

RJA Series

Features

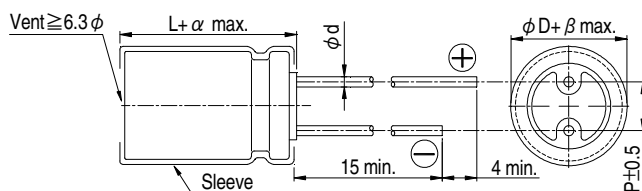
- 105°C, wide temperature range
- Suitable for high reliability products
- RoHS compliance



Specifications

| Items | Performance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|----------------|---------------|-----------|--------------------|------------------------------|------|-----------------------------------|-----------------|------------------------|-----|------------|-----------------|----------|----------|------|------|------|------|-----------------|------|------|-----------|----------|------|---------|------|------|------|------|------|--------------|----------|---|---|---|---|---|---|---|-----------|----------|----|---|---|---|---|---|---|
| Category Temperature Range | 6.3 ~ 63V | 100V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | -55°C ~ +105°C | -40°C ~ +105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% (at 120 Hz, 20°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current (at 20°C) | I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanδ (at 120 Hz, 20°C) | <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max)</td> <td>0.23</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.08</td> </tr> </tbody> </table> <p>When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.</p> | | Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | Tanδ (max) | 0.23 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanδ (max) | 0.23 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics (at 120 Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Impedance Ratio</td> <td>Z(-25°C)</td> <td>φ D < 16</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> </tr> <tr> <td>Z(-40/-55°C)</td> <td>φ D < 16</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>12</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>6</td> </tr> </tbody> </table> | | Rated Voltage | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | Impedance Ratio | Z(-25°C) | φ D < 16 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | /Z(+20°C) | φ D ≥ 16 | 5 | 4 | 3 | 2 | 2 | 2 | 3 | Z(-40/-55°C) | φ D < 16 | 8 | 6 | 4 | 4 | 4 | 3 | 3 | /Z(+20°C) | φ D ≥ 16 | 12 | 8 | 6 | 4 | 3 | 3 | 6 |
| Rated Voltage | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impedance Ratio | Z(-25°C) | φ D < 16 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | /Z(+20°C) | φ D ≥ 16 | 5 | 4 | 3 | 2 | 2 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Z(-40/-55°C) | φ D < 16 | 8 | 6 | 4 | 4 | 4 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | /Z(+20°C) | φ D ≥ 16 | 12 | 8 | 6 | 4 | 3 | 3 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance | <table border="1"> <thead> <tr> <th>Test Time</th> <th>2,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 2,000 hours at 105°C.</p> | | Test Time | 2,000 Hrs | Capacitance Change | Within ±20% of initial value | Tanδ | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Time | 2,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanδ | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life Test | <table border="1"> <thead> <tr> <th>Test Time</th> <th>1,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.</p> | | Test Time | 1,000 Hrs | Capacitance Change | Within ±20% of initial value | Tanδ | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Time | 1,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanδ | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Current and Frequency Multipliers | <table border="1"> <thead> <tr> <th rowspan="2">Cap.(μF)</th> <th colspan="5">Freq.(Hz)</th> </tr> <tr> <th>60 (50)</th> <th>120</th> <th>500</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <td>≤ 100</td> <td>0.70</td> <td>1.00</td> <td>1.30</td> <td>1.40</td> <td>1.50</td> </tr> <tr> <td>100 < C ≤ 1,000</td> <td>0.75</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.35</td> </tr> <tr> <td>1,000 <</td> <td>0.80</td> <td>1.00</td> <td>1.10</td> <td>1.12</td> <td>1.15</td> </tr> </tbody> </table> | | Cap.(μF) | Freq.(Hz) | | | | | 60 (50) | 120 | 500 | 1k | 10k up | ≤ 100 | 0.70 | 1.00 | 1.30 | 1.40 | 1.50 | 100 < C ≤ 1,000 | 0.75 | 1.00 | 1.20 | 1.30 | 1.35 | 1,000 < | 0.80 | 1.00 | 1.10 | 1.12 | 1.15 | | | | | | | | | | | | | | | | | | |
| Cap.(μF) | Freq.(Hz) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 60 (50) | 120 | 500 | 1k | 10k up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ≤ 100 | 0.70 | 1.00 | 1.30 | 1.40 | 1.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 < C ≤ 1,000 | 0.75 | 1.00 | 1.20 | 1.30 | 1.35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,000 < | 0.80 | 1.00 | 1.10 | 1.12 | 1.15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

| φ D | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
|-----|--------------------------|-----|-----|-----|------|-----|-----|
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| φ d | 0.5 | | 0.6 | | 0.8 | | |
| α | L < 20: 1.5, L ≥ 20: 2.0 | | | | | | |
| β | 0.5 | | | | | | |



