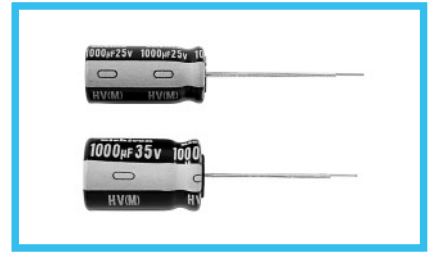
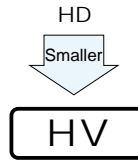


# ALUMINUM ELECTROLYTIC CAPACITORS

**HV** High Ripple Low Impedance series



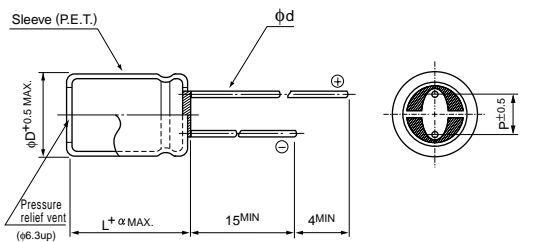
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2002/95/EC).



## Specifications

| Item  | Performance Characteristics   |  |      |      |      |      |            |
|---|---|--|------|------|------|------|------------|
| Category Temperature Range  | -40 to +105°C   |  |      |      |      |      |            |
| Rated Voltage Range   | 6.3 to 35V  |  |      |      |      |      |            |
| Rated Capacitance Range   | 47 to 8200µF  |  |      |      |      |      |            |
| 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.   |  |      |      |      |      |            |
| Tangent of loss angle (tan δ)   | Rated voltage (V)   | 6.3  | 10   | 16   | 25   | 35   | 120Hz 20°C |
|   | tan δ (MAX.)  | 0.21   | 0.18 | 0.15 | 0.13 | 0.11 |            |
| 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   | 120Hz      |
|   | Impedance ratio ZT / Z20 (MAX.)   | Z-25°C / Z+20°C  | 2    | 2    | 2    | 2    |            |
|   |   | Z-40°C / Z+20°C  | 3    | 3    | 3    | 3    | 3          |
| Endurance   | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 6000 hours (5000 hours for φD=5 and 6.3) at 105°C, the peak voltage shall not exceed the rated voltage. |  |      |      |      |      |            |
|   | Capacitance change  | Within ±25% of the initial capacitance value (6.3V 10V : ±30%) |      |      |      |      |            |
|   | 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

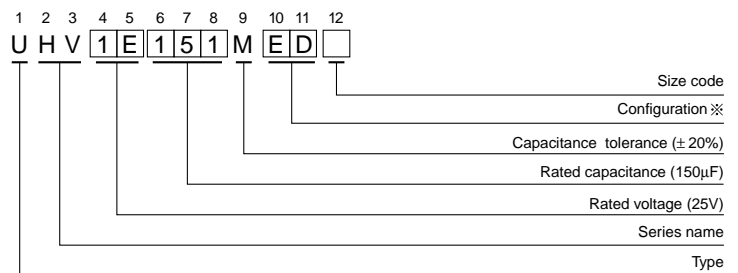


|    |          | (mm) |     |     |      |     |  |
|----|----------|------|-----|-----|------|-----|--|
| α  | (L < 20) | 1.5  |     |     |      |     |  |
|    | (L ≥ 20) | 2.0  |     |     |      |     |  |
|    |          |      |     |     |      |     |  |
| φD | 5        | 6.3  | 8   | 10  | 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.

● Please refer to page 20 about the end seal configuration.

## Type numbering system (Example : 25V 150µF)



| ※ 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 page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

● Dimension table in next page.

