

### Surface Mount Type

Series: **HB** Type : **V**

Country of Origin

Japan



- **Features** Endurance: 105°C 2000 h  
5.8 mm height (≤φ6.3)  
Vibration-proof product is available upon request. (φ8≤)  
RoHS directive compliant(Parts No:EEE\*)

#### ■ Specifications

Category temp. range	-40 to +105°C								
Rated W.V. Range	4 to 50 V .DC								
Nominal Cap. Range	0.1 to 470 μ F								
Capacitance Tolerance	±20 % (120Hz/+20°C)								
DC Leakage Current	I ≤ 0.01 CV or 3(μ A) after 2 minutes (Whichever is greater) (Bi-Polar I=0.02 CV or 6 (μA) after 2 minutes) (Whichever is greater)								
tan δ	Please see the attached standard products list								
Characteristics at Low Temperature	W.V. (V)	4	6.3	10	16	25	35	50	(Impedance ratio at 120 Hz)
	-25 / +20 °C	7	4	3	2	2	2	2	
	-40 / +20 °C	15	8	6	4	4	3	3	
Endurance	After applying rated working voltage for 2000 hours at +105±2°C and then being stabilized at +20°C, capacitors shall meet the following limits.								
	Capacitance change	±20% of initial measured value(4W.V.:±35 %, 6.3W.V.:±25 % φ4 to φ6.3)							
	tan δ	≤ 200 % of initial specified value							
Shelf Life	After storage for 1000 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)								
	After reflow soldering and then being stabilized at +20°C, capacitor shall meet the following limits.								
	Capacitance change	±10% of initial measured value							
Resistance to Soldering Heat	tan δ	≤ initial specified value							
	DC leakage current	≤ initial specified value							

#### ■ Marking

Example: 50V 1 μF (Polarized)

W.V. code

Negative polarity marking (No marking for the bi-polar)

Capacitance (μF)

Series identification (HB:Bi-polar)

Lot number

W.V. code

V	4	6.3	10	16	25	35	50
Code	g	j	A	C	E	V	H

#### ■ Dimensions in mm (not to scale)

Size code	D	L	A, B	H	I	W	P	K
B	4.0	5.8	4.3	5.5MAX	1.8	0.65±0.1	1.0	0.35 -0.20 to +0.15
C	5.0	5.8	5.3	6.5MAX	2.2	0.65±0.1	1.5	0.35 -0.20 to +0.15
D	6.3	5.8	6.6	7.8MAX	2.6	0.65±0.1	1.8	0.35 -0.20 to +0.15
E	8.0	6.2	8.3	9.5MAX	3.4	0.65±0.1	2.2	0.35 -0.20 to +0.15
F	8.0	10.2	8.3	10.0MAX	3.4	0.90±0.2	3.1	0.70 ±0.2
G	10.0	10.2	10.3	12.0MAX	3.5	0.90±0.2	4.6	0.70 ±0.2

#### ■ Case size

W.V.(V)	4		6.3		10		16		25		35		50	
	Polarized	Polarized	Bi-polar	Polarized	Bi-polar	Polarized	Bi-polar	Polarized	Bi-polar	Polarized	Bi-polar	Polarized	Bi-polar	
0.1 to 0.47												B	B	
1.0												B	B	
2.2												B	B	
3.3												B	D	
4.7									B	B		C	D	
6.8									B			C		
10					B	B	C		D	C		D		
22		B				C			D	D		E		
33		B		C	D				D	E		F		
47	B	C	D			D			E	F		G		
68														
100	C	D		E		F			F		G			
150	D													
220	D	F		F		G			G					
330		F				G								
470				G										

