

## CLZ Series

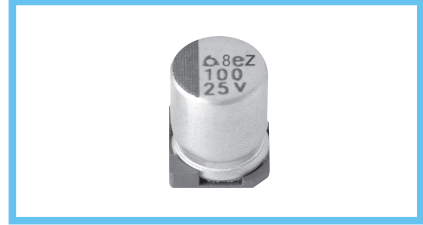
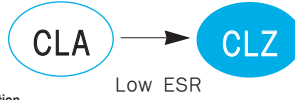
• 125°C 1,000~5,000Hrs assured.

- Vertical SMD type.
- Wide Temp., Low ESR.
- Suitable to fit for automotive equipment.
- RoHS compliant.
- Halogen-free capacitors are also available.

• AEC-Q200 compliant : Please contact us for more details, test data, information.

Solvent-proof

WV ≤ 80V<sub>DC</sub>

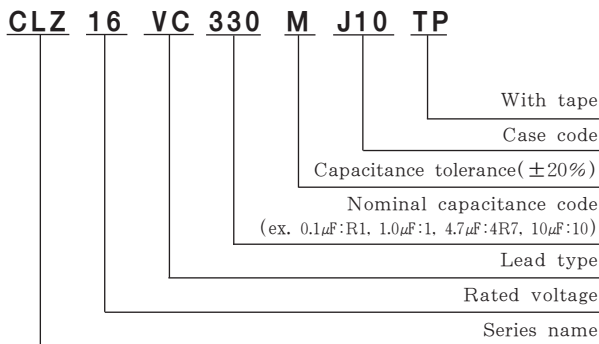


### SPECIFICATIONS

Item	Characteristics																								
Rated Voltage Range	10 ~ 400 V <sub>DC</sub>																								
Operating Temperature Range	-40 ~ +125°C																								
Capacitance Tolerance	±20%(M)																								
Leakage Current	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Rated voltage(V<sub>DC</sub>)</td> <td>10~100</td> <td>160~400</td> </tr> <tr> <td>Max. Leakage current (μA)</td> <td>I=0.01CV(μA) or 3μA, whichever is greater. (at 20°C, 2 minutes)</td> <td>0.04CV + 100(μA) (at 20°C, 2 minutes)</td> </tr> </table> <p style="text-align: center; font-size: small;">Where, C : Nominal capacitance(μF), V : Rated voltage(V<sub>DC</sub>)</p>	Rated voltage(V <sub>DC</sub> )	10~100	160~400	Max. Leakage current (μA)	I=0.01CV(μA) or 3μA, whichever is greater. (at 20°C, 2 minutes)	0.04CV + 100(μA) (at 20°C, 2 minutes)																		
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Max. Leakage current (μA)	I=0.01CV(μA) or 3μA, whichever is greater. (at 20°C, 2 minutes)	0.04CV + 100(μA) (at 20°C, 2 minutes)																							
Dissipation Factor(Tanδ)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Rated voltage(V<sub>DC</sub>)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50~80</td> <td>100</td> <td>160~250</td> <td>400</td> </tr> <tr> <td>Tanδ(Max.)</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>0.20</td> <td>0.24</td> </tr> </table> <p style="text-align: right; font-size: small;">(at 20°C, 120Hz)</p>	Rated voltage(V <sub>DC</sub> )	10	16	25	35	50~80	100	160~250	400	Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.20	0.24						
Rated voltage(V <sub>DC</sub> )	10	16	25	35	50~80	100	160~250	400																	
Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.20	0.24																	
Temperature Characteristics (Max. Impedance ratio)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Rated voltage(V<sub>DC</sub>)</td> <td>10</td> <td>16</td> <td>25</td> <td>35~100</td> <td>160~250</td> <td>400</td> </tr> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>6</td> <td>10</td> </tr> </table> <p style="text-align: right; font-size: small;">(at 120Hz)</p>	Rated voltage(V <sub>DC</sub> )	10	16	25	35~100	160~250	400	Z(-25°C)/Z(+20°C)	4	3	2	2	3	6	Z(-40°C)/Z(+20°C)	8	6	4	3	6	10			
Rated voltage(V <sub>DC</sub> )	10	16	25	35~100	160~250	400																			
Z(-25°C)/Z(+20°C)	4	3	2	2	3	6																			
Z(-40°C)/Z(+20°C)	8	6	4	3	6	10																			
Load Life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified time at 125°C.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Case Code</td> <td>10~80V</td> <td>100V</td> <td>160~400V</td> </tr> <tr> <td>D55~F60</td> <td>1,000Hrs</td> <td>-</td> <td>-</td> </tr> <tr> <td>H63</td> <td>3,000Hrs</td> <td>-</td> <td>-</td> </tr> <tr> <td>H10</td> <td>5,000Hrs</td> <td>2,000Hrs</td> <td>-</td> </tr> <tr> <td>J10</td> <td>5,000Hrs</td> <td>2,000Hrs</td> <td>2,000Hrs</td> </tr> <tr> <td>K14~M22</td> <td>5,000Hrs</td> <td>5,000Hrs</td> <td>2,000Hrs</td> </tr> </table> <p>Capacitance change ≤ ±30% of the initial value                      Tanδ ≤ 300% of the initial specified value                      Leakage current ≤ The initial specified value</p>	Case Code	10~80V	100V	160~400V	D55~F60	1,000Hrs	-	-	H63	3,000Hrs	-	-	H10	5,000Hrs	2,000Hrs	-	J10	5,000Hrs	2,000Hrs	2,000Hrs	K14~M22	5,000Hrs	5,000Hrs	2,000Hrs
Case Code	10~80V	100V	160~400V																						
D55~F60	1,000Hrs	-	-																						
H63	3,000Hrs	-	-																						
H10	5,000Hrs	2,000Hrs	-																						
J10	5,000Hrs	2,000Hrs	2,000Hrs																						
K14~M22	5,000Hrs	5,000Hrs	2,000Hrs																						
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. (Where, D55 ~ F60 is 500 hours)</p> <p>Capacitance change ≤ ±30% of the initial value                      Tanδ ≤ 300% of the initial specified value                      Leakage current ≤ The initial specified value (where, 500% for ≥ WV 80 V<sub>DC</sub>)</p>																								
Others	Satisfied characteristics KS C IEC 60384-4																								

