

## RZ Extremely Low Impedance Series

Long Life   
 Solvent Proof   
 Low Impedance



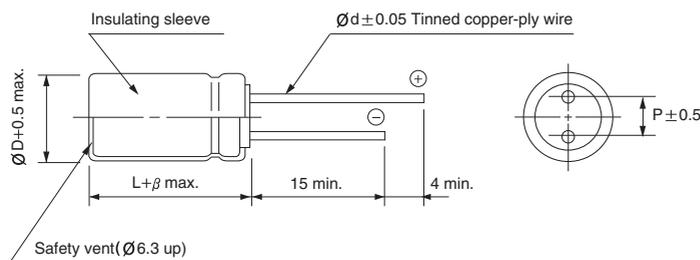
- Extremely low impedance at high frequency
- High reliability withstanding 5000 hours load life at 105°C (2000/3000 hours for smaller case sizes as specified below)
- Ideally suited for use in switching power supplies
- Complied to the RoHS directive

$\Rightarrow$  Long life

| Item   | Characteristics  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
|--|--|------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------------|-----------------------------------|------------|----|------|------|------|------|------|------|------|
| Operating temperature range  | -55 ~ +105°C   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Leakage current max.   | I = 0.01CV or 3µA whichever is greater (after 2 minutes)<br>I = 0.03CV or 4µA whichever is greater (after 1 minute)  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Capacitance tolerance  | ±20% at 120Hz, 20°C  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Dissipation factor max. (at 120Hz, 20°C)   | Capacitance > 1000µF : tanδ increases by 0.02 for each 1000µF from below value   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
|  | <table border="1"> <thead> <tr> <th>WV</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </tbody> </table> | WV                           | 6.3                       | 10                           | 16                           | 25                                | 35                                | 50         | 63 | tanδ | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 |
| WV   | 6.3  | 10                           | 16                        | 25                           | 35                           | 50                                | 63                                |            |    |      |      |      |      |      |      |      |
| tanδ   | 0.22   | 0.19                         | 0.16                      | 0.14                         | 0.12                         | 0.10                              | 0.08                              |            |    |      |      |      |      |      |      |      |
| Low temperature characteristics (Impedance ratio at 120Hz)   | <table border="1"> <thead> <tr> <th>WV</th> <th>6.3, 10</th> <th>16 ~ 35</th> <th>50, 63</th> </tr> </thead> <tbody> <tr> <td>Z-55°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> </tr> </tbody> </table>  | WV                           | 6.3, 10                   | 16 ~ 35                      | 50, 63                       | Z-55°C/Z+20°C                     | 4                                 | 3          | 2  |      |      |      |      |      |      |      |
|  | WV   | 6.3, 10                      | 16 ~ 35                   | 50, 63                       |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Z-55°C/Z+20°C  | 4  | 3                            | 2                         |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Load life  | After an application of DC bias voltage plus the rated AC ripple current for 5000 hours at 105°C. The measurement shall meet the following limits. The DC voltage plus the peak AC voltage combined must not exceed the rated voltage.   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
|  | <table border="1"> <tbody> <tr> <td>Leakage current</td> <td>Less than specified value</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> </tbody> </table>                                 | Leakage current              | Less than specified value | Capacitance change           | Within ±20% of initial value | tanδ                              | Less than 200% of specified value |            |    |      |      |      |      |      |      |      |
|  | Leakage current  | Less than specified value    |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
|  | Capacitance change   | Within ±20% of initial value |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| tanδ   | Less than 200% of specified value  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| <table border="1"> <thead> <tr> <th>∅D</th> <th>∅D ≤ 6.3</th> <th>∅D = 8</th> <th>∅D ≥ 10</th> </tr> </thead> <tbody> <tr> <td>Life time</td> <td>2000 hours</td> <td>3000 hours</td> <td>5000 hours</td> </tr> </tbody> </table>                                    | ∅D   | ∅D ≤ 6.3                     | ∅D = 8                    | ∅D ≥ 10                      | Life time                    | 2000 hours                        | 3000 hours                        | 5000 hours |    |      |      |      |      |      |      |      |
| ∅D   | ∅D ≤ 6.3   | ∅D = 8                       | ∅D ≥ 10                   |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Life time  | 2000 hours   | 3000 hours                   | 5000 hours                |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4   |  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| Shelf life (at 105°C)  | After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
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|  | Leakage current  | Less than specified value    |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
|  | Capacitance change   | Within ±20% of initial value |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| tanδ   | Less than 150% of specified value  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
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| Capacitance change   | Within ±20% of initial value   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| tanδ   | Less than 150% of specified value  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
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| Capacitance change   | Within ±20% of initial value   |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |
| tanδ   | Less than 150% of specified value  |                              |                           |                              |                              |                                   |                                   |            |    |      |      |      |      |      |      |      |

