



**THE DATASHEET OF
VZH101M1HTR-1010S**



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
- AEC-Q200 qualified



Marking color: Black

Specifications

Items	Performance																																
Category Temperature Range	-55°C ~ +105°C																																
Capacitance Tolerance	±20% (at 120 Hz, 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 120 Hz, 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 120 Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th colspan="2">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 rowspan="2">Impedance Ratio</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> <td>2</td> </tr> <tr> <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> <td>3</td> </tr> </tbody> </table>	Rated Voltage		6.3	10	16	25	35	50	63	80	100	Impedance Ratio	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	2	Z(-55°C)/Z(+20°C)	8	5	4	3	3	3	3	3	3
Rated Voltage		6.3	10	16	25	35	50	63	80	100																							
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Endurance	<table border="1"> <tbody> <tr> <td>Test Time</td> <td>2,000 Hrs for $\phi D \leq 6.3\text{mm}$ & $8 \times 6.5\text{L}$ & $10 \phi \times 7.7\text{L}$; 5,000 Hrs for $\phi D \geq 8\text{mm}$</td> </tr> <tr> <td>Capacitance Change</td> <td>Within ±30% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 300% of specified value</td> </tr> <tr> <td>Leakage Current</td> <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 $\phi D \leq 6.3\text{mm}$ & $8 \times 6.5\text{L}$ & $10 \phi \times 7.7\text{L}$; 5,000 Hrs for $\phi D \geq 8\text{mm}$	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 and 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> <td>Multiplier</td> <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

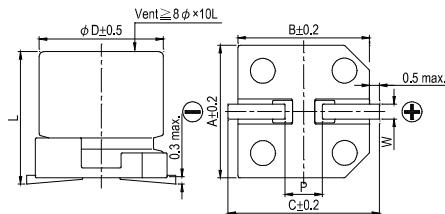
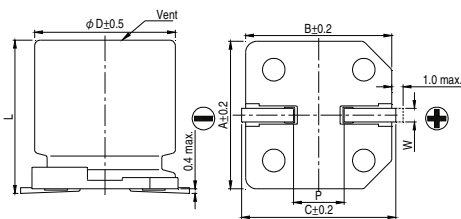


Fig. 2



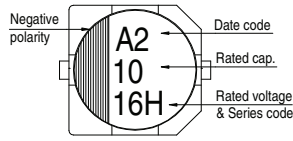
Lead Spacing and Diameter

Unit: mm

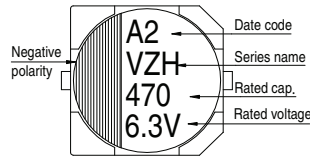
ϕD	L	A	B	C	W	P ± 0.2	Fig. No.
4	5.7 ± 0.3	4.3	4.3	5.1	0.5 ~ 0.8	1.0	1
5	5.7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	7.7 ± 0.3	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
10	10 ± 0.5	10.3	10.3	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

All product specifications in the catalog are subject to change without notice. (Cat. 2023E1)