CLZ Series

### PART NUMBERING SYSTEM



### RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Rated Voltage(V <sub>DC</sub> )	Size code	Freq.(Hz)				
		Cap.(μF)	120	1K	10K	100K
10 ~ 100	D55 ~ J10	10	0.66	0.86	0.93	1.00
		22 ~ 470	0.93	0.97	1.00	1.00
	K14 ~ M22	47 ~ 100	0.40	0.75	0.90	1.00
		220 ~ 1,000	0.50	0.85	0.94	1.00
		2,200 ~ 3,300	0.75	0.90	0.95	1.00
160 ~ 400	J10 ~ M22	4,700	0.85	0.95	0.98	1.00
		1 ~ 33	1.00	1.50	1.75	1.80
		47 ~ 68	1.00	1.30	1.40	1.50

## DIMENSIONS OF CLZ Series

Unit(mm)

### DIMENSIONS

● Vibration Resistance

<Size code: D55~M22>    <Size code: H10~M22>

: Dummy terminals  
 : Solder land on PC board

**Recommended solder land on PC board**

### MARKING

<D55~J10>                      <K14~M22>

Note 1 : L±0.5 for 8×6.3(H63)~18×21.5(M22)  
 Note 2 : 4×5.2(D55), 5×5.2(E55) is excluded symbol mark.

