

## VUA Series

### Features

- 6.3  $\phi$  ~ 18  $\phi$ , 125°C, 1,000 ~ 2,000 hours assured
- Chip type high temperature range, for +125°C use
- For automobile modules and other high temperature applications
- RoHS compliant
- AEC-Q200 compliant



Marking color: Black

### Specifications

Items	Performance																				
Category Temperature Range	-40°C ~ +125°C																				
Capacitance Tolerance	±20% (at 120 Hz, 20°C)																				
Leakage Current (at 20°C)	I = 0.03CV or 4 (μA) whichever is greater (after 1 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>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Tanδ (max)</td> <td>0.32</td> <td>0.24</td> <td>0.21</td> <td>0.18</td> <td>0.15</td> <td>0.15</td> </tr> </table> <p>When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000μF increase.</p>	Rated Voltage	10	16	25	35	50	63	Tanδ (max)	0.32	0.24	0.21	0.18	0.15	0.15						
Rated Voltage	10	16	25	35	50	63															
Tanδ (max)	0.32	0.24	0.21	0.18	0.15	0.15															
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>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-25°C)/Z(+20°C)</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>12</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> </tr> </table>	Rated Voltage	10	16	25	35	50	63	Impedance Ratio	Z(-25°C)/Z(+20°C)	6	5	4	3	3	Z(-40°C)/Z(+20°C)	12	8	6	4	4
Rated Voltage	10	16	25	35	50	63															
Impedance Ratio	Z(-25°C)/Z(+20°C)	6	5	4	3	3															
	Z(-40°C)/Z(+20°C)	12	8	6	4	4															
Endurance	<table border="1"> <tr> <td>Test Time</td> <td>1,000 Hrs for <math>\phi D \leq 8 \times 6.5</math> mm 2,000 Hrs for <math>\phi D \geq 8 \times 10</math> 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 1,000 / 2,000 hours at 125°C.</p>	Test Time	1,000 Hrs for $\phi D \leq 8 \times 6.5$ mm 2,000 Hrs for $\phi D \geq 8 \times 10$ mm	Capacitance Change	Within ±30% of initial value	Tanδ	Less than 300% of specified value	Leakage Current	Within specified value												
Test Time	1,000 Hrs for $\phi D \leq 8 \times 6.5$ mm 2,000 Hrs for $\phi D \geq 8 \times 10$ mm																				
Capacitance Change	Within ±30% of initial value																				
Tanδ	Less than 300% of specified value																				
Leakage Current	Within specified value																				
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 125°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												
Test Time	1,000 Hrs																				
Capacitance Change	Within ±30% of initial value																				
Tanδ	Less than 300% of specified value																				
Leakage Current	Within specified value																				
Ripple Current and Frequency Multipliers	<table border="1"> <tr> <td></td> <td>Freq.(Hz)</td> <td>50</td> <td>120</td> <td>1k</td> <td>10k up</td> </tr> <tr> <td rowspan="2">Cap.(μF)</td> <td>≤ 330</td> <td>0.80</td> <td>1.0</td> <td>1.25</td> <td>1.40</td> </tr> <tr> <td>330 &lt; C ≤ 4,700</td> <td>0.85</td> <td>1.0</td> <td>1.20</td> <td>1.30</td> </tr> </table>		Freq.(Hz)	50	120	1k	10k up	Cap.(μF)	≤ 330	0.80	1.0	1.25	1.40	330 < C ≤ 4,700	0.85	1.0	1.20	1.30			
	Freq.(Hz)	50	120	1k	10k up																
Cap.(μF)	≤ 330	0.80	1.0	1.25	1.40																
	330 < C ≤ 4,700	0.85	1.0	1.20	1.30																

