

# KWA Series

- Ideal for low profile power supply applications
- Longer life form KHE series
- Rated voltage range : 400 to 450V<sub>dc</sub>, Capacitance range : 27 to 120μF
- Endurance with ripple current : 5,000 hours at 105°C
- Non solvent resistant type
- RoHS2 Compliant

KWA

Longer life  
KHE

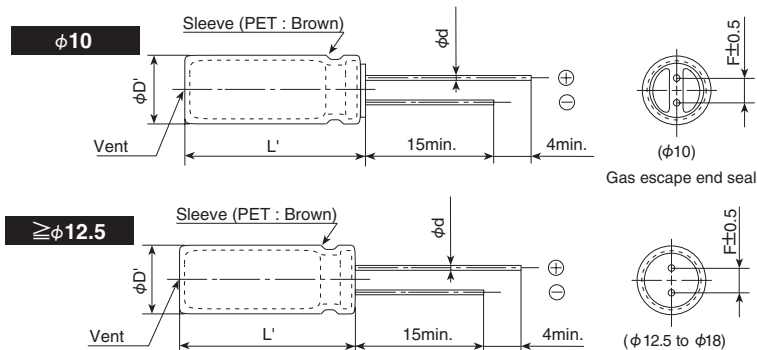


## SPECIFICATIONS

| Items                                                        | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |                 |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|-----------------|
| Category                                                     | -40 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |                 |
| Temperature Range                                            |                                                                                                                                                                                                                                                                                       |                                      |      |      |                 |
| Rated Voltage Range                                          | 400 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |      |      |                 |
| Capacitance Tolerance                                        | ± 20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |                 |
| Leakage Current                                              | I=0.04CV+100 (after 1 minute)<br>I=0.02CV+25 (after 5 minutes)<br>Where, I : Max. leakage current(μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃)                                                                                                                   |                                      |      |      |                 |
| Dissipation Factor<br>(tan δ )                               | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 400 to 450V                          |      |      | (at 20℃, 120Hz) |
|                                                              | tan δ (Max.)                                                                                                                                                                                                                                                                          | 0.20                                 |      |      |                 |
| Low Temperature<br>Characteristics<br>(Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 400V                                 | 420V | 450V | (at 120Hz)      |
|                                                              | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 5                                    | 6    | 6    |                 |
|                                                              | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 6                                    | —    | —    |                 |
| Endurance                                                    | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 5,000 hours at 105℃.                                         |                                      |      |      |                 |
|                                                              | Capacitance change                                                                                                                                                                                                                                                                    | ≤ ±20% of the initial value          |      |      |                 |
|                                                              | D.F. (tan δ )                                                                                                                                                                                                                                                                         | ≤200% of the initial specified value |      |      |                 |
|                                                              | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |                 |
| Shelf Life                                                   | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |                 |
|                                                              | Capacitance change                                                                                                                                                                                                                                                                    | ≤ ±20% of the initial value          |      |      |                 |
|                                                              | D.F. (tan δ )                                                                                                                                                                                                                                                                         | ≤200% of the initial specified value |      |      |                 |
|                                                              | Leakage current                                                                                                                                                                                                                                                                       | ≤500% of the initial specified value |      |      |                 |

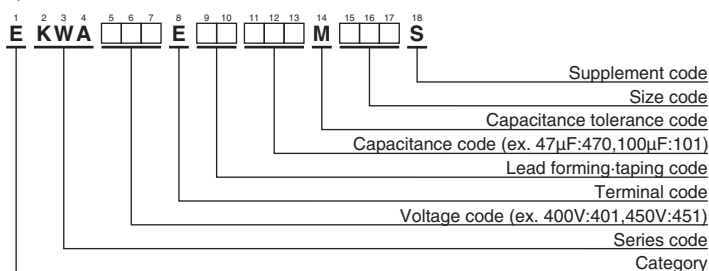
## DIMENSIONS [mm]

● Terminal Code : E



| φD  | 10          | 12.5 | 14.5 | 16  | 18  |
|-----|-------------|------|------|-----|-----|
| φd  | 0.6         | 0.6  | 0.8  | 0.8 | 0.8 |
| F   | 5.0         | 5.0  | 7.5  | 7.5 | 7.5 |
| φD' | φD+0.5 max. |      |      |     |     |
| L'  | L+2.0 max.  |      |      |     |     |

## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|--------------------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|-------|--------------------------------------------------------------|--------------------|
| 400                      | 33          | 10×30                 | 0.20  | 320                                                          | EKWA401E□□330MJ30S | 450                      | 27          | 10×30                 | 0.20  | 290                                                          | EKWA451E□□270MJ30S |
|                          | 39          | 10×35                 | 0.20  | 370                                                          | EKWA401E□□390MJ35S |                          | 33          | 10×35                 | 0.20  | 340                                                          | EKWA451E□□330MJ35S |
|                          | 47          | 10×40                 | 0.20  | 420                                                          | EKWA401E□□470MJ40S |                          | 39          | 10×40                 | 0.20  | 380                                                          | EKWA451E□□390MJ40S |
|                          | 56          | 10×45                 | 0.20  | 480                                                          | EKWA401E□□560MJ45S |                          | 47          | 10×45                 | 0.20  | 440                                                          | EKWA451E□□470MJ45S |
|                          | 56          | 12.5×30               | 0.20  | 460                                                          | EKWA401E□□560MK30S |                          | 47          | 12.5×30               | 0.20  | 420                                                          | EKWA451E□□470MK30S |
|                          | 68          | 12.5×35               | 0.20  | 530                                                          | EKWA401E□□680MK35S |                          | 56          | 12.5×35               | 0.20  | 480                                                          | EKWA451E□□560MK35S |
|                          | 82          | 12.5×40               | 0.20  | 610                                                          | EKWA401E□□820MK40S |                          | 68          | 12.5×40               | 0.20  | 550                                                          | EKWA451E□□680MK40S |
|                          | 82          | 14.5×31.5             | 0.20  | 590                                                          | EKWA401E□□820MUN3S |                          | 68          | 14.5×31.5             | 0.20  | 530                                                          | EKWA451E□□680MUN3S |
|                          | 100         | 12.5×45               | 0.20  | 690                                                          | EKWA401E□□101MK45S |                          | 82          | 12.5×45               | 0.20  | 630                                                          | EKWA451E□□820MK45S |
|                          | 100         | 14.5×40               | 0.20  | 700                                                          | EKWA401E□□101MU40S |                          | 82          | 14.5×35               | 0.20  | 620                                                          | EKWA451E□□820MU35S |
|                          | 100         | 16×31.5               | 0.20  | 710                                                          | EKWA401E□□101MLN3S |                          | 82          | 16×31.5               | 0.20  | 640                                                          | EKWA451E□□820MLN3S |
|                          | 120         | 14.5×45               | 0.20  | 790                                                          | EKWA401E□□121MU45S |                          | 100         | 14.5×45               | 0.20  | 720                                                          | EKWA451E□□101MU45S |
| 420                      | 120         | 16×35                 | 0.20  | 800                                                          | EKWA401E□□121ML35S | 450                      | 100         | 16×35                 | 0.20  | 730                                                          | EKWA451E□□101ML35S |
|                          | 120         | 18×31.5               | 0.20  | 800                                                          | EKWA401E□□121MMN3S |                          | 120         | 18×31.5               | 0.20  | 800                                                          | EKWA451E□□121MMN3S |
|                          | 33          | 10×30                 | 0.20  | 320                                                          | EKWA421E□□330MJ30S |                          |             |                       |       |                                                              |                    |
|                          | 39          | 10×35                 | 0.20  | 370                                                          | EKWA421E□□390MJ35S |                          |             |                       |       |                                                              |                    |
|                          | 47          | 10×40                 | 0.20  | 420                                                          | EKWA421E□□470MJ40S |                          |             |                       |       |                                                              |                    |
|                          | 56          | 10×50                 | 0.20  | 500                                                          | EKWA421E□□560MJ50S |                          |             |                       |       |                                                              |                    |
|                          | 56          | 12.5×30               | 0.20  | 460                                                          | EKWA421E□□560MK30S |                          |             |                       |       |                                                              |                    |
|                          | 68          | 12.5×35               | 0.20  | 530                                                          | EKWA421E□□680MK35S |                          |             |                       |       |                                                              |                    |
|                          | 68          | 14.5×31.5             | 0.20  | 530                                                          | EKWA421E□□680MUN3S |                          |             |                       |       |                                                              |                    |
|                          | 82          | 12.5×40               | 0.20  | 610                                                          | EKWA421E□□820MK40S |                          |             |                       |       |                                                              |                    |
|                          | 82          | 14.5×35               | 0.20  | 620                                                          | EKWA421E□□820MU35S |                          |             |                       |       |                                                              |                    |
|                          | 100         | 12.5×50               | 0.20  | 680                                                          | EKWA421E□□101MK50S |                          |             |                       |       |                                                              |                    |
|                          | 100         | 14.5×40               | 0.20  | 700                                                          | EKWA421E□□101MU40S |                          |             |                       |       |                                                              |                    |
|                          | 100         | 16×31.5               | 0.20  | 710                                                          | EKWA421E□□101MLN3S |                          |             |                       |       |                                                              |                    |
|                          | 120         | 14.5×45               | 0.20  | 790                                                          | EKWA421E□□121MU45S |                          |             |                       |       |                                                              |                    |
|                          | 120         | 16×35                 | 0.20  | 800                                                          | EKWA421E□□121ML35S |                          |             |                       |       |                                                              |                    |
|                          | 120         | 18×31.5               | 0.20  | 800                                                          | EKWA421E□□121MMN3S |                          |             |                       |       |                                                              |                    |

□□ : Enter the appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|---------------|------|------|------|------|
| 27 to 82        |               | 1.00 | 1.50 | 1.75 | 1.80 |
| 100 to 120      |               | 1.00 | 1.30 | 1.40 | 1.50 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.