



RN Series

Features

- 85°C, 2,000 hours assured, standard bi-polarized series
- Suitable for use in circuits which has a reversed or unknown polarity
- RoHS Compliance

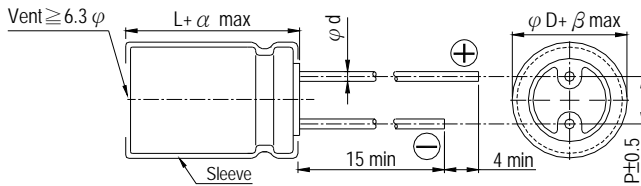


Sleeve & Marking Color: Yellow & Black

Specifications

| Items | Performance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---------------------------------|---------------------------------|--------------------|-------------------------------|--------------------|-----------------------------------|-----------------|------------------------|-----------------|---|---------------------------------|---------------------------------|------------|-----------------|-------------------|------|------|------|------|------|------|------|------|------|---|---|--|-------------------|---|---|---|---|---|---|---|---|---|---|---|
| Category Temperature Range | -40°C ~ +85°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% (at 120Hz, 20°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current (at 20°C) | <table border="1"> <tr> <td>Rated voltage</td> <td>≤ 100V</td> <td colspan="2">> 100V</td> </tr> <tr> <td>Time</td> <td>after 2 minutes</td> <td colspan="2">after 5 minutes</td> </tr> <tr> <td>Leakage Current</td> <td>I = 0.03CV or 4 (μA) whichever is greater</td> <td>CV ≤ 1,000 I = 0.03CV+15(μA)</td> <td>CV > 1,000 I = 0.02CV+25(μA)</td> </tr> </table> <p>Where, C = rated capacitance in μF V = rated DC working voltage in V</p> | Rated voltage | ≤ 100V | > 100V | | Time | after 2 minutes | after 5 minutes | | Leakage Current | I = 0.03CV or 4 (μA) whichever is greater | CV ≤ 1,000 I = 0.03CV+15(μA) | CV > 1,000 I = 0.02CV+25(μA) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated voltage | ≤ 100V | > 100V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Time | after 2 minutes | after 5 minutes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | I = 0.03CV or 4 (μA) whichever is greater | CV ≤ 1,000 I = 0.03CV+15(μA) | CV > 1,000 I = 0.02CV+25(μA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (Tanδ at 120 Hz, 20°C) | <table border="1"> <tr> <td>Rated Voltage</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> </tr> <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> <td>0.12</td> <td>0.14</td> <td>0.17</td> </tr> </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 | 160 | 200 | 250 | Tanδ (max) | 0.23 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | 0.12 | 0.14 | 0.17 | | | | | | | | | | | | | | | |
| Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanδ (max) | 0.23 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | 0.12 | 0.14 | 0.17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics (at 120Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <tr> <td colspan="2">Rated Voltage</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> </tr> <tr> <td>Impedance Ratio</td> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td></td> <td>Z(-40°C)/Z(+20°C)</td> <td>8</td> <td>6</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>4</td> </tr> </table> | Rated Voltage | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | Impedance Ratio | Z(-25°C)/Z(+20°C) | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | Z(-40°C)/Z(+20°C) | 8 | 6 | 6 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 |
| Rated Voltage | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impedance Ratio | Z(-25°C)/Z(+20°C) | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Z(-40°C)/Z(+20°C) | 8 | 6 | 6 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance (After application of the rated voltage at 85°C, the polarity inverted every 250 Hrs.) | <table border="1"> <tr> <td>Test Time</td> <td>2,000 Hrs</td> </tr> <tr> <td>Capacitance Change</td> <td>With in ±20% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </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 85°C.</p> | Test Time | 2,000 Hrs | Capacitance Change | With in ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Time | 2,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | With in ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life Test | <table border="1"> <tr> <td>Test Time</td> <td>1,000 Hrs</td> </tr> <tr> <td>Capacitance Change</td> <td>With in ±20% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 250V (Refer to JIS C 5101-4 4.1).</p> | Test Time | 1,000 Hrs | Capacitance Change | With in ±20% of initial value | Dissipation Factor | Less than 200% of specified value | Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Time | 1,000 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | With in ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | Less than 200% of specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Within specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Diagram of Dimensions



Lead Spacing and Diameter

Unit: mm

| | | | | | | | |
|----|-----|-----|-----|----------------------|------|-----|-----|
| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| φd | 0.5 | | 0.6 | | | 0.8 | |
| α | 1.0 | | | L<20: 1.5, L≥20: 2.0 | | | |
| β | 0.5 | | | | | | |



