

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

Smaller



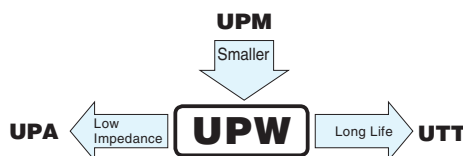
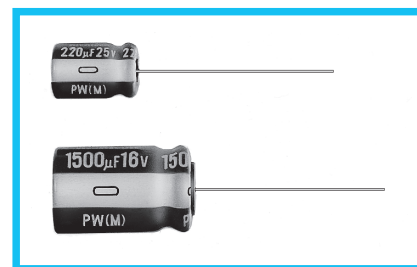
Low Impedance



Long Life

Anti-Solvent  
Feature  
(Through  
100V only)

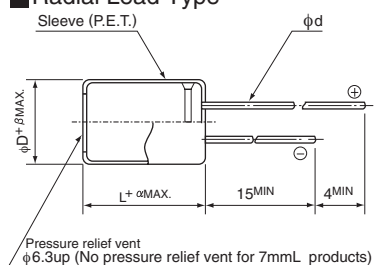
- Smaller case size and lower impedance than UPM.
- Low impedance and high reliability withstanding 2000 hours to 8000 hours.
- Capacitance ranges available based on the numerical values in E12 series under JIS.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                          | Performance Characteristics                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------|----------|---------|---------|----------|--------------------------------------------------------------------------|------|------------|-----------|-----------|--------------------|---------------------------------------------------|--|--|--|--|--|--|--|--|--|
| Category Temperature Range    | -55 to +105°C (6.3 to 100V), -40 to + 105°C (160 to 400V), -25 to +105°C (450V)                                                                                                                                                                                                                                                 |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Rated Voltage Range           | 6.3 to 450V                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Rated Capacitance Range       | 0.47 to 15000μF                                                                                                                                                                                                                                                                                                                 |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                                                                                             |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Leakage Current               | Rated voltage (V)                                                                                                                                                                                                                                                                                                               | 6.3 to 100                                                                                                                      |      |          |         |         |          | 160 to 450                                                               |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               | 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. |      |          |         |         |          | CV ≤ 1000: I = 0.1CV+40 (μA) max.<br>CV > 1000: I = 0.04CV+100 (μA) max. |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Tangent of loss angle (tan δ) | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz at 20°C                                                                                                                                                                                                               |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               | Rated voltage (V)                                                                                                                                                                                                                                                                                                               | 6.3                                                                                                                             | 10   | 16       | 25      | 35      | 50       | 63                                                                       | 100  | 160 to 250 | 315 · 350 | 400 · 450 |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               | tan δ (MAX.)                                                                                                                                                                                                                                                                                                                    | 0.22                                                                                                                            | 0.19 | 0.16     | 0.14    | 0.12    | 0.10     | 0.09                                                                     | 0.08 | 0.15       | 0.20      | 0.25      |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Stability at Low Temperature  | 120Hz                                                                                                                                                                                                                                                                                                                           |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               | Rated voltage (V)                                                                                                                                                                                                                                                                                                               |                                                                                                                                 |      | 6.3 · 10 | 16 · 25 | 35 · 50 | 63 · 100 | 160 · 200                                                                | 250  | 315 · 350  | 400       | 450       |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               | Impedance ratio (MAX.)                                                                                                                                                                                                                                                                                                          | Z-25°C / Z+20°C                                                                                                                 |      |          | —       | —       | —        | —                                                                        | 3    | 3          | 4         | 6         | 15                 |                                                   |  |  |  |  |  |  |  |  |  |
|                               |                                                                                                                                                                                                                                                                                                                                 | Z-40°C / Z+20°C                                                                                                                 |      |          | —       | —       | —        | —                                                                        | 4    | 6          | 8         | 10        | —                  |                                                   |  |  |  |  |  |  |  |  |  |
| 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 8000 hours (2000 hours for φD=4, 5 and 6.3, 3000 hours for φD=8, 5000 hours for φD=10, 7000 hours for φD=12.5) at 105°C, the peak voltage shall not exceed the rated voltage. |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
|                               |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           | Capacitance change | Within ±20% 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 |  |  |  |  |  |  |  |  |  |
| 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.                                                                                         |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |
| Marking                       | Printed with white color letter on dark brown sleeve.                                                                                                                                                                                                                                                                           |                                                                                                                                 |      |          |         |         |          |                                                                          |      |            |           |           |                    |                                                   |  |  |  |  |  |  |  |  |  |

