



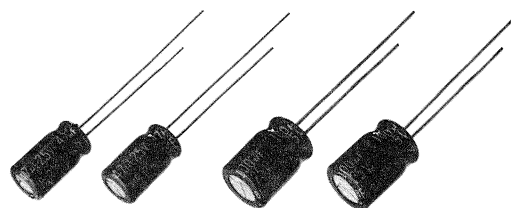
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## Bi-polar Series SU

### Features

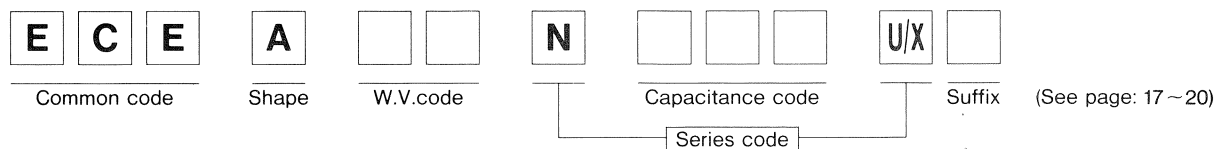
- Ideal for circuits where polarity is not constant or reverse voltage is applied when switches are turned on or off
- Life: 2000 hours at +85°C



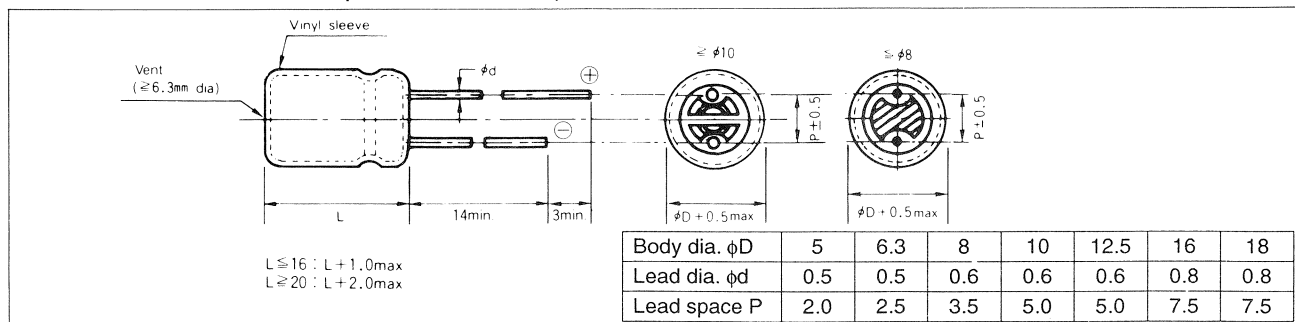
### Specifications

| Item                               | Performance Characteristics                                                                |                                 |      |      |      |      |                             |
|------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------|------|------|------|------|-----------------------------|
| Operating Temperature Range        | -40 to +85°C                                                                               |                                 |      |      |      |      |                             |
| Rated Working Voltage Range        | 6.3 to 50V DC                                                                              |                                 |      |      |      |      |                             |
| Nominal Capacitance Range          | 0.47 to 6800μF                                                                             |                                 |      |      |      |      |                             |
| Capacitance Tolerance              | ±20%(120Hz, +20°C)                                                                         |                                 |      |      |      |      |                             |
| Leakage Current                    | $I \leq 0.03CV + 3 [\mu A]$ after 5 minutes application of rated working voltage at +20°C. |                                 |      |      |      |      |                             |
| tan δ (120Hz, +20°C)               | Working voltage[V]                                                                         | 6.3                             | 10   | 16   | 25   | 35   | 50                          |
|                                    | tan δ max.                                                                                 | 0.30                            | 0.25 | 0.20 | 0.15 | 0.15 | 0.15                        |
| Characteristics at Low Temperature | Impedance ratio max.at 120Hz                                                               |                                 |      |      |      |      |                             |
|                                    | Working voltage[V]                                                                         | 6.3                             | 10   | 16   | 25   | 35   | 50                          |
|                                    | -25°C/+20°C                                                                                | 4                               | 3    | 2    | 2    | 2    | 2                           |
|                                    | -40°C/+20°C                                                                                | 8                               | 6    | 4    | 4    | 4    | 3                           |
| Endurance                          | Test conditions                                                                            |                                 |      |      |      |      |                             |
|                                    | Duration : 2000 hours                                                                      |                                 |      |      |      |      |                             |
|                                    | Ambient temperature : +85°C                                                                |                                 |      |      |      |      |                             |
|                                    | Applied voltage : Rated DC working voltage to each polarity for 1000 hours                 |                                 |      |      |      |      |                             |
|                                    | Post test requirements at +20°C                                                            |                                 |      |      |      |      |                             |
|                                    | Leakage current : ≤ Initial specified value                                                |                                 |      |      |      |      |                             |
| Shelf Life                         | Capacitance change : ±20% of initial measured value                                        |                                 |      |      |      |      |                             |
|                                    | tan δ : ≤150% of initial specified value                                                   |                                 |      |      |      |      |                             |
|                                    | Test conditions                                                                            |                                 |      |      |      |      |                             |
| Shelf Life                         | Duration : 1000 hours                                                                      |                                 |      |      |      |      |                             |
|                                    | Ambient temperature : +85°C                                                                |                                 |      |      |      |      |                             |
|                                    | Applied voltage : (None)                                                                   |                                 |      |      |      |      |                             |
|                                    |                                                                                            | Post test requirements at +20°C |      |      |      |      | Same limits for "Endurance" |

