



## RUA Series

### Features

- 130°C, 2,000 ~ 3,000 hours assured
- For automobile modules and other high temperature applications
- RoHS Compliance

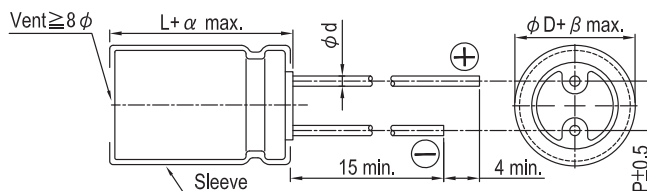


Sleeve & Marking Color: Black & White

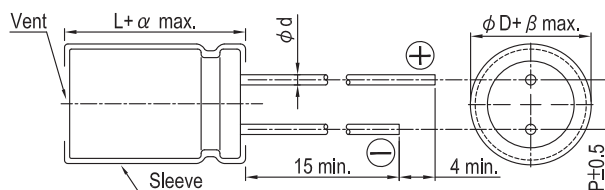
### Specifications

| Items                                      | Performance                                                                                                                                                                                                                                                                                                                                                                      |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|------|------|------|----------------|----------------------------------|------|------|------------------------------------|------|-----|---------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Category Temperature Range                 | 10 ~ 250V                                                                                                                                                                                                                                                                                                                                                                        |                     |                                                                      |      |      |      | 350 ~ 450V     |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | -40°C ~ +130°C                                                                                                                                                                                                                                                                                                                                                                   |                     |                                                                      |      |      |      | -25°C ~ +130°C |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Capacitance Tolerance                      | ±20% (at 120Hz, 20°C)                                                                                                                                                                                                                                                                                                                                                            |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Leakage Current (at 20°C)                  | Rated voltage                                                                                                                                                                                                                                                                                                                                                                    |                     | ≤ 100V                                                               |      |      |      |                | > 100V                           |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Time                                                                                                                                                                                                                                                                                                                                                                             |                     | after 2 minutes                                                      |      |      |      |                | after 1 minutes                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Leakage Current                                                                                                                                                                                                                                                                                                                                                                  |                     | I = 0.01CV or 3 (μA)<br>whichever is greater                         |      |      |      |                | CV ≤ 1,000<br>I = 0.1CV + 40(μA) |      |      | CV > 1,000<br>I = 0.04CV + 100(μA) |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  |                     | Where, C = rated capacitance in μF V = rated DC working voltage in V |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Tanδ (at 120 Hz, 20°C)                     | <table><tr><td>Rated Voltage</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>Tanδ (max)</td><td>0.15</td><td>0.12</td><td>0.10</td><td>0.10</td><td>0.08</td><td>0.08</td><td>0.20</td><td>0.20</td><td>0.20</td><td>0.24</td><td>0.24</td><td>0.24</td></tr></table> |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     | Rated Voltage | 10 | 16 | 25 | 35 | 50 | 63 | 160 | 200 | 250 | 350 | 400 | 450 | Tanδ (max) | 0.15 | 0.12 | 0.10 | 0.10 | 0.08 | 0.08 | 0.20 | 0.20 | 0.20 | 0.24 | 0.24 | 0.24 |
| Rated Voltage                              | 10                                                                                                                                                                                                                                                                                                                                                                               | 16                  | 25                                                                   | 35   | 50   | 63   | 160            | 200                              | 250  | 350  | 400                                | 450  |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Tanδ (max)                                 | 0.15                                                                                                                                                                                                                                                                                                                                                                             | 0.12                | 0.10                                                                 | 0.10 | 0.08 | 0.08 | 0.20           | 0.20                             | 0.20 | 0.24 | 0.24                               | 0.24 |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Low Temperature Characteristics (at 120Hz) | Impedance ratio shall not exceed the values given in the table below.                                                                                                                                                                                                                                                                                                            |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Rated Voltage                                                                                                                                                                                                                                                                                                                                                                    |                     | 10                                                                   | 16   | 25   | 35   | 50             | 63                               | 160  | 200  | 250                                | 350  | 400 | 450           |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Impedance Ratio                                                                                                                                                                                                                                                                                                                                                                  | Z(-25°C) / Z(+20°C) | 3                                                                    | 2    | 2    | 2    | 2              | 2                                | 3    | 3    | 3                                  | 6    | 6   | 6             |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Z(-40°C) / Z(+20°C)                        |                                                                                                                                                                                                                                                                                                                                                                                  | 6                   | 4                                                                    | 4    | 4    | 4    | 4              | 6                                | 6    | 6    | -                                  | -    | -   |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Endurance                                  | Test Time                                                                                                                                                                                                                                                                                                                                                                        |                     | 2,000 Hrs for ϕD ≤ 8 mm;<br>3,000 Hrs for ϕD ≥ 10 mm                 |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Capacitance Change                                                                                                                                                                                                                                                                                                                                                               |                     | Within ±20% of initial value                                         |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Tanδ                                                                                                                                                                                                                                                                                                                                                                             |                     | Less than 200% of specified value                                    |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Leakage Current                                                                                                                                                                                                                                                                                                                                                                  |                     | Within specified value                                               |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | * The above specifications shall be satisfied when the capacitors are restored to 20°C after applied with ratedsubjected to DC voltage with the rated ripple current is applied for 2,000 / 3,000 hours at 130°C.                                                                                                                                                                |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Shelf Life Test                            | Test Time                                                                                                                                                                                                                                                                                                                                                                        |                     | 1,000 hrs                                                            |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Capacitance Change                                                                                                                                                                                                                                                                                                                                                               |                     | Within ±20% of initial value                                         |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Tanδ                                                                                                                                                                                                                                                                                                                                                                             |                     | Less than 200% of specified value                                    |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | Leakage Current                                                                                                                                                                                                                                                                                                                                                                  |                     | Less than 500% of specified value                                    |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | * The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 130 °C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).                                                                                           |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
| Ripple Current and Frequency Multipliers   | W. V.(V)                                                                                                                                                                                                                                                                                                                                                                         | Cap.(μF)            | Freq.(Hz)                                                            |      | 120  | 1k   | 10k            | 100k up                          |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  |                     | 0.47 ~ 100                                                           |      | 1.00 | 1.85 | 2.25           | 2.50                             |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | 10 ~ 63                                                                                                                                                                                                                                                                                                                                                                          | 150 ~ 470           |                                                                      | 1.00 | 1.70 | 1.88 | 2.00           |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  | 1,000               |                                                                      | 1.00 | 1.45 | 1.58 | 1.65           |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  | 160 ~ 450           | Under 33                                                             |      | 1.00 | 1.50 | 1.75           | 1.80                             |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            | 47 up above                                                                                                                                                                                                                                                                                                                                                                      |                     | 1.00                                                                 | 1.30 | 1.40 | 1.50 |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                  |                     |                                                                      |      |      |      |                |                                  |      |      |                                    |      |     |               |    |    |    |    |    |    |     |     |     |     |     |     |            |      |      |      |      |      |      |      |      |      |      |      |      |