## Radial Lead Type

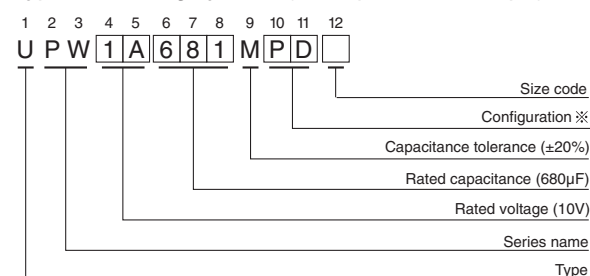


|   |              |
|---|--------------|
| α | (L = 7) 1.0  |
|   | (L < 20) 1.5 |
|   | (L ≥ 20) 2.0 |

|    | φD   | 4      | 5      | 6.3 | 8   | 10  | 12.5 | 16  | 18   | 20   | 22   | 25  |
|----|------|--------|--------|-----|-----|-----|------|-----|------|------|------|-----|
| P  | 1.5  | 2.0    | 2.5    | 3.5 | 5.0 | 5.0 | 7.5  | 7.5 | 10.0 | 10.0 | 12.5 |     |
| φd | 0.45 | 0.5    | 0.5    | 0.6 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8  | 1.0  | 1.0  | 1.0 |
|    |      | (0.45) | (0.45) |     |     |     | ※0.8 |     |      |      |      |     |
| β  | 0.5  | 0.5    | 0.5    | 0.5 | 0.5 | 0.5 | 0.5  | 0.5 | 0.5  | 0.5  | 1.0  | 1.0 |

※: Applied to L>25 products  
( ): Applied to 7mmL products

## Type numbering system (Example : 10V 680µF)



### ※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|----------------------------------------|
| 4 · 5      | DD                                     |
| 6.3        | ED (7mm L: DD)                         |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |
| 20 to 25   | RD                                     |

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

## Frequency coefficient of rated ripple current

| V          | Cap. (µF)     | Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|------------|---------------|-----------|------|-------|-------|------|---------------|
| 6.3 to 100 | 2.2 to 56     |           | 0.20 | 0.30  | 0.50  | 0.80 | 1.00          |
|            | 68 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 15000 |           | 0.80 | 0.85  | 0.90  | 0.95 | 1.00          |
| 160 to 450 | 0.47 to 220   |           | 0.80 | 1.00  | 1.25  | 1.40 | 1.60          |
|            | 330 to 470    |           | 0.90 | 1.00  | 1.10  | 1.13 | 1.15          |

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.

