

# Type AVEZ $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$ Low Impedance SMT Aluminum Electrolytic Capacitors

For Filtering, Bypassing and Power Supply Decoupling



Type AVEZ Capacitors are rated for 1000 hours at  $105\text{ }^{\circ}\text{C}$  with low impedance characteristics. They are ideal for high density PC board packaging. The Type AVEZ offers a low in-place-cost for a high quality performer. The vertical cylindrical cases facilitate automatic mounting and reflow soldering into the same footprint of like-rated tantalum capacitors except without the need for voltage derating. Type AVEZ is RoHS compliant.

## Highlights

- $+105\text{ }^{\circ}\text{C}$ , Up to 1000 Hours Load Life
- Capacitance Range:  $1.0\text{ }\mu\text{F}$  to  $220\text{ }\mu\text{F}$
- Voltage Range:  $6.3\text{ Vdc}$  to  $50\text{ Vdc}$

## Specifications

|                               |  |
|-------------------------------|--|
| <b>Operating Temperature:</b> | $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$  |
| <b>Rated Voltage:</b>         | 6.3, 10, 16, 25, 35, 50 Vdc  |
| <b>Capacitance:</b>           | $1.0\text{ }\mu\text{F}$ to $220\text{ }\mu\text{F}$   |
| <b>Capacitance Tolerance:</b> | $\pm 20\%$ @ 120 Hz and $+20\text{ }^{\circ}\text{C}$  |
| <b>Leakage Current:</b>       | $I = 0.01\text{ CV}$ or $3\text{ }(\mu\text{A})$ whichever is greater after 2 minutes<br>C = rated capacitance in $\mu\text{F}$ , V = rated DC working voltage |

### Ripple Current Multiplier:

| Vdc \ Freq. (Hz) | 50, 60   | 120  | 1 k  | 10 k up |
|------------------|----------|------|------|---------|
|                  | 6.3 ~ 50 | 0.64 | 0.80 | 0.93    |

### Dissipation Factor: ( $\text{Tan } \delta$ at 120 Hz, $20\text{ }^{\circ}\text{C}$ )

| Rated Voltage    | 6.3  | 10   | 16   | 25   | 35   | 50   |
|------------------|------|------|------|------|------|------|
| Tan $\delta$ Max | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 |

### Low Temperature Characteristic (at 120 Hz):

| Rated Voltage   |   | 6.3 | 10 | 16 | 25 | 35 | 50 |
|-----------------|---|-----|----|----|----|----|----|
| Impedance Ratio | $Z(-25\text{ }^{\circ}\text{C}) / Z(+20\text{ }^{\circ}\text{C})$ | 4   | 3  | 2  | 2  | 2  | 2  |
|                 | $Z(-40\text{ }^{\circ}\text{C}) / Z(+20\text{ }^{\circ}\text{C})$ | 8   | 5  | 4  | 3  | 3  | 3  |



### Load Life Test:

|                    |                                    |
|--------------------|------------------------------------|
| Test Time          | 1,000 Hours                        |
| Capacitance Change | Within $\pm 25\%$ of initial value |
| Dissipation Factor | Less than 200% of specified value  |
| Leakage Current    | Within specified value             |

Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

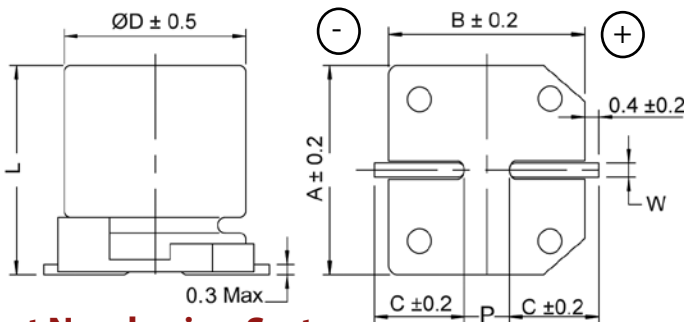
\* The above specifications shall be satisfied when the capacitors are restored to  $20\text{ }^{\circ}\text{C}$  after the rated voltage is applied for 1,000 hrs at  $105\text{ }^{\circ}\text{C}$

