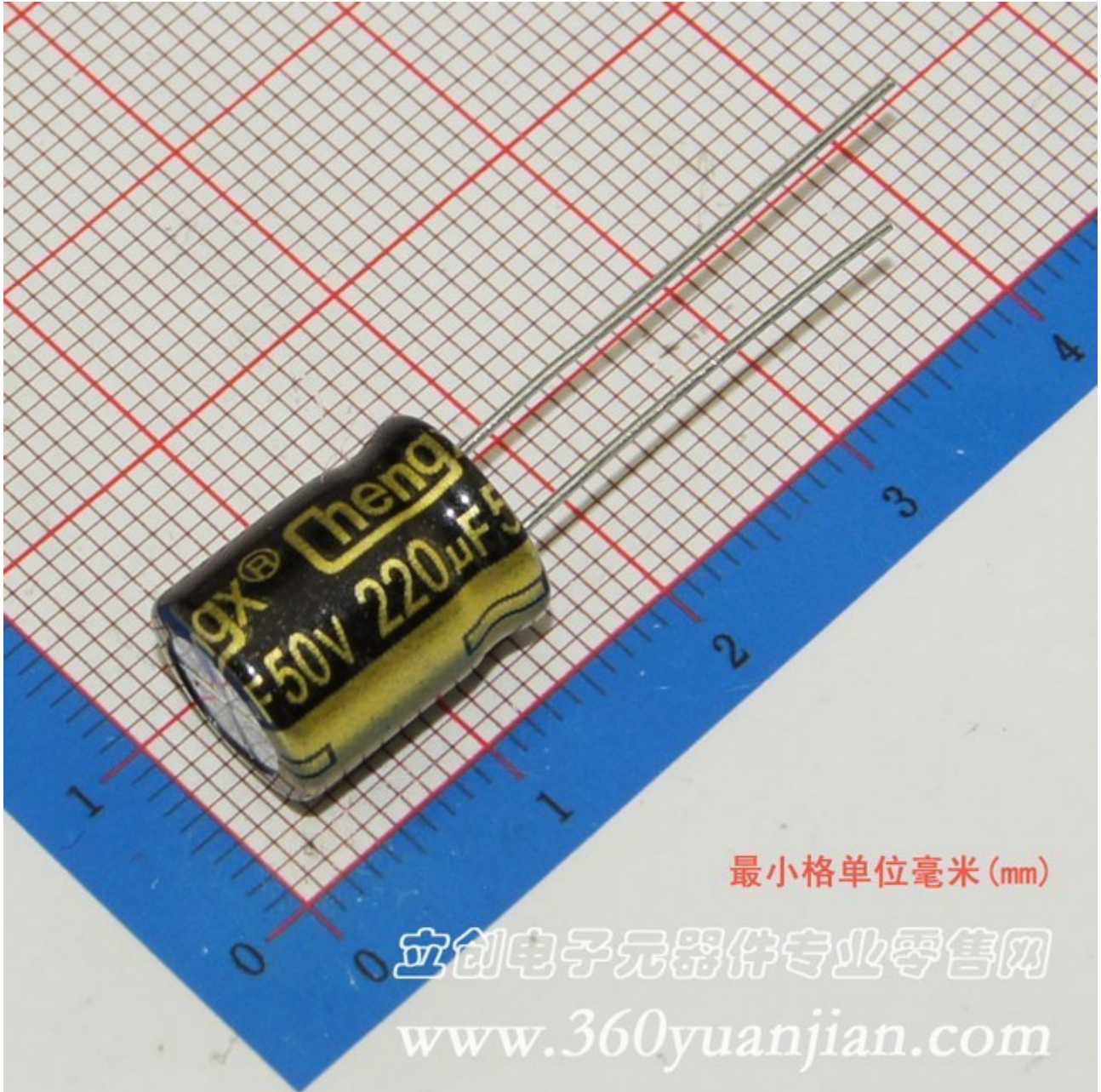


此商品编号对应的规格参数是： 220uf 50v 黑高频/10\*13 直插

此商品的实物图片为：



## GR Series

+105°C, High Ripple Current(高纹波), Low Impedance(低阻抗品)