### Diagram of Dimensions



The case size of 16×20 is suitable for below diagram:



### Lead Spacing and Diameter

Unit: mm

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

All product specifications in the catalog are subject to change without notice. (CAT. 2018E1)



Dimension and Permissible Ripple Current  
 Dimension:  $\phi D \times L$  (mm)  
 Ripple Current: mA/rms at 120 Hz, 130°C

| Cap.( $\mu$ F) | Contents | 10V (1A)          |      | 16V (1C)          |     | 25V (1E)          |     | 35V (1V)          |     | 50V (1H)          |     | 63V (1J)          |     |
|----------------|----------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                |          | $\phi D \times L$ | 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  |
| 10             | 100      |                   |      |                   |     |                   |     |                   |     | 8×11.5            | 84  | 8×11.5            | 84  |
| 22             | 220      |                   |      |                   |     |                   |     | 8×11.5            | 113 | 10×12.5           | 149 | 10×12.5           | 149 |
| 33             | 330      |                   |      |                   |     | 8×11.5            | 138 | 10×12.5           | 162 | 10×16             | 200 | 10×16             | 200 |
| 47             | 470      |                   |      | 8×11.5            | 150 | 10×12.5           | 194 | 10×16             | 213 | 10×16             | 239 | 10×20             | 260 |
| 100            | 101      | 10×12.5           | 231  | 10×16             | 285 | 10×16             | 312 | 10×20             | 338 |                   |     |                   |     |
| 220            | 221      | 10×16             | 378  | 10×20             | 458 | 12.5×20           | 557 | 12.5×25           | 605 | 12.5×20           | 419 | 12.5×20           | 419 |
| 330            | 331      | 10×16             | 462  | 12.5×20           | 621 | 12.5×25           | 740 | 16×20             | 755 |                   |     |                   |     |
| 470            | 471      | 10×20             | 599  | 12.5×25           | 806 | 16×20             | 902 |                   |     | 16×20             | 689 |                   |     |
| 1,000          | 102      | 16×20             | 1073 |                   |     |                   |     |                   |     |                   |     |                   |     |

| Cap.( $\mu$ F) | Contents | 160V (2C)         |     | 200V (2D)         |     | 250V (2E)         |     | 350V (2V)         |     | 400V (2G)         |     | 450V (2W)         |     |
|----------------|----------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                |          | $\phi D \times L$ | 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  |
| 4.7            | 4R7      |                   |     |                   |     |                   |     | 10×20             | 53  | 10×20             | 53  | 10×25             | 58  |
| 10             | 100      |                   |     | 10×20             | 78  | 10×20             | 78  | 10×25             | 85  | 10×25             | 86  | 12.5×20           | 86  |
| 22             | 220      | 10×20             | 115 | 10×25             | 126 | 12.5×20           | 128 | 12.5×25           | 139 | 12.5×25           | 142 | 16×25             | 154 |
| 33             | 330      | 10×25             | 154 | 12.5×20           | 157 | 12.5×25           | 171 | 16×25             | 189 | 16×25             | 189 | 16×31.5           | 203 |
| 47             | 470      | 12.5×20           | 187 | 12.5×25           | 204 | 16×25             | 225 | 16×31.5           | 243 | 16×31.5           | 243 |                   |     |
| 68             | 680      | 12.5×25           | 245 | 16×20             | 250 | 16×31.5           | 292 |                   |     |                   |     |                   |     |
| 100            | 101      | 16×25             | 329 | 16×25             | 329 |                   |     |                   |     |                   |     |                   |     |
| 150            | 151      | 16×31.5           | 434 |                   |     |                   |     |                   |     |                   |     |                   |     |

## Part Numbering System

|             |             |                       |               |                              |             |                   |                           |
|-------------|-------------|-----------------------|---------------|------------------------------|-------------|-------------------|---------------------------|
| RUA Series  | 470 $\mu$ F | ±20%                  | 16V           | Bulk Package                 | Gas Type    | 12.5 $\phi$ × 25L | Pb-free and PET sleeve    |
| <b>RUA</b>  | <b>471</b>  | <b>M</b>              | <b>1C</b>     | <b>BK</b>                    | <b>-</b>    | <b>1325</b>       |                           |
| Series Name | Capacitance | Capacitance Tolerance | Rated Voltage | Lead Configuration & 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.



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

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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