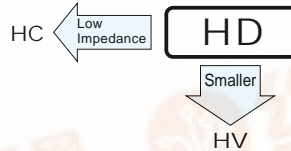
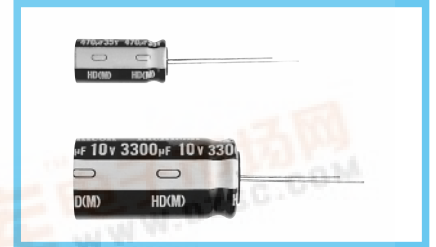


ALUMINUM ELECTROLYTIC CAPACITORS

HD High Ripple Low Impedance series



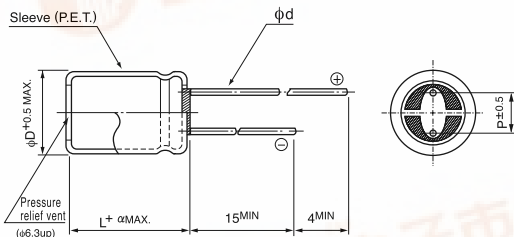
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.
- Adapted to the RoHS directive (2002/95/EC).



Specifications

| Item | Performance Characteristics | | | | | | | |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------|------|------|------|------|---------------|
| Category Temperature Range | -40 ~ +105°C | | | | | | | |
| Rated Voltage Range | 6.3 ~ 50V | | | | | | | |
| Rated Capacitance Range | 22 ~ 6800μF | | | | | | | |
| Capacitance Tolerance | ±20% at 120Hz, 20°C | | | | | | | |
| Leakage Current | After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA), whichever is greater. | | | | | | | |
| tan δ | Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 120Hz 20°C |
| | tan δ (MAX.) | 0.22 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | |
| For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. | | | | | | | | |
| Stability at Low Temperature | Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 120Hz |
| | Impedance ratio | Z-25°C / Z+20°C | 2 | 2 | 2 | 2 | 2 | |
| | ZT / Z20 (MAX.) | Z-40°C / Z+20°C | 3 | 3 | 3 | 3 | 3 | 3 |
| Endurance | After an application of D.C. bias voltage plus the rated ripple current for 5000 hours (φD ≤ 6.3 : 2000 hours, φD=8 : 3000 hours, φD=10 : 4000 hours) at 105°C the peak voltage shall not exceed the rated D.C. voltage, capacitors meet the characteristic requirements listed below. | | | | | | | |
| | Capacitance change | Within ± 25% of initial value | | | | | | |
| | tan δ | 200% or less of initial specified value | | | | | | |
| | Leakage current | Initial specified value or less | | | | | | |
| Marking | Printed with white color letter on black sleeve. | | | | | | | |

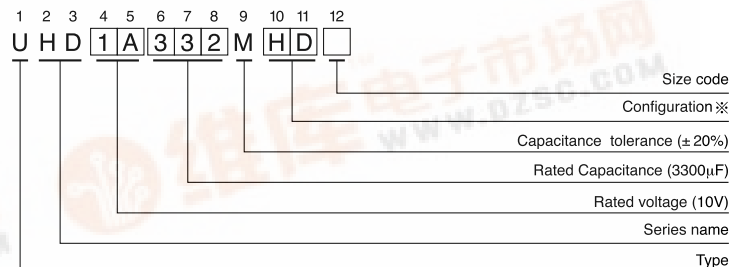
Radial Lead Type



| | | (mm) | | | | | |
|----|----------|------|-----|-----|------|-----|--|
| α | (L < 20) | 1.5 | | | | | |
| | (L ≥ 20) | 2.0 | | | | | |
| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | |
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | |
| φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | |

*In case L > 25 for the φ12.5 dia. unit, lead dia. φd = 0.8mm.

Type numbering system (Example : 10V 3300μF)



※ Configuration

| φ D | Pb-free leadwire Pb-free PET sleeve |
|-----------|----------------------------------------|
| 5 | DD |
| 6.3 | ED |
| 8 · 10 | PD |
| 12.5 · 16 | HD |

• Please refer to page 21 about the end seal configuration.

Please refer to page 21, 22, 23 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.



