



Chinsan Electronic  
Since 1970

# Taiwan Chinsan Electronic Ind., Co., Ltd.

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## ALUMINUM ELECTROLYTIC CAPACITORS



### CES Series

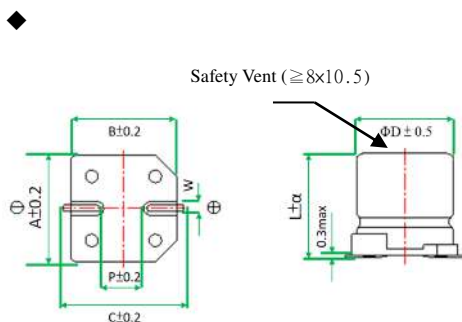
- Low impedance
- Load life 1,000 to 2,000 hours at 105°C



#### ◆ SPECIFICATIONS

| Item  | Performance Characteristics  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
|---|--|-------------------------------|-----------------------------|--------------------------|-------------------------------|-----------------|-------------------------------|----|------------------|-------------------|------|------|------|------|------|-------------------|------|------|------|------|------|-------|-------------------|---|---|---|---|---|-------------------|----|---|---|---|---|
| Category Temperature Range  | -55 ~ +105°C   |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Working Voltage Range   | 6.3 ~ 50Vdc  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Capacitance Range   | 1 ~ 3,300 μF   |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Capacitance Tolerance   | ±20% (at 25°C and 120Hz)   |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Dissipation Factor (tanδ)<br>(at 25°C, 120Hz)   | <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> </tr> </thead> <tbody> <tr> <td>tanδ(Max) Ø4~Ø10</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> </tr> <tr> <td>Ø12.5</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </tbody> </table>  | Rated Voltage (V)             | 6.3                         | 10                       | 16                            | 25              | 35                            | 50 | tanδ(Max) Ø4~Ø10 | 0.22              | 0.20 | 0.16 | 0.14 | 0.12 | 0.12 | Ø12.5             | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12  |                   |   |   |   |   |   |                   |    |   |   |   |   |
|   | Rated Voltage (V)  | 6.3                           | 10                          | 16                       | 25                            | 35              | 50                            |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| tanδ(Max) Ø4~Ø10  | 0.22   | 0.20                          | 0.16                        | 0.14                     | 0.12                          | 0.12            |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Ø12.5   | 0.26   | 0.22                          | 0.18                        | 0.16                     | 0.14                          | 0.12            |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| The above values should be increased by 0.02 for every additional 1000μF  |  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Leakage Current   | (Ø4~Ø10) I=0.01CV or 3μA whichever is greater impress the rated voltage for 2 minutes.<br>(Ø12.5) I=0.03CV or 4μA whichever is greater impress the rated voltage for 1 minutes.<br>I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V)   |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Low Temperature Characteristics<br>Impedance Ratio(MAX)   | <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> </tr> </thead> <tbody> <tr> <td rowspan="2">Ø4~Ø10</td> <td>Z(-25°C)/Z(+20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C)/Z(+20°C)</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td rowspan="2">Ø12.5</td> <td>Z(-25°C)/Z(+20°C)</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-55°C)/Z(+20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </tbody> </table> | Rated voltage (V)             | 6.3                         | 10                       | 16                            | 25              | 35                            | 50 | Ø4~Ø10           | Z(-25°C)/Z(+20°C) | 2    | 2    | 2    | 2    | 2    | Z(-55°C)/Z(+20°C) | 5    | 4    | 4    | 3    | 3    | Ø12.5 | Z(-25°C)/Z(+20°C) | 3 | 3 | 2 | 2 | 2 | Z(-55°C)/Z(+20°C) | 10 | 8 | 6 | 4 | 3 |
|   | Rated voltage (V)  | 6.3                           | 10                          | 16                       | 25                            | 35              | 50                            |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Ø4~Ø10  | Z(-25°C)/Z(+20°C)  | 2                             | 2                           | 2                        | 2                             | 2               |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
|   | Z(-55°C)/Z(+20°C)  | 5                             | 4                           | 4                        | 3                             | 3               |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Ø12.5   | Z(-25°C)/Z(+20°C)  | 3                             | 3                           | 2                        | 2                             | 2               |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
|   | Z(-55°C)/Z(+20°C)  | 10                            | 8                           | 6                        | 4                             | 3               |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| (at 120Hz)  |  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Endurance   | The following specifications shall be satisfied when the capacitors are restored to 25°C after subjected to DC voltage with the rated voltage is applied for 2,000 hours (Ø4~6.3x5.8 for 1,000 hours) at 105°C   |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Shelf Life  | <table border="1"> <tbody> <tr> <td>Capacitance change</td> <td>≅ ±20% of the initial value</td> </tr> <tr> <td>Dissipation factor(tanδ)</td> <td>≅ 200% of the specified value</td> </tr> <tr> <td>Leakage current</td> <td>≅ specified value</td> </tr> </tbody> </table>  | Capacitance change            | ≅ ±20% of the initial value | Dissipation factor(tanδ) | ≅ 200% of the specified value | Leakage current | ≅ specified value             |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
|   | Capacitance change   | ≅ ±20% of the initial value   |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
|   | Dissipation factor(tanδ)   | ≅ 200% of the specified value |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Leakage current   | ≅ specified value  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| The following requirements shall be satisfied when the capacitor are restored to 25°C after exposing them for 1000 hours at 105°C without voltage applied.  |  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| <table border="1"> <tbody> <tr> <td>Capacitance change</td> <td>≅ ±20% of the initial value</td> </tr> <tr> <td>Dissipation factor(tanδ)</td> <td>≅ 200% of the specified value</td> </tr> <tr> <td>Leakage current</td> <td>≅ 200% of the specified value</td> </tr> </tbody> </table> |  | Capacitance change            | ≅ ±20% of the initial value | Dissipation factor(tanδ) | ≅ 200% of the specified value | Leakage current | ≅ 200% of the specified value |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Capacitance change  | ≅ ±20% of the initial value  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Dissipation factor(tanδ)  | ≅ 200% of the specified value  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Leakage current   | ≅ 200% of the specified value  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |
| Others  | Conforms to JIS-C-5101-4 (1998), characteristic W  |                               |                             |                          |                               |                 |                               |    |                  |                   |      |      |      |      |      |                   |      |      |      |      |      |       |                   |   |   |   |   |   |                   |    |   |   |   |   |

