

Surface Mount Type

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

HB High temperature Lead-Free reflow (suffix:A*)



■ Features

- Endurance: 105 °C 2000 h
- Vibration-proof product is available upon request. (φ8 mm and larger)
- RoHS directive compliant

■ Specifications

| | | | | | | | | | |
|------------------------------------|---|--|-----|----|----|----|----|----|-----------------------------|
| Category Temp. Range | -40 °C to +105 °C | | | | | | | | |
| Rated W.V. Range | 6.3 V.DC to 50 V.DC | | | | | | | | |
| Nominal Cap. Range | 0.1 μF to 1500 μF | | | | | | | | |
| Capacitance Tolerance | ±20 % (120 Hz/ +20 °C) | | | | | | | | |
| DC Leakage Current | I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater) | | | | | | | | |
| tan δ | Please see the attached High temperature lead-free reflow products list. | | | | | | | | |
| Characteristics at Low Temperature | Standard | W.V.(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | (Impedance ratio at 120 Hz) |
| | | Z(-25 °C)/Z(+20 °C) | 4 | 3 | 2 | 2 | 2 | 2 | |
| | Miniaturization product | Z(-25 °C)/Z(+21 °C) | 4 | 3 | 2 | 2 | 2 | 2 | |
| | | Z(-40 °C)/Z(+21 °C) | 10 | 8 | 6 | 6 | 4 | 4 | |
| Endurance | After applying rated working voltage for 2000 hours at +105 °C±2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits. | | | | | | | | |
| | Capacitance change | ±20 % of initial measured value (16 V.DC or less : Within ±25 %, Miniaturization product : Within ±35 %) | | | | | | | |
| | tan δ | ≤ 200 % of initial specified value | | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | | |
| Shelf Life | After storage for 1000 hours at +105 °C±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, capacitors shall meet the following limits. | | | | | | | | |
| Resistance to Soldering Heat | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits. | | | | | | | | |
| | Capacitance change | ±10 % of initial measured value | | | | | | | |
| | tan δ | ≤ initial specified value | | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | | |

■ Frequency correction factor for ripple current

| | | | | |
|-------------------|----------------|------|------|---------|
| Correction factor | Frequency (Hz) | | | |
| | 50, 60 | 120 | 1 k | 10 k to |
| | 0.70 | 1.00 | 1.30 | 1.70 |

■ Marking

Example : 6.3 V 22 μF (Polarized)
Marking color : BLACK

| | | | |
|---|-------|---|------|
| j | 6.3 V | E | 25 V |
| A | 10 V | V | 35 V |
| C | 16 V | H | 50 V |

■ Dimensions in mm (not to scale)

(Unit : mm)

| Size code | D | L | A, B | H | I | W | P | K |
|-----------|------|----------|------|-----------|-----|----------|-----|--|
| B | 4.0 | 5.8±0.3 | 4.3 | 5.5 max. | 1.8 | 0.65±0.1 | 1.0 | 0.35 ^{+0.15} _{-0.20} |
| C | 5.0 | 5.8±0.3 | 5.3 | 6.5 max. | 2.2 | 0.65±0.1 | 1.5 | 0.35 ^{+0.15} _{-0.20} |
| D | 6.3 | 5.8±0.3 | 6.6 | 7.8 max. | 2.6 | 0.65±0.1 | 1.8 | 0.35 ^{+0.15} _{-0.20} |
| D8 | 6.3 | 7.7±0.3 | 6.6 | 7.8 max. | 2.6 | 0.65±0.1 | 1.8 | 0.35 ^{+0.15} _{-0.20} |
| E | 8.0 | 6.2±0.3 | 8.3 | 9.5 max. | 3.4 | 0.65±0.1 | 2.2 | 0.35 ^{+0.15} _{-0.20} |
| F | 8.0 | 10.2±0.3 | 8.3 | 10.0 max. | 3.4 | 0.90±0.2 | 3.1 | 0.70±0.20 |
| G | 10.0 | 10.2±0.3 | 10.3 | 12.0 max. | 3.5 | 0.90±0.2 | 4.6 | 0.70±0.20 |

