

### Radial Lead Type

Series: **NHG** Type: **A**



#### ■ Features

- Endurance : 105 °C 1000 h to 2000 h
- RoHS directive compliant

#### ■ Specifications

|                       |   |   |
|-----------------------|---|---|
| Category Temp. Range  | -55 °C to +105 °C   | -25 °C to +105 °C                             |
| Rated W.V. Range      | 6.3 V.DC to 100 V.DC  | 160 V.DC to 450 V.DC                          |
| Nominal Cap. Range    | 0.1 μF to 22000 μF  | 1.0 μF to 330 μF                              |
| Capacitance Tolerance | ±20 % (120 Hz/+20 °C)   |   |
| DC Leakage Current    | $I \leq 0.01 CV$ or $3 (\mu A)$ After 2 minutes<br>(Which is greater)   | $I \leq 0.06 CV + 10 (\mu A)$ After 2 minutes |
| tan δ                 | Please see the attached standard products list  |   |
| Endurance             | <p>After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), When the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below.</p> <p>Duration : 6.3 V.DC to 100 V.DC : (φ5 to φ8)=1000 hours, (φ10 to φ18)=2000 hours<br/>160 V.DC to 450 V.DC : 2000 hours</p> |   |
|                       | Capacitance change  | ±20 % of initial measured value               |
|                       | tan δ   | ≤ 200 % of initial specified value            |
|                       | DC leakage current  | ≤ initial specified value                     |
| Shelf Life            | After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)   |   |

#### ■ Frequency correction factor for ripple current

| W.V.(V.DC) | Cap. (μF)     | Frequency (Hz) |      |      |      |       |
|------------|---------------|----------------|------|------|------|-------|
|            |               | 60             | 120  | 1 k  | 10 k | 100 k |
| 6.3 to 100 | 0.1 to 33     | 0.75           | 1.00 | 1.55 | 1.80 | 2.00  |
|            | 47 to 470     | 0.80           | 1.00 | 1.35 | 1.50 | 1.50  |
|            | 1000 to 22000 | 0.85           | 1.00 | 1.10 | 1.15 | 1.15  |
| 160 to 450 | 1 to 330      | 0.80           | 1.00 | 1.35 | 1.50 | 1.50  |

#### ■ Dimensions in mm (not to scale)



(mm)

|              | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|--------------|-----|-----|-----|-----|------|-----|-----|
| Body Dia. φD | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
| Lead Dia. φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| Lead space F | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |

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.