Case code	∅D	L	A	B	C	W	P	a	b	c	a	b	c
D55	4	5.2	4.3	4.3	5.1	0.5~0.8	1.0	1.0	2.6	1.6			
E55	5	5.2	5.3	5.3	5.9	0.5~0.8	1.4	1.4	3.0	1.6			
F55	6.3	5.2	6.6	6.6	7.2	0.5~0.8	1.9	1.9	3.5	1.6			
F60	6.3	5.7	6.6	6.6	7.2	0.5~0.8	1.9	1.9	3.5	1.6			
H63	8	6.3	8.3	8.3	9.0	0.5~0.8	2.3	2.3	4.5	1.6			
H10	8	10	8.3	8.3	9.0	0.7~1.1	3.1	3.1	4.2	2.2	3.1	4.2	3.5
J10	10	10	10.3	10.3	11.0	0.7~1.1	4.5	4.5	4.4	2.2	4.5	4.4	3.5
K14	12.5	13.5	13.0	13.0	13.7	1.0~1.3	4.2	4.0	5.7	2.5	3.4	6.3	9.3
L17	16	16.5	17.0	17.0	18.0	1.0~1.3	6.5	6.0	6.9	2.5	4.7	7.8	9.6
L22	16	21.5	17.0	17.0	18.0	1.0~1.3	6.5	6.0	6.9	2.5			
M17	18	16.5	19.0	19.0	20.0	1.0~1.3	6.5	6.0	7.9	2.5	4.7	8.8	9.6
M22	18	21.5	19.0	19.0	20.0	1.0~1.3	6.5	6.0	7.9	2.5			

※ Please inquire beforehand for 16, 18∅ size

● Vibration Resistance →

## RATINGS OF CLZ Series

V <sub>DC</sub> / μF	10	16	25	35	50	63	80	100
10		D55 7.00 105 12	E55 3.30 49.5 23	F60 1.60 24.0 69	F60 2.80 42.0 51	H63 2.00 110 60	H10 1.20 80.4 70	H10 1.60 107.2 70
22	E55 3.30 49.5 23	E55 3.30 49.5 23	F55 2.00 30.0 40	F60 1.60 24.0 69	H63 1.60 30.0 83	H10 1.00 50.0 70	J10 0.55 35.0 115	J10 1.00 64.0 95
33	E55 3.30 49.5 23	F55 2.00 30.0 40	F60 1.60 24.0 69	H63 0.90 14.0 110	H10 0.70 11.0 160	J10 0.55 27.5 115	J10 0.55 35.0 115	J10 0.80 51.2 115
47	F55 2.00 30.0 40	F60 1.60 24.0 69	H63 0.90 14.0 110	H10 0.40 6.0 220	J10 0.50 7.5 247	J10 0.55 27.5 115	K14 0.33 21.1 450	K14 0.33 19.8 450
100	H63 0.90 14.0 110	H63 0.90 14.0 110	H10 0.40 6.0 220	H10 0.40 6.0 220	J10 0.50 7.5 247	K14 0.33 16.5 450	L17 0.24 15.4 650	K14 0.33 19.8 450
220	H10 0.40 6.0 220	H10 0.40 6.0 220	J10 0.30 4.5 296	J10 0.30 4.5 296	K14 0.23 3.5 550	L17 0.24 12.0 650	M17 0.16 10.2 950	
330	J10 0.30 4.5 296	J10 0.30 4.5 296	K14 0.14 2.1 750	K14 0.14 2.1 750	L17 0.15 2.3 850	L17 0.24 12.0 650		
470	J10 0.30 4.5 296	K14 0.14 2.1 750	L17 0.10 1.5 1,000	M17 0.10 1.5 1,000	M17 0.15 2.3 920	L22 0.16 8.0 950		
1,000	K14 0.14 2.1 750	M17 0.10 1.5 1,200	M22 0.058 0.87 1,550					
2,200	L17 0.10 1.5 1,000							
3,300	M17 0.10 1.5 1,200							
4,700	M22 0.058 0.87 1,550							

↑ Rated Ripple Current (mA<sub>rms</sub>/125°C, 100kHz)  
 ↑ ESR (Ω max./-40°C, 100kHz)  
 ↑ ESR (Ω max./20°C, 100kHz)  
 ↑ Case code

V <sub>DC</sub> / μF	160	200	250	400
1				J10 18
2.2				J10 26
3.3				J10 37
4.7				K14 70
10	K14 100	K14 100	L17 120	L22 140
22	L17 180	L17 180	M17 205	
33	M17 245	M17 245	M22 260	
47	M22 315	M22 315		
68	M22 380			

↑ Rated Ripple Current (mA<sub>rms</sub>/125°C, 120Hz)  
 ↑ Case code