## Standard Ratings

| Cap. (μF) |     | V (Code)<br>Item Code |  | 6.3 (0J)                     |                    |                | 10 (1A)                                   |                              |                    | 16 (1C)        |   |                              |                    |                |   |
|-----------|-----|-----------------------|--|------------------------------|--------------------|----------------|---|------------------------------|--------------------|----------------|---|------------------------------|--------------------|----------------|---|
|           |     |                       |  | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mArms)<br>105°C / 100kHz |
|           |     |                       |  |                              | 20°C / 100kHz      | -10°C / 100kHz |   |                              | 20°C / 100kHz      | -10°C / 100kHz |   |                              | 20°C / 100kHz      | -10°C / 100kHz |   |
| 100       | 101 |                       |  |                              |                    |                |   |                              |                    |                |   |                              |                    |                |   |
| 150       | 151 |                       |  |                              |                    |                | 5 × 11                                    | 0.23                         | 0.76               | 360            | 6.3 × 11                                  | 0.10                         | 0.33               | 450            |   |
| 220       | 221 | 5 × 11                |  | 0.23                         | 0.76               | 360            | 6.3 × 11                                  | 0.10                         | 0.33               | 450            | 6.3 × 11                                  | 0.10                         | 0.33               | 550            |   |
| 330       | 331 | 6.3 × 11              |  | 0.10                         | 0.33               | 460            | 6.3 × 11                                  | 0.10                         | 0.33               | 550            | 8 × 11.5                                  | 0.059                        | 0.181              | 830            |   |
| 470       | 471 | 6.3 × 11              |  | 0.10                         | 0.33               | 550            | 8 × 11.5                                  | 0.059                        | 0.181              | 820            | 8 × 11.5                                  | 0.059                        | 0.181              | 990            |   |
| 680       | 681 | 8 × 11.5              |  | 0.059                        | 0.181              | 900            | 8 × 11.5                                  | 0.059                        | 0.181              | 990            | 10 × 12.5                                 | 0.043                        | 0.133              | 1360           |   |
|           |     |                       |  |                              |                    |                |   |                              |                    |                | ▲ 8 × 15                                  | 0.046                        | 0.143              | 1330           |   |
| 820       | 821 | 8 × 11.5              |  | 0.059                        | 0.181              | 990            | 10 × 12.5                                 | 0.043                        | 0.133              | 1250           | 10 × 16                                   | 0.030                        | 0.095              | 1650           |   |
| 1000      | 102 | 10 × 12.5             |  | 0.043                        | 0.133              | 1250           | 10 × 12.5                                 | 0.043                        | 0.133              | 1360           | 10 × 16                                   | 0.030                        | 0.095              | 1815           |   |
|           |     |                       |  |                              |                    |                | ▲ 8 × 15                                  | 0.046                        | 0.143              | 1330           | ▲ 8 × 20                                  | 0.031                        | 0.105              | 1550           |   |
| 1200      | 122 | 10 × 12.5             |  | 0.043                        | 0.133              | 1360           | 10 × 16                                   | 0.030                        | 0.095              | 1650           | 10 × 20                                   | 0.019                        | 0.057              | 1930           |   |
|           |     | ▲ 8 × 15              |  | 0.046                        | 0.143              | 1330           |   |                              |                    |                |   |                              |                    |                |   |
| 1500      | 152 | 8 × 20                |  | 0.031                        | 0.105              | 1550           | 10 × 16                                   | 0.030                        | 0.095              | 1815           | 10 × 20                                   | 0.019                        | 0.057              | 2160           |   |
|           |     |                       |  |                              |                    |                | ▲ 8 × 20                                  | 0.031                        | 0.105              | 1550           |   |                              |                    |                |   |
| 1800      | 182 | 10 × 16               |  | 0.030                        | 0.095              | 1815           | 10 × 20                                   | 0.019                        | 0.057              | 2160           | 10 × 25                                   | 0.017                        | 0.051              | 2475           |   |
| 2200      | 222 | 10 × 20               |  | 0.019                        | 0.057              | 2160           | 10 × 25                                   | 0.017                        | 0.051              | 2475           | 12.5 × 20                                 | 0.016                        | 0.041              | 2725           |   |
| 2700      | 272 | 10 × 25               |  | 0.017                        | 0.051              | 2475           | 12.5 × 20                                 | 0.016                        | 0.041              | 2475           | 12.5 × 25                                 | 0.014                        | 0.036              | 3190           |   |
| 3300      | 332 | 12.5 × 20             |  | 0.016                        | 0.041              | 2500           | 12.5 × 20                                 | 0.016                        | 0.041              | 2725           | 12.5 × 31.5                               | 0.012                        | 0.031              | 3795           |   |
|           |     |                       |  |                              |                    |                |   |                              |                    |                | ▲ 16 × 20                                 | 0.014                        | 0.036              | 3575           |   |
| 3900      | 392 | 12.5 × 20             |  | 0.016                        | 0.041              | 2725           | 12.5 × 25                                 | 0.014                        | 0.036              | 3190           | 12.5 × 35.5                               | 0.011                        | 0.029              | 3925           |   |
| 4700      | 472 | 12.5 × 25             |  | 0.014                        | 0.036              | 3190           | 12.5 × 31.5                               | 0.012                        | 0.031              | 3795           | 16 × 25                                   | 0.012                        | 0.033              | 3990           |   |
|           |     |                       |  |                              |                    |                | ▲ 16 × 20                                 | 0.014                        | 0.036              | 3575           |   |                              |                    |                |   |
| 5600      | 562 | 12.5 × 31.5           |  | 0.012                        | 0.031              | 3795           | 12.5 × 35.5                               | 0.011                        | 0.029              | 3925           |   |                              |                    |                |   |
| 6800      | 682 | 12.5 × 35.5           |  | 0.011                        | 0.029              | 3925           | 16 × 25                                   | 0.012                        | 0.033              | 3990           |   |                              |                    |                |   |
|           |     | ▲ 16 × 20             |  | 0.014                        | 0.036              | 3575           |   |                              |                    |                |   |                              |                    |                |   |
| 8200      | 822 | 16 × 25               |  | 0.012                        | 0.033              | 3990           |   |                              |                    |                |   |                              |                    |                |   |