### Explanation of Part Numbers



### Dimensions in mm (not to scale)



# Aluminum Electrolytic Capacitors

## Radial Lead Type

## Bi-polar Series SU

### Case Size

φD×L[mm]

| W.V.[V.DC]<br>Cap.[μF] | 6.3<br>(0J) | 10<br>(1A) | 16<br>(1C) | 25<br>(1E) | 35<br>(1V) | 50<br>(1H) |
|------------------------|-------------|------------|------------|------------|------------|------------|
| 0.47(R47)              |             |            |            |            |            | 5 × 11     |
| 1 (010)                |             |            |            |            |            | 5 × 11     |
| 2.2 (2R2)              |             |            |            |            |            | 5 × 11     |
| 3.3 (3R3)              |             |            |            | 5 × 11     |            | 5 × 11     |
| 4.7 (4R7)              |             |            |            | 5 × 11     | 5 × 11     | 5 × 11     |
| 10 (100)               |             |            | 5 × 11     | 5 × 11     | 5 × 11     | 6.3×11.2   |
| 22 (220)               |             | 5 × 11     | 5 × 11     | ●5 × 11    | 6.3×11.2   | 8 × 11.5   |
| 33 (330)               | 5 × 11      | 5 × 11     | 5 × 11     | 6.3×11.2   | 8 × 11.5   | 8 × 11.5   |
| 47 (470)               | 5 × 11      | 5 × 11     | 6.3×11.2   | 6.3×11.2   | 8 × 11.5   | 10 × 12.5  |
| 100 (101)              | 6.3×11.2    | 6.3×11.2   | 8 × 11.5   | 8 × 11.5   | 10 × 16    | 10 × 20    |
| 220 (221)              | 8 × 11.5    | 8 × 11.5   | ●10 × 12.5 | 10 × 16    | 12.5×20    | 12.5×25    |
| 330 (331)              | 8 × 11.5    | 10 × 16    | 10 × 16    | 12.5×20    | 12.5×20    | 16 × 25    |
| 470 (471)              | ●10 × 12.5  | 10 × 16    | 10 × 20    | 12.5×20    | 12.5×25    | 16 × 31.5  |
| 1000 (102)             | 10 × 20     | ●12.5×20   | 12.5×25    | 16 × 25    |            |            |
| 2200 (222)             | 12.5×25     | 16 × 25    | 16 × 31.5  | 18 × 35.5  |            |            |
| 3300 (332)             | 16 × 25     | 16 × 31.5  | 18 × 35.5  |            |            |            |
| 4700 (472)             | 16 × 31.5   | 18 × 35.5  |            |            |            |            |
| 6800 (682)             | 18 × 35.5   |            |            |            |            |            |

( ) indicates W.V. and capacitance code.

● indicates an "X" in the part number suffix.