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Apr. 2005

■ Standard Products

W.V. (V)	Cap. (±20%) (μF)	Case size			Specification		Part No. (RoHS: not compliant)		Part No. (RoHS: compliant)		Min. Packaging Qty
		Dia. (mm)	Length (mm)	Size Code	Ripple current (120Hz) (+105°C) (mA)	tan δ (120Hz) (+20°C)		Reflow		Reflow	Taping (pcs)
4	47	4	5.8	B	34	0.50	EEVHB0G470R	(1)	EEEHB0G470R	(4)	2000
	100	5	5.8	C	61	0.50	EEVHB0G101R	(1)	EEEHB0G101R	(4)	1000
	150	6.3	5.8	D	82	0.50	EEVHB0G151P	(1)	EEEHB0G151P	(4)	1000
	220	6.3	5.8	D	82	0.50	EEVHB0G221P	(1)	EEEHB0G221P	(4)	1000
6.3	22	4	5.8	B	26	0.30	EEVHB0J220R	(1)	EEEHB0J220R	(4)	2000
	33	4	5.8	B	29	0.30	EEVHB0J330R	(1)	EEEHB0J330R	(4)	2000
	47	5	5.8	C	46	0.30	EEVHB0J470R	(1)	EEEHB0J470R	(4)	1000
	100	6.3	5.8	D	71	0.30	EEVHB0J101P	(1)	EEEHB0J101P	(4)	1000
	220	8	10.2	F	150	0.35	EEVHB0J221P	(2)	EEEHB0J221P	(5)	500
	330	8	10.2	F	230	0.35	EEVHB0J331P	(2)	EEEHB0J331P	(5)	500
10	33	5	5.8	C	43	0.22	EEVHB1A330R	(1)	EEEHB1A330R	(4)	1000
	100	8	6.2	E	110	0.26	EEVHB1A101P	(2)	EEEHB1A101P	(5)	1000
	220	8	10.2	F	160	0.26	EEVHB1A221P	(2)	EEEHB1A221P	(5)	500
	470	10	10.2	G	270	0.26	EEVHB1A471P	(2)	EEEHB1A471P	(5)	500
16	10	4	5.8	B	28	0.16	EEVHB1C100R	(1)	EEEHB1C100R	(4)	2000
	22	5	5.8	C	39	0.16	EEVHB1C220R	(1)	EEEHB1C220R	(4)	1000
	47	6.3	5.8	D	70	0.16	EEVHB1C470P	(1)	EEEHB1C470P	(4)	1000
	100	8.0	10.2	F	120	0.20	EEVHB1C101P	(2)	EEEHB1C101P	(5)	500
	220	10	10.2	G	210	0.20	EEVHB1C221P	(2)	EEEHB1C221P	(5)	500
	330	10	10.2	G	230	0.20	EEVHB1C331P	(2)	EEEHB1C331P	(5)	500
25	4.7	4	5.8	B	22	0.14	EEVHB1E4R7R	(1)	EEEHB1E4R7R	(4)	2000
	6.8	4	5.8	B	25	0.14	EEVHB1E6R8R	(1)	EEEHB1E6R8R	(4)	2000
	33	6.3	5.8	D	65	0.14	EEVHB1E330P	(1)	EEEHB1E330P	(4)	1000
	47	8	6.2	E	91	0.16	EEVHB1E470P	(2)	EEEHB1E470P	(5)	1000
	100	8	10.2	F	130	0.16	EEVHB1E101P	(2)	EEEHB1E101P	(5)	500
	220	10	10.2	G	190	0.16	EEVHB1E221P	(2)	EEEHB1E221P	(5)	500
35	10	5	5.8	C	28	0.12	EEVHB1V100R	(1)	EEEHB1V100R	(4)	1000
	22	6.3	5.8	D	55	0.12	EEVHB1V220P	(1)	EEEHB1V220P	(4)	1000
	33	8	6.2	E	84	0.14	EEVHB1V330P	(2)	EEEHB1V330P	(5)	1000
	47	8	10.2	F	98	0.14	EEVHB1V470P	(2)	EEEHB1V470P	(5)	500
	100	10	10.2	G	160	0.14	EEVHB1V101P	(2)	EEEHB1V101P	(5)	500
50	0.1	4	5.8	B	1	0.12	EEVHB1HR10R	(1)	EEEHB1HR10R	(4)	2000
	0.22	4	5.8	B	2	0.12	EEVHB1HR22R	(1)	EEEHB1HR22R	(4)	2000
	0.33	4	5.8	B	3	0.12	EEVHB1HR33R	(1)	EEEHB1HR33R	(4)	2000
	0.47	4	5.8	B	5	0.12	EEVHB1HR47R	(1)	EEEHB1HR47R	(4)	2000
	1	4	5.8	B	10	0.12	EEVHB1H1R0R	(1)	EEEHB1H1R0R	(4)	2000
	2.2	4	5.8	B	16	0.12	EEVHB1H2R2R	(1)	EEEHB1H2R2R	(4)	2000
	3.3	4	5.8	B	16	0.12	EEVHB1H3R3R	(1)	EEEHB1H3R3R	(4)	2000
	4.7	5	5.8	C	23	0.12	EEVHB1H4R7R	(1)	EEEHB1H4R7R	(4)	1000
	6.8	5	5.8	C	23	0.12	EEVHB1H6R8R	(1)	EEEHB1H6R8R	(4)	1000
	10	6.3	5.8	D	35	0.12	EEVHB1H100P	(1)	EEEHB1H100P	(4)	1000
	22	8	6.2	E	70	0.12	EEVHB1H220P	(2)	EEEHB1H220P	(5)	1000
	33	8	10.2	F	91	0.12	EEVHB1H330P	(2)	EEEHB1H330P	(5)	500
	47	10	10.2	G	100	0.12	EEVHB1H470P	(2)	EEEHB1H470P	(5)	500

The taping dimensions are explained on p.187 of our Catalog. Please use it as a reference guide.  
 Reflow Profile(Fig-1 to Fig-5) listed on the last page. Endurance: 105°C 2000h

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■ Standard Products(Bi-polar)

