

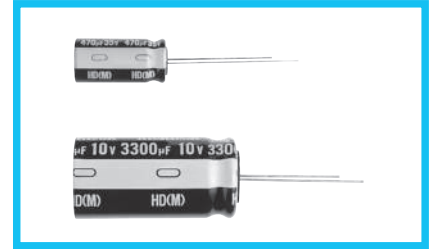
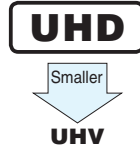
# ALUMINUM ELECTROLYTIC CAPACITORS

# UHD

High Ripple Low Impedance



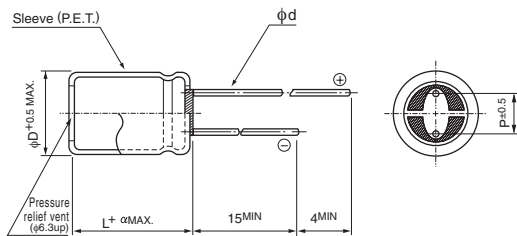
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2011/65/EU,(EU)2015/863).



## Specifications

| Item  | Performance Characteristics   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
|---|---|-----------------|---|----------|----------|----------|------|-------|---------------|--------|-------|----|-----|--------|---------|--|----------|----------|----------|----------|
| Category Temperature Range  | -40 to +105°C   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Rated Voltage Range   | 6.3 to 50V  |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Rated Capacitance Range   | 22 to 6800μF  |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Capacitance Tolerance   | ±20% at 120Hz, 20°C   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Leakage Current   | After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3 (μA), whichever is greater.   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Tangent of loss angle (tan δ)   | Rated voltage (V)   | 6.3             | 10  | 16       | 25       | 35       | 50   | 120Hz |               |        |       |    |     |        |         |  |          |          |          |          |
|   | tan δ (MAX.)  | 0.22            | 0.19  | 0.16     | 0.14     | 0.12     | 0.10 | 20°C  |               |        |       |    |     |        |         |  |          |          |          |          |
| 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 (MAX.)  | Z-25°C / Z+20°C | 2   | 2        | 2        | 2        | 2    | 2     |               |        |       |    |     |        |         |  |          |          |          |          |
| Z-40°C / Z+20°C   |   | 3               | 3   | 3        | 3        | 3        | 3    |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Endurance   | The specifications listed below shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied at 105°C for the condition listed at right. The peak voltage shall not exceed the rated voltage. |                 | <table border="1"> <tr> <td>Rated Voltage</td> <td>φD(mm)</td> <td>≤φ6.3</td> <td>φ8</td> <td>φ10</td> <td>≥φ12.5</td> </tr> <tr> <td>6.3~50V</td> <td></td> <td>2000hrs.</td> <td>3000hrs.</td> <td>4000hrs.</td> <td>5000hrs.</td> </tr> </table> |          |          |          |      |       | Rated Voltage | φD(mm) | ≤φ6.3 | φ8 | φ10 | ≥φ12.5 | 6.3~50V |  | 2000hrs. | 3000hrs. | 4000hrs. | 5000hrs. |
|   | Rated Voltage   | φD(mm)          | ≤φ6.3   | φ8       | φ10      | ≥φ12.5   |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
|   | 6.3~50V   |                 | 2000hrs.  | 3000hrs. | 4000hrs. | 5000hrs. |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Capacitance change  | Within ±25% of the initial capacitance value  |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| tan δ   | 200% or less than the initial specified value   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Leakage current   | Less than or equal to the initial specified value   |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |
| Marking   | Printed with white color letter on black sleeve.  |                 |   |          |          |          |      |       |               |        |       |    |     |        |         |  |          |          |          |          |

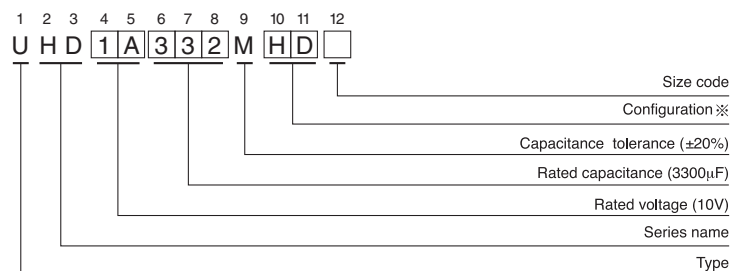
## Radial Lead Type



| α        |     | (mm) |     |     |     |     |      |     |
|----------|-----|------|-----|-----|-----|-----|------|-----|
| (L < 20) | 1.5 | φD   | 5   | 6.3 | 8   | 10  | 12.5 | 16  |
| (L ≥ 20) | 2.0 | 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<br>Pb-free PET sleeve |
|---------|--|
| 5       | DD                                     |
| 6.3     | ED                                     |
| 8-10    | PD                                     |
| 12.5-16 | HD                                     |

- Please refer to the Guidelines for Aluminum Electrolytic Capacitors for end seal configuration information.

