

# ALUMINUM ELECTROLYTIC CAPACITORS

**UPA** Miniature Sized, Low Impedance, High Reliability For Switching Power Supplies



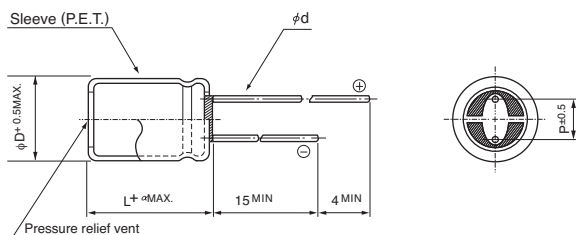
- Lower impedance than UPW.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item  | Performance Characteristics   |  |      |      |      |      |            |
|---|---|--|------|------|------|------|------------|
| Category Temperature Range  | -55 to +105°C   |  |      |      |      |      |            |
| Rated Voltage Range   | 6.3 to 35V  |  |      |      |      |      |            |
| Rated Capacitance Range   | 180 to 10000µF  |  |      |      |      |      |            |
| Capacitance Tolerance   | ±20% at 120Hz, 20°C   |  |      |      |      |      |            |
| Leakage Current   | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (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.)  | 0.22   | 0.19 | 0.16 | 0.14 | 0.12 |            |
| 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-55°C / Z+20°C  | 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 5000 hours (3000 hours for φD=8, 4000 hours for φD=10) at 105°C, the peak voltage shall not exceed the rated voltage. |  |      |      |      |      |            |
|   | Capacitance change  | Within ±20% of the initial capacitance value (6.3V, 10V : ±30%)  |      |      |      |      |            |
|   | tan δ   | 200% or less than the initial specified value (6.3V, 10V : 300%) |      |      |      |      |            |
| Shelf Life  | After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.                                 |  |      |      |      |      |            |
|   | Leakage current   |  |      |      |      |      |            |
| Marking   | Printed with white color letter on dark brown sleeve.   |  |      |      |      |      |            |

## Radial Lead Type

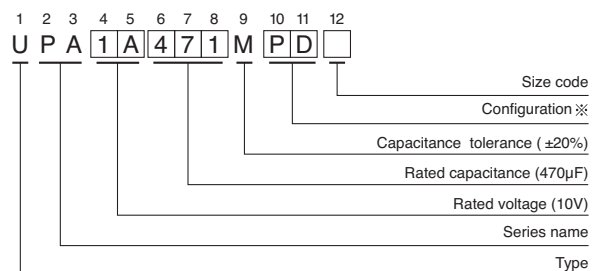


|   |          |     |
|---|----------|-----|
| α | (L < 20) | 1.5 |
|   | (L ≥ 20) | 2.0 |

|    | (mm) |     |      |     |     |
|----|------|-----|------|-----|-----|
| φD | 8    | 10  | 12.5 | 16  | 18  |
| P  | 3.5  | 5.0 | 5.0  | 7.5 | 7.5 |
| φd | 0.6  | 0.6 | *0.6 | 0.8 | 0.8 |

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

## Type numbering system (Example : 10V 470µF)



※ Configuration

| φD         | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |

## Frequency coefficient of rated ripple current

| Cap. (µF)     | Frequency |       |       |      |               |
|---------------|-----------|-------|-------|------|---------------|
|               | 50Hz      | 120Hz | 300Hz | 1kHz | 10kHz or more |
| 180 to 330    | 0.55      | 0.65  | 0.75  | 0.85 | 1.00          |
| 390 to 1000   | 0.70      | 0.75  | 0.80  | 0.90 | 1.00          |
| 1200 to 10000 | 0.80      | 0.85  | 0.90  | 0.95 | 1.00          |

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

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.

