

# SCREW TERMINAL TYPE ALUMINUM ELECTROLYTIC CAPACITORS

## HCGHA Series

(Warranty of 2,000 hours at 105°C)

### Features

- Warranty life of 2000 hours at 105°C through improvement of electrolyte liquid



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ALUMINUM ELECTROLYTIC CAPACITORS

### Product Specifications

| Items                      | Specifications                                                                                                                                                                                                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature range          | -40°C ~ +105°C                                                                                                                                                                                                                                                                        |
| Capacitance tolerance      | ±20% (20°C, 120Hz)                                                                                                                                                                                                                                                                    |
| Rated voltage              | 25 ~ 400V.DC                                                                                                                                                                                                                                                                          |
| Leakage current            | 0.01CV (μA) or 5mA, whichever is smaller or less<br>[C = nominal capacitance (μF), V = rated voltage (V)]                                                                                                                                                                             |
| Dissipation factor         | Less than the value specified in the standard products table. (20°C, 120Hz)                                                                                                                                                                                                           |
| Permissible ripple current | As specified in the standard products table. (105°C, 120Hz)                                                                                                                                                                                                                           |
| High-temperature load      | After the rated voltage (specified ripple current convolution) is applied at 105°C for 2000 hours:<br>Capacitance tolerance: ±15% or less of the initial value<br>Dissipation factor: 175% or less of the specified initial value<br>Leakage current: Specified initial value or less |
| Others                     | JIS C 5101-4.                                                                                                                                                                                                                                                                         |

### Ripple current correction coefficient

| Temperature (°C)       | 40    | 55  | 70  | 85  | 105  |
|------------------------|-------|-----|-----|-----|------|
| Correction coefficient | 4.9   | 3.9 | 3.0 | 1.8 | 1.0  |
| Frequency (Hz)         | 50/60 | 120 | 300 | 1K  | ≥10K |
| Correction coefficient | 0.8   | 1.0 | 1.1 | 1.3 | 1.4  |

Ripple current should be under 60 Arms at M5 terminal in accordance with from the permissible current.

### Attachment of legs

- See page 38 for shapes and dimensions.
- Product names in the Standard Units Rating Table correspond to the attachment legs for Type Y (Type I for ø36 only), but Type I attachment legs may be used (Shape Code = I).
- If attachment legs are not necessary, enter "N" for the attachment leg shape code.
- Attachment legs will be delivered separately.

