

## ROA Aluminum Electrolytic Capacitors For Audio

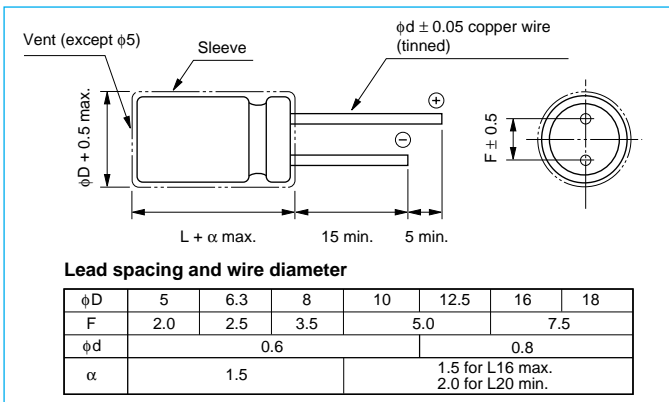
### ■ CERAFINE SERIES Fine ceramic adopted electrolytic capacitor for audio

- True audio reproduction by the suppression of electrical noise due to external vibration.
- As the charging and discharging speed between the oxidized film of anode and field surface of electrolyte and the variation of potential due to unevenness of fibers of separating paper sheets are improved by the electro-chemical action of super fine ceramic particles, this product realizes high grade audio tone with excellent sound resolution power, good rise in the low-pitched sound region and no distortion in the medium and high-pitched sound region.

### Series ROA Standard for Audio (Common name: Cerafine)

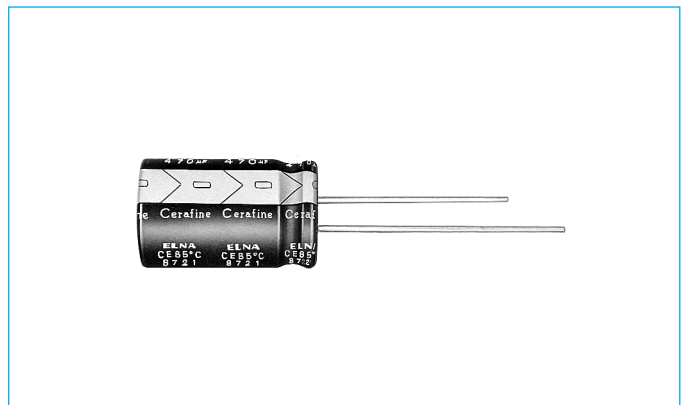
- All lead wires are oxygen-free copper for extremely low distortion. (Third high frequency distortion 10 kHz, 0.1 A, -120 dB or less)
- Vinyl sleeve is of wine red finish with gold "Cerafine" mark.

