# A700 Polymer Aluminum, 2 – 25 VDC

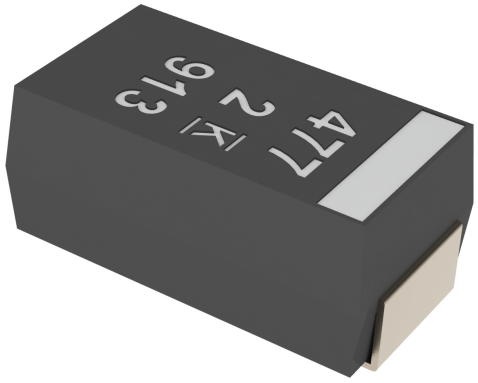
## Overview

The KEMET Aluminum Organic Capacitor (AO-CAP) is a solid state aluminum capacitor. The cathode is a conductive organic polymer, which results in very low ESR and improved capacitance retention at high frequency. AO-CAPs may be operated at steady state voltages up to 100% of rated voltage without the need to de-rate.

Since there is no liquid electrolyte, the A700 offers long operational lifetimes, low ESR, and high operational temperatures. The inherent low ESR renders the A700 suitable for high ripple current handling. The small package size, high ripple current capability, high operating temperature, low parasistics, and high capacitance makes the A700 ideal for high performance microprocessor, FPGA, and ASIC decoupling designs.

## Benefits

- ESR: 4.5 – 70 mΩ
- Polymer cathode technology
- High frequency capacitance retention
- Non-ignition failure mode
- 100% accelerated steady state aging
- 100% surge current tested
- Volumetric efficiency
- Self-healing mechanism
- EIA standard case sizes

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## Applications

Typical applications include DC/DC converters, notebook PCs, telecommunications, displays, and industrial applications.

## Environmental Compliance

RoHS compliant (6/6) according to Directive 2002/95/EC when ordered with 100% Sn solder.



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## K-SIM

For a detailed analysis of specific part numbers, please visit ksim.kemet.com to access KEMET's K-SIM software. KEMET K-SIM is designed to simulate behavior of components with respect to frequency, ambient temperature, and DC bias levels.

## Ordering Information

| A | 700 | V | 476 | M | 006 | A | T | E018 | |
|---|---|---|---|---|---|---|---|---|---|
| Capacitor Class | Series | Case Size | Capacitance Code (pF) | Capacitance Tolerance | Rated Voltage (VDC) | Failure Rate/ Design | Termination Finish | ESR Code | Packaging (C-Spec) |
| A = Aluminum | 700 = Aluminum Polymer | D<br>V<br>W<br>X | First two digits represent significant figures. Third digit specifies number of zeros. | M = ±20% | 002 = 2<br>2R5 = 2.5<br>004 = 4<br>006 = 6.3<br>008 = 8<br>010 = 10<br>12R = 12.5<br>016 = 16<br>025 = 25 | A = N/A | T = 100% Matte Tin (Sn)-plated | E = ESR Last three digits specify ESR in mΩ (018 = 18 mΩ) | Blank = 7" Reel<br>7280 = 13" Reel |

## Performance Characteristics

| Item | Performance Characteristics |
|---|---|
| Operating Temperature | –55°C to 105°C/125°C (Refer to part number for maximum temperature rating) |
| Rated Capacitance Range | 6.8 – 560 µF at 120 Hz/25°C |
| Capacitance Tolerance | M Tolerance (20%) |
| Rated Voltage Range | 2 – 25 V |
| DF (120 Hz) | 6% |
| ESR (100 kHz) | Refer to Part Number Electrical Specification Table |
| Leakage Current | ≤ 4 V Rating: ≤ 0.06 CV (µA) at rated voltage after 5 minutes<br>> 4 V Rating: ≤ 0.04 CV (µA) at rated voltage after 5 minutes<br>If there is any concern about leakage current, please perform pre-conditioning to the part following below conditions:<br>* Temperature: 105°C maximum<br>* Voltage: Rated Voltage<br>* Series Resistor: 1,000 Ω<br>* Charge Time: 1 hour minimum<br>* Measuring: Discharge the capacitor(s), store them for 4 to 24 hours at room temperature and RH ≤ 60% |

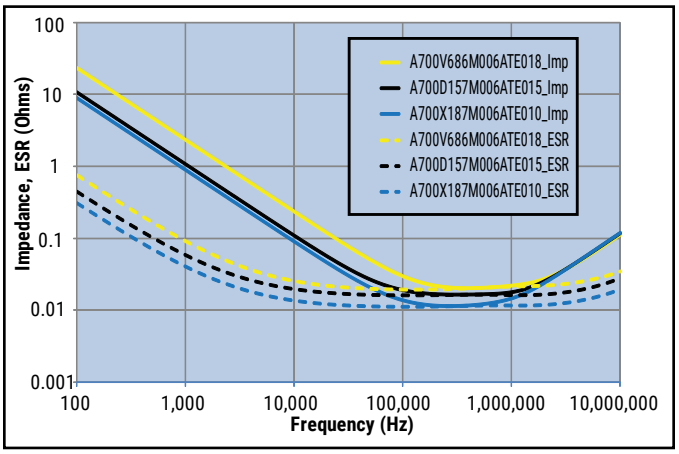
## Qualification

| Test | Condition | | Characteristics | | | |
|---|---|---|---|---|---|---|
| Endurance | 105°C/125°C[*2] at rated voltage, 2,000 hours[*3] | | Δ C/C | Within ±10%[*4] of initial value | | |
| | | | DF | ≤ initial limit | | |
| | | | DCL | Within 1.25 x initial limit | | |
| | | | ESR | Within 2.0 x initial limit | | |
| Storage Life | 105°C/125°C[*2] at 0 volts, 2,000 hours[*3] | | Δ C/C | Within ±10%[*4] of initial value | | |
| | | | DF | Within initial limits | | |
| | | | DCL | Within 1.25 x initial limit | | |
| | | | ESR | Within 2.0 x initial limit | | |
| Humidity | 60°C, 90% RH, 1,000 hours, rated voltage 60°C, 90% RH, 500 hours, no Load | | Δ C/C | Within −5/+30%[*5] of initial value<br>A700V477M002AT PN: −30%/+70% of initial value | | |
| | | | DF | ≤ initial limit | | |
| | | | DCL | Within 5.0 x initial limit | | |
| Temperature Stability | Extreme temperature exposure at a succession of continuous steps at +25°C, −55°C, +85°C, +105°C/+125°C[*2] | | +25°C | −55°C | +85°C | +105°C/125°C |
| | | Δ C/C | IL[*1] | ±15% | ±15% | ±20% |
| | | DF | IL | IL | 1.2 x IL | 1.5 x IL |
| | | DCL | IL | N/A | 10 x IL | 10 x IL |
| Surge Voltage | 105°C / 125°C[*2], 1.32 x rated voltage, 33 Ω resistance, 1,000 cycles | | Δ C/C | Within ±10%[*4] of initial value | | |
| | | | DF | Within initial limits | | |
| | | | DCL | Within initial limits | | |
| | | | ESR | Within initial limits | | |
| Mechanical Shock/ Vibration | MIL–STD–202, Method 213, Condition I, 100 G peak<br>MIL–STD–202, Method 204, Condition D, 10 Hz to 2,000 Hz, 20 G peak | | Δ C/C | Within ±10% of initial value | | |
| | | | DF | Within initial limits | | |
| | | | DCL | Within initial limits | | |

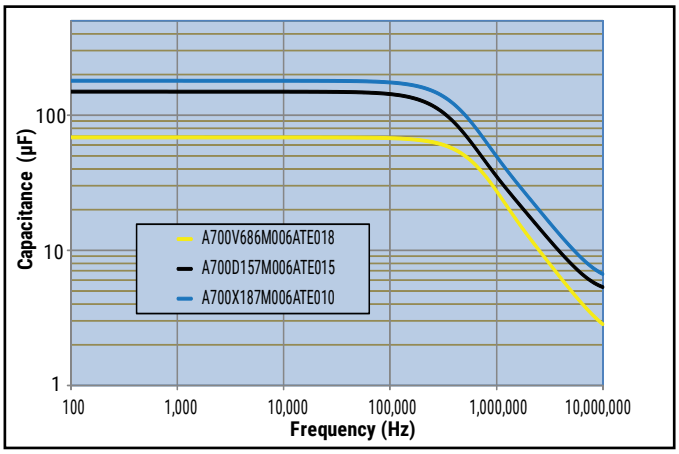
*[*1] IL = Initial Limit*
*[*2] Refer to part number specifications for individual temperature classification*
*[*3] PN A700V337M002AT test condition specification goes up to 1,000 hours*
*[*4] For PN's : A700V337M002AT & A700V477M002AT capacitance change is within ± 20 of intial value*
*[*5] For PN's : A700V337M002AT & A700V477M002AT capacitance change is within −30/+70% of intial value*

