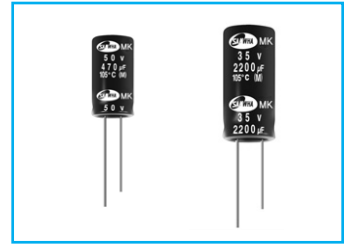


MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



High Ripple Current Series



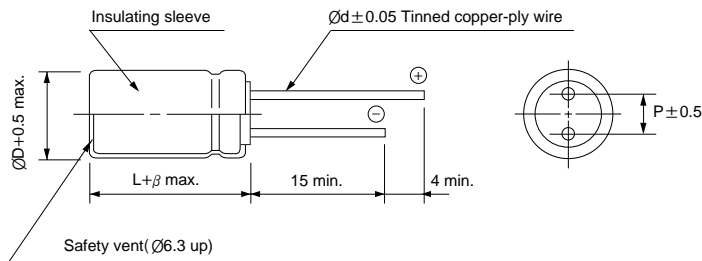
- Ripple current compared with LK series
- Enabled high ripple current by a reduction of impedance at high frequency
- High reliability withstanding 5000 hours load life at 105°C (2000 ~ 4000 hours for smaller case sizes as specified below)
- Complied to the RoHS directive



| Item | Characteristics | | | | | | | | | | | | | | | | | | |
|---|---|-----------------|---------------------------|--------------------|----------------------------------|------|---------------------------------------|------|----|-----|------|------|------|------|------|------|------|------|------|
| Operating temperature range | -40 ~ +105°C | | | | | | | | | | | | | | | | | | |
| Leakage current max. | I = 0.01CV or 3μA whichever is greater (after 2 minutes) I = 0.03CV or 4μA whichever is greater (after 1 minute) | | | | | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% (20°C, 120Hz) | | | | | | | | | | | | | | | | | | |
| Dissipation factor max. (at 120Hz, 20°C) | <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> <th>100</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> <td>0.08</td> </tr> </tbody> </table> | WV | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | tanδ | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.08 |
| WV | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | |
| tanδ | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.08 | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120Hz) | <table border="1"> <thead> <tr> <th>Z-40°C / Z+20°C</th> <th>Z-25°C / Z+20°C</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>2</td> </tr> </tbody> </table> | Z-40°C / Z+20°C | Z-25°C / Z+20°C | 3 | 2 | | | | | | | | | | | | | | |
| Z-40°C / Z+20°C | Z-25°C / Z+20°C | | | | | | | | | | | | | | | | | | |
| 3 | 2 | | | | | | | | | | | | | | | | | | |
| Load life (after application of the rated voltage for 5000 hours at 105°C) | <table border="1"> <tbody> <tr> <td>Leakage current</td> <td>Less than specified value</td> </tr> <tr> <td>Capacitance change</td> <td>Within ±25% of the initial value</td> </tr> <tr> <td>tanδ</td> <td>Less than 200% of the specified value</td> </tr> </tbody> </table> <p>Ø5, 6.3 : 2000 hours, Ø8 : 3000 hours, Ø10 : 4000 hours</p> | Leakage current | Less than specified value | Capacitance change | Within ±25% of the initial value | tanδ | Less than 200% of the specified value | | | | | | | | | | | | |
| Leakage current | Less than specified value | | | | | | | | | | | | | | | | | | |
| Capacitance change | Within ±25% of the initial value | | | | | | | | | | | | | | | | | | |
| tanδ | Less than 200% of the specified value | | | | | | | | | | | | | | | | | | |
| Shelf life (at 105°C) | After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. | | | | | | | | | | | | | | | | | | |

● DRAWING

Unit : mm



| ØD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
|----|-----|-----|-----|-----|------|-----|-----|
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| Ød | 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(Hz) | 120 | 1k | 10k | 100k ≤ |
|--------------|---------------|------|------|------|--------|
| ~ 33 | | 0.40 | 0.65 | 0.82 | 1.00 |
| 39 ~ 270 | | 0.50 | 0.70 | 0.84 | 1.00 |
| 330 ~ 680 | | 0.55 | 0.75 | 0.86 | 1.00 |
| 820 ~ 1800 | | 0.60 | 0.86 | 0.88 | 1.00 |
| 2200 ~ 15000 | | 0.70 | 0.85 | 0.90 | 1.00 |