ALUMINUM ELECTROLYTIC CAPACITORS



HD series

Standard ratings

| V (Code) Cap. (μF) / Item Code | | 6.3 (0J) | | | | 10 (1A) | | | |
|-----------------------------------|-----|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
| | | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz |
| | | | 20°C / 100kHz | -10°C / 100kHz | | | 20°C / 100kHz | -10°C / 100kHz | |
| 100 | 101 | | | | | 5 × 11 | 0.30 | 1.0 | 250 |
| 150 | 151 | 5 × 11 | 0.30 | 1.0 | 250 | | | | |
| 220 | 221 | | | | | 6.3 × 11 | 0.13 | 0.41 | 405 |
| 330 | 331 | 6.3 × 11 | 0.13 | 0.41 | 405 | | | | |
| 470 | 471 | | | | | 8 × 11.5 | 0.072 | 0.22 | 760 |
| 560 | 561 | 8 × 11.5 | 0.072 | 0.22 | 760 | | | | |
| 680 | 681 | | | | | 8 × 15 | 0.056 | 0.17 | 995 |
| 820 | 821 | 8 × 15 | 0.056 | 0.17 | 995 | ▲ 10 × 12.5 | 0.053 | 0.16 | 1030 |
| 1000 | 102 | 10 × 12.5 | 0.053 | 0.16 | 1030 | 8 × 20 | 0.041 | 0.13 | 1250 |
| 1200 | 122 | ▲ 10 × 16 | 0.038 | 0.12 | 1430 | ▲ 10 × 16 | 0.038 | 0.12 | 1430 |
| 1500 | 152 | 10 × 20 | 0.023 | 0.069 | 1820 | | | | |
| 2200 | 222 | 10 × 25 | 0.022 | 0.066 | 2150 | 10 × 25 | 0.022 | 0.066 | 2150 |
| 3300 | 332 | 12.5 × 20 | 0.021 | 0.053 | 2360 | 12.5 × 20 | 0.021 | 0.053 | 2360 |
| 3900 | 392 | 12.5 × 25 | 0.018 | 0.045 | 2770 | 12.5 × 25 | 0.018 | 0.045 | 2770 |
| 4700 | 472 | 12.5 × 25 | 0.018 | 0.045 | 2770 | 12.5 × 31.5 | 0.016 | 0.041 | 3290 |
| 5600 | 562 | ▲ 16 × 20 | 0.018 | 0.045 | 3140 | ▲ 16 × 20 | 0.018 | 0.045 | 3140 |
| 6800 | 682 | 16 × 25 | 0.016 | 0.043 | 3460 | 12.5 × 35.5 | 0.015 | 0.039 | 3400 |

| V (Code) Cap. (μF) / Item Code | | 16 (1C) | | | | 25 (1E) | | | |
|-----------------------------------|-----|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
| | | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz |
| | | | 20°C / 100kHz | -10°C / 100kHz | | | 20°C / 100kHz | -10°C / 100kHz | |
| 47 | 470 | | | | | 5 × 11 | 0.30 | 1.0 | 250 |
| 56 | 560 | 5 × 11 | 0.30 | 1.0 | 250 | | | | |
| 100 | 101 | | | | | 6.3 × 11 | 0.13 | 0.41 | 405 |
| 120 | 121 | 6.3 × 11 | 0.13 | 0.41 | 405 | | | | |
| 220 | 221 | | | | | 8 × 11.5 | 0.072 | 0.22 | 760 |
| 330 | 331 | 8 × 11.5 | 0.072 | 0.22 | 760 | 8 × 15 | 0.056 | 0.17 | 995 |
| 470 | 471 | ▲ 10 × 12.5 | 0.053 | 0.16 | 1030 | ▲ 10 × 12.5 | 0.053 | 0.16 | 1030 |
| 680 | 681 | 8 × 20 | 0.041 | 0.13 | 1250 | 8 × 20 | 0.041 | 0.13 | 1250 |
| 820 | 821 | ▲ 10 × 16 | 0.038 | 0.12 | 1430 | ▲ 10 × 16 | 0.038 | 0.12 | 1430 |
| 1000 | 102 | 10 × 20 | 0.023 | 0.069 | 1820 | 10 × 20 | 0.023 | 0.069 | 1820 |
| 1200 | 122 | 10 × 25 | 0.022 | 0.066 | 2150 | 10 × 25 | 0.022 | 0.066 | 2150 |
| 1500 | 152 | 12.5 × 20 | 0.021 | 0.053 | 2360 | 12.5 × 20 | 0.021 | 0.053 | 2360 |
| 1800 | 182 | | | | | 12.5 × 25 | 0.018 | 0.045 | 2770 |
| 2200 | 222 | 12.5 × 25 | 0.018 | 0.045 | 2770 | 12.5 × 31.5 | 0.016 | 0.041 | 3290 |
| 2700 | 272 | ▲ 16 × 20 | 0.018 | 0.045 | 3140 | ▲ 16 × 20 | 0.018 | 0.045 | 3140 |
| 3300 | 332 | 12.5 × 35.5 | 0.015 | 0.039 | 3400 | 12.5 × 35.5 | 0.015 | 0.039 | 3400 |
| 3900 | 392 | 16 × 25 | 0.016 | 0.043 | 3460 | 16 × 25 | 0.016 | 0.043 | 3460 |

▲ : In this case, [6] will be put at 12th digit of type numbering system.