### FEATURES

1. Low impedance for high frequency.
2. Life time: 2000~4000 hours at 105°C.



### SPECIFICATIONS

| Item  | Performance Characteristics  |  |       |      |      |           |       |       |       |
|---|--|--|-------|------|------|-----------|-------|-------|-------|
| Operating Temperature Range                                 | -40 to +105°C  |  |       |      |      |           |       |       |       |
| Rated Working Voltage Range                                 | 6.3 to 100V  |  |       |      |      |           |       |       |       |
| Nominal Capacitance Range                                   | 2.2 to 4700µF  |  |       |      |      |           |       |       |       |
| Capacitance Tolerance                                       | ±20% (120Hz, +20°C)  |  |       |      |      |           |       |       |       |
| Leakage Current   | I ≤ 0.01CV or 3(µA) whichever is greater measured after 2 minutes application of rated working voltage at 20°C   |  |       |      |      |           |       |       |       |
| tan δ (120Hz, +20°C)  | Working Voltage (V)  | 6.3    10    16    25    35    50    63    100               |       |      |      |           |       |       |       |
|   | tan δ (max.)   | 0.22    0.19    0.16    0.14    0.12    0.10    0.09    0.08 |       |      |      |           |       |       |       |
| For capacitance value > 1000µF, add 0.02 per another 1000µF |  |  |       |      |      |           |       |       |       |
| Low Temperature Characteristics                             | Impedance ratio max. at 120Hz  |  |       |      |      |           |       |       |       |
|   | Working Voltage (V)  | 6.3    10    16    25    35    50    63    100               |       |      |      |           |       |       |       |
|   | Z-25°C / Z+20°C  | 4    3    2    2    2    2    2    2                         |       |      |      |           |       |       |       |
|   | Z-40°C / Z+20°C  | 8    6    4    3    3    3    3    3                         |       |      |      |           |       |       |       |
| High Temperature Loading                                    | Test conditions  | Post test requirements at +20°C                              |       |      |      |           |       |       |       |
|   | Duration : <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>φD</td> <td>5~6.3</td> <td>8~10</td> <td>12.5</td> </tr> <tr> <td>Load life</td> <td>2000h</td> <td>3000h</td> <td>4000h</td> </tr> </table><br>Ambient temp. : +105°C<br>Applied voltage : Rated DC working voltage with rated ripple current | φD   | 5~6.3 | 8~10 | 12.5 | Load life | 2000h | 3000h | 4000h |
| φD  | 5~6.3  | 8~10   | 12.5  |      |      |           |       |       |       |
| Load life   | 2000h  | 3000h  | 4000h |      |      |           |       |       |       |
| Shelf Life  | Test conditions  | Post test requirements at +20°C                              |       |      |      |           |       |       |       |
|   | Duration : 1000 hours<br>Ambient temp. : +105°C<br>Applied voltage : (None)  | Same limits for high temperature loading.                    |       |      |      |           |       |       |       |
| Others  | JIS C - 5101 (IEC 60384)   |  |       |      |      |           |       |       |       |

### CASE SIZE TABLE



| φD | 5            | 6.3 | 8(L<20) | 8(L≥20)      | 10  | 12.5 |  |  |
|----|--------------|-----|---------|--------------|-----|------|--|--|
| F  | 2.0          | 2.5 | 3.5     |              | 5.0 | 5.0  |  |  |
| φd | 0.5          |     | 0.6     |              | 0.6 |      |  |  |
| α  | (L < 20) 1.5 |     |         | (L ≥ 20) 2.0 |     |      |  |  |
| β  | (D < 20) 0.5 |     |         | (D ≥ 20) 1.0 |     |      |  |  |

