

HLZ LOW IMPEDANCE ELECTROLYTIC CAPACITOR

Low impedance

Endurance 2000 hours

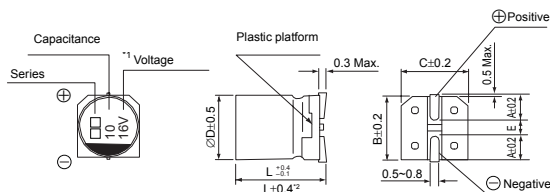
RoHS & REACH compliant, Halogen-free

SPECIFICATIONS

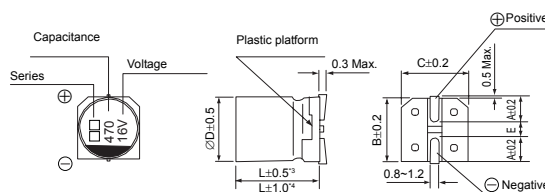
| Items | Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|--------------------|------------------------------|--------------------|---|-----------------|---------------------------------|-----------------|----------|--------------------|--------|------|------|------|--------------------|------|------|-----------|------|------|---------------|-----------|--------------------|------|---|---|---|--------------------|----|---|---|---|---|
| Operation Temperature Range | -55 ~ +105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage Range | 6.3 ~ 100V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Range | 1 ~ 4700μF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | Leakage current ≤0.01CV or 3μA (∅4~∅10), whichever is greater (after 2 minutes application of rated voltage at 20°C) Leakage current ≤0.03CV or 4μA (∅12.5~∅16), whichever is greater (after 1 minute application of rated voltage at 20°C) C: Nominal capacitance (μF) , V: Rated voltage (V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (tan δ) | Measurement frequency : 120Hz, Temperature : 20°C <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 , 63</th> <th>80 , 100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">tan δ (max.)</td> <td>∅4~∅10</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> </tr> <tr> <td>∅12.5~∅16</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.10</td> </tr> </tbody> </table> | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 , 63 | 80 , 100 | tan δ (max.) | ∅4~∅10 | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | ∅12.5~∅16 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.10 | | | | | | | | | |
| Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 , 63 | 80 , 100 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ (max.) | ∅4~∅10 | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ∅12.5~∅16 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stability at Low Temperature | Measurement frequency : 120Hz <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 ~ 100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance Ratio</td> <td rowspan="2">∅4~∅10</td> <td>Z(-25°C) / Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C) / Z(20°C)</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td rowspan="2">ZT/Z20 (max.)</td> <td rowspan="2">∅12.5~∅16</td> <td>Z(-25°C) / Z(20°C)</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C) / Z(20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </tbody> </table> | Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 ~ 100 | Impedance Ratio | ∅4~∅10 | Z(-25°C) / Z(20°C) | 2 | 2 | 2 | 2 | Z(-55°C) / Z(20°C) | 5 | 4 | 4 | 3 | 3 | ZT/Z20 (max.) | ∅12.5~∅16 | Z(-25°C) / Z(20°C) | 3 | 3 | 2 | 2 | Z(-55°C) / Z(20°C) | 10 | 8 | 6 | 4 | 3 |
| Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 ~ 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impedance Ratio | ∅4~∅10 | Z(-25°C) / Z(20°C) | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Z(-55°C) / Z(20°C) | 5 | 4 | 4 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZT/Z20 (max.) | ∅12.5~∅16 | Z(-25°C) / Z(20°C) | 3 | 3 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Z(-55°C) / Z(20°C) | 10 | 8 | 6 | 4 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Load Life | After 2000 hours application of the rated voltage at 105°C, they meet the characteristics listed below. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table> | Capacitance Change | Within ±20% of initial value | Dissipation Factor | 200% or less of initial specified value | Leakage Current | initial specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±20% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | 200% or less of initial specified value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | initial specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf Life | After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | After reflow soldering and restored at room temperature, they meet the characteristics listed below. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>initial specified value or less</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table> | Capacitance Change | Within ±10% of initial value | Dissipation Factor | initial specified value or less | Leakage Current | initial specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Change | Within ±10% of initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | initial specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | initial specified value or less | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Marking | Black print on the case top. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

DRAWING (Unit: mm)

(∅4~∅6.3×7.7)



(∅8×10.5~∅16)



*1. Voltage mark for 6.3V is [6V]
 *2. Applicable to ∅6.3×7.7
 *3. Applicable to ∅8×10.5~∅10
 *4. Applicable to ∅12.5~∅16

