

Surface Mount Type

Series: **HD** Type: **V**
 ※6.3V to 35V : High temperature Lead-Free reflow (suffix:A*)
 50V to 100V : Standard Lead-Free reflow



■ Features

- Endurance: 105 °C 5000 h
- Vibration-proof product is available upon request.(φ8 ≤)
- RoHS directive compliant

■ Specifications

| | | | | | | | | | | |
|------------------------------------|---|------------------------------------|----|----|----|----|----|----|-----|-----------------------------|
| Category Temp. Range | -40 °C to +105 °C | | | | | | | | | |
| Rated W.V. Range | 6.3 V.DC to 100 V.DC | | | | | | | | | |
| Nominal Cap. Range | 0.47 μF to 1000 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 | W.V. (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | (Impedance ratio at 120 Hz) |
| | Z(-25 °C)/Z(+20 °C) | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | Z(-40 °C)/Z(+20 °C) | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Endurance | After applying rated working voltage for 5000 hours at +105 °C±2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits. | | | | | | | | | |
| | Capacitance change | ±30 % of initial measured value | | | | | | | | |
| | tan δ | ≤ 300 % 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) | | | | | | | | | |
| | Capacitance change | ±20 % of initial measured value | | | | | | | | |
| | tan δ | ≤ 200 % of initial specified value | | | | | | | | |
| | DC leakage current | ≤ initial specified value | | | | | | | | |
| 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 | | | | | | | | |

■ Marking

Example: 6.3 V 330 μF
Marking color: BLACK

Rated Voltage Mark

| | | | |
|---|-------|----|-------|
| j | 6.3 V | H | 50 V |
| A | 10 V | J | 63 V |
| C | 16 V | 2A | 100 V |
| E | 25 V | | |
| V | 35 V | | |

■ Dimensions in mm (not to scale)

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

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 temperature Lead-Free reflow Products(6.3V to 35V)

Endurance : 105 °C 5000 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.) | Impedance (100 kHz) (+20 °C) | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) |
| (V) | (μF) | (mm) | (mm) | | | | | | | |
| 6.3 | 330 | 8.0 | 10.2 | F | 230 | 1.5 | 0.30 | EEEHD0J331AP | (7) | 500 |
| | 1000 | 10.0 | 10.2 | G | 313 | 0.8 | 0.50 | EEEHD0J102AP | (7) | 500 |
| 10 | 100 | 8.0 | 6.2 | E | 62 | 2.0 | 0.30 | EEEHD1A101AP | (7) | 1000 |
| | 220 | 8.0 | 10.2 | F | 160 | 1.5 | 0.30 | EEEHD1A221AP | (7) | 500 |
| | 330 | 10.0 | 10.2 | G | 238 | 0.8 | 0.30 | EEEHD1A331AP | (7) | 500 |
| 16 | 10 | 4.0 | 5.8 | B | 28 | 12.0 | 0.20 | EEEHD1C100AR | (5) | 2000 |
| | 22 | 5.0 | 5.8 | C | 39 | 7.2 | 0.20 | EEEHD1C220AR | (5) | 1000 |
| | 47 | 6.3 | 5.8 | D | 70 | 4.0 | 0.20 | EEEHD1C470AP | (5) | 1000 |
| | 100 | 8.0 | 10.2 | F | 130 | 1.5 | 0.20 | EEEHD1C101AP | (7) | 500 |
| | 220 | 10.0 | 10.2 | G | 220 | 0.8 | 0.20 | EEEHD1C221AP | (7) | 500 |
| 25 | 470 | 10.0 | 10.2 | G | 340 | 0.8 | 0.20 | EEEHD1C471AP | (7) | 500 |
| | 4.7 | 4.0 | 5.8 | B | 17 | 12.0 | 0.16 | EEEHD1E4R7AR | (5) | 2000 |
| | 10 | 5.0 | 5.8 | C | 28 | 7.2 | 0.16 | EEEHD1E100AR | (5) | 1000 |
| | 22 | 6.3 | 5.8 | D | 55 | 4.0 | 0.16 | EEEHD1E220AP | (5) | 1000 |
| | 33 | 6.3 | 5.8 | D | 55 | 4.0 | 0.16 | EEEHD1E330AP | (5) | 1000 |
| | 47 | 8.0 | 6.2 | E | 56 | 2.0 | 0.18 | EEEHD1E470AP | (7) | 1000 |
| 35 | 100 | 8.0 | 10.2 | F | 130 | 1.5 | 0.16 | EEEHD1E101AP | (7) | 500 |
| | 330 | 10.0 | 10.2 | G | 238 | 0.8 | 0.16 | EEEHD1E331AP | (7) | 500 |
| | 4.7 | 4.0 | 5.8 | B | 17 | 12.0 | 0.13 | EEEHD1V4R7AR | (5) | 2000 |
| | 10 | 5.0 | 5.8 | C | 28 | 7.2 | 0.13 | EEEHD1V100AR | (5) | 1000 |
| | 22 | 6.3 | 5.8 | D | 55 | 4.0 | 0.13 | EEEHD1V220AP | (5) | 1000 |
| | 33 | 8.0 | 6.2 | E | 53 | 2.0 | 0.16 | EEEHD1V330AP | (7) | 1000 |
| | | 6.3 | 7.7 | D8 | 57 | 2.0 | 0.13 | EEEHDV330XAP | (5) | 900 |
| | 47 | 6.3 | 7.7 | D8 | 57 | 2.0 | 0.14 | EEEHDV470XAP | (5) | 900 |
| 47 | 8.0 | 10.2 | F | 79 | 1.5 | 0.14 | EEEHD1V470AP | (7) | 500 | |
| 100 | 10.0 | 10.2 | G | 101 | 0.8 | 0.14 | EEEHD1V101AP | (7) | 500 | |
| 220 | 10.0 | 10.2 | G | 220 | 0.8 | 0.14 | EEEHD1V221AP | (7) | 500 | |

