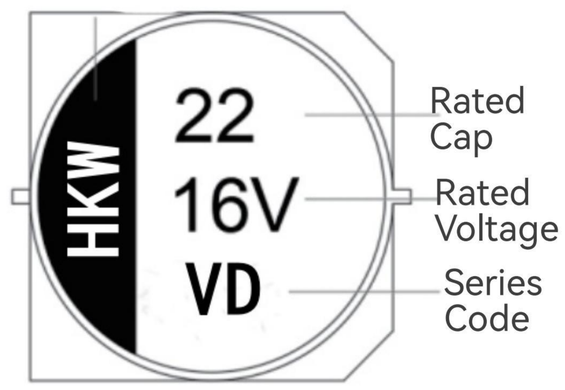



Fig.2

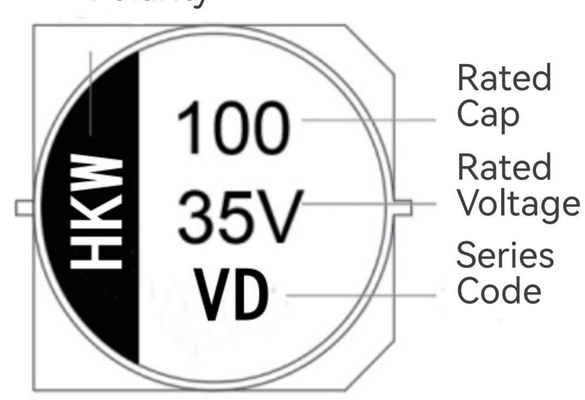



Marking

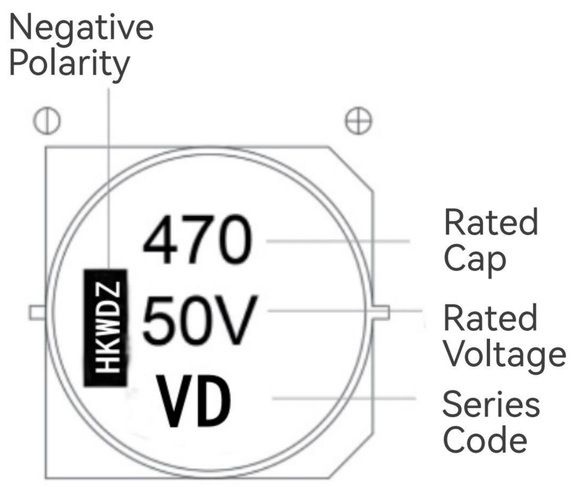
ΦD=4～5mm




ΦD=6.3~10.2mm




ΦD=12.5mm




## 尺寸表 size table

单位 Unit: mm

| ΦD | L | A | B | C | E±0.2 | H | Fig.No. |
|---|---|---|---|---|---|---|---|
| 4 | 5.8±0.3 | 5.0 | 4.3 | 4.3 | 1.0 | 0.5 ~ 0.8 | 1 |
| 5 | 5.8±0.3 | 6.0 | 5.3 | 5.3 | 1.3 | | |
| 6.3 | 5.8±0.3 | 7.3 | 6.6 | 6.6 | 2.2 | | |
| 6.3 | 7.7±0.3 | 7.3 | 6.6 | 6.6 | 2.2 | | |
| 8 | 6.5±0.3 | 8.9 | 8.3 | 8.3 | 2.3 | | |
| 8 | 10.5±0.5 | 9.0 | 8.3 | 8.3 | 3.1 | 0.8 ~ 1.1 | |
| 10 | 10.5±0.5 | 11.0 | 10.3 | 10.3 | 4.5 | | |
| 10 | 12.5±0.5 | 11.0 | 10.3 | 10.3 | 4.5 | | |
| 12.5 | 13.5±0.5 | 13.6 | 13 | 13 | 4.5 | 1.1 ~ 1.4 | 2 |
| 12.5 | 16±0.5 | 13.6 | 13 | 13 | 4.5 | | |
| 16 | 16.5±0.5 | 18.0 | 17 | 17 | 6.4 | | |
| 16 | 21.5±0.5 | 18.0 | 17 | 17 | 6.4 | | |
| 18 | 16.5±0.5 | 20.0 | 19 | 19 | 6.4 | | |
| 18 | 21.5±0.5 | 20.0 | 19 | 19 | 6.4 | | |