00 Sep. 2010

### 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>(120 Hz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endurance<br>(hours) | 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) |               |                         |                 |
| 6.3         | 220                     | 5            | 11             | 140  | 0.28                          | 1000                 | 0.5               | 2.0              | 5.0                  | 2.5                  | ECA0JHG221( ) | 200                     | 2000            |
|             | 470                     | 6.3          | 11.2           | 230  | 0.28                          | 1000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA0JHG471( ) | 200                     | 2000            |
|             | 1000                    | 8            | 11.5           | 380  | 0.28                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA0JHG102( ) | 200                     | 1000            |
|             | 2200                    | 10           | 16             | 710  | 0.30                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA0JHG222( ) | 200                     | 500             |
|             | 3300                    | 10           | 20             | 840  | 0.32                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA0JHG332( ) | 200                     | 500             |
|             | 4700                    | 12.5         | 20             | 1090   | 0.34                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA0JHG472( ) | 200                     | 500             |
|             | 6800                    | 12.5         | 25             | 1350   | 0.38                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA0JHG682( ) | 200                     | 500             |
|             | 10000                   | 16           | 25             | 1650   | 0.46                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA0JHG103( ) | 100                     | 250             |
|             | 15000                   | 16           | 31.5           | 2010   | 0.56                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA0JHG153    | 100                     |                 |
| 22000       | 18                      | 35.5         | 2350           | 0.70   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA0JHG223           | 50            |                         |                 |
| 10          | 330                     | 6.3          | 11.2           | 200  | 0.24                          | 1000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA1AHG331( ) | 200                     | 2000            |
|             | 470                     | 8            | 11.5           | 250  | 0.24                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1AHG471( ) | 200                     | 1000            |
|             | 1000                    | 10           | 12.5           | 460  | 0.24                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1AHG102( ) | 200                     | 500             |
|             | 2200                    | 10           | 20             | 760  | 0.26                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1AHG222( ) | 200                     | 500             |
|             | 3300                    | 12.5         | 20             | 1000   | 0.28                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1AHG332( ) | 200                     | 500             |
|             | 4700                    | 12.5         | 25             | 1260   | 0.30                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1AHG472( ) | 200                     | 500             |
|             | 6800                    | 16           | 25             | 1570   | 0.34                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA1AHG682( ) | 100                     | 250             |
|             | 10000                   | 16           | 31.5           | 1890   | 0.42                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA1AHG103    | 100                     |                 |
| 15000       | 18                      | 35.5         | 2180           | 0.52   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA1AHG153           | 50            |                         |                 |
| 16          | 100                     | 5            | 11             | 110  | 0.20                          | 1000                 | 0.5               | 2.0              | 5.0                  | 2.5                  | ECA1CHG101( ) | 200                     | 2000            |
|             | 220                     | 6.3          | 11.2           | 180  | 0.20                          | 1000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA1CHG221( ) | 200                     | 2000            |
|             | 330                     | 8            | 11.5           | 260  | 0.20                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1CHG331( ) | 200                     | 1000            |
|             | 470                     | 8            | 11.5           | 310  | 0.20                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1CHG471( ) | 200                     | 1000            |
|             | 1000                    | 10           | 16             | 560  | 0.20                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1CHG102( ) | 200                     | 500             |
|             | 2200                    | 12.5         | 20             | 920  | 0.22                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1CHG222( ) | 200                     | 500             |
|             | 3300                    | 12.5         | 25             | 1170   | 0.24                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1CHG332( ) | 200                     | 500             |
|             | 4700                    | 16           | 25             | 1480   | 0.26                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA1CHG472( ) | 100                     | 250             |
|             | 6800                    | 16           | 31.5           | 1780   | 0.30                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA1CHG682    | 100                     |                 |
| 10000       | 18                      | 35.5         | 2060           | 0.38   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA1CHG103           | 50            |                         |                 |
| 25          | 47                      | 5            | 11             | 91   | 0.16                          | 1000                 | 0.5               | 2.0              | 5.0                  | 2.5                  | ECA1EHG470( ) | 200                     | 2000            |
|             | 100                     | 6.3          | 11.2           | 130  | 0.16                          | 1000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA1EHG101( ) | 200                     | 2000            |
|             | 220                     | 8            | 11.5           | 230  | 0.16                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1EHG221( ) | 200                     | 1000            |
|             | 330                     | 8            | 11.5           | 310  | 0.16                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1EHG331( ) | 200                     | 1000            |
|             | 470                     | 10           | 12.5           | 380  | 0.16                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1EHG471( ) | 200                     | 500             |
|             | 1000                    | 10           | 20             | 680  | 0.16                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1EHG102( ) | 200                     | 500             |
|             | 2200                    | 12.5         | 25             | 1090   | 0.18                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1EHG222( ) | 200                     | 500             |
|             | 3300                    | 16           | 25             | 1400   | 0.20                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA1EHG332( ) | 100                     | 250             |
|             | 4700                    | 16           | 31.5           | 1750   | 0.22                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA1EHG472    | 100                     |                 |
| 6800        | 18                      | 35.5         | 2040           | 0.26   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA1EHG682           | 50            |                         |                 |
| 35          | 47                      | 5            | 11             | 90   | 0.14                          | 1000                 | 0.5               | 2.0              | 5.0                  | 2.5                  | ECA1VHG470( ) | 200                     | 2000            |
|             | 100                     | 6.3          | 11.2           | 150  | 0.14                          | 1000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA1VHG101( ) | 200                     | 2000            |
|             | 220                     | 8            | 11.5           | 270  | 0.14                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA1VHG221( ) | 200                     | 1000            |
|             | 330                     | 10           | 12.5           | 350  | 0.14                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1VHG331( ) | 200                     | 500             |
|             | 470                     | 10           | 16             | 460  | 0.14                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1VHG471( ) | 200                     | 500             |
|             | 1000                    | 12.5         | 20             | 810  | 0.14                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA1VHG102( ) | 200                     | 500             |
|             | 2200                    | 16           | 25             | 1260   | 0.16                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA1VHG222( ) | 100                     | 250             |
|             | 3300                    | 16           | 31.5           | 1610   | 0.18                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA1VHG332    | 100                     |                 |
| 4700        | 18                      | 35.5         | 1910           | 0.20   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA1VHG472           | 50            |                         |                 |

