



## RLA Series

### Features

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

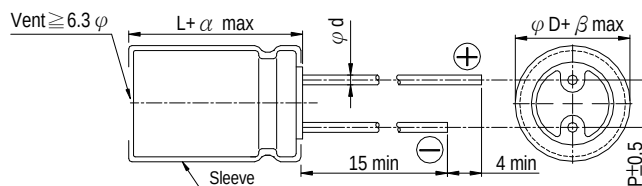


Sleeve & Marking Color: Orange & Black

### 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 (μA) whichever is greater (after 2 minutes)<br>Where, C = rated capacitance in μF V = rated DC working voltage in V                                                                                                                                                                                                                                                                                                                                                                       |      |      |      |        |      |      |      |     |                       |           |                    |                              |      |                                   |                 |                        |      |            |                 |                   |                 |      |      |      |      |      |                |      |                   |      |      |      |   |   |   |   |   |
| Tanδ (at 120Hz, 20°C)                      | <table><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>Tanδ (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 1,000μF, 0.02 shall be added every 1,000μF increase.</p>                                                                                                                                        |      |      |      |        |      |      |      |     | Rated Voltage         | 6.3       | 10                 | 16                           | 25   | 35                                | 50              | 63                     | 100  | Tanδ (max) | 0.24            | 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  |     |                       |           |                    |                              |      |                                   |                 |                        |      |            |                 |                   |                 |      |      |      |      |      |                |      |                   |      |      |      |   |   |   |   |   |
| Tanδ (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><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></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><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><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              | 2    | Z(-40°C)/Z(+20°C) | 10   | 8    | 6    | 4 | 4 | 3 | 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    | 2   |                       |           |                    |                              |      |                                   |                 |                        |      |            |                 |                   |                 |      |      |      |      |      |                |      |                   |      |      |      |   |   |   |   |   |
|                                            | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 10   | 8    | 6    | 4      | 4    | 3    | 3    | 3   |                       |           |                    |                              |      |                                   |                 |                        |      |            |                 |                   |                 |      |      |      |      |      |                |      |                   |      |      |      |   |   |   |   |   |
| Endurance                                  | <table><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>Tanδ</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 | 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><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>Tanδ</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 | 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 & Frequency Multipliers     | <table><tr><td>Freq.(Hz)<br/>Cap.(μF)</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>                                                                                  |      |      |      |        |      |      |      |     | Freq.(Hz)<br>Cap.(μF) | 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 |   |   |   |   |   |
| Freq.(Hz)<br>Cap.(μF)                      | 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.



**Стандарт  
Электрон  
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331