ex. ECEA□□N□□□X

Radial lead  
Bi-polar SU

### Standard Products

| W.V.<br>[V.DC] | Cap.<br>[μF] | Part No.    | Cap.tol.[%]<br>(120Hz/+20℃) | D.C.L.<br>(+20℃/5min)<br>[μA] max. | tan δ<br>(120Hz/+20℃)<br>max. | Ripple Current<br>(120Hz/+85℃)<br>[mA]rms<br>max. | Dimensions<br>[mm] |      |
|----------------|--------------|-------------|-----------------------------|------------------------------------|-------------------------------|---------------------------------------------------|--------------------|------|
|                |              |             |                             |                                    |                               |                                                   | φD                 | L    |
| 6.3            | 33           | ECEA0JN330U | ±20                         | 9.2                                | 0.30                          | 80                                                | 5                  | 11   |
|                | 47           | ECEA0JN470U |                             | 11.8                               | 0.30                          | 90                                                | 5                  | 11   |
|                | 100          | ECEA0JN101U |                             | 21.9                               | 0.30                          | 130                                               | 6.3                | 11.2 |
|                | 220          | ECEA0JN221U |                             | 44.5                               | 0.30                          | 200                                               | 8                  | 11.5 |
|                | 330          | ECEA0JN331U |                             | 65.3                               | 0.30                          | 250                                               | 8                  | 11.5 |
|                | 470          | ECEA0JN471X |                             | 91.8                               | 0.30                          | 310                                               | 10                 | 12.5 |
|                | 1000         | ECEA0JN102U |                             | 192.0                              | 0.30                          | 430                                               | 10                 | 20   |
|                | 2200         | ECEA0JN222U |                             | 418.8                              | 0.30                          | 660                                               | 12.5               | 25   |
|                | 3300         | ECEA0JN332U |                             | 626.7                              | 0.30                          | 760                                               | 16                 | 25   |
|                | 4700         | ECEA0JN472U |                             | 891.3                              | 0.30                          | 1170                                              | 16                 | 31.5 |
|                | 6800         | ECEA0JN682U |                             | 1288.2                             | 0.30                          | 1450                                              | 18                 | 35.5 |
| 10             | 22           | ECEA1AN220U | ±20                         | 9.6                                | 0.25                          | 60                                                | 5                  | 11   |
|                | 33           | ECEA1AN330U |                             | 12.9                               | 0.25                          | 80                                                | 5                  | 11   |
|                | 47           | ECEA1AN470U |                             | 17.1                               | 0.25                          | 90                                                | 5                  | 11   |
|                | 100          | ECEA1AN101U |                             | 33.0                               | 0.25                          | 130                                               | 6.3                | 11.2 |
|                | 220          | ECEA1AN221U |                             | 69.0                               | 0.25                          | 200                                               | 8                  | 11.5 |
|                | 330          | ECEA1AN331U |                             | 102.0                              | 0.25                          | 280                                               | 10                 | 16   |
|                | 470          | ECEA1AN471U |                             | 144.0                              | 0.25                          | 340                                               | 10                 | 16   |
|                | 1000         | ECEA1AN102X |                             | 303.0                              | 0.25                          | 470                                               | 12.5               | 20   |
|                | 2200         | ECEA1AN222U |                             | 663.0                              | 0.25                          | 690                                               | 16                 | 25   |
|                | 3300         | ECEA1AN332U |                             | 993.0                              | 0.25                          | 1090                                              | 16                 | 31.5 |
|                | 4700         | ECEA1AN472U |                             | 1413.0                             | 0.25                          | 1200                                              | 18                 | 35.5 |