() reference size

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

High temperate Lead-Free reflow Products

Endurance : 105 °C 2000 h

| W.V. | Cap. (±20 %) | Case size | | | Specification | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty |
|------|-----------------|-----------|--------|---------------|--|-------------------------------|------------------------------|--------|------------------------|
| | | Dia. | Length | *Size Code | Ripple Current (120 Hz) (+105°C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | | | Taping |
| (V) | (μF) | (mm) | (mm) | | | | | (pcs) | |
| 6.3 | 22 | 4 | 5.8 | B | 26 | 0.30 | EEEHBOJ220AR | (5) | 2000 |
| | 33 | 4 | 5.8 | B | 29 | 0.30 | EEEHBOJ330AR | (5) | 2000 |
| | 47 | 4 | 5.8 | (B) | 26 | 0.50 | EEEHBJ470UAR | (5) | 2000 |
| | | 5 | 5.8 | C | 46 | 0.30 | EEEHBOJ470AR | (5) | 1000 |
| | 100 | 5 | 5.8 | (C) | 42 | 0.50 | EEEHBJ101UAR | (5) | 1000 |
| | | 6.3 | 5.8 | D | 71 | 0.30 | EEEHBOJ101AP | (5) | 1000 |
| | 220 | 6.3 | 5.8 | (D) | 80 | 0.50 | EEEHBJ221UAP | (5) | 1000 |
| | | 8 | 10.2 | F | 150 | 0.35 | EEEHBOJ221AP | (7) | 500 |
| | 330 | 8 | 6.2 | (E) | 180 | 0.50 | EEEHBJ331UAP | (7) | 1000 |
| | | 8 | 10.2 | F | 230 | 0.35 | EEEHBOJ331AP | (7) | 500 |
| 470 | 8 | 10.2 | (F) | 230 | 0.50 | EEEHBJ471UAP | (7) | 500 | |
| 1500 | 10 | 10.2 | (G) | 290 | 0.50 | EEEHBJ152UAP | (7) | 500 | |
| 10 | 33 | 4 | 5.8 | (B) | 23 | 0.30 | EEEHBA330UAR | (5) | 2000 |
| | | 5 | 5.8 | C | 43 | 0.26 | EEEHB1A330AR | (5) | 1000 |
| | 68 | 6.3 | 5.8 | D | 70 | 0.22 | EEEHB1A680AP | (5) | 1000 |
| | 100 | 6.3 | 5.8 | (D) | 71 | 0.30 | EEEHBA101UAP | (5) | 1000 |
| | | 8 | 6.2 | E | 110 | 0.26 | EEEHB1A101AP | (7) | 1000 |
| | 150 | 6.3 | 5.8 | (D) | 64 | 0.50 | EEEHBA151UAP | (5) | 1000 |
| | 220 | 8 | 6.2 | (E) | 110 | 0.30 | EEEHBA221UAP | (7) | 1000 |
| | | 8 | 10.2 | F | 160 | 0.26 | EEEHB1A221AP | (7) | 500 |
| | 470 | 8 | 10.2 | (F) | 220 | 0.35 | EEEHBA471UAP | (7) | 500 |
