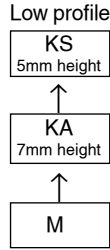


### Radial Lead Type

Series: **KS**    Type : **A**

- **Features**    Endurance:85°C 1000 h  
5 mm height  
RoHS directive compliant

■ **Specifications**

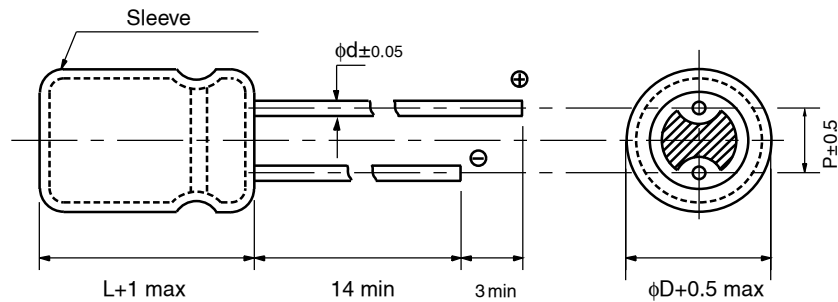


Country of Origin  
Japan  
Malaysia



|                                    |                                                                                                                                                                                       |                                              |     |    |    |    |    |    |                             |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----|----|----|----|----|----|-----------------------------|
| Category temp. range               | -40 to +85°C                                                                                                                                                                          |                                              |     |    |    |    |    |    |                             |
| Rated W.V. Range                   | 4 to 50 V .DC                                                                                                                                                                         |                                              |     |    |    |    |    |    |                             |
| Nominal Cap. Range                 | 0.1 to 330 μ F                                                                                                                                                                        |                                              |     |    |    |    |    |    |                             |
| Capacitance Tolerance              | ±20 % (120Hz/+20°C)                                                                                                                                                                   |                                              |     |    |    |    |    |    |                             |
| DC Leakage Current                 | I ≤ 0.01 CV or 3(μ A) after 2 minutes (Whichever is greater)                                                                                                                          |                                              |     |    |    |    |    |    |                             |
| tan δ                              | Please see the attached standard products list.                                                                                                                                       |                                              |     |    |    |    |    |    |                             |
| Characteristics at Low Temperature | W.V. (V)                                                                                                                                                                              | 4                                            | 6.3 | 10 | 16 | 25 | 35 | 50 | (Impedance ratio at 120 Hz) |
|                                    | Z(-25°C)/Z(+20°C)                                                                                                                                                                     | 7                                            | 4   | 3  | 2  | 2  | 2  | 2  |                             |
|                                    | Z(-40°C)/Z(+20°C)                                                                                                                                                                     | 15                                           | 8   | 6  | 4  | 4  | 3  | 3  |                             |
| Endurance                          | After applying rated working voltage for 1000 hours at +85°C and then being stabilized at +20°C, capacitors shall meet the following limits.                                          |                                              |     |    |    |    |    |    |                             |
|                                    | Capacitance change                                                                                                                                                                    | ± 20% of initial measured value (4V. : ±30%) |     |    |    |    |    |    |                             |
|                                    | tan δ                                                                                                                                                                                 | ≤200 % of initial specified value            |     |    |    |    |    |    |                             |
|                                    | DC leakage current                                                                                                                                                                    | ≤initial specified value                     |     |    |    |    |    |    |                             |
| Shelf Life                         | After storage for 1000 hours at +85±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance(With voltage treatment) |                                              |     |    |    |    |    |    |                             |

■ **Dimensions in mm (not to scale)**



|              | (mm) |      |      |      |      |
|--------------|------|------|------|------|------|
| Body Dia. φD | 3    | 4    | 5    | 6.3  | 8    |
| Lead Dia. φd | 0.4  | 0.45 | 0.45 | 0.45 | 0.45 |
| Lead Space P | 1.0  | 1.5  | 2.0  | 2.5  | 2.5  |

