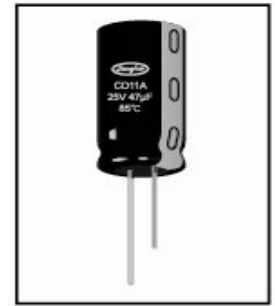


# CD 11A PA Series



2000h at 85°C

- Load life of 2000 hours at 85°C
- True audio reproduction by the suppression of electrical noise due to external vibration



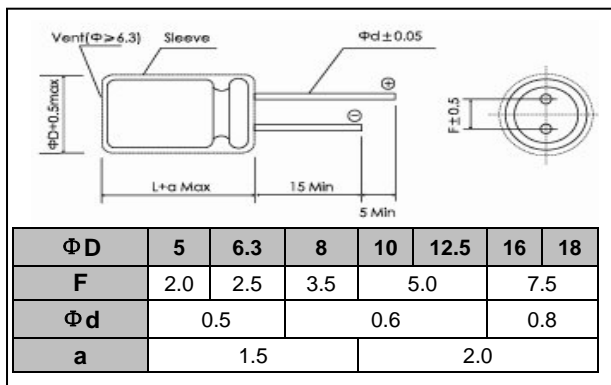
| Items   | Characteristics   |     |      |      |      |      |      |      |      |
|---|---|-----|------|------|------|------|------|------|------|
| Operating Temperature Range(°C)   | -40 ~ +85   |     |      |      |      |      |      |      |      |
| Voltage Range (V)   | 6.3~ 100  |     |      |      |      |      |      |      |      |
| Capacitance Tolerance (20°C,120Hz)  | ±20%  |     |      |      |      |      |      |      |      |
| Leakage Current (µA)  | After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.001CV or 4, whichever is greater<br>C:Nominal Capacitance(µF) V:Rated Voltage(V) |     |      |      |      |      |      |      |      |
| Dissipation Factor (20°C, 120Hz)  | Rated Voltage(V)  | 6.3 | 10   | 16   | 25   | 35   | 50   | 63   | 100  |
|   | Tan δ(max)  | 0.3 | 0.25 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.10 |
| When nominal capacitance is over 1000µF tan δ shall be added 0.02 to the listed value with increase of every 1000µF |   |     |      |      |      |      |      |      |      |

|   | Useful Life                              | Load Life                                | Endurance Test                               | Shelf Life   |
|---|--|--|--|--|
| Lifetime  | 3000h                                    | 2000h                                    | 2500h  | 1000h  |
| Leakage Current   | Not more than specified value            | Not more than specified value            | Not more than specified value                | Not more than specified value  |
| Capacitance Change  | Within ±30% of initial value             | Within ±20% of initial value             | Within ±20% of initial value                 | Within ±20% of initial value   |
| Dissipation Factor  | Not more than 300% of specified value    | Not more than 150% of specified value    | Not more than 150% of specified value        | Not more than 150% of specified value  |
| Condition:<br>Applied Voltage<br>Applied Current<br>Applied Temperature | U <sub>R</sub><br>I <sub>R</sub><br>85°C | U <sub>R</sub><br>I <sub>R</sub><br>85°C | U <sub>R</sub><br>I <sub>R</sub> = 0<br>85°C | U <sub>R</sub> = 0<br>I <sub>R</sub> = 0<br>85°C<br><br>After test:<br>U <sub>R</sub> to be applied for<br>30min>24h before<br>measurement |

## Dimensions

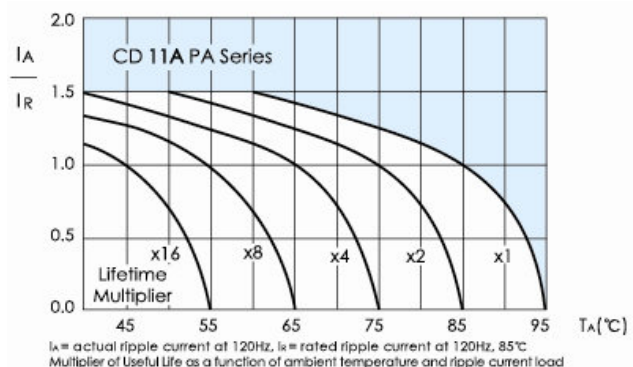
mm

## Frequency Coefficient



| Rated Voltage(v) | Frequency CV(µFv) | Frequency |       |      |       |        |
|------------------|-------------------|-----------|-------|------|-------|--------|
|                  |                   | 50~60Hz   | 120Hz | 1kHz | 10KHZ | 100KHz |
| 6.3~16           | ALL CV value      | 0.80      | 1.00  | 1.10 | 1.20  | 1.20   |
| 25~35            | ≤1000             | 0.80      | 1.00  | 1.50 | 1.70  | 1.70   |
|                  | >1000             | 0.80      | 1.00  | 1.20 | 1.30  | 1.30   |
| 50~100           | ≤1000             | 0.80      | 1.00  | 1.60 | 1.90  | 1.90   |
|                  | >1000             | 0.80      | 1.00  | 1.20 | 1.30  | 1.30   |

