

FEATURES

1. For general purpose.
2. Life 2000 hours at +85°C.
3. Wide CV value range.
4. Safety vent construction products.

SPECIFICATIONS

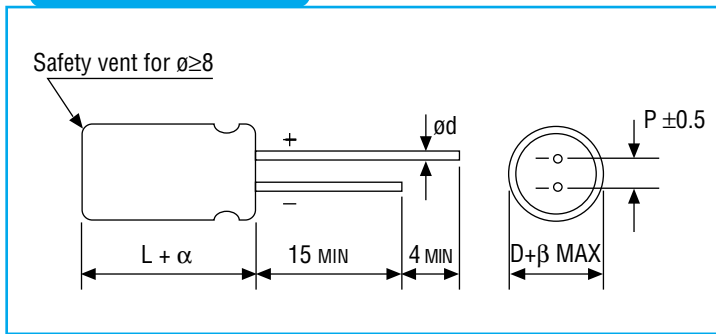
| Item | Performance Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|--|---|---------------------|-------------------------------|------|--------|-------|------|--------|-----------|------|---------------------|------|------|------|------|-----------|------|------|------|---------------------|------|--------------|------|------|------|------|---------------------|-----------|---------------------|------|------|------|------|------|-----------|----------------|------|------|------|------|---|----|
| Operating Temperature Range | -25 to +85°C | -25 to +85°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Working Voltage Range | 6.3 to 100V | 160 to 450V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nominal Capacitance Range | 0.1 to 33000 μ F | 0.47 to 330 μ F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | \pm 20% (120Hz, +20°C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | $I \leq 0.01CV$ or $3(\mu A)$ after 2 minutes whichever is greater measured with rated working voltage applied at +20°C | $I \leq 0.03CV + 40(\mu A)$ after 2 minutes application of rated working voltage at +20°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor tan δ | <table border="1"> <thead> <tr> <th>Working 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> </tr> </thead> <tbody> <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> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Working voltage [V]</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tan δ (max.)</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.25</td> <td>0.25</td> <td>0.25</td> </tr> </tbody> </table> <p>(120Hz, +20°C) For capacitance value > 1000μF, add 0.02 per another 1000μF</p> | | Working voltage [V] | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | tan δ (max.) | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | Working voltage [V] | 160 | 200 | 250 | 350 | 400 | 450 | tan δ (max.) | 0.20 | 0.20 | 0.20 | 0.25 | 0.25 | 0.25 | | | | | | | | | |
| Working voltage [V] | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ (max.) | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Working voltage [V] | 160 | 200 | 250 | 350 | 400 | 450 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ (max.) | 0.20 | 0.20 | 0.20 | 0.25 | 0.25 | 0.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Current | <p>Refer to standard products table (120Hz, +85°C) Correction factor for frequency</p> <table border="1"> <thead> <tr> <th>Voltage [V]</th> <th>Capacitance Range (μF)</th> <th>50Hz</th> <th>120Hz</th> <th>300Hz</th> <th>1kHz</th> <th>10kHz~</th> </tr> </thead> <tbody> <tr> <td rowspan="3">6.3 ~ 100</td> <td>~ 47</td> <td>0.75</td> <td>1.00</td> <td>1.35</td> <td>1.57</td> <td>2.00</td> </tr> <tr> <td>100 ~ 470</td> <td>0.80</td> <td>1.00</td> <td>1.23</td> <td>1.34</td> <td>1.50</td> </tr> <tr> <td>1000 ~ 33000</td> <td>0.85</td> <td>1.00</td> <td>1.10</td> <td>1.13</td> <td>1.15</td> </tr> <tr> <td rowspan="2">160 ~ 450</td> <td>0.47 ~ 220</td> <td>0.80</td> <td>1.00</td> <td>1.25</td> <td>1.40</td> <td>1.60</td> </tr> <tr> <td>270 ~ 330</td> <td>0.90</td> <td>1.00</td> <td>1.10</td> <td>1.13</td> <td>1.15</td> </tr> </tbody> </table> | | Voltage [V] | Capacitance Range (μ F) | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz~ | 6.3 ~ 100 | ~ 47 | 0.75 | 1.00 | 1.35 | 1.57 | 2.00 | 100 ~ 470 | 0.80 | 1.00 | 1.23 | 1.34 | 1.50 | 1000 ~ 33000 | 0.85 | 1.00 | 1.10 | 1.13 | 1.15 | 160 ~ 450 | 0.47 ~ 220 | 0.80 | 1.00 | 1.25 | 1.40 | 1.60 | 270 ~ 330 | 0.90 | 1.00 | 1.10 | 1.13 | 1.15 | | |
| Voltage [V] | Capacitance Range (μ F) | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz~ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.3 ~ 100 | ~ 47 | 0.75 | 1.00 | 1.35 | 1.57 | 2.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 ~ 470 | 0.80 | 1.00 | 1.23 | 1.34 | 1.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1000 ~ 33000 | 0.85 | 1.00 | 1.10 | 1.13 | 1.15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 160 ~ 450 | 0.47 ~ 220 | 0.80 | 1.00 | 1.25 | 1.40 | 1.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 270 ~ 330 | 0.90 | 1.00 | 1.10 | 1.13 | 1.15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics | <p>Impedance ratio max. at 120Hz</p> <table border="1"> <thead> <tr> <th>Working 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> </tr> </thead> <tbody> <tr> <td>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> </tr> <tr> <td>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> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Working voltage [V]</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Z-25°C/ Z+20°C</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> <td>6</td> <td>15</td> </tr> </tbody> </table> <p>For capacitance value > 1000μF, Add 0.5 per another 1000μF for Z-25°C/ Z+20°C Add 1.0 per another 1000μF for Z-40°C/ Z+20°C</p> | | Working voltage [V] | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | Z-25°C/ Z+20°C | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | Z-40°C/ Z+20°C | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | Working voltage [V] | 160 | 200 | 250 | 350 | 400 | 450 | Z-25°C/ Z+20°C | 3 | 3 | 4 | 4 | 6 | 15 |
| Working voltage [V] | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z-25°C/ Z+20°C | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z-40°C/ Z+20°C | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Working voltage [V] | 160 | 200 | 250 | 350 | 400 | 450 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z-25°C/ Z+20°C | 3 | 3 | 4 | 4 | 6 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SPECIFICATIONS