#### ◆ DIMENSIONS (mm)



| Code | Size      | ΦD   | L    | α            | A    | B    | C    | W       | P   |
|------|-----------|------|------|--------------|------|------|------|---------|-----|
| 0458 | 4x5.8     | 4    | 5.8  | +0.4<br>-0.1 | 4.3  | 4.3  | 4.8  | 0.5~0.8 | 1   |
| 0558 | 5x5.8     | 5    | 5.8  | +0.4<br>-0.1 | 5.3  | 5.3  | 5.8  | 0.5~0.8 | 1.3 |
| 6358 | 6.3x5.8   | 6.3  | 5.8  | +0.4<br>-0.1 | 6.6  | 6.6  | 7.3  | 0.5~0.8 | 2.1 |
| 6377 | 6.3x7.7   | 6.3  | 7.7  | ±0.3         | 6.6  | 6.6  | 7.3  | 0.5~0.8 | 2.1 |
| 0862 | 8x6.2     | 8    | 6.2  | +0.4<br>-0.1 | 8.3  | 8.3  | 8.8  | 0.5~0.8 | 2.2 |
| 08A5 | 8x10.5    | 8    | 10.5 | 0.5          | 8.3  | 8.3  | 9.1  | 0.8~1.2 | 3.1 |
| 10A5 | 10x10.5   | 10   | 10.5 | 0.5          | 10.3 | 10.3 | 11   | 0.8~1.2 | 4.6 |
| 10C5 | 10x12.5   | 10   | 12.5 | 0.5          | 10.3 | 10.3 | 11   | 0.8~1.2 | 4.6 |
| 12D5 | 12.5x13.5 | 12.5 | 13.5 | 1.0          | 12.8 | 12.8 | 13.8 | 0.8~1.2 | 4.6 |
| 1216 | 12.5x16   | 12.5 | 16   | 1.0          | 12.8 | 12.8 | 13.8 | 0.8~1.2 | 4.6 |