**GR Series**

**+105°C, High Ripple Current(高纹波), Low Impedance(低阻抗品)**

**STANDARD RATINGS**

| Voltage (Code) |      | 6.3V (0J) |           |                | 10V (1A)  |           |                | 16V (1C)  |           |                |
|----------------|------|-----------|-----------|----------------|-----------|-----------|----------------|-----------|-----------|----------------|
| Cap.(μF)       | Code | Case Size | Impedance | Ripple Current | Case Size | Impedance | Ripple Current | Case Size | Impedance | Ripple Current |
| 100            | 107  |           |           |                |           |           |                | 6.3x11    | 0.220     | 340            |
| 120            | 127  |           |           |                |           |           |                | 6.3x11    | 0.220     | 340            |
| 150            | 157  |           |           |                | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            |
|                |      |           |           |                |           |           |                | 8x12      | 0.130     | 640            |
| 180            | 187  | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            |
|                |      |           |           |                |           |           |                | 8x12      | 0.130     | 640            |
| 220            | 227  | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            |
|                |      |           |           |                |           |           |                | 8x12      | 0.130     | 640            |
| 270            | 277  | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            | 8x12      | 0.130     | 640            |
|                |      |           |           |                | 8x12      | 0.130     | 640            |           |           |                |
| 330            | 337  | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.220     | 340            | 8x12      | 0.130     | 640            |
|                |      |           |           |                | 8x12      | 0.130     | 640            |           |           |                |
| 390            | 397  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            |
| 470            | 477  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            |
|                |      |           |           |                |           |           |                | 10x12.5   | 0.080     | 865            |
| 560            | 567  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 10x12.5   | 0.080     | 865            |
| 680            | 687  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 8x16      | 0.087     | 640            |
|                |      |           |           |                |           |           |                | 10x12.5   | 0.080     | 865            |
| 820            | 827  | 8x12      | 0.130     | 640            | 10x12.5   | 0.080     | 865            | 10x16     | 0.060     | 1210           |
|                |      | 10x12.5   | 0.080     | 865            |           |           |                |           |           |                |
| 1000           | 108  | 8x12      | 0.130     | 640            | 8x16      | 0.087     | 640            | 10x16     | 0.060     | 1210           |
|                |      | 10x12.5   | 0.080     | 865            | 10x16     | 0.060     | 1210           |           |           |                |
| 1200           | 128  | 8x16      | 0.087     | 840            | 10x20     | 0.046     | 1400           | 10x20     | 0.046     | 1400           |
|                |      | 10x12.5   | 0.080     | 865            |           |           |                |           |           |                |
| 1500           | 158  | 8x20      | 0.069     | 1050           | 10x20     | 0.046     | 1400           | 10x20     | 0.046     | 1400           |
|                |      | 10x16     | 0.060     | 1210           |           |           |                |           |           |                |
| 1800           | 188  | 10x20     | 0.046     | 1400           | 10x20     | 0.046     | 1400           | 10x25     | 0.042     | 1650           |
|                |      |           |           |                |           |           |                | 12.5x20   | 0.035     | 1900           |
| 2200           | 228  | 10x20     | 0.046     | 1400           | 10x20     | 0.046     | 1400           | 12.5x20   | 0.035     | 1900           |
| 2700           | 278  | 10x25     | 0.042     | 1650           | 10x25     | 0.042     | 1650           | 12.5x25   | 0.030     | 2124           |
|                |      | 12.5x20   | 0.035     | 1900           | 12.5x20   | 0.035     | 1900           |           |           |                |
| 3300           | 338  | 10x25     | 0.042     | 1650           | 12.5x25   | 0.030     | 2124           |           |           |                |
|                |      | 12.5x20   | 0.035     | 1900           |           |           |                |           |           |                |
| 3900           | 398  | 12.5x20   | 0.035     | 1900           |           |           |                |           |           |                |
| 4700           | 478  | 12.5x25   | 0.030     | 2124           |           |           |                |           |           |                |

Maximum Allowable Ripple Current (mA rms) at 105°C 100kHz

Case Size φD x L(mm)

