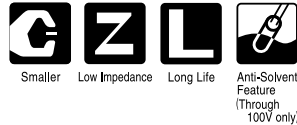
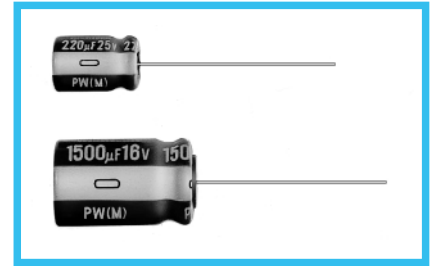
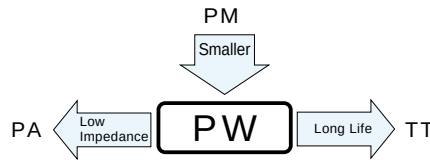


**PW** Miniature Sized, Low Impedance,  
High Reliability For Switching Power Supplies  
series



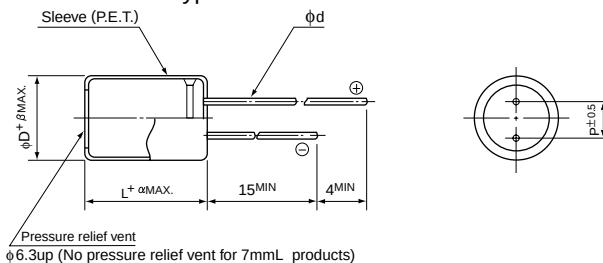
- Smaller case size and lower impedance than PM series.
- Low impedance and high reliability withstanding 2000 hours to 8000 hours.
- Capacitance ranges available based on the numerical values in E12 series under JIS.
- Compliant to the RoHS directive (2011/65/EU).



## 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, leakage current is not more than 0.03CV or 4 (μA), whichever is greater. |          |         |         |          | CV ≤ 1000: I = 0.1CV+40 (μA) max. (1 minute's)<br>CV > 1000: I = 0.04CV+100 (μA) max. (1 minute's) |      |           |            |           |           |                    |  |                                                   |  |  |  |  |  |  |  |  |  |
| 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

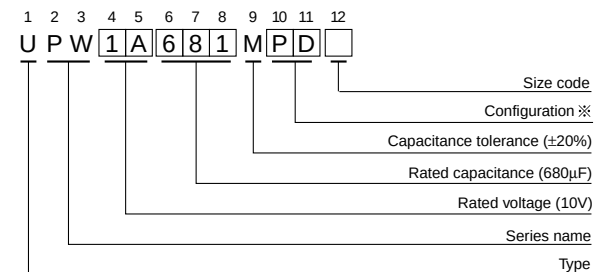


|   |              |
|---|--------------|
| α | (L = 7) 1.0  |
|   | (L < 20) 1.5 |
|   | (L ≥ 20) 2.0 |

| 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  | 0.8 | 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  | 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 | 0.47 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.

## ■Standard Ratings

| Cap.(μF) | V(Code)<br>Item<br>Code | 6.3 (0J)                    |                    |                |                                                        | 10 (1A)                     |                    |                |                                                        |
|----------|-------------------------|-----------------------------|--------------------|----------------|--------------------------------------------------------|-----------------------------|--------------------|----------------|--------------------------------------------------------|
|          |                         | 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 |                                                        |
| 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.