| | | 10 | 10.2 | G | 270 | 0.26 | EEEHB1A471AP | (7) | 500 |
| 16 | 10 | 4 | 5.8 | B | 28 | 0.16 | EEEHB1C100AR | (5) | 2000 |
| | 22 | 4 | 5.8 | (B) | 29.5 | 0.26 | EEEHBC220UAR | (5) | 2000 |
| | | 5 | 5.8 | C | 39 | 0.16 | EEEHB1C220AR | (5) | 1000 |
| | 33 | 6.3 | 5.8 | D | 65 | 0.16 | EEEHB1C330AP | (5) | 1000 |
| | | 5 | 5.8 | (C) | 39 | 0.26 | EEEHBC470UAR | (5) | 1000 |
| | 47 | 6.3 | 5.8 | D | 70 | 0.16 | EEEHB1C470AP | (5) | 1000 |
| | | 6.3 | 7.7 | D8 | 84 | 0.16 | EEEHBC470XAP | (5) | 900 |
| | 100 | 6.3 | 5.8 | (D) | 70 | 0.26 | EEEHBC101UAP | (5) | 1000 |
| | | 8 | 10.2 | F | 120 | 0.20 | EEEHB1C101AP | (7) | 500 |
| | 220 | 8 | 10.2 | (F) | 150 | 0.20 | EEEHBC221UAP | (7) | 500 |
| 10 | | 10.2 | G | 210 | 0.20 | EEEHB1C221AP | (7) | 500 | |
| 330 | 10 | 10.2 | G | 230 | 0.20 | EEEHB1C331AP | (7) | 500 | |
| 470 | 8 | 10.2 | (F) | 240 | 0.40 | EEEHBC471UAP | (7) | 500 | |
| | 10 | 10.2 | G | 340 | 0.20 | EEEHB1C471AP | (7) | 500 | |
| 25 | 4.7 | 4 | 5.8 | B | 22 | 0.14 | EEEHB1E4R7AR | (5) | 2000 |
| | 6.8 | 4 | 5.8 | B | 25 | 0.14 | EEEHB1E6R8AR | (5) | 2000 |
| | 10 | 4 | 5.8 | (B) | 28 | 0.16 | EEEHBE100UAR | (5) | 2000 |
| | | 5 | 5.8 | C | 28 | 0.14 | EEEHB1E100AR | (5) | 1000 |
| | 22 | 6.3 | 5.8 | D | 55 | 0.14 | EEEHB1E220AP | (5) | 1000 |
| | 33 | 5 | 5.8 | (C) | 50 | 0.20 | EEEHBE330UAR | (5) | 1000 |
| | | 6.3 | 5.8 | D | 65 | 0.14 | EEEHB1E330AP | (5) | 1000 |
| | 47 | 6.3 | 5.8 | (D) | 65 | 0.20 | EEEHBE470UAR | (5) | 1000 |
| | | 8 | 6.2 | E | 91 | 0.16 | EEEHB1E470AP | (7) | 1000 |
| | 100 | 8 | 6.2 | (E) | 100 | 0.16 | EEEHBE101UAP | (7) | 1000 |
| 8 | | 10.2 | F | 130 | 0.16 | EEEHB1E101AP | (7) | 500 | |
| 220 | 8 | 10.2 | (F) | 130 | 0.30 | EEEHBE221UAP | (7) | 500 | |
| | 10 | 10.2 | G | 190 | 0.16 | EEEHB1E221AP | (7) | 500 | |
| 330 | 8 | 10.2 | (F) | 130 | 0.30 | EEEHBE331UAP | (7) | 500 | |
| | 10 | 10.2 | G | 220 | 0.16 | EEEHB1E331AP | (7) | 500 | |
| 470 | 10 | 10.2 | (G) | 230 | 0.30 | EEEHBE471UAP | (7) | 500 | |