**Shelf Life Test:** Test time: 1000 hours; test limits are the same as those for life test.

# Type AVEZ $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$ Low Impedance SMT Aluminum Electrolytic Capacitors

## Outline Drawing, Case Code & Dimensions Table

Fig. 1



| Case Code | Ø D (mm) | L (mm)    | A (mm) | B (mm) | C (mm) | W (mm)     | P ± 0.2 (mm) |
|-----------|----------|-----------|--------|--------|--------|------------|--------------|
| B         | 4.0      | 5.3 ± 0.2 | 4.3    | 4.3    | 2.0    | 0.5 to 0.8 | 1.0          |
| C         | 5.0      | 5.3 ± 0.2 | 5.3    | 5.3    | 2.3    | 0.5 to 0.8 | 1.5          |
| D         | 6.3      | 5.3 ± 0.2 | 6.6    | 6.6    | 2.7    | 0.5 to 0.8 | 2.0          |
| X         | 6.3      | 7.7 ± 0.3 | 6.6    | 6.6    | 2.7    | 0.5 to 0.8 | 2.0          |

## Part Numbering System

|             |  |                       |   |           |  |                |
|-------------|--|-----------------------|---|-----------|--|----------------|
| <b>AVEZ</b> | <b>106</b>   | <b>M</b>              | <b>25</b>   | <b>C</b>  | <b>12T</b>   | <b>-F</b>      |
| Type        | Capacitance  | Capacitance Tolerance | Voltage Code  | Case Code | Packaging Code   | RoHS Compliant |
| <b>AVEZ</b> | <b>105</b> = 1.0 µF<br><b>106</b> = 10.0 µF<br><b>107</b> = 100.0 µF | <b>M</b> = ±20%       | <b>06</b> = 6.3 Vdc<br><b>10</b> = 10 Vdc<br><b>16</b> = 16 Vdc<br><b>25</b> = 25 Vdc<br><b>35</b> = 35 Vdc<br><b>50</b> = 50 Vdc | See Table | <b>12</b> = Carrier Tape<br>Width (mm)<br><b>T</b> = Tape & Reel |                |

## Ratings

| Cap (µF)                      | Catalog Part Number | Max DCL 2 min. (µA) | Max DF 120 Hz 20 °C | Max Impedance 100 kHz 20 °C (ohms) | Max Ripple Current 100 kHz 105 °C (mA) | Case Code | Size D x L (mm) | Quantity per Reel (each) |
|-------------------------------|---------------------|---------------------|---------------------|------------------------------------|--|-----------|-----------------|--------------------------|
| <b>6.3 Vdc ( 8 Vdc Surge)</b> |                     |                     |                     |                                    |  |           |                 |                          |
| 22                            | AVEZ226M06B12T-F    | 3.0                 | 0.28                | 3.20                               | 65                                     | B         | 4 x 5.3         | 2000                     |
| 33                            | AVEZ336M06C12T-F    | 3.0                 | 0.28                | 1.50                               | 110                                    | C         | 5 x 5.3         | 1000                     |
| 47                            | AVEZ476M06C12T-F    | 3.0                 | 0.28                | 1.50                               | 110                                    | C         | 5 x 5.3         | 1000                     |
| 100                           | AVEZ107M06D16T-F    | 6.3                 | 0.28                | 0.85                               | 170                                    | D         | 6.3 x 5.3       | 1000                     |
| 150                           | AVEZ157M06X16T-F    | 9.5                 | 0.28                | 0.50                               | 255                                    | X         | 6.3 x 7.7       | 1000                     |
| 220                           | AVEZ227M06X16T-F    | 13.9                | 0.28                | 0.50                               | 255                                    | X         | 6.3 x 7.7       | 1000                     |
| <b>10 Vdc ( 13 Vdc Surge)</b> |                     |                     |                     |                                    |  |           |                 |                          |
| 10                            | AVEZ106M10B12T-F    | 3.0                 | 0.24                | 3.20                               | 65                                     | B         | 4 x 5.3         | 2000                     |
| 22                            | AVEZ226M10C12T-F    | 3.0                 | 0.24                | 1.50                               | 110                                    | C         | 5 x 5.3         | 1000                     |
| 33                            | AVEZ336M10C12T-F    | 3.0                 | 0.24                | 1.50                               | 110                                    | C         | 5 x 5.3         | 1000                     |
| 47                            | AVEZ476M10D16T-F    | 3.0                 | 0.24                | 0.85                               | 170                                    | D         | 6.3 x 5.3       | 1000                     |
| 100                           | AVEZ107M10D16T-F    | 6.3                 | 0.24                | 0.85                               | 170                                    | D         | 6.3 x 5.3       | 1000                     |
| 150                           | AVEZ157M10X16T-F    | 9.5                 | 0.24                | 0.50                               | 255                                    | X         | 6.3 x 7.7       | 1000                     |
| 220                           | AVEZ227M10X16T-F    | 13.9                | 0.24                | 0.50                               | 255                                    | X         | 6.3 x 7.7       | 1000                     |