#### Outline Drawing



Unit: mm

#### Photo



#### Specifications

| No.                   | Item                                      | Performance  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
|-----------------------|---|--|-------------------|----------|-----------------|---------------------------------|-----------------------|------------------------------|-------|---|-----|-------|------|------|------|------|------|------|------|------|
| 1                     | Temperature range (°C)                    | -40 to +85   |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| 2                     | Leakage current (μA)                      | Less than 0.01 CV or 3 whichever is larger (after five minutes) C: Capacitance (μF), V Voltage (V)   |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| 3                     | Capacitance tolerance (%)                 | ±20 (20°C, 120 Hz)   |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| 4                     | Tangent of loss angle (tan δ)             | <table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>tan δ</td> <td>0.23</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> </tr> </tbody> </table> <p>0.02 is added to each 1000 μF increase over 1000 μF</p> | Rated voltage (V) | 6.3      | 10              | 16                              | 25                    | 35                           | 50    | 63                                      | 100 | tan δ | 0.23 | 0.20 | 0.16 | 0.16 | 0.14 | 0.12 | 0.12 | 0.12 |
| Rated voltage (V)     | 6.3                                       | 10   | 16                | 25       | 35              | 50                              | 63                    | 100                          |       |   |     |       |      |      |      |      |      |      |      |      |
| tan δ                 | 0.23                                      | 0.20   | 0.16              | 0.16     | 0.14            | 0.12                            | 0.12                  | 0.12                         |       |   |     |       |      |      |      |      |      |      |      |      |
| 5                     | Endurance (85°C) (Applied ripple current) | <table border="1"> <tbody> <tr> <td>Test time</td> <td>1000 hrs</td> </tr> <tr> <td>Leakage current</td> <td>Initial specified value or less</td> </tr> <tr> <td>Change in capacitance</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>tan δ</td> <td>150% or less of initial specified value</td> </tr> </tbody> </table>   | Test time         | 1000 hrs | Leakage current | Initial specified value or less | Change in capacitance | Within ±20% of initial value | tan δ | 150% or less of initial specified value |     |       |      |      |      |      |      |      |      |      |
| Test time             | 1000 hrs                                  |  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| Leakage current       | Initial specified value or less           |  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| Change in capacitance | Within ±20% of initial value              |  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| tan δ                 | 150% or less of initial specified value   |  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| 6                     | Max. storage temp. (85°C)                 | Test time 500 hrs. Others have same as endurance in No. 5, Voltage application treatment.  |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |
| 7                     | Applicable Standards                      | JIS C 5101-1, 5101-4 1998 (IEC 60384-1 1992, 60384-4 1985)   |                   |          |                 |                                 |                       |                              |       |   |     |       |      |      |      |      |      |      |      |      |

#### Coefficients of Frequency for Ripple Current

| Rated Voltage (V) | Frequency (Hz)    |         |     |     |      |       |
|-------------------|-------------------|---------|-----|-----|------|-------|
|                   | Rated Voltage (V) | 50 • 60 | 120 | 1 k | 10 k | 100 k |
| 6.3 to 16         | All CV value      | 0.8     | 1   | 1.1 | 1.2  | 1.2   |
|                   | ≤1000             | 0.8     | 1   | 1.5 | 1.7  | 1.7   |
| 25 to 35          | 1000 <            | 0.8     | 1   | 1.2 | 1.3  | 1.3   |
|                   | ≤1000             | 0.8     | 1   | 1.6 | 1.9  | 1.9   |
| 50 to 100         | 1000 <            | 0.8     | 1   | 1.2 | 1.3  | 1.3   |
|                   | ≤1000             | 0.8     | 1   | 1.6 | 1.9  | 1.9   |

#### Coefficients of Temperature for Ripple Current

| Temperature (°C) | +70 or less | +85 |
|------------------|-------------|-----|
| Coefficients     | 1.35        | 1   |

**ROA Aluminum Electrolytic Capacitors For Audio**

Case size by working voltage & capacitance (in mm)

(mm)