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## ■ Standard Ratings

| V (Code)<br><br>Item<br>Cap.(μF)Code |     | 6.3 (0J)                    |                    |                |                                             | 10 (1A)                     |                    |                |                                             |
|--------------------------------------|-----|-----------------------------|--------------------|----------------|---------------------------------------------|-----------------------------|--------------------|----------------|---------------------------------------------|
|                                      |     | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mA Arms)<br>105°C / 100kHz | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                | Rated ripple<br>(mA Arms)<br>105°C / 100kHz |
|                                      |     |                             | 20°C / 100kHz      | −10°C / 100kHz |                                             |                             | 20°C / 100kHz      | −10°C / 100kHz |                                             |
| 22                                   | 220 | 5 × 11                      | 0.60               | 1.20           | 180                                         | 5 × 11<br>▲ 4 × 7           | 0.60<br>2.00       | 1.20<br>5.00   | 180<br>65                                   |
| 27                                   | 270 | 4 × 7                       | 2.00               | 5.00           | 65                                          |                             |                    |                |                                             |
| 33                                   | 330 | 5 × 11<br>▲ 5 × 7           | 0.60<br>0.95       | 1.20<br>2.40   | 180<br>120                                  | 5 × 11<br>▲ 5 × 7           | 0.60<br>0.95       | 1.20<br>2.40   | 180<br>120                                  |
| 39                                   | 390 |                             |                    |                |                                             | 5 × 7                       | 0.95               | 2.40           | 120                                         |
| 47                                   | 470 | 5 × 11<br>▲ 5 × 7           | 0.60<br>0.95       | 1.20<br>2.40   | 180<br>120                                  | 5 × 11<br>▲ 4 × 11          | 0.60<br>1.30       | 1.20<br>2.60   | 180<br>120                                  |
| 56                                   | 560 | 5 × 7                       | 0.95               | 2.40           | 120                                         |                             |                    |                |                                             |
| 68                                   | 680 | 4 × 11                      | 1.30               | 2.60           | 120                                         |                             |                    |                |                                             |
| 82                                   | 820 |                             |                    |                |                                             | 5 × 11<br>▲ 6.3 × 7         | 0.60<br>0.45       | 1.20<br>1.20   | 180<br>200                                  |
| 100                                  | 101 | 5 × 11                      | 0.60               | 1.20           | 180                                         | 5 × 11<br>▲ 5 × 15          | 0.60<br>0.50       | 1.20<br>1.00   | 180<br>235                                  |
| 120                                  | 121 | 6.3 × 7                     | 0.45               | 1.20           | 200                                         |                             |                    |                |                                             |
| 150                                  | 151 | 6.3 × 11<br>▲ 5 × 15        | 0.25<br>0.50       | 0.50<br>1.00   | 290<br>235                                  | 6.3 × 11                    | 0.25               | 0.50           | 290                                         |
| 180                                  | 181 |                             |                    |                |                                             | 6.3 × 11                    | 0.25               | 0.50           | 290                                         |
| 220                                  | 221 | 6.3 × 11                    | 0.25               | 0.50           | 290                                         | 6.3 × 11<br>▲ 6.3 × 15      | 0.25<br>0.23       | 0.50<br>0.46   | 290<br>430                                  |
| 330                                  | 331 | 6.3 × 11<br>▲ 6.3 × 15      | 0.25<br>0.23       | 0.50<br>0.46   | 290<br>430                                  | 8 × 11.5                    | 0.117              | 0.234          | 555                                         |
| 470                                  | 471 | 8 × 11.5                    | 0.117              | 0.234          | 555                                         | 8 × 11.5                    | 0.117              | 0.234          | 555                                         |
| 560                                  | 561 | 8 × 11.5                    | 0.117              | 0.234          | 555                                         |                             |                    |                |                                             |
| 680                                  | 681 | 10 × 12.5                   | 0.090              | 0.180          | 755                                         | 10 × 12.5<br>▲ 8 × 15       | 0.090<br>0.085     | 0.180<br>0.170 | 760<br>730                                  |
| 820                                  | 821 | 8 × 15<br>▲ 10 × 12.5       | 0.085<br>0.090     | 0.170<br>0.180 | 730<br>755                                  |                             |                    |                |                                             |
| 1000                                 | 102 | 10 × 12.5                   | 0.090              | 0.180          | 755                                         | 10 × 16<br>▲ 8 × 20         | 0.068<br>0.065     | 0.136<br>0.130 | 1050<br>995                                 |
| 1200                                 | 122 | 8 × 20<br>▲ 10 × 16         | 0.065<br>0.068     | 0.130<br>0.136 | 995<br>1050                                 | 10 × 20                     | 0.052              | 0.104          | 1220                                        |
| 1500                                 | 152 | 10 × 20                     | 0.052              | 0.104          | 1220                                        | 10 × 20<br>▲ 10 × 25        | 0.052<br>0.045     | 0.104<br>0.090 | 1220<br>1440                                |
| 2200                                 | 222 | 12.5 × 20<br>▲ 10 × 25      | 0.038<br>0.045     | 0.076<br>0.090 | 1655<br>1440                                | 12.5 × 20<br>▲ 10 × 31.5    | 0.038<br>0.035     | 0.076<br>0.070 | 1655<br>1815                                |
| 2700                                 | 272 | 10 × 31.5                   | 0.035              | 0.070          | 1815                                        | 12.5 × 25                   | 0.030              | 0.060          | 1945                                        |
| 3300                                 | 332 | 12.5 × 20                   | 0.038              | 0.076          | 1655                                        | 12.5 × 25<br>▲ 12.5 × 31.5  | 0.030<br>0.025     | 0.060<br>0.050 | 1950<br>2310                                |
| 3900                                 | 392 | 12.5 × 25                   | 0.030              | 0.060          | 1945                                        | 12.5 × 35.5<br>▲ 16 × 20    | 0.022<br>0.029     | 0.044<br>0.058 | 2510<br>2210                                |
| 4700                                 | 472 | 16 × 25<br>▲ 12.5 × 31.5    | 0.022<br>0.025     | 0.044<br>0.050 | 2555<br>2310                                | 16 × 25                     | 0.022              | 0.044          | 2555                                        |
| 5600                                 | 562 | 12.5 × 35.5<br>▲ 16 × 20    | 0.022<br>0.029     | 0.044<br>0.058 | 2510<br>2210                                | 16 × 25<br>▲ 18 × 20        | 0.022<br>0.028     | 0.044<br>0.056 | 2560<br>2490                                |
| 6800                                 | 682 | 16 × 25<br>▲ 18 × 20        | 0.022<br>0.028     | 0.044<br>0.056 | 2560<br>2490                                | 16 × 31.5<br>▲ 18 × 25      | 0.018<br>0.020     | 0.036<br>0.040 | 3010<br>2740                                |
| 8200                                 | 822 | 16 × 31.5                   | 0.018              | 0.036          | 3010                                        | 16 × 35.5<br>▲ 18 × 31.5    | 0.016<br>0.016     | 0.032<br>0.032 | 3150<br>3635                                |
| 10000                                | 103 | 16 × 31.5<br>▲ 18 × 25      | 0.016<br>0.020     | 0.032<br>0.040 | 3150<br>2740                                | 18 × 35.5                   | 0.015              | 0.030          | 3680                                        |
| 12000                                | 123 | 18 × 31.5                   | 0.016              | 0.032          | 3635                                        |                             |                    |                |                                             |
| 15000                                | 153 | 18 × 35.5                   | 0.015              | 0.030          | 3680                                        | 18 × 40                     | 0.014              | 0.028          | 3800                                        |

