

Features

- 8φ ~ 18φ, 125°C, 3,000 ~ 5,000 hours assured
- Chip type high temperature range, for +125°C use
- For automobile modules and other high temperature applications
- RoHS compliance
- AEC-Q200 qualified



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>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> </tr> </table> <p>When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.</p>	Rated Voltage	10	16	25	35	50	63	Tanδ (max)	0.22	0.18	0.16	0.14	0.12	0.12									
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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 colspan="2">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> <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> <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	3	Z(-40°C)/Z(+20°C)	12	8	6	4	4	4
Rated Voltage		10	16	25	35	50	63																	
Impedance Ratio	Z(-25°C)/Z(+20°C)	6	5	4	3	3	3																	
	Z(-40°C)/Z(+20°C)	12	8	6	4	4	4																	
Endurance	<table border="1"> <tr> <td>Test Time</td> <td>3,000 Hrs for φ D ≤ 10 mm; 5,000 Hrs for φ D ≥ 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 3,000 / 5,000 hours at 125°C.</p>	Test Time	3,000 Hrs for φ D ≤ 10 mm; 5,000 Hrs for φ D ≥ 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 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															
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Ripple Current and Frequency Multipliers	<table border="1"> <tr> <td rowspan="2">Cap.(μF)</td> <td>Freq.(Hz)</td> <td>50</td> <td>120</td> <td>1k</td> <td>10k up</td> </tr> <tr> <td>≤ 330</td> <td>0.80</td> <td>1.0</td> <td>1.25</td> <td>1.40</td> </tr> <tr> <td>330 < C ≤ 3,300</td> <td></td> <td>0.85</td> <td>1.0</td> <td>1.20</td> <td>1.30</td> </tr> </table>	Cap.(μF)	Freq.(Hz)	50	120	1k	10k up	≤ 330	0.80	1.0	1.25	1.40	330 < C ≤ 3,300		0.85	1.0	1.20	1.30						
Cap.(μF)	Freq.(Hz)		50	120	1k	10k up																		
	≤ 330	0.80	1.0	1.25	1.40																			
330 < C ≤ 3,300		0.85	1.0	1.20	1.30																			

Diagram of Dimensions

Fig. 1

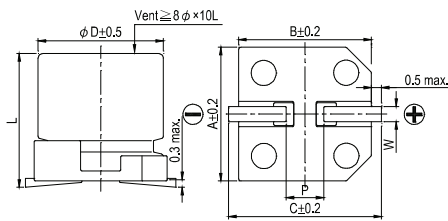
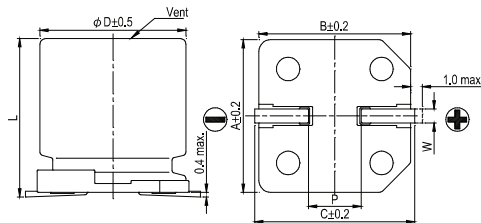


Fig. 2



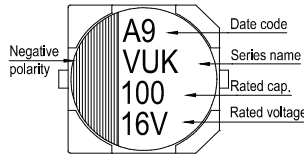
Lead Spacing and Diameter

Unit: mm

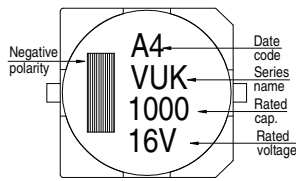
φ D	L	A	B	C	W	P ± 0.2	Fig. No.
8	10 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1	1
10	10 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7	1
12.5	13.5 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
12.5	16 ± 0.5	13.0	13.0	13.7	1.1 ~ 1.4	4.4	2
16	16.5 ± 0.5	17.0	17.0	18.0	1.1 ~ 1.4	6.4	2
18	16.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2
18	21.5 ± 0.5	19.0	19.0	20.0	1.1 ~ 1.4	6.4	2

Marking

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



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



Dimension and Permissible Ripple Current

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

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

Cap. (μF)	Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		$\phi D \times L$	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
100	101			8×10	85	8×10	85	10×10	110	12.5×13.5	170	12.5×13.5	150
220	221	8×10	85	10×10	150	10×10	150	12.5×13.5	200	16×16.5	250	16×16.5	230
330	331	10×10	150	12.5×13.5	230	12.5×13.5	230	16×16.5	280	18×16.5	340	18×16.5	320
470	471	12.5×13.5	230	12.5×13.5	250	16×16.5	310	18×16.5	380	18×21.5	430	18×21.5	410
680	681	12.5×13.5	250	12.5×13.5	280	16×16.5	350	18×16.5	450				
1,000	102	12.5×16	350	16×16.5	440	18×21.5	540						
1,500	152	12.5×16	350	16×16.5	460								
2,200	222	18×16.5	620	18×21.5	710								
3,300	332	18×21.5	770										

Part Numbering System

VUK Series 330 μF $\pm 20\%$ 16V Carrier Tape 12.5 ϕ × 13.5L

VUK **331** **M** **1C** **TR** - **1313** **XX**

Series Name Capacitance Capacitance Tolerance Rated Voltage Package Type Terminal Type Case Size S = Standard
 KS = AEC-Q200 Qualified, Safety Critical Application
 LS = AEC-Q200 Qualified, Non-Safety Critical Application