

## VZH Series

### Features

- 4 φ ~ 18 φ, 105°C, 2,000 ~ 5,000 hours assured
- Large capacitance with ultra low impedance capacitors
- Designed for surface mounting on high density PC board
- RoHS Compliance



Marking color: Black

### Specifications

Items	Performance																														
Category Temperature Range	-55°C ~ +105°C																														
Capacitance Tolerance	±20% (at 120Hz, 20°C)																														
Leakage Current (at 20°C)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF V = rated DC working voltage in V																														
Tanδ (at 120Hz, 20°C)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max)</td> <td>0.30</td> <td>0.26</td> <td>0.22</td> <td>0.16</td> <td>0.13</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> <td>0.07</td> </tr> </tbody> </table> <p>When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.</p>	Rated Voltage	6.3	10	16	25	35	50	63	80	100	Tanδ (max)	0.30	0.26	0.22	0.16	0.13	0.10	0.08	0.08	0.07										
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Low Temperature Characteristics (at 120Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Impedance</td> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Ratio</td> <td>Z(-55°C)/Z(+20°C)</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage	6.3	10	16	25	35	50	63	80	100	Impedance	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	Ratio	Z(-55°C)/Z(+20°C)	8	5	4	3	3	3	3	3
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Endurance	<table border="1"> <thead> <tr> <th>Test Time</th> <td>2,000 Hrs for φD ≤ 6.3mm &amp; 8×6.5L &amp; 10 φ×7.7L; 5,000 Hrs for φD ≥ 8mm</td> </tr> </thead> <tbody> <tr> <th>Capacitance Change</th> <td>Within ±30% of initial value</td> </tr> <tr> <th>Tanδ</th> <td>Less than 300% of specified value</td> </tr> <tr> <th>Leakage Current</th> <td>Within specified value</td> </tr> </tbody> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 2,000 ~ 5,000 hours at 105°C.</p>	Test Time	2,000 Hrs for φD ≤ 6.3mm & 8×6.5L & 10 φ×7.7L; 5,000 Hrs for φD ≥ 8mm	Capacitance Change	Within ±30% of initial value	Tanδ	Less than 300% of specified value	Leakage Current	Within specified value																						
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Ripple Current & Frequency Multipliers	<table border="1"> <thead> <tr> <th>Frequency(Hz)</th> <th>50, 60</th> <th>120</th> <th>1k</th> <th>10k up</th> </tr> </thead> <tbody> <tr> <th>Multiplier</th> <td>0.60</td> <td>0.70</td> <td>0.85</td> <td>1.0</td> </tr> </tbody> </table>	Frequency(Hz)	50, 60	120	1k	10k up	Multiplier	0.60	0.70	0.85	1.0																				
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### Diagram of Dimensions

Fig. 1

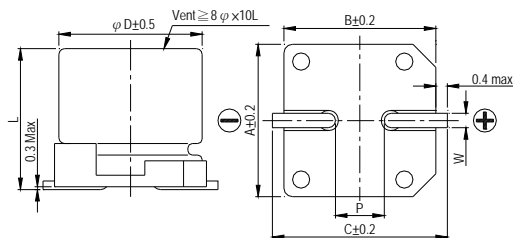
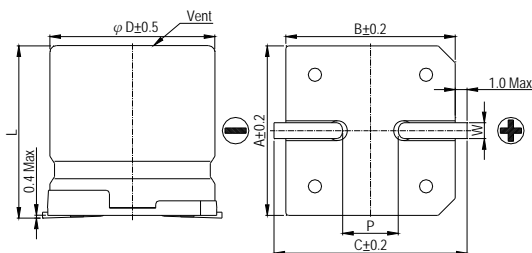


Fig. 2



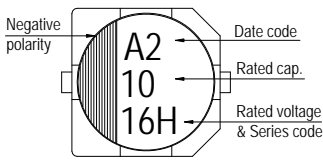
### Lead Spacing and Diameter

Unit: mm

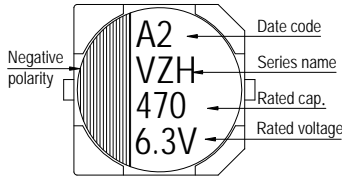
φD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.4	8.4	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.4	8.4	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.4	10.4	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.4	10.4	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
16	21.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

