

# ALUMINUM ELECTROLYTIC CAPACITORS

**RS** series Compact & Low-profile Sized

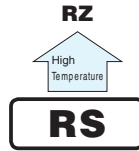


Smaller



Anti-Solvent Feature  
(Through 100V only)

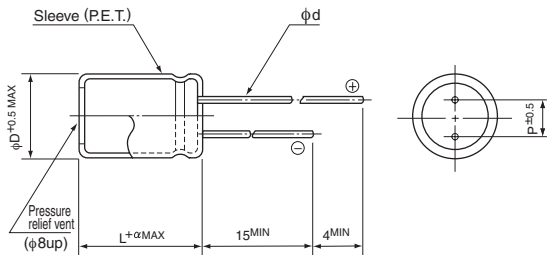
- Compact & low profile case size.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                            | Performance Characteristics   |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
|---------------------------------|---|--|--|------------|---|--|--|------|------|------|------|------|-----|-----|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|---------------------------------|----|----|---|---|---|---|---|---|---|---|---|----|
| Category Temperature Range      | -40 to +85°C  |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Rated Voltage Range             | 6.3 to 400V   |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Rated Capacitance Range         | 0.1 to 10000µF  |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Capacitance Tolerance           | ±20% at 120Hz, 20°C   |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Leakage Current                 | <table border="1"> <tr> <th>Rated voltage (V)</th> <th>6.3 to 100</th> <th>160 to 400</th> </tr> <tr> <td>_____</td> <td>After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (µA), whichever is greater.<br/>After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3 (µA), whichever is greater.</td> <td>After 1 minute's application of rated voltage at 20°C, I = 0.04CV+100 (µA) or less</td> </tr> </table>  | Rated voltage (V)  | 6.3 to 100                                   | 160 to 400 | _____   | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (µA), whichever is greater.<br>After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3 (µA), whichever is greater. | After 1 minute's application of rated voltage at 20°C, I = 0.04CV+100 (µA) or less |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
|                                 | Rated voltage (V)   | 6.3 to 100   | 160 to 400                                   |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| _____                           | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (µA), whichever is greater.<br>After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3 (µA), whichever is greater.  | After 1 minute's application of rated voltage at 20°C, I = 0.04CV+100 (µA) or less |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Tangent of loss angle (tan δ)   | For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF. Measurement frequency : 120Hz at 20°C<br><table border="1"> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>400</th> </tr> <tr> <td>tan δ (MAX.)</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.25</td> </tr> </table>   | Rated voltage (V)  | 6.3  | 10         | 16  | 25   | 35   | 50   | 63   | 100  | 160  | 200  | 250 | 400 | tan δ (MAX.)                    | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.20 | 0.20 | 0.20 | 0.25 |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Rated voltage (V)               | 6.3   | 10   | 16   | 25         | 35  | 50   | 63   | 100  | 160  | 200  | 250  | 400  |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| tan δ (MAX.)                    | 0.28  | 0.24   | 0.20   | 0.16       | 0.14  | 0.12   | 0.10   | 0.08 | 0.20 | 0.20 | 0.20 | 0.25 |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Stability at Low Temperature    | Measurement frequency : 120Hz<br><table border="1"> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>400</th> </tr> <tr> <td>Impedance ratio Z-25°C / Z+20°C</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>ZT / Z20 (MAX.) Z-40°C / Z+20°C</td> <td>12</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>6</td> <td>10</td> </tr> </table> | Rated voltage (V)  | 6.3  | 10         | 16  | 25   | 35   | 50   | 63   | 100  | 160  | 200  | 250 | 400 | Impedance ratio Z-25°C / Z+20°C | 5    | 4    | 3    | 2    | 2    | 2    | 2    | 2    | 3    | 3    | 3    | 6    | ZT / Z20 (MAX.) Z-40°C / Z+20°C | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 10 |
|                                 | Rated voltage (V)   | 6.3  | 10   | 16         | 25  | 35   | 50   | 63   | 100  | 160  | 200  | 250  | 400 |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Impedance ratio Z-25°C / Z+20°C | 5   | 4  | 3  | 2          | 2   | 2  | 2  | 2    | 3    | 3    | 3    | 6    |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| ZT / Z20 (MAX.) Z-40°C / Z+20°C | 12  | 10   | 8  | 5          | 4   | 3  | 3  | 3    | 4    | 4    | 6    | 10   |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Endurance                       | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 85°C.<br><table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of the initial capacitance value</td> </tr> <tr> <td>tan δ</td> <td>200% or less than the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Less than or equal to the initial specified value</td> </tr> </table>   | Capacitance change   | Within ±20% of the initial capacitance value | tan δ      | 200% or less than the initial specified value | Leakage current  | Less than or equal to the initial specified value                                  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Capacitance change              | Within ±20% of the initial capacitance value  |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| tan δ                           | 200% or less than the initial specified value   |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Leakage current                 | Less than or equal to the initial specified value   |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Shelf Life                      | After storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.  |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |
| Marking                         | Printed with white color letter on black sleeve.  |  |  |            |   |  |  |      |      |      |      |      |     |     |                                 |      |      |      |      |      |      |      |      |      |      |      |      |                                 |    |    |   |   |   |   |   |   |   |   |   |    |