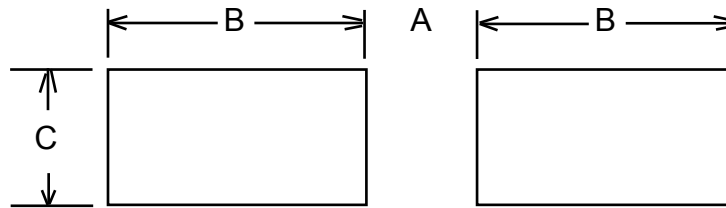
# Type AVEZ -55 °C to +105 °C

## Low Impedance SMT Aluminum Electrolytic Capacitors

| Cap<br>( $\mu$ F)             | Catalog<br>Part Number | Max<br>DCL<br>2 min.<br>( $\mu$ A) | Max<br>DF<br>120 Hz 20 °C | Max<br>Impedance<br>100 kHz 20 °C<br>(ohms) | Max<br>Ripple Current<br>100 kHz 105 °C<br>(mA) | Case<br>Code | Size<br>D x L<br>(mm) | Quantity<br>per Reel<br>(each) |
|-------------------------------|------------------------|------------------------------------|---------------------------|---|---|--------------|-----------------------|--------------------------------|
| <b>16 Vdc ( 13 Vdc Surge)</b> |                        |                                    |                           |   |   |              |                       |                                |
| 10                            | AVEZ106M16B12T-F       | 3.0                                | 0.2                       | 3.20  | 65  | B            | 4 x 5.3               | 2000                           |
| 22                            | AVEZ226M16C12T-F       | 3.0                                | 0.2                       | 1.50  | 110   | C            | 5 x 5.3               | 1000                           |
| 33                            | AVEZ336M16D16T-F       | 3.0                                | 0.2                       | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 47                            | AVEZ476M16D16T-F       | 3.0                                | 0.2                       | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 100                           | AVEZ107M16D16T-F       | 6.3                                | 0.2                       | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 150                           | AVEZ157M16X16T-F       | 9.5                                | 0.2                       | 0.50  | 255   | X            | 6.3 x 7.7             | 1000                           |
| 220                           | AVEZ227M16X16T-F       | 13.9                               | 0.2                       | 0.50  | 255   | X            | 6.3 x 7.7             | 1000                           |
| <b>25 Vdc ( 31 Vdc Surge)</b> |                        |                                    |                           |   |   |              |                       |                                |
| 4.7                           | AVEZ475M25B12T-F       | 3.0                                | 0.16                      | 3.20  | 65  | B            | 4 x 5.3               | 2000                           |
| 10                            | AVEZ106M25C12T-F       | 3.0                                | 0.16                      | 1.50  | 110   | C            | 5 x 5.3               | 1000                           |
| 22                            | AVEZ226M25D16T-F       | 3.0                                | 0.16                      | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 33                            | AVEZ336M25D16T-F       | 3.0                                | 0.16                      | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 47                            | AVEZ476M25D16T-F       | 3.0                                | 0.16                      | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 100                           | AVEZ107M25X16T-F       | 6.3                                | 0.16                      | 0.5   | 255   | X            | 6.3 x 7.7             | 1000                           |
| <b>35 Vdc ( 44 Vdc Surge)</b> |                        |                                    |                           |   |   |              |                       |                                |
| 4.7                           | AVEZ475M35B12T-F       | 3.0                                | 0.14                      | 3.20  | 65  | B            | 4 x 5.3               | 2000                           |
| 10                            | AVEZ106M35C12T-F       | 3.0                                | 0.14                      | 1.50  | 110   | C            | 5 x 5.3               | 1000                           |
| 22                            | AVEZ226M35D16T-F       | 3.0                                | 0.14                      | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 33                            | AVEZ336M35D16T-F       | 3.0                                | 0.14                      | 0.85  | 170   | D            | 6.3 x 5.3             | 1000                           |
| 47                            | AVEZ476M35X16T-F       | 3.0                                | 0.14                      | 0.50  | 255   | X            | 6.3 x 7.7             | 1000                           |
| <b>50 Vdc ( 63 Vdc Surge)</b> |                        |                                    |                           |   |   |              |                       |                                |
| 1.0                           | AVEZ105M50B12T-F       | 3.0                                | 0.12                      | 5.0   | 30  | B            | 4 x 5.3               | 2000                           |
| 2.2                           | AVEZ225M50B12T-F       | 3.0                                | 0.12                      | 5.0   | 30  | B            | 4 x 5.3               | 2000                           |
| 3.3                           | AVEZ335M50B12T-F       | 3.0                                | 0.12                      | 5.0   | 30  | B            | 4 x 5.3               | 2000                           |
| 4.7                           | AVEZ475M50C12T-F       | 3.0                                | 0.12                      | 3.0   | 50  | C            | 5 x 5.3               | 1000                           |
| 10                            | AVEZ106M50D16T-F       | 3.0                                | 0.12                      | 2.0   | 70  | D            | 6.3 x 5.3             | 1000                           |
| 22                            | AVEZ226M50D16T-F       | 3.0                                | 0.12                      | 3.0   | 70  | D            | 6.3 x 5.3             | 1000                           |
| 33                            | AVEZ336M50X16T-F       | 3.0                                | 0.12                      | 1.0   | 170   | X            | 6.3 x 7.7             | 1000                           |

