

Radial Lead Type

Series: **HD** Type: **A**

■ Features

- Endurance : 105 °C 1000 h to 2000 h
- Minaturize, Higher Capacitance :
1 Size Miniturized Product of Current A-NHG
- RoHS directive compliant



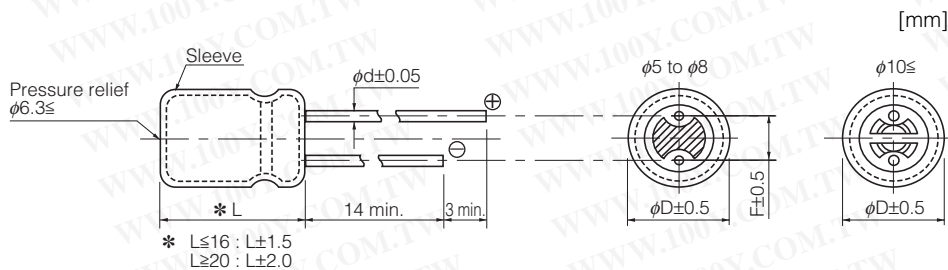
■ Specifications

| | |
|-----------------------|---|
| Category Temp. Range | -55 °C to +105 °C |
| Rated W.V. Range | 10 V.DC to 50 V.DC |
| Nominal Cap. Range | 0.1 μF to 22000 μF |
| Capacitance Tolerance | ±20 % (120 Hz/+20 °C) |
| DC Leakage Current | $I \leq 0.01 CV$ or 3 (μA) After 2 minutes (Which is greater) |
| tan δ | Please see the attached standard products list |
| Endurance | After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), When the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below. Duration : φ5 to φ8=1000 hours, φ10 to φ18=2000 hours |
| | Capacitance change ±20 % of initial measured value |
| | 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) |

■ Frequency correction factor for ripple current

| W.V.(V.DC) | Cap. (μF) | Frequency (Hz) | | | | |
|------------|---------------|----------------|------|------|------|-------|
| | | 60 | 120 | 1 k | 10 k | 100 k |
| 10 to 50 | 0.1 to 33 | 0.75 | 1.00 | 1.55 | 1.80 | 2.00 |
| | 47 to 470 | 0.80 | 1.00 | 1.35 | 1.50 | 1.50 |
| | 1000 to 22000 | 0.85 | 1.00 | 1.10 | 1.15 | 1.15 |

■ Dimensions in mm (not to scale)



(mm)

| | | | | | | | |
|--------------|-----|-----|-----|-----|------|-----|-----|
| Body Dia. φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
| Lead Dia. φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| Lead space F | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |

