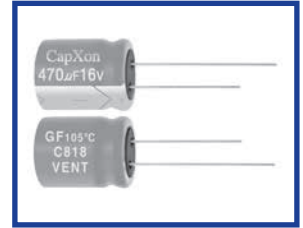


GF Series Low Impedance

Features

- ◆ Used in mother board, computer peripheral, etc.
- ◆ Endurance 3000 ~ 5000 Hrs at 105 °C
- ◆ Safety vent construction design.
- ◆ RoHS Compliant



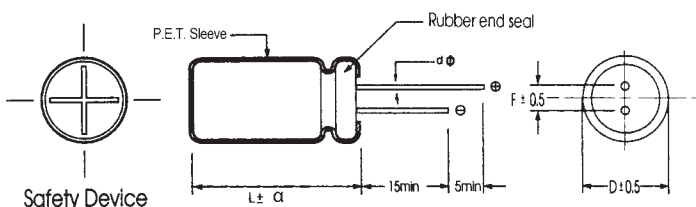
Specifications

| Item | Performance Characteristics | | | | | | | | |
|--|--|---------------------------------------|------------|----|----|----|----|----|-----|
| Operating Temperature Range | -55 to +105°C | | | | | | | | |
| Rated Voltage Range | 6.3 to 100 VDC | | | | | | | | |
| Capacitance Range | 4.7 to 6800 µF | | | | | | | | |
| Capacitance Tolerance | ±20% (120Hz, +20°C) | | | | | | | | |
| Leakage Current (+20°C, max.) | I ≤ 0.01 CV or 3 (µA) After 2 minutes whichever is greater measured with rated working voltage applied. | | | | | | | | |
| Dissipation Factor (tan δ, at 20°C, 120Hz) | Working Voltage (VDC) | 6.3 10 16 25 35 50 63 100 | | | | | | | |
| | D.F. (%)max | 16 14 12 10 9 8 8 8 | | | | | | | |
| Low Temperature Characteristics (at 120Hz) | Impedance ratio max | | | | | | | | |
| | Working Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| | Z(-25°C) / Z(20°C) | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| | Z(-40°C) / Z(20°C) | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 3 |
| Endurance | Test conditions | | | | | | | | |
| | Duration time | :as right | | | | | | | |
| Shelf Life | Test conditions | | | | | | | | |
| | Duration time | :1000Hrs | | | | | | | |
| Endurance | Ambient temperature | :+105°C | | | | | | | |
| | Applied voltage | :Rated DC working voltage | | | | | | | |
| Shelf Life | Ambient temperature | :+105°C | | | | | | | |
| | Applied voltage | :None | | | | | | | |
| Endurance | After test requirement at +20°C | | | | | | | | |
| | Capacitance change | :≤ ±20% of the initial measured value | | | | | | | |
| Shelf Life | After test requirement at +20°C: Same limits as Endurance. | | | | | | | | |
| | Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes. | | | | | | | | |
| Endurance | D φ | | Life hours | | | | | | |
| | 5 - 6.3 φ | | 3000 | | | | | | |
| Shelf Life | 8 φ | | 4000 | | | | | | |
| | ≥ 10 φ | | 5000 | | | | | | |

Multiplier for Ripple Current vs. Frequency

| CAP (µF) \ Frequency (Hz) | 50(60) | 120 | 400 | 1K | 10K | 50K-100K |
|---------------------------|--------|------|------|------|------|----------|
| CAP ≤ 10 | 0.47 | 0.59 | 0.76 | 0.85 | 0.97 | 1.0 |
| 10 < CAP ≤ 100 | 0.52 | 0.62 | 0.80 | 0.89 | 0.97 | 1.0 |
| 100 < CAP ≤ 1000 | 0.58 | 0.72 | 0.84 | 0.90 | 0.98 | 1.0 |
| 1000 < CAP | 0.63 | 0.78 | 0.87 | 0.91 | 0.98 | 1.0 |

Diagram of Dimensions: (unit:mm)



| D φ | 5 | 6.3 | 8 | 10 | 13 | 16 | 18 |
|-----|-----|--------|---------------|---------------|--------|-----|-----|
| F | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| d φ | 0.5 | | L < 20 0.5 | L ≥ 20 0.6 | 0.6 | | 0.8 |
| | α | | D = 18 | | D > 18 | | |
| | | D < 18 | L < 35.5 | L ≥ 35.5 | | | |
| | | 1.5 | 1.5 | 2.0 | 2.0 | | |

