

**SM Snap-in terminal Type, Standard Series**

- ◆ Applicable Standard  
Characteristic W of JIS C 5141
- ◆ Operating Temperature Range  
-40°C ~ +85°C (6.3~250V.DC)  
-25°C ~ +85°C (315~450V.DC)
- ◆ Rated Working Voltage Range  
6.3~450 V.DC

## ◆ Rated Voltage and Surge Voltage

|                   |     |    |    |    |    |    |    |     |     |     |     |     |     |     |
|-------------------|-----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| Rated Voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| Surge Voltage (V) | 8   | 13 | 20 | 32 | 44 | 63 | 79 | 125 | 200 | 250 | 300 | 400 | 450 | 500 |

## ◆ DC Leakage Current

Applying the rated DC voltage to the capacitor. The leakage current is measured at 5 minutes after the DC voltage across the capacitor reached the rated voltage. The leakage current shall not exceed the value below. (at 25°C)

$$I \leq 3\sqrt{CV} \mu A,$$

I: Leakage Current ( $\mu A$ ) C: Nominal Capacitance ( $\mu F$ )

V: Rated Voltage (V)

## ◆ Capacitance Tolerance

The capacitance shall be within the following tolerance to the nominal capacitance.

-20% ~ +20% (At 25°C, 120Hz)

◆ Tangent of Loss Angle (Tan  $\delta$ )

Tan  $\delta$  shall not exceed the value below. (At 25°C, 120Hz)

When nominal capacitance is over 1000  $\mu F$ . Tan  $\delta$  shall be added 0.01 to the listed value with increase of every 1000  $\mu F$ .

|                   |      |      |       |      |       |        |         |      |
|-------------------|------|------|-------|------|-------|--------|---------|------|
| Rated Voltage (V) | 6.3  | 10   | 16,25 | 35   | 50,63 | 80,100 | 160~400 | 450  |
| Tan $\delta$      | 0.45 | 0.40 | 0.35  | 0.30 | 0.25  | 0.20   | 0.15    | 0.20 |

## ◆ Load Life

The following specifications shall be satisfied when the capacitors are restored to 25°C after the rated voltage is applied for 2000 hours at 85°C.

|                    |  |
|--------------------|--|
| Capacitance Change | $\leq \pm 20\%$ of the initial measured value. |
| Tan $\delta$       | $\leq 200\%$ of the initial specified value.   |
| Leakage Current    | $\leq$ The initial specified value.            |

## ◆ Shelf Life

The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1000 hours at 85°C without voltage applied.

The capacitors shall be subjected to voltage treatment specified in item 4.4 of JIS C 5102, before the measurements.

|                    |  |
|--------------------|--|
| Capacitance Change | $\leq \pm 20\%$ of the initial measured value. |
| Tan $\delta$       | $\leq 200\%$ of the initial specified value.   |
| Leakage Current    | $\leq$ The initial specified value.            |

## ◆ Solder ability

The lead wires shall be dipped into Methanol (JIS K 1501) or Isopropyl Alcohol (JIS K 1522 or JIS K 8839) solution of 10  $\pm$ 20% Rosin (JIS K 5902) for 2  $\pm$ 0.5 seconds, and then dipped into solder H63A (JIS Z 3282) at 235  $\pm$ 5°C for 2  $\pm$ 0.5 seconds.

The depth of immersion shall be 2 to 2.5 mm of the capacitor body.

After immersion, the solder shall cover at least 3/4 of the lead wire surface immersed.

## ◆ Lead Strength

## Pull Strength

The lead wire shall not get loose or cut off, while a parallel force is gradually applied to the lead wire up to 5N and retained for 10 second.

## Bending Strength

Apply the 0.25Kg weight to the end of the lead wire, and lean the capacitors body 90° and return to the original position within approximately 5 seconds.