## Electrical Characteristics

### ESR vs. Frequency



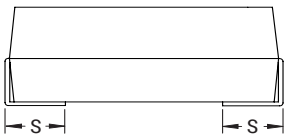

### Capacitance vs. Frequency



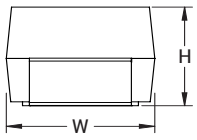

## Dimensions – Millimeters (Inches)

Metric will govern

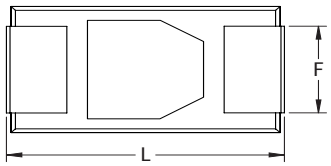
SIDE VIEW




END VIEW




BOTTOM VIEW




| Case Size | | Component | | | | | Typical Weight |
|---|---|---|---|---|---|---|---|
| KEMET | EIA | L | W | H | F ±0.1 ±(0.004) | S ±0.3 ±(0.012) | (mg) |
| D | 7343–31 | 7.3±0.3 (0.287±0.012) | 4.3±0.3 (0.169±0.012) | 2.8±0.3 (0.098±0.012) | 2.4 (0.094) | 1.3 (0.051) | 196.58 |
| V | 7343–20 | 7.3±0.3 (0.287±0.012) | 4.3±0.3 (0.169±0.012) | 2.0 (0.079) Maximum* | 2.4 (0.094) | 1.3 (0.051) | 132.72 |
| W | 7343–15 | 7.3±0.3 (0.287±0.012) | 4.3±0.3 (0.169±0.012) | 1.4±0.1 (0.055±0.004) | 2.4 (0.094) | 1.3 (0.051) | 305.03 |
| X | 7343–43 | 7.3±0.3 (0.287±0.012) | 4.3±0.3 (0.169±0.012) | 4.0±0.3 (0.157±0.012) | 2.4 (0.094) | 1.3 (0.051) | 305.03 |

*Notes: (Ref) – Dimensions provided for reference only.*
** Maximum Height is 2.1 for A700V477M002AT/A700V337M2R5AT*

## Table 1 – Ratings & Part Number Reference

| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current (rms) | MSL | Maximum Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| 2 | 100 | V/7343-20 | A700V107M002ATE016 | 12 | 6 | 16 | 4,100 | 3 | 125 |
| 2 | 100 | V/7343-20 | A700V107M002ATE018 | 12 | 6 | 18 | 3,900 | 3 | 125 |
| 2 | 100 | V/7343-20 | A700V107M002ATE025 | 12 | 6 | 25 | 3,300 | 3 | 125 |
| 2 | 100 | V/7343-20 | A700V107M002ATE028 | 12 | 6 | 28 | 3,100 | 3 | 125 |
| 2 | 150 | V/7343-20 | A700V157M002ATE015 | 18 | 6 | 15 | 4,200 | 3 | 125 |
| 2 | 150 | V/7343-20 | A700V157M002ATE018 | 18 | 6 | 18 | 3,900 | 3 | 125 |
| 2 | 150 | V/7343-20 | A700V157M002ATE025 | 18 | 6 | 25 | 3,300 | 3 | 125 |
| 2 | 150 | V/7343-20 | A700V157M002ATE028 | 18 | 6 | 28 | 3,100 | 3 | 125 |
| 2 | 180 | D/7343-31 | A700D187M002ATE015 | 22 | 6 | 15 | 4,100 | 3 | 125 |
| 2 | 180 | D/7343-31 | A700D187M002ATE018 | 22 | 6 | 18 | 3,700 | 3 | 125 |
| 2 | 220 | W/7343-15 | A700W227M002ATE006 | 26 | 6 | 6 | 6,900 | 3 | 125 |
| 2 | 220 | W/7343-15 | A700W227M002ATE009 | 26 | 6 | 9 | 5,700 | 3 | 125 |
| 2 | 220 | V/7343-20 | A700V227M002ATE009 | 26 | 6 | 9 | 5,500 | 3 | 125 |
| 2 | 220 | V/7343-20 | A700V227M002ATE015 | 26 | 6 | 15 | 4,200 | 3 | 125 |
| 2 | 220 | V/7343-20 | A700V227M002ATE018 | 26 | 6 | 18 | 3,900 | 3 | 125 |
| 2 | 220 | D/7343-31 | A700D227M002ATE009 | 26 | 6 | 9 | 5,300 | 3 | 125 |
| 2 | 220 | D/7343-31 | A700D227M002ATE012 | 26 | 6 | 12 | 4,600 | 3 | 125 |
| 2 | 220 | D/7343-31 | A700D227M002ATE015 | 26 | 6 | 15 | 4,100 | 3 | 125 |
| 2 | 220 | D/7343-31 | A700D227M002ATE018 | 26 | 6 | 18 | 3,700 | 3 | 125 |
| 2 | 270 | X/7343-43 | A700X277M002ATE010 | 32 | 6 | 10 | 4,700 | 3 | 125 |
| 2 | 270 | X/7343-43 | A700X277M002ATE012 | 32 | 6 | 12 | 4,300 | 3 | 125 |
| 2 | 270 | X/7343-43 | A700X277M002ATE015 | 32 | 6 | 15 | 3,900 | 3 | 125 |
| 2 | 330 | V/7343-20 | A700V337M002ATE4R5 | 40 | 6 | 4.5 | 7,750 | 3 | 125 |
| 2 | 330 | V/7343-20 | A700V337M002ATE006 | 40 | 6 | 6 | 6,700 | 3 | 125 |
| 2 | 330 | V/7343-20 | A700V337M002ATE009 | 40 | 6 | 9 | 5,500 | 3 | 125 |
| 2 | 330 | D/7343-31 | A700D337M002ATE007 | 40 | 6 | 7 | 6,000 | 3 | 125 |
| 2 | 330 | D/7343-31 | A700D337M002ATE009 | 40 | 6 | 9 | 5,300 | 3 | 125 |
| 2 | 330 | D/7343-31 | A700D337M002ATE012 | 40 | 6 | 12 | 4,600 | 3 | 125 |
| 2 | 330 | X/7343-43 | A700X337M002ATE010 | 40 | 6 | 10 | 4,700 | 3 | 125 |
| 2 | 330 | X/7343-43 | A700X337M002ATE015 | 40 | 6 | 15 | 3,900 | 3 | 125 |
| 2 | 390 | X/7343-43 | A700X397M002ATE010 | 47 | 6 | 10 | 4,700 | 3 | 125 |
| 2 | 390 | X/7343-43 | A700X397M002ATE015 | 47 | 6 | 15 | 3,900 | 3 | 125 |
| 2 | 470 | V/7343-21 | A700V477M002ATE4R5 | 56 | 6 | 4.5 | 7,750 | 3 | 105 |
| 2 | 470 | V/7343-21 | A700V477M002ATE006 | 56 | 6 | 6 | 6,700 | 3 | 105 |
| 2 | 470 | D/7343-31 | A700D477M002ATE005 | 56 | 6 | 5 | 7,100 | 3 | 125 |
| 2 | 470 | D/7343-31 | A700D477M002ATE006 | 56 | 6 | 6 | 6,500 | 3 | 125 |
| 2 | 470 | X/7343-43 | A700X477M002ATE005 | 56 | 6 | 5 | 6,700 | 3 | 125 |
| 2 | 470 | X/7343-43 | A700X477M002ATE007 | 56 | 6 | 7 | 5,700 | 3 | 125 |
| 2 | 470 | X/7343-43 | A700X477M002ATE010 | 56 | 6 | 10 | 4,700 | 3 | 125 |
| 2 | 470 | X/7343-43 | A700X477M002ATE015 | 56 | 6 | 15 | 3,900 | 3 | 125 |
| 2 | 560 | X/7343-43 | A700X567M002ATE4R5 | 67 | 6 | 4.5 | 7,000 | 3 | 125 |
| 2 | 560 | X/7343-43 | A700X567M002ATE005 | 67 | 6 | 5 | 6,700 | 3 | 125 |
| 2 | 560 | X/7343-43 | A700X567M002ATE006 | 67 | 6 | 6 | 6,100 | 3 | 125 |
| 2 | 560 | X/7343-43 | A700X567M002ATE009 | 67 | 6 | 9 | 5,000 | 3 | 125 |
| 2.5 | 68 | V/7343-20 | A700V686M2R5ATE020 | 10 | 6 | 20 | 3,700 | 3 | 125 |
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current | MSL | Maximum Operating Temp. |

*Also available on large (13 inch) reels. Add 7280 to the end of the part number.*
*Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating. Substitutions can include better than series.*

