

Surface Mount Type

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

Specifications

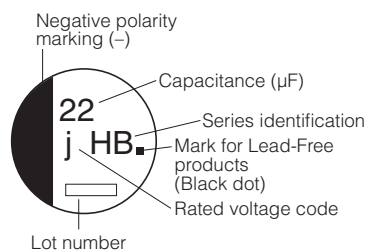
| | | | | | | | | | |
|------------------------------------|---|--|-----|----|----|----|----|----|-----------------------------|
| Category temperature range | -40 °C to +105 °C | | | | | | | | |
| Rated voltage range | 6.3 V.DC to 50 V.DC | | | | | | | | |
| Capacitance range | 1 µF to 1500 µF | | | | | | | | |
| Capacitance tolerance | ±20 % (120 Hz/ +20 °C) | | | | | | | | |
| Leakage current | I ≤ 0.01 CV or 3 (µA) After 2 minutes (Whichever is greater) | | | | | | | | |
| Dissipation factor (tan δ) | Please see the attached characteristics list | | | | | | | | |
| Characteristics at low temperature | Standard | V.DC | 6.3 | 10 | 16 | 25 | 35 | 50 | (Impedance ratio at 120 Hz) |
| | | Z(-25 °C)/Z(+20 °C) | 4 | 3 | 2 | 2 | 2 | 2 | |
| | Z(-40 °C)/Z(+20 °C) | 8 | 6 | 4 | 4 | 3 | 3 | | |
| | Miniaturization product | Z(-25 °C)/Z(+20 °C) | 4 | 3 | 2 | 2 | 2 | 2 | |
| | | Z(-40 °C)/Z(+20 °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 | Within ±20 % of the initial value (16 V.DC or less : Within ±25 %, Miniaturization product : Within ±35 %) | | | | | | | |
| | tan δ | ≤200 % of the initial limit | | | | | | | |
| | DC leakage current | Within the initial limit | | | | | | | |
| 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) | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits. | | | | | | | | |
| | Capacitance change | Within ±10 % of the initial value | | | | | | | |
| | tan δ | Within the initial limit | | | | | | | |
| | DC leakage current | Within the initial limit | | | | | | | |
| AEC-Q200 | AEC-Q200 compliant | | | | | | | | |

Frequency correction factor for ripple current

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

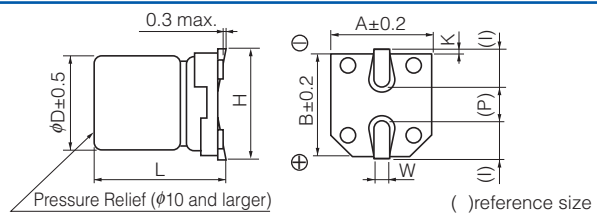
Marking

Example : 6.3 V.DC 22 µF
 Marking color : BLACK



| | | | | | | |
|-------------------|-----|----|----|----|----|----|
| R. Voltage (V.DC) | 6.3 | 10 | 16 | 25 | 35 | 50 |
| Code | j | A | C | E | V | H |

Dimensions



| Size code | φD | 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 |

Characteristics list

Endurance : 105 °C 2000 h

| Rated voltage (V.DC) | Cap. (±20 %) (μF) | Case size (mm) | | Size* code | Specification | | Part No. | Reflow | Min. Packaging Q'ty |
|----------------------|-------------------|----------------|------|------------|---|-------------------------|--------------|--------|---------------------|
| | | φD | L | | Ripple current (120 Hz) (+105 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | | | Taping (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 |
| | 47 | 5 | 5.8 | (C) | 39 | 0.26 | EEEHBC470UAR | (5) | 1000 |
| | | 6.3 | 5.8 | D | 70 | 0.16 | EEEHB1C470AP | (5) | 1000 |
| | 6.3 | 7.7 | D8 | 84 | 0.16 | EEEHBC470XAP | (5) | 900 | |
| | | 6.3 | 5.8 | (D) | 70 | 0.26 | EEEHBC101UAP | (5) | 1000 |
| | 100 | 8 | 10.2 | F | 120 | 0.20 | EEEHB1C101AP | (7) | 500 |
| | | 8 | 10.2 | (F) | 150 | 0.20 | EEEHBC221UAP | (7) | 500 |
| | 220 | 10 | 10.2 | G | 210 | 0.20 | EEEHB1C221AP | (7) | 500 |
| | | 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"

Characteristics list

Endurance : 105 °C 2000 h

| Rated voltage (V.DC) | Cap. (±20 %) (μF) | Case size (mm) | | Size* code | Specification | | Part No. | Reflow | Min. Packaging Q'ty | |
|----------------------|-------------------|----------------|------|------------|---|-------------------------|--------------|--------------|---------------------|------|
| | | φD | L | | Ripple current (120 Hz) (+105 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) | |
| 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 | 47 | 6.3 | 7.7 | D8 | 98 | 0.20 | EEEHBV470YAP | (5) | 900 |
| | | | 8 | 6.2 | (E) | 91 | 0.18 | EEEHBV470UAP | (7) | 1000 |
| | | | 8 | 10.2 | F | 98 | 0.14 | EEEHB1V470AP | (7) | 500 |
| | 100 | 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 | 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 | 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 | 47 | 6.3 | 7.7 | D8 | 63 | 0.12 | EEEHBH470YAP | (5) | 900 |
| | | | 8 | 10.2 | (F) | 95 | 0.12 | EEEHBH470UAP | (7) | 500 |
| | | | 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 | | |

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

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