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

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## ■ Standard Ratings

| Cap. (μF) | V(Code) | Item Code | 16 (1C)                     |                    |                | 25 (1E)                     |                    |                |                                           |
|-----------|---------|-----------|-----------------------------|--------------------|----------------|-----------------------------|--------------------|----------------|-------------------------------------------|
|           |         |           | 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 / 100kHz      | -10°C / 100kHz |                             | 20°C / 100kHz      | -10°C / 100kHz |                                           |
| 4.7       | 4R7     |           |                             |                    |                | 5 × 11                      | 0.60               | 1.20           | 180                                       |
| 10        | 100     |           | 5 × 11                      | 0.60               | 1.20           | 5 × 11                      | 0.60               | 1.20           | 180                                       |
|           |         |           |                             |                    |                | ▲4 × 7                      | 2.00               | 5.00           | 65                                        |
| 15        | 150     |           | 4 × 7                       | 2.00               | 5.00           |                             |                    |                |                                           |
| 22        | 220     |           | 5 × 11                      | 0.60               | 1.20           | 5 × 11                      | 0.60               | 1.20           | 180                                       |
|           |         |           | ▲5 × 7                      | 0.95               | 2.40           | ▲5 × 7                      | 0.95               | 2.40           | 120                                       |
| 27        | 270     |           | 5 × 7                       | 0.95               | 2.40           | 4 × 11                      | 1.30               | 2.60           | 120                                       |
| 33        | 330     |           | 5 × 11                      | 0.60               | 1.20           | 5 × 11                      | 0.60               | 1.20           | 180                                       |
|           |         |           | ▲6.3 × 7                    | 0.45               | 1.20           |                             |                    |                |                                           |
| 39        | 390     |           | 4 × 11                      | 1.30               | 2.60           | 5 × 11                      | 0.60               | 1.20           | 180                                       |
|           |         |           |                             |                    |                | ▲6.3 × 7                    | 0.45               | 1.20           | 200                                       |
| 47        | 470     |           | 5 × 11                      | 0.60               | 1.20           | 5 × 11                      | 0.60               | 1.20           | 180                                       |
| 56        | 560     |           | 5 × 11                      | 0.60               | 1.20           | 5 × 15                      | 0.50               | 1.00           | 235                                       |
|           |         |           | ▲6.3 × 7                    | 0.45               | 1.20           |                             |                    |                |                                           |
| 82        | 820     |           | 5 × 15                      | 0.50               | 1.00           | 6.3 × 11                    | 0.25               | 0.50           | 290                                       |
| 100       | 101     |           | 6.3 × 11                    | 0.25               | 0.50           | 6.3 × 11                    | 0.25               | 0.50           | 290                                       |
| 120       | 121     |           | 6.3 × 11                    | 0.25               | 0.50           | 6.3 × 15                    | 0.23               | 0.46           | 430                                       |
| 150       | 151     |           | 6.3 × 11                    | 0.25               | 0.50           | 8 × 11.5                    | 0.117              | 0.234          | 555                                       |
| 180       | 181     |           | 6.3 × 15                    | 0.23               | 0.46           |                             |                    |                |                                           |
| 220       | 221     |           | 8 × 11.5                    | 0.117              | 0.234          | 8 × 11.5                    | 0.117              | 0.234          | 555                                       |
| 330       | 331     |           | 8 × 11.5                    | 0.117              | 0.234          | 10 × 12.5                   | 0.090              | 0.180          | 760                                       |
|           |         |           |                             |                    |                | ▲8 × 15                     | 0.085              | 0.170          | 730                                       |
| 470       | 471     |           | 10 × 12.5                   | 0.090              | 0.180          | 10 × 16                     | 0.068              | 0.136          | 1050                                      |
|           |         |           | ▲8 × 15                     | 0.085              | 0.170          | ▲8 × 20                     | 0.065              | 0.130          | 995                                       |
| 560       | 561     |           |                             |                    |                | 10 × 20                     | 0.052              | 0.104          | 1220                                      |
| 680       | 681     |           | 10 × 16                     | 0.068              | 0.136          | 10 × 20                     | 0.052              | 0.104          | 1220                                      |
|           |         |           | ▲8 × 20                     | 0.065              | 0.130          |                             |                    |                |                                           |
| 820       | 821     |           | 10 × 20                     | 0.052              | 0.104          | 10 × 25                     | 0.045              | 0.090          | 1440                                      |
| 1000      | 102     |           | 10 × 20                     | 0.052              | 0.104          | 12.5 × 20                   | 0.038              | 0.076          | 1660                                      |
|           |         |           |                             |                    |                | ▲10 × 31.5                  | 0.035              | 0.070          | 1815                                      |
| 1200      | 122     |           | 10 × 25                     | 0.045              | 0.090          |                             |                    |                |                                           |
| 1500      | 152     |           | 12.5 × 20                   | 0.038              | 0.076          | 16 × 25                     | 0.022              | 0.044          | 2555                                      |
|           |         |           | ▲10 × 31.5                  | 0.035              | 0.070          | ▲12.5 × 25                  | 0.030              | 0.060          | 1950                                      |
| 1800      | 182     |           |                             |                    |                | 12.5 × 31.5                 | 0.025              | 0.050          | 2310                                      |
|           |         |           |                             |                    |                | ▲16 × 20                    | 0.029              | 0.058          | 2210                                      |
| 2200      | 222     |           | 12.5 × 25                   | 0.030              | 0.060          | 16 × 25                     | 0.022              | 0.044          | 2555                                      |
|           |         |           |                             |                    |                | ▲18 × 20                    | 0.028              | 0.056          | 2490                                      |
|           |         |           |                             |                    |                | ※12.5 × 35.5                | 0.022              | 0.044          | 2510                                      |
| 2700      | 272     |           | 12.5 × 31.5                 | 0.025              | 0.050          | 16 × 25                     | 0.022              | 0.044          | 2555                                      |
|           |         |           | ▲16 × 20                    | 0.029              | 0.058          |                             |                    |                |                                           |
| 3300      | 332     |           | 16 × 25                     | 0.022              | 0.044          | 16 × 31.5                   | 0.018              | 0.036          | 3010                                      |
|           |         |           | ▲12.5 × 35.5                | 0.022              | 0.044          | ▲18 × 25                    | 0.020              | 0.040          | 2740                                      |
| 3900      | 392     |           | 16 × 25                     | 0.022              | 0.044          | 16 × 35.5                   | 0.016              | 0.032          | 3150                                      |
|           |         |           | ▲18 × 20                    | 0.028              | 0.056          | ▲18 × 31.5                  | 0.016              | 0.032          | 3635                                      |
| 4700      | 472     |           | 16 × 31.5                   | 0.018              | 0.036          | 18 × 35.5                   | 0.015              | 0.030          | 3680                                      |
|           |         |           | ▲18 × 25                    | 0.020              | 0.040          |                             |                    |                |                                           |
| 5600      | 562     |           | 16 × 35.5                   | 0.016              | 0.032          |                             |                    |                |                                           |
|           |         |           | ▲18 × 31.5                  | 0.016              | 0.032          |                             |                    |                |                                           |
| 6800      | 682     |           | 18 × 35.5                   | 0.015              | 0.030          | 18 × 40                     | 0.014              | 0.028          | 3800                                      |
| 8200      | 822     |           | 18 × 35.5                   | 0.015              | 0.030          |                             |                    |                |                                           |
| 10000     | 103     |           | 18 × 40                     | 0.014              | 0.028          |                             |                    |                |                                           |

