



# HLZ LOW IMPEDANCE ELECTROLYTIC CAPACITOR

Low impedance with temperature range -55~+105°C

Load life of 1000~2000 hours

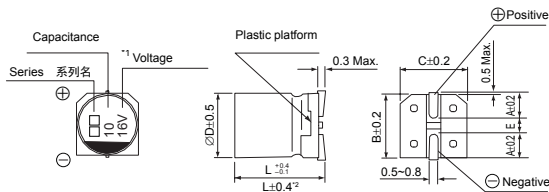
RoHS & REACH compliant, Halogen-free

## SPECIFICATIONS

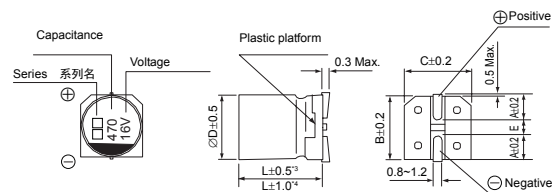
Items	Characteristics																																				
Operation Temperature Range	-55 ~ +105°C																																				
Voltage Range	6.3 ~ 50V																																				
Capacitance Range	1 ~ 4700μF																																				
Capacitance Tolerance	±20% at 120Hz, 20°C																																				
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</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>0.12</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>0.12</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	tan δ (max.)	∅4~∅10	0.22	0.19	0.16	0.14	0.12	0.12	∅12.5~∅16	0.26	0.22	0.18	0.16	0.14	0.12														
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		Z(-55°C) / Z(20°C)	10	8	6	4	3	3																													
Load Life	After 2000 hrs. (1000 hrs. for ∅4~∅6.3×5.4) 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																														
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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																														
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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	0.6	300
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		25			35			50		
$\mu\text{F}$		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						

**FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT**

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient	Ø4 ~ Ø10	1 ~ 68 $\mu\text{F}$	0.35	0.50	0.64	0.83
		100 ~ 2200 $\mu\text{F}$	0.40	0.55	0.70	0.85
	Ø12.5 ~ Ø16	~ 680 $\mu\text{F}$	0.45	0.65	0.80	0.90
		1000 ~ 4700 $\mu\text{F}$	0.65	0.85	0.95	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**

<b>HLZ</b>	<b>106</b>	<b>M</b>	<b>0035</b>	<b>0405</b>	<b>R</b>	<b>-</b>
↓	↓	↓	↓	↓	↓	↓
<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 = 10 $\mu\text{F}$ 107 = 100 $\mu\text{F}$	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	

Note: Specification is subject to change without further notice. For more details and updates, please visit our website.