

### Features

- 8φ ~ 18φ, 150°C, 1,000 hours assured
- Chip type high temperature range, for +150°C use
- For automobile modules and other high temperature applications
- RoHS compliance
- AEC-Q200 qualified



Marking color: Black

### Specifications

Items	Performance																					
Category Temperature Range	-55°C ~ +150°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"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Tanδ (max)</td> <td>Dφ ≤ 10</td> <td>0.26</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> </tr> <tr> <td>Dφ ≥ 12.5</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </tbody> </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	Tanδ (max)	Dφ ≤ 10	0.26	0.20	0.16	0.14	0.14	Dφ ≥ 12.5	0.22	0.18	0.16	0.14	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"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-40°C) / Z(+20°C)</td> <td>Dφ ≤ 10</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> </tr> <tr> <td>Dφ ≥ 12.5</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> </tr> </tbody> </table>	Rated Voltage		10	16	25	35	50	Impedance Ratio	Z(-40°C) / Z(+20°C)	Dφ ≤ 10	10	8	6	4	4	Dφ ≥ 12.5	8	6	4	4	4
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### Diagram of Dimensions

Fig. 1

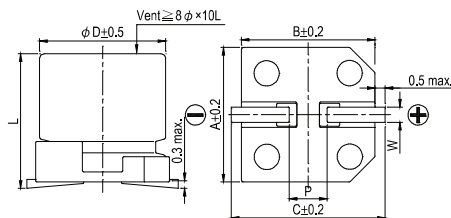
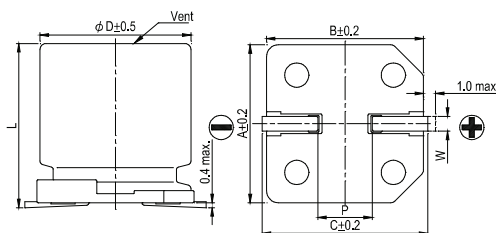


Fig. 2



### Lead Spacing and Diameter

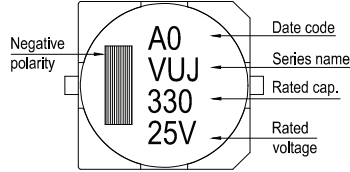
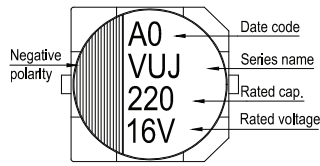
Unit: mm

φD	L	A	B	C	W	P ± 0.2	Fig. No.
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
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	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 100k Hz, 150°C

Cap. ( $\mu\text{F}$ )	Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
33	330									8×10	70
47	470							8×10	80	10×10	100
100	101			8×10	110	8×10	110	10×10	120	12.5×13.5	420
220	221	8×10	110	10×10	150	10×10	150	12.5×13.5	550	16×16.5	550
330	331	10×10	150			12.5×13.5	650	12.5×13.5	650	16×21.5	650
470	471			12.5×13.5	750	12.5×13.5	700	16×16.5	750	16×21.5	850
680	681	12.5×13.5	800	12.5×13.5	800	16×16.5	800	16×21.5	950	18×21.5	1,100
1,000	102	12.5×13.5	900	16×16.5	850	16×21.5	1,000	18×21.5	1,150		
2,200	222	18×21.5	1,350	18×21.5	1,350						
3,300	332	18×21.5	1,400								

### Part Numbering System

VUJ series    220 $\mu\text{F}$      $\pm 20\%$     10V    Carrier Tape    8 $\phi$ ×10L

**VUJ**    **221**    **M**    **1A**    **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