Case Size

| WV Cap(μF) | 6.3 | | | | 10 | | | | φ DxL(mm) |
|---------------|---------|--------|-----------|-------|---------|--------|-----------|-------|-----------|
| | Size | Ripple | Impedance | | Size | Ripple | Impedance | | |
| | | | +20°C | -10°C | | | +20°C | -10°C | |
| 68 | | | | | 5x11 | 190 | 0.70 | 2.065 | |
| 82 | | | | | 5x11 | 210 | 0.50 | 1.475 | |
| 100 | 5x11 | 200 | 0.40 | 1.240 | 5x11 | 242 | 0.31 | 0.915 | |
| 120 | 5x11 | 210 | 0.38 | 1.178 | 5x11 | 261 | 0.28 | 0.826 | |
| 150 | 5x11 | 225 | 0.35 | 1.085 | 6.3x11 | 300 | 0.26 | 0.767 | |
| 180 | 6.3x11 | 300 | 0.32 | 0.992 | 6.3x11 | 350 | 0.22 | 0.649 | |
| 220 | 6.3x11 | 360 | 0.25 | 0.775 | 6.3x11 | 390 | 0.18 | 0.531 | |
| 270 | 6.3x11 | 377 | 0.24 | 0.744 | 6.3x15 | 460 | 0.16 | 0.472 | |
| 330 | 6.3x11 | 395 | 0.20 | 0.465 | 8x11.5 | 540 | 0.11 | 0.325 | |
| 390 | 8x11.5 | 576 | 0.14 | 0.434 | 8x11.5 | 620 | 0.095 | 0.280 | |
| 470 | 8x11.5 | 600 | 0.095 | 0.294 | 8x11.5 | 750 | 0.075 | 0.221 | |
| 560 | 8x16 | 720 | 0.087 | 0.270 | 8x16 | 870 | 0.072 | 0.212 | |
| 680 | 8x16 | 800 | 0.080 | 0.248 | 8x20 | 1010 | 0.068 | 0.201 | |
| | 10x16 | 814 | 0.084 | 0.260 | | | | | |
| 820 | 8x20 | 970 | 0.070 | 0.217 | 8x20 | 1030 | 0.065 | 0.192 | |
| 1000 | 10x12.5 | 1000 | 0.055 | 0.168 | 8x20 | 1220 | 0.050 | 0.148 | |
| | | | | | 10x16 | 1400 | 0.042 | 0.124 | |
| | | | | | 10x20 | 1560 | 0.035 | 0.095 | |
| 1200 | 8x20 | 1150 | 0.048 | 0.146 | | | | | |
| | 10x16 | 1180 | 0.050 | 0.152 | | | | | |
| 1500 | 10x20 | 1400 | 0.045 | 0.137 | 10x20 | 1670 | 0.032 | 0.086 | |
| | 10x25 | 1560 | 0.043 | 0.131 | | | | | |
| 1800 | 10x20 | 1500 | 0.041 | 0.125 | 10x25 | 2000 | 0.028 | 0.076 | |
| 2200 | 10x25 | 1720 | 0.037 | 0.113 | 13x20 | 2370 | 0.025 | 0.065 | |
| | 13x20 | 1890 | 0.039 | 0.119 | | | | | |
| 2700 | 13x20 | 2080 | 0.034 | 0.095 | 13x20 | 2400 | 0.023 | 0.060 | |
| 3300 | 13x20 | 2290 | 0.026 | 0.073 | 13x25 | 2720 | 0.021 | 0.055 | |
| 3900 | 10x30 | 2450 | 0.024 | 0.067 | 13x30 | 3000 | 0.020 | 0.052 | |
| | 13x25 | 2670 | 0.022 | 0.062 | | | | | |
| 4700 | 13x30 | 3200 | 0.021 | 0.059 | 13x35 | 3450 | 0.019 | 0.049 | |
| 5600 | 13x35 | 3270 | 0.020 | 0.056 | 16x31.5 | 3460 | 0.018 | 0.047 | |
| 6800 | 16x31.5 | 3490 | 0.018 | 0.050 | 16x31.5 | 3630 | 0.016 | 0.042 | |

