

## HBV Series

### Features

- 105°C, 10,000 hours assured
- Low ESR and High ripple current
- RoHS compliant
- AEC-Q200 compliant

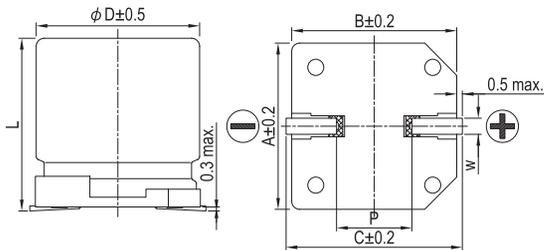


Marking color: Dark Green

### 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)	See Standard Ratings																						
Low Temperature Characteristics (at 100k Hz)	Impedance ratio shall not exceed the values given in the table below																						
	<table border="1"> <thead> <tr> <th colspan="2">Rated Voltage</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio</td> <td>Z (-25°C) / Z (+20°C)</td> <td>1.5</td> <td>1.5</td> <td>1.5</td> <td>1.5</td> <td>1.5</td> <td>1.5</td> </tr> <tr> <td>Z (-55°C) / Z (+20°C)</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> </tr> </tbody> </table>	Rated Voltage		16	25	35	50	63	80	Impedance ratio	Z (-25°C) / Z (+20°C)	1.5	1.5	1.5	1.5	1.5	1.5	Z (-55°C) / Z (+20°C)	2.0	2.0	2.0	2.0	2.0
Rated Voltage		16	25	35	50	63	80																
Impedance ratio	Z (-25°C) / Z (+20°C)	1.5	1.5	1.5	1.5	1.5	1.5																
	Z (-55°C) / Z (+20°C)	2.0	2.0	2.0	2.0	2.0	2.0																
Endurance	Test Time	10,000 Hrs																					
	Capacitance Change	Within ±30% of initial value																					
	Tanδ	Less than 200% of specified value																					
	ESR	Less than 200% of specified value																					
	Leakage Current	Within specified value																					
Shelf Life Test	* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 10,000 hours at 105°C. * After storage for 1,000 hours at 105 ± 2°C with no voltage applied and then being stabilized at 20°C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)																						
Resistance to Soldering Heat (Please refer to page 15 for reflowsoldering conditions)	Capacitance Change	Within ±10% of initial value																					
	Tanδ	Within specified value																					
	ESR	Within specified value																					
	Leakage Current	Within specified value																					
Ripple Current and Frequency Multipliers	Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k																		
	Multiplier	0.1	0.3	0.6	1.0																		

### Diagram of Dimensions



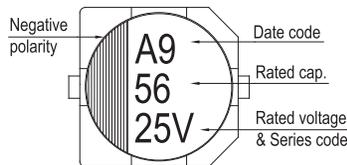
### Lead Spacing and Diameter

Unit: mm

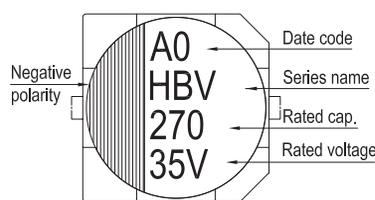
φD	L	A	B	C	W	P ± 0.2
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

### Marking

φD = 6.3



φD = 8 ~ 10





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

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

Standard Ratings

Rated Voltage (V)	Surge Voltage (V)	Capacitance ( $\mu$ F)	Size $\phi D \times L$ (mm)	Tan $\delta$ (120 Hz, 20°C)	L C ( $\mu$ A)	E S R (m $\Omega$ /at 100kHz, 20°C max.)	Rated R. C. (mA/rms at 100k Hz, 105°C)
16V (1C)	18.4	82	6.3 $\times$ 5.8	0.16	13.1	50	1,300
		150	6.3 $\times$ 7.7		24.0	30	2,000
		270	8 $\times$ 10		43.2	27	2,300
		470	10 $\times$ 10		75.2	20	2,500
25V (1E)	28.8	47	6.3 $\times$ 5.8	0.14	11.8	50	1,300
		56	6.3 $\times$ 5.8		14.0	50	1,300
		68	6.3 $\times$ 7.7		17.0	30	2,000
		100	6.3 $\times$ 7.7		25.0	30	2,000
		150	8 $\times$ 10		37.5	27	2,300
		220	8 $\times$ 10		55.0	27	2,300
		330	10 $\times$ 10		82.5	20	2,500
			10 $\times$ 12.5		82.5	16	2,900
35V (1V)	40.3	27	6.3 $\times$ 5.8	0.12	9.5	60	1,300
		33			11.6		
		47			16.5		
		68	6.3 $\times$ 7.7		23.8	35	2,000
		100	8 $\times$ 10		35.0	27	2,300
		150	8 $\times$ 10		52.5	27	2,300
		220	10 $\times$ 10		77.0	20	2,500
		270	10 $\times$ 10		94.5	20	2,500
50V(1H)	57.5	22	6.3 $\times$ 5.8	0.10	11.0	80	1,100
		33	6.3 $\times$ 7.7		16.5	40	1,600
		47	8 $\times$ 10		23.5	30	1,800
		68	8 $\times$ 10		34.0	30	1,800
		100	10 $\times$ 10		50.0	28	2,000
63V(1J)	72.5	10	6.3 $\times$ 5.8	0.08	6.3	120	1,000
		22	6.3 $\times$ 7.7		13.9	80	1,500
		27	8 $\times$ 10		17.0	40	1,700
		33			20.8		
		47			29.6		
		56	10 $\times$ 10		35.3	30	1,800
		68			42.8		
		82			51.7		
80V(1K)	92.0	22	8 $\times$ 10	0.08	17.6	45	1,550
		33	10 $\times$ 10		26.4	36	1,700
		47	10 $\times$ 10		37.6	36	1,700

Hybrid

Part Numbering System

HBV Series	220 $\mu$ F	$\pm$ 20%	25V	Carrier Tape	8 $\phi$ $\times$ 10L	General Purpose
<b>HBV</b>	<b>221</b>	<b>M</b>	<b>1E</b>	<b>TR</b>	<b>-</b>	<b>0810</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" on page 87..