

VZR Series

Features

- $5\phi \sim 18\phi$, 105°C, 7,000 ~ 8,000 hours assured
- Low Impedance temperature range up to +105°C
- For automobile modules and high temperature applications
- RoHS compliant
- AEC-Q200 compliant



Marking color: Black

Specifications

Items	Performance														
Category Temperature Range	-25°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"> <tr> <td>Rated Voltage</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tanδ (max.)</td> <td>0.32</td> <td>0.28</td> <td>0.26</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> </tr> </table> <p>When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.</p>	Rated Voltage	6.3	10	16	25	35	50	Tanδ (max.)	0.32	0.28	0.26	0.16	0.14	0.14
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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"> <tr> <td>Rated Voltage</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>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> </tr> </table>	Rated Voltage	6.3	10	16	25	35	50	Impedance Ratio	Z(-25°C) / Z(+20°C)	4	3	2	2	2
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Endurance	<table border="1"> <tr> <td>Test Time</td> <td>7,000 Hrs for $\phi D \leq 10$ mm; 8,000 Hrs for $\phi D \geq 12.5$ 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> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 7,000 ~ 8,000 hours at 105°C.</p>	Test Time	7,000 Hrs for $\phi D \leq 10$ mm; 8,000 Hrs for $\phi D \geq 12.5$ mm	Capacitance Change	Within ± 30% of initial value	Tanδ	Less than 300% of specified value	Leakage Current	Within specified value						
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Shelf Life Test	<table border="1"> <tr> <td>Test Time</td> <td>1,000 Hrs</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> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.</p>	Test Time	1,000 Hrs	Capacitance Change	Within ± 30% of initial value	Tanδ	Less than 300% of specified value	Leakage Current	Within specified value						
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Leakage Current	Within specified value														
Ripple Current and Frequency Multipliers	<table border="1"> <tr> <td>Frequency (Hz)</td> <td>50</td> <td>120</td> <td>1k</td> <td>10k up</td> </tr> <tr> <td>Multiplier</td> <td>0.35</td> <td>0.50</td> <td>0.83</td> <td>1.0</td> </tr> </table>	Frequency (Hz)	50	120	1k	10k up	Multiplier	0.35	0.50	0.83	1.0				
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Diagram of Dimensions

Fig. 1

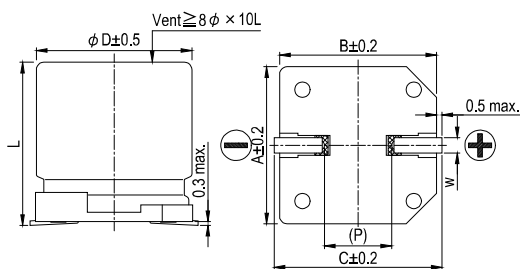
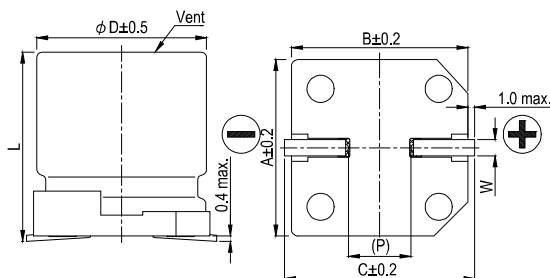


Fig. 2



Lead Spacing and Diameter

Unit: mm

φ D	L	A	B	C	W	P	Fig. No.
5	7 ± 0.3	5.3	5.3	5.9	0.5 ~ 0.8	1.5	1
6.3	7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	8.7 ± 0.5	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.1	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

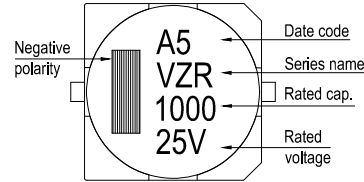
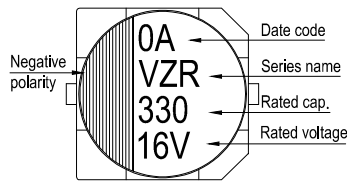
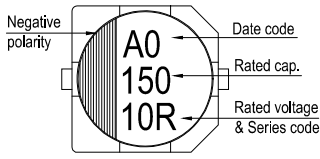
The diagram is marking " () " for reference dimension.

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})	6.3V (0J)			10V (1A)			16V (1C)			25V (1E)			35V (1V)			50V (1H)			
	Cap. (μF)	Contents	$\phi D \times L$	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		
10	100														5×7	2.2	95		
22	220							5×7	2.2	95	5×7	2.2	95	5×7	2.2	95			
33	330					5×7	2.2	95			6.3×7	1.1	140	6.3×8.7	1.0	230			
47	470	5×7	2.2	95				6.3×7	1.1	140	6.3×7	1.1	140	6.3×8.7	1.0	230	8×10	0.53	350
100	101	6.3×7	1.1	140				6.3×7	1.1	140	6.3×8.7	1.0	230				8×10	0.53	350
150	151					6.3×7	1.1	140	6.3×8.7	1.0	230								
220	221	6.3×8.7	1.0	230				6.3×8.7	1.0	230	8×10	0.22	600	8×10	0.22	600	10×10	0.35	670
330	331	6.3×8.7	1.0	230				8×10	0.22	600	8×10	0.22	600	10×10	0.16	850	12.5×13.5	0.18	850
390	391																12.5×16	0.15	950
470	471	8×10	0.22	600				8×10	0.22	600	10×10	0.16	850	12.5×13.5	0.092	950	16×16.5	0.12	1,200
680	681				10×10	0.16	850							12.5×16	0.074	1,200			
820	821	10×10	0.16	850													18×16.5	0.12	1,300
1,000	102										12.5×13.5	0.092	950	16×16.5	0.066	1,450	16×21.5	0.08	1,600
1,200	122										12.5×16	0.074	1,200						
1,500	152							12.5×13.5	0.092	950	16×16.5	0.066	1,450	18×16.5	0.064	1,550	18×21.5	0.072	1,650
1,800	182				12.5×13.5	0.092	950	12.5×16	0.074	1,200	16×16.5	0.066	1,450						
2,200	222	12.5×13.5	0.092	950	12.5×16	0.074	1,200	16×16.5	0.066	1,450	18×16.5	0.064	1,550	16×21.5	0.041	2,000			
2,700	272	12.5×16	0.074	1,200							16×21.5	0.041	2,000	18×21.5	0.039	2,150			
3,300	332				16×16.5	0.066	1,450	18×16.5	0.064	1,550	18×21.5	0.039	2,150						
3,900	392	16×16.5	0.066	1,450															
4,700	472				18×16.5	0.064	1,550	16×21.5	0.041	2,000									
5,600	562	18×16.5	0.064	1,550	16×21.5	0.041	2,000	18×21.5	0.039	2,150									
6,800	682	16×21.5	0.041	2,000	18×21.5	0.039	2,150												
8,200	822	18×21.5	0.039	2,150															

Part Numbering System

VZR Series 470 μF $\pm 20\%$ 6.3V Carrier Tape 8 ϕ ×10L General Purpose

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

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

Note: For more details, please refer to "Part Numbering System - SMD Type" on page 106.