## UPA

### Standard Ratings

| Cap.(μF) |     | V (Code)  |                             | 6.3 (0J)           |                   |   | 10 (1A)                     |                    |                   | 16 (1C)                     |                    |                   |   |      |
|----------|-----|-----------|-----------------------------|--------------------|-------------------|---|-----------------------------|--------------------|-------------------|-----------------------------|--------------------|-------------------|---|------|
|          |     | Item Code | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                   | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                   | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                   | Rated ripple<br>(mArms)<br>105°C / 100kHz |      |
|          |     |           |                             | 20°C /<br>100kHz   | -10°C /<br>100kHz |   |                             | 20°C /<br>100kHz   | -10°C /<br>100kHz |                             | 20°C /<br>100kHz   | -10°C /<br>100kHz |   |      |
| 330      | 331 |           |                             |                    |                   |   |                             |                    |                   | 8 × 11.5                    |                    |                   | 630                                       |      |
| 390      | 391 |           |                             |                    |                   |   |                             |                    |                   | 8 × 11.5                    | 0.090              | 0.180             | 630                                       |      |
| 470      | 471 |           |                             |                    |                   |   | 8 × 11.5                    | 0.090              | 0.180             | 630                         | 10 × 12.5          | 0.063             | 0.126                                     | 900  |
| 560      | 561 |           | 8 × 11.5                    | 0.090              | 0.180             | 630                                       | 8 × 11.5                    | 0.090              | 0.180             | 630                         |                    |                   |   |      |
| 680      | 681 |           | 8 × 11.5                    | 0.090              | 0.180             | 630                                       |                             |                    |                   |                             | 8 × 15             | 0.062             | 0.124                                     | 860  |
|          |     |           |                             |                    |                   |   |                             |                    |                   |                             | ▲10 × 12.5         | 0.063             | 0.126                                     | 900  |
| 820      | 821 |           |                             |                    |                   |   | 8 × 15                      | 0.062              | 0.124             | 860                         | 8 × 20             | 0.044             | 0.088                                     | 1220 |
|          |     |           |                             |                    |                   |   | ▲10 × 12.5                  | 0.063              | 0.126             | 900                         | ▲10 × 16           | 0.049             | 0.098                                     | 1240 |
|          |     |           |                             |                    |                   |   | 8 × 20                      | 0.044              | 0.088             | 1220                        | 10 × 16            | 0.049             | 0.098                                     | 1240 |
| 1000     | 102 |           | 8 × 15                      | 0.062              | 0.124             | 860                                       | ▲10 × 12.5                  | 0.063              | 0.126             | 900                         | ●10 × 20           | 0.035             | 0.070                                     | 1490 |
|          |     |           | ▲10 × 12.5                  | 0.063              | 0.126             | 900                                       | ●10 × 16                    | 0.049              | 0.098             | 1240                        |                    |                   |   |      |
| 1200     | 122 |           | 10 × 12.5                   | 0.063              | 0.126             | 900                                       | 8 × 20                      | 0.044              | 0.088             | 1220                        | 10 × 20            | 0.035             | 0.070                                     | 1490 |
|          |     |           | ●10 × 16                    | 0.049              | 0.098             | 1240                                      | ▲10 × 16                    | 0.049              | 0.098             | 1240                        |                    |                   |   |      |
| 1500     | 152 |           | 8 × 20                      | 0.044              | 0.088             | 1220                                      |                             |                    |                   |                             |                    |                   |   |      |
|          |     |           | ▲10 × 16                    | 0.049              | 0.098             | 1240                                      | 10 × 20                     | 0.035              | 0.070             | 1490                        | 10 × 25            | 0.033             | 0.066                                     | 1680 |