DIMENSIONS (Unit: mm)

| ∅D x L | 4 x 5.4 | 5 x 5.4 | 6.3 x 5.4 | 6.3 x 7.7 | 8 x 10.5 | 10 x 10.5 | 10 x 13.5 | 12.5 x 13.5 | 12.5 x 16 | 16 x 16.5 |
|---------|---------|---------|-----------|-----------|----------|-----------|-----------|-------------|-----------|-----------|
| A | 2.0 | 2.2 | 2.6 | 2.6 | 3.0 | 3.3 | 3.3 | 4.9 | 4.9 | 5.8 |
| B | 4.3 | 5.3 | 6.6 | 6.6 | 8.4 | 10.4 | 10.4 | 13.0 | 13.0 | 17.0 |
| C | 4.3 | 5.3 | 6.6 | 6.6 | 8.4 | 10.4 | 10.4 | 13.0 | 13.0 | 17.0 |
| E ± 0.2 | 1.0 | 1.4 | 1.9 | 1.9 | 3.1 | 4.7 | 4.7 | 4.7 | 4.7 | 6.4 |
| L | 5.4 | 5.4 | 5.4 | 7.7 | 10.5 | 10.5 | 13.5 | 13.5 | 16.0 | 16.5 |

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE

| WV | | 6.3 | | | 10 | | | 16 | | |
|------|------|----------------------------|----------------|----------------|----------------------------|----------------|----------------|--------------------------|----------------|----------------|
| μF | Code | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current |
| | | 10 | 106 | | | | | | | 4 x 5.4 |
| 15 | 156 | | | | | | | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) |
| 22 | 226 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) |
| 33 | 336 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) |
| 47 | 476 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) |
| 68 | 686 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 | 1.0 | 140 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) |
| 100 | 107 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) |
| 150 | 157 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 0.6 | 230 |
| 220 | 227 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 (6.3 x 7.7) | 0.3 (0.6) | 450 (230) |
| 330 | 337 | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 | 0.3 | 450 | 10 x 10.5 (8 x 10.5) | 0.15 (0.3) | 670 (450) |
| 470 | 477 | 8 x 10.5 (6.3 x 7.7) | 0.3 (0.6) | 450 (230) | 8 x 10.5 | 0.3 | 450 | 10 x 10.5 (8 x 10.5) | 0.15 (0.3) | 670 (450) |
| 680 | 687 | 8 x 10.5 | 0.3 | 450 | 10 x 10.5 | 0.15 | 670 | 10 x 10.5 | 0.15 | 670 |
| 1000 | 108 | 10 x 10.5 (8 x 10.5) | 0.15 (0.3) | 670 (450) | 10 x 10.5 | 0.15 | 670 | 10 x 10.5 | 0.15 | 670 |
| 1500 | 158 | 10 x 13.5 (10 x 10.5) | 0.13 (0.15) | 750 (670) | 12.5 x 13.5 (10 x 13.5) | 0.11 (0.13) | 820 (750) | 12.5 x 13.5 | 0.11 | 820 |
| 2200 | 228 | 12.5 x 13.5 (10 x 13.5) | 0.11 (0.13) | 820 (750) | 12.5 x 16 | 0.09 | 950 | 16 x 16.5 (12.5 x 16) | 0.08 (0.09) | 1260 (950) |
| 3300 | 338 | 12.5 x 16 (12.5 x 13.5) | 0.09 (0.11) | 950 (820) | 16 x 16.5 | 0.08 | 1260 | 16 x 16.5 | 0.08 | 1260 |
| 4700 | 478 | 16 x 16.5 | 0.08 | 1260 | 16 x 16.5 | 0.08 | 1260 | | | |

| WV | | 25 | | | 35 | | | 50 | | |
|-----|------|--------------------------|--------------|----------------|--------------------------|--------------|----------------|--------------------------|--------------|----------------|
| μF | Code | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current |
| | | 1 | 104 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 |
| 1.5 | 154 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 2.2 | 225 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 3.3 | 335 | | | | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 5.0 | 30 |
| 4.7 | 475 | 4 x 5.4 | 3.0 | 60 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 | 3.0 | 50 |
| 6.8 | 685 | 4 x 5.4 | 3.0 | 60 | 5 x 5.4 | 1.8 | 95 | 6.3 x 5.4 | 2.0 | 70 |
| 10 | 106 | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 5 x 5.4 (4 x 5.4) | 1.8 (3.0) | 95 (60) | 6.3 x 5.4 | 2.0 | 70 |
| 15 | 156 | 6.3 x 5.4 | 1.8 | 95 | 5 x 5.4 | 1.8 | 95 | 6.3 x 5.4 | 2.0 | 70 |
| 22 | 226 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 1.0 (2.0) | 120 (70) |
| 33 | 336 | 6.3 x 5.4 (5 x 5.4) | 1.0 (1.8) | 140 (95) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 1.0 | 120 |
| 47 | 476 | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 (6.3 x 5.4) | 0.6 (1.0) | 230 (140) | 6.3 x 7.7 | 1.0 | 120 |
| 68 | 686 | 6.3 x 7.7 | 0.6 | 230 | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 | 0.6 | 300 |
| 100 | 107 | 6.3 x 7.7 | 0.6 | 230 | 8 x 10.5 (6.3 x 7.7) | 0.3 (0.6) | 450 (230) | 8 x 10.5 (10 x 10.5) | 0.6 (0.3) | 300 (500) |
| 150 | 157 | 8 x 10.5 (6.3 x 7.7) | 0.3 (0.6) | 450 (230) | 8 x 10.5 | 0.3 | 450 | 10 x 10.5 | 0.3 | 500 |