*Size code():Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

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Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ High temperate Lead-Free reflow Products

Endurance : 105 °C 2000 h

| W.V. | Cap. (±20 %) | Case size | | | Specification | | Part No. (RoHS:compliant) | Reflow | Min. Packaging Q'ty | | | | | | | | |
|------|-----------------|-----------|--------|---------------|--|-------------------------------|------------------------------|--------|------------------------|-----|------|-----|-----|------|--------------|-----|------|
| | | Dia. | Length | *Size Code | Ripple Current (120 Hz) (+105°C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) | | | | | | | | |
| (V) | (μF) | (mm) | (mm) | | | | | | | | | | | | | | |
| 35 | 4.7 | 4 | 5.8 | B | 21 | 0.12 | EEEHB1V4R7AR | (5) | 2000 | | | | | | | | |
| | 6.8 | 4 | 5.8 | (B) | 25 | 0.12 | EEEHBV6R8UAR | (5) | 2000 | | | | | | | | |
| | 10 | 5 | 5.8 | C | 28 | 0.12 | EEEHB1V100AR | (5) | 1000 | | | | | | | | |
| | 22 | 6.3 | 5.8 | D | 55 | 0.12 | EEEHB1V220AP | (5) | 1000 | | | | | | | | |
| | 33 | 8 | 6.2 | E | 84 | 0.14 | EEEHB1V330AP | (7) | 1000 | | | | | | | | |
| | 47 | 6.3 | 7.7 | D8 | 98 | 0.20 | EEEHBV470YAP | (5) | 900 | | | | | | | | |
| | | | | | | | | | | 8 | 6.2 | (E) | 91 | 0.18 | EEEHBV470UAP | (7) | 1000 |
| | | | | | | | | | | | | | | | | | |
| | 100 | 8 | 10.2 | (F) | 98 | 0.20 | EEEHBV101UAP | (7) | 500 | | | | | | | | |
| | | | | | | | | | | 10 | 10.2 | G | 160 | 0.14 | EEEHB1V101AP | (7) | 500 |
| 220 | 10 | 10.2 | (G) | 180 | 0.14 | EEEHBV221UAP | (7) | 500 | | | | | | | | | |
| 50 | 0.1 | 4 | 5.8 | B | 1 | 0.12 | EEEHB1HR10AR | (5) | 2000 | | | | | | | | |
| | 0.22 | 4 | 5.8 | B | 2 | 0.12 | EEEHB1HR22AR | (5) | 2000 | | | | | | | | |
| | 0.33 | 4 | 5.8 | B | 3 | 0.12 | EEEHB1HR33AR | (5) | 2000 | | | | | | | | |
| | 0.47 | 4 | 5.8 | B | 5 | 0.12 | EEEHB1HR47AR | (5) | 2000 | | | | | | | | |
| | 0.68 | 4 | 5.8 | B | 7 | 0.12 | EEEHB1HR68AR | (5) | 2000 | | | | | | | | |
| | 1 | 4 | 5.8 | B | 10 | 0.12 | EEEHB1H1R0AR | (5) | 2000 | | | | | | | | |
| | 2.2 | 4 | 5.8 | B | 16 | 0.12 | EEEHB1H2R2AR | (5) | 2000 | | | | | | | | |
| | 3.3 | 4 | 5.8 | B | 16 | 0.12 | EEEHB1H3R3AR | (5) | 2000 | | | | | | | | |
| | 4.7 | 5 | 5.8 | C | 23 | 0.12 | EEEHB1H4R7AR | (5) | 1000 | | | | | | | | |
| | 6.8 | 5 | 5.8 | C | 23 | 0.12 | EEEHB1H6R8AR | (5) | 1000 | | | | | | | | |
| | 10 | 6.3 | 5.8 | D | 35 | 0.12 | EEEHB1H100AP | (5) | 1000 | | | | | | | | |
| | 22 | 6.3 | 5.8 | (D) | 35 | 0.14 | EEEHBH220UAP | (5) | 1000 | | | | | | | | |
| | | | | | | | | | | 8 | 6.2 | E | 70 | 0.12 | EEEHB1H220AP | (7) | 1000 |
| | 33 | 8 | 10.2 | F | 91 | 0.12 | EEEHB1H330AP | (7) | 500 | | | | | | | | |
| 47 | | | | | | | | | | 6.3 | 7.7 | D8 | 63 | 0.12 | EEEHBH470YAP | (5) | 900 |
| | | | | | | | | | | | | | | | | | |
| 10 | 10 | 10.2 | G | 100 | 0.12 | EEEHB1H470AP | (7) | 500 | | | | | | | | | |
| 100 | 10 | 10.2 | (G) | 250 | 0.12 | EEEHBH101UAP | (7) | 500 | | | | | | | | | |
| 220 | 10 | 10.2 | (G) | 270 | 0.18 | EEEHBH221UAP | (7) | 500 | | | | | | | | | |

*Size code():Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

Данный компонент на территории Российской Федерации

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