## ■ Standard Ratings

| Cap. (μF) | V(Code) | Item Code                | 16 (1C)                     |                    |                | 25 (1E)                                   |                             |                    |                |                                           |
|-----------|---------|--------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
|           |         |                          | 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 |                                           |
| 4.7       | 4R7     |                          |                             |                    |                | 5 × 11                                    | 0.60                        | 1.20               | 180            |                                           |
| 10        | 100     | 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      |                                           |
| 15        | 150     | 4 × 7                    | 2.00                        | 5.00               | 65             |                                           |                             |                    |                |                                           |
| 22        | 220     | 5 × 11                   | 0.60                        | 1.20               | 180            | 5 × 11                                    | 0.60                        | 1.20               | 180            |                                           |
|           |         | ▲ 5 × 7                  | 0.95                        | 2.40               | 120            | ▲ 5 × 7                                   | 0.95                        | 2.40               | 120            |                                           |
| 27        | 270     | 5 × 7                    | 0.95                        | 2.40               | 120            | 4 × 11                                    | 1.30                        | 2.60               | 120            |                                           |
| 33        | 330     | 5 × 11                   | 0.60                        | 1.20               | 180            | 5 × 11                                    | 0.60                        | 1.20               | 180            |                                           |
|           |         | ▲ 6.3 × 7                | 0.45                        | 1.20               | 200            |                                           |                             |                    |                |                                           |
| 39        | 390     | 4 × 11                   | 1.30                        | 2.60               | 120            | 5 × 11<br>▲ 6.3 × 7                       | 0.60<br>0.45                | 1.20<br>1.20       | 180<br>200     |                                           |
| 47        | 470     | 5 × 11                   | 0.60                        | 1.20               | 180            | 5 × 11                                    | 0.60                        | 1.20               | 180            |                                           |
| 56        | 560     | 5 × 11                   | 0.60                        | 1.20               | 180            | 5 × 15                                    | 0.50                        | 1.00               | 235            |                                           |
|           |         | ▲ 6.3 × 7                | 0.45                        | 1.20               | 200            |                                           |                             |                    |                |                                           |
| 82        | 820     | 5 × 15                   | 0.50                        | 1.00               | 235            | 6.3 × 11                                  | 0.25                        | 0.50               | 290            |                                           |
| 100       | 101     | 6.3 × 11                 | 0.25                        | 0.50               | 290            | 6.3 × 11                                  | 0.25                        | 0.50               | 290            |                                           |
| 120       | 121     | 6.3 × 11                 | 0.25                        | 0.50               | 290            | 6.3 × 15                                  | 0.23                        | 0.46               | 430            |                                           |
| 150       | 151     | 6.3 × 11                 | 0.25                        | 0.50               | 290            | 8 × 11.5                                  | 0.117                       | 0.234              | 555            |                                           |
| 180       | 181     | 6.3 × 15                 | 0.23                        | 0.46               | 430            |                                           |                             |                    |                |                                           |
| 220       | 221     | 8 × 11.5                 | 0.117                       | 0.234              | 555            | 8 × 11.5                                  | 0.117                       | 0.234              | 555            |                                           |
| 330       | 331     | 8 × 11.5                 | 0.117                       | 0.234              | 555            | 10 × 12.5                                 | 0.090                       | 0.180              | 760            |                                           |
|           |         |                          |                             |                    | ▲ 8 × 15       | 0.085                                     | 0.170                       | 730                |                |                                           |
| 470       | 471     | 10 × 12.5                | 0.090                       | 0.180              | 760            | 10 × 16                                   | 0.068                       | 0.136              | 1050           |                                           |
|           |         | ▲ 8 × 15                 | 0.085                       | 0.170              | 730            | ▲ 8 × 20                                  | 0.065                       | 0.130              | 995            |                                           |
| 560       | 561     |                          |                             |                    | 10 × 20        | 0.052                                     | 0.104                       | 1220               |                |                                           |
| 680       | 681     | 10 × 16                  | 0.068                       | 0.136              | 1050           | 10 × 20                                   | 0.052                       | 0.104              | 1220           |                                           |
|           |         | ▲ 8 × 20                 | 0.065                       | 0.130              | 995            |                                           |                             |                    |                |                                           |
| 820       | 821     | 10 × 20                  | 0.052                       | 0.104              | 1220           | 10 × 25                                   | 0.045                       | 0.090              | 1440           |                                           |
| 1000      | 102     | 10 × 20                  | 0.052                       | 0.104              | 1220           | 12.5 × 20                                 | 0.038                       | 0.076              | 1660           |                                           |
|           |         |                          |                             |                    | ▲ 10 × 31.5    | 0.035                                     | 0.070                       | 1815               |                |                                           |
| 1200      | 122     | 10 × 25                  | 0.045                       | 0.090              | 1440           |                                           |                             |                    |                |                                           |
| 1500      | 152     | 12.5 × 20                | 0.038                       | 0.076              | 1655           | 16 × 25                                   | 0.022                       | 0.044              | 2555           |                                           |
|           |         | ▲ 10 × 31.5              | 0.035                       | 0.070              | 1815           | ▲ 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              | 1945           | 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<br>▲ 16 × 20 | 0.025<br>0.029              | 0.050<br>0.058     | 2310<br>2210   | 16 × 25                                   | 0.022                       | 0.044              | 2555           |                                           |
| 3300      | 332     | 16 × 25                  | 0.022                       | 0.044              | 2555           | 16 × 31.5                                 | 0.018                       | 0.036              | 3010           |                                           |
|           |         | ▲ 12.5 × 35.5            | 0.022                       | 0.044              | 2510           | ▲ 18 × 25                                 | 0.020                       | 0.040              | 2740           |                                           |
| 3900      | 392     | 16 × 25                  | 0.022                       | 0.044              | 2560           | 16 × 35.5                                 | 0.016                       | 0.032              | 3150           |                                           |
|           |         | ▲ 18 × 20                | 0.028                       | 0.056              | 2490           | ▲ 18 × 31.5                               | 0.016                       | 0.032              | 3635           |                                           |
| 4700      | 472     | 16 × 31.5<br>▲ 18 × 25   | 0.018<br>0.020              | 0.036<br>0.040     | 3010<br>2740   | 18 × 35.5                                 | 0.015                       | 0.030              | 3680           |                                           |
|           |         | 16 × 35.5<br>▲ 18 × 31.5 | 0.016<br>0.016              | 0.032<br>0.032     | 3150<br>3635   |                                           |                             |                    |                |                                           |
| 6800      | 682     | 18 × 35.5                | 0.015                       | 0.030              | 3680           | 18 × 40                                   | 0.014                       | 0.028              | 3800           |                                           |
| 8200      | 822     | 18 × 35.5                | 0.015                       | 0.030              | 3680           |                                           |                             |                    |                |                                           |
| 10000     | 103     | 18 × 40                  | 0.014                       | 0.028              | 3800           |                                           |                             |                    |                |                                           |