## 规格特性表 Table of specifications and characteristics

| $U_R$(V) / CAP(μF) | 6.3V | | | 10V | | | 16V | | | 25V | | | 35V | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω |
| 4.7 | | | | | | | | | | | | | 4*5.8 | 90 | 1.35 |
| 10 | | | | | | | 4*5.8 | 90 | 1.35 | 4*5.8 | 90 | 1.35 | 5*5.8 | 160 | 0.70 |
| 22 | 4*5.8 | 90 | 1.35 | 4*5.8 | 90 | 1.35 | 5*5.8 | 160 | 0.70 | 5*5.8 | 160 | 0.70 | 6.3*5.8 | 240 | 0.36 |
| 47 | 5*5.8 | 160 | 0.70 | 5*5.8 | 160 | 0.70 | 5*5.8 | 160 | 0.70 | 6.3*5.8 | 240 | 0.36 | 6.3*7.7 | 300 | 0.30 |
| 100 | 6.3*5.8 | 240 | 0.36 | 6.3*5.8 | 240 | 0.36 | 6.3*5.8 | 240 | 0.36 | 6.3*7.7 | 300 | 0.30 | 8*10.5 | 650 | 0.16 |
| 220 | 6.3*5.8 | 240 | 0.36 | 6.3*7.7 | 300 | 0.30 | 6.3*7.7 | 300 | 0.30 | 8*10.5 | 650 | 0.16 | 10*10.5 | 850 | 0.09 |
| 330 | 6.3*7.7 | 300 | 0.30 | 8*10.5 | 650 | 0.16 | 8*10.5 | 650 | 0.16 | 8*10.5 | 650 | 0.16 | 10*10.5 | 850 | 0.09 |
| 470 | 8*10.5 | 650 | 0.16 | 8*10.5 | 650 | 0.16 | 10*10.5 | 850 | 0.09 | 10*10.5 | 850 | 0.09 | 10*12.5 | 1090 | 0.065 |
| 680 | 8*10.5 | 650 | 0.16 | 10*10.5 | 850 | 0.09 | 10*10.5 | 850 | 0.09 | 12.5*13.5 | 1190 | 0.06 | 12.5*13.5 | 1190 | 0.06 |
| 1000 | 10*10.5 | 850 | 0.09 | 10*10.5 | 850 | 0.09 | 12.5*13.5 | 1190 | 0.06 | 12.5*16 | 1260 | 0.056 | 16*16.5 | 1800 | 0.038 |
| 1500 | 10*10.5 | 850 | 0.09 | 12.5*13.5 | 1190 | 0.06 | 12.5*16 | 1260 | 0.056 | 16*16.5 | 1800 | 0.038 | 18*16.5 | 1980 | 0.035 |
| 2200 | 12.5*13.5 | 1190 | 0.06 | 12.5*16 | 1260 | 0.056 | 16*16.5 | 1800 | 0.038 | 16*21.5 | 1650 | 0.038 | 18*21.5 | 2100 | 0.033 |
| 3300 | 12.5*16 | 1260 | 0.056 | 16*16.5 | 1800 | 0.038 | 16*16.5 | 1800 | 0.038 | 18*16.5 | 1980 | 0.035 | | | |
| 4700 | 16*16.5 | 1800 | 0.038 | 16*16.5 | 1800 | 0.038 | 18*16.5 | 1980 | 0.035 | | | | | | |
| 6800 | 18*16.5 | 1980 | 0.035 | 18*16.5 | 1980 | 0.035 | | | | | | | | | |
| 8200 | 18*21.5 | 2100 | 0.033 | 18*21.5 | 2100 | 0.033 | | | | | | | | | |

| $U_R$(V) / CAP(μF) | 50V | | | 63V | | | 80V | | | 100V | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω | ΦDxL mm*mm | $I_{AC,R}$ 100KHz 105℃ mA | $ESR_{max}$ 100KHz 25℃ Ω |
| 4.7 | 4*5.8 | 60 | 3.0 | 5*5.8 | 70 | 1.9 | | | | | | |
| 10 | 5*5.8 | 85 | 1.5 | 6.3*5.8 | 80 | 1.5 | 6.3*7.7 | 60 | 2.4 | 6.3*7.7 | 60 | 2.4 |
| 22 | 6.3*5.8 | 165 | 0.88 | 6.3*7.7 | 120 | 1.2 | 8*10.5 | 130 | 1.3 | 8*10.5 | 130 | 1.3 |
| 33 | 6.3*7.7 | 195 | 0.68 | 8*10.5 | 250 | 0.65 | 10*10.5 | 200 | 0.7 | 10*10.5 | 200 | 0.7 |
| 47 | 8*10.5 | 350 | 0.34 | 8*10.5 | 250 | 0.65 | 10*10.5 | 200 | 0.7 | 12.5*13.5 | 460 | 0.32 |
| 100 | 10*10.5 | 670 | 0.18 | 10*10.5 | 400 | 0.35 | 12.5*13.5 | 460 | 0.32 | 12.5*13.5 | 460 | 0.32 |
| 220 | 10*12.5 | 730 | 0.15 | 12.5*13.5 | 720 | 0.15 | 12.5*16 | 570 | 0.25 | 16*16.5 | 650 | 0.17 |
| 330 | 12.5*13.5 | 650 | 0.12 | 16*16.5 | 900 | 0.082 | 16*16.5 | 650 | 0.17 | 16*21.5 | 900 | 0.15 |
| 470 | 12.5*16 | 870 | 0.1 | 16*16.5 | 900 | 0.082 | 16*21.5 | 900 | 0.15 | 18*21.5 | 950 | 0.15 |
| 680 | 16*16.5 | 1000 | 0.073 | 16*21.5 | 1150 | 0.080 | 18*21.5 | 950 | 0.15 | | | |
| 1000 | 18*16.5 | 1500 | 0.066 | 18*21.5 | 1250 | 0.060 | | | | | | |
| 1500 | 18*21.5 | 1620 | 0.050 | | | | | | | | | |

## 额定纹波电流频率修正系数 Frequency correction factor for ripple current

| Frequency（Hz） | 50 | 120 | 300 | 1K | ≥ 10K |
|---|---|---|---|---|---|
| Coefficient（kf） | 0.35 | 0.50 | 0.64 | 0.83 | 1.00 |