Maximum Impedance (Ω) at 20°C 100kHz

**GR Series**

**+105°C, High Ripple Current(高纹波), Low Impedance(低阻抗品)**

**STANDARD RATINGS**

| Voltage (Code) |      | 25V (1E)  |           |                | 35V (1V)  |           |                | 50V (1H)  |           |                |
|----------------|------|-----------|-----------|----------------|-----------|-----------|----------------|-----------|-----------|----------------|
| Cap.( $\mu$ F) | Code | Case Size | Impedance | Ripple Current | Case Size | Impedance | Ripple Current | Case Size | Impedance | Ripple Current |
| 33             | 336  |           |           |                |           |           |                | 6.3x11    | 0.300     | 295            |
| 39             | 396  |           |           |                |           |           |                | 6.3x11    | 0.300     | 295            |
| 47             | 476  |           |           |                | 6.3x11    | 0.220     | 340            | 6.3x11    | 0.300     | 295            |
| 56             | 566  |           |           |                | 6.3x11    | 0.220     | 340            | 8x12      | 0.170     | 555            |
| 68             | 686  |           |           |                | 6.3x11    | 0.220     | 340            | 8x12      | 0.170     | 555            |
| 82             | 826  | 6.3x11    | 0.220     | 340            | 8x12      | 0.130     | 640            | 8x12      | 0.170     | 555            |
| 100            | 107  | 6.3x11    | 0.220     | 340            | 8x12      | 0.130     | 640            | 10x12.5   | 0.120     | 760            |
| 120            | 127  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 8x16      | 0.120     | 730            |
|                |      |           |           |                |           |           |                | 10x12.5   | 0.120     | 760            |
| 150            | 157  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 10x16     | 0.084     | 1050           |
| 180            | 187  | 8x12      | 0.130     | 640            | 10x12.5   | 0.080     | 865            | 8x20      | 0.091     | 910            |
|                |      |           |           |                |           |           |                | 10x16     | 0.084     | 1050           |
| 220            | 227  | 8x12      | 0.130     | 640            | 8x12      | 0.130     | 640            | 10x16     | 0.084     | 1050           |
|                |      |           |           |                | 8x16      | 0.087     | 840            |           |           |                |
|                |      |           |           |                | 10x12.5   | 0.080     | 865            |           |           |                |
| 270            | 277  | 8x12      | 0.130     | 640            | 10x16     | 0.060     | 1210           | 10x25     | 0.055     | 1440           |
|                |      | 10x12.5   | 0.080     | 865            |           |           |                |           |           |                |
| 330            | 337  | 8x12      | 0.130     | 640            | 8x20      | 0.069     | 1050           | 12.5x20   | 0.045     | 1660           |
|                |      |           |           |                | 10x12.5   | 0.080     | 865            |           |           |                |
|                |      |           |           |                | 10x16     | 0.060     | 1210           |           |           |                |
| 390            | 397  | 10x12.5   | 0.080     | 865            | 10x16     | 0.060     | 1210           | 12.5x20   | 0.045     | 1660           |
| 470            | 477  | 8x16      | 0.087     | 840            | 10x16     | 0.060     | 1210           | 12.5x25   | 0.034     | 1950           |
|                |      | 10x12.5   | 0.080     | 865            |           |           |                |           |           |                |
| 560            | 567  | 10x16     | 0.060     | 1210           | 10x20     | 0.046     | 1400           | 12.5x25   | 0.034     | 1950           |
| 680            | 687  | 10x16     | 0.060     | 1210           | 10x20     | 0.046     | 1400           |           |           |                |
| 820            | 827  | 10x20     | 0.046     | 1400           | 10x25     | 0.042     | 1650           |           |           |                |
|                |      |           |           |                | 12.5x20   | 0.035     | 1900           |           |           |                |
| 1000           | 108  | 10x20     | 0.046     | 1400           | 12.5x20   | 0.035     | 1900           |           |           |                |
|                |      |           |           |                | 12.5x25   | 0.030     | 2124           |           |           |                |
| 1200           | 128  | 10x20     | 0.046     | 1400           |           |           |                |           |           |                |
| 1500           | 158  | 10x25     | 0.042     | 1650           |           |           |                |           |           |                |
|                |      | 12.5x20   | 0.035     | 1900           |           |           |                |           |           |                |
| 1800           | 188  | 12.5x25   | 0.030     | 2124           |           |           |                |           |           |                |
| 2200           | 228  | 12.5x25   | 0.030     | 2124           |           |           |                |           |           |                |