## Table 1 – Ratings & Part Number Reference cont.

| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current (rms) | MSL | Maximum Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| 2.5 | 68 | V/7343-20 | A700V686M2R5ATE028 | 10 | 6 | 28 | 3,100 | 3 | 125 |
| 2.5 | 82 | V/7343-20 | A700V826M2R5ATE018 | 12 | 6 | 18 | 3,900 | 3 | 125 |
| 2.5 | 82 | V/7343-20 | A700V826M2R5ATE025 | 12 | 6 | 25 | 3,300 | 3 | 125 |
| 2.5 | 82 | V/7343-20 | A700V826M2R5ATE028 | 12 | 6 | 28 | 3,100 | 3 | 125 |
| 2.5 | 100 | D/7343-31 | A700D107M2R5ATE018 | 15 | 6 | 18 | 3,700 | 3 | 125 |
| 2.5 | 100 | D/7343-31 | A700D107M2R5ATE025 | 15 | 6 | 25 | 3,200 | 3 | 125 |
| 2.5 | 100 | D/7343-31 | A700D107M2R5ATE028 | 15 | 6 | 28 | 3,000 | 3 | 125 |
| 2.5 | 120 | D/7343-31 | A700D127M2R5ATE015 | 18 | 6 | 15 | 4,100 | 3 | 125 |
| 2.5 | 120 | D/7343-31 | A700D127M2R5ATE018 | 18 | 6 | 18 | 3,700 | 3 | 125 |
| 2.5 | 150 | D/7343-31 | A700D157M2R5ATE015 | 23 | 6 | 15 | 4,100 | 3 | 125 |
| 2.5 | 150 | D/7343-31 | A700D157M2R5ATE018 | 23 | 6 | 18 | 3,700 | 3 | 125 |
| 2.5 | 180 | D/7343-31 | A700D187M2R5ATE015 | 27 | 6 | 15 | 4,100 | 3 | 125 |
| 2.5 | 180 | D/7343-31 | A700D187M2R5ATE018 | 27 | 6 | 18 | 3,700 | 3 | 125 |
| 2.5 | 180 | X/7343-43 | A700X187M2R5ATE010 | 27 | 6 | 10 | 4,700 | 3 | 125 |
| 2.5 | 180 | X/7343-43 | A700X187M2R5ATE015 | 27 | 6 | 15 | 3,900 | 3 | 125 |
| 2.5 | 180 | X/7343-43 | A700X187M2R5ATE018 | 27 | 6 | 18 | 3,500 | 3 | 125 |
| 2.5 | 220 | W/7343-15 | A700W227M2R5ATE006 | 33 | 6 | 6 | 6,900 | 3 | 125 |
| 2.5 | 220 | W/7343-15 | A700W227M2R5ATE009 | 33 | 6 | 9 | 5,700 | 3 | 125 |
| 2.5 | 220 | X/7343-43 | A700X227M2R5ATE009 | 33 | 6 | 9 | 5,000 | 3 | 125 |
| 2.5 | 220 | X/7343-43 | A700X227M2R5ATE010 | 33 | 6 | 10 | 4,700 | 3 | 125 |
| 2.5 | 220 | X/7343-43 | A700X227M2R5ATE015 | 33 | 6 | 15 | 3,900 | 3 | 125 |
| 2.5 | 330 | V/7343-20 | A700V337M2R5ATE4R5 | 50 | 6 | 4.5 | 7,750 | 3 | 125 |
| 2.5 | 330 | V/7343-20 | A700V337M2R5ATE006 | 50 | 6 | 6 | 6,700 | 3 | 125 |
| 2.5 | 330 | V/7343-20 | A700V337M2R5ATE009 | 50 | 6 | 9 | 5,500 | 3 | 125 |
| 2.5 | 330 | X/7343-43 | A700X337M2R5ATE010 | 50 | 6 | 10 | 4,700 | 3 | 125 |
| 2.5 | 330 | X/7343-43 | A700X337M2R5ATE015 | 50 | 6 | 15 | 3,900 | 3 | 125 |
| 2.5 | 470 | X/7343-43 | A700X477M2R5ATE005 | 70 | 6 | 5 | 6,700 | 3 | 125 |
| 2.5 | 470 | X/7343-43 | A700X477M2R5ATE007 | 70 | 6 | 7 | 5,700 | 3 | 125 |
| 2.5 | 470 | X/7343-43 | A700X477M2R5ATE010 | 70 | 6 | 10 | 4,700 | 3 | 125 |
| 2.5 | 470 | X/7343-43 | A700X477M2R5ATE015 | 70 | 6 | 15 | 3,900 | 3 | 125 |
| 2.5 | 560 | X/7343-43 | A700X567M2R5ATE4R5 | 84 | 6 | 4.5 | 7,000 | 3 | 125 |
| 2.5 | 560 | X/7343-43 | A700X567M2R5ATE006 | 84 | 6 | 6 | 6,100 | 3 | 125 |
| 2.5 | 560 | X/7343-43 | A700X567M2R5ATE009 | 84 | 6 | 9 | 5,000 | 3 | 125 |
| 4 | 68 | V/7343-20 | A700V686M004ATE020 | 16 | 6 | 20 | 3,700 | 3 | 125 |
| 4 | 68 | V/7343-20 | A700V686M004ATE028 | 16 | 6 | 28 | 3,100 | 3 | 125 |
| 4 | 82 | V/7343-20 | A700V826M004ATE016 | 20 | 6 | 16 | 4,100 | 3 | 125 |
| 4 | 82 | V/7343-20 | A700V826M004ATE018 | 20 | 6 | 18 | 3,900 | 3 | 125 |
| 4 | 82 | V/7343-20 | A700V826M004ATE025 | 20 | 6 | 25 | 3,300 | 3 | 125 |
| 4 | 82 | V/7343-20 | A700V826M004ATE028 | 20 | 6 | 28 | 3,100 | 3 | 125 |
| 4 | 100 | D/7343-31 | A700D107M004ATE018 | 24 | 6 | 18 | 3,700 | 3 | 125 |
| 4 | 100 | D/7343-31 | A700D107M004ATE025 | 24 | 6 | 25 | 3,200 | 3 | 125 |
| 4 | 100 | D/7343-31 | A700D107M004ATE028 | 24 | 6 | 28 | 3,000 | 3 | 125 |
| 4 | 100 | V/7343-20 | A700V107M004ATE025 | 24 | 6 | 25 | 3,300 | 3 | 125 |
| 4 | 100 | V/7343-20 | A700V107M004ATE028 | 24 | 6 | 28 | 3,100 | 3 | 125 |
| 4 | 120 | D/7343-31 | A700D127M004ATE015 | 29 | 6 | 15 | 4,100 | 3 | 125 |
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current | MSL | Maximum Operating Temp. |

*Also available on large (13 inch) reels. Add 7280 to the end of the part number.*
*Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating. Substitutions can include better than series.*