### Diagram of Dimensions

Fig. 1

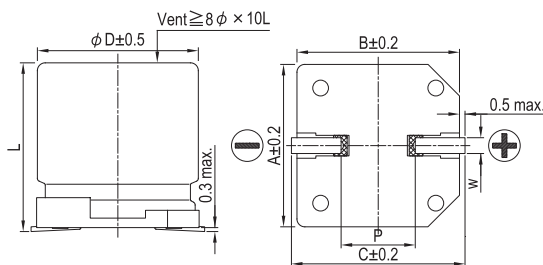
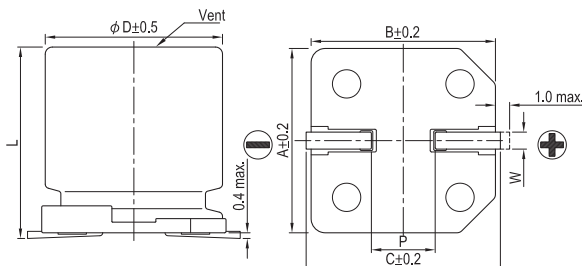


Fig. 2



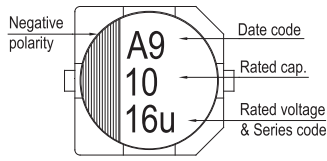
Lead Spacing and Diameter

Unit: mm

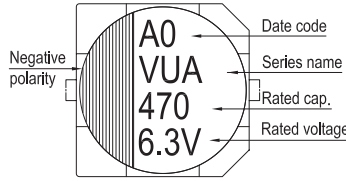
φ D	L	A	B	C	W	P ± 0.2	Fig. No.
6.3	5.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0	1
8	6.5 ± 0.3	8.3	8.3	9.0	0.5 ~ 0.8	2.3	1
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	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
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

### Marking

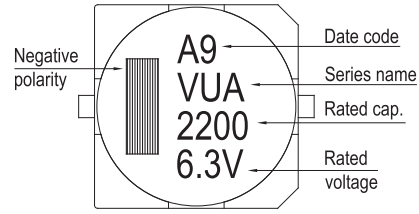
$\phi D = 6.3 \text{ mm}$



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



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



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

Ripple Current: mA/rms at 120 Hz, 125°C

### Dimension and Permissible Ripple Current

Rated Volt. (V <sub>DC</sub> )		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
Cap. ( $\mu\text{F}$ )	Contents	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
10	100											8×6.5	60
22	220							6.3×5.7	50	8×6.5	75	8×10	100
33	330			6.3×5.7	50	6.3×5.7	50	6.3×7.7	70	8×10	130	10×10	150
47	470			6.3×7.7	70	6.3×7.7	70	8×6.5	75	8×10	130	10×10	150
68	680	6.3×5.7	50	8×6.5	75	8×6.5	75	8×10	130	10×10	180	10×10	150
100	101	8×6.5	75	8×6.5	75	8×10	130	10×10	180	12.5×13.5	357	12.5×13.5	300
220	221	8×10	130	10×10	180	10×10	180	12.5×13.5	357	12.5×16	400	16×16.5	600
330	331	8×10	130	12.5×13.5	480	12.5×13.5	480	16×16.5	650	16×16.5	650	16×16.5	600
470	471	12.5×13.5	480	12.5×13.5	480	12.5×13.5	480	16×16.5	650	16×16.5	650	18×16.5	800
680	681	12.5×13.5	480	12.5×13.5	480	12.5×16	585	16×16.5	650	18×16.5	855		
1,000	102	12.5×16	585	12.5×16	585	16×16.5	650	18×16.5	855				
1,500	152	12.5×16	585	16×16.5	650	18×16.5	855						
2,200	222	16×16.5	650	18×16.5	855								
3,300	332	18×16.5	855										
4,700	472	18×16.5	855										

### Part Numbering System

VUA Series	33 $\mu\text{F}$	$\pm 20\%$	16V	Carrier Tape	6.3 $\phi$ × 5.7L	General Purpose
<b>VUA</b>	<b>330</b>	<b>M</b>	<b>1C</b>	<b>TR</b>	<b>-</b>	<b>0606</b>
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.

SMD