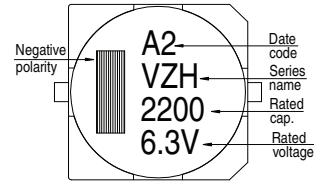
Marking
 $\phi D \leq 6.3 \text{ mm}$



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



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



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

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

Impedance: Ω at 100k Hz, 20°C

Dimension and Permissible Ripple Current

Rated Volt. (V _{DC})	Cap. (μF)	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																		4x5.7	2.9	60										
2.2	2R2																		4x5.7	2.9	60										
3.3	3R3																		4x5.7	2.9	60										
4.7	4R7																	4x5.7	1.35	80	5x5.7	1.52	85								
10	100								4x5.7	1.35	80	4x5.7	1.35	80	5x5.7	1.35	80	5x5.7	0.80	150	6.3x5.7	0.88	165								
22	220	4x5.7	1.35	80	4x5.7	1.35	80	5x5.7	0.80	150	5x5.7	0.80	150	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x7.7	0.68	185						
33	330	4x5.7	1.35	80	5x5.7	0.80	150	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x7.7	0.68	185	8x6.5	0.68	185						
47	470	5x5.7	0.80	150	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x7.7	0.68	185	8x6.5	0.68	185						
68	680												6.3x5.7	0.44	230	8x6.5	0.36	280	8x10	0.34	369	8x10	0.34	369							
100	101	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x7.7	0.36	280	8x6.5	0.36	280	8x10	0.17	450	8x10	0.17	450	10x10	0.18	553						
150	151	6.3x5.7	0.44	230	6.3x5.7	0.44	230	6.3x7.7	0.36	280	8x6.5	0.36	280	8x10	0.17	450	8x10	0.17	450	10x7.7	0.17	450	10x10	0.17	450	12.5x13.5	0.12	650			
220	221	6.3x5.7	0.44	230	6.3x7.7	0.36	280	8x6.5	0.36	280	6.3x7.7	0.36	280	8x10	0.17	450	8x10	0.17	450	10x7.7	0.17	450	10x10	0.09	670	12.5x13.5	0.12	650			
330	331	8x6.5	0.36	280	8x10	0.17	450	10x7.7	0.17	450	8x10	0.17	450	8x10	0.17	450	8x10	0.17	450	10x10	0.090	670	10x10	0.070	820	12.5x13.5	0.12	650			
470	471	8x10	0.17	450	10x7.7	0.17	450	10x7.7	0.17	450	8x10	0.17	450	8x10	0.17	450	10x10	0.09	670	10x10	0.09	670	10x10	0.09	670	12.5x16	0.060	950	16x16.5	0.073	1,000
680	681	8x10	0.17	450	10x7.7	0.17	450	10x7.7	0.17	450	10x10	0.09	670	10x10	0.09	670	12.5x13.5	0.070	820	12.5x16	0.060	950	16x16.5	0.073	1,000	16x16.5	0.073	1,000			
1,000	102	8x10	0.17	450	10x10	0.09	670	12.5x13.5	0.070	820	12.5x16	0.060	950	12.5x16	0.060	950	16x16.5	0.054	1,260	16x16.5	0.054	1,260	16x16.5	0.054	1,260	18x16.5	0.073	1,000	18x16.5	0.066	1,500
1,500	152	10x10	0.09	670	12.5x13.5	0.070	820	12.5x16	0.060	950	12.5x16	0.060	950	16x16.5	0.054	1,260	16x16.5	0.054	1,260	18x16.5	0.048	1,500	16x21.5	0.038	1,630	18x21.5	0.05	1,620	18x21.5	0.05	1,620
2,200	222	12.5x13.5	0.070	820	12.5x16	0.060	950	16x16.5	0.054	1,260	16x16.5	0.054	1,260	16x16.5	0.054	1,260	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750
3,300	332	12.5x16	0.060	950	16x16.5	0.054	1,260	16x16.5	0.054	1,260	16x16.5	0.054	1,260	18x16.5	0.048	1,500	16x21.5	0.038	1,630	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750
4,700	472	16x16.5	0.054	1,260	16x16.5	0.054	1,260	16x16.5	0.054	1,260	18x16.5	0.048	1,500	16x21.5	0.038	1,630	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750
6,800	682	18x16.5	0.048	1,500	16x21.5	0.038	1,630	16x21.5	0.038	1,630	18x16.5	0.048	1,500	16x21.5	0.038	1,630	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750
8,200	822	18x16.5	0.048	1,500	16x21.5	0.038	1,630	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750	18x21.5	0.038	1,750

Dimension: $\phi D \times L$ (mm)

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

Impedance: Ω / at 100k Hz, 20°C

Dimension and Permissible Ripple Current

Rated Volt. (Voc)		63V (1J)			80V (1K)			100V (2A)		
Cap. (μ F)	Contents	$\phi D \times L$	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	16×16.5	0.17	650
220	221	12.5×13.5	0.15	700	16×16.5	0.17	650	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	16×21.5	0.15	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 μ F $\pm 20\%$ 6.3V Carrier Tape 8 ϕ × 10L

VZH **471** **M** **0J** **TR** - **0810**

Series Name Capacitance Capacitance Tolerance Rated Voltage Package Type Terminal Type Case Size

XX

S = Standard
KS = AEC-Q200 Qualified, Safety Critical Application
LS = AEC-Q200 Qualified, Non-Safety Critical Application

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