## Frequency coefficient of rated ripple current

| Cap. (μF)    | Frequency | 50Hz | 120Hz | 1kHz | 10kHz | 100kHz or more |
|--------------|-----------|------|-------|------|-------|----------------|
| 22 to 33     |           | 0.45 | 0.55  | 0.75 | 0.90  | 1.00           |
| 47 to 330    |           | 0.60 | 0.70  | 0.85 | 0.95  | 1.00           |
| 470 to 1000  |           | 0.65 | 0.75  | 0.90 | 0.98  | 1.00           |
| 1200 to 6800 |           | 0.75 | 0.80  | 0.95 | 1.00  | 1.00           |

• Dimension table in next page.

UHD

## ■ Dimensions

| Rated Voltage<br>(V)<br>(code) | Rated Capacitance<br>( $\mu$ F) | Case Size<br>$\phi$ D $\times$ L (mm) | tan $\delta$ | Leakage Current<br>( $\mu$ A)<br>(at 20°C after<br>2 minutes) | Impedance ( $\Omega$ )<br>MAX. |                  | Rated Ripple<br>(mArms)<br>(105°C/100kHz) | Part Number  |
|--------------------------------|---------------------------------|---------------------------------------|--------------|---|--------------------------------|------------------|---|--------------|
|                                |                                 |                                       |              |   | 20°C/<br>100kHz                | -10°C/<br>100kHz |   |              |
| 6.3<br>(0J)                    | 150                             | 5 $\times$ 11                         | 0.22         | 9.45  | 0.30                           | 1.00             | 250                                       | UHD0J151MDD  |
|                                | 330                             | 6.3 $\times$ 11                       | 0.22         | 20.79   | 0.13                           | 0.41             | 405                                       | UHD0J331MED  |
|                                | 560                             | 8 $\times$ 11.5                       | 0.22         | 35.28   | 0.072                          | 0.22             | 760                                       | UHD0J561MPD  |
|                                | 820                             | 8 $\times$ 15                         | 0.22         | 51.66   | 0.056                          | 0.17             | 995                                       | UHD0J821MPD  |
|                                | 1000                            | 10 $\times$ 12.5                      | 0.22         | 63  | 0.053                          | 0.16             | 1030                                      | UHD0J102MPD  |
|                                | 1200                            | 8 $\times$ 20                         | 0.22         | 75.6  | 0.041                          | 0.13             | 1250                                      | UHD0J122MPD  |
|                                | 1200                            | 10 $\times$ 16                        | 0.22         | 75.6  | 0.038                          | 0.12             | 1430                                      | UHD0J122MPD6 |
|                                | 1500                            | 10 $\times$ 20                        | 0.22         | 94.5  | 0.023                          | 0.069            | 1820                                      | UHD0J152MPD  |
|                                | 2200                            | 10 $\times$ 25                        | 0.24         | 138.6   | 0.022                          | 0.066            | 2150                                      | UHD0J222MPD  |
|                                | 3300                            | 12.5 $\times$ 20                      | 0.26         | 207.9   | 0.021                          | 0.053            | 2360                                      | UHD0J332MHD  |
|                                | 3900                            | 12.5 $\times$ 25                      | 0.26         | 245.7   | 0.018                          | 0.045            | 2770                                      | UHD0J392MHD  |
|                                | 4700                            | 12.5 $\times$ 31.5                    | 0.28         | 296.1   | 0.016                          | 0.041            | 3290                                      | UHD0J472MHD  |
|                                | 5600                            | 12.5 $\times$ 35.5                    | 0.30         | 352.8   | 0.015                          | 0.039            | 3400                                      | UHD0J562MHD  |
|                                | 5600                            | 16 $\times$ 20                        | 0.30         | 352.8   | 0.018                          | 0.045            | 3140                                      | UHD0J562MHD6 |
| 6800                           | 16 $\times$ 25                  | 0.32                                  | 428.4        | 0.016   | 0.043                          | 3460             | UHD0J682MHD                               |              |
| 10<br>(1A)                     | 100                             | 5 $\times$ 11                         | 0.19         | 10  | 0.30                           | 1.00             | 250                                       | UHD1A101MDD  |
|                                | 220                             | 6.3 $\times$ 11                       | 0.19         | 22  | 0.13                           | 0.41             | 405                                       | UHD1A221MED  |
|                                | 470                             | 8 $\times$ 11.5                       | 0.19         | 47  | 0.072                          | 0.22             | 760                                       | UHD1A471MPD  |
|                                | 680                             | 8 $\times$ 15                         | 0.19         | 68  | 0.056                          | 0.17             | 995                                       | UHD1A681MPD  |
|                                | 680                             | 10 $\times$ 12.5                      | 0.19         | 68  | 0.053                          | 0.16             | 1030                                      | UHD1A681MPD6 |