#### ◆ Marking

≅ 6.3Φ



≅ 8Φ



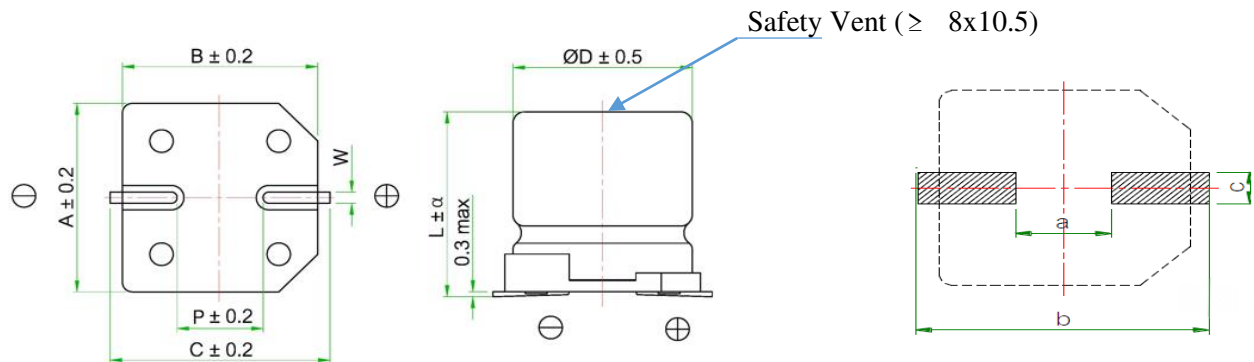
## Aluminum Electrolytic Capacitor

|                 |                 |               |            |             |                     |                   |
|-----------------|-----------------|---------------|------------|-------------|---------------------|-------------------|
| <b>Customer</b> | <b>Digi-Key</b> | <b>SERIES</b> | <b>CES</b> | <b>NO.:</b> | <b>PUBLISH DATE</b> | <b>2022-03-28</b> |
|-----------------|-----------------|---------------|------------|-------------|---------------------|-------------------|

1、Tape & Reel (TR)\ Cut Tape (CT)\ Digi-Reel.

2、Diagram of Dimensions (unit : mm.), and Recommended soldering pad dimensions.

| Size Code | ΦD  | L    | A   | B   | C   | W       | P   | α        | a   | b    | c   |
|-----------|-----|------|-----|-----|-----|---------|-----|----------|-----|------|-----|
| 6358      | 6.3 | 5.8  | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.1 | 0.4/-0.1 | 2.1 | 9.1  | 1.6 |
| 08A5      | 8   | 10.5 | 8.3 | 8.3 | 9.1 | 0.8~1.2 | 3.1 | 0.5      | 3.0 | 11.0 | 2.5 |



| No. | CHINSAN Part No. | Customer Part No. | Capacitance (uF) | Tolerance On rated Capacitance (%) | Working Voltage (Vdc) | Surge Voltage (Vdc) | Category Temp Range (°C) | Tanδ @ 25°C (120Hz) (Max) | Leakage Current (uA) (2 min.) | Rated Ripple Current (mA rms) @ 105°C 120Hz | Rated Ripple Current (mA rms) @ 105°C 100kHz | Impedance @20°C (Ω max/ 100kHz) | Endurance @ 105°C (Hours) | Dimensions (mm) |        |   |   |       | Appearance Drawing No |
|-----|------------------|-------------------|------------------|------------------------------------|-----------------------|---------------------|--------------------------|---------------------------|-------------------------------|---|--|---------------------------------|---------------------------|-----------------|--------|---|---|-------|-----------------------|
|     |                  |                   |                  |                                    |                       |                     |                          |                           |                               |   |  |                                 |                           | DΦ              | L      | a | d | P     |                       |
| 1   | CES1C101MCB6358  |                   | 100              | ±20%                               | 16                    |                     | -55° C ~ 105° C          | 0.16                      | 16                            |   | 140mA @ 100 kHz                              | 1.0 Ω                           | 1000 Hrs @ 105° C         | 6.3mm           | 5.8mm  |   |   | 2.1mm | ---                   |
| 2   | CES1V221MCB08A5  |                   | 220              | ±20%                               | 35                    |                     | -55° C ~ 105° C          | 0.12                      | 77                            |   | 450mA @ 100 kHz                              | 0.3 Ω                           | 2000 Hrs @ 125° C         | 8.0mm           | 10.5mm |   |   | 3.1mm |                       |

※Test leakage current before testing dissipation factor and capacitance during the electric characteristic test.

|                 |                    |                   |                    |
|-----------------|--------------------|-------------------|--------------------|
| <b>REMARKS:</b> | <b>APPROVED BY</b> | <b>CHECKED BY</b> | <b>PREPARED BY</b> |
|                 | 李科高                | 张铭仁               | 聂婷                 |