▲ : 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.

UPW

## ■ Standard Ratings

| V(Code)   |              | 35 (1V)                     |                    |                 |                                                         | 50 (1H )                    |                    |                 |                                                         |
|-----------|--------------|-----------------------------|--------------------|-----------------|---------------------------------------------------------|-----------------------------|--------------------|-----------------|---------------------------------------------------------|
| Cap. (μF) | Item<br>Code | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                 | Rated ripple<br>(mA <sub>rms</sub> )<br>105° C / 100kHz | Case size<br>φD × L<br>(mm) | Impedance (Ω) MAX. |                 | Rated ripple<br>(mA <sub>rms</sub> )<br>105° C / 100kHz |
|           |              |                             | 20° C / 100kHz     | −10° C / 100kHz |                                                         |                             | 20° C / 100kHz     | −10° C / 100kHz |                                                         |
| 2.2       | 2R2          |                             |                    |                 |                                                         | 5 × 11                      | 3.00               | 6.00            | 55                                                      |
| 3.3       | 3R3          |                             |                    |                 |                                                         | 5 × 11                      | 2.60               | 5.20            | 65                                                      |
| 4.7       | 4R7          | 5 × 11                      | 0.60               | 1.20            | 180                                                     | 5 × 11                      | 2.30               | 4.60            | 90                                                      |
| 6.8       | 6R8          | 4 × 7                       | 2.00               | 5.00            | 65                                                      |                             |                    |                 |                                                         |
| 10        | 100          | 5 × 11                      | 0.60               | 1.20            | 180                                                     | 5 × 11                      | 1.40               | 2.80            | 120                                                     |
|           |              | ▲ 5 × 7                     | 0.95               | 2.40            | 120                                                     | ▲ 4 × 11                    | 2.50               | 5.00            | 90                                                      |
| 12        | 120          | 5 × 7                       | 0.95               | 2.40            | 120                                                     |                             |                    |                 |                                                         |
| 18        | 180          | 4 × 11                      | 1.30               | 2.60            | 120                                                     | 5 × 11                      | 1.30               | 2.60            | 155                                                     |
| 22        | 220          | 5 × 11                      | 0.60               | 1.20            | 180                                                     | 5 × 11                      | 1.20               | 2.40            | 170                                                     |
| 27        | 270          | 5 × 11                      | 0.60               | 1.20            | 180                                                     | 5 × 15                      | 0.90               | 1.80            | 215                                                     |
|           |              | ▲ 6.3 × 7                   | 0.45               | 1.20            | 200                                                     |                             |                    |                 |                                                         |
| 33        | 330          | 5 × 11                      | 0.60               | 1.20            | 180                                                     | 6.3 × 11                    | 0.43               | 0.86            | 300                                                     |
| 39        | 390          | 5 × 15                      | 0.50               | 1.00            | 235                                                     |                             |                    |                 |                                                         |
| 47        | 470          | 6.3 × 11                    | 0.25               | 0.50            | 290                                                     | 6.3 × 11                    | 0.43               | 0.86            | 300                                                     |
| 56        | 560          | 6.3 × 11                    | 0.25               | 0.50            | 290                                                     | 6.3 × 15                    | 0.40               | 0.80            | 360                                                     |
| 82        | 820          | 6.3 × 15                    | 0.23               | 0.46            | 430                                                     | 8 × 11.5                    | 0.234              | 0.468           | 485                                                     |
| 100       | 101          | 8 × 11.5                    | 0.117              | 0.234           | 555                                                     | 8 × 11.5                    | 0.234              | 0.468           | 485                                                     |
| 120       | 121          |                             |                    |                 |                                                         | 8 × 15                      | 0.155              | 0.310           | 635                                                     |
|           |              |                             |                    |                 |                                                         | ▲ 10 × 12.5                 | 0.162              | 0.324           | 620                                                     |
| 150       | 151          | 8 × 11.5                    | 0.117              | 0.234           | 555                                                     | 10 × 12.5                   | 0.162              | 0.324           | 615                                                     |
| 180       | 181          |                             |                    |                 |                                                         | 8 × 20                      | 0.120              | 0.240           | 860                                                     |