| WV(V)<br>Cap.(μF) | 6.3       | 10        | 16        | 25        | 35        | 50        | 63        | 100       |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0.47              |           |           |           |           |           | 5 x 11    |           | 5 x 11    |
| 1                 |           |           |           |           |           | 5 x 11    |           | 5 x 11    |
| 2.2               |           |           |           |           |           | 5 x 11    | 5 x 11    | 6.3 x 11  |
| 3.3               |           |           |           |           |           | 5 x 11    | 5 x 11    | 8 x 11.5  |
| 4.7               |           |           |           | 5 x 11    | 5 x 11    | 6.3 x 11  | 6.3 x 11  | 8 x 11.5  |
| 10                |           |           | 5 x 11    | 5 x 11    | 6.3 x 11  | 6.3 x 11  | 8 x 11.5  | 10 x 12.5 |
| 22                |           | 5 x 11    | 6.3 x 11  | 6.3 x 11  | 8 x 11.5  | 10 x 12.5 | 10 x 12.5 | 10 x 20   |
| 33                | 5 x 11    | 6.3 x 11  | 6.3 x 11  | 8 x 11.5  | 10 x 12.5 | 10 x 12.5 | 10 x 16   | 12.5 x 20 |
| 47                | 6.3 x 11  | 6.3 x 11  | 8 x 11.5  | 8 x 11.5  | 10 x 12.5 | 10 x 16   | 10 x 20   | 12.5 x 25 |
| 100               | 8 x 11.5  | 8 x 11.5  | 10 x 12.5 | 10 x 16   | 10 x 20   | 12.5 x 20 | 12.5 x 20 | 16 x 25   |
| 220               | 10 x 12.5 | 10 x 12.5 | 10 x 16   | 10 x 20   | 12.5 x 25 | 16 x 25   | 16 x 31.5 | 18 x 40   |
| 330               | 10 x 12.5 | 10 x 16   | 10 x 20   | 12.5 x 20 | 16 x 25   | 16 x 31.5 | 16 x 35.5 |           |
| 470               | 10 x 16   | 10 x 20   | 12.5 x 20 | 12.5 x 25 | 16 x 25   | 16 x 35.5 | 18 x 35.5 |           |
| 1000              | 12.5 x 20 | 12.5 x 25 | 16 x 25   | 16 x 31.5 | 18 x 35.5 |           |           |           |
| 2200              | 16 x 25   | 16 x 31.5 | 18 x 35.5 |           |           |           |           |           |
| 3300              | 16 x 31.5 | 18 x 35.5 |           |           |           |           |           |           |
| 4700              | 16 x 35.5 |           |           |           |           |           |           |           |
| 6800              | 18 x 40   |           |           |           |           |           |           |           |

**Standard Ratings**

| ELNA PART NO. / WV (V) | CAP. (μF) | SIZE (φx L) (mm) | tan δ | Ripple Current (mArms) |
|------------------------|-----------|------------------|-------|------------------------|
| <b>6.3 V</b>           |           |                  |       |                        |
| ROA-6V330MP9           | 33        | 5 x 11           | 0.23  | 55                     |
| ROA-6V470MP9           | 47        | 6.3 x 11         | 0.23  | 80                     |
| ROA-6V101MP9           | 100       | 8 x 11.5         | 0.23  | 135                    |
| ROA-6V221MP9           | 220       | 10 x 12.5        | 0.23  | 240                    |
| ROA-6V331MP9           | 330       | 10 x 12.5        | 0.23  | 290                    |
| ROA-6V471MP9           | 470       | 10 x 16          | 0.23  | 390                    |
| ROA-6V102MP9           | 1000      | 12.5 x 20        | 0.23  | 710                    |
| ROA-6V222MP9           | 2200      | 16 x 25          | 0.25  | 1280                   |
| ROA-6V332MP9           | 3300      | 16 x 31.5        | 0.27  | 1660                   |
| ROA-6V472MP9           | 4700      | 16 x 35.5        | 0.29  | 2000                   |
| ROA-6V682MP9           | 6800      | 18 x 40          | 0.33  | 2550                   |
| <b>10 V</b>            |           |                  |       |                        |
| ROA-10V220MP9          | 22        | 5 x 11           | 0.20  | 50                     |
| ROA-10V330MP9          | 33        | 6.3 x 11         | 0.20  | 70                     |
| ROA-10V470MP9          | 47        | 6.3 x 11         | 0.20  | 85                     |
| ROA-10V101MP9          | 100       | 8 x 11.5         | 0.20  | 145                    |
| ROA-10V221MP9          | 220       | 10 x 12.5        | 0.20  | 260                    |
| ROA-10V331MP9          | 330       | 10 x 16          | 0.20  | 350                    |
| ROA-10V471MP9          | 470       | 10 x 20          | 0.20  | 455                    |
| ROA-10V102MP9          | 1000      | 12.5 x 25        | 0.20  | 835                    |
| ROA-10V222MP9          | 2200      | 16 x 31.5        | 0.22  | 1500                   |

