

## HBV Series

### Features

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

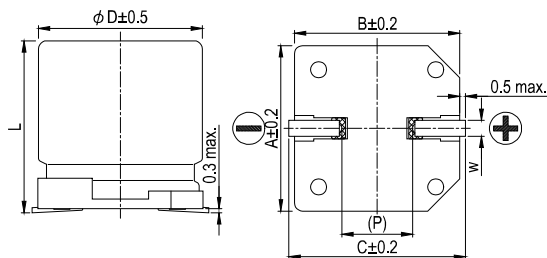


Marking color: Dark Green

### Specifications

Items	Performance							
Category Temperature Range	-55℃ ~ +105℃							
Capacitance Tolerance	± 20% (at 120 Hz, 20℃)							
Leakage Current (at 20℃)	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℃)	See Standard Ratings							
Low Temperature Characteristics (at 100k Hz)	Impedance ratio shall not exceed the values given in the table below							
	Rated Voltage		16	25	35	50	63	80
	Impedance ratio	Z (-25℃) / Z (+20℃)	1.5	1.5	1.5	1.5	1.5	1.5
		Z (-55℃) / Z (+20℃)	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					
	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 10,000 hours at 105℃.							
Shelf Life Test	* After storage for 1,000 hours at 105 ± 2℃ with no voltage applied and then being stabilized at 20℃, 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

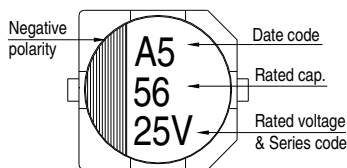
Unit: mm

φ D	L	A	B	C	W	P
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

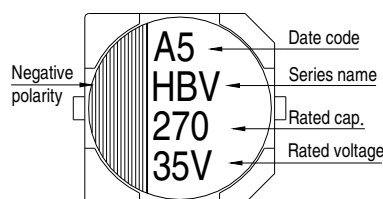
The diagram is marking " ( ) " for reference dimension.

### Marking

φ D = 6.3



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

## 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..