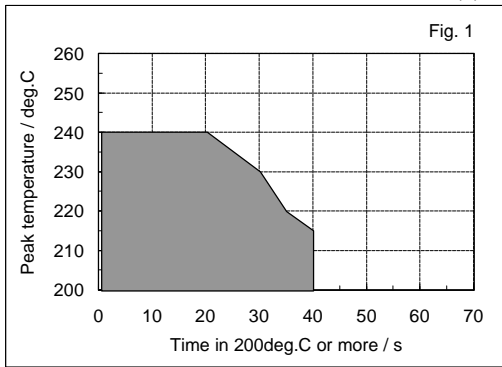
W.V. (V)	Cap. (±20%) (μF)	Case size			Specification		Part No. (RoHS: not compliant)		Part No. (RoHS: compliant)		Min. Packaging Q'ty Taping (pcs)
		Dia. (mm)	Length (mm)	Size Code	Ripple current (120Hz) (+105°C) (mA)	tan δ (120Hz) (+20°C)	Reflow	Reflow			
6.3	47	6.3	5.8	D	35	0.60	EEVHP0J470P	(1)	EEEHP0J470P	(4)	1000
10	10	4	5.8	B	20	0.44	EEVHP1A100R	(1)	EEEHP1A100R	(4)	2000
	33	6.3	5.8	D	26	0.44	EEVHP1A330P	(1)	EEEHP1A330P	(4)	1000
16	10	5	5.8	C	25	0.32	EEVHP1C100R	(1)	EEEHP1C100R	(4)	1000
25	3.3	4	5.8	B	12	0.28	EEVHP1E3R3R	(1)	EEEHP1E3R3R	(4)	2000
	4.7	4	5.8	B	12	0.28	EEVHP1E4R7R	(1)	EEEHP1E4R7R	(4)	2000
	10	6.3	5.8	D	28	0.28	EEVHP1E100P	(1)	EEEHP1E100P	(4)	1000
	22	6.3	5.8	D	55	0.28	EEVHP1E220P	(1)	EEEHP1E220P	(4)	1000
35	2.2	4	5.8	B	10	0.24	EEVHP1V2R2R	(1)	EEEHP1V2R2R	(4)	2000
50	0.22	4	5.8	B	2	0.24	EEVHP1HR22R	(1)	EEEHP1HR22R	(4)	2000
	0.33	4	5.8	B	3	0.24	EEVHP1HR33R	(1)	EEEHP1HR33R	(4)	2000
	0.47	4	5.8	B	5	0.24	EEVHP1HR47R	(1)	EEEHP1HR47R	(4)	2000
	1	4	5.8	B	10	0.24	EEVHP1H1R0R	(1)	EEEHP1H1R0R	(4)	2000
	3.3	6.3	5.8	D	16	0.24	EEVHP1H3R3P	(1)	EEEHP1H3R3P	(4)	1000
	4.7	6.3	5.8	D	23	0.24	EEVHP1H4R7P	(1)	EEEHP1H4R7P	(4)	1000

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Reflow Profile(Fig-1 to Fig-5) listed on the last page.

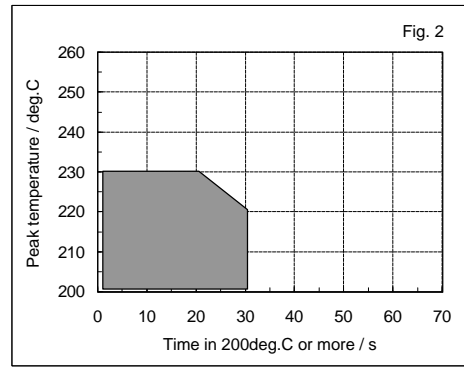
Endurance : 105°C 2000h

Pre-fix	Suffix	Case Diameter	RoHS Compliant	Terminal Finish	Reflow Condition		Reflow Chart
					Peak Temperature	Time above 200	
ECE-V	R	3mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
EEV-	R	4mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
	Q	12.5mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series) (3) Fig.3 (EB series only)
	M	16mm to 18mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series) (3) Fig.3 (EB series only)
EEE-	R	3mm to 5mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	6mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	8mm to 10mm	Yes	Sn-Bi	235 for 5 seconds	60 seconds	(5) Fig.5

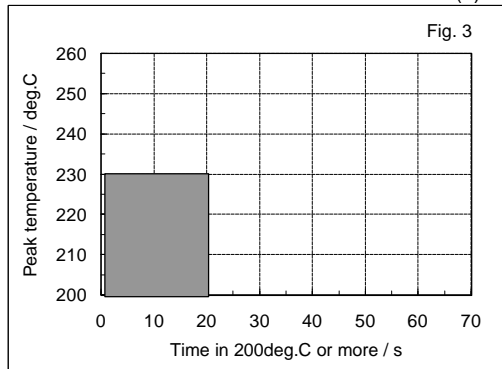
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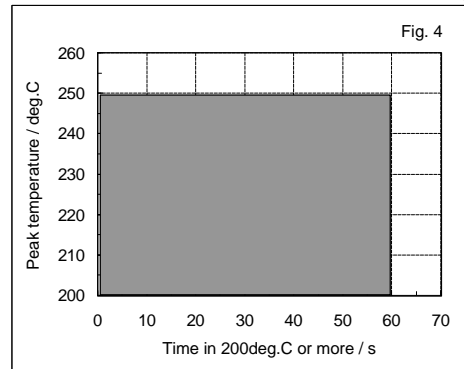
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(3)



(4)



(5)