NEW

■ Standard Products

| W.V. | Cap. (±20 %) | Case size | | Specification | | | Lead Length | | | | Part No. | Min. Packaging Qty | | |
|------|-----------------|-----------|--------|---|-------------------------------|----------------------|-------------|------------|--------------|--------------|---------------|--------------------|--------|-------|
| | | Dia. | Length | Ripple Current (120 Hz) (+105 °C) | tan δ (120 Hz) (+20 °C) | Endurance (hours) | Lead Dia. | Lead Space | | | | Straight Leads | Taping | |
| | | | | | | | | Straight | Taping *B | Taping *H | | | | (pcs) |
| 10 | (V) | (μF) | (mm) | (mm) | (mA r.m.s.) | (hours) | (mm) | (mm) | (mm) | (mm) | | | | |
| | | 330 | 6.3 | 11.2 | 200 | 0.24 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1A331() | 200 | 2000 |
| | | 470 | 8 | 11.5 | 250 | 0.24 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1A471() | 200 | 1000 |
| | | 1000 | 10 | 12.5 | 460 | 0.24 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1A102() | 200 | 500 |
| | | 2200 | 10 | 16 | 760 | 0.26 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1A222() | 200 | 500 |
| | | 4700 | 12.5 | 20 | 1260 | 0.30 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1A472() | 200 | 500 |
| | | 6800 | 12.5 | 25 | 1570 | 0.34 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1A682() | 200 | 500 |
| | | 10000 | 16 | 25 | 1890 | 0.42 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1A103() | 100 | 250 |
| | | 15000 | 16 | 31.5 | 2180 | 0.52 | 2000 | 0.8 | 7.5 | | | EEUHD1A153 | 100 | |
| 16 | | 22000 | 18 | 35.5 | 2400 | 0.66 | 2000 | 0.8 | 7.5 | | | EEUHD1A223 | 50 | |
| | | 100 | 5 | 11 | 110 | 0.20 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1C101() | 200 | 2000 |
| | | 220 | 6.3 | 11.2 | 180 | 0.20 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1C221() | 200 | 2000 |
| | | 330 | 8 | 11.5 | 260 | 0.20 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1C331() | 200 | 1000 |
| | | 470 | 8 | 11.5 | 310 | 0.20 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1C471() | 200 | 1000 |
| | | 3300 | 12.5 | 20 | 1170 | 0.24 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1C332() | 200 | 500 |
| | | 4700 | 12.5 | 25 | 1480 | 0.26 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1C472() | 200 | 500 |
| | | 6800 | 16 | 25 | 1780 | 0.30 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1C682() | 100 | 250 |
| | | 8200 | 16 | 25 | 1780 | 0.34 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1C822() | 100 | 250 |
| 25 | | 10000 | 16 | 31.5 | 2060 | 0.38 | 2000 | 0.8 | 7.5 | | | EEUHD1C103 | 100 | |
| | | 15000 | 18 | 35.5 | 2210 | 0.48 | 2000 | 0.8 | 7.5 | | | EEUHD1C153 | 50 | |
| | | 47 | 5 | 11 | 91 | 0.16 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1E470() | 200 | 2000 |
| | | 68 | 5 | 11 | 91 | 0.16 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1E680() | 200 | 2000 |
| | | 100 | 6.3 | 11.2 | 130 | 0.16 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1E101() | 200 | 2000 |
| | | 220 | 8 | 11.5 | 230 | 0.16 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1E221() | 200 | 1000 |
| | | 330 | 8 | 11.5 | 310 | 0.16 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1E331() | 200 | 1000 |
| | | 470 | 10 | 12.5 | 380 | 0.16 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1E471() | 200 | 500 |
| | | 1000 | 10 | 16 | 680 | 0.16 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1E102() | 200 | 500 |
| | | 2200 | 12.5 | 20 | 1090 | 0.18 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1E222() | 200 | 500 |
| | | 3300 | 12.5 | 25 | 1400 | 0.20 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1E332() | 200 | 500 |
| | | 4700 | 16 | 25 | 1750 | 0.22 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1E472() | 100 | 250 |
| 35 | | 5600 | 16 | 25 | 1750 | 0.24 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1E562() | 100 | 250 |
| | | 6800 | 16 | 31.5 | 2040 | 0.26 | 2000 | 0.8 | 7.5 | | | EEUHD1E682 | 100 | |
| | | 10000 | 18 | 35.5 | 2200 | 0.34 | 2000 | 0.8 | 7.5 | | | EEUHD1E103 | 50 | |
| | | 47 | 5 | 11 | 90 | 0.14 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1V470() | 200 | 2000 |
| | | 100 | 6.3 | 11.2 | 150 | 0.14 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1V101() | 200 | 2000 |
| | | 220 | 8 | 11.5 | 270 | 0.14 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1V221() | 200 | 1000 |
| | | 330 | 10 | 12.5 | 350 | 0.14 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1V331() | 200 | 500 |
| | | 470 | 10 | 16 | 460 | 0.14 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1V471() | 200 | 500 |
| | | 680 | 10 | 16 | 460 | 0.14 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1V681() | 200 | 500 |
| | | 2200 | 12.5 | 25 | 1260 | 0.16 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1V222() | 200 | 500 |
| | 3300 | 16 | 25 | 1610 | 0.18 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1V332() | 100 | 250 | |
| | 4700 | 16 | 31.5 | 1910 | 0.20 | 2000 | 0.8 | 7.5 | | | EEUHD1V472 | 100 | | |
| | 6800 | 18 | 35.5 | 2050 | 0.24 | 2000 | 0.8 | 7.5 | | | EEUHD1V682 | 50 | | |