## Table 1 – Ratings & Part Number Reference cont.

| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current (rms) | MSL | Maximum Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| 4 | 120 | D/7343-31 | A700D127M004ATE018 | 29 | 6 | 18 | 3,700 | 3 | 125 |
| 4 | 150 | D/7343-31 | A700D157M004ATE015 | 36 | 6 | 15 | 4,100 | 3 | 125 |
| 4 | 150 | D/7343-31 | A700D157M004ATE018 | 36 | 6 | 18 | 3,700 | 3 | 125 |
| 4 | 150 | V/7343-20 | A700V157M004ATE015 | 36 | 6 | 15 | 4,200 | 3 | 125 |
| 4 | 150 | V/7343-20 | A700V157M004ATE016 | 36 | 6 | 16 | 4,100 | 3 | 125 |
| 4 | 150 | V/7343-20 | A700V157M004ATE018 | 36 | 6 | 18 | 3,900 | 3 | 125 |
| 4 | 180 | D/7343-31 | A700D187M004ATE012 | 43 | 6 | 12 | 4,600 | 3 | 125 |
| 4 | 180 | D/7343-31 | A700D187M004ATE015 | 43 | 6 | 15 | 4,100 | 3 | 125 |
| 4 | 180 | D/7343-31 | A700D187M004ATE018 | 43 | 6 | 18 | 3,700 | 3 | 125 |
| 4 | 180 | X/7343-43 | A700X187M004ATE010 | 43 | 6 | 10 | 4,700 | 3 | 125 |
| 4 | 180 | X/7343-43 | A700X187M004ATE015 | 43 | 6 | 15 | 3,900 | 3 | 125 |
| 4 | 180 | X/7343-43 | A700X187M004ATE018 | 43 | 6 | 18 | 3,500 | 3 | 125 |
| 4 | 220 | D/7343-31 | A700D227M004ATE009 | 53 | 6 | 9 | 5,300 | 3 | 125 |
| 4 | 220 | D/7343-31 | A700D227M004ATE010 | 53 | 6 | 10 | 5,000 | 3 | 125 |
| 4 | 220 | D/7343-31 | A700D227M004ATE015 | 53 | 6 | 15 | 4,100 | 3 | 125 |
| 4 | 220 | X/7343-43 | A700X227M004ATE009 | 53 | 6 | 9 | 5,000 | 3 | 125 |
| 4 | 220 | X/7343-43 | A700X227M004ATE010 | 53 | 6 | 10 | 4,700 | 3 | 125 |
| 4 | 220 | X/7343-43 | A700X227M004ATE015 | 53 | 6 | 15 | 3,900 | 3 | 125 |
| 4 | 270 | X/7343-43 | A700X277M004ATE010 | 65 | 6 | 10 | 4,700 | 3 | 125 |
| 4 | 270 | X/7343-43 | A700X277M004ATE015 | 65 | 6 | 15 | 3,900 | 3 | 125 |
| 4 | 330 | X/7343-43 | A700X337M004ATE008 | 79 | 6 | 8 | 5,300 | 3 | 125 |
| 4 | 330 | X/7343-43 | A700X337M004ATE010 | 79 | 6 | 10 | 4,700 | 3 | 125 |
| 4 | 330 | X/7343-43 | A700X337M004ATE015 | 79 | 6 | 15 | 3,900 | 3 | 125 |
| 6.3 | 10 | V/7343-20 | A700V106M006ATE055 | 3 | 6 | 55 | 2,200 | 3 | 125 |
| 6.3 | 22 | V/7343-20 | A700V226M006ATE028 | 6 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 22 | V/7343-20 | A700V226M006ATE045 | 6 | 6 | 45 | 2,400 | 3 | 125 |
| 6.3 | 33 | V/7343-20 | A700V336M006ATE018 | 8 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 33 | V/7343-20 | A700V336M006ATE025 | 8 | 6 | 25 | 3,300 | 3 | 125 |
| 6.3 | 33 | V/7343-20 | A700V336M006ATE028 | 8 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 47 | V/7343-20 | A700V476M006ATE018 | 12 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 47 | V/7343-20 | A700V476M006ATE025 | 12 | 6 | 25 | 3,300 | 3 | 125 |
| 6.3 | 47 | V/7343-20 | A700V476M006ATE028 | 12 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 56 | V/7343-20 | A700V566M006ATE018 | 14 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 56 | V/7343-20 | A700V566M006ATE025 | 14 | 6 | 25 | 3,300 | 3 | 125 |
| 6.3 | 56 | V/7343-20 | A700V566M006ATE028 | 14 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 68 | V/7343-20 | A700V686M006ATE015 | 17 | 6 | 15 | 4,200 | 3 | 125 |
| 6.3 | 68 | V/7343-20 | A700V686M006ATE018 | 17 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 68 | V/7343-20 | A700V686M006ATE025 | 17 | 6 | 25 | 3,300 | 3 | 125 |
| 6.3 | 68 | V/7343-20 | A700V686M006ATE028 | 17 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 82 | V/7343-20 | A700V826M006ATE018 | 21 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 82 | V/7343-20 | A700V826M006ATE025 | 21 | 6 | 25 | 3,300 | 3 | 125 |
| 6.3 | 82 | V/7343-20 | A700V826M006ATE028 | 21 | 6 | 28 | 3,100 | 3 | 125 |
| 6.3 | 100 | V/7343-20 | A700V107M006ATE015 | 25 | 6 | 15 | 4,200 | 3 | 125 |
| 6.3 | 100 | V/7343-20 | A700V107M006ATE018 | 25 | 6 | 18 | 3,900 | 3 | 125 |
| 6.3 | 100 | V/7343-20 | A700V107M006ATE025 | 25 | 6 | 25 | 3,300 | 3 | 125 |
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current | MSL | Maximum Operating Temp. |

*Also available on large (13 inch) reels. Add 7280 to the end of the part number.*
*Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating. Substitutions can include better than series.*

## Table 1 – Ratings & Part Number Reference cont.

| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current (rms) | MSL | Maximum Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| 6.3 | 100 | D/7343-31 | A700D107M006ATE015 | 25 | 6 | 15 | 4,100 | 3 | 125 |
| 6.3 | 100 | D/7343-31 | A700D107M006ATE018 | 25 | 6 | 18 | 3,700 | 3 | 125 |
| 6.3 | 120 | D/7343-31 | A700D127M006ATE012 | 30 | 6 | 12 | 4,600 | 3 | 125 |
| 6.3 | 120 | D/7343-31 | A700D127M006ATE015 | 30 | 6 | 15 | 4,100 | 3 | 125 |
| 6.3 | 120 | D/7343-31 | A700D127M006ATE018 | 30 | 6 | 18 | 3,700 | 3 | 125 |
| 6.3 | 150 | D/7343-31 | A700D157M006ATE010 | 38 | 6 | 10 | 5,000 | 3 | 125 |
| 6.3 | 150 | D/7343-31 | A700D157M006ATE012 | 38 | 6 | 12 | 4,600 | 3 | 125 |
| 6.3 | 150 | D/7343-31 | A700D157M006ATE015 | 38 | 6 | 15 | 4,100 | 3 | 125 |
| 6.3 | 150 | X/7343-43 | A700X157M006ATE010 | 38 | 6 | 10 | 4,700 | 3 | 125 |
| 6.3 | 150 | X/7343-43 | A700X157M006ATE012 | 38 | 6 | 12 | 4,300 | 3 | 125 |
| 6.3 | 150 | X/7343-43 | A700X157M006ATE015 | 38 | 6 | 15 | 3,900 | 3 | 125 |
| 6.3 | 180 | D/7343-31 | A700D187M006ATE010 | 45 | 6 | 10 | 5,000 | 3 | 125 |
| 6.3 | 180 | D/7343-31 | A700D187M006ATE015 | 45 | 6 | 15 | 4,100 | 3 | 125 |
| 6.3 | 180 | X/7343-43 | A700X187M006ATE010 | 45 | 6 | 10 | 4,700 | 3 | 125 |
| 6.3 | 180 | X/7343-43 | A700X187M006ATE015 | 45 | 6 | 15 | 3,900 | 3 | 125 |
| 6.3 | 220 | X/7343-43 | A700X227M006ATE007 | 55 | 6 | 7 | 5,700 | 3 | 125 |
| 6.3 | 220 | X/7343-43 | A700X227M006ATE010 | 55 | 6 | 10 | 4,700 | 3 | 125 |
| 6.3 | 220 | X/7343-43 | A700X227M006ATE015 | 55 | 6 | 15 | 3,900 | 3 | 125 |
| 8 | 10 | V/7343-20 | A700V106M008ATE055 | 3 | 6 | 55 | 2,200 | 3 | 125 |
| 8 | 22 | V/7343-20 | A700V226M008ATE028 | 7 | 6 | 28 | 3,100 | 3 | 125 |
| 8 | 22 | V/7343-20 | A700V226M008ATE045 | 7 | 6 | 45 | 2,400 | 3 | 125 |
| 8 | 33 | V/7343-20 | A700V336M008ATE018 | 11 | 6 | 18 | 3,900 | 3 | 125 |
| 8 | 33 | V/7343-20 | A700V336M008ATE025 | 11 | 6 | 25 | 3,300 | 3 | 125 |
| 8 | 33 | V/7343-20 | A700V336M008ATE028 | 11 | 6 | 28 | 3,100 | 3 | 125 |
| 8 | 56 | D/7343-31 | A700D566M008ATE015 | 18 | 6 | 15 | 4,100 | 3 | 125 |
| 8 | 56 | D/7343-31 | A700D566M008ATE018 | 18 | 6 | 18 | 3,700 | 3 | 125 |
| 8 | 68 | D/7343-31 | A700D686M008ATE015 | 22 | 6 | 15 | 4,100 | 3 | 125 |
| 8 | 68 | D/7343-31 | A700D686M008ATE018 | 22 | 6 | 18 | 3,700 | 3 | 125 |
| 8 | 100 | X/7343-43 | A700X107M008ATE010 | 32 | 6 | 10 | 4,700 | 3 | 125 |
| 8 | 100 | X/7343-43 | A700X107M008ATE012 | 32 | 6 | 12 | 4,300 | 3 | 125 |
| 8 | 100 | X/7343-43 | A700X107M008ATE015 | 32 | 6 | 15 | 3,900 | 3 | 125 |
| 10 | 10 | V/7343-20 | A700V106M010ATE055 | 4 | 6 | 55 | 2,200 | 3 | 125 |
| 10 | 22 | V/7343-20 | A700V226M010ATE028 | 9 | 6 | 28 | 3,100 | 3 | 125 |
| 10 | 22 | V/7343-20 | A700V226M010ATE045 | 9 | 6 | 45 | 2,400 | 3 | 125 |
| 10 | 33 | V/7343-20 | A700V336M010ATE018 | 13 | 6 | 18 | 3,900 | 3 | 125 |
| 10 | 33 | V/7343-20 | A700V336M010ATE025 | 13 | 6 | 25 | 3,300 | 3 | 125 |
| 10 | 33 | V/7343-20 | A700V336M010ATE028 | 13 | 6 | 28 | 3,100 | 3 | 125 |
| 10 | 47 | V/7343-20 | A700V476M010ATE025 | 19 | 6 | 25 | 3,300 | 3 | 125 |
| 10 | 47 | V/7343-20 | A700V476M010ATE028 | 19 | 6 | 28 | 3,100 | 3 | 125 |
| 10 | 56 | D/7343-31 | A700D566M010ATE015 | 22 | 6 | 15 | 4,100 | 3 | 125 |
| 10 | 56 | D/7343-31 | A700D566M010ATE018 | 22 | 6 | 18 | 3,700 | 3 | 125 |
| 10 | 68 | D/7343-31 | A700D686M010ATE015 | 27 | 6 | 15 | 4,100 | 3 | 125 |
| 10 | 68 | D/7343-31 | A700D686M010ATE018 | 27 | 6 | 18 | 3,700 | 3 | 125 |
| 10 | 100 | X/7343-43 | A700X107M010ATE010 | 40 | 6 | 10 | 4,700 | 3 | 125 |
| 10 | 100 | X/7343-43 | A700X107M010ATE015 | 40 | 6 | 15 | 3,900 | 3 | 125 |
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current | MSL | Maximum Operating Temp. |