### Standard value and case size

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C, 120Hz | Ripple current<br>(Arms)<br>105°C, 120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|---------------------|------------------------------------------|--------------|
| 25V(1E)                | 10000               | 36×53                 | A5        | 0.35                | 2.9                                      | HCGHA1E103I  |
|                        | 15000               | 36×83                 | A8        | 0.35                | 4.2                                      | HCGHA1E153I  |
|                        | 22000               | 36×83                 | A8        | 0.35                | 5.1                                      | HCGHA1E223I  |
|                        | 33000               | 36×100                | A10       | 0.40                | 6.3                                      | HCGHA1E333I  |
|                        | 47000               | 51×75                 | C8R       | 0.40                | 8.0                                      | HCGHA1E473Y  |
|                        | 68000               | 51×115                | C12R      | 0.50                | 10.0                                     | HCGHA1E683Y  |
|                        | 100000              | 64×96                 | D10R      | 0.60                | 11.3                                     | HCGHA1E104Y  |
|                        | 150000              | 64×115                | D12R      | 0.80                | 12.9                                     | HCGHA1E154Y  |
|                        | 220000              | 77×115                | E12R      | 1.00                | 14.8                                     | HCGHA1E224Y  |
|                        | 330000              | 90×131                | F13R      | 1.00                | 19.9                                     | HCGHA1E334Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C, 120Hz | Ripple current<br>(Arms)<br>105°C, 120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|---------------------|------------------------------------------|--------------|
| 35V(1V)                | 6800                | 36×53                 | A5        | 0.30                | 2.6                                      | HCGHA1V682I  |
|                        | 10000               | 36×83                 | A8        | 0.30                | 3.7                                      | HCGHA1V103I  |
|                        | 15000               | 36×83                 | A8        | 0.30                | 4.5                                      | HCGHA1V153I  |
|                        | 22000               | 36×100                | A10       | 0.35                | 5.5                                      | HCGHA1V223I  |
|                        | 33000               | 51×75                 | C8R       | 0.40                | 6.7                                      | HCGHA1V333Y  |
|                        | 47000               | 51×96                 | C10R      | 0.45                | 8.1                                      | HCGHA1V473Y  |
|                        | 68000               | 51×115                | C12R      | 0.50                | 10.0                                     | HCGHA1V683Y  |
|                        | 100000              | 64×115                | D12R      | 0.60                | 12.1                                     | HCGHA1V104Y  |
|                        | 150000              | 77×115                | E12R      | 0.70                | 13.8                                     | HCGHA1V154Y  |
|                        | 220000              | 90×131                | F13R      | 0.70                | 17.6                                     | HCGHA1V224Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C, 120Hz | Ripple current<br>(Arms)<br>105°C, 120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|---------------------|------------------------------------------|--------------|
| 50V(1H)                | 3300                | 36×53                 | A5        | 0.20                | 2.2                                      | HCGHA1H332I  |
|                        | 4700                | 36×53                 | A5        | 0.25                | 3.3                                      | HCGHA1H472I  |
|                        | 6800                | 36×83                 | A8        | 0.25                | 3.4                                      | HCGHA1H682I  |
|                        | 10000               | 36×83                 | A8        | 0.25                | 4.1                                      | HCGHA1H103I  |
|                        | 15000               | 36×100                | A10       | 0.30                | 4.9                                      | HCGHA1H153I  |
|                        | 22000               | 51×75                 | C8R       | 0.35                | 5.9                                      | HCGHA1H223Y  |
|                        | 33000               | 51×115                | C12R      | 0.40                | 7.8                                      | HCGHA1H333Y  |
|                        | 47000               | 64×96                 | D10R      | 0.40                | 9.5                                      | HCGHA1H473Y  |
|                        | 68000               | 64×115                | D12R      | 0.45                | 11.6                                     | HCGHA1H683Y  |
|                        | 100000              | 77×115                | E12R      | 0.50                | 14.1                                     | HCGHA1H104Y  |
|                        | 150000              | 90×131                | F13R      | 0.50                | 18.9                                     | HCGHA1H154Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C, 120Hz | Ripple current<br>(Arms)<br>105°C, 120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|---------------------|------------------------------------------|--------------|
| 63V(1J)                | 2200                | 36×53                 | A5        | 0.15                | 2.1                                      | HCGHA1J222I  |
|                        | 3300                | 36×53                 | A5        | 0.20                | 2.2                                      | HCGHA1J332I  |
|                        | 4700                | 36×83                 | A8        | 0.20                | 3.1                                      | HCGHA1J472I  |
|                        | 6800                | 36×83                 | A8        | 0.20                | 3.7                                      | HCGHA1J682I  |
|                        | 10000               | 36×100                | A10       | 0.25                | 4.4                                      | HCGHA1J103I  |
|                        | 15000               | 51×75                 | C8R       | 0.25                | 5.7                                      | HCGHA1J153Y  |
|                        | 22000               | 51×96                 | C10R      | 0.30                | 6.8                                      | HCGHA1J223Y  |
|                        | 33000               | 64×96                 | D10R      | 0.30                | 9.2                                      | HCGHA1J333Y  |
|                        | 47000               | 64×115                | D12R      | 0.35                | 10.9                                     | HCGHA1J473Y  |
|                        | 68000               | 77×115                | E12R      | 0.40                | 13.0                                     | HCGHA1J683Y  |
|                        | 100000              | 90×131                | F13R      | 0.40                | 17.2                                     | HCGHA1J104Y  |