| Item | Performance Characteristics | |
|--------------------------|---|--|
| High Temperature Loading | Test conditions Duration : 2000 hours Ambient temperature : +85°C Applied voltage : Rated DC working voltage Post test requirements at +20°C Leakage current : ≤ Initial specified value Capacitance change : ≤ ±20% of initial measured value tan δ : ≤ 200% of initial specified value | |
| Shelf Life | Test conditions Duration : 1000 hours Ambient temperature : +85°C Applied voltage : (None) | Post test requirements at +20°C Same limits for high temperature loading. |
| Others | JIS C - 5141 JIS C - 5102 | |

CASE SIZE TABLE

Unit : mm



| D ø | 5 | 6.3 | 8 | 10 | 13 | 16 | 18 | 22 | 25 |
|--------|--------------|-----|-----|--------------|-----|--------------|-----|------|--------------|
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 | 10.0 | 12.5 |
| d ø | 0.5 | | | 0.6 | | 0.8 | | | 1.0 |
| α MAX. | (L < 20) 1.5 | | | (L < 20) 1.5 | | (D < 20) 0.5 | | | (D < 20) 0.5 |
| | (L ≥ 20) 2.0 | | | (L ≥ 20) 2.0 | | (D ≥ 20) 1.0 | | | (D ≥ 20) 1.0 |

DIMENSIONS

ø D x L (mm)

