

### Radial Lead Type

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

#### ■ Features

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



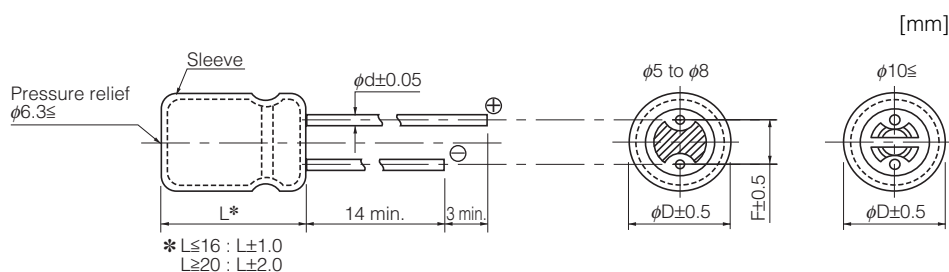
#### ■ Specifications

|                       |                                                                                                                                                                                                                                                                              |                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 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 (μA) After 2 minutes<br>(Which is greater)                                                                                                                                                                                                             | $I \leq 0.06 CV + 10$ (μA) After 2 minutes |
| tan δ                 | Please see the attached standard products list                                                                                                                                                                                                                               |                                            |
| Endurance             | 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. |                                            |
|                       | 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                                                                                                                                                        |                                            |
|                       | Capacitance change                                                                                                                                                                                                                                                           | ±20 % of initial measured value            |
|                       | tan δ                                                                                                                                                                                                                                                                        | ≤ 200 % of initial specified value         |
| Shelf Life            | DC leakage current                                                                                                                                                                                                                                                           | ≤ initial specified value                  |
|                       | 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)

|              |     |     |     |     |      |     |     |
|--------------|-----|-----|-----|-----|------|-----|-----|
| 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.  | 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) | Endurance | Lead Dia.   | Lead Space |              |              |               | Straight Leads      | Taping |
|       |                 |           |        |                                         |                               |           |             | Straight   | Taping<br>*B | Taping<br>*i |               |                     |        |
| (V)   | (μF)            | (mm)      | (mm)   | (mA r.m.s.)                             |                               | (hours)   | (mm)        | (mm)       | (mm)         | (mm)         |               | (pcs)               | (pcs)  |
| 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    |
| 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.

■ 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)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endurance | Lead Dia.   | Lead Space |              |              |               | Straight Leads      | Taping |
|      |                 |           |        |                                                        |                               |           |             | Straight   | Taping<br>*B | Taping<br>*i |               |                     |        |
| (V)  | (μF)            | (mm)      | (mm)   | (mA r.m.s.)                                            |                               | (hours)   | (mm)        | (mm)       | (mm)         | (mm)         |               | (pcs)               | (pcs)  |
| 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. | Cap.<br>(±20 %) | Case size |        | Specification                              |                               |                | Lead Length  |            |              |               | Part No.      | Min. Packaging Q'ty |        |
|------|-----------------|-----------|--------|--------------------------------------------|-------------------------------|----------------|--------------|------------|--------------|---------------|---------------|---------------------|--------|
|      |                 | Dia.      | Length | Ripple<br>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)          |               | (pcs)               | (pcs)  |
| 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            |                     |        |

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■ Standard Products

| W.V.<br><br>(V) | Cap.<br>(±20 %)<br><br>(μF) | Case size |        | Specification                                          |                               |                          | Lead Length           |                      |                      |                      | Part No.      | Min. Packaging Q'ty         |                     |
|-----------------|-----------------------------|-----------|--------|--------------------------------------------------------|-------------------------------|--------------------------|-----------------------|----------------------|----------------------|----------------------|---------------|-----------------------------|---------------------|
|                 |                             | Dia.      | Length | Ripple Current<br>(120 Hz)<br>(+105 °C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) | Endurance<br><br>(hours) | Lead Dia.<br><br>(mm) | Lead Space           |                      |                      |               | Straight Leads<br><br>(pcs) | Taping<br><br>(pcs) |
|                 |                             |           |        |                                                        |                               |                          |                       | Straight<br><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                 |
|                 | 47                          | 16        | 31.5   | 250                                                    | 0.24                          | 2000                     | 0.8                   | 7.5                  |                      |                      | ECA2GHG470    | 100                         |                     |
| 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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