# Type AVEZ $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$ Low Impedance SMT Aluminum Electrolytic Capacitors

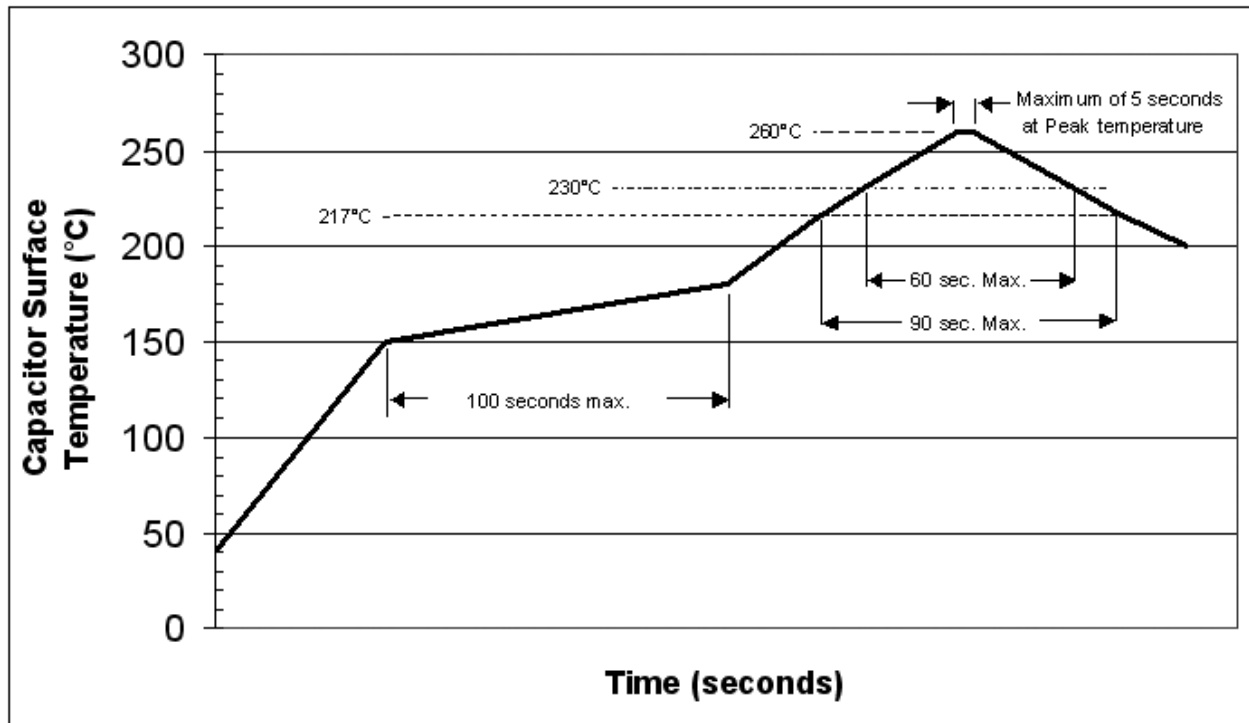
## Recommended Land Patterns by case size for AVEZ series



| Case Code | Case Size | Land Dimensions (mm) |     |     |
|-----------|-----------|----------------------|-----|-----|
|           |           | C                    | B   | A   |
| B         | 4x5.3     | 1.6                  | 2.6 | 1   |
| C         | 5x5.3     | 1.6                  | 3   | 1.4 |
| D         | 6.3x5.3   | 1.6                  | 3.5 | 1.9 |
| X         | 6.3x7.7   | 1.6                  | 3.5 | 1.9 |

## Recommended Soldering Methods

Recommended Reflow Soldering Profile:



Parts should be subjected to just one reflow soldering process.

Soldering with a solder iron should be performed with a maximum soldering iron tip temperature of  $350\pm 5\text{ }^{\circ}\text{C}$  for 3 to 4 seconds.

# Type AVEZ $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$

## Low Impedance SMT Aluminum Electrolytic Capacitors

---

**Notice and Disclaimer:** All product drawings, descriptions, specifications, statements, information and data (collectively, the "Information") in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements ("Cornell Dubilier") has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.