When requesting taped product, please put the letter "B" or "i" between the "( )". Lead wire pitch B=5 mm, 7.5 mm, i=2.5 mm. The taping dimensions are explained on EE189 of our Catalog. Please use it as a reference guide.

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00 Sep. 2010

### Standard Products

| W.V. | Cap.<br>(±20 %) | Case size |        | Specification                           |                               |                | Lead Length  |            |              | Part No.      | Min. Packaging Q'ty |        |              |
|------|-----------------|-----------|--------|---|-------------------------------|----------------|--------------|------------|--------------|---------------|---------------------|--------|--------------|
|      |                 | Dia.      | Length | Ripple Current<br>(120 Hz)<br>(+105 °C) | tan δ<br>(120 Hz)<br>(+20 °C) | Endur-<br>ance | Lead<br>Dia. | Lead Space |              |               | Straight<br>Leads   | Taping |              |
|      |                 |           |        |   |                               |                |              | Straight   | Taping<br>*B |               |                     |        | Taping<br>*i |
| (V)  | (μF)            | (mm)      | (mm)   | (mA r.m.s.)                             |                               | (hours)        | (mm)         | (mm)       | (mm)         | (mm)          |                     |        |              |
| 50   | 0.1             | 5         | 11     | 1.1                                     | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG0R1( )       | 200    | 2000         |
|      | 0.22            | 5         | 11     | 2.3                                     | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHGR22( )       | 200    | 2000         |
|      | 0.33            | 5         | 11     | 3.5                                     | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHGR33( )       | 200    | 2000         |
|      | 0.47            | 5         | 11     | 5                                       | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHGR47( )       | 200    | 2000         |
|      | 1               | 5         | 11     | 10                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG010( )       | 200    | 2000         |
|      | 2.2             | 5         | 11     | 18                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG2R2( )       | 200    | 2000         |
|      | 3.3             | 5         | 11     | 22                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG3R3( )       | 200    | 2000         |
|      | 4.7             | 5         | 11     | 26                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG4R7( )       | 200    | 2000         |
|      | 10              | 5         | 11     | 39                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG100( )       | 200    | 2000         |
|      | 22              | 5         | 11     | 65                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG220( )       | 200    | 2000         |
|      | 33              | 5         | 11     | 90                                      | 0.12                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1HHG330( )       | 200    | 2000         |
|      | 47              | 6.3       | 11.2   | 110                                     | 0.12                          | 1000           | 0.5          | 2.5        | 5.0          | 2.5           | ECA1HHG470( )       | 200    | 2000         |
|      | 100             | 8         | 11.5   | 180                                     | 0.12                          | 1000           | 0.6          | 3.5        | 5.0          |               | ECA1HHG101( )       | 200    | 1000         |
|      | 220             | 10        | 12.5   | 300                                     | 0.12                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1HHG221( )       | 200    | 500          |
|      | 330             | 10        | 16     | 410                                     | 0.12                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1HHG331( )       | 200    | 500          |
|      | 470             | 10        | 20     | 530                                     | 0.12                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1HHG471( )       | 200    | 500          |
|      | 1000            | 12.5      | 25     | 950                                     | 0.12                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1HHG102( )       | 200    | 500          |
| 2200 | 16              | 31.5      | 1470   | 0.14                                    | 2000                          | 0.8            | 7.5          |            |              | ECA1HHG222    | 100                 |        |              |
| 3300 | 18              | 35.5      | 1770   | 0.16                                    | 2000                          | 0.8            | 7.5          |            |              | ECA1HHG332    | 50                  |        |              |
| 63   | 10              | 5         | 11     | 46                                      | 0.10                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1JHG100( )       | 200    | 2000         |
|      | 22              | 5         | 11     | 71                                      | 0.10                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA1JHG220( )       | 200    | 2000         |
|      | 33              | 6.3       | 11.2   | 100                                     | 0.10                          | 1000           | 0.5          | 2.5        | 5.0          | 2.5           | ECA1JHG330( )       | 200    | 2000         |
|      | 47              | 6.3       | 11.2   | 120                                     | 0.10                          | 1000           | 0.5          | 2.5        | 5.0          | 2.5           | ECA1JHG470( )       | 200    | 2000         |
|      | 100             | 10        | 12.5   | 215                                     | 0.10                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1JHG101( )       | 200    | 500          |
|      | 220             | 10        | 16     | 335                                     | 0.10                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1JHG221( )       | 200    | 500          |
|      | 330             | 10        | 20     | 510                                     | 0.10                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1JHG331( )       | 200    | 500          |
|      | 470             | 12.5      | 20     | 640                                     | 0.10                          | 2000           | 0.6          | 5.0        | 5.0          |               | ECA1JHG471( )       | 200    | 500          |
|      | 1000            | 16        | 25     | 930                                     | 0.10                          | 2000           | 0.8          | 7.5        | 7.5          |               | ECA1JHG102( )       | 100    | 250          |
| 2200 | 18              | 35.5      | 1610   | 0.12                                    | 2000                          | 0.8            | 7.5          |            |              | ECA1JHG222    | 50                  |        |              |
| 100  | 0.47            | 5         | 11     | 9                                       | 0.08                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA2AHGR47( )       | 200    | 2000         |
|      | 1               | 5         | 11     | 14                                      | 0.08                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA2AHG010( )       | 200    | 2000         |
|      | 2.2             | 5         | 11     | 21                                      | 0.08                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA2AHG2R2( )       | 200    | 2000         |
|      | 3.3             | 5         | 11     | 31                                      | 0.08                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA2AHG3R3( )       | 200    | 2000         |
|      | 4.7             | 5         | 11     | 38                                      | 0.08                          | 1000           | 0.5          | 2.0        | 5.0          | 2.5           | ECA2AHG4R7( )       | 200    | 2000         |
|      | 10              | 6.3       | 11.2   | 54                                      | 0.08                          | 1000           | 0.5          | 2.5        | 5.0          | 2.5           | ECA2AHG100( )       | 200    | 2000         |
| 22   | 6.3             | 11.2      | 93     | 0.08                                    | 1000                          | 0.5            | 2.5          | 5.0        | 2.5          | ECA2AHG220( ) | 200                 | 2000   |              |