|                                | 1000                            | 8 $\times$ 20                         | 0.19         | 100   | 0.041                          | 0.13             | 1250                                      | UHD1A102MPD  |
|                                | 1000                            | 10 $\times$ 16                        | 0.19         | 100   | 0.038                          | 0.12             | 1430                                      | UHD1A102MPD6 |
|                                | 1200                            | 10 $\times$ 20                        | 0.19         | 120   | 0.023                          | 0.069            | 1820                                      | UHD1A122MPD  |
|                                | 1500                            | 10 $\times$ 25                        | 0.19         | 150   | 0.022                          | 0.066            | 2150                                      | UHD1A152MPD  |
|                                | 2200                            | 12.5 $\times$ 20                      | 0.21         | 220   | 0.021                          | 0.053            | 2360                                      | UHD1A222MHD  |
|                                | 3300                            | 12.5 $\times$ 25                      | 0.23         | 330   | 0.018                          | 0.045            | 2770                                      | UHD1A332MHD  |
|                                | 3900                            | 12.5 $\times$ 31.5                    | 0.23         | 390   | 0.016                          | 0.041            | 3290                                      | UHD1A392MHD  |
|                                | 3900                            | 16 $\times$ 20                        | 0.23         | 390   | 0.018                          | 0.045            | 3140                                      | UHD1A392MHD6 |
|                                | 4700                            | 12.5 $\times$ 35.5                    | 0.25         | 470   | 0.015                          | 0.039            | 3400                                      | UHD1A472MHD  |
| 5600                           | 16 $\times$ 25                  | 0.27                                  | 560          | 0.016   | 0.043                          | 3460             | UHD1A562MHD                               |              |
| 16<br>(1C)                     | 56                              | 5 $\times$ 11                         | 0.16         | 8.96  | 0.30                           | 1.00             | 250                                       | UHD1C560MDD  |
|                                | 120                             | 6.3 $\times$ 11                       | 0.16         | 19.2  | 0.13                           | 0.41             | 405                                       | UHD1C121MED  |
|                                | 330                             | 8 $\times$ 11.5                       | 0.16         | 52.8  | 0.072                          | 0.22             | 760                                       | UHD1C331MPD  |
|                                | 470                             | 8 $\times$ 15                         | 0.16         | 75.2  | 0.056                          | 0.17             | 995                                       | UHD1C471MPD  |
|                                | 470                             | 10 $\times$ 12.5                      | 0.16         | 75.2  | 0.053                          | 0.16             | 1030                                      | UHD1C471MPD6 |
|                                | 680                             | 8 $\times$ 20                         | 0.16         | 108.8   | 0.041                          | 0.13             | 1250                                      | UHD1C681MPD  |
|                                | 680                             | 10 $\times$ 16                        | 0.16         | 108.8   | 0.038                          | 0.12             | 1430                                      | UHD1C681MPD6 |
|                                | 1000                            | 10 $\times$ 20                        | 0.16         | 160   | 0.023                          | 0.069            | 1820                                      | UHD1C102MPD  |
|                                | 1200                            | 10 $\times$ 25                        | 0.16         | 192   | 0.022                          | 0.066            | 2150                                      | UHD1C122MPD  |
|                                | 1500                            | 12.5 $\times$ 20                      | 0.16         | 240   | 0.021                          | 0.053            | 2360                                      | UHD1C152MHD  |
|                                | 2200                            | 12.5 $\times$ 25                      | 0.18         | 352   | 0.018                          | 0.045            | 2770                                      | UHD1C222MHD  |
|                                | 2700                            | 12.5 $\times$ 31.5                    | 0.18         | 432   | 0.016                          | 0.041            | 3290                                      | UHD1C272MHD  |
|                                | 2700                            | 16 $\times$ 20                        | 0.18         | 432   | 0.018                          | 0.045            | 3140                                      | UHD1C272MHD6 |
|                                | 3300                            | 12.5 $\times$ 35.5                    | 0.20         | 528   | 0.015                          | 0.039            | 3400                                      | UHD1C332MHD  |
| 3900                           | 16 $\times$ 25                  | 0.20                                  | 624          | 0.016   | 0.043                          | 3460             | UHD1C392MHD                               |              |