### ● DRAWING

Unit : mm



| ∅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 |
| ∅d | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| β  | 1.5 |     |     | 2.0 |      |     |     |

### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| µF \ Frequency | 120Hz | 1kHz | 10kHz | 50kHz | 100kHz ≤ |
|----------------|-------|------|-------|-------|----------|
| ~ 33           | 0.40  | 0.65 | 0.82  | 0.91  | 1.00     |
| 47 ~ 220       | 0.50  | 0.70 | 0.84  | 0.92  | 1.00     |
| 330 ~ 680      | 0.55  | 0.75 | 0.86  | 0.93  | 1.00     |
| 1000 ~ 1500    | 0.60  | 0.80 | 0.88  | 0.94  | 1.00     |
| 2200 ~         | 0.70  | 0.85 | 0.90  | 0.95  | 1.00     |

# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

**RZ** series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV<br>Item<br>μF | 6.3          |                      |                            | 10           |                      |                            | 16           |                      |                            | 25           |                      |                            |
|------------------|--------------|----------------------|----------------------------|--------------|----------------------|----------------------------|--------------|----------------------|----------------------------|--------------|----------------------|----------------------------|
|                  | ∅D×L<br>(mm) | Impedance<br>(Ω)max. | Ripple current<br>(mA rms) |
|                  |              | 20°C<br>100kHz       | 105°C<br>100kHz            |
| 33               |              |                      |                            |              |                      |                            |              |                      |                            | 5×11         | 0.80                 | 155                        |
| 47               |              |                      |                            |              |                      |                            | 5×11         | 0.80                 | 155                        | 6.3×11       | 0.55                 | 210                        |
| 68               |              |                      |                            | 5×11         | 0.80                 | 155                        | 6.3×11       | 0.50                 | 220                        | 6.3×11       | 0.36                 | 260                        |
| 100              | 5×11         | 0.85                 | 150                        | 6.3×11       | 0.55                 | 210                        | 6.3×11       | 0.35                 | 265                        | 8×11.5       | 0.24                 | 383                        |
| 150              | 6.3×11       | 0.49                 | 225                        | 6.3×11       | 0.35                 | 265                        | 8×11.5       | 0.23                 | 388                        | 8×11.5       | 0.16                 | 460                        |
| 220              | 6.3×11       | 0.30                 | 285                        | 8×11.5       | 0.24                 | 387                        | 8×11.5       | 0.16                 | 460                        | 10×12.5      | 0.13                 | 600                        |
| 330              | 8×11.5       | 0.20                 | 292                        | 8×11.5       | 0.16                 | 460                        | 10×12.5      | 0.12                 | 625                        | 10×16        | 0.095                | 750                        |
| 470              | 10×12.5      | 0.14                 | 575                        | 10×12.5      | 0.13                 | 600                        | 10×16        | 0.09                 | 770                        | 10×20        | 0.065                | 1020                       |
| 680              | 10×16        | 0.11                 | 700                        | 10×16        | 0.09                 | 770                        | 10×20        | 0.065                | 1020                       | 12.5×20      | 0.046                | 1392                       |
| 1000             | 10×20        | 0.075                | 950                        | 10×20        | 0.060                | 1060                       | 12.5×20      | 0.047                | 1411                       | 12.5×25      | 0.036                | 1660                       |
| 1500             | 10×25        | 0.055                | 1220                       | 12.5×20      | 0.045                | 1417                       | 12.5×25      | 0.036                | 1660                       | 16×20        | 0.034                | 1770                       |
| 2200             | 12.5×20      | 0.043                | 1438                       | 12.5×25      | 0.034                | 1710                       | 16×20        | 0.033                | 1800                       | 16×25        | 0.028                | 2051                       |
| 3300             | 12.5×25      | 0.034                | 1710                       | 16×20        | 0.031                | 1850                       | 16×25        | 0.027                | 2095                       | 16×35.5      | 0.020                | 2680                       |
| 4700             | 16×25        | 0.032                | 1935                       | 16×31.5      | 0.023                | 2420                       | 16×35.5      | 0.020                | 2680                       | 18×40        | 0.018                | 2960                       |
| 6800             | 16×31.5      | 0.024                | 2370                       | 16×35.5      | 0.020                | 2680                       | 18×35.5      | 0.018                | 2900                       |              |                      |                            |
| 10000            | 16×40        | 0.020                | 2750                       | 18×40        | 0.017                | 3040                       |              |                      |                            |              |                      |                            |
| 15000            | 18×40        | 0.018                | 2960                       |              |                      |                            |              |                      |                            |              |                      |                            |