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| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 80V(1K)                | 2200                | 36×53                 | A5        | 0.15               | 2.1                                     | HCGHA1K222 I |
|                        | 3300                | 36×83                 | A8        | 0.15               | 3.0                                     | HCGHA1K332 I |
|                        | 4700                | 36×83                 | A8        | 0.15               | 3.6                                     | HCGHA1K472 I |
|                        | 6800                | 36×100                | A10       | 0.20               | 4.0                                     | HCGHA1K682 I |
|                        | 10000               | 51×75                 | C8R       | 0.20               | 5.2                                     | HCGHA1K103Y  |
|                        | 15000               | 51×96                 | C10R      | 0.25               | 6.2                                     | HCGHA1K153Y  |
|                        | 22000               | 64×96                 | D10R      | 0.25               | 8.2                                     | HCGHA1K223Y  |
|                        | 33000               | 77×96                 | E10R      | 0.30               | 9.7                                     | HCGHA1K333Y  |
|                        | 47000               | 77×115                | E12R      | 0.30               | 12.5                                    | HCGHA1K473Y  |
|                        | 68000               | 90×131                | F13R      | 0.30               | 16.4                                    | HCGHA1K683Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 100V(2A)               | 1000                | 36×53                 | A5        | 0.15               | 1.4                                     | HCGHA2A102 I |
|                        | 1500                | 36×53                 | A5        | 0.15               | 1.7                                     | HCGHA2A152 I |
|                        | 2200                | 36×83                 | A8        | 0.15               | 2.5                                     | HCGHA2A222 I |
|                        | 3300                | 36×83                 | A8        | 0.15               | 3.0                                     | HCGHA2A332 I |
|                        | 4700                | 36×100                | A10       | 0.15               | 3.9                                     | HCGHA2A472 I |
|                        | 6800                | 51×75                 | C8R       | 0.15               | 5.0                                     | HCGHA2A682Y  |
|                        | 10000               | 51×96                 | C10R      | 0.15               | 6.5                                     | HCGHA2A103Y  |
|                        | 15000               | 64×96                 | D10R      | 0.20               | 7.6                                     | HCGHA2A153Y  |
|                        | 22000               | 77×96                 | E10R      | 0.20               | 9.7                                     | HCGHA2A223Y  |
|                        | 33000               | 77×130                | E13R      | 0.25               | 11.8                                    | HCGHA2A333Y  |
|                        | 47000               | 90×131                | F13R      | 0.25               | 15.0                                    | HCGHA2A473Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 160V(2C)               | 470                 | 36×53                 | A5        | 0.15               | 1.0                                     | HCGHA2C471 I |
|                        | 680                 | 36×53                 | A5        | 0.15               | 1.1                                     | HCGHA2C681 I |
|                        | 1000                | 36×83                 | A8        | 0.15               | 1.7                                     | HCGHA2C102 I |
|                        | 1500                | 36×83                 | A8        | 0.15               | 2.0                                     | HCGHA2C152 I |
|                        | 2200                | 36×100                | A10       | 0.15               | 2.7                                     | HCGHA2C222 I |
|                        | 3300                | 51×75                 | C8R       | 0.15               | 3.5                                     | HCGHA2C332Y  |
|                        | 4700                | 51×96                 | C10R      | 0.15               | 4.4                                     | HCGHA2C472Y  |
|                        | 6800                | 64×96                 | D10R      | 0.15               | 5.9                                     | HCGHA2C682Y  |
|                        | 10000               | 77×96                 | E10R      | 0.15               | 7.6                                     | HCGHA2C103Y  |
|                        | 15000               | 77×130                | E13R      | 0.15               | 10.3                                    | HCGHA2C153Y  |
|                        | 22000               | 90×131                | F13R      | 0.15               | 13.2                                    | HCGHA2C223Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 200V(2D)               | 330                 | 36×53                 | A5        | 0.15               | 0.8                                     | HCGHA2D331 I |
|                        | 470                 | 36×53                 | A5        | 0.15               | 1.0                                     | HCGHA2D471 I |
|                        | 680                 | 36×53                 | A5        | 0.15               | 1.1                                     | HCGHA2D681 I |
|                        | 1000                | 36×83                 | A8        | 0.15               | 1.7                                     | HCGHA2D102 I |
|                        | 1500                | 36×100                | A10       | 0.15               | 2.2                                     | HCGHA2D152 I |
|                        | 2200                | 51×75                 | C8R       | 0.15               | 2.8                                     | HCGHA2D222Y  |
|                        | 3300                | 51×96                 | C10R      | 0.15               | 3.7                                     | HCGHA2D332Y  |
|                        | 4700                | 64×96                 | D10R      | 0.15               | 4.9                                     | HCGHA2D472Y  |
|                        | 6800                | 64×115                | D12R      | 0.15               | 6.3                                     | HCGHA2D682Y  |
|                        | 10000               | 77×115                | E12R      | 0.15               | 8.1                                     | HCGHA2D103Y  |
|                        | 15000               | 90×131                | F13R      | 0.15               | 10.9                                    | HCGHA2D153Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 250V(2E)               | 330                 | 36×53                 | A5        | 0.15               | 0.8                                     | HCGHA2E331 I |
|                        | 470                 | 36×53                 | A5        | 0.15               | 1.0                                     | HCGHA2E471 I |
|                        | 680                 | 36×83                 | A8        | 0.15               | 1.4                                     | HCGHA2E681 I |
|                        | 1000                | 36×100                | A10       | 0.15               | 1.9                                     | HCGHA2E102 I |
|                        | 1500                | 51×75                 | C8R       | 0.15               | 2.3                                     | HCGHA2E152Y  |
|                        | 2200                | 51×96                 | C10R      | 0.15               | 3.1                                     | HCGHA2E222Y  |
|                        | 3300                | 64×96                 | D10R      | 0.15               | 4.2                                     | HCGHA2E332Y  |
|                        | 4700                | 64×115                | D12R      | 0.15               | 5.4                                     | HCGHA2E472Y  |
|                        | 6800                | 77×115                | E12R      | 0.15               | 6.9                                     | HCGHA2E682Y  |
|                        | 10000               | 77×155                | E16R      | 0.15               | 9.3                                     | HCGHA2E103Y  |
|                        | 15000               | 90×157                | F16R      | 0.15               | 12.2                                    | HCGHA2E153Y  |