For cut leads, formed leads or taped parts, please add the appropriate code after the size code (12th digit).  
If there is no size code in the part number, please add size code "1" and then add the appropriate code.

UHD

## ■ Dimensions

| Rated Voltage<br>(V)<br>(code) | Rated Capacitance<br>( $\mu$ F) | Case Size<br>$\phi$ D×L (mm) | tan $\delta$ | Leakage Current<br>( $\mu$ A)<br>(at 20°C after<br>2 minutes) | Impedance ( $\Omega$ )<br>MAX. |                  | Rated Ripple<br>(mArms)<br>(105°C/100kHz) | Part Number  |
|--------------------------------|---------------------------------|------------------------------|--------------|---|--------------------------------|------------------|---|--------------|
|                                |                                 |                              |              |   | 20°C/<br>100kHz                | -10°C/<br>100kHz |   |              |
| 25<br>(1E)                     | 47                              | 5×11                         | 0.14         | 11.75   | 0.30                           | 1.00             | 250                                       | UHD1E470MDD  |
|                                | 100                             | 6.3×11                       | 0.14         | 25  | 0.13                           | 0.41             | 405                                       | UHD1E101MED  |
|                                | 220                             | 8×11.5                       | 0.14         | 55  | 0.072                          | 0.22             | 760                                       | UHD1E221MPD  |
|                                | 330                             | 8×15                         | 0.14         | 82.5  | 0.056                          | 0.17             | 995                                       | UHD1E331MPD  |
|                                | 330                             | 10×12.5                      | 0.14         | 82.5  | 0.053                          | 0.16             | 1030                                      | UHD1E331MPD6 |
|                                | 470                             | 8×20                         | 0.14         | 117.5   | 0.041                          | 0.13             | 1250                                      | UHD1E471MPD  |
|                                | 470                             | 10×16                        | 0.14         | 117.5   | 0.038                          | 0.12             | 1430                                      | UHD1E471MPD6 |
|                                | 680                             | 10×20                        | 0.14         | 170   | 0.023                          | 0.069            | 1820                                      | UHD1E681MPD  |
|                                | 820                             | 10×25                        | 0.14         | 205   | 0.022                          | 0.066            | 2150                                      | UHD1E821MPD  |
|                                | 1000                            | 12.5×20                      | 0.14         | 250   | 0.021                          | 0.053            | 2360                                      | UHD1E102MHD  |
|                                | 1500                            | 12.5×25                      | 0.14         | 375   | 0.018                          | 0.045            | 2770                                      | UHD1E152MHD  |
|                                | 1800                            | 12.5×31.5                    | 0.14         | 450   | 0.016                          | 0.041            | 3290                                      | UHD1E182MHD  |
|                                | 1800                            | 16×20                        | 0.14         | 450   | 0.018                          | 0.045            | 3140                                      | UHD1E182MHD6 |
|                                | 2200                            | 12.5×35.5                    | 0.16         | 550   | 0.015                          | 0.039            | 3400                                      | UHD1E222MHD  |
| 2700                           | 16×25                           | 0.16                         | 675          | 0.016   | 0.043                          | 3460             | UHD1E272MHD                               |              |
| 35<br>(1V)                     | 33                              | 5×11                         | 0.12         | 11.55   | 0.30                           | 1.00             | 250                                       | UHD1V330MDD  |
|                                | 56                              | 6.3×11                       | 0.12         | 19.6  | 0.13                           | 0.41             | 405                                       | UHD1V560MED  |
|                                | 150                             | 8×11.5                       | 0.12         | 52.5  | 0.072                          | 0.22             | 760                                       | UHD1V151MPD  |
|                                | 220                             | 8×15                         | 0.12         | 77  | 0.056                          | 0.17             | 995                                       | UHD1V221MPD  |
|                                | 220                             | 10×12.5                      | 0.12         | 77  | 0.053                          | 0.16             | 1030                                      | UHD1V221MPD6 |
|                                | 270                             | 8×20                         | 0.12         | 94.5  | 0.041                          | 0.13             | 1250                                      | UHD1V271MPD  |