Ripple Current (mA, rms) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

φ pDxL(mm)

| WV Cap(μF) | 16 | | | | 25 | | | |
|---------------|---------|--------|-----------|-------|---------|--------|-----------|--------|
| | Size | Ripple | Impedance | | Size | Ripple | Impedance | |
| | | | +20°C | -10°C | | | +20°C | -10°C |
| 39 | | | | | 5x11 | 210 | 0.42 | 1.218 |
| 47 | 5x11 | 200 | 0.40 | 1.16 | 5x11 | 240 | 0.35 | 1.015 |
| 56 | 5x11 | 220 | 0.38 | 1.10 | 5x11 | 256 | 0.31 | 0.899 |
| 68 | 5x11 | 230 | 0.35 | 1.02 | 6.3x11 | 300 | 0.28 | 0.812 |
| 82 | 5x11 | 260 | 0.31 | 0.90 | 6.3x11 | 350 | 0.24 | 0.696 |
| 100 | 6.3x11 | 360 | 0.25 | 0.73 | 6.3x11 | 410 | 0.15 | 0.435 |
| 120 | 6.3x11 | 365 | 0.23 | 0.67 | 6.3x15 | 490 | 0.13 | 0.377 |
| 150 | 6.3x11 | 385 | 0.21 | 0.61 | 8x11.5 | 540 | 0.11 | 0.319 |
| 180 | 8x11.5 | 520 | 0.19 | 0.55 | 8x11.5 | 620 | 0.098 | 0.2842 |
| 220 | 8x11.5 | 575 | 0.14 | 0.41 | 8x11.5 | 750 | 0.075 | 0.218 |
| 270 | 8x11.5 | 600 | 0.12 | 0.35 | 8x16 | 850 | 0.063 | 0.183 |
| 330 | 8x11.5 | 740 | 0.08 | 0.23 | 8x16 | 990 | 0.056 | 0.1624 |
| | | | | | 10x12.5 | 1010 | 0.054 | 0.1566 |
| 390 | 8x16 | 790 | 0.075 | 0.22 | 10x12.5 | 1050 | 0.051 | 0.1479 |
| 470 | 8x16 | 990 | 0.062 | 0.18 | 8x20 | 1260 | 0.045 | 0.1305 |
| | 10x12.5 | 1000 | 0.058 | 0.17 | 10x16 | 1415 | 0.042 | 0.1218 |
| 560 | 8x20 | 1070 | 0.057 | 0.17 | 10x20 | 1450 | 0.040 | 0.116 |
| 680 | 8x20 | 1120 | 0.055 | 0.16 | 10x20 | 1570 | 0.035 | 0.1015 |
| | 10x16 | 1280 | 0.052 | 0.15 | | | | |
| 820 | 10x20 | 1400 | 0.048 | 0.14 | 10x25 | 1910 | 0.032 | 0.093 |
| 1000 | 10x20 | 1840 | 0.035 | 0.09 | 13x20 | 2340 | 0.025 | 0.055 |
| 1200 | 10x25 | 1920 | 0.032 | 0.08 | 13x20 | 2390 | 0.025 | 0.055 |
| 1500 | 10x25 | 2050 | 0.030 | 0.08 | 13x25 | 2710 | 0.023 | 0.0506 |
| | 13x20 | 2200 | 0.029 | 0.07 | | | | |
| 1800 | 13x20 | 2380 | 0.026 | 0.07 | 13x30 | 3150 | 0.021 | 0.0462 |
| 2200 | 13x25 | 2750 | 0.022 | 0.06 | 13x35 | 3420 | 0.018 | 0.0396 |
| 2700 | 13x25 | 3000 | 0.022 | 0.06 | 16x31.5 | 3480 | 0.018 | 0.0396 |
| 3300 | 13x35 | 3490 | 0.018 | 0.05 | 16x31.5 | 3600 | 0.018 | 0.0396 |
| 3900 | 16x25 | 3520 | 0.018 | 0.05 | | | | |
| 4700 | 16x31.5 | 3770 | 0.017 | 0.04 | | | | |