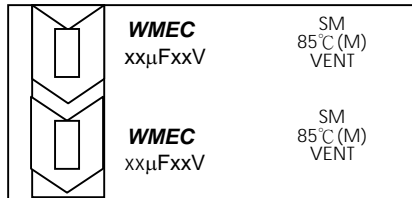
Then, repeat this cycle in the posited direction at the same speed. After that, the lead wire shall not loose or cut off.

◆ Marking

Color Style: white marking on black sleeve.

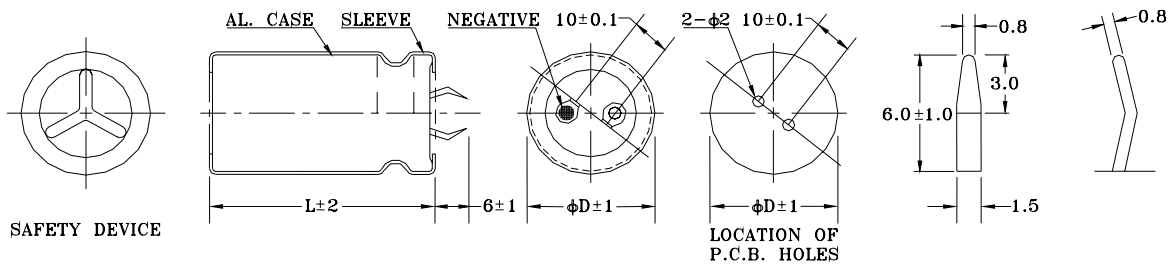
The following items shall be marked on each capacitor.

Example:



- (1) Series Name
- (2) Maximum Operating Temperature
- (3) Capacitance Tolerance
- (4) Polarity
- (5) WMEC Electronics Co., Ltd. Marking
- (6) Nominal Capacitance
- (7) Rated Voltage

◆ Dimensions (mm)



◆ Case Size & Permissible Max. Ripple Current Case Size

Max. Ripple Current : mA (rms) ( 85°C,120Hz)

| wv<br>ΦD<br>μF | 6.3   |      |       |      |       |      |       |      | 10    |       |       |       |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |       | 25    |       | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C   | SIZE  | R.C   | SIZE  | R.C  | SIZE  | R.C  |
| 6800           |       |      |       |      |       |      |       |      |       | 22x25 | 2.66  |       |       |      |       |      |
| 10000          | 22x25 | 2.92 |       |      |       |      |       |      |       | 22x30 | 3.31  | 25x25 | 3.41  |      |       |      |
| 15000          | 22x35 | 3.83 | 25x30 | 3.97 | 30x25 | 4.07 |       |      | 22x40 | 4.56  | 25x30 | 4.42  | 30x25 | 4.29 |       |      |
| 22000          |       |      | 25x40 | 4.99 | 30x30 | 4.89 | 35x25 | 4.99 |       |       | 25x40 | 5.23  | 30x35 | 5.40 | 35x30 | 5.53 |
| 33000          |       |      | 25x50 | 6.10 | 30x40 | 6.05 | 35x30 | 5.91 |       |       |       |       | 30x45 | 6.57 | 35x35 | 6.46 |
| 47000          |       |      |       |      | 30x50 | 7.14 | 35x40 | 7.06 |       |       |       |       |       |      |       |      |