## Lifetime Diagram



## Temperature Coefficient

|                 |      |     |
|-----------------|------|-----|
| Temperature(°C) | +70  | +85 |
| Coefficient     | 1.35 | 1   |

## Ratings for CD 11A PA Series

| U <sub>R</sub><br>(Surge Voltage)<br>Code | Rated Capacitance              | Max ESR<br>20°C,<br>120Hz | Rated Ripple Current<br>85°C, 120Hz | Size<br>ΦD×L | P/N                 |                     |
|---|--------------------------------|---------------------------|-------------------------------------|--------------|---------------------|---------------------|
| (v)                                       | (μF)                           | (Ω)                       | (mA <sub>rms</sub> )                | (mm)         | -                   |                     |
| <b>6.3</b><br>(7.2)<br><b>0J</b>          | 100                            | 3.98                      | 85                                  | 5x11.5       | ECR0JPA101M□□050011 |                     |
|   | 220                            | 1.81                      | 150                                 | 6.3x11.5     | ECR0JPA221M□□063011 |                     |
|   | 330                            | 1.21                      | 180                                 | 6.3x11.5     | ECR0JPA331M□□063011 |                     |
|   | 470                            | 0.85                      | 260                                 | 8x11.5       | ECR0JPA471M□□080011 |                     |
|   | 1000                           | 0.40                      | 450                                 | 10x12.5      | ECR0JPA102M□□100012 |                     |
|   | 2200                           | 0.19                      | 890                                 | 12.5x20      | ECR0JPA222M□□125020 |                     |
|   | 3300                           | 0.14                      | 1050                                | 12.5x20      | ECR0JPA332M□□125020 |                     |
|   | 4700                           | 0.10                      | 1550                                | 16x25        | ECR0JPA472M□□160025 |                     |
|   | 6800                           | 0.08                      | 1750                                | 16x25        | ECR0JPA682M□□160025 |                     |
|   | 10000                          | 0.06                      | 2150                                | 16x31.5      | ECR0JPA103M□□160031 |                     |
|   | 15000                          | 0.05                      | 2700                                | 18x35.5      | ECR0JPA153M□□180035 |                     |
|   | <b>10</b><br>(13)<br><b>1A</b> | 33                        | 10.05                               | 55           | 5x11.5              | ECR1APA330M□□050011 |
|   |                                | 47                        | 7.06                                | 65           | 5x11.5              | ECR1APA470M□□050011 |
| 100                                       |                                | 3.32                      | 95                                  | 5x11.5       | ECR1APA101M□□050011 |                     |
| 220                                       |                                | 1.51                      | 165                                 | 6.3x11.5     | ECR1APA221M□□063011 |                     |
| 330                                       |                                | 1.01                      | 240                                 | 8x11.5       | ECR1APA331M□□080011 |                     |
| 470                                       |                                | 0.71                      | 280                                 | 8x11.5       | ECR1APA471M□□080011 |                     |
| 1000                                      |                                | 0.33                      | 540                                 | 10x16        | ECR1APA102M□□100016 |                     |
| 2200                                      |                                | 0.16                      | 970                                 | 12.5x20      | ECR1APA222M□□125020 |                     |
| 3300                                      |                                | 0.12                      | 1250                                | 12.5x25      | ECR1APA332M□□125025 |                     |
| 4700                                      |                                | 0.09                      | 1650                                | 16x25        | ECR1APA472M□□160025 |                     |
| 6800                                      |                                | 0.07                      | 2050                                | 16x31.5      | ECR1APA682M□□160031 |                     |
| 10000                                     |                                | 0.06                      | 2550                                | 18x35.5      | ECR1APA103M□□180035 |                     |