Ripple Current (mA, rms) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

φ DxD(mm)

| WV Cap(μF) | 35 | | | | 50 | | | |
|---------------|---------|--------|-----------|-------|---------|--------|-----------|--------|
| | Size | Ripple | Impedance | | Size | Ripple | Impedance | |
| | | | +20°C | -10°C | | | +20°C | -10°C |
| 22 | | | | | 5x11 | 220 | 0.35 | 1.015 |
| 27 | | | | | 6.3x11 | 265 | 0.34 | 0.986 |
| 33 | 5x11 | 230 | 0.32 | 0.934 | 6.3x11 | 280 | 0.32 | 0.928 |
| 39 | 6.3x11 | 277 | 0.31 | 0.905 | 6.3x11 | 300 | 0.28 | 0.812 |
| 47 | 6.3x11 | 340 | 0.20 | 0.584 | 8x11.5 | 360 | 0.20 | 0.580 |
| 56 | 6.3x11 | 375 | 0.20 | 0.584 | 8x11.5 | 385 | 0.19 | 0.551 |
| 68 | 6.3x11 | 400 | 0.19 | 0.555 | 8x11.5 | 400 | 0.17 | 0.493 |
| 82 | 8x11.5 | 480 | 0.17 | 0.496 | 8x11.5 | 550 | 0.12 | 0.348 |
| 100 | 8x11.5 | 560 | 0.15 | 0.438 | 8x11.5 | 730 | 0.075 | 0.2175 |
| 120 | 8x11.5 | 585 | 0.13 | 0.38 | 8x16 | 770 | 0.073 | 0.2117 |
| 150 | 8x11.5 | 680 | 0.11 | 0.321 | 10x12.5 | 790 | 0.072 | 0.2088 |
| 180 | 8x16 | 810 | 0.098 | 0.286 | 10x12.5 | 870 | 0.068 | 0.1972 |
| 220 | 8x16 | 1000 | 0.056 | 0.164 | 8x20 | 1060 | 0.055 | 0.1595 |
| 270 | 10x12.5 | 1060 | 0.052 | 0.152 | 10x16 | 1090 | 0.055 | 0.1595 |
| 330 | 10x16 | 1190 | 0.050 | 0.146 | 10x16 | 1385 | 0.045 | 0.1305 |
| 390 | 8x20 | 1210 | 0.041 | 0.12 | 10x20 | 1500 | 0.043 | 0.1247 |
| 470 | 10x16 | 1400 | 0.038 | 0.111 | 10x25 | 1850 | 0.032 | 0.0928 |
| 560 | 10x20 | 1550 | 0.035 | 0.102 | | | | |
| 680 | 10x20 | 1850 | 0.034 | 0.064 | 13x20 | 1910 | 0.031 | 0.0899 |
| 820 | 10x25 | 2040 | 0.031 | 0.064 | 13x20 | 2000 | 0.030 | 0.0870 |
| 1000 | 13x20 | 2260 | 0.029 | 0.061 | 13x20 | 2150 | 0.028 | 0.0812 |
| 1200 | 13x25 | 2630 | 0.021 | 0.053 | 13x25 | 2490 | 0.026 | 0.0754 |
| 1500 | | | | | 13x30 | 2770 | 0.025 | 0.0725 |
| 1800 | 13x25 | 2780 | 0.019 | 0.048 | 16x25 | 2960 | 0.024 | 0.0696 |
| 2200 | 13x30 | 2950 | 0.019 | 0.048 | 16x25 | 3000 | 0.020 | 0.0580 |
| 2700 | 16x25 | 3150 | 0.018 | 0.045 | | | | |
| | 13x35 | 3350 | 0.018 | 0.045 | | | | |
| | 16x31.5 | 3600 | 0.017 | 0.043 | | | | |
| | 16x31.5 | 3670 | 0.016 | 0.04 | | | | |
| | 16x35.5 | 3750 | 0.015 | 0.038 | | | | |
| | 18x31.5 | 3850 | 0.014 | 0.035 | | | | |