|          |     |           | ●10 × 20                    | 0.035              | 0.070             | 1490                                      |                             |                    |                   |                             |                    |                   |   |      |
| 1800     | 182 |           |                             |                    |                   |   | 10 × 20                     | 0.035              | 0.070             | 1490                        |                    |                   |   |      |
|          |     |           |                             |                    |                   |   | ▲10 × 25                    | 0.033              | 0.066             | 1680                        |                    |                   |   |      |
| 2200     | 222 |           | 10 × 20                     | 0.035              | 0.070             | 1490                                      | 10 × 25                     | 0.033              | 0.066             | 1680                        | 12.5 × 20          | 0.029             | 0.058                                     | 1890 |
|          |     |           | ●10 × 25                    | 0.033              | 0.066             | 1680                                      | ●12.5 × 20                  | 0.029              | 0.058             | 1890                        | ●12.5 × 25         | 0.022             | 0.044                                     | 2280 |
| 2700     | 272 |           | 10 × 25                     | 0.033              | 0.066             | 1680                                      | 12.5 × 20                   | 0.029              | 0.058             | 1890                        | 12.5 × 25          | 0.022             | 0.044                                     | 2280 |
| 3300     | 332 |           | 12.5 × 20                   | 0.029              | 0.058             | 1890                                      | 12.5 × 25                   | 0.022              | 0.044             | 2280                        | 12.5 × 31.5        | 0.018             | 0.036                                     | 2720 |
|          |     |           |                             |                    |                   |   |                             |                    |                   |                             | ▲16 × 20           | 0.026             | 0.052                                     | 2330 |
| 3900     | 392 |           | 12.5 × 25                   | 0.022              | 0.044             | 2280                                      | 12.5 × 25                   | 0.022              | 0.044             | 2280                        | 12.5 × 35.5        | 0.016             | 0.032                                     | 2940 |
| 4700     | 472 |           | 12.5 × 25                   | 0.022              | 0.044             | 2280                                      | 12.5 × 31.5                 | 0.018              | 0.036             | 2720                        | 16 × 25            | 0.019             | 0.038                                     | 2760 |
|          |     |           |                             |                    |                   |   | ▲16 × 20                    | 0.026              | 0.052             | 2330                        | ▲18 × 20           | 0.025             | 0.050                                     | 2640 |
| 5600     | 562 |           | 12.5 × 31.5                 | 0.018              | 0.036             | 2720                                      | 12.5 × 35.5                 | 0.016              | 0.032             | 2940                        | 16 × 31.5          | 0.017             | 0.035                                     | 2810 |
|          |     |           | ▲16 × 20                    | 0.026              | 0.052             | 2330                                      |                             |                    |                   |                             | ▲18 × 25           | 0.018             | 0.036                                     | 2850 |
| 6800     | 682 |           | 12.5 × 35.5                 | 0.016              | 0.032             | 2940                                      | 16 × 25                     | 0.019              | 0.038             | 2760                        | 18 × 25            | 0.018             | 0.036                                     | 2850 |
| 8200     | 822 |           | 16 × 25                     | 0.019              | 0.038             | 2760                                      | 16 × 31.5                   | 0.017              | 0.034             | 2810                        |                    |                   |   |      |
|          |     |           | ▲18 × 20                    | 0.025              | 0.050             | 2640                                      | ▲18 × 25                    | 0.018              | 0.036             | 2850                        |                    |                   |   |      |
| 10000    | 103 |           | 16 × 31.5                   | 0.017              | 0.034             | 2810                                      |                             |                    |                   |                             |                    |                   |   |      |
|          |     |           | ▲18 × 25                    | 0.018              | 0.036             | 2850                                      |                             |                    |                   |                             |                    |                   |   |      |