| <b>16</b><br>(20)<br><b>1C</b>            |                                | 22                        | 11.46                               | 50           | 5x11.5              | ECR1CPA220M□□050011 |
|   | 33                             | 7.64                      | 60                                  | 5x11.5       | ECR1CPA330M□□050011 |                     |
|   | 47                             | 5.36                      | 75                                  | 5x11.5       | ECR1CPA470M□□050011 |                     |
|   | 100                            | 2.52                      | 120                                 | 6.3x11.5     | ECR1CPA101M□□063011 |                     |
|   | 220                            | 1.15                      | 220                                 | 8x11.5       | ECR1CPA221M□□080011 |                     |
|   | 330                            | 0.76                      | 270                                 | 8x11.5       | ECR1CPA331M□□080011 |                     |
|   | 470                            | 0.54                      | 390                                 | 10x12.5      | ECR1CPA471M□□100012 |                     |
|   | 1000                           | 0.25                      | 680                                 | 10x20        | ECR1CPA102M□□100020 |                     |
|   | 2200                           | 0.13                      | 1200                                | 12.5x25      | ECR1CPA222M□□125025 |                     |
|   | 3300                           | 0.10                      | 1600                                | 16x25        | ECR1CPA332M□□160025 |                     |
|   | 4700                           | 0.07                      | 2050                                | 16x31.5      | ECR1CPA472M□□160031 |                     |
|   | 6800                           | 0.06                      | 2550                                | 18x35.5      | ECR1CPA682M□□180035 |                     |
|   | <b>25</b><br>(32)<br><b>1E</b> | 22                        | 9.65                                | 55           | 5x11.5              | ECR1EPA220M□□050011 |
| 33  |                                | 6.43                      | 70                                  | 5x11.5       | ECR1EPA330M□□050011 |                     |
| 47  |                                | 4.52                      | 80                                  | 5x11.5       | ECR1EPA470M□□050011 |                     |
| 100                                       |                                | 2.12                      | 140                                 | 6.3x11.5     | ECR1EPA101M□□063011 |                     |
| 220                                       |                                | 0.97                      | 240                                 | 8x11.5       | ECR1EPA221M□□080011 |                     |
| 330                                       |                                | 0.64                      | 350                                 | 10x12.5      | ECR1EPA331M□□100012 |                     |
| 470                                       |                                | 0.45                      | 460                                 | 10x16        | ECR1EPA471M□□100016 |                     |
| 1000                                      |                                | 0.21                      | 850                                 | 12.5x20      | ECR1EPA102M□□125020 |                     |
| 2200                                      |                                | 0.11                      | 1500                                | 16x25        | ECR1EPA222M□□160025 |                     |
| 3300                                      |                                | 0.08                      | 1900                                | 16x31.5      | ECR1EPA332M□□160031 |                     |
| 4700                                      |                                | 0.06                      | 2450                                | 18x35.5      | ECR1EPA472M□□180035 |                     |
| <b>35</b><br>(44)<br><b>1V</b>            |                                | 4.7                       | 39.53                               | 25           | 5x11.5              | ECR1VPA4R7M□□050011 |
|   |                                | 10                        | 18.58                               | 40           | 5x11.5              | ECR1VPA100M□□050011 |
|   | 22                             | 8.44                      | 60                                  | 5x11.5       | ECR1VPA220M□□050011 |                     |
|   | 33                             | 5.63                      | 75                                  | 5x11.5       | ECR1VPA330M□□050011 |                     |