*Also available on large (13 inch) reels. Add 7280 to the end of the part number.*
*Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating. Substitutions can include better than series.*

## Table 1 – Ratings & Part Number Reference cont.

| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current (rms) | MSL | Maximum Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| 10 | 120 | X/7343-43 | A700X127M010ATE010 | 48 | 6 | 10 | 4,700 | 3 | 125 |
| 10 | 120 | X/7343-43 | A700X127M010ATE015 | 48 | 6 | 15 | 3,900 | 3 | 125 |
| 10 | 150 | X/7343-43 | A700X157M010ATE010 | 60 | 6 | 10 | 4,700 | 3 | 125 |
| 10 | 150 | X/7343-43 | A700X157M010ATE015 | 60 | 6 | 15 | 3,900 | 3 | 125 |
| 12.5 | 10 | V/7343-20 | A700V106M12RATE040 | 5 | 6 | 40 | 2,600 | 3 | 125 |
| 12.5 | 10 | V/7343-20 | A700V106M12RATE055 | 5 | 6 | 55 | 2,200 | 3 | 125 |
| 12.5 | 10 | V/7343-20 | A700V106M12RATE060 | 5 | 6 | 60 | 2,100 | 3 | 125 |
| 12.5 | 15 | V/7343-20 | A700V156M12RATE040 | 8 | 6 | 40 | 2,600 | 3 | 125 |
| 12.5 | 15 | V/7343-20 | A700V156M12RATE045 | 8 | 6 | 45 | 2,400 | 3 | 125 |
| 12.5 | 22 | V/7343-20 | A700V226M12RATE030 | 11 | 6 | 30 | 3,000 | 3 | 125 |
| 12.5 | 33 | V/7343-20 | A700V336M12RATE025 | 17 | 6 | 25 | 3,300 | 3 | 125 |
| 12.5 | 56 | D/7343-31 | A700D566M12RATE020 | 28 | 6 | 20 | 3,500 | 3 | 125 |
| 12.5 | 47 | D/7343-31 | A700D476M12RATE020 | 24 | 6 | 20 | 3,500 | 3 | 125 |
| 12.5 | 47 | D/7343-31 | A700D476M12RATE025 | 24 | 6 | 25 | 3,200 | 3 | 125 |
| 12.5 | 100 | X/7343-43 | A700X107M12RATE012 | 50 | 6 | 12 | 4,300 | 3 | 125 |
| 12.5 | 100 | X/7343-43 | A700X107M12RATE015 | 50 | 6 | 15 | 3,900 | 3 | 125 |
| 16 | 6.8 | V/7343-20 | A700V685M016ATE070 | 4 | 6 | 70 | 2,000 | 3 | 125 |
| 16 | 8.2 | V/7343-20 | A700V825M016ATE045 | 5 | 6 | 45 | 2,400 | 3 | 125 |
| 16 | 10 | V/7343-20 | A700V106M016ATE045 | 6 | 6 | 45 | 2,400 | 3 | 125 |
| 16 | 10 | V/7343-20 | A700V106M016ATE060 | 6 | 6 | 60 | 2,100 | 3 | 125 |
| 16 | 15 | V/7343-20 | A700V156M016ATE040 | 10 | 6 | 40 | 2,600 | 3 | 125 |
| 16 | 22 | D/7343-31 | A700D226M016ATE018 | 14 | 6 | 18 | 3,700 | 3 | 125 |
| 16 | 22 | D/7343-31 | A700D226M016ATE025 | 14 | 6 | 25 | 3,200 | 3 | 125 |
| 16 | 22 | D/7343-31 | A700D226M016ATE030 | 14 | 6 | 30 | 2,900 | 3 | 125 |
| 25 | 15 | V/7343-20 | A700V156M025ATE040 | 15 | 6 | 40 | 2,600 | 3 | 125 |
| VDC at 105°C | µF | KEMET/EIA | (See below for part options) | µA at +25°C Maximum/ 5 Minutes | % at +25°C 120 Hz Maximum | mΩ at 25°C 100 kHz Maximum | mA at 100 kHz with/T = +20°C at −55°C to 125°C | Reflow Temp ≤ 260°C | °C |
| Rated Voltage | Rated Capacitance | Case Code/ Case Size | KEMET Part Number | DC Leakage | DF | ESR | Ripple Current | MSL | Maximum Operating Temp. |

*Also available on large (13 inch) reels. Add 7280 to the end of the part number.*
*Higher voltage ratings and tighter tolerance product including ESR may be substituted within the same size at KEMET's option. Voltage substitutions will be marked with the higher voltage rating. Substitutions can include better than series.*

## Derating Guidelines

| Voltage Rating | Maximum Recommended Steady State Voltage | Maximum Recommended Transient Voltage (1 ms – 1 µs) |
|---|---|---|
| | −55°C to 125°C | |
| 2 – 25 V | $V_R$ | $V_R$ |

*$V_R$ = Rated Voltage*

## Ripple Current/Ripple Voltage

Permissible AC ripple voltage and current are related to equivalent series resistance (ESR) and the power dissipation capabilities of the device. Permissible AC ripple voltage which may be applied is limited by two criteria

1. The positive peak AC voltage plus the DC bias voltage, if any, must not exceed the DC voltage rating of the capacitor.
2. The negative peak AC voltage, in combination with bias voltage, if any, must not exceed the allowable limits specified for reverse voltage. See the Reverse Voltage section for allowable limits

Power capability is determined based on a 20°C temperature rise. A higher temperature rise and therefore higher power capability is allowable as long as the ambient temperature plus temperature rise due to ripple current does not exceed the rated temperature of the part.
The maximum power dissipation by case size can be determined using the below table.

| KEMET Series and Case Code | EIA Case Code | Maximum Power Dissipation (Pmax) mWatts at 25°C with +20°C Rise |
|---|---|---|
| A700W | 7343-15 | 290 |
| A700V | 7343-20 | 270 |
| A700D | 7343-31 | 250 |
| A700X | 7343-43 | 225 |

Using the Pmax of the device, the maximum allowable rms ripple current or voltage may be determined.

$I(max) = \sqrt{Pmax/R}$
$E(max) = Z\sqrt{Pmax/R}$

*I = rms ripple current (amperes)*
*E = rms ripple voltage (volts)*
*Pmax = maximum power dissipation(watts)*
*R = ESR at specified frequency (ohms)*
*Z = Impedance at specified frequency (Ohms)*

*Refer to part number listings for permittable Arms limits.*

## Reverse Voltage

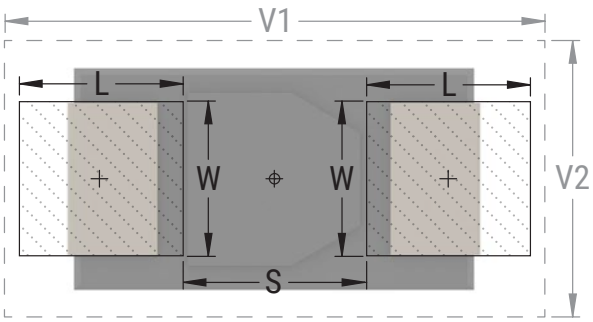
Polymer aluminum capacitors are polar devices and may be permanently damaged or destroyed if connected in the wrong polarity. These devices will withstand a certain degree of transient voltage reversal for short periods as shown in the below table. Please note that these parts may not be operated continuously in reverse, even within these limits.

| Temperature | Permissible Transient Reverse Voltage |
|---|---|
| 25°C | 60% of Rated Voltage |
| 55°C | 50% of Rated Voltage |
| 85°C | 40% of Rated Voltage |
| 125°C | 30% of Rated Voltage |

