

HBW Series

Features

- 125°C, 4,000 hours assured
- Low ESR and High ripple current
- RoHS compliant
- AEC-Q200 compliant

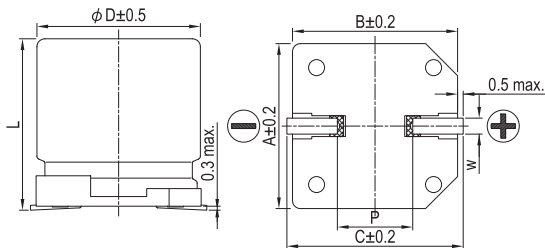


Marking color: Dark Green

Specifications

Items	Performance																							
Category Temperature Range	-55℃ ~ +125℃																							
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																							
	<table><tr><td colspan="2">Rated Voltage</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td></tr><tr><td rowspan="2">Impedance ratio</td><td>Z (-25℃) / Z (+20℃)</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℃) / Z (+20℃)</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></table>	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
	Rated Voltage		16	25	35	50	63	80																
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Endurance	<table><tr><td>Test Time</td><td>4,000 Hrs</td></tr><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></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													
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	* The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 4,000 hours at 125℃.																							
Shelf Life Test	* After storage for 1,000 hours at 125 ± 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)	<table><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></table>	Capacitance Change	Within ±10% of initial value	Tanδ	Within specified value	ESR	Within specified value	Leakage Current	Within specified value															
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Ripple Current and Frequency Multipliers	<table><tr><td>Frequency (Hz)</td><td>120 ≤ f < 1k</td><td>1k ≤ f < 10k</td><td>10k ≤ f < 100k</td><td>100k ≤ f < 500k</td></tr><tr><td>Multiplier</td><td>0.1</td><td>0.3</td><td>0.6</td><td>1.0</td></tr></table>	Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k	Multiplier	0.1	0.3	0.6	1.0													
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Diagram of Dimensions



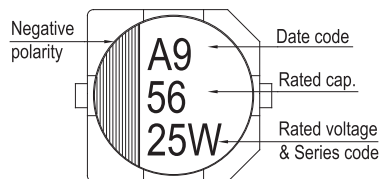
Lead Spacing and Diameter

Unit: mm

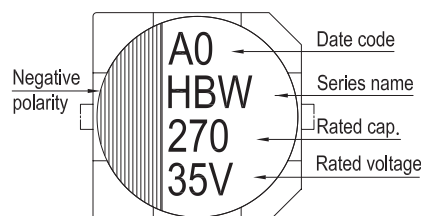
φ D	L	A	B	C	W	P ± 0.2
6.3	5.8 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
6.3	7.7 ± 0.3	6.6	6.6	7.2	0.5 ~ 0.8	2.0
8	10.0 ± 0.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
10	10.0 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7
10	12.5 ± 0.5	10.3	10.3	11.0	0.7 ~ 1.3	4.7

Marking

φ D = 6.3



φ D = 8 ~ 10





Dimension: ϕD×L(mm)
Ripple Current: mA/rms at 100k Hz, 125°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, 125°C)
16V (1C)	18.4	82	6.3 × 5.8	0.16	13.1	50	900
		150	6.3 × 7.7		24.0	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 × 5.8	0.14	11.8	50	900
		56	6.3 × 5.8		14.0	50	900
		68	6.3 × 7.7		17.0	30	1,400
		100	6.3 × 7.7		25.0	30	1,400
		150	8 × 10		37.5	27	1,600
		220	8 × 10		55.0	27	1,600
		330	10 × 10		82.5	20	2,000
35V (1V)	40.3	27	6.3 × 5.8	0.12	9.5	60	900
		33			11.6		
		47			16.5		
		68	6.3 × 7.7		23.8	35	1,400
		100	8 × 10		35.0	27	1,600
		150	8 × 10		52.5	27	1,600
		220	10 × 10		77.0	20	2,000
		270	10 × 10		94.5	20	2,000
50V(1H)	57.5	22	6.3 × 5.8	0.10	11.0	80	750
		33	6.3 × 7.7		16.5	40	1,100
		47	8 × 10		23.5	30	1,250
		68	8 × 10		34.0	30	1,250
		100	10 × 10		50.0	28	1,600
		120	10 × 10		60.0	28	1,600
63V(1J)	72.5	10	6.3 × 5.8	0.08	6.3	120	700
		22	6.3 × 7.7		13.9	80	900
		27	8 × 10		17.0	40	1,100
		33			20.8		
		47			29.6		
		56	10 × 10		35.3	30	1,400
			10 × 12.5		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		26.4	36	1,360
		47	10 × 10		37.6	36	1,360

Part Numbering System

HBW Series	220μF	±20%	25V	Carrier Tape	8 ϕ × 10L	General Purpose
HBW	221	M	1E	TR	-	0810
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.

Hybrid