| Cap. (μF) | Voltage Code | 6.3V OJ | | 10V 1A | | 16V 1C | | 25V 1E | | 35V 1V | |
|-----------|--------------|---------|------|----------------|------|--------|------|----------------|------|----------------|------|
| | | | | | | | | | | | |
| 0.1 | 104 | | | | | | | | | | |
| 0.22 | 224 | | | | | | | | | | |
| 0.33 | 334 | | | | | | | | | | |
| 0.47 | 474 | | | | | | | | | | |
| 1 | 105 | | | | | | | | | | |
| 2.2 | 225 | | | | | | | | | | |
| 3.3 | 335 | | | | | | | | | | |
| 4.7 | 475 | | | | | | | 5x11 | 30 | 5x11 | 35 |
| 10 | 106 | | | | | 5x11 | 40 | 5x11 | 50 | 5x11 | 55 |
| 22 | 226 | 5x11 | 35 | 5x11 | 55 | 5x11 | 75 | 5x11 | 80 | 5x11 | 85 |
| 33 | 336 | 5x11 | 55 | 5x11 | 80 | 5x11 | 90 | 5x11 | 95 | 5x11 | 105 |
| 47 | 476 | 5x11 | 75 | 5x11 | 95 | 5x11 | 110 | 5x11 | 115 | 5x11 | 130 |
| 100 | 107 | 5x11 | 130 | 5x11 | 145 | 5x11 | 160 | 6.3x11 | 190 | 6.3x11 | 210 |
| 220 | 227 | 5x11 | 200 | 6.3x11 | 230 | 6.3x11 | 260 | 8x12 | 330 | 10x12.5 (8x14) | 385 |
| 330 | 337 | 6.3x11 | 270 | 6.3x11 | 290 | 8x12 | 370 | 10x12.5 (8x14) | 440 | 10x12.5 (8x14) | 470 |
| 470 | 477 | 6.3x11 | 320 | 8x12 | 350 | 8x12 | 440 | 10x12.5 (8x14) | 520 | 10x16 | 580 |
| 1000 | 108 | 8x12 | 540 | 10x12.5 (8x14) | 620 | 10x16 | 710 | 10x20 | 830 | 13x20 | 1000 |
| 2200 | 228 | 10x20 | 900 | 10x20 | 970 | 13x20 | 1150 | 13x25 | 1300 | 16x25 | 1550 |
| 3300 | 338 | 10x20 | 1050 | 13x20 | 1250 | 13x25 | 1400 | 16x25 | 1650 | 16x35 | 1950 |
| 4700 | 478 | 13x20 | 1350 | 13x25 | 1500 | 16x25 | 1700 | 16x35 | 2050 | 18x30 | 2400 |
| 6800 | 688 | 13x25 | 1600 | 16x25 | 1850 | 16x35 | 2150 | 18x35 | 2550 | 22x30 | 3000 |
| 10000 | 109 | 16x25 | 2000 | 16x35 | 2350 | 18x35 | 2700 | 22x35 | 3000 | 22x35 | 3000 |
| 15000 | 159 | 16x35 | 2550 | 18x35 | 2950 | 22x40 | 3000 | 25x30 | 2900 | 22x50 | 3700 |
| 22000 | 229 | 18x40 | 3200 | 22x35 | 3700 | 25x30 | 3400 | 22x50 | 3800 | 25x40 | 3600 |
| 33000 | 339 | 22x30 | 2900 | 25x30 | 3300 | 25x40 | 4000 | 25x50 | 4500 | | |
| | | 22x50 | 3900 | 22x50 | 4500 | | | | | | |
| | | 25x40 | 3800 | 25x40 | 4800 | | | | | | |

Maximum Allowable Ripple Current (mA rms) at 85°C 120Hz

DIMENSIONS

ø D x L (mm)