| Cap. (μF) |     | V (Code)<br>Item Code |  | 25 (1E)                      |                    |                | 35 (1V)                                   |                              |                    |                |   |  |  |  |
|-----------|-----|-----------------------|--|------------------------------|--------------------|----------------|---|------------------------------|--------------------|----------------|---|--|--|--|
|           |     |                       |  | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φ D × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mArms)<br>105°C / 100kHz |  |  |  |
|           |     |                       |  |                              | 20°C / 100kHz      | -10°C / 100kHz |   |                              | 20°C / 100kHz      | -10°C / 100kHz |   |  |  |  |
| 47        | 470 |                       |  |                              |                    | 5 × 11         | 0.23                                      | 0.76                         | 360                |                |   |  |  |  |
| 68        | 680 | 5 × 11                |  | 0.23                         | 0.76               | 360            | 6.3 × 11                                  | 0.10                         | 0.33               | 450            |   |  |  |  |
| 100       | 101 | 6.3 × 11              |  | 0.10                         | 0.33               | 450            | 6.3 × 11                                  | 0.10                         | 0.33               | 550            |   |  |  |  |
| 150       | 151 | 6.3 × 11              |  | 0.10                         | 0.33               | 550            | 8 × 11.5                                  | 0.059                        | 0.181              | 820            |   |  |  |  |
| 220       | 221 | 8 × 11.5              |  | 0.059                        | 0.181              | 810            | 8 × 11.5                                  | 0.059                        | 0.181              | 990            |   |  |  |  |
| 270       | 271 | 8 × 11.5              |  | 0.059                        | 0.181              | 900            | 8 × 15                                    | 0.046                        | 0.143              | 1330           |   |  |  |  |
| 330       | 331 | 8 × 11.5              |  | 0.059                        | 0.181              | 990            | 10 × 12.5                                 | 0.043                        | 0.133              | 1360           |   |  |  |  |
| 390       | 391 | 8 × 15                |  | 0.046                        | 0.143              | 1330           | 8 × 20                                    | 0.031                        | 0.105              | 1550           |   |  |  |  |
| 470       | 471 | 10 × 12.5             |  | 0.043                        | 0.133              | 1360           | 10 × 16                                   | 0.030                        | 0.095              | 1815           |   |  |  |  |
| 560       | 561 | 8 × 20                |  | 0.031                        | 0.105              | 1550           | 10 × 20                                   | 0.019                        | 0.057              | 2160           |   |  |  |  |
| 680       | 681 | 10 × 16               |  | 0.030                        | 0.095              | 1815           | 10 × 25                                   | 0.017                        | 0.051              | 2475           |   |  |  |  |
| 820       | 821 | 10 × 20               |  | 0.019                        | 0.057              | 2160           | 12.5 × 20                                 | 0.016                        | 0.041              | 2725           |   |  |  |  |
| 1000      | 102 | 10 × 25               |  | 0.017                        | 0.051              | 2475           | 12.5 × 20                                 | 0.016                        | 0.041              | 2920           |   |  |  |  |
| 1200      | 122 | 12.5 × 20             |  | 0.016                        | 0.041              | 2475           | 12.5 × 25                                 | 0.014                        | 0.036              | 3190           |   |  |  |  |
| 1500      | 152 | 12.5 × 20             |  | 0.016                        | 0.041              | 2725           | 12.5 × 31.5                               | 0.012                        | 0.031              | 3795           |   |  |  |  |
|           |     |                       |  |                              |                    |                | ▲ 16 × 20                                 | 0.014                        | 0.036              | 3575           |   |  |  |  |
| 1800      | 182 | 12.5 × 25             |  | 0.014                        | 0.036              | 3190           | 12.5 × 35.5                               | 0.011                        | 0.029              | 3925           |   |  |  |  |
| 2200      | 222 | 12.5 × 31.5           |  | 0.012                        | 0.031              | 3795           | 16 × 25                                   | 0.012                        | 0.033              | 3990           |   |  |  |  |
|           |     | ▲ 16 × 20             |  | 0.014                        | 0.036              | 3575           |   |                              |                    |                |   |  |  |  |
| 2700      | 272 | 12.5 × 35.5           |  | 0.011                        | 0.029              | 3925           |   |                              |                    |                |   |  |  |  |
| 3300      | 332 | 16 × 25               |  | 0.012                        | 0.033              | 3990           |   |                              |                    |                |   |  |  |  |

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

### Frequency coefficient of rated ripple current

| Cap. (μF)    | Frequency | 120Hz | 1kHz | 10kHz | 100kHz |
|--------------|-----------|-------|------|-------|--------|
| 47 to 150    |           | 0.40  | 0.75 | 0.90  | 1.00   |
| 220 to 560   |           | 0.50  | 0.85 | 0.94  | 1.00   |
| 680 to 1800  |           | 0.60  | 0.87 | 0.95  | 1.00   |
| 2200 to 3900 |           | 0.75  | 0.90 | 0.95  | 1.00   |
| 4700 to 8200 |           | 0.85  | 0.95 | 0.98  | 1.00   |