| ELNA PART NO. / WV (V) | CAP. (μF) | SIZE (φx L) (mm) | tan δ | Ripple Current (mArms) |
|------------------------|-----------|------------------|-------|------------------------|
| ROA-10V332MP9          | 3300      | 18 x 35.5        | 0.24  | 1980                   |
| <b>16 V</b>            |           |                  |       |                        |
| ROA-16V100MP9          | 10        | 5 x 11           | 0.16  | 35                     |
| ROA-16V220MP9          | 22        | 6.3 x 11         | 0.16  | 65                     |
| ROA-16V330MP9          | 33        | 6.3 x 11         | 0.16  | 80                     |
| ROA-16V470MP9          | 47        | 8 x 11.5         | 0.16  | 110                    |
| ROA-16V101MP9          | 100       | 10 x 12.5        | 0.16  | 195                    |
| ROA-16V221MP9          | 220       | 10 x 16          | 0.16  | 320                    |
| ROA-16V331MP9          | 330       | 10 x 20          | 0.16  | 425                    |
| ROA-16V471MP9          | 470       | 12.5 x 20        | 0.16  | 585                    |
| ROA-16V102MP9          | 1000      | 16 x 25          | 0.16  | 1080                   |
| ROA-16V222MP9          | 2200      | 18 x 35.5        | 0.18  | 1870                   |
| <b>25 V</b>            |           |                  |       |                        |
| ROA-25V4R7MP9          | 4.7       | 5 x 11           | 0.16  | 25                     |
| ROA-25V100MP9          | 10        | 5 x 11           | 0.16  | 35                     |
| ROA-25V220MP9          | 22        | 6.3 x 11         | 0.16  | 65                     |
| ROA-25V330MP9          | 33        | 8 x 11.5         | 0.16  | 95                     |
| ROA-25V470MP9          | 47        | 8 x 11.5         | 0.16  | 110                    |
| ROA-25V101MP9          | 100       | 10 x 16          | 0.16  | 215                    |
| ROA-25V221MP9          | 220       | 10 x 20          | 0.16  | 350                    |
| ROA-25V331MP9          | 330       | 12.5 x 20        | 0.16  | 490                    |
| ROA-25V471MP9          | 470       | 12.5 x 25        | 0.16  | 640                    |