## Table 2 – Land Dimensions/Courtyard

| KEMET | Metric Size Code | Density Level A: Maximum (Most) Land Protrusion (mm) | | | | | Density Level B: Median (Nominal) Land Protrusion (mm) | | | | | Density Level C: Minimum (Least) Land Protrusion (mm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Case | EIA | W | L | S | V1 | V2 | W | L | S | V1 | V2 | W | L | S | V1 | V2 |
| D | 7343–31 | 2.55 | 2.77 | 3.67 | 10.22 | 5.60 | 2.43 | 2.37 | 3.87 | 9.12 | 5.10 | 2.33 | 1.99 | 4.03 | 8.26 | 4.84 |
| V | 7343–20 | 2.55 | 2.77 | 3.67 | 10.22 | 5.60 | 2.43 | 2.37 | 3.87 | 9.12 | 5.10 | 2.33 | 1.99 | 4.03 | 8.26 | 4.84 |
| W | 7343–15 | 2.55 | 2.77 | 3.67 | 10.22 | 5.60 | 2.43 | 2.37 | 3.87 | 9.12 | 5.10 | 2.33 | 1.99 | 4.03 | 8.26 | 4.84 |
| X[1] | 7343–43 | 2.55 | 2.77 | 3.67 | 10.22 | 5.60 | 2.43 | 2.37 | 3.87 | 9.12 | 5.10 | 2.33 | 1.99 | 4.03 | 8.26 | 4.84 |

***Density Level A:*** *For low-density product applications. Recommended for wave solder applications and provides a wider process window for reflow solder processes.*
***Density Level B:*** *For products with a moderate level of component density. Provides a robust solder attachment condition for reflow solder processes.*
***Density Level C:*** *For high component density product applications. Before adapting the minimum land pattern variations the user should perform qualification testing based on the conditions outlined in IPC standard 7351 (IPC–7351).*
[1] *Height of these chips may create problems in wave soldering.*
[2] *Land pattern geometry is too small for silkscreen outline.*



Grid Placement Courtyard

## Soldering Process

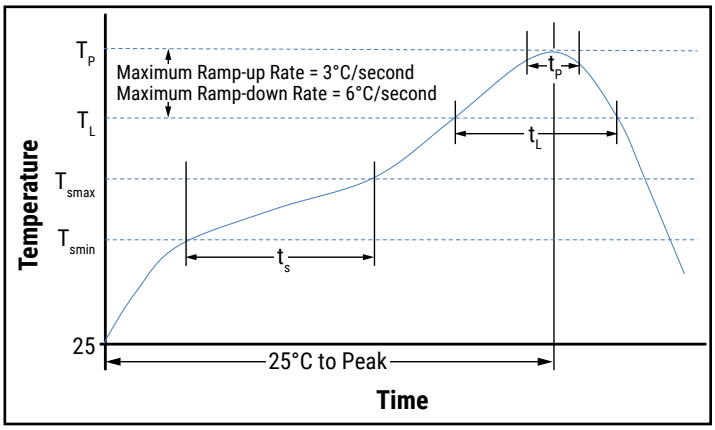
KEMET's families of surface mount capacitors are compatible with wave (single or dual), convection, IR, or vapor phase reflow techniques. Preheating of these components is recommended to avoid extreme thermal stress. KEMET's recommended profile conditions for convection and IR reflow reflect the profile conditions of the IPC/J–STD–020D standard for moisture sensitivity testing. The devices can safely withstand a maximum of three reflow passes at these conditions.

Please note that although the X/7343–43 case size can withstand wave soldering, the tall profile (4.3 mm maximum) dictates care in wave process development.

Hand soldering should be performed with care due to the difficulty in process control. If performed, care should be taken to avoid contact of the soldering iron to the molded case. The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. Once reflow occurs, the iron should be removed immediately. "Wiping" the edges of a chip and heating the top surface is not recommended.

| Profile Feature | SnPb Assembly | Pb-Free Assembly |
|---|---|---|
| Preheat/Soak | | |
| Temperature Minimum ($T_{smin}$) | 100°C | 150°C |
| Temperature Maximum ($T_{smax}$) | 150°C | 200°C |
| Time ($t_s$) from $T_{smin}$ to $T_{smax}$) | 60 – 120 seconds | 60 – 120 seconds |
| Ramp-up Rate ($T_L$ to $T_P$) | 3°C/seconds maximum | 3°C/seconds maximum |
| Liquidous Temperature ($T_L$) | 183°C | 217°C |
| Time Above Liquidous ($t_L$) | 60 – 150 seconds | 60 – 150 seconds |
| Peak Temperature ($T_P$) | 220°C*<br>235°C** | 250°C*<br>260°C** |
| Time within 5°C of Maximum Peak Temperature ($t_p$) | 20 seconds maximum | 30 seconds maximum |
| Ramp-down Rate ($T_P$ to $T_L$) | 6°C/seconds maximum | 6°C/seconds maximum |
| Time 25°C to Peak Temperature | 6 minutes maximum | 8 minutes maximum |

*Note: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow.*
** For Case Size height > 2.5 mm*
*** For Case Size height ≤ 2.5 mm*



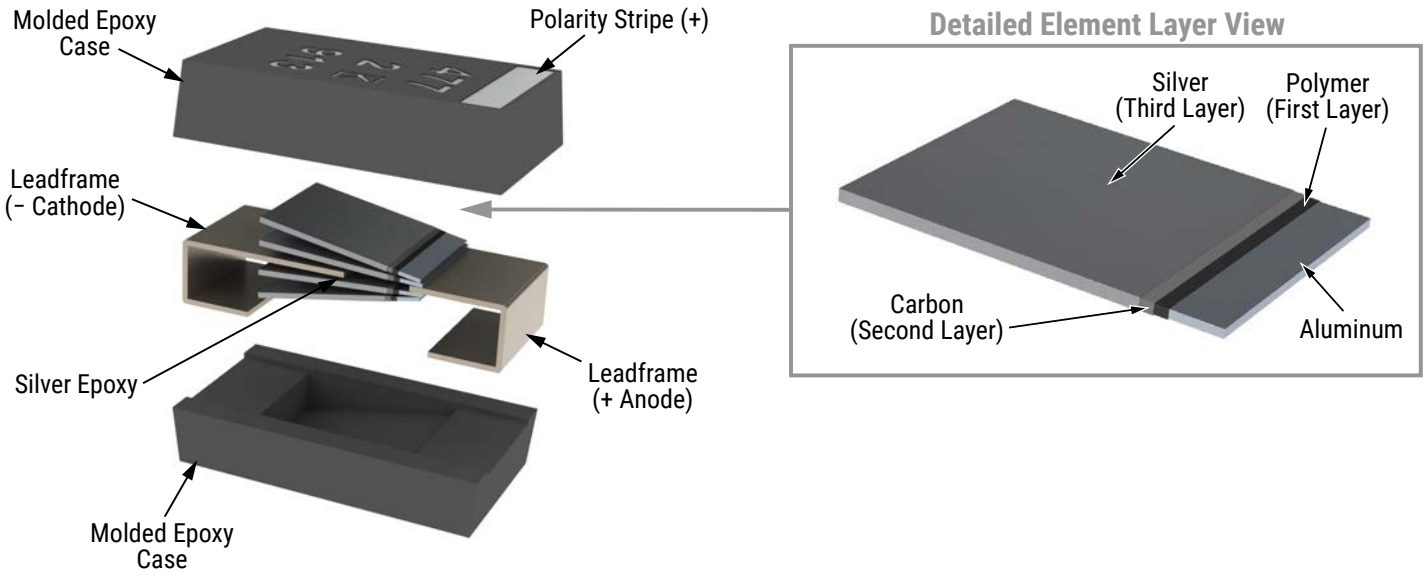

## Storage

All AO-CAP Series are shipped in moisture barrier bags (MBBs) with desiccant and humidity indicator card (HIC). These parts are classified as MSL3 (Moisture Sensitivity Level 3) per IPC/JEDEC J–STD–020 and packaged per IPC/JEDEC J–STD–033. MSL3 specifies a floor time of 168H at 30°C maximum temperature and 60% relative humidity. Unused capacitors should be sealed in a MBB with fresh desiccant.

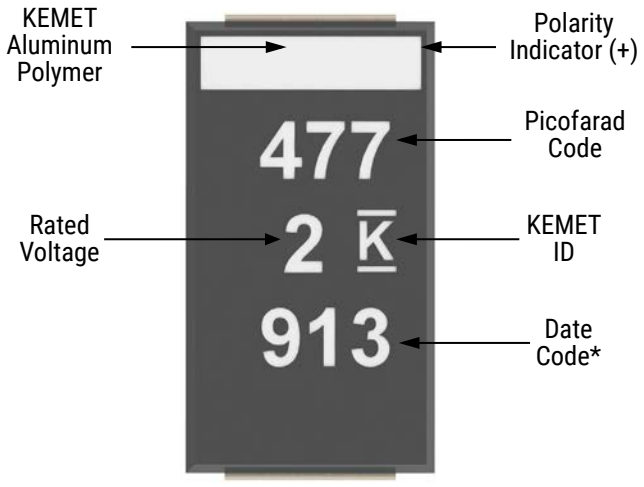
The calculated shelf life in a sealed bag would be 12 months from a bag seal date in a storage environment of < 40°C and humidity < 90% RH. It should be 24 months from a bag seal date in a storage environment of < 30°C and humidity < 70% RH.