| U <sub>R</sub><br>(Surge Voltage)<br>Code | Rated Capacitance                | Max ESR<br>20°C,<br>120Hz | Rated Ripple Current<br>85°C, 120Hz | Size<br>ΦD×L        | P/N                 |                     |
|---|----------------------------------|---------------------------|-------------------------------------|---------------------|---------------------|---------------------|
| (v)                                       | (μF)                             | (Ω)                       | (mA <sub>rms</sub> )                | (mm)                | -                   |                     |
| <b>35</b><br>(44)<br><b>1V</b>            | 47                               | 3.95                      | 100                                 | 6.3x11.5            | ECR1VPA470M□□063011 |                     |
|   | 100                              | 1.86                      | 170                                 | 8x11.5              | ECR1VPA101M□□080011 |                     |
|   | 220                              | 0.84                      | 310                                 | 10x12.5             | ECR1VPA221M□□100012 |                     |
|   | 330                              | 0.56                      | 420                                 | 10x16               | ECR1VPA331M□□100016 |                     |
|   | 470                              | 0.40                      | 540                                 | 10x20               | ECR1VPA471M□□100020 |                     |
|   | 1000                             | 0.19                      | 990                                 | 12.5x20             | ECR1VPA102M□□125020 |                     |
|   | 2200                             | 0.10                      | 1750                                | 16x31.5             | ECR1VPA222M□□160031 |                     |
|   | 3300                             | 0.07                      | 2250                                | 18x35.5             | ECR1VPA332M□□180035 |                     |
|   | <b>50</b><br>(63)<br><b>1H</b>   | 0.47                      | 338.80                              | 9                   | 5x11.5              | ECR1HPA4R7M□□050011 |
|   |                                  | 1                         | 159.24                              | 14                  | 5x11.5              | ECR1HPA010M□□050011 |
| 2.2                                       |                                  | 72.38                     | 20                                  | 5x11.5              | ECR1HPA2R2M□□050011 |                     |
| 3.3                                       |                                  | 48.25                     | 25                                  | 5x11.5              | ECR1HPA3R3M□□050011 |                     |
| 4.7                                       |                                  | 33.88                     | 30                                  | 5x11.5              | ECR1HPA4R7M□□050011 |                     |
| 10  |                                  | 15.92                     | 40                                  | 5x11.5              | ECR1HPA100M□□050011 |                     |
| 22  |                                  | 7.24                      | 65                                  | 5x11.5              | ECR1HPA220M□□050011 |                     |
| 33  |                                  | 4.83                      | 90                                  | 6.3x11.5            | ECR1HPA330M□□063011 |                     |
| 47  |                                  | 3.39                      | 110                                 | 6.3x11.5            | ECR1HPA470M□□063011 |                     |
| 100                                       |                                  | 1.59                      | 190                                 | 8x11.5              | ECR1HPA101M□□080011 |                     |
| 220                                       |                                  | 0.72                      | 370                                 | 10x16               | ECR1HPA221M□□100016 |                     |
| 330                                       |                                  | 0.48                      | 490                                 | 10x20               | ECR1HPA331M□□100020 |                     |
| 470                                       |                                  | 0.34                      | 670                                 | 12.5x20             | ECR1HPA471M□□125020 |                     |
| 1000                                      |                                  | 0.16                      | 1250                                | 16x25               | ECR1HPA102M□□160025 |                     |
| 2200                                      | 0.08                             | 2100                      | 18x35.5                             | ECR1HPA222M□□180035 |                     |                     |
| <b>63</b><br>(79)<br><b>1J</b>            | 4.7                              | 28.23                     | 30                                  | 5x11.5              | ECR1JPA4R7M□□050011 |                     |
|   | 10                               | 13.27                     | 45                                  | 5x11.5              | ECR1JPA100M□□050011 |                     |
|   | 22                               | 6.03                      | 80                                  | 6.3x11.5            | ECR1JPA220M□□063011 |                     |
|   | 33                               | 4.02                      | 100                                 | 6.3x11.5            | ECR1JPA330M□□063011 |                     |
|   | 47                               | 2.82                      | 140                                 | 8x11.5              | ECR1JPA470M□□080011 |                     |
|   | 100                              | 1.33                      | 250                                 | 10x12.5             | ECR1JPA101M□□100012 |                     |
|   | 220                              | 0.60                      | 440                                 | 10x20               | ECR1JPA221M□□100020 |                     |
|   | 330                              | 0.40                      | 620                                 | 12.5x20             | ECR1JPA331M□□125020 |                     |
|   | 470                              | 0.28                      | 810                                 | 12.5x25             | ECR1JPA471M□□125025 |                     |
|   | 1000                             | 0.13                      | 1500                                | 16x31.5             | ECR1JPA102M□□160031 |                     |
|   | <b>100</b><br>(125)<br><b>2A</b> | 0.47                      | 282.33                              | 10                  | 5x11.5              | ECR2APA4R7M□□050011 |
|   |                                  | 1                         | 132.70                              | 15                  | 5x11.5              | ECR2APA010M□□050011 |
|   |                                  | 2.2                       | 60.32                               | 20                  | 5x11.5              | ECR2APA2R2M□□050011 |
| 3.3                                       |                                  | 40.21                     | 25                                  | 5x11.5              | ECR2APA3R3M□□050011 |                     |
| 4.7                                       |                                  | 28.23                     | 30                                  | 5x11.5              | ECR2APA4R7M□□050011 |                     |
| 10  |                                  | 13.27                     | 55                                  | 6.3x11.5            | ECR2APA100M□□063011 |                     |
| 22  |                                  | 6.03                      | 95                                  | 8x11.5              | ECR2APA220M□□080011 |                     |
| 33  |                                  | 4.02                      | 140                                 | 10x12.5             | ECR2APA330M□□100012 |                     |
| 47  |                                  | 2.82                      | 180                                 | 10x16               | ECR2APA470M□□100016 |                     |
| 100                                       |                                  | 1.33                      | 340                                 | 12.5x20             | ECR2APA101M□□125020 |                     |
| 220                                       |                                  | 0.60                      | 640                                 | 16x25               | ECR2APA221M□□160025 |                     |
| 330                                       |                                  | 0.40                      | 780                                 | 16x25               | ECR2APA331M□□160025 |                     |
| 470                                       |                                  | 0.28                      | 1000                                | 16x31.5             | ECR2APA471M□□160031 |                     |

Customer products are available on request.