Dimension: $\phi D \times L$ (mm)
Ripple Current: mA/rms at 120 Hz, 105°C

Dimension and Permissible Ripple Current

| Cap.(μ F) | Rated Volt. (V _{DC}) Contents | 6.3V (0J) | | 10V (1A) | | 16V (1C) | | 25V (1E) | | 35V (1V) | | 50V (1H) | | 63V (1J) | | 100V (2A) | |
|----------------|---|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-----|
| | | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA |
| 2.2 | 2R2 | | | | | | | | | | | 5×11 | 20 | | | 5×11 | 26 |
| 3.3 | 3R3 | | | | | | | | | | | 5×11 | 30 | | | 5×11 | 31 |
| 4.7 | 4R7 | | | | | | | | | | | 5×11 | 33 | 5×11 | 36 | 5×11 | 36 |
| 10 | 100 | | | | | | | | | | | 5×11 | 50 | 5×11 | 54 | 6.3×11 | 40 |
| 22 | 220 | | | | | | | | | | | 5×11 | 78 | 5×11 | 64 | 6.3×11 | 93 |
| 33 | 330 | | | | | | | | | 5×11 | 85 | 5×11 | 90 | 6.3×11 | 100 | 8×11.5 | 111 |
| 47 | 470 | | | | | | | 5×11 | 97 | 5×11 | 90 | 6.3×11 | 117 | 6.3×11 | 129 | 10×12.5 | 144 |
| 100 | 101 | | | | | 5×11 | 110 | 5×11 | 120 | 6.3×11 | 150 | 8×11.5 | 188 | 10×12.5 | 235 | 10×20 | 183 |
| 220 | 221 | | | 5×11 | 150 | 6.3×11 | 180 | 8×11.5 | 236 | 8×11.5 | 270 | 10×16 | 335 | 10×20 | 400 | 12.5×25 | 440 |
| 330 | 331 | | | 6.3×11 | 200 | 8×11.5 | 260 | 8×11.5 | 330 | 10×12.5 | 350 | 10×16 | 410 | 10×20 | 490 | 16×25 | 478 |
| 470 | 471 | 6.3×11 | 230 | 6.3×11 | 250 | 8×11.5 | 310 | 10×12.5 | 380 | 10×16 | 460 | 12.5×20 | 590 | 12.5×20 | 665 | 16×31.5 | 688 |
| 1,000 | 102 | 8×11.5 | 380 | 10×12.5 | 460 | 10×16 | 560 | 10×20 | 680 | 12.5×20 | 830 | 16×25 | 1,080 | 16×25 | 1,190 | | |
| 2,200 | 222 | 10×16 | 690 | 10×20 | 760 | 12.5×20 | 920 | 12.5×25 | 1,090 | 16×25 | 1,260 | 16×35.5 | 1,470 | | | | |
| 3,300 | 332 | 10×20 | 840 | 12.5×20 | 1,100 | 12.5×25 | 1,170 | 16×25 | 1,400 | 16×35.5 | 1,610 | 18×35.5 | 1,650 | | | | |
| 4,700 | 472 | 12.5×20 | 1,090 | 12.5×25 | 1,260 | 16×25 | 1,480 | 16×31.5 | 1,710 | 18×35.5 | 1,900 | | | | | | |
| 6,800 | 682 | 12.5×25 | 1,460 | 16×25 | 1,690 | 16×31.5 | 1,930 | 18×35.5 | 2,160 | | | | | | | | |
| 10,000 | 103 | 16×25 | 1,990 | 16×31.5 | 2,220 | 18×31.5 | 2,330 | | | | | | | | | | |
| 22,000 | 223 | 18×35.5 | 2,930 | 18×40 | 3,230 | | | | | | | | | | | | |

Part Numbering System

RJA Series 470 μ F \pm 20% 6.3V Bulk Package Gas Type 6.3 ϕ × 11L Pb-free and PET sleeve

RJA **471** **M** **0J** **BK** - **0611**

Series Name Capacitance Capacitance Tolerance Rated Voltage Lead Configuration and Package Rubber Type Case Size Lead Wire and Sleeve type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.

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[SK106M016AC3KAKPLP](#) [SK107M025AE3EAKPLP](#) [B43827A1106M8](#) [B41022A5686M6](#) [EKMA160EC3101MF07D](#)
[ESMG160ETD221MF11D](#) [EKZH160ETD152MJ20S](#) [EKMA350ELL100ME07D](#) [ESMG160ETD101ME11D](#) [SK107M025AE3KAKPLP](#)
[EKMG350ETD471MJ16S](#) [35YXA330MEFC10X12.5](#) [RGA221M2ABK-1320G](#) [ERR1HM1R0D11OT](#) [ERR1CM222W20OT](#)
[TM1081EMF202RB](#) [RXQ271M2EBK-1836](#) [RXW103M1CBK-1840](#) [B41896C5278M](#) [B41851A8107M000](#) [EKMA160ETD470MF07D](#)
[510D476M035CC3DE3](#) [SK228M025AH5AAKPLP](#) [LKMK2502W101MF](#)