If baking is required, refer to IPC/JEDEC J–STD–033 for bake procedure.

## Construction




## Capacitor Marking

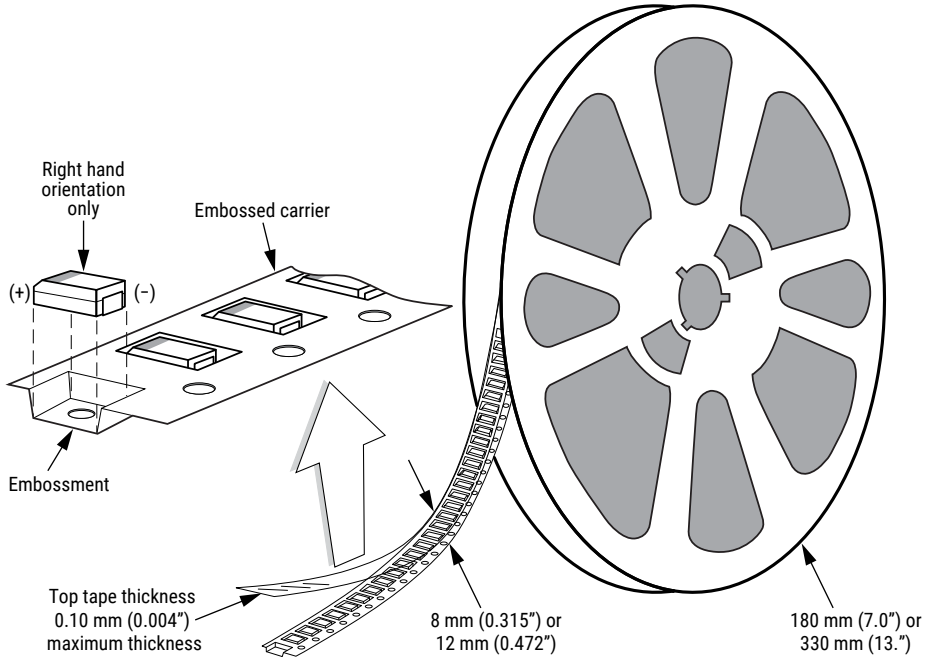



* 913 = 13th week of 2019

| Date Code * | |
|---|---|
| 1st digit = Last number of Year | 5 = 2015<br>6 = 2016<br>7 = 2017<br>8 = 2018<br>9 =2019<br>0 = 2020 |
| 2nd and 3rd digit = Week of the Year | 01 = 1st week of the Year to<br>52 = 52nd week of the Year |

## Tape & Reel Packaging Information

KEMET's molded chip capacitor families are packaged in 8 and 12 mm plastic tape on 7" and 13" reels in accordance with *EIA Standard 481*: Embossed Carrier Taping of Surface Mount Components for Automatic Handling. This packaging system is compatible with all tape-fed automatic pick-and-place systems.

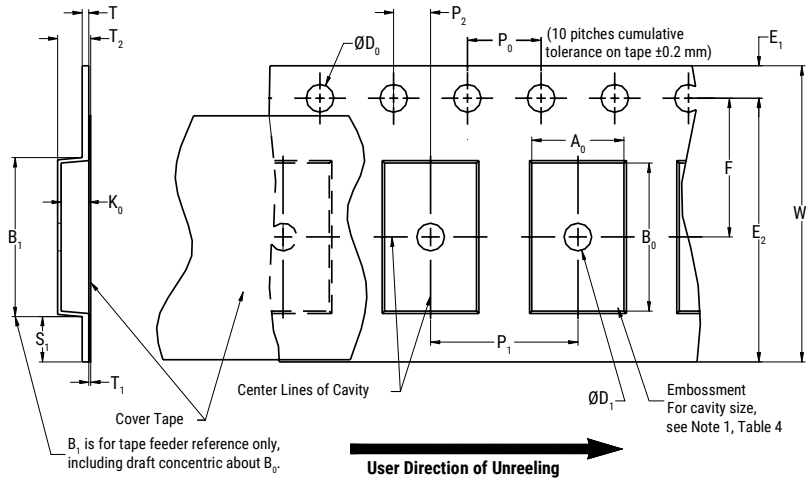



## Table 3 – Packaging Quantity

| Case Code | | Tape Width (mm) | 7" Reel* | 13" Reel* |
|---|---|---|---|---|
| KEMET | EIA | | | |
| P | 2012-10 | 8 | 3,000 | N/A |
| R | 2012-12 | 8 | 2,500 | 10,000 |
| I | 3216-10 | 8 | 3,000 | N/A |
| S | 3216-12 | 8 | 2,500 | 10,000 |
| A | 3216-18 | 8 | 2,000 | N/A |
| T | 3528-12 | 8 | 3,000 | 10,000 |
| M | 3528-15 | 8 | 2,500 | 8,000 |
| B | 3528-21 | 8 | 2,000 | 8,000 |
| U | 6032-15 | 12 | 1,000 | 5,000 |
| L | 6032-19 | 12 | 1,000 | 3,000 |
| C | 6032-28 | 12 | 500 | 3,000 |
| Q | 7343-12 | 12 | 1,000 | 3,000 |
| W | 7343-15 | 12 | 1,000 | 3,000 |
| Z | 7343-17 | 12 | 1,000 | 3,000 |
| V | 7343-19 | 12 | 1,000 | 3,000 |
| D | 7343-31 | 12 | 500 | 2,500 |
| Y | 7343-40 | 12 | 500 | 2,000 |
| X | 7343-43 | 12 | 500 | 2,000 |
| J | 7360-15 | 12 | 1,000 | 3,000 |
| H | 7360-20 | 12 | 1,000 | 3,000 |
| O | 7360-43 | 12 | 250 | 1,000 |

** No C-Spec required for 7" reel packaging. C-7280 required for 13" reel packaging.*

## Figure 1 – Embossed (Plastic) Carrier Tape Dimensions




## Table 4 – Embossed (Plastic) Carrier Tape Dimensions

Metric will govern

| Constant Dimensions — Millimeters (Inches) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Tape Size | $D_0$ | $D_1$ Minimum Note 1 | $E_1$ | $P_0$ | $P_2$ | R Reference Note 2 | $S_1$ Minimum Note 3 | T Maximum | $T_1$ Maximum |
| 8 mm | 1.5 +0.10/−0.0 (0.059 +0.004/−0.0) | 1.0 (0.039) | 1.75 ±0.10 (0.069 ±0.004) | 4.0 ±0.10 (0.157 ±0.004) | 2.0 ±0.05 (0.079 ±0.002) | 25.0 (0.984) | 0.600 (0.024) | 0.600 (0.024) | 0.100 (0.004) |
| 12 mm | | 1.5 (0.059) | | | | 30 (1.181) | | | |

| Variable Dimensions — Millimeters (Inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tape Size | Pitch | $B_1$ Maximum Note 4 | $E_2$ Minimum | F | $P_1$ | $T_2$ Maximum | W Maximum | $A_0$, $B_0$ & $K_0$ |
| 8 mm | Single (4 mm) | 4.35 (0.171) | 6.25 (0.246) | 3.5 ±0.05 (0.138 ±0.002) | 2.0 ±0.05 or 4.0 ±0.10 (0.079 ±0.002 or 0.157 ±0.004) | 2.5 (0.098) | 8.3 (0.327) | Note 5 |
| 12 mm | Single (4 mm) and Double (8 mm) | 8.2 (0.323) | 10.25 (0.404) | 5.5 ±0.05 (0.217 ±0.002) | 2.0 ±0.05 (0.079 ±0.002) or 4.0 ±0.10 (0.157 ±0.004) or 8.0 ±0.10 (0.315 ±0.004) | 4.6 (0.181) | 12.3 (0.484) | |

*1. The embossment hole location shall be measured from the sprocket hole controlling the location of the embossment. Dimensions of embossment location and hole location shall be applied independent of each other.*

*2. The tape, with or without components, shall pass around R without damage (see Figure 4).*

*3. If $S_1$ < 1.0 mm, there may not be enough area for cover tape to be properly applied (see EIA Standard 481–D, paragraph 4.3, section b).*

*4. $B_1$ dimension is a reference dimension for tape feeder clearance only.*

*5. The cavity defined by $A_0$, $B_0$ and $K_0$ shall surround the component with sufficient clearance that:*

*(a) the component does not protrude above the top surface of the carrier tape.*

*(b) the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.*

*(c) rotation of the component is limited to 20° maximum for 8 and 12 mm tapes (see Figure 2).*

*(d) lateral movement of the component is restricted to 0.5 mm maximum for 8 mm and 12 mm wide tape (see Figure 3).*

*(e) see Addendum in EIA Standard 481–D for standards relating to more precise taping requirements.*