| Cap. (μF) | Voltage Code | 50V | | 63V | | 100V | | 160V | | 200V | |
|-----------|--------------|-------------------------|----------------------|-------------------------|----------------------|----------------|--------------|----------------|------------|----------------|------------------|
| | | 1H | | 1J | | 2A | | 2C | | 2D | |
| 0.1 | 104 | 5x11 | 1.1 | | | 5x11 | 2.1 | | | | |
| 0.22 | 224 | 5x11 | 2.3 | | | 5x11 | 4.7 | | | | |
| 0.33 | 334 | 5x11 | 3.5 | | | 5x11 | 7 | | | | |
| 0.47 | 474 | 5x11 | 5 | | | 5x11 | 10 | 6.3x11 | 12 | 6.3x11 | 12 |
| 1 | 105 | 5x11 | 10 | | | 5x11 | 21 | 6.3x11 | 17 | 6.3x11 | 17 |
| 2.2 | 225 | 5x11 | 23 | | | 5x11 | 30 | 6.3x11 | 26 | 6.3x11 | 26 |
| 3.3 | 335 | 5x11 | 35 | | | 5x11 | 40 | 6.3x11 | 29 | 6.3x11 | 29 |
| 4.7 | 475 | 5x11 | 40 | | | 5x11 | 45 | 6.3x11 | 34 | 8x12 | 39 |
| 10 | 106 | 5x11 | 60 | 5x11 | 65 | 6.3x11 | 75 | 8x12 | 58 | 10x12.5 (8x14) | 61 |
| 22 | 226 | 5x11 | 95 | 5x11 | 100 | 8x12 | 130 | 10x16 | 95 | 10x20 | 99 |
| 33 | 336 | 6.3x11 | 120 | 6.3x11 | 140 | 8x12 | 180 | 10x20 | 120 | 13x20 | 140 |
| 47 | 476 | 6.3x11 | 155 | 6.3x11 | 170 | 10x12.5 (8x14) | 230 | 13x20 | 160 | 13x20 | 160 |
| 100 | 107 | 8x12 | 260 | 10x12.5 (8x14) | 300 | 10x20 | 370 | 13x25 | 240 | 16x30 | 250 |
| 220 | 227 | 10x12.5 (8x14) | 410 | 10x16 | 470 | 13x25 | 620 | 16x35 | 380 | 18x35 | 390 |
| 330 | 337 | 10x16 | 520 | 10x20 | 710 | 13x25 | 760 | 18x40 22x30 | 490 500 | 22x40 25x30 | 800 750 |
| 470 | 477 | 13x20 | 740 | 13x20 | 900 | 16x25 | 1000 | 22x40 25x30 | 850 800 | 22x50 25x40 | 1100 1050 |
| 1000 | 108 | 13x25 | 1100 | 16x25 | 1300 | 18x40 | 1380 | 25x50 | 1300 | | |
| 2200 | 228 | 16x35 | 1700 | 18x35 | 2300 | 22x50 25x40 | 2400 2400 | | | | |
| 3300 | 338 | 18x35 22x30 22x40 | 2200 2300 2900 | 22x40 25x30 22x50 | 2700 2600 3400 | 25x50 | 2900 | | | | |
| 4700 | 478 | 25x30 22x50 25x40 | 2900 3400 3200 | 25x40 | 3200 | | | | | | |
| 6800 | 688 | 22x50 25x40 | 3400 3200 | 25x50 | 3900 | | | | | | |
| 10000 | 109 | 25x50 | 4000 | | | | | | | Case Size | Allowable ripple |

ø D x L (mm)

| Cap. (μF) | Voltage Code | 250V | | 315V | | 350V | | 400V | | 450V | |
|-----------|--------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------------|
| | | 2E | | 2F | | 2V | | 2G | | 2W | |
| 0.47 | 474 | 6.3x11 | 12 | | | | | | | | |
| 1 | 105 | 6.3x11 | 17 | 6.3x11 | 17 | 6.3x11 | 18 | 8x12 | 18 | 8x12 | 18 |
| 2.2 | 225 | 6.3x11 | 26 | 8x12 | 30 | 8x12 | 25 | 10x12.5 (8x14) | 28 | 10x12.5 (8x14) | 28 |
| 3.3 | 335 | 8x12 | 33 | 10x12.5 (8x14) | 35 | 10x12.5 (8x14) | 32 | 10x12.5 (8x14) | 32 | 10x16 | 35 |
| 4.7 | 475 | 8x12 | 39 | 10x12.5 (8x14) | 42 | 10x12.5 (8x14) | 39 | 10x16 | 41 | 10x20 | 43 |
| 10 | 106 | 10x16 | 64 | 10x20 | 70 | 10x20 | 65 | 13x20 | 70 | 13x20 | 70 |
| 22 | 226 | 13x20 | 110 | 13x20 | 110 | 13x25 | 110 | 16x25 | 120 | 16x25 | 120 |
| 33 | 336 | 13x20 | 140 | 16x25 | 150 | 16x25 | 130 | 16x30 | 140 | 16x35 | 150 |
| 47 | 476 | 13x25 | 170 | 16x25 | 180 | 16x35 | 160 | 16x35 | 160 | 18x40 22x30 | 170 200 |
| 100 | 107 | 16x30 | 250 | 18x35 | 270 | 18x40 22x30 | 250 350 | 22x40 25x30 | 350 350 | 22x40 | 350 |
| 220 | 227 | 18x40 22x30 | 430 400 | 22x50 25x30 | 700 600 | 22x50 25x40 | 700 700 | 25x50 | 750 | | |
| 330 | 337 | 22x50 25x30 | 900 750 | 25x50 | 950 | | | | | | |
| 470 | 477 | 25x50 | 1200 | | | | | | | Case Size | Allowable ripple |

Allowable Ripple (mA rms) at 85°C 120Hz