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### 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>(120 Hz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endurance<br>(hours) | 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) |               |                         |                 |
| 100         | 33                      | 8            | 11.5           | 130  | 0.08                          | 1000                 | 0.6               | 3.5              | 5.0                  |                      | ECA2AHG330( ) | 200                     | 1000            |
|             | 47                      | 10           | 12.5           | 165  | 0.08                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2AHG470( ) | 200                     | 500             |
|             | 100                     | 10           | 20             | 265  | 0.08                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2AHG101( ) | 200                     | 500             |
|             | 220                     | 12.5         | 25             | 440  | 0.08                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2AHG221( ) | 200                     | 500             |
|             | 330                     | 16           | 25             | 540  | 0.08                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA2AHG331( ) | 100                     | 250             |
|             | 470                     | 16           | 25             | 715  | 0.08                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA2AHG471( ) | 100                     | 250             |
|             | 1000                    | 18           | 35.5           | 985  | 0.08                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA2AHG102    | 50                      |                 |
| 160         | 1                       | 6.3          | 11.2           | 17   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2CHG010( ) | 200                     | 2000            |
|             | 2.2                     | 6.3          | 11.2           | 25   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2CHG2R2( ) | 200                     | 2000            |
|             | 3.3                     | 6.3          | 11.2           | 36   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2CHG3R3( ) | 200                     | 2000            |
|             | 4.7                     | 6.3          | 11.2           | 43   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2CHG4R7( ) | 200                     | 2000            |
|             | 10                      | 10           | 12.5           | 70   | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2CHG100( ) | 200                     | 500             |
|             | 22                      | 10           | 20             | 130  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2CHG220( ) | 200                     | 500             |
|             | 33                      | 10           | 20             | 180  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2CHG330( ) | 200                     | 500             |
|             | 47                      | 12.5         | 20             | 220  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2CHG470( ) | 200                     | 500             |
|             | 100                     | 16           | 25             | 335  | 0.15                          | 2000                 | 0.8               | 7.5              | 7.5                  |                      | ECA2CHG101( ) | 100                     | 250             |
|             | 220                     | 16           | 31.5           | 540  | 0.15                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA2CHG221    | 100                     |                 |
| 330         | 18                      | 31.5         | 705            | 0.15   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA2CHG331           | 50            |                         |                 |
| 200         | 1                       | 6.3          | 11.2           | 17   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2DHG010( ) | 200                     | 2000            |
|             | 2.2                     | 6.3          | 11.2           | 25   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2DHG2R2( ) | 200                     | 2000            |
|             | 3.3                     | 6.3          | 11.2           | 36   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2DHG3R3( ) | 200                     | 2000            |
|             | 4.7                     | 8            | 11.5           | 50   | 0.15                          | 2000                 | 0.6               | 3.5              | 5.0                  |                      | ECA2DHG4R7( ) | 200                     | 1000            |
|             | 10                      | 10           | 16             | 80   | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2DHG100( ) | 200                     | 500             |
|             | 22                      | 10           | 20             | 140  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2DHG220( ) | 200                     | 500             |
|             | 33                      | 12.5         | 20             | 190  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2DHG330( ) | 200                     | 500             |