ALUMINUM ELECTROLYTIC CAPACITORS



HD series

Standard ratings

| Cap. (μF) | V (Code) Item Code | 35 (1V) | | | | 50 (1H) | | | |
|-----------|--------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
| | | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz | Case size φD × L (mm) | Impedance (Ω) MAX. | | Rated ripple (mArms) 105°C / 100kHz |
| | | | 20°C / 100kHz | -10°C / 100kHz | | | 20°C / 100kHz | -10°C / 100kHz | |
| 22 | 220 | | | | | 5 × 11 | 0.34 | 1.18 | 238 |
| 33 | 330 | 5 × 11 | 0.30 | 1.0 | 250 | | | | |
| 56 | 560 | 6.3 × 11 | 0.13 | 0.41 | 405 | 6.3 × 11 | 0.14 | 0.50 | 385 |
| 100 | 101 | | | | | 8 × 11.5 | 0.074 | 0.22 | 724 |
| 120 | 121 | | | | | 8 × 15 | 0.061 | 0.18 | 950 |
| 150 | 151 | 8 × 11.5 | 0.072 | 0.22 | 760 | 10 × 12.5 | 0.061 | 0.18 | 979 |
| 180 | 181 | | | | | 8 × 20 | 0.046 | 0.14 | 1190 |
| 220 | 221 | 8 × 15 | 0.056 | 0.17 | 995 | 10 × 16 | 0.042 | 0.12 | 1370 |
| | | ▲10 × 12.5 | 0.053 | 0.16 | 1030 | | | | |
| 270 | 271 | 8 × 20 | 0.041 | 0.13 | 1250 | 10 × 20 | 0.030 | 0.090 | 1580 |
| 330 | 331 | 10 × 16 | 0.038 | 0.12 | 1430 | 10 × 25 | 0.028 | 0.085 | 1870 |
| 470 | 471 | 10 × 20 | 0.023 | 0.069 | 1820 | 12.5 × 20 | 0.027 | 0.068 | 2050 |
| 560 | 561 | 10 × 25 | 0.022 | 0.066 | 2150 | 12.5 × 25 | 0.023 | 0.059 | 2410 |
| 680 | 681 | 12.5 × 20 | 0.021 | 0.053 | 2360 | 12.5 × 31.5 | 0.021 | 0.052 | 2860 |
| 820 | 821 | | | | | 12.5 × 35.5 | 0.019 | 0.051 | 2960 |
| | | | | | | ▲16 × 20 | 0.023 | 0.059 | 2730 |
| 1000 | 102 | 12.5 × 25 | 0.018 | 0.045 | 2770 | 16 × 25 | 0.021 | 0.056 | 3010 |
| 1200 | 122 | 12.5 × 31.5 | 0.016 | 0.041 | 3290 | | | | |
| | | ▲16 × 20 | 0.018 | 0.045 | 3140 | | | | |
| 1500 | 152 | 12.5 × 35.5 | 0.015 | 0.039 | 3400 | | | | |
| 1800 | 182 | 16 × 25 | 0.016 | 0.043 | 3460 | | | | |

▲ : In this case, [6] will be put at 12th digit of type numbering system.

Frequency coefficient of rated ripple current

| Cap. (μF) | Frequency | | | | |
|-------------|-----------|-------|------|-------|--------|
| | 50Hz | 120Hz | 1kHz | 10kHz | 100kHz |
| 22 ~ 33 | 0.45 | 0.55 | 0.75 | 0.90 | 1.00 |
| 39 ~ 330 | 0.60 | 0.70 | 0.85 | 0.95 | 1.00 |
| 390 ~ 1000 | 0.65 | 0.75 | 0.90 | 0.98 | 1.00 |
| 1200 ~ 6800 | 0.75 | 0.80 | 0.95 | 1.00 | 1.00 |