## Radial Lead Type

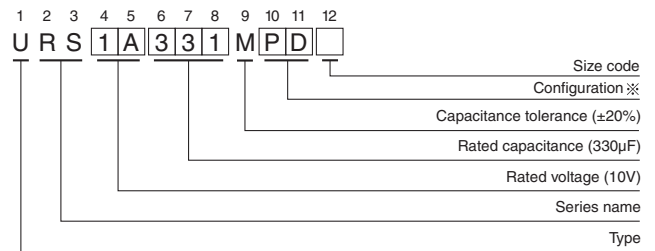


|    | (mm) |     |     |     |      |     |     |      |
|----|------|-----|-----|-----|------|-----|-----|------|
| φD | 5    | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20   |
| P  | 2.0  | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0 |
| φd | 0.5  | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0  |

|   |               |
|---|---------------|
| α | (φD < 20) 1.5 |
|   | (φD ≥ 20) 2.0 |

• Please refer to page 20 about the end seal configuration.

## Type numbering system (Example : 10V 330µF)



※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 5 · 6.3    | DD                                     |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |
| 20         | RD                                     |

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

● Dimension table in next page.



## ■ Dimensions

| V        |      | 6.3       |      | 10        |      | 16          |      | 25        |      | 35          |      | 50                        |                 |
|----------|------|-----------|------|-----------|------|-------------|------|-----------|------|-------------|------|---------------------------|-----------------|
| Cap.(μF) | Code | 0J        |      | 1A        |      | 1C          |      | 1E        |      | 1V          |      | 1H                        |                 |
| 0.1      | 0R1  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 1.1             |
| 0.22     | R22  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 2.3             |
| 0.33     | R33  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 3.5             |
| 0.47     | R47  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 5               |
| 1        | 010  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 13              |
| 2.2      | 2R2  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 26              |
| 3.3      | 3R3  |           |      |           |      |             |      |           |      |             |      | 5 × 9                     | 35              |
| 4.7      | 4R7  |           |      |           |      |             |      | 5 × 9     | 30   | 5 × 9       | 35   | 5 × 9                     | 40              |
| 10       | 100  |           |      |           |      | 5 × 9       | 40   | 5 × 9     | 50   | 5 × 9       | 55   | 5 × 9                     | 65              |
| 22       | 220  | 5 × 9     | 35   | 5 × 9     | 55   | 5 × 9       | 70   | 5 × 9     | 75   | 5 × 9       | 95   | 5 × 9                     | 90              |
| 33       | 330  | 5 × 9     | 55   | 5 × 9     | 75   | 5 × 9       | 85   | 5 × 9     | 95   | 5 × 9       | 100  | 6.3 × 9                   | 120             |
| 47       | 470  | 5 × 9     | 75   | 5 × 9     | 90   | 5 × 9       | 100  | 5 × 9     | 110  | 6.3 × 9     | 130  | 6.3 × 9                   | 140             |
| 100      | 101  | 5 × 9     | 125  | 5 × 9     | 135  | 6.3 × 9     | 160  | 6.3 × 9   | 180  | 8 × 9       | 220  | 10 × 9                    | 240             |
| 220      | 221  | 6.3 × 9   | 200  | 6.3 × 9   | 220  | 8 × 9       | 290  | 10 × 9    | 310  | 10 × 9      | 340  | 10 × 12.5                 | 420             |
| 330      | 331  | 6.3 × 9   | 250  | 8 × 9     | 300  | 10 × 9      | 360  | 10 × 9    | 380  | 10 × 12.5   | 480  | 12.5 × 12.5               | 530             |
| 470      | 471  | 8 × 9     | 330  | 8 × 9     | 360  | 10 × 9      | 410  | 10 × 12.5 | 530  | 12.5 × 12.5 | 590  | 16 × 15                   | 750             |
| 1000     | 102  | 10 × 9    | 510  | 10 × 12.5 | 620  | 12.5 × 12.5 | 720  | 12.5 × 15 | 830  | 16 × 15     | 1010 | 18 × 20                   | 1160            |
| 2200     | 222  | 12.5 × 15 | 890  | 12.5 × 15 | 960  | 16 × 15     | 1160 | 18 × 15   | 1360 | 18 × 20     | 1560 | 20 × 25                   | 1750            |
| 3300     | 332  | 16 × 15   | 1200 | 16 × 15   | 1300 | 18 × 15     | 1460 | 18 × 20   | 1720 | 20 × 25     | 2000 |                           |                 |
| 4700     | 472  | 16 × 15   | 1410 | 18 × 15   | 1550 | 18 × 20     | 1770 | 18 × 25   | 2050 |             |      |                           |                 |
| 6800     | 682  | 18 × 15   | 1660 | 18 × 20   | 1850 | 18 × 25     | 2170 |           |      |             |      |                           |                 |
| 10000    | 103  | 18 × 20   | 2020 | 18 × 25   | 2350 |             |      |           |      |             |      | Case size<br>φ D × L (mm) | Rated<br>ripple |

