

# 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 Vdc to 50 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 ( $\mu\text{A}$ ) whichever is greater after 2 minutes<br>$C$ = rated capacitance in $\mu\text{F}$ , $V$ = rated DC working voltage |

### Ripple Current Multiplier:

| Freq. (Hz) | 50, 60 | 120  | 1 k  | 10 k up |
|------------|--------|------|------|---------|
| Vdc        |        |      |      |         |
| 6.3 ~ 50   | 0.64   | 0.80 | 0.93 | 1.00    |

### 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             |



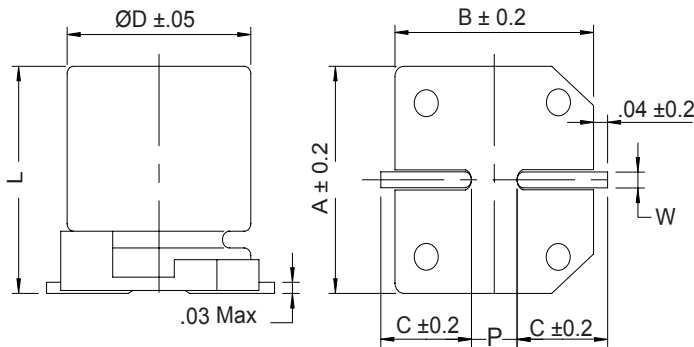
\* The above specifications shall be satisfied when the capacitors are restored to  $20\text{ }^{\circ}\text{C}$  after the rated voltage is applied for 1,000 hrs at  $105\text{ }^{\circ}\text{C}$

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

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### Outline Drawing, Case Code & Dimensions Table



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

### Part Numbering System

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

### Ratings Table

| 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                     |

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### Ratings Table

| Cap<br>( $\mu\text{F}$ )      | Catalog<br>Part Number | Max<br>DCL<br>2 min.<br>( $\mu\text{A}$ ) | Max<br>DF<br>120 Hz 20 $^{\circ}\text{C}$ | Max<br>Impedance<br>100 kHz 20 $^{\circ}\text{C}$<br>(ohms) | Max<br>Ripple Current<br>100 kHz 105 $^{\circ}\text{C}$<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                           |

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