| Rated Voltage<br>V. DC | Capacitance<br>(μF) | Case size<br>øDXL(mm) | Case code | tanδ<br>20°C,120Hz | Ripple current<br>(Arms)<br>105°C,120Hz | Product name |
|------------------------|---------------------|-----------------------|-----------|--------------------|-----------------------------------------|--------------|
| 400V(2G)               | 1000                | 51×75                 | C8R       | 0.15               | 2.5                                     | HCGHA2G102Y  |
|                        | 1200                | 51×96                 | C10R      | 0.15               | 3.0                                     | HCGHA2G122Y  |
|                        | 1500                | 51×115                | C12R      | 0.15               | 3.6                                     | HCGHA2G152Y  |
|                        | 1800                | 51×130                | C13R      | 0.15               | 4.1                                     | HCGHA2G182Y  |
|                        | 2200                | 64×96                 | D10R      | 0.15               | 4.5                                     | HCGHA2G222Y  |
|                        | 2700                | 64×115                | D12R      | 0.15               | 5.3                                     | HCGHA2G272Y  |
|                        | 3300                | 64×130                | D13R      | 0.15               | 6.2                                     | HCGHA2G332Y  |
|                        | 3900                | 64×155                | D16R      | 0.15               | 7.2                                     | HCGHA2G392YD |
|                        |                     | 77×115                | E12R      | 0.15               | 6.8                                     | HCGHA2G392YE |
|                        | 4700                | 64×195                | D20R      | 0.15               | 8.7                                     | HCGHA2G472YD |
|                        |                     | 77×130                | E13R      | 0.15               | 7.8                                     | HCGHA2G472YE |
|                        | 5600                | 64×195                | D20R      | 0.15               | 9.6                                     | HCGHA2G562YD |
|                        |                     | 77×155                | E16R      | 0.15               | 9.2                                     | HCGHA2G562YE |
|                        | 6800                | 90×157                | F16R      | 0.15               | 10.7                                    | HCGHA2G682Y  |
|                        | 8200                | 90×157                | F16R      | 0.15               | 11.8                                    | HCGHA2G822Y  |
|                        | 10000               | 90×196                | F20R      | 0.15               | 14.1                                    | HCGHA2G103Y  |