| WV<br>Item<br>μF | 35           |                      |                            | 50           |                      |                            | 63           |                      |                            |
|------------------|--------------|----------------------|----------------------------|--------------|----------------------|----------------------------|--------------|----------------------|----------------------------|
|                  | ∅D×L<br>(mm) | Impedance<br>(Ω)max. | Ripple current<br>(mA rms) | ∅D×L<br>(mm) | Impedance<br>(Ω)max. | Ripple current<br>(mA rms) | ∅D×L<br>(mm) | Impedance<br>(Ω)max. | Ripple current<br>(mA rms) |
|                  |              | 20°C<br>100kHz       | 105°C<br>100kHz            |              | 20°C<br>100kHz       | 105°C<br>100kHz            |              | 20°C<br>100kHz       | 105°C<br>100kHz            |
| 1.0              |              |                      |                            | 5×11         | 4.0                  | 36                         |              |                      |                            |
| 1.5              |              |                      |                            | 5×11         | 3.8                  | 45                         |              |                      |                            |
| 2.2              |              |                      |                            | 5×11         | 3.5                  | 54                         |              |                      |                            |
| 3.3              |              |                      |                            | 5×11         | 3.0                  | 66                         |              |                      |                            |
| 4.7              |              |                      |                            | 5×11         | 2.2                  | 81                         |              |                      |                            |
| 6.8              |              |                      |                            | 5×11         | 1.8                  | 91                         |              |                      |                            |
| 10               |              |                      |                            | 5×11         | 1.8                  | 115                        | 5×11         | 1.06                 | 135                        |
| 15               |              |                      |                            | 5×11         | 0.93                 | 145                        | 6.3×11       | 0.73                 | 185                        |
| 22               | 5×11         | 0.75                 | 160                        | 6.3×11       | 0.65                 | 195                        | 6.3×11       | 0.52                 | 215                        |
| 33               | 6.3×11       | 0.49                 | 225                        | 6.3×11       | 0.43                 | 240                        | 8×11.5       | 0.35                 | 320                        |
| 47               | 6.3×11       | 0.34                 | 270                        | 8×11.5       | 0.30                 | 344                        | 8×11.5       | 0.25                 | 365                        |
| 68               | 8×11.5       | 0.24                 | 384                        | 8×11.5       | 0.20                 | 410                        | 10×12.5      | 0.19                 | 495                        |
| 100              | 8×11.5       | 0.16                 | 460                        | 10×16        | 0.16                 | 581                        | 10×20        | 0.12                 | 750                        |
| 150              | 10×12.5      | 0.12                 | 625                        | 10×20        | 0.10                 | 820                        | 10×25        | 0.09                 | 950                        |
| 220              | 10×16        | 0.09                 | 770                        | 10×25        | 0.075                | 1040                       | 12.5×20      | 0.065                | 1140                       |
| 330              | 10×20        | 0.060                | 1060                       | 12.5×20      | 0.075                | 1281                       | 12.5×25      | 0.049                | 1420                       |
| 470              | 12.5×20      | 0.046                | 1401                       | 12.5×25      | 0.044                | 1500                       | 16×25        | 0.042                | 1700                       |
| 680              | 12.5×25      | 0.036                | 1660                       | 16×20        | 0.040                | 1630                       | 16×31.5      | 0.032                | 2050                       |
| 1000             | 16×20        | 0.034                | 1770                       | 16×31.5      | 0.030                | 2120                       | 18×35.5      | 0.029                | 2280                       |
| 1500             | 16×31.5      | 0.028                | 2385                       | 16×40        | 0.026                | 2410                       |              |                      |                            |
| 2200             | 16×35.5      | 0.020                | 2680                       | 18×40        | 0.024                | 2560                       |              |                      |                            |
| 3300             | 18×40        | 0.017                | 3040                       |              |                      |                            |              |                      |                            |