|           |              |                             |                    |                 |                                                         | ▲ 10 × 16                   | 0.119              | 0.238           | 850                                                     |
| 220       | 221          | 10 × 12.5                   | 0.090              | 0.180           | 760                                                     | 10 × 16                     | 0.119              | 0.238           | 850                                                     |
|           |              | ▲ 8 × 15                    | 0.085              | 0.170           | 730                                                     | ▲ 10 × 20                   | 0.090              | 0.180           | 1030                                                    |
| 270       | 271          |                             |                    |                 |                                                         | 10 × 25                     | 0.082              | 0.164           | 1200                                                    |
| 330       | 331          | 10 × 16                     | 0.068              | 0.136           | 1050                                                    | 10 × 20                     | 0.090              | 0.180           | 1030                                                    |
|           |              | ▲ 8 × 20                    | 0.065              | 0.130           | 995                                                     | ▲ 10 × 31.5                 | 0.060              | 0.120           | 1610                                                    |
| 390       | 391          | 10 × 20                     | 0.052              | 0.104           | 1220                                                    | 12.5 × 20                   | 0.063              | 0.126           | 1480                                                    |
| 470       | 471          | 10 × 20                     | 0.052              | 0.104           | 1220                                                    | 12.5 × 20                   | 0.060              | 0.120           | 1500                                                    |
| 560       | 561          | 10 × 25                     | 0.045              | 0.090           | 1440                                                    | 12.5 × 25                   | 0.050              | 0.100           | 1832                                                    |
| 680       | 681          | 12.5 × 20                   | 0.038              | 0.076           | 1660                                                    | 12.5 × 25                   | 0.050              | 0.100           | 1840                                                    |
|           |              | ▲ 10 × 31.5                 | 0.035              | 0.070           | 1815                                                    | ▲ 16 × 20                   | 0.048              | 0.096           | 1840                                                    |
| 820       | 821          |                             |                    |                 |                                                         | 12.5 × 35.5                 | 0.034              | 0.068           | 2290                                                    |
|           |              |                             |                    |                 |                                                         | ▲ 18 × 20                   | 0.042              | 0.084           | 2420                                                    |
| 1000      | 102          | 12.5 × 25                   | 0.030              | 0.060           | 1950                                                    | 16 × 25                     | 0.034              | 0.068           | 2235                                                    |
| 1200      | 122          | 12.5 × 31.5                 | 0.025              | 0.050           | 2310                                                    | 16 × 31.5                   | 0.028              | 0.056           | 2700                                                    |
|           |              | ▲ 16 × 20                   | 0.029              | 0.058           | 2210                                                    | ▲ 18 × 25                   | 0.029              | 0.058           | 2610                                                    |
| 1500      | 152          | 16 × 25                     | 0.022              | 0.044           | 2555                                                    | 16 × 31.5                   | 0.028              | 0.056           | 2700                                                    |
|           |              | ▲ 12.5 × 35.5               | 0.022              | 0.044           | 2510                                                    | ▲ 16 × 35.5                 | 0.025              | 0.050           | 2790                                                    |
| 1800      | 182          | 16 × 25                     | 0.022              | 0.044           | 2555                                                    | 18 × 31.5                   | 0.025              | 0.050           | 3000                                                    |
|           |              | ▲ 18 × 20                   | 0.028              | 0.056           | 2490                                                    |                             |                    |                 |                                                         |
| 2200      | 222          | 16 × 31.5                   | 0.018              | 0.036           | 3010                                                    | 18 × 35.5                   | 0.023              | 0.046           | 3100                                                    |
|           |              | ▲ 18 × 25                   | 0.020              | 0.040           | 2740                                                    |                             |                    |                 |                                                         |
| 2700      | 272          | 16 × 35.5                   | 0.016              | 0.032           | 3150                                                    |                             |                    |                 |                                                         |
|           |              | ▲ 18 × 31.5                 | 0.016              | 0.032           | 3635                                                    |                             |                    |                 |                                                         |
| 3300      | 332          | 18 × 35.5                   | 0.015              | 0.030           | 3680                                                    |                             |                    |                 |                                                         |
| 4700      | 472          | 18 × 40                     | 0.014              | 0.028           | 3800                                                    |                             |                    |                 |                                                         |