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT & IMPEDANCE

| WV Code μF | | 25 | | | 35 | | | 50 | | |
|------------------|-----|----------------------------|----------------|----------------|----------------------------|----------------|----------------|---|-------------------------|------------------------|
| | | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current |
| 220 | 227 | 8 × 10.5 | 0.3 | 450 | 10 × 10.5 (8 × 10.5) | 0.15 (0.3) | 670 (450) | 10 × 10.5 | 0.3 | 500 |
| 330 | 337 | 10 × 10.5 (8 × 10.5) | 0.15 (0.3) | 670 (450) | 10 × 10.5 | 0.15 | 670 | 16 × 16.5 (12.5 × 13.5) (10 × 13.5) | 0.12 (0.2) (0.25) | 1060 (650) (580) |
| 470 | 477 | 10 × 10.5 | 0.15 | 670 | 10 × 13.5 (10 × 10.5) | 0.13 (0.15) | 750 (670) | 16 × 16.5 (12.5 × 16) | 0.12 (0.15) | 1060 (700) |
| 680 | 687 | 10 × 13.5 | 0.13 | 750 | 12.5 × 13.5 (10 × 13.5) | 0.11 (0.13) | 820 (750) | 16 × 16.5 | 0.12 | 1060 |
| 1000 | 108 | 16 × 16.5 (12.5 × 13.5) | 0.08 (0.11) | 1260 (820) | 16 × 16.5 (12.5 × 16) | 0.08 (0.09) | 1260 (950) | | | |
| 1500 | 158 | 12.5 × 16 | 0.09 | 950 | 16 × 16.5 | 0.08 | 1260 | | | |
| 2200 | 228 | 16 × 16.5 | 0.08 | 1260 | | | | | | |

| WV Code μF | | 63 | | | 80 | | | 80 | | |
|------------------|-----|-------------|-----------|----------------|-----------|-----------|----------------|-------------|-----------|----------------|
| | | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current | Case size | Impedance | Ripple current |
| 10 | 106 | 6.3 × 7.7 | 1.5 | 95 | | | | 6.3 × 7.7 | 4.0 | 65 |
| 22 | 226 | 6.3 × 7.7 | 1.0 | 130 | 6.3 × 7.7 | 2.0 | 130 | | | |
| 47 | 476 | 8 × 10.5 | 0.65 | 250 | | | | 10 × 10.5 | 0.65 | 350 |
| 100 | 107 | 10 × 10.5 | 0.50 | 430 | | | | 12.5 × 13.5 | 0.60 | 500 |
| 220 | 227 | 12.5 × 13.5 | 0.30 | 550 | | | | | | |

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

| Frequency | | 50Hz | 120Hz | 300Hz | 1KHz | 10KHz~ | |
|-------------|-------------|---------------|-------|-------|------|--------|------|
| Coefficient | Ø4 ~ Ø10 | 1 ~ 68μF | 0.35 | 0.50 | 0.64 | 0.83 | 1.00 |
| | | 100 ~ 2200μF | 0.40 | 0.55 | 0.70 | 0.85 | 1.00 |
| | Ø12.5 ~ Ø16 | ~ 680μF | 0.45 | 0.65 | 0.80 | 0.90 | 1.00 |
| | | 1000 ~ 4700μF | 0.65 | 0.85 | 0.95 | 1.00 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

◆ How to order

| | | | | | | |
|-------------|---|------------------|--|--|----------------|--|
| <u>HLZ</u> | <u>106</u> | <u>M</u> | <u>0035</u> | <u>0405</u> | <u>R</u> | <u>-</u> |
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| <u>Type</u> | <u>Capacitance code</u> | <u>Tolerance</u> | <u>Rated Voltage</u> | <u>Size Code</u> | <u>Package</u> | <u>Additional characters may be added for special requirements</u> |
| HLZ | pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 107 = 100uF | M: +/-20% | Code 0035: 35VDC For DC Voltage 0006: 6.3VDC 0035: 35VDC 0050: 50VDC | Code 0405: Size 4x5.4mm Size for V-chip E-cap 0405: Size 4x5.4mm 1010: Size 10x10.5mm 1616: Size 16x16.5mm | R: Tape & Reel | |