



RLA Series

Features

- 85°C, standard low leakage current series
- 2,000 hours assured
- RoHS Compliance

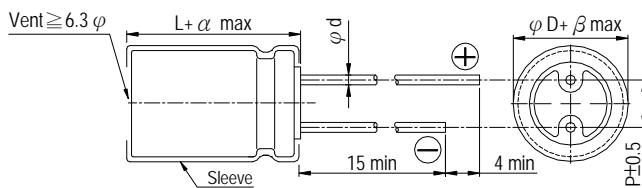


Sleeve & Marking Color: Orange & Black

Specifications

| Items                                      | Performance  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
|--|--|-----------------|-----------|--------------------|------------------------------|--------------|-----------------------------------|-----------------|------------------------|------|--------------------|-------------------|------|------|-----------------|------|------|------|------|-------------------|----------------|------|------|------|------|------|---|
| Category Temperature Range                 | -40°C ~ +85°C  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Capacitance Tolerance                      | ±20% (at 120Hz, 20°C)  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Leakage Current (at 20°C)                  | $I = 0.002CV$ or $0.4 (\mu A)$ whichever is greater (after 2 minutes)<br>Where, C = rated capacitance in $\mu F$ V = rated DC working voltage in V   |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Tan $\delta$ (at 120Hz, 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> </tr> <tr> <td>Tan<math>\delta</math> (max)</td> <td>0.24</td> <td>0.21</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> </table> <p>When the capacitance exceeds 1,000<math>\mu F</math>, 0.02 shall be added every 1,000<math>\mu F</math> increase.</p>  | Rated Voltage   | 6.3       | 10                 | 16                           | 25           | 35                                | 50              | 63                     | 100  | Tan $\delta$ (max) | 0.24              | 0.21 | 0.16 | 0.14            | 0.12 | 0.10 | 0.09 | 0.08 |                   |                |      |      |      |      |      |   |
| Rated Voltage                              | 6.3  | 10              | 16        | 25                 | 35                           | 50           | 63                                | 100             |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Tan $\delta$ (max)                         | 0.24   | 0.21            | 0.16      | 0.14               | 0.12                         | 0.10         | 0.09                              | 0.08            |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Low Temperature Characteristics (at 120Hz) | <p>Impedance ratio shall not exceed the values given in the table below.</p> <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> </tr> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-25°C)/Z(+20°C)</td> <td>5</td> <td>4</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table> | Rated Voltage   | 6.3       | 10                 | 16                           | 25           | 35                                | 50              | 63                     | 100  | Impedance Ratio    | Z(-25°C)/Z(+20°C) | 5    | 4    | 2               | 2    | 2    | 2    | 2    | Z(-40°C)/Z(+20°C) | 10             | 8    | 6    | 4    | 4    | 3    | 3 |
| Rated Voltage                              | 6.3  | 10              | 16        | 25                 | 35                           | 50           | 63                                | 100             |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Impedance Ratio                            | Z(-25°C)/Z(+20°C)  | 5               | 4         | 2                  | 2                            | 2            | 2                                 | 2               |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
|  | Z(-40°C)/Z(+20°C)  | 10              | 8         | 6                  | 4                            | 4            | 3                                 | 3               |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Endurance                                  | <table border="1"> <tr> <td>Test Time</td> <td>2,000 Hrs</td> </tr> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tan<math>\delta</math></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 | Within ±20% of initial value | Tan $\delta$ | Less than 200% of specified value | Leakage Current | Within specified value |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Test Time                                  | 2,000 Hrs  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Capacitance Change                         | Within ±20% of initial value   |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Tan $\delta$                               | 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>Within ±20% of initial value</td> </tr> <tr> <td>Tan<math>\delta</math></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.</p>                                   | Test Time       | 1,000 Hrs | Capacitance Change | Within ±20% of initial value | Tan $\delta$ | Less than 200% of specified value | Leakage Current | Within specified value |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Test Time                                  | 1,000 Hrs  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Capacitance Change                         | Within ±20% of initial value   |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Tan $\delta$                               | Less than 200% of specified value  |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Leakage Current                            | Within specified value   |                 |           |                    |                              |              |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
| Ripple Current & Frequency Multipliers     | <table border="1"> <tr> <td rowspan="4">Cap.(<math>\mu F</math>)</td> <td>Freq.(Hz)</td> <td>60 (50)</td> <td>120</td> <td>500</td> <td>1k</td> <td>10k up</td> </tr> <tr> <td>Under 100</td> <td>0.70</td> <td>1.00</td> <td>1.35</td> <td>1.55</td> <td>2.00</td> </tr> <tr> <td>100 &lt; C ≤ 1,000</td> <td>0.83</td> <td>1.00</td> <td>1.23</td> <td>1.32</td> <td>1.50</td> </tr> <tr> <td>1,000 up above</td> <td>0.90</td> <td>1.00</td> <td>1.10</td> <td>1.12</td> <td>1.15</td> </tr> </table>                 | Cap.( $\mu F$ ) | Freq.(Hz) | 60 (50)            | 120                          | 500          | 1k                                | 10k up          | Under 100              | 0.70 | 1.00               | 1.35              | 1.55 | 2.00 | 100 < C ≤ 1,000 | 0.83 | 1.00 | 1.23 | 1.32 | 1.50              | 1,000 up above | 0.90 | 1.00 | 1.10 | 1.12 | 1.15 |   |
| Cap.( $\mu F$ )                            | Freq.(Hz)  |                 | 60 (50)   | 120                | 500                          | 1k           | 10k up                            |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
|  | Under 100  |                 | 0.70      | 1.00               | 1.35                         | 1.55         | 2.00                              |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
|  | 100 < C ≤ 1,000  |                 | 0.83      | 1.00               | 1.23                         | 1.32         | 1.50                              |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |
|  | 1,000 up above   | 0.90            | 1.00      | 1.10               | 1.12                         | 1.15         |                                   |                 |                        |      |                    |                   |      |      |                 |      |      |      |      |                   |                |      |      |      |      |      |   |

Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

|          |                          |     |     |     |      |     |     |
|----------|--------------------------|-----|-----|-----|------|-----|-----|
| $\phi D$ | 5                        | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
| P        | 2.0                      | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| $\phi d$ | 0.5                      |     | 0.6 |     | 0.8  |     |     |
| $\alpha$ | L < 20: 1.5, L ≥ 20: 2.0 |     |     |     |      |     |     |
| $\beta$  | 0.5                      |     |     |     |      |     |     |



Dimension:  $\phi D \times L(\text{mm})$   
Ripple Current: mA/rms at 120 Hz, 85°C

## Dimension & Permissible Ripple Current

| $\mu\text{F}$ | V. DC<br>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              | 29    |                   |       | 5×11              | 33    |
| 3.3           | 3R3               |                   |       |                   |       |                   |       |                   |       |                   |       | 5×11              | 35    |                   |       | 5×11              | 40    |
| 4.7           | 4R7               |                   |       |                   |       |                   |       | 5×11              | 31    | 5×11              | 40    | 5×11              | 42    | 5×11              | 45    | 5×11              | 48    |
| 10            | 100               |                   |       |                   |       | 5×11              | 44    | 5×11              | 54    | 5×11              | 58    | 5×11              | 65    | 5×11              | 70    | 6.3×11            | 80    |
| 22            | 220               |                   |       | 5×11              | 59    | 5×11              | 75    | 5×11              | 80    | 5×11              | 87    | 5×11              | 95    | 6.3×11            | 115   | 8×11.5            | 135   |
| 33            | 330               | 5×11              | 55    | 5×11              | 84    | 5×11              | 90    | 5×11              | 97    | 5×11              | 105   | 6.3×11            | 125   | 6.3×11            | 140   | 10×12.5           | 195   |
| 47            | 470               | 5×11              | 79    | 5×11              | 100   | 5×11              | 110   | 5×11              | 115   | 6.3×11            | 145   | 6.3×11            | 150   | 8×11.5            | 190   | 10×16             | 255   |
| 100           | 101               | 5×11              | 130   | 5×11              | 145   | 6.3×11            | 180   | 6.3×11            | 190   | 8×11.5            | 240   | 8×11.5            | 255   | 10×12.5           | 320   | 12.5×20           | 450   |
| 220           | 221               | 6.3×11            | 230   | 6.3×11            | 250   | 8×11.5            | 300   | 8×11.5            | 320   | 10×12.5           | 420   | 10×16             | 490   | 10×20             | 565   | 16×25             | 810   |
| 330           | 331               | 6.3×11            | 280   | 8×11.5            | 350   | 8×11.5            | 370   | 10×12.5           | 470   | 10×16             | 570   | 10×20             | 650   | 12.5×20           | 765   | 16×25             | 990   |
| 470           | 471               | 8×11.5            | 380   | 8×11.5            | 415   | 10×12.5           | 520   | 10×16             | 620   | 10×20             | 740   | 12.5×20           | 860   | 12.5×25           | 990   | 16×31.5           | 1,250 |
| 1,000         | 102               | 10×12.5           | 650   | 10×16             | 790   | 10×20             | 910   | 12.5×20           | 1,090 | 12.5×25           | 1,300 | 16×25             | 1,530 | 16×31.5           | 1,700 |                   |       |
| 2,200         | 222               | 12.5×20           | 1,150 | 12.5×20           | 1,240 | 12.5×25           | 1,420 | 16×25             | 1,660 | 16×31.5           | 1,890 | 18×35.5           | 2,160 |                   |       |                   |       |
| 3,300         | 332               | 12.5×20           | 1,380 | 12.5×25           | 1,590 | 16×25             | 1,840 | 16×31.5           | 2,070 | 18×35.5           | 2,340 |                   |       |                   |       |                   |       |
| 4,700         | 472               | 16×25             | 1,880 | 16×25             | 1,980 | 16×31.5           | 2,260 | 18×35.5           | 2,520 | 18×40             | 2,690 |                   |       |                   |       |                   |       |

## Part Numbering System

|            |                   |                       |               |                              |             |                  |                              |
|------------|-------------------|-----------------------|---------------|------------------------------|-------------|------------------|------------------------------|
| RLA series | 470 $\mu\text{F}$ | $\pm 20\%$            | 6.3V          | Bulk Package                 | Gas Type    | 8 $\phi$ × 11.5L | Pb-free and PET coating case |
| <b>RLA</b> | <b>471</b>        | <b>M</b>              | <b>0J</b>     | <b>BK</b>                    | -           | <b>0811</b>      |                              |
| Series     | Capacitance       | Capacitance Tolerance | Rated Voltage | Lead Configuration & Package | Rubber Type | Case Size        | Lead Wire and Coating Type   |

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 10.

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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