MINIATURE TYPES

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

MK series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV Item μF | 6.3 | | | 10 | | | 16 | | | 25 | | |
|------------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|
| | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz |
| 4.7 | | | | | | | | | | 5×11 | 0.525 | 250 |
| 10 | | | | | | | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 |
| 22 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 |
| 33 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 | 5×11 | 0.525 | 250 |
| 47 | 5×11 | 0.450 | 250 | 5×11 | 0.450 | 250 | 5×11 | 0.450 | 250 | 5×11 | 0.450 | 250 |
| 100 | 5×11 | 0.450 | 250 | 5×11 | 0.450 | 250 | 6.3×11 | 0.225 | 405 | 6.3×11 | 0.225 | 405 |
| 150 | 6.3×11 | 0.225 | 405 | 6.3×11 | 0.225 | 405 | 6.3×11 | 0.225 | 405 | 8×11.5 | 0.108 | 760 |
| 220 | 6.3×11 | 0.225 | 405 | 6.3×11 | 0.225 | 405 | 8×11.5 | 0.108 | 760 | 8×11.5 | 0.108 | 760 |
| 330 | 6.3×11 | 0.225 | 405 | 8×11.5 | 0.108 | 760 | 8×11.5 | 0.108 | 760 | 10×12.5 | 0.088 | 1030 |
| 470 | 8×11.5 | 0.108 | 760 | 8×11.5 | 0.108 | 760 | 10×12.5 | 0.088 | 1030 | 10×16 | 0.065 | 1430 |
| 680 | 10×12.5 | 0.088 | 1030 | 10×12.5 | 0.088 | 1030 | 10×16 | 0.065 | 1430 | 10×20 | 0.050 | 1820 |
| 1000 | 10×16 | 0.065 | 1430 | 10×16 | 0.065 | 1430 | 10×20 | 0.050 | 1820 | 12.5×20 | 0.043 | 2360 |
| 1500 | 10×20 | 0.050 | 1820 | 10×20 | 0.050 | 1820 | 12.5×20 | 0.043 | 2360 | 16×20 | 0.024 | 2880 |
| 2200 | 12.5×20 | 0.043 | 2360 | 12.5×20 | 0.043 | 2360 | 12.5×25 | 0.029 | 2770 | 16×25 | 0.024 | 3114 |
| 3300 | 12.5×20 | 0.040 | 2360 | 12.5×25 | 0.029 | 2770 | 16×25 | 0.024 | 3114 | 16×31.5 | 0.024 | 3312 |
| 4700 | 16×25 | 0.024 | 3114 | 16×25 | 0.024 | 3114 | 16×31.5 | 0.024 | 3312 | 18×35.5 | 0.022 | 3420 |
| 6800 | 16×25 | 0.024 | 3114 | 16×31.5 | 0.024 | 3312 | 18×35.5 | 0.022 | 3420 | | | |
| 10000 | 16×31.5 | 0.024 | 3312 | 18×35.5 | 0.022 | 3420 | | | | | | |
| 15000 | 18×35.5 | 0.022 | 3420 | | | | | | | | | |

| WV Item μF | 35 | | | 50 | | | 63 | | | 100 | | |
|------------------|--------------|--|--|--------------|--|--|--------------|--|--|--------------|--|--|
| | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz | ØD×L (mm) | Impedance (Ω)max. 20°C 100kHz | Ripple current (mA rms) 105°C 100kHz |
| 0.47 | | | | 5×11 | 3.00 | 250 | | | | | | |
| 1.0 | | | | 5×11 | 3.00 | 250 | | | | | | |
| 2.2 | | | | 5×11 | 3.00 | 250 | | | | 5×11 | 2.0 | 125 |
| 3.3 | | | | 5×11 | 1.50 | 250 | 5×11 | 2.0 | 165 | 5×11 | 2.0 | 125 |
| 4.7 | 5×11 | 0.525 | 250 | 5×11 | 1.50 | 250 | 5×11 | 2.0 | 165 | 5×11 | 2.0 | 125 |
| 10 | 5×11 | 0.525 | 250 | 5×11 | 0.750 | 250 | 5×11 | 0.45 | 165 | 6.3×11 | 0.50 | 205 |
| 22 | 5×11 | 0.525 | 250 | 5×11 | 0.390 | 250 | 6.3×11 | 0.30 | 265 | 8×11.5 | 0.30 | 355 |
| 33 | 5×11 | 0.450 | 250 | 6.3×11 | 0.255 | 405 | 6.3×11 | 0.30 | 265 | 10×12.5 | 0.25 | 450 |
| 47 | 6.3×11 | 0.225 | 405 | 6.3×11 | 0.210 | 405 | 8×11.5 | 0.20 | 500 | 10×16 | 0.20 | 580 |
| 100 | 8×11.5 | 0.108 | 760 | 8×11.5 | 0.108 | 760 | 10×16 | 0.10 | 945 | 12.5×20 | 0.10 | 1045 |
| 150 | 8×11.5 | 0.108 | 760 | 10×12.5 | 0.088 | 1030 | 10×20 | 0.08 | 1100 | 12.5×25 | 0.070 | 1195 |
| 220 | 10×12.5 | 0.088 | 1030 | 10×16 | 0.065 | 1430 | 10×25 | 0.07 | 1300 | 16×25 | 0.060 | 1600 |
| 330 | 10×16 | 0.065 | 1430 | 10×20 | 0.050 | 1820 | 12.5×20 | 0.04 | 1495 | 16×31.5 | 0.040 | 1750 |
| 470 | 10×20 | 0.050 | 1820 | 12.5×20 | 0.043 | 2360 | 16×20 | 0.035 | 1990 | 18×40 | 0.030 | 2060 |
| 680 | 12.5×20 | 0.043 | 2360 | 12.5×25 | 0.029 | 2770 | 16×25 | 0.030 | 2780 | | | |
| 1000 | 12.5×25 | 0.029 | 2770 | 16×25 | 0.027 | 3114 | 16×35.5 | 0.020 | 2835 | | | |
| 1500 | 16×25 | 0.024 | 3114 | 16×31.5 | 0.024 | 3312 | | | | | | |
| 2200 | 16×31.5 | 0.024 | 3312 | 18×35.5 | 0.022 | 3420 | | | | | | |
| 3300 | 18×35.5 | 0.022 | 3420 | | | | | | | | | |