▲ : 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.

## ■ Standard Ratings

| V(Code)  |      | 35 (1V)                     |                    |                |                                           | 50 (1H )                    |                    |                |                                           |
|----------|------|-----------------------------|--------------------|----------------|-------------------------------------------|-----------------------------|--------------------|----------------|-------------------------------------------|
| Cap.(μF) | Item | 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 |
|          | Code |                             | 20°C / 100kHz      | −10°C / 100kHz |                                           |                             | 20°C / 100kHz      | −10°C / 100kHz |                                           |
| 0.47     | R47  |                             |                    |                |                                           | 5 × 11                      | 5.00               | 10.0           | 25                                        |
| 1        | 010  |                             |                    |                |                                           | 5 × 11                      | 3.50               | 7.00           | 40                                        |
| 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.

## ■ Standard Ratings

| Cap.(μF) | V(Code) | Item          | 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 |                                           |
| 0.47     | R47     |               |                             |                    |                |                                           | 5 × 11                      | 43.0               | 86.0           | 20                                        |
| 1        | 010     |               |                             |                    |                |                                           | 5 × 11                      | 20.0               | 40.0           | 30                                        |
| 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                    | 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) | 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  | Δ 18 × 40 | 285 | 20 × 40     | 290 | 22 × 50     | 350 | 25 × 50     | 350 |
| 220       | 221     | ● 18 × 35.5 | 500  | Δ 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 |           |     |             |     |             |     |             |     |

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

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

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

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

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