Ripple Current (mA, rms) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

φ DxL(mm)

| WV Cap(μF) | 63 | | | | 100 | | | |
|---------------|---------|--------|-----------|-------|---------|--------|-----------|-------|
| | Size | Ripple | Impedance | | Size | Ripple | Impedance | |
| | | | +20°C | -10°C | | | +20°C | -10°C |
| 4.7 | | | | | 5x11 | 105 | 1.60 | 4.64 |
| 5.6 | | | | | 5x11 | 116 | 1.49 | 4.321 |
| 6.8 | | | | | 5x11 | 120 | 1.45 | 4.205 |
| 10 | 5x11 | 135 | 0.95 | 2.755 | 6.3x11 | 170 | 0.70 | 2.03 |
| 15 | 6.3x11 | 168 | 0.85 | 2.465 | 8x11.5 | 255 | 0.61 | 1.769 |
| 18 | 6.3x11 | 170 | 0.82 | 2.378 | 8x11.5 | 270 | 0.56 | 1.624 |
| 22 | 6.3x11 | 250 | 0.75 | 2.175 | 8x11.5 | 320 | 0.48 | 1.392 |
| 27 | 6.3x11 | 260 | 0.55 | 1.595 | 8x11.5 | 340 | 0.39 | 1.131 |
| 33 | 6.3x11 | 270 | 0.38 | 1.102 | 8x16 | 400 | 0.31 | 0.899 |
| 39 | 8x11.5 | 320 | 0.35 | 1.015 | 8x16 | 425 | 0.29 | 0.841 |
| | | | | | 10x12.5 | 440 | 0.27 | 0.783 |
| 47 | 8x11.5 | 400 | 0.22 | 0.638 | 10x12.5 | 450 | 0.25 | 0.725 |
| 56 | 8x11.5 | 420 | 0.22 | 0.638 | 10x16 | 540 | 0.21 | 0.609 |
| 68 | 10x12.5 | 500 | 0.20 | 0.58 | 10x20 | 630 | 0.18 | 0.522 |
| 82 | 8x16 | 540 | 0.17 | 0.493 | 10x20 | 720 | 0.15 | 0.435 |
| | 10x12.5 | 570 | 0.16 | 0.464 | | | | |
| 100 | 10x12.5 | 720 | 0.14 | 0.406 | 10x25 | 890 | 0.12 | 0.348 |
| 120 | 8x20 | 790 | 0.14 | 0.406 | 10x25 | 900 | 0.12 | 0.348 |
| | 10x16 | 835 | 0.13 | 0.377 | 13x20 | 980 | 0.11 | 0.319 |
| 150 | 10x16 | 900 | 0.11 | 0.319 | 13x20 | 1100 | 0.095 | 0.276 |
| 180 | 10x20 | 1200 | 0.095 | 0.276 | 13x25 | 1250 | 0.078 | 0.226 |
| 220 | 10x25 | 1315 | 0.075 | 0.218 | 13x30 | 1420 | 0.065 | 0.189 |
| | | | | | 16x21 | 1270 | 0.075 | 0.218 |
| 270 | 13x20 | 1400 | 0.071 | 0.206 | 13x35 | 1630 | 0.057 | 0.165 |
| | | | | | 16x25 | 1570 | 0.058 | 0.168 |
| 330 | 10x30 | 1750 | 0.047 | 0.136 | 13x40 | 1650 | 0.045 | 0.131 |
| | 13x25 | 1870 | 0.045 | 0.131 | | | | |
| 390 | 13x25 | 1920 | 0.044 | 0.128 | 16x31.5 | 1850 | 0.043 | 0.125 |
| 470 | 13x30 | 2225 | 0.041 | 0.119 | 16x35.5 | 1900 | 0.032 | 0.093 |
| | 16x21 | 1970 | 0.043 | 0.125 | 18x31.5 | 1700 | 0.038 | 0.095 |
| 560 | 16x25 | 2350 | 0.039 | 0.098 | 16x41 | 2170 | 0.032 | 0.08 |
| | | | | | 18x31.5 | 2100 | 0.031 | 0.078 |
| 680 | 16x31.5 | 2600 | 0.035 | 0.088 | 18x35.5 | 2400 | 0.029 | 0.073 |
| 820 | 16x31.5 | 2650 | 0.031 | 0.078 | | | | |
| 1000 | 16x35.5 | 2780 | 0.026 | 0.065 | | | | |
| | 18x31.5 | 3230 | 0.028 | 0.070 | | | | |

Ripple Current (mA, rms) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

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