When requesting taped product, please put the letter "B" or "H" between the "()". Lead wire pitch B=5 mm, 7.5 mm, H=2.5 mm. The taping dimensions are explained on EE189 of our Catalog. Please use it as a reference guide.

Standard Products

| W.V. (V) | Cap. (±20 %) (μF) | Case size | | Specification | | | Lead Length | | | Part No. | Min. Packaging Q'ty | | |
|-------------|-------------------------|--------------|----------------|--|-------------------------------|----------------------|-------------------|------------------|----------------------|----------|-------------------------|-----------------|----------------------|
| | | Dia. (mm) | Length (mm) | Ripple Current (120 Hz) (+105 °C) (mA r.m.s.) | tan δ (120 Hz) (+20 °C) | Endurance (hours) | Lead Dia. (mm) | Lead Space | | | Straight Leads (pcs) | Taping (pcs) | |
| | | | | | | | | Straight (mm) | Taping *B (mm) | | | | Taping *H (mm) |
| 50 | 0.1 | 5 | 11 | 1.1 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1HR10() | 200 | 2000 |
| | 0.22 | 5 | 11 | 2.3 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1HR22() | 200 | 2000 |
| | 0.33 | 5 | 11 | 3.5 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1HR33() | 200 | 2000 |
| | 0.47 | 5 | 11 | 5 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1HR47() | 200 | 2000 |
| | 1 | 5 | 11 | 10 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H1R0() | 200 | 2000 |
| | 2.2 | 5 | 11 | 18 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H2R2() | 200 | 2000 |
| | 3.3 | 5 | 11 | 22 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H3R3() | 200 | 2000 |
| | 4.7 | 5 | 11 | 26 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H4R7() | 200 | 2000 |
| | 10 | 5 | 11 | 39 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H100() | 200 | 2000 |
| | 22 | 5 | 11 | 65 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H220() | 200 | 2000 |
| | 33 | 5 | 11 | 90 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H330() | 200 | 2000 |
| | 47 | 6.3 | 11.2 | 110 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H470() | 200 | 2000 |
| | 68 | 6.3 | 11.2 | 110 | 0.12 | 1000 | 0.5 | 2.5 | 5.0 | 2.5 | EEUHD1H680() | 200 | 2000 |
| | 100 | 8 | 11.5 | 180 | 0.12 | 1000 | 0.6 | 3.5 | 5.0 | | EEUHD1H101() | 200 | 1000 |
| | 220 | 10 | 12.5 | 300 | 0.12 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1H221() | 200 | 500 |
| | 330 | 10 | 16 | 410 | 0.12 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1H331() | 200 | 500 |
| | 470 | 10 | 20 | 530 | 0.12 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1H471() | 200 | 500 |
| | 560 | 16 | 15 | 650 | 0.12 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1H561S() | 100 | 250 |
| | 680 | 16 | 15 | 650 | 0.12 | 2000 | 0.8 | 7.5 | 7.5 | | EEUHD1H681S() | 100 | 250 |
| | 1000 | 12.5 | 25 | 950 | 0.12 | 2000 | 0.6 | 5.0 | 5.0 | | EEUHD1H102() | 200 | 500 |
| | 2200 | 16 | 31.5 | 1470 | 0.14 | 2000 | 0.8 | 7.5 | | | EEUHD1H222 | 100 | |
| | 3300 | 18 | 35.5 | 1770 | 0.16 | 2000 | 0.8 | 7.5 | | | EEUHD1H332 | 50 | |

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