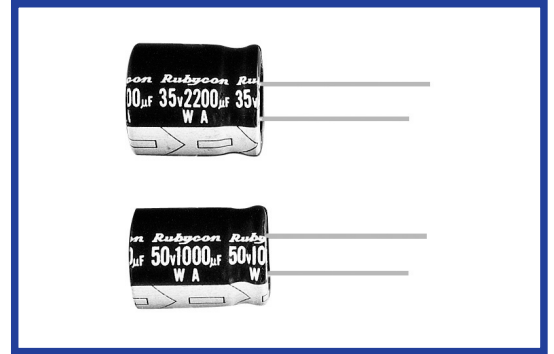


**WA SERIES**
**85°C Low profile.**
**◆FEATURES**

- 9~25mm height.
- RoHS compliance.


**◆SPECIFICATIONS**

| Items  | Characteristics  |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|------|------|------|------|------|------|------|------|------|-------------------|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|---------------|------|------|------|------|------|------|------|------|------|------|------|------|------------------|----|----|---|---|---|---|---|---|---|---|---|---|------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| Category Temperature Range   | -40~+85°C  | -25~+85°C  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Rated Voltage Range  | 6.3~250V.DC  | 350~450V.DC  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capacitance Tolerance  | ±20%(20°C, 120Hz)  |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leakage Current(MAX)   | 6.3~50V.DC   | 160~450V.DC  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | I=0.01CV or 3µA whichever is greater.<br>(After 2 minutes application of rated voltage)  | CV≤1000  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | CV>1000  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | I=0.1CV+40µA (1minute)<br>I=0.03CV+15µA (5minutes)   | I=0.04CV+100µA (1minute)<br>I=0.02CV+25µA (5minutes) |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | I=Leakage Current(µA)  | C=Capacitance(µF)      V=Rated Voltage(V)            |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dissipation Factor(MAX)<br>(tanδ)  | <table border="1"> <thead> <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>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>(20°C, 120Hz)</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> </tr> </tbody> </table>   |  |      |      |      |      |      |      |      |      |      | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 160 | 200 | 250 | 350 | 400 | 450 | (20°C, 120Hz) | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Rated Voltage (V)  | 6.3  | 10   | 16   | 25   | 35   | 50   | 160  | 200  | 250  | 350  | 400               | 450 |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| (20°C, 120Hz)  | 0.26   | 0.22   | 0.18 | 0.16 | 0.14 | 0.12 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20              |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| When capacitance is over 1000µF, tanδ shall be added 0.02 to the listed value with increase of every 1000µF. |  |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Endurance  | After applying rated voltage with rated ripple current for 2000 hours at 85°C, the capacitors shall meet the following requirements.   |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Capacitance Change   | Within ±25% of the initial value.                    |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Dissipation Factor   | Not more than 200% of the specified value.           |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Leakage Current  | Not more than the specified value.                   |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Low Temperature Stability Impedance Ratio(MAX)   | <table border="1"> <thead> <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>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>(120Hz)</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td>5</td> <td>5</td> <td>7</td> </tr> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>12</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |  |      |      |      |      |      |      |      |      |      | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 160 | 200 | 250 | 350 | 400 | 450 | (120Hz)       | 6    | 4    | 4    | 3    | 2    | 2    | 3    | 3    | 3    | 5    | 5    | 7    | Z(-25°C)/Z(20°C) | 12 | 10 | 8 | 6 | 4 | 3 | - | - | - | - | - | - | Z(-40°C)/Z(20°C) |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Rated Voltage (V)  | 6.3  | 10   | 16   | 25   | 35   | 50   | 160  | 200  | 250  | 350  | 400               | 450 |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | (120Hz)  | 6  | 4    | 4    | 3    | 2    | 2    | 3    | 3    | 3    | 5    | 5                 | 7   |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Z(-25°C)/Z(20°C)   | 12   | 10   | 8    | 6    | 4    | 3    | -    | -    | -    | -    | -    | -                 |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
| Z(-40°C)/Z(20°C)   |  |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Z(-25°C)/Z(20°C)   |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Z(-40°C)/Z(20°C)   |  |      |      |      |      |      |      |      |      |      |                   |     |    |    |    |    |    |     |     |     |     |     |     |               |      |      |      |      |      |      |      |      |      |      |      |      |                  |    |    |   |   |   |   |   |   |   |   |   |   |                  |  |  |  |  |  |  |  |  |  |  |  |  |

**◆MULTIPLIER FOR RIPPLE CURRENT**

| Frequency (Hz) |              | 60(50) | 120 | 500  | 1k   | 10k≤ |
|----------------|--------------|--------|-----|------|------|------|
| Coefficient    | 1.5~6.8µF    | 0.65   | 1.0 | 1.20 | 1.30 | 1.50 |
|                | 10~68µF      | 0.8    | 1.0 | 1.20 | 1.30 | 1.50 |
|                | 100~1000µF   | 0.8    | 1.0 | 1.10 | 1.15 | 1.20 |
|                | 2200~10000µF | 0.8    | 1.0 | 1.05 | 1.10 | 1.15 |

**◆OPTION**

|            | Code |
|------------|------|
| PET Sleeve | EFC  |

**◆PART NUMBER**

|               |        |             |                       |        |              |           |
|---------------|--------|-------------|-----------------------|--------|--------------|-----------|
| □□□           | WA     | □□□□□       | M                     | □□□    | □□           | D×L       |
| Rated Voltage | Series | Capacitance | Capacitance Tolerance | Option | Lead Forming | Case Size |