|             | 47                      | 12.5         | 20             | 220  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2DHG470( ) | 200                     | 500             |
|             | 100                     | 16           | 25             | 335  | 0.15                          | 2000                 | 0.8               | 7.5              | 7.5                  | 2.5                  | ECA2DHG101( ) | 100                     | 250             |
|             | 220                     | 18           | 31.5           | 575  | 0.15                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA2DHG221    | 50                      |                 |
| 250         | 1                       | 6.3          | 11.2           | 17   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2EHG010( ) | 200                     | 2000            |
|             | 2.2                     | 6.3          | 11.2           | 29   | 0.15                          | 2000                 | 0.5               | 2.5              | 5.0                  | 2.5                  | ECA2EHG2R2( ) | 200                     | 2000            |
|             | 3.3                     | 8            | 11.5           | 42   | 0.15                          | 2000                 | 0.6               | 3.5              | 5.0                  |                      | ECA2EHG3R3    | 200                     | 1000            |
|             | 4.7                     | 8            | 11.5           | 50   | 0.15                          | 2000                 | 0.6               | 3.5              | 5.0                  |                      | ECA2EHG4R7( ) | 200                     | 1000            |
|             | 10                      | 10           | 16             | 88   | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2EHG100( ) | 200                     | 500             |
|             | 22                      | 12.5         | 20             | 155  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2EHG220( ) | 200                     | 500             |
|             | 33                      | 12.5         | 20             | 190  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2EHG330( ) | 200                     | 500             |
|             | 47                      | 12.5         | 25             | 230  | 0.15                          | 2000                 | 0.6               | 5.0              | 5.0                  |                      | ECA2EHG470( ) | 200                     | 500             |
|             | 100                     | 16           | 31.5           | 365  | 0.15                          | 2000                 | 0.8               | 7.5              |                      |                      | ECA2EHG101    | 100                     |                 |
|             | 350                     | 1            | 6.3            | 11.2   | 18                            | 0.20                 | 2000              | 0.5              | 2.5                  | 5.0                  | 2.5           | ECA2VHG010( )           | 200             |
| 2.2         | 8                       | 11.5         | 31             | 0.20   | 2000                          | 0.6                  | 3.5               | 5.0              |                      | ECA2VHG2R2( )        | 200           | 1000                    |                 |
| 3.3         | 10                      | 12.5         | 38             | 0.20   | 2000                          | 0.6                  | 5.0               | 5.0              |                      | ECA2VHG3R3( )        | 200           | 500                     |                 |
| 4.7         | 10                      | 16           | 50             | 0.20   | 2000                          | 0.6                  | 5.0               | 5.0              |                      | ECA2VHG4R7( )        | 200           | 500                     |                 |
| 10          | 10                      | 20           | 82             | 0.20   | 2000                          | 0.6                  | 5.0               | 5.0              |                      | ECA2VHG100( )        | 200           | 500                     |                 |
| 22          | 12.5                    | 20           | 130            | 0.20   | 2000                          | 0.6                  | 5.0               | 5.0              |                      | ECA2VHG220( )        | 200           | 500                     |                 |
| 33          | 16                      | 25           | 195            | 0.20   | 2000                          | 0.8                  | 7.5               | 7.5              |                      | ECA2VHG330( )        | 100           | 250                     |                 |
| 47          | 16                      | 25           | 230            | 0.20   | 2000                          | 0.8                  | 7.5               | 7.5              |                      | ECA2VHG470( )        | 100           | 250                     |                 |
| 100         | 18                      | 31.5         | 375            | 0.20   | 2000                          | 0.8                  | 7.5               |                  |                      | ECA2VHG101           | 50            |                         |                 |