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

UPW

## ■ Standard Ratings

| Cap.(μF) | V(Code)<br>Item<br>Code | 63 (1J)                     |                    |                |                                           | 100 (2A)                    |                    |                |                                           |
|----------|-------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
|          |                         | 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 / 100kHz      | -10°C / 100kHz |                                           |                             | 20°C / 100kHz      | -10°C / 100kHz |                                           |
| 2.2      | 2R2                     |                             |                    |                |                                           | 5 × 11                      | 9.80               | 19.6           | 44                                        |
| 3.3      | 3R3                     |                             |                    |                |                                           | 5 × 11                      | 6.60               | 13.2           | 58                                        |
| 4.7      | 4R7                     | 5 × 11                      | 4.70               | 9.40           | 68                                        | 5 × 11                      | 4.60               | 9.20           | 74                                        |
| 6.8      | 6R8                     | 5 × 11                      | 2.50               | 5.00           | 95                                        | 5 × 11                      | 3.50               | 7.00           | 95                                        |
|          |                         | ▲ 4 × 11                    | 3.50               | 7.00           | 80                                        |                             |                    |                |                                           |
| 10       | 100                     | 5 × 11                      | 2.10               | 4.20           | 110                                       | 6.3 × 11                    | 1.80               | 3.60           | 130                                       |
| 12       | 120                     | 5 × 11                      | 2.00               | 4.00           | 145                                       |                             |                    |                |                                           |
| 15       | 150                     | 6.3 × 11                    | 1.20               | 2.40           | 160                                       | 8 × 11.5                    | 0.83               | 1.66           | 180                                       |
| 18       | 180                     | 5 × 15                      | 1.30               | 2.60           | 200                                       | 6.3 × 15                    | 0.80               | 1.60           | 200                                       |
| 22       | 220                     | 6.3 × 11                    | 0.71               | 1.42           | 250                                       | 8 × 11.5                    | 0.68               | 1.36           | 230                                       |
| 33       | 330                     | 6.3 × 11                    | 0.71               | 1.42           | 250                                       | 10 × 12.5                   | 0.46               | 0.92           | 320                                       |
|          |                         | ▲ 8 × 15                    |                    |                |                                           | ▲ 8 × 15                    | 0.45               | 0.90           | 360                                       |
| 39       | 390                     | 6.3 × 15                    | 0.70               | 1.40           | 330                                       |                             |                    |                |                                           |
| 47       | 470                     | 8 × 11.5                    | 0.342              | 0.684          | 405                                       | 10 × 16                     | 0.37               | 0.74           | 420                                       |
|          |                         |                             |                    |                |                                           | ▲ 8 × 20                    | 0.37               | 0.74           | 420                                       |
| 68       | 680                     | 8 × 11.5                    | 0.342              | 0.684          | 405                                       | 10 × 20                     | 0.30               | 0.60           | 490                                       |
| 82       | 820                     |                             |                    |                |                                           | 10 × 25                     | 0.25               | 0.50           | 540                                       |
| 100      | 101                     | 10 × 12.5                   | 0.256              | 0.512          | 540                                       | 12.5 × 20                   | 0.18               | 0.36           | 580                                       |
|          |                         | ▲ 8 × 15                    | 0.230              | 0.460          | 535                                       |                             |                    |                |                                           |
| 120      | 121                     | 10 × 16                     | 0.194              | 0.388          | 600                                       |                             |                    |                |                                           |
| 150      | 151                     | 10 × 16                     | 0.194              | 0.388          | 660                                       | 12.5 × 25                   | 0.13               | 0.26           | 710                                       |
| 180      | 181                     | 10 × 20                     | 0.147              | 0.294          | 890                                       | 12.5 × 31.5                 | 0.12               | 0.24           | 790                                       |
|          |                         | ▲ 12.5 × 15                 | 0.150              | 0.300          | 1020                                      | ▲ 16 × 20                   | 0.13               | 0.26           | 750                                       |
| 220      | 221                     | 10 × 20                     | 0.147              | 0.294          | 885                                       | 16 × 25                     | 0.10               | 0.20           | 890                                       |
|          |                         | ▲ 10 × 25                   | 0.130              | 0.260          | 1050                                      | ▲ 18 × 20                   | 0.11               | 0.22           | 850                                       |
| 270      | 271                     | 16 × 15                     | 0.090              | 0.180          | 1410                                      |                             |                    |                |                                           |
| 330      | 331                     | 12.5 × 20                   | 0.085              | 0.170          | 1290                                      | 16 × 25                     | 0.090              | 0.18           | 1080                                      |
| 390      | 391                     | 12.5 × 25                   | 0.070              | 0.140          | 1720                                      | 18 × 25                     | 0.083              | 0.166          | 1260                                      |
|          |                         | ▲ 18 × 15                   | 0.086              | 0.172          | 1690                                      |                             |                    |                |                                           |
| 470      | 471                     | 12.5 × 25                   | 0.070              | 0.140          | 1720                                      | 16 × 31.5                   | 0.076              | 0.152          | 1310                                      |
|          |                         | ▲ 12.5 × 31.5               | 0.055              | 0.110          | 2090                                      |                             |                    |                |                                           |
|          |                         | ※ 16 × 20                   | 0.059              | 0.118          | 1770                                      |                             |                    |                |                                           |
| 560      | 561                     |                             |                    |                |                                           | 18 × 31.5                   | 0.068              | 0.136          | 1370                                      |
| 680      | 681                     | 16 × 25                     | 0.050              | 0.100          | 2160                                      | 16 × 35.5                   | 0.064              | 0.128          | 1410                                      |
|          |                         | ▲ 12.5 × 35.5               | 0.047              | 0.094          | 2270                                      |                             |                    |                |                                           |
|          |                         | ※ 18 × 20                   | 0.055              | 0.110          | 2290                                      |                             |                    |                |                                           |
| 820      | 821                     | 16 × 31.5                   | 0.043              | 0.086          | 2670                                      |                             |                    |                |                                           |
|          |                         | ▲ 18 × 25                   | 0.043              | 0.086          | 2590                                      |                             |                    |                |                                           |
| 1000     | 102                     | 16 × 31.5                   | 0.043              | 0.086          | 2770                                      | 18 × 40                     | 0.047              | 0.094          | 1520                                      |
|          |                         | ▲ 16 × 35.5                 | 0.036              | 0.072          | 2770                                      |                             |                    |                |                                           |
| 1200     | 122                     | 18 × 31.5                   | 0.032              | 0.064          | 2950                                      |                             |                    |                |                                           |
| 1500     | 152                     | 18 × 35.5                   | 0.030              | 0.060          | 3100                                      |                             |                    |                |                                           |
| 2200     | 222                     | 18 × 40                     | 0.028              | 0.056          | 3200                                      |                             |                    |                |                                           |