## Marking

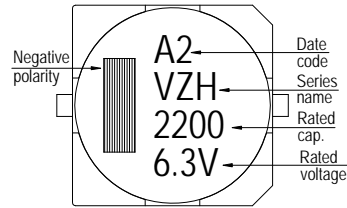
$\phi D \leq 6.3\text{mm}$



$\phi D = 8 \sim 10\text{mm}$



$\phi D \geq 12.5\text{mm}$



Dimension:  $\phi D \times L(\text{mm})$

Ripple Current: mA/rms at 100k Hz, 105°C

Impedance:  $\Omega/$  at 100k Hz, 20°C

## Dimension & Permissible Ripple Current

$\mu\text{F}$	V. DC Contents	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)			
		$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	
1	010															4×5.7	2.9	60		
2.2	2R2															4×5.7	2.9	60		
3.3	3R3															4×5.7	2.9	60		
4.7	4R7														4×5.7	1.35	80			
10	100							4×5.7	1.35	80	4×5.7	1.35	80	5×5.7	0.80	150	6.3×5.7	0.88	165	
22	220	4×5.7	1.35	80	4×5.7	1.35	80	5×5.7	0.80	150	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.88	165	
33	330	4×5.7	1.35	80	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7	0.68	185	
47	470	5×5.7	0.80	150	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.68 0.68	185 185	
68	680													8×6.5	0.36	280	8×10	0.34	369	
100	101	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.36 0.36	280 280	8×10	0.17	450	8×10 10×10	0.34 0.18	369 553	
150	151	6.3×5.7	0.44	230	6.3×5.7	0.44	230	6.3×7.7 8×6.5	0.36 0.36	280 280	8×10	0.17	450	8×10 10×7.7	0.17 0.17	450 450	10×10	0.18	553	
220	221	6.3×7.7	0.36	280	6.3×7.7 8×6.5	0.36 0.36	280 280	6.3×7.7	0.36	280	8×10 10×7.7	0.17 0.17	450 450	10×10	0.09	670	12.5×13.5	0.12	650	
330	331	8×6.5 8×10	0.36 0.17	280 450	8×10 10×7.7	0.17 0.17	450 450	8×10 10×7.7	0.17 0.17	450 450	8×10	0.17	450	12.5×13.5	0.070	820	12.5×13.5	0.12	650	
470	471	8×10 10×7.7	0.17 0.17	450 450	8×10 10×7.7	0.17 0.17	450 450	8×10 10×10	0.17 0.09	450 670	10×10	0.09	670	12.5×16	0.060	950	16×16.5	0.073	1,000	
680	681	8×10 10×7.7	0.17 0.17	450 450	10×10	0.09	670	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.073	1,000	
1,000	102	8×10	0.17	450	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	18×16.5	0.066	1,500	
1,500	152	10×10	0.09	670	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×21.5	0.05	1,620	
2,200	222	12.5×13.5	0.070	820	12.5×16	0.060	950	16×16.5	0.054	1,260	16×16.5	0.054	1,260	18×21.5	0.038	1,750				
3,300	332	12.5×16	0.060	950	16×16.5	0.054	1,260	16×16.5 16×21.5	0.054 0.038	1,260 1,630	18×16.5 16×21.5 18×21.5	0.048 0.038 0.038	1,500 1,630 1,750							
4,700	472	16×16.5	0.054	1,260	16×16.5	0.054	1,260	18×16.5 16×21.5	0.048 0.038	1,500 1,630										
6,800	682	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×16.5 16×21.5	0.048 0.038	1,500 1,630													
8,200	822	18×16.5 16×21.5	0.048 0.038	1,500 1,630	18×21.5	0.038	1,750													



Dimension:  $\phi D \times L$ (mm)  
 Ripple Current: mA/rms at 100k Hz, 105°C  
 Impedance:  $\Omega$ / at 100k Hz, 20°C

### Dimension & Permissible Ripple Current

$\mu F$	V. DC Contents	63V (1J)			80V (1K)			100V (2A)		
		$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA	$\phi D \times L$	Imp.	mA
4.7	4R7	5×5.7	1.90	70						
10	100	6.3×5.7	1.20	130						
22	220	6.3×7.7	0.90	150	8×10	1.3	130	8×10	1.3	130
33	330	8×10	0.50	280	8×10	1.3	130	10×10	0.7	200
47	470	8×10	0.50	280	10×10	0.7	200	10×10	0.7	200
100	101	10×10	0.25	450	10×10	0.7	200	12.5×13.5	0.32	450
150	151	12.5×13.5	0.15	700	12.5×13.5	0.32	450	12.5×16	0.26	550
220	221	12.5×13.5	0.15	700	12.5×16	0.26	550	16×16.5 18×21.5	0.17 0.15	650 950
330	331	16×16.5	0.082	900	16×16.5	0.17	650	18×16.5 16×21.5	0.15 0.15	850 900
470	471	16×16.5	0.082	900	18×16.5 16×21.5	0.15 0.15	850 900	18×21.5	0.15	950
680	681	18×16.5 16×21.5	0.080 0.080	1,150 1,150	18×21.5	0.15	950			
1,000	102	18×21.5	0.06	1,250						

### Part Numbering System

VZH series	470 $\mu F$	$\pm 20\%$	6.3V	Carrier Tape	8 $\phi \times 10L$	Pb-free and PET coating case
<b>VZH</b>	<b>471</b>	<b>M</b>	<b>0J</b>	<b>TR</b>	<b>-</b>	<b>0810</b>
Series name	Capacitance	Capacitance Tolerance	Rated Voltage	Package Type	Terminal Type	Case size
						Lead Wire and Coating Type

Note: For more details, please refer to "Part Numbering System (SMD Type)" on page 12.