### ■ Standard Products

| W.V.<br>(V) | Cap.<br>(±20%)<br>(μF) | Case size    |                | Specification                                |                             | Lead Length       |                  |                      |                      | Part No.       | Min.PackagingQty       |                 |
|-------------|------------------------|--------------|----------------|----------------------------------------------|-----------------------------|-------------------|------------------|----------------------|----------------------|----------------|------------------------|-----------------|
|             |                        | Dia.<br>(mm) | Length<br>(mm) | Ripple current<br>(120Hz)<br>(+85°C)<br>(mA) | tan δ<br>(120Hz)<br>(+20°C) | Lead Dia.<br>(mm) | Lead Space       |                      |                      |                | Straight Leas<br>(pcs) | Taping<br>(pcs) |
|             |                        |              |                |                                              |                             |                   | Straight<br>(mm) | Taping<br>*B<br>(mm) | Taping<br>*i<br>(mm) |                |                        |                 |
| 4           | 22                     | 3            | 5              | 19                                           | 0.35                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA0GKK220( ) | 200                    | 2000            |
|             | 33                     | 4            | 5              | 26                                           | 0.35                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA0GKS330( ) | 200                    | 2000            |
|             | 47                     | 4            | 5              | 34                                           | 0.35                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA0GKS470( ) | 200                    | 2000            |
|             | 100                    | 5            | 5              | 61                                           | 0.35                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA0GKS101( ) | 200                    | 2000            |
|             | 220                    | 6.3          | 5              | 82                                           | 0.35                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA0GKS221( ) | 200                    | 2000            |
| 6.3         | 22                     | 4            | 5              | 29                                           | 0.24                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA0JKS220( ) | 200                    | 2000            |
|             | 33                     | 5            | 5              | 38                                           | 0.24                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA0JKS330( ) | 200                    | 2000            |
|             | 47                     | 5            | 5              | 46                                           | 0.24                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA0JKS470( ) | 200                    | 2000            |
|             | 100                    | 6.3          | 5              | 71                                           | 0.24                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA0JKS101( ) | 200                    | 2000            |
|             | 330                    | 8            | 5              | 130                                          | 0.24                        | 0.45              | 2.5              |                      | 2.5                  | ECEA0JKS331( ) | 200                    | 1000            |
|             |                        | 8            | 5              | 130                                          | 0.24                        | 0.45              |                  | 5.0                  |                      | ECEA0JKS331Q   |                        | 1000            |
| 10          | 22                     | 5            | 5              | 35                                           | 0.20                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1AKS220( ) | 200                    | 2000            |
|             | 33                     | 5            | 5              | 43                                           | 0.20                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1AKS330( ) | 200                    | 2000            |
|             | 47                     | 6.3          | 5              | 65                                           | 0.20                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1AKS470( ) | 200                    | 2000            |
|             | 100                    | 6.3          | 5              | 80                                           | 0.20                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1AKS101( ) | 200                    | 2000            |
|             | 220                    | 8            | 5              | 120                                          | 0.20                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1AKS221( ) | 200                    | 1000            |
|             |                        | 8            | 5              | 120                                          | 0.20                        | 0.45              |                  | 5.0                  |                      | ECEA1AKS221Q   |                        | 1000            |
| 16          | 10                     | 3            | 5              | 20                                           | 0.16                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1CKK100( ) | 200                    | 2000            |
|             |                        | 4            | 5              | 28                                           | 0.16                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1CKS100( ) | 200                    | 2000            |
|             | 22                     | 5            | 5              | 39                                           | 0.16                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1CKS220( ) | 200                    | 2000            |
|             | 33                     | 6.3          | 5              | 60                                           | 0.16                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1CKS330( ) | 200                    | 2000            |
|             | 47                     | 6.3          | 5              | 70                                           | 0.16                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1CKS470( ) | 200                    | 2000            |
|             | 100                    | 8            | 5              | 91                                           | 0.16                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1CKS101( ) | 200                    | 1000            |
|             |                        | 8            | 5              | 91                                           | 0.16                        | 0.45              |                  | 5.0                  |                      | ECEA1CKS101Q   |                        | 1000            |
| 25          | 2.2                    | 3            | 5              | 8                                            | 0.14                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1EKK2R2( ) | 200                    | 2000            |
|             | 3.3                    | 3            | 5              | 10                                           | 0.14                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1EKK3R3( ) | 200                    | 2000            |
|             | 4.7                    | 3            | 5              | 12                                           | 0.14                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1EKK4R7( ) | 200                    | 2000            |
|             |                        | 4            | 5              | 22                                           | 0.14                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1EKS4R7( ) | 200                    | 2000            |
|             | 10                     | 5            | 5              | 28                                           | 0.14                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1EKS100( ) | 200                    | 2000            |
|             | 22                     | 6.3          | 5              | 55                                           | 0.14                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1EKS220( ) | 200                    | 2000            |
|             | 33                     | 6.3          | 5              | 65                                           | 0.14                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1EKS330( ) | 200                    | 2000            |
|             | 100                    | 8            | 5              | 85                                           | 0.14                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1EKS101( ) | 200                    | 1000            |
| 8           |                        | 5            | 85             | 0.14                                         | 0.45                        |                   | 5.0              |                      | ECEA1EKS101Q         |                | 1000                   |                 |
| 35          | 3.3                    | 4            | 5              | 16                                           | 0.12                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1VKS3R3( ) | 200                    | 2000            |
|             | 4.7                    | 4            | 5              | 22                                           | 0.12                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1VKS4R7( ) | 200                    | 2000            |
|             | 10                     | 5            | 5              | 30                                           | 0.12                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1VKS100( ) | 200                    | 2000            |
|             | 22                     | 6.3          | 5              | 60                                           | 0.12                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1VKS220( ) | 200                    | 2000            |
|             | 33                     | 8            | 5              | 65                                           | 0.12                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1VKS330( ) | 200                    | 1000            |
|             |                        | 8            | 5              | 65                                           | 0.12                        | 0.45              |                  | 5.0                  |                      | ECEA1VKS330Q   |                        | 1000            |
|             | 47                     | 8            | 5              | 85                                           | 0.12                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1VKS470( ) | 200                    | 1000            |
| 8           |                        | 5            | 85             | 0.12                                         | 0.45                        |                   | 5.0              |                      | ECEA1VKS470Q         |                | 1000                   |                 |
| 50          | 0.1                    | 3            | 5              | 1                                            | 0.10                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1HKK0R1( ) | 200                    | 2000            |
|             |                        | 4            | 5              | 1                                            | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKS0R1( ) | 200                    | 2000            |