| wv<br>ΦD<br>μF | 16    |      |       |      |       |      |       |      | 25    |       |       |       |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |       | 25    |       | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C   | SIZE  | R.C   | SIZE  | R.C  | SIZE  | R.C  |
| 3300           |       |      |       |      |       |      |       |      |       | 22x25 | 2.10  |       |       |      |       |      |
| 4700           | 22x25 | 2.47 |       |      |       |      |       |      |       | 22x30 | 2.63  | 25x25 | 2.71  |      |       |      |
| 6800           | 22x30 | 3.06 | 25x25 | 3.15 |       |      |       |      | 22x35 | 3.24  | 25x30 | 3.36  | 30x25 | 3.44 |       |      |
| 10000          | 22x35 | 3.76 | 25x30 | 3.89 | 30x25 | 3.99 |       |      | 22x45 | 4.44  | 25x40 | 4.32  | 30x30 | 4.23 | 35x25 | 4.32 |
| 15000          | 22x45 | 4.74 | 25x40 | 4.94 | 30x30 | 4.83 | 35x25 | 4.94 |       |       | 25x40 | 5.39  | 30x40 | 5.34 | 35x30 | 5.22 |
| 22000          |       |      | 25x45 | 5.76 | 30x40 | 5.96 | 35x30 | 5.82 |       |       |       |       | 30x50 | 6.48 | 35x40 | 6.41 |
| 33000          |       |      |       |      | 30x50 | 7.13 | 35x45 | 7.35 |       |       |       |       |       |      |       |      |

| wv<br>ΦD<br>μF | 35    |      |       |      |       |      |       |      | 50    |       |       |       |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |       | 25    |       | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C   | SIZE  | R.C   | SIZE  | R.C  | SIZE  | R.C  |
| 1500           |       |      |       |      |       |      |       |      |       | 22x25 | 2.01  |       |       |      |       |      |
| 2200           | 22x25 | 1.94 |       |      |       |      |       |      |       | 22x30 | 2.50  | 25x25 | 2.58  |      |       |      |
| 3300           | 22x30 | 2.48 | 25x25 | 2.55 |       |      |       |      | 22x35 | 3.14  | 25x30 | 3.26  |       |      |       |      |
| 4700           | 22x35 | 3.06 | 25x30 | 3.17 | 30x25 | 3.25 |       |      | 22x40 | 4.02  | 25x35 | 3.98  | 30x25 | 3.34 |       |      |
| 6800           | 22x45 | 3.91 | 25x40 | 3.87 | 30x30 | 3.99 | 35x25 | 4.07 |       |       | 25x42 | 5.20  | 30x30 | 4.10 | 35x25 | 4.19 |
| 10000          |       |      | 25x50 | 5.10 | 30x40 | 5.06 | 35x30 | 4.94 |       |       |       |       | 35x50 | 5.16 | 35x30 | 5.04 |
| 15000          |       |      |       |      | 30x50 | 6.22 | 35x40 | 6.15 |       |       |       |       | 30x50 | 6.32 | 35x40 | 6.25 |

| wv<br>ΦD<br>μF | 63    |      |       |      |       |      |       |      | 80    |       |       |       |       |       |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |       | 25    |       | 30    |       | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C   | SIZE  | R.C   | SIZE  | R.C   | SIZE  | R.C  |
| 1000           |       |      |       |      |       |      |       |      |       | 22x35 | 2.17  |       |       |       |       |      |
| 1500           | 22x35 | 2.01 |       |      |       |      |       |      |       | 22x35 | 2.83  | 25x30 | 2.93  | 30x25 | 3.00  |      |
| 2200           | 22x35 | 2.65 | 25x30 | 2.75 | 30x25 | 2.81 |       |      | 22x40 | 3.42  | 25x35 | 3.55  | 30x30 | 3.66  | 35x25 | 3.74 |
| 3300           | 22x45 | 3.47 | 25x40 | 3.62 | 30x30 | 3.54 | 35x25 | 3.62 |       |       | 25x45 | 4.56  | 30x35 | 4.50  | 35x30 | 4.61 |
| 4700           |       |      | 25x45 | 4.38 | 30x35 | 4.32 | 35x30 | 4.43 |       |       |       |       | 30x35 | 5.63  | 35x40 | 5.80 |
| 6800           |       |      | 25x52 | 5.21 | 30x45 | 5.38 | 35x40 | 5.54 |       |       |       |       | 30x52 | 6.12  |       |      |
| 10000          |       |      |       |      | 30x60 | 6.78 |       |      |       |       |       |       |       |       |       |      |