|                                | 330                             | 10×16                        | 0.12         | 115.5   | 0.038                          | 0.12             | 1430                                      | UHD1V331MPD  |
|                                | 470                             | 10×20                        | 0.12         | 164.5   | 0.023                          | 0.069            | 1820                                      | UHD1V471MPD  |
|                                | 560                             | 10×25                        | 0.12         | 196   | 0.022                          | 0.066            | 2150                                      | UHD1V561MPD  |
|                                | 680                             | 12.5×20                      | 0.12         | 238   | 0.021                          | 0.053            | 2360                                      | UHD1V681MHD  |
|                                | 1000                            | 12.5×25                      | 0.12         | 350   | 0.018                          | 0.045            | 2770                                      | UHD1V102MHD  |
|                                | 1200                            | 12.5×31.5                    | 0.12         | 420   | 0.016                          | 0.041            | 3290                                      | UHD1V122MHD  |
|                                | 1200                            | 16×20                        | 0.12         | 420   | 0.018                          | 0.045            | 3140                                      | UHD1V122MHD6 |
|                                | 1500                            | 12.5×35.5                    | 0.12         | 525   | 0.015                          | 0.039            | 3400                                      | UHD1V152MHD  |
| 1800                           | 16×25                           | 0.12                         | 630          | 0.016   | 0.043                          | 3460             | UHD1V182MHD                               |              |
| 50<br>(1H)                     | 22                              | 5×11                         | 0.10         | 11  | 0.34                           | 1.18             | 238                                       | UHD1H220MDD  |
|                                | 56                              | 6.3×11                       | 0.10         | 28  | 0.14                           | 0.50             | 385                                       | UHD1H560MED  |
|                                | 100                             | 8×11.5                       | 0.10         | 50  | 0.074                          | 0.22             | 724                                       | UHD1H101MPD  |
|                                | 120                             | 8×15                         | 0.10         | 60  | 0.061                          | 0.18             | 950                                       | UHD1H121MPD  |
|                                | 150                             | 10×12.5                      | 0.10         | 75  | 0.061                          | 0.18             | 979                                       | UHD1H151MPD  |
|                                | 180                             | 8×20                         | 0.10         | 90  | 0.046                          | 0.14             | 1190                                      | UHD1H181MPD  |
|                                | 220                             | 10×16                        | 0.10         | 110   | 0.042                          | 0.12             | 1370                                      | UHD1H221MPD  |
|                                | 270                             | 10×20                        | 0.10         | 135   | 0.030                          | 0.090            | 1580                                      | UHD1H271MPD  |
|                                | 330                             | 10×25                        | 0.10         | 165   | 0.028                          | 0.085            | 1870                                      | UHD1H331MPD  |
|                                | 470                             | 12.5×20                      | 0.10         | 235   | 0.027                          | 0.068            | 2050                                      | UHD1H471MHD  |
|                                | 560                             | 12.5×25                      | 0.10         | 280   | 0.023                          | 0.059            | 2410                                      | UHD1H561MHD  |
|                                | 680                             | 12.5×31.5                    | 0.10         | 340   | 0.021                          | 0.052            | 2860                                      | UHD1H681MHD  |
|                                | 820                             | 12.5×35.5                    | 0.10         | 410   | 0.019                          | 0.051            | 2960                                      | UHD1H821MHD  |
|                                | 820                             | 16×20                        | 0.10         | 410   | 0.023                          | 0.059            | 2730                                      | UHD1H821MHD6 |
| 1000                           | 16×25                           | 0.10                         | 500          | 0.021   | 0.056                          | 3010             | UHD1H102MHD                               |              |

For cut leads, formed leads or taped parts, please add the appropriate code after the size code (12th digit).

If there is no size code in the part number, please add size code "1" and then add the appropriate code.

- For formed lead or taped product specifications and minimum order quantity, please refer to the Guidelines for Aluminum Electrolytic Capacitors.