When requesting taped product, please put the letter "B" or "i" between the "( )". Lead wire pitch B=5mm, i=2.5mm.  
The taping dimensions are explained on p.196 of our Catalog. Please use it as a reference guide.  
Endurance : 85°C 1000h

Design, and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and / or use. Should a safety concern arise regarding this product, please be sure to contact us immediately. Mar.2006

### ■ Standard Products

| W.V.<br>(V) | Cap.<br>(±20%)<br>(μF) | Case size    |                | Specification                                |                             | Lead Length       |                  |                      |                      | Part No.       | Min.Packaging Q'ty      |                 |
|-------------|------------------------|--------------|----------------|----------------------------------------------|-----------------------------|-------------------|------------------|----------------------|----------------------|----------------|-------------------------|-----------------|
|             |                        | Dia.<br>(mm) | Length<br>(mm) | Ripple current<br>(120Hz)<br>(+85°C)<br>(mA) | tan δ<br>(120Hz)<br>(+20°C) | Lead Dia.<br>(mm) | Lead Space       |                      |                      |                | Straight Leads<br>(pcs) | Taping<br>(pcs) |
|             |                        |              |                |                                              |                             |                   | Straight<br>(mm) | Taping<br>*B<br>(mm) | Taping<br>*i<br>(mm) |                |                         |                 |
| 50          | 0.22                   | 3            | 5              | 2                                            | 0.10                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1HKKR22( ) | 200                     | 2000            |
|             |                        | 4            | 5              | 2                                            | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKSR22( ) | 200                     | 2000            |
|             | 0.33                   | 3            | 5              | 3                                            | 0.10                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1HKKR33( ) | 200                     | 2000            |
|             |                        | 4            | 5              | 3                                            | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKSR33( ) | 200                     | 2000            |
|             | 0.47                   | 3            | 5              | 5                                            | 0.10                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1HKKR47( ) | 200                     | 2000            |
|             |                        | 4            | 5              | 5                                            | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKSR47( ) | 200                     | 2000            |
|             | 1                      | 3            | 5              | 8                                            | 0.10                        | 0.40              | 1.0              | 5.0                  | 2.5                  | ECEA1HKK010( ) | 200                     | 2000            |
|             |                        | 4            | 5              | 10                                           | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKS010( ) | 200                     | 2000            |
|             | 2.2                    | 4            | 5              | 16                                           | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKS2R2( ) | 200                     | 2000            |
|             | 3.3                    | 4            | 5              | 16                                           | 0.10                        | 0.45              | 1.5              | 5.0                  | 2.5                  | ECEA1HKS3R3( ) | 200                     | 2000            |
|             | 4.7                    | 5            | 5              | 23                                           | 0.10                        | 0.45              | 2.0              | 5.0                  | 2.5                  | ECEA1HKS4R7( ) | 200                     | 2000            |
|             | 10                     | 6.3          | 5              | 35                                           | 0.10                        | 0.45              | 2.5              | 5.0                  | 2.5                  | ECEA1HKS100( ) | 200                     | 2000            |
|             | 22                     | 8            | 5              | 60                                           | 0.10                        | 0.45              | 2.5              |                      | 2.5                  | ECEA1HKS220( ) | 200                     | 1000            |
|             |                        | 8            | 5              | 60                                           | 0.10                        | 0.45              |                  | 5.0                  |                      | ECEA1HKS220Q   |                         | 1000            |

When requesting taped product, please put the letter "B" or "i" between the "( )". Lead wire pitch B=5mm, i=2.5mm.  
The taping dimensions are explained on p.196 of our Catalog. Please use it as a reference guide.  
Endurance : 85°C 1000h