◆ Case Size & Permissible Max. Ripple Current Case Size

Max. Ripple Current : mA (rms) (85°C, 120Hz)

| wv<br>ΦD<br>μF | 100   |      |       |      |       |      |       |      | 160   |      |       |      |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |      | 25    |      | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  |
| 220            |       |      |       |      |       |      |       |      | 22x25 | 1.09 |       |      |       |      |       |      |
| 330            |       |      |       |      |       |      |       |      | 22x30 | 1.42 | 25x25 | 1.46 |       |      |       |      |
| 470            |       |      |       |      |       |      |       |      | 22x40 | 1.89 | 25x35 | 1.96 | 30x25 | 1.90 |       |      |
| 680            | 22x25 | 1.79 |       |      |       |      |       |      | 22x50 | 2.49 | 25x45 | 2.60 | 30x35 | 2.56 | 35x30 | 2.62 |
| 1000           | 22x35 | 2.45 | 25x30 | 2.53 | 30x25 | 2.60 |       |      |       |      |       |      | 30x45 | 3.40 | 35x40 | 3.50 |
| 1500           | 22x45 | 3.12 | 25x35 | 3.09 | 30x30 | 3.18 | 35x25 | 3.25 |       |      |       |      |       |      | 35x50 | 4.35 |
| 2200           |       |      | 25x45 | 3.91 | 30x35 | 3.85 | 35x30 | 3.95 |       |      |       |      |       |      |       |      |
| 3300           |       |      |       |      | 30x45 | 4.93 | 35x35 | 4.85 |       |      |       |      |       |      |       |      |

| wv<br>ΦD<br>μF | 200   |      |       |      |       |      |       |      | 250   |      |       |      |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |      | 25    |      | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  |
| 180            | 22x30 |      |       |      |       |      |       |      | 22x30 | 0.96 | 25x25 | 0.99 |       |      |       |      |
| 220            | 22x25 | 1.16 | 25x25 | 1.19 |       |      |       |      | 22x35 | 1.23 | 25x30 | 1.27 | 30x25 | 1.30 |       |      |
| 330            | 22x35 | 1.50 | 25x30 | 1.56 | 30x25 | 1.60 |       |      | 22x45 | 1.66 | 25x35 | 1.64 | 30x30 | 1.69 | 35x25 | 1.73 |
| 450            | 22x35 | 1.78 |       |      |       |      |       |      |       |      |       |      |       |      |       |      |
| 470            | 22x40 | .81  | 25x40 | 2.06 | 30x30 | 2.02 | 35x25 | 2.06 |       |      | 25x45 | 2.16 | 30x35 | 2.13 | 35x30 | 2.18 |
| 560            | 22x40 | 1.81 |       |      |       |      |       |      |       |      |       |      |       |      |       |      |
| 680            | 22x50 | 2.75 | 25x50 | 2.71 | 30x40 | 2.69 | 35x30 | 2.62 |       |      |       |      | 30x45 | 2.81 | 35x40 | 2.89 |
| 820            | 22x50 | 2.95 |       |      |       |      |       |      |       |      |       |      |       |      |       |      |
| 1000           |       |      | 25x50 | 3.62 | 30x51 | 3.54 | 35x40 | 3.50 |       |      |       |      |       |      | 35x50 | 3.79 |