When requesting taped product, please put the letter "B" or "i" between the "( )". Lead wire pitch B=5 mm, 7.5 mm, i=2.5 mm. The taping dimensions are explained on EE189 of our Catalog. Please use it as a reference guide.

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.

00 Sep. 2010

### ■ 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>(120 Hz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endur-<br>ance<br>(hours) | 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) |
| 400         | 1                       | 6.3          | 11.2           | 18   | 0.24                          | 2000                      | 0.5               | 2.5              | 5.0                  | 2.5      | ECA2GHG010( )           | 200             | 2000                 |
|             | 2.2                     | 8            | 11.5           | 30   | 0.24                          | 2000                      | 0.6               | 3.5              | 5.0                  |          | ECA2GHG2R2( )           | 200             | 1000                 |
|             | 3.3                     | 10           | 12.5           | 40   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2GHG3R3( )           | 200             | 500                  |
|             | 4.7                     | 10           | 16             | 50   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2GHG4R7( )           | 200             | 500                  |
|             | 10                      | 10           | 20             | 80   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2GHG100( )           | 200             | 500                  |
|             | 22                      | 12.5         | 25             | 145  | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2GHG220( )           | 200             | 500                  |
|             | 33                      | 16           | 25             | 195  | 0.24                          | 2000                      | 0.8               | 7.5              | 7.5                  |          | ECA2GHG330( )           | 100             | 250                  |
| 450         | 1                       | 8            | 11.5           | 18   | 0.24                          | 2000                      | 0.6               | 3.5              | 5.0                  |          | ECA2WHG010( )           | 200             | 1000                 |
|             | 2.2                     | 10           | 12.5           | 29   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2WHG2R2( )           | 200             | 500                  |
|             | 3.3                     | 10           | 16             | 41   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2WHG3R3( )           | 200             | 500                  |
|             | 4.7                     | 10           | 20             | 49   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2WHG4R7( )           | 200             | 500                  |
|             | 10                      | 12.5         | 20             | 75   | 0.24                          | 2000                      | 0.6               | 5.0              | 5.0                  |          | ECA2WHG100( )           | 200             | 500                  |
|             | 22                      | 16           | 25             | 115  | 0.24                          | 2000                      | 0.8               | 7.5              | 7.5                  |          | ECA2WHG220( )           | 100             | 250                  |
|             | 33                      | 16           | 31.5           | 155  | 0.24                          | 2000                      | 0.8               | 7.5              |                      |          | ECA2WHG330              | 100             |                      |

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