■ Standard Lead-Free reflow Products(50V to 100V)

Endurance : 105 °C 5000 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.) | Impedance (100 kHz) (+20 °C) | tan δ (120 Hz) (+20 °C) | | | Taping (pcs) |
| (V) | (μF) | (mm) | (mm) | | | | | | | |
| 50 | 0.47 | 4.0 | 5.8 | B | 5 | 12.0 | 0.12 | EEEHD1HR47R | (1) | 2000 |
| | 1 | 4.0 | 5.8 | B | 7 | 12.0 | 0.12 | EEEHD1H1R0R | (1) | 2000 |
| | 2.2 | 4.0 | 5.8 | B | 12 | 12.0 | 0.12 | EEEHD1H2R2R | (1) | 2000 |
| | 3.3 | 4.0 | 5.8 | B | 16 | 12.0 | 0.12 | EEEHD1H3R3R | (1) | 2000 |
| | 4.7 | 5.0 | 5.8 | C | 21 | 7.2 | 0.12 | EEEHD1H4R7R | (1) | 1000 |
| | 10 | 6.3 | 5.8 | D | 33 | 4.0 | 0.12 | EEEHD1H100P | (1) | 1000 |
| | 22 | 8.0 | 6.2 | E | 50 | 2.0 | 0.14 | EEEHD1H220P | (2) | 1000 |
| | 33 | 8.0 | 10.2 | F | 74 | 1.5 | 0.14 | EEEHD1H330P | (2) | 500 |
| 63 | 47 | 10.0 | 10.2 | G | 94 | 0.8 | 0.14 | EEEHD1H470P | (2) | 500 |
| | 10 | 8.0 | 6.2 | E | 45 | 2.0 | 0.18 | EEEHD1J100P | (2) | 1000 |
| | 22 | 8.0 | 10.2 | F | 65 | 1.5 | 0.18 | EEEHD1J220P | (2) | 500 |
| 100 | 33 | 10.0 | 10.2 | G | 80 | 0.8 | 0.18 | EEEHD1J330P | (2) | 500 |
| | 3.3 | 8.0 | 6.2 | E | 30 | 2.0 | 0.18 | EEEHD2A3R3P | (2) | 1000 |
| | 4.7 | 8.0 | 10.2 | F | 50 | 1.5 | 0.18 | EEEHD2A4R7P | (2) | 500 |
| | 10 | 8.0 | 10.2 | F | 55 | 1.5 | 0.18 | EEEHD2A100P | (2) | 500 |
| | 22 | 10.0 | 10.2 | G | 70 | 0.8 | 0.18 | EEEHD2A220P | (2) | 500 |

The taping dimensions are explained on p.177 of our Catalog. Please use it as a reference guide.
Reflow Profile(Fig-1 to Fig-11) listed on p.175 of our Catalog.

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