### Standard Products

| W.V.<br>[V.DC] | Cap.<br>[μF] | Part No.    | Cap.tol. [%]<br>(120Hz / +20°C) | D.C.L.<br>(+20°C / 5min)<br>[μA] max. | tan δ<br>(120Hz +20°C)<br>max. | Ripple Current<br>(120Hz +85°C)<br>[mA]rms<br>max. | Dimensions<br>[mm] |      |
|----------------|--------------|-------------|---------------------------------|---------------------------------------|--------------------------------|----------------------------------------------------|--------------------|------|
|                |              |             |                                 |                                       |                                |                                                    | φD                 | L    |
| 16             | 10           | ECEA1CN100U | ±20                             | 7.8                                   | 0.20                           | 40                                                 | 5                  | 11   |
|                | 22           | ECEA1CN220U |                                 | 13.5                                  | 0.20                           | 60                                                 | 5                  | 11   |
|                | 33           | ECEA1CN330U |                                 | 18.8                                  | 0.20                           | 80                                                 | 5                  | 11   |
|                | 47           | ECEA1CN470U |                                 | 25.5                                  | 0.20                           | 100                                                | 6.3                | 11.2 |
|                | 100          | ECEA1CN101U |                                 | 51.0                                  | 0.20                           | 180                                                | 8                  | 11.5 |
|                | 220          | ECEA1CN221X |                                 | 108.6                                 | 0.20                           | 260                                                | 10                 | 12.5 |
|                | 330          | ECEA1CN331U |                                 | 161.4                                 | 0.20                           | 330                                                | 10                 | 16   |
|                | 470          | ECEA1CN471U |                                 | 228.6                                 | 0.20                           | 380                                                | 10                 | 20   |
|                | 1000         | ECEA1CN102U |                                 | 483.0                                 | 0.20                           | 560                                                | 12.5               | 25   |
|                | 2200         | ECEA1CN222U |                                 | 1059.0                                | 0.20                           | 750                                                | 16                 | 31.5 |
|                | 3300         | ECEA1CN332U |                                 | 1587.0                                | 0.20                           | 900                                                | 18                 | 35.5 |
| 25             | 3.3          | ECEA1EN3R3U | ±20                             | 5.4                                   | 0.15                           | 20                                                 | 5                  | 11   |
|                | 4.7          | ECEA1EN4R7U |                                 | 6.5                                   | 0.15                           | 25                                                 | 5                  | 11   |
|                | 10           | ECEA1EN100U |                                 | 10.5                                  | 0.15                           | 45                                                 | 5                  | 11   |
|                | 22           | ECEA1EN220X |                                 | 19.5                                  | 0.15                           | 60                                                 | 5                  | 11   |
|                | 33           | ECEA1EN330U |                                 | 27.7                                  | 0.15                           | 90                                                 | 6.3                | 11.2 |
|                | 47           | ECEA1EN470U |                                 | 38.2                                  | 0.15                           | 110                                                | 6.3                | 11.2 |
|                | 100          | ECEA1EN101U |                                 | 78.0                                  | 0.15                           | 180                                                | 8                  | 11.5 |
|                | 220          | ECEA1EN221U |                                 | 168.0                                 | 0.15                           | 320                                                | 10                 | 16   |
|                | 330          | ECEA1EN331U |                                 | 250.5                                 | 0.15                           | 350                                                | 12.5               | 20   |
|                | 470          | ECEA1EN471U |                                 | 355.5                                 | 0.15                           | 430                                                | 12.5               | 20   |
|                | 1000         | ECEA1EN102U |                                 | 753.0                                 | 0.15                           | 680                                                | 16                 | 25   |
|                | 2200         | ECEA1EN222U |                                 | 1653.0                                | 0.15                           | 900                                                | 18                 | 35.5 |
| 35             | 4.7          | ECEA1VN4R7U | ±20                             | 7.9                                   | 0.15                           | 30                                                 | 5                  | 11   |
|                | 10           | ECEA1VN100U |                                 | 13.5                                  | 0.15                           | 43                                                 | 5                  | 11   |
|                | 22           | ECEA1VN220U |                                 | 26.1                                  | 0.15                           | 80                                                 | 6.3                | 11.2 |
|                | 33           | ECEA1VN330U |                                 | 37.6                                  | 0.15                           | 100                                                | 8                  | 11.5 |
|                | 47           | ECEA1VN470U |                                 | 52.3                                  | 0.15                           | 120                                                | 8                  | 11.5 |
|                | 100          | ECEA1VN101U |                                 | 108.0                                 | 0.15                           | 230                                                | 10                 | 16   |
|                | 220          | ECEA1VN221U |                                 | 234.0                                 | 0.15                           | 360                                                | 12.5               | 20   |
|                | 330          | ECEA1VN331U |                                 | 349.5                                 | 0.15                           | 450                                                | 12.5               | 20   |
|                | 470          | ECEA1VN471U |                                 | 496.5                                 | 0.15                           | 590                                                | 12.5               | 25   |
| 50             | 0.47         | ECEA1HNR47U | ±20                             | 3.7                                   | 0.15                           | 10                                                 | 5                  | 11   |
|                | 1            | ECEA1HN010U |                                 | 4.5                                   | 0.15                           | 10                                                 | 5                  | 11   |
|                | 2.2          | ECEA1HN2R2U |                                 | 6.3                                   | 0.15                           | 18                                                 | 5                  | 11   |
|                | 3.3          | ECEA1HN3R3U |                                 | 7.9                                   | 0.15                           | 25                                                 | 5                  | 11   |
|                | 4.7          | ECEA1HN4R7U |                                 | 10.0                                  | 0.15                           | 30                                                 | 5                  | 11   |
|                | 10           | ECEA1HN100U |                                 | 18.0                                  | 0.15                           | 50                                                 | 6.3                | 11.2 |
|                | 22           | ECEA1HN220U |                                 | 36.0                                  | 0.15                           | 90                                                 | 8                  | 11.5 |
|                | 33           | ECEA1HN330U |                                 | 52.5                                  | 0.15                           | 110                                                | 8                  | 11.5 |
|                | 47           | ECEA1HN470U |                                 | 73.5                                  | 0.15                           | 140                                                | 10                 | 12.5 |
|                | 100          | ECEA1HN101U |                                 | 153.0                                 | 0.15                           | 250                                                | 10                 | 20   |
|                | 220          | ECEA1HN221U |                                 | 333.0                                 | 0.15                           | 360                                                | 12.5               | 25   |
|                | 330          | ECEA1HN331U |                                 | 498.0                                 | 0.15                           | 450                                                | 16                 | 25   |
|                | 470          | ECEA1HN471U |                                 | 708.0                                 | 0.15                           | 590                                                | 16                 | 31.5 |