| Cap.(μF) |     | V (Code)  |                             | 25 (1E)            |                   |   | 35 (1V)                     |                    |                   |   |
|----------|-----|-----------|-----------------------------|--------------------|-------------------|---|-----------------------------|--------------------|-------------------|---|
|          |     | Item Code | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                   | Rated ripple<br>(mArms)<br>105°C / 100kHz | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                   | Rated ripple<br>(mArms)<br>105°C / 100kHz |
|          |     |           |                             | 20°C /<br>100kHz   | -10°C /<br>100kHz |   |                             | 20°C /<br>100kHz   | -10°C /<br>100kHz |   |
| 180      | 181 |           |                             |                    |                   |   | 8 × 11.5                    | 0.090              | 0.180             | 630                                       |
| 270      | 271 |           | 8 × 11.5                    | 0.090              | 0.180             | 630                                       | 8 × 15                      | 0.062              | 0.124             | 860                                       |
|          |     |           |                             |                    |                   |   | ▲10 × 12.5                  | 0.063              | 0.126             | 900                                       |
| 330      | 331 |           | 8 × 11.5                    | 0.090              | 0.180             | 630                                       |                             |                    |                   |   |
| 390      | 391 |           | 8 × 15                      | 0.062              | 0.124             | 860                                       | 8 × 20                      | 0.044              | 0.088             | 1220                                      |
|          |     |           |                             |                    |                   |   | ▲10 × 16                    | 0.049              | 0.098             | 1240                                      |
| 470      | 471 |           | 8 × 15                      | 0.062              | 0.124             | 860                                       |                             |                    |                   |   |
|          |     |           | ▲10 × 12.5                  | 0.063              | 0.126             | 900                                       |                             |                    |                   |   |
| 560      | 561 |           | 8 × 20                      | 0.044              | 0.088             | 1220                                      | 10 × 20                     | 0.035              | 0.070             | 1490                                      |
|          |     |           | ▲10 × 16                    | 0.049              | 0.098             | 1240                                      |                             |                    |                   |   |
| 680      | 681 |           | 10 × 16                     | 0.049              | 0.098             | 1240                                      | 10 × 25                     | 0.033              | 0.066             | 1680                                      |
| 820      | 821 |           | 10 × 20                     | 0.035              | 0.070             | 1490                                      | 12.5 × 20                   | 0.029              | 0.058             | 1890                                      |
| 1000     | 102 |           | 10 × 25                     | 0.033              | 0.066             | 1680                                      | 12.5 × 20                   | 0.029              | 0.058             | 1890                                      |
|          |     |           | ●12.5 × 20                  | 0.029              | 0.058             | 1890                                      |                             |                    |                   |   |
| 1200     | 122 |           | 12.5 × 20                   | 0.029              | 0.058             | 1890                                      | 12.5 × 25                   | 0.022              | 0.044             | 2280                                      |
| 1500     | 152 |           |                             |                    |                   |   | 12.5 × 31.5                 | 0.018              | 0.036             | 2720                                      |
|          |     |           |                             |                    |                   |   | ▲16 × 20                    | 0.026              | 0.052             | 2330                                      |
| 1800     | 182 |           | 12.5 × 25                   | 0.022              | 0.044             | 2280                                      | 12.5 × 35.5                 | 0.016              | 0.032             | 2940                                      |
|          |     |           |                             |                    |                   |   | ▲16 × 20                    | 0.026              | 0.052             | 2330                                      |
| 2200     | 222 |           | 12.5 × 31.5                 | 0.018              | 0.036             | 2720                                      | 16 × 25                     | 0.019              | 0.038             | 2760                                      |
|          |     |           | ▲16 × 20                    | 0.026              | 0.052             | 2330                                      | ▲18 × 20                    | 0.025              | 0.050             | 2640                                      |
| 2700     | 272 |           | 12.5 × 35.5                 | 0.016              | 0.032             | 2940                                      | 16 × 31.5                   | 0.017              | 0.035             | 2810                                      |
|          |     |           |                             |                    |                   |   | ▲18 × 25                    | 0.018              | 0.036             | 2850                                      |
| 3300     | 332 |           | 16 × 25                     | 0.019              | 0.038             | 2760                                      | 18 × 31.5                   | 0.016              | 0.032             | 2910                                      |
|          |     |           | ▲18 × 20                    | 0.025              | 0.050             | 2640                                      |                             |                    |                   |   |
| 4700     | 472 |           | 18 × 25                     | 0.018              | 0.036             | 2850                                      |                             |                    |                   |   |

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

● : In this case, [3] will be put at 12th digit of type numbering system.

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