Note: Allowable Ripple Current 120 Hz at 85°C

## ROA Aluminum Electrolytic Capacitors For Audio

### Standard Ratings

| ELNA PART NO. / WV (V) | CAP. (μF) | SIZE (φx L) (mm) | tan δ | Ripple Current (mArms) |
|------------------------|-----------|------------------|-------|------------------------|
| ROA-25V102MP9          | 1000      | 16 x 31.5        | 0.16  | 1180                   |
| <b>35 V</b>            |           |                  |       |                        |
| ROA-35V4R7MP9          | 4.7       | 5 x 11           | 0.14  | 25                     |
| ROA-35V100MP9          | 10        | 6.3 x 11         | 0.14  | 45                     |
| ROA-35V220MP9          | 22        | 8 x 11.5         | 0.14  | 80                     |
| ROA-35V330MP9          | 33        | 10 x 12.5        | 0.14  | 120                    |
| ROA-35V470MP9          | 47        | 10 x 12.5        | 0.14  | 140                    |
| ROA-35V101MP9          | 100       | 10 x 20          | 0.14  | 250                    |
| ROA-35V221MP9          | 220       | 12.5 x 25        | 0.14  | 465                    |
| ROA-35V331MP9          | 330       | 16 x 25          | 0.14  | 665                    |
| ROA-35V471MP9          | 470       | 16 x 25          | 0.14  | 795                    |
| ROA-35V102MP9          | 1000      | 18 x 35.5        | 0.14  | 1430                   |
| <b>50 V</b>            |           |                  |       |                        |
| ROA-50VR47MP9          | 0.47      | 5 x 11           | 0.12  | 9                      |
| ROA-50V010MP9          | 1         | 5 x 11           | 0.12  | 14                     |
| ROA-50V2R2MP9          | 2.2       | 5 x 11           | 0.12  | 20                     |
| ROA-50V3R3MP9          | 3.3       | 5 x 11           | 0.12  | 25                     |
| ROA-50V4R7MP9          | 4.7       | 6.3 x 11         | 0.12  | 35                     |
| ROA-50V100MP9          | 10        | 6.3 x 11         | 0.12  | 50                     |
| ROA-50V220MP9          | 22        | 10 x 12.5        | 0.12  | 105                    |
| ROA-50V330MP9          | 33        | 10 x 12.5        | 0.12  | 130                    |
| ROA-50V470MP9          | 47        | 10 x 16          | 0.12  | 170                    |
| ROA-50V101MP9          | 100       | 12.5 x 20        | 0.12  | 310                    |
| ROA-50V221MP9          | 220       | 16 x 25          | 0.12  | 585                    |
| ROA-50V331MP9          | 330       | 16 x 31.5        | 0.12  | 785                    |
| ROA-50V471MP9          | 470       | 16 x 35.5        | 0.12  | 985                    |
| <b>63 V</b>            |           |                  |       |                        |
| ROA-63V2R2MP9          | 2.2       | 5 x 11           | 0.12  | 20                     |
| ROA-63V3R3MP9          | 3.3       | 5 x 11           | 0.12  | 25                     |
| ROA-63V4R7MP9          | 4.7       | 6.3 x 11         | 0.12  | 35                     |
| ROA-63V100MP9          | 10        | 8 x 11.5         | 0.12  | 60                     |
| ROA-63V220MP9          | 22        | 10 x 12.5        | 0.12  | 105                    |
| ROA-63V330MP9          | 33        | 10 x 16          | 0.12  | 140                    |
| ROA-63V470MP9          | 47        | 10 x 20          | 0.12  | 185                    |
| ROA-63V101MP9          | 100       | 12.5 x 20        | 0.12  | 310                    |
| ROA-63V221MP9          | 220       | 16 x 31.5        | 0.12  | 640                    |
| ROA-63V331MP9          | 330       | 16 x 35.5        | 0.12  | 825                    |

| ELNA PART NO. / WV (V) | CAP. (μF) | SIZE (φx L) (mm) | tan δ | Ripple Current (mArms) |
|------------------------|-----------|------------------|-------|------------------------|
| ROA-63V471MP9          | 470       | 18 x 35.5        | 0.12  | 1050                   |
| <b>100 V</b>           |           |                  |       |                        |
| ROA-100VR47MP9         | 0.47      | 5 x 11           | 0.12  | 9                      |
| ROA-100V010MP9         | 1         | 5 x 11           | 0.12  | 14                     |
| ROA-100V2R2MP9         | 2.2       | 6.3 x 11         | 0.12  | 20                     |
| ROA-100V3R3MP9         | 3.3       | 8 x 11.5         | 0.12  | 30                     |
| ROA-100V4R7MP9         | 4.7       | 8 x 11.5         | 0.12  | 40                     |
| ROA-100V100MP9         | 10        | 10 x 12.5        | 0.12  | 70                     |
| ROA-100V220MP9         | 22        | 10 x 20          | 0.12  | 125                    |
| ROA-100V330MP9         | 33        | 12.5 x 20        | 0.12  | 175                    |
| ROA-100V470MP9         | 47        | 12.5 x 25        | 0.12  | 230                    |
| ROA-100V101MP9         | 100       | 16 x 25          | 0.12  | 395                    |
| ROA-100V221MP9         | 220       | 18 x 40          | 0.12  | 760                    |

Note: Allowable Ripple Current 120 Hz at 85°C