▲ : 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.

| Cap. (μF) | V(Code)<br>Code | 160         |      | 200       |      | 250         |      | 315       |     | 350         |     | 400         |     | 450         |     |
|-----------|-----------------|-------------|------|-----------|------|-------------|------|-----------|-----|-------------|-----|-------------|-----|-------------|-----|
|           |                 | 2C          |      | 2D        |      | 2E          |      | 2F        |     | 2V          |     | 2G          |     | 2W          |     |
| 0.47      | R47             | 6.3 × 11    | 12   | 6.3 × 11  | 12   | 6.3 × 11    | 12   | 8 × 11.5  | 11  | 8 × 11.5    | 11  |             |     |             |     |
| 1         | 010             | 6.3 × 11    | 17   | 6.3 × 11  | 17   | 6.3 × 11    | 17   | 8 × 11.5  | 16  | 10 × 12.5   | 17  | 10 × 12.5   | 16  | 10 × 12.5   | 18  |
| 2.2       | 2R2             | 6.3 × 11    | 25   | 6.3 × 11  | 25   | 8 × 11.5    | 29   | 10 × 12.5 | 28  | 10 × 16     | 31  | 10 × 16     | 27  | 10 × 20     | 29  |
| 3.3       | 3R3             | 8 × 11.5    | 36   | 8 × 11.5  | 36   | 10 × 12.5   | 42   | 10 × 12.5 | 34  | 10 × 16     | 38  | 10 × 20     | 36  | 12.5 × 20   | 41  |
| 4.7       | 4R7             | 8 × 11.5    | 43   | 10 × 12.5 | 50   | 10 × 12.5   | 50   | 10 × 16   | 45  | 10 × 20     | 49  | 10 × 20     | 43  | 12.5 × 20   | 49  |
| 10        | 100             | 10 × 12.5   | 70   | 10 × 16   | 80   | 10 × 20     | 88   | 10 × 20   | 72  | 12.5 × 20   | 82  | 12.5 × 25   | 72  | 16 × 25     | 75  |
| 22        | 220             | 10 × 20     | 130  | 10 × 20   | 140  | 12.5 × 25   | 155  | 12.5 × 25 | 120 | 16 × 25     | 130 | 16 × 25     | 110 | 16 × 31.5   | 115 |
| 33        | 330             | 12.5 × 20   | 180  | 12.5 × 25 | 190  | 12.5 × 25   | 190  | 16 × 25   | 155 | 16 × 31.5   | 160 | 16 × 31.5   | 140 | ● 18 × 35.5 | 145 |
| 47        | 470             | 12.5 × 25   | 220  | 12.5 × 25 | 220  | 16 × 25     | 230  | 16 × 35.5 | 190 | ● 18 × 35.5 | 200 | ● 18 × 35.5 | 170 | 20 × 40     | 175 |
| 100       | 101             | 16 × 25     | 330  | 16 × 31.5 | 335  | ● 18 × 35.5 | 340  | ▲ 18 × 40 | 285 | 20 × 40     | 290 | 22 × 50     | 350 | 25 × 50     | 350 |
| 220       | 221             | ● 18 × 35.5 | 500  | ▲ 18 × 40 | 515  | 20 × 40     | 525  | 22 × 50   | 540 | 25 × 50     | 550 |             |     |             |     |
| 330       | 331             | 20 × 40     | 900  | 22 × 40   | 1100 | 22 × 50     | 1150 |           |     |             |     |             |     |             |     |
| 470       | 471             | 22 × 50     | 1200 | 22 × 50   | 1310 | 25 × 50     | 1350 |           |     |             |     |             |     |             |     |

※1 Rated ripple current (mArms) at 105°C 120Hz

Size φ20 × 31 is available for capacitors marked "●"

Size φ20 × 35 is available for capacitors marked "▲"

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