Dimension: $\phi D \times L$ (mm)

Ripple Current: mA/rms at 120 Hz, 85°C

Dimension & Permissible Ripple Current

| μF | 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 |
| 1 | 010 | | | | | | | | | | | 5×11 | 15 | 5×11 | 18 | 5×11 | 23 |
| 2.2 | 2R2 | | | | | | | | | | | 5×11 | 23 | 5×11 | 25 | 6.3×11 | 26 |
| 3.3 | 3R3 | | | | | | | | | | | 5×11 | 28 | 5×11 | 31 | 6.3×11 | 32 |
| 4.7 | 4R7 | | | | | | | | | 5×11 | 32 | 5×11 | 34 | 6.3×11 | 37 | 6.3×11 | 40 |
| 10 | 100 | | | | | 5×11 | 40 | 5×11 | 42 | 5×11 | 46 | 6.3×11 | 55 | 6.3×11 | 60 | 8×11.5 | 66 |
| 22 | 220 | 5×11 | 50 | 5×11 | 56 | 5×11 | 59 | 6.3×11 | 63 | 6.3×11 | 76 | 8×11.5 | 82 | 8×11.5 | 90 | 10×16 | 120 |
| 33 | 330 | 5×11 | 62 | 5×11 | 69 | 5×11 | 73 | 6.3×11 | 78 | 8×11.5 | 94 | 8×11.5 | 104 | 10×12.5 | 135 | 10×20 | 175 |
| 47 | 470 | 5×11 | 74 | 5×11 | 82 | 6.3×11 | 88 | 6.3×11 | 95 | 8×11.5 | 115 | 10×12.5 | 135 | 10×16 | 175 | 12.5×20 | 200 |
| 100 | 101 | 6.3×11 | 115 | 6.3×11 | 120 | 8×11.5 | 149 | 8×11.5 | 155 | 10×16 | 202 | 10×20 | 235 | 12.5×20 | 270 | 16×25 | 350 |
| 220 | 221 | 8×11.5 | 181 | 8×11.5 | 200 | 10×12.5 | 240 | 10×16 | 294 | 12.5×20 | 335 | 12.5×25 | 378 | 16×25 | 443 | 16×35.5 | 590 |
| 330 | 331 | 8×11.5 | 250 | 10×16 | 308 | 10×16 | 330 | 12.5×20 | 384 | 12.5×20 | 429 | 16×25 | 496 | 16×31.5 | 653 | | |
| 470 | 471 | 10×12.5 | 329 | 10×16 | 365 | 10×20 | 435 | 12.5×25 | 479 | 16×25 | 548 | 16×25 | 590 | 18×35.5 | 815 | | |
| 1,000 | 102 | 10×20 | 505 | 12.5×20 | 598 | 12.5×25 | 659 | 16×25 | 700 | 16×31.5 | 880 | 16×31.5 | 920 | | | | |
| 2,200 | 222 | 12.5×25 | 840 | 16×25 | 992 | 16×31.5 | 1,150 | 18×35.5 | 1,347 | | | | | | | | |

| μF | V. DC Contents | 160V (2C) | | 200V (2D) | | 250V (2E) | |
|---------|-------------------|-------------------|-----|-------------------|-----|-------------------|-----|
| | | $\phi D \times L$ | mA | $\phi D \times L$ | mA | $\phi D \times L$ | mA |
| 0.47 | R47 | 5×11 | 10 | 5×11 | 10 | 6.3×11 | 12 |
| 1 | 010 | 6.3×11 | 14 | 8×11.5 | 16 | 8×11.5 | 16 |
| 2.2 | 2R2 | 8×11.5 | 23 | 8×11.5 | 28 | 10×12.5 | 32 |
| 3.3 | 3R3 | 8×11.5 | 33 | 10×12.5 | 33 | 10×16 | 46 |
| 4.7 | 4R7 | 10×12.5 | 39 | 10×16 | 46 | 10×20 | 62 |
| 10 | 100 | 10×16 | 75 | 10×20 | 83 | 10×20 | 99 |
| 22 | 220 | 12.5×20 | 146 | 12.5×20 | 146 | 12.5×25 | 172 |
| 33 | 330 | 12.5×20 | 179 | 12.5×25 | 197 | 16×25 | 211 |
| 47 | 470 | 12.5×25 | 235 | | | | |