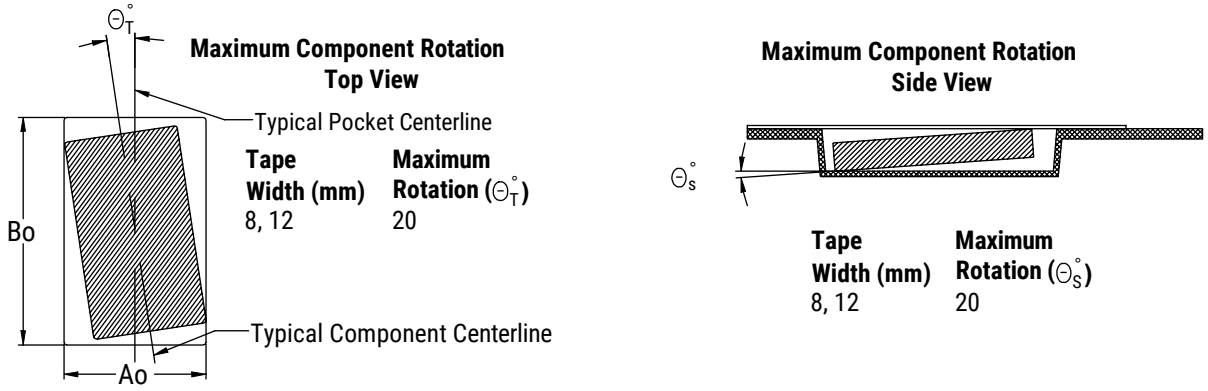
## Packaging Information Performance Notes

**1. Cover tape break force:** 1.0 kg minimum.
**2. Cover tape peel strength:** The total peel strength of the cover tape from the carrier tape shall be:

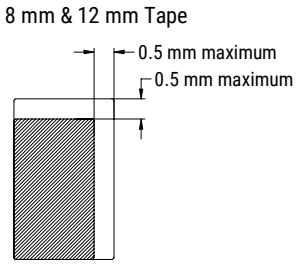
| Tape Width | Peel Strength |
|---|---|
| 8 mm | 0.1 to 1.0 newton (10 to 100 gf) |
| 12 mm | 0.1 to 1.3 newton (10 to 130 gf) |

The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ±10 mm/minute.
**3. Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. *Refer to EIA Standards 556 and 624*.

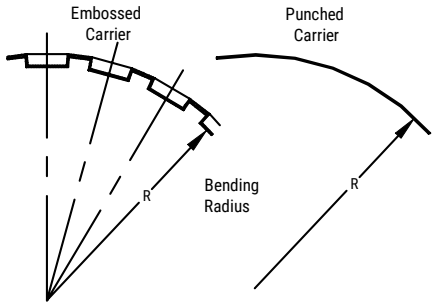
## Figure 2 – Maximum Component Rotation



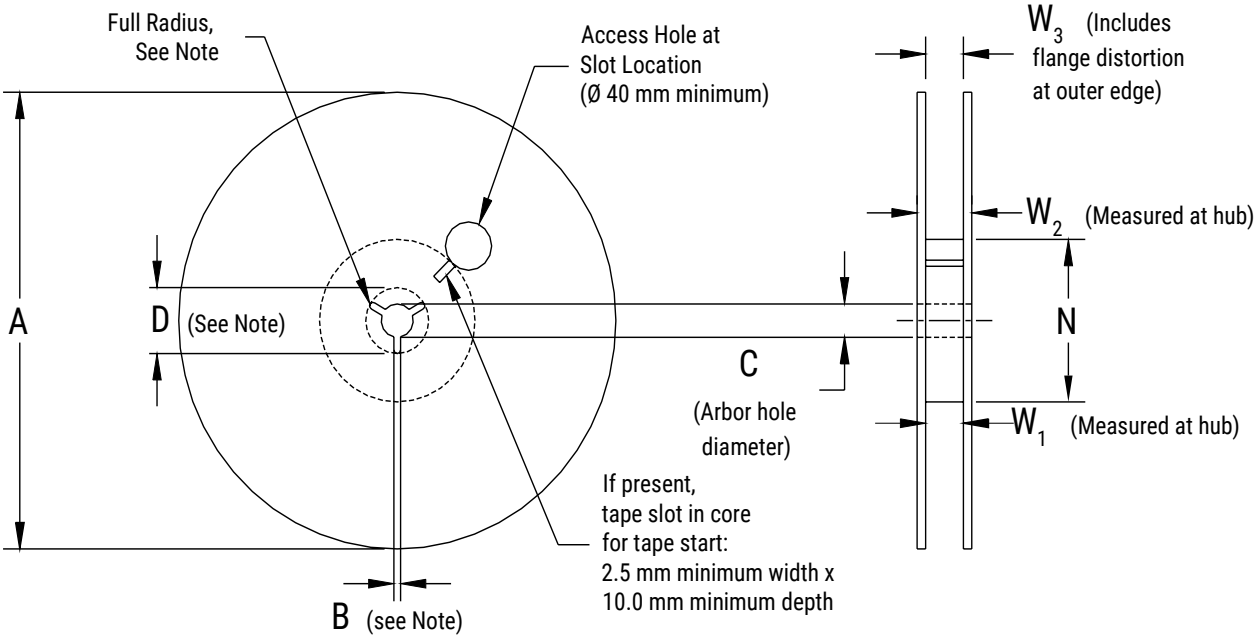

## Figure 3 – Maximum Lateral Movement




## Figure 4 – Bending Radius



## Figure 5 – Reel Dimensions




Note: Drive spokes optional; if used, dimensions B and D shall apply.

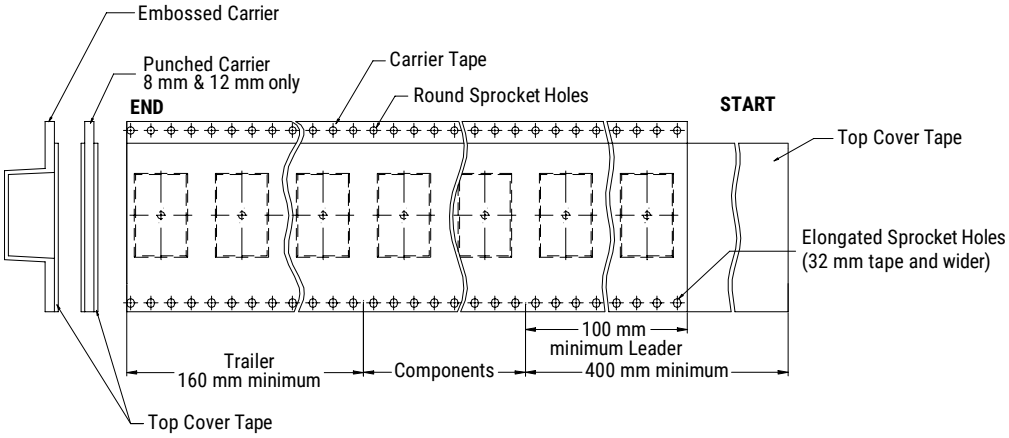
## Table 5 – Reel Dimensions

Metric will govern

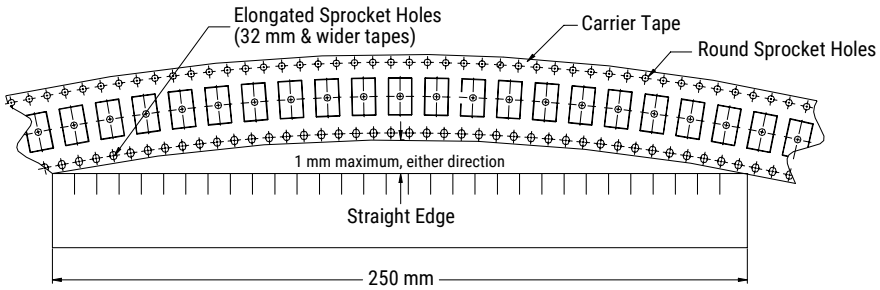
| Constant Dimensions — Millimeters (Inches) | | | | |
|---|---|---|---|---|
| Tape Size | A | B Minimum | C | D Minimum |
| 8 mm | 178 ±0.20 (7.008 ±0.008) or 330 ±0.20 (13.000 ±0.008) | 1.5 (0.059) | 13.0 +0.5/−0.2 (0.521 +0.02/−0.008) | 20.2 (0.795) |
| 12 mm | | | | |

| Variable Dimensions — Millimeters (Inches) | | | | |
|---|---|---|---|---|
| Tape Size | N Minimum | $W_1$ | $W_2$ Maximum | $W_3$ |
| 8 mm | 50 (1.969) | 8.4 +1.5/−0.0 (0.331 +0.059/−0.0) | 14.4 (0.567) | Shall accommodate tape width without interference |
| 12 mm | | 12.4 +2.0/−0.0 (0.488 +0.078/−0.0) | 18.4 (0.724) | |

## Figure 6 – Tape Leader & Trailer Dimensions




## Figure 7 – Maximum Camber



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