

## HBS Series

### Features

- 125°C, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliance

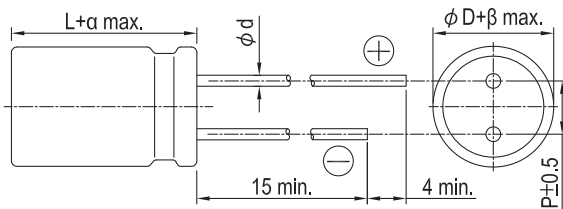


Marking color: Dark Green

### Specifications

Items	Performance										
Category Temperature Range	-55°C ~ +125°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										
Endurance	<table border="1"> <thead> <tr> <th>Test Time</th> <th>4,000 Hrs</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±30% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>ESR</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table>	Test Time	4,000 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
	Test Time	4,000 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	* After storage for 1,000 hours at 125 ± 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	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Within specified value</td> </tr> <tr> <td>ESR</td> <td>Within specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±10% of initial value	Tanδ	Within specified value	ESR	Within specified value	Leakage Current	Within specified value		
	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	<table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>120 ≤ f &lt; 1k</th> <th>1k ≤ f &lt; 10k</th> <th>10k ≤ f &lt; 100k</th> <th>100k ≤ f &lt; 500k</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.10</td> <td>0.3</td> <td>0.6</td> <td>1.0</td> </tr> </tbody> </table>	Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k	Multiplier	0.10	0.3	0.6	1.0
Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k							
Multiplier	0.10	0.3	0.6	1.0							

### Diagram of Dimensions

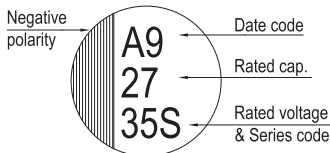


Lead Spacing and Diameter Unit: mm

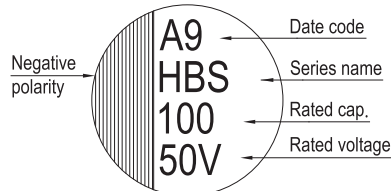
	6.3	6.3	8	10	10
φ D	6.3	6.3	8	10	10
L	6	8	10	10	12
P	2.5	2.5	3.5	5.0	5.0
φ d	0.45		0.6		
α	1.0				
β	0.5				

### Marking

φ D = 6.3



φ D = 8 ~ 10



Dimension:  $\phi D \times L$ (mm)  
Ripple Current: mA/rms at 100k Hz, 125°C

### Standard Ratings

Rated Volt. (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 ( $\mu\Omega$ /at 100kHz, 20°C max.)	Rated R. C. (mA/rms at 100k Hz, 125°C)
16V (1C)	18.4	82	6.3 × 6	0.16	13.1	50	900
		150	6.3 × 8		24	30	1,400
		270	8 × 10		43.2	27	1,600
		470	10 × 10		75.2	20	2,000
25V (1E)	28.8	47	6.3 × 6	0.14	11.8	50	900
		56			14		
		68			17		
		100	6.3 × 8		17	30	1,400
		150	6.3 × 8		25	30	1,400
		220	8 × 10		37.5	27	1,600
		330	8 × 10		55	27	1,600
35V (1V)	40.3	27	6.3 × 6	0.12	9.5	60	900
		33			11.6		
		47			16.5		
		68	6.3 × 8		23.8	35	1,400
		100	8 × 10		35	27	1,600
		150	8 × 10		52.5	27	1,600
		220	10 × 10		77	20	2,000
		270	10 × 10		94.5	20	2,000
50V(1H)	57.5	22	6.3 × 6	0.10	11	80	750
		33	6.3 × 8		16.5	40	1,100
		47	8 × 10		23.5	30	1,250
		68	8 × 10		34	30	1,250
		100	10 × 10		50	28	1,600
		120	10 × 10		60	28	1,600
63V(1J)	72.5	10	6.3 × 6	0.08	6.3	120	700
		22	6.3 × 8		13.9	80	900
		27	8 × 10		17	40	1,100
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,400
			10 × 12		35.3	26	1,500
		68	10 × 10		42.8	30	1,400
82	10 × 10	51.7	30	1,400			
80V (1K)	92.0	22	8 × 10	0.08	17.6	45	1,050
		33	10 × 10		35.3	36	1,360
		47	10 × 10		37.6	36	1,360

Hybrid

### Part Numbering System

HBS Series	220 $\mu F$	$\pm 20\%$	25V	Bulk Package	Gas Type	8 $\phi$ × 10L	Pb-free and PET coating case
<b>HBS</b>	<b>221</b>	<b>M</b>	<b>1E</b>	<b>BK</b>	-	<b>0810</b>	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case size	Lead Wire and Coating Type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.