| wv<br>ΦD<br>μF | 315   |      |       |      |       |      |       |      | 350   |      |       |      |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |      | 25    |      | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  |
| 100            | 22x25 | 0.73 | 25x25 | 0.86 |       |      |       |      | 22x30 | 0.78 |       |      |       |      |       |      |
| 150            | 22x35 | 1.01 | 25x30 | 1.05 | 30x25 | 1.08 |       |      | 22x40 | 1.07 | 25x30 | 1.05 | 30x25 | 1.08 |       |      |
| 220            | 22x45 | 1.35 | 25x35 | 1.34 | 30x30 | 1.38 | 35x25 | 1.41 | 22x50 | 1.41 | 25x45 | 1.48 | 30x35 | 1.46 | 35x25 | 1.41 |
| 330            |       |      | 25x45 | 1.81 | 30x35 | 1.79 | 35x30 | 1.83 |       |      |       |      | 30x45 | 1.95 | 35x35 | 1.92 |
| 470            |       |      |       |      | 30x51 | 2.33 | 35x35 | 2.29 |       |      |       |      | 30x60 | 2.61 | 35x45 | 2.50 |
| 680            |       |      |       |      |       |      | 35x45 | 3.01 |       |      |       |      |       |      |       |      |

| wv<br>ΦD<br>μF | 400   |      |       |      |       |      |       |      | 450   |      |       |      |       |      |       |      |
|----------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|                | 22    |      | 25    |      | 30    |      | 35    |      | 22    |      | 25    |      | 30    |      | 35    |      |
|                | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  | SIZE  | R.C  |
| 47             | 22x25 | 0.50 |       |      |       |      |       |      | 22x30 | 0.41 |       |      |       |      |       |      |
| 68             | 22x30 | 0.64 | 25x25 | 0.66 |       |      |       |      | 22x35 | 0.52 | 25x30 | 0.54 | 30x25 | 0.55 |       |      |
| 100            | 22x40 | 0.87 | 25x25 | 0.86 | 30x25 | 0.88 |       |      | 22x45 | 0.70 | 25x40 | 0.73 | 30x30 | 0.71 | 35x25 |      |
| 150            |       |      | 25x45 | 1.22 | 30x35 | 1.20 | 35x30 | 1.23 |       |      | 25x50 | 0.97 | 30x40 | 0.96 | 35x30 | 0.73 |
| 220            |       |      |       |      | 30x40 | 1.53 | 35x35 | 1.57 |       |      |       |      | 30x50 | 1.27 | 35x40 | 0.94 |
| 680            |       |      |       |      |       |      | 35x50 | 2.00 |       |      |       |      |       |      |       |      |

## ◆ Frequency Multipliers

| Freq.(Hz)<br>W <sub>v</sub> | 60(50) | 120 | 500  | 1K   | ≥ 10K |
|-----------------------------|--------|-----|------|------|-------|
| 6.3~100                     | 0.88   | 1   | 1.06 | 1.15 | 1.20  |
| 160~250                     | 0.85   | 1   | 1.20 | 1.25 | 1.45  |
| 315~450                     | 0.88   | 1   | 1.15 | 1.20 | 1.40  |

## ◆ Temperature Multipliers

| Temp. (°C)<br>WV | 40  | 60   | 70   | 85   |
|------------------|-----|------|------|------|
| 6.3 ~ 450        | 1.9 | 1.42 | 1.30 | 1.00 |

## ◆ Packaging Specification

| Case size<br>φ D | Carton Box Capacity<br>(pcs) | Carton Box Size |       |       |
|------------------|------------------------------|-----------------|-------|-------|
|                  |                              | L(mm)           | H(mm) | W(mm) |
| 22               | 600                          | 470             | 310   | 310   |
| 30               | 500                          | 470             | 310   | 310   |
| 35               | 400                          | 470             | 310   | 310   |

The following s items hall be marked on the box.

|               |              |      |
|---------------|--------------|------|
| <b>WMEC</b> ® | Customer     |      |
| WMEC P/N      | PO. No.      |      |
| Lot No.       | Customer P/N |      |
| Final Date    | Description  |      |
| Inspection    | Quantity     | PCS. |

## ◆ Other

For other specifications, Characteristic W of JIS C 5141 shall be satisfied.

Aluminum Electrolytic Capacitors may be damaged by corrosion, which is caused by and halogen Ted hydrocarbon solvents.

Please let us know in advance the solvent name and conditions for your P.C.B. cleaning.

We guarantee our products without any prohibited substance about environment.