| V        |      | 63          |     | 100       |     | 160       |     | 200       |     | 250       |     | 400                       |                 |
|----------|------|-------------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|---------------------------|-----------------|
| Cap.(μF) | Code | 1J          |     | 2A        |     | 2C        |     | 2D        |     | 2E        |     | 2G                        |                 |
| 0.1      | 0R1  |             |     | 5 × 9     | 1.9 |           |     |           |     |           |     |                           |                 |
| 0.22     | R22  |             |     | 5 × 9     | 4.5 |           |     |           |     |           |     |                           |                 |
| 0.33     | R33  |             |     | 5 × 9     | 6.5 |           |     |           |     |           |     |                           |                 |
| 0.47     | R47  |             |     | 5 × 9     | 8   |           |     |           |     |           |     |                           |                 |
| 1        | 010  |             |     | 5 × 9     | 17  |           |     |           |     |           |     |                           |                 |
| 2.2      | 2R2  |             |     | 5 × 9     | 26  |           |     |           |     |           |     |                           |                 |
| 3.3      | 3R3  |             |     | 5 × 9     | 35  |           |     |           |     |           |     |                           |                 |
| 4.7      | 4R7  |             |     | 6.3 × 9   | 45  |           |     |           |     |           |     |                           |                 |
| 10       | 100  | 5 × 9       | 60  | 6.3 × 9   | 70  |           |     |           |     |           |     | 16 × 15                   | 140             |
| 22       | 220  | 6.3 × 9     | 100 | 8 × 9     | 130 |           |     |           |     | 16 × 15   | 280 | ● 18 × 15                 | 280             |
| 33       | 330  | 8 × 9       | 140 | 10 × 9    | 180 |           |     | 16 × 15   | 350 | ● 18 × 15 | 350 | 18 × 20                   | 350             |
| 47       | 470  | 8 × 9       | 170 | 10 × 12.5 | 230 | 16 × 15   | 420 | ● 18 × 15 | 420 | △ 18 × 20 | 420 | ★ 18 × 25                 | 420             |
| 68       | 680  |             |     |           |     | ● 18 × 15 | 490 | △ 18 × 20 | 490 | 18 × 20   | 490 | 20 × 25                   | 490             |
| 100      | 101  | 10 × 9      | 250 | 12.5 × 15 | 370 | △ 18 × 20 | 590 | ★ 18 × 25 | 590 | 18 × 25   | 590 |                           |                 |
| 150      | 151  |             |     |           |     | ★ 18 × 25 | 710 | 18 × 25   | 710 |           |     |                           |                 |
| 220      | 221  | 12.5 × 12.5 | 490 | 16 × 15   | 620 | 20 × 25   | 770 |           |     |           |     |                           |                 |
| 330      | 331  | 12.5 × 15   | 710 | 18 × 15   | 760 |           |     |           |     |           |     | Case size<br>φ D × L (mm) | Rated<br>ripple |
| 470      | 471  | 16 × 15     | 900 |           |     |           |     |           |     |           |     |                           |                 |

Rated ripple current (mA<sub>rms</sub>) at 85°C 120Hz

Size φ 16 × 20 is available for capacitors marked "●"  
 Size φ 20 × 15 is available for capacitors marked "△"  
 Size φ 20 × 20 is available for capacitors marked "★"

In this case, [ ] will be put at 12th digit of type numbering system.

## ● Frequency coefficient of rated ripple current

| V          | Cap.(μF)      | Frequency |       |       |       |               |
|------------|---------------|-----------|-------|-------|-------|---------------|
|            |               | 50Hz      | 120Hz | 300Hz | 1 kHz | 10kHz or more |
| 6.3 to 100 | 0.1 to 47     | 0.75      | 1.00  | 1.35  | 1.57  | 2.00          |
|            | 100 to 470    | 0.80      | 1.00  | 1.23  | 1.34  | 1.50          |
|            | 1000 to 10000 | 0.85      | 1.00  | 1.10  | 1.13  | 1.15          |
| 160 to 400 | 10 to 220     | 0.80      | 1.00  | 1.25  | 1.40  | 1.60          |

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[107CKR010M](#) [107CKH063MSA](#) [RJH-25V222MI9#](#) [RJH-35V221MG5#](#) [B43827A1106M8](#) [RJH-50V221MH6#](#) [EKYA500ELL470MF11D](#)  
[B41022A5686M6](#) [ESRG250ELL101MH09D](#) [EKMA160EC3101MF07D](#) [RJB-10V471MG3#](#) [ESMG160ETD221MF11D](#)  
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[LKMD1401H181MF](#) [LKMI2502G820MF](#) [LKMJ2001J122MF](#) [LKML2501C472MF](#) [LKMJ4002C681MF](#) [450MXH330MEFCSN25X45](#)  
[450MXK330MA2RFC22X50](#) [63ZLH560MEFCG412.5X30](#) [ELH2DM331O25KT](#) [ELH2DM471P30KT](#)