Maximum Allowable Ripple Current (mA rms) at 105°C 100kHz

Case Size  $\phi$ D x L(mm)

Maximum Impedance ( $\Omega$ ) at 20°C 100kHz

## GR Series

+105°C, High Ripple Current(高纹波), Low Impedance(低阻抗品)

### STANDARD RATINGS

| Voltage(Code)  |      | 63V(1J)   |           |                | 100V(2A)  |           |                |  |  |  |
|----------------|------|-----------|-----------|----------------|-----------|-----------|----------------|--|--|--|
| Cap.( $\mu$ F) | Code | Case Size | Impedance | Ripple Current | Case Size | Impedance | Ripple Current |  |  |  |
| 15             | 156  |           |           |                | 6.3x11    | 0.960     | 115            |  |  |  |
| 22             | 226  | 6.3x11    | 0.960     | 115            |           |           |                |  |  |  |
| 27             | 276  | 6.3x11    | 0.960     | 115            | 8x12      | 0.504     | 232            |  |  |  |
| 33             | 336  | 6.3x11    | 0.960     | 115            |           |           |                |  |  |  |
| 39             | 396  | 8x12      | 0.504     | 232            | 8x16      | 0.360     | 300            |  |  |  |
| 47             | 476  | 8x12      | 0.504     | 232            | 10x12.5   | 0.344     | 314            |  |  |  |
| 56             | 566  | 8x12      | 0.504     | 232            | 8x20      | 0.264     | 362            |  |  |  |
| 68             | 686  | 8x12      | 0.504     | 232            | 10x16     | 0.248     | 357            |  |  |  |
| 82             | 826  | 10x12.5   | 0.344     | 314            | 10x20     | 0.168     | 466            |  |  |  |
| 100            | 107  | 8x16      | 0.360     | 300            | 10x20     | 0.168     | 466            |  |  |  |
|                |      | 10x12.5   | 0.344     | 314            |           |           |                |  |  |  |
| 120            | 127  | 10x16     | 0.248     | 357            | 12.5x20   | 0.128     | 690            |  |  |  |
| 150            | 157  | 8x20      | 0.264     | 362            |           |           |                |  |  |  |
| 180            | 187  | 10x20     | 0.168     | 466            | 12.5x25   | 0.096     | 922            |  |  |  |
| 220            | 227  | 10x20     | 0.168     | 466            | 12.5x25   | 0.096     | 922            |  |  |  |
| 270            | 277  | 12.5x20   | 0.128     | 690            |           |           |                |  |  |  |
| 330            | 337  | 12.5x20   | 0.128     | 690            |           |           |                |  |  |  |
| 390            | 397  | 12.5x25   | 0.096     | 922            |           |           |                |  |  |  |

Maximum Allowable Ripple Current (mA rms) at 105 °C 100kHz

Case Size  $\phi$ D x L(mm)

Maximum Impedance( $\Omega$ ) at 20 °C 100kHz

### RIPPLE CURRENT MULTIPLIER

| Frequency Coefficient |             |           |      |      |      |      |
|-----------------------|-------------|-----------|------|------|------|------|
| Cap( $\mu$ F)         | Coefficient | Freq.(Hz) | 120  | 1k   | 10k  | 100k |
| ~180                  |             |           | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 ~ 560             |             |           | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 ~ 1800            |             |           | 0.60 | 0.87 | 0.95 | 1.00 |
| 2200 ~ 3900           |             |           | 0.75 | 0.90 | 0.95 | 1.00 |
| 4700                  |             |           | 0.85 | 0.95 | 0.98 | 1.00 |

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