

## Overview

The KEMET Aluminum Organic Capacitor (AO-CAP) is a solid state aluminum capacitor with an aluminum oxide dielectric and conductive polymer cathode. The use of the conductive polymer cathode 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 (no derating) with equivalent or better reliability than tantalum capacitors operating at the recommended derated voltage.

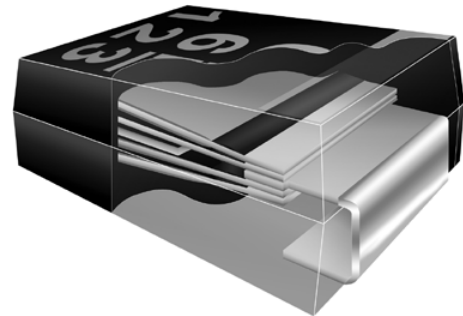
The A700 Series AO-CAP offers the same advantages as the polymer tantalum capacitors but also has the added advantages of 125°C performance capability, higher ripple current handling capability and a lower ESR range. Packaged with multiple anodes/elements to reduce the depth that the signal must penetrate, this parallel arrangement reduces the ESR further still to achieve lower ESR than other types of surface mount capacitors with similar capacitance ranges. With reduced ESR, the enhanced capacitance retention at higher frequencies provides the lowest total capacitance and an economical solution for power applications.

## Benefits

- ESR: 6mΩ to 70mΩ
- Voltage: 2V to 16V
- Capacitance: 6.8μF to 470μF
- Operating Temperature: -55°C to 125°C
- 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

## 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

## SPICE

For a detailed analysis of specific part numbers, please visit [kemet.com](http://kemet.com) for a free download of KEMET's SPICE software. The KEMET SPICE program is freeware intended to aid design engineers in analyzing the performance of these capacitors over frequency, temperature, ripple, and DC bias conditions.

## Ordering Information

A	700	V	476	M	006	A	T	E018	
Capacitor Class	Series	Case Size	Capacitance Code (pF)	Capacitance Tolerance	Voltage	Failure Rate/ Design	Lead Material	ESR Code	Packaging (C-Spec)
A = Aluminum	A700 = Aluminum Polymer	D = 7343-31 V = 7343-20 W = 7343-15 X = 7343-43	First two digits represent significant figures. Third digit specifies number of zeros.	M = ±20%	002 = 2V 2R5 = 2.5V 004 = 4V 006 = 6.3V 008 = 8V 010 = 10V 12R = 12.5V 016 = 16V	A = N/A	T = 100% Matte Tin (Sn) Plated	E = ESR Last three digits specify ESR in mOhms. (018 = 18mOhms)	Blank = 7" Reel 7280 = 13" Reel

## Performance Characteristics

Item	Performance Characteristics
Operating Temperature	-55°C to 125°C
Rated Capacitance Range	6.8µF–470µF @ 120 Hz/25°C
Capacitance Tolerance	M Tolerance (20%)
Rated Voltage Range	2V–16V
DF(120Hz)	6%
ESR (100kHz)	Refer to Part Number Electrical Specification Table
Leakage Current	≤ 4V Rating: ≤ 0.06CV (µA) at Rated Voltage after 5 minutes > 4V Rating: ≤ 0.04CV (µA) at Rated Voltage after 5 minutes

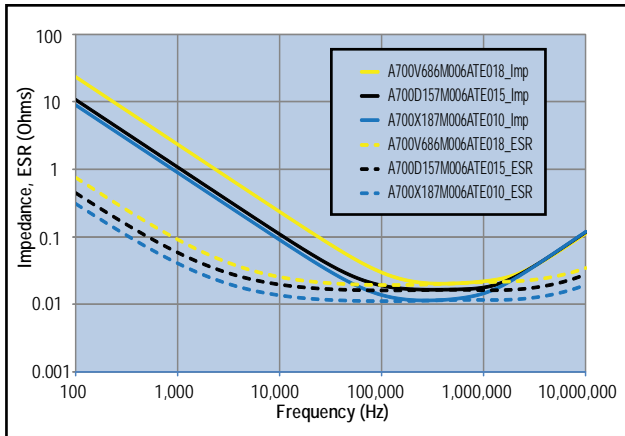
## Qualification

Test	Condition	Characteristics					
Endurance	125°C @ Rated Voltage, 2000 Hours	ΔC/C	Within ±10% of initial value				
		DF	≤ initial limit				
		DCL	Within 1.25 x initial limit				
		ESR	Within 2.0 x initial limit				
Storage Life	125°C @ 0 Volts, 2000 Hours	ΔC/C	Within ±10% 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	ΔC/C	Within -5%/+30% 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, +25°C, +85°C, +125°C, +25°C	+25°C	-55°C	+85°C	+125°C		
		ΔC/C	IL*	±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	125°C, 1.32 x Rated Voltage, 33W Resistance, 1000 cycles	ΔC/C	Within ±10% of initial value		
				DF	Within initial limits		
DCL	Within initial limits						
ESR	Within initial limits						
Mechanical Shock/Vibration	MIL-Std-202, Meth. 213, Cond. I, 100G Peak. MIL-Std-202, Meth. 204, Cond. D, 10Hz to 2000Hz, 20G Peak	ΔC/C	Within ±10% of initial value				
		DF	Within initial limits				
		DCL	Within initial limits				

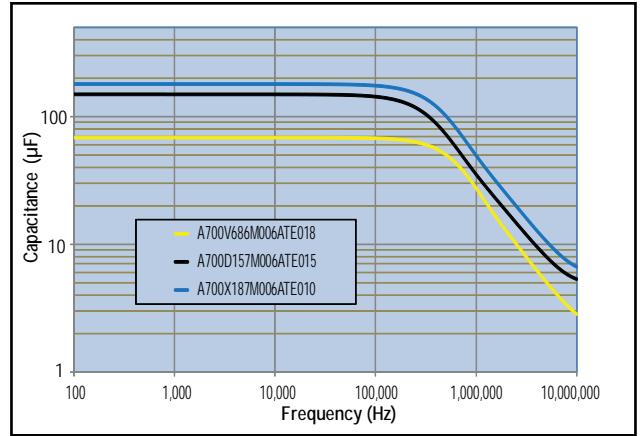
\*IL = Initial Limit

## Electrical Characteristics

ESR vs. Frequency



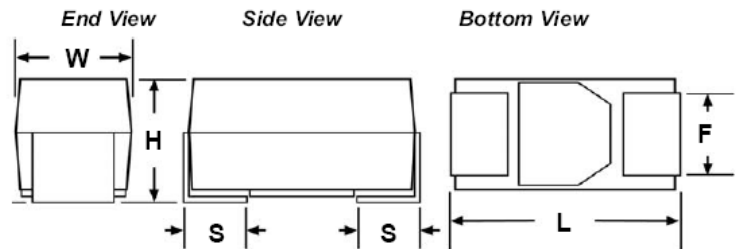
Capacitance vs. Frequency



## Dimensions – Millimeters (Inches)

Metric will govern

Case Size		Component				
KEMET	EIA	L*	W*	H*	F* ±0.1 ±(.004)	S* ±0.3 ±(.012)
D	7343-31	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.8 ± 0.3 (.098 ± .012)	2.4 (.094)	1.3 (.051)
V	7343-20	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.0 (.079) max	2.4 (.094)	1.3 (.051)
W	7343-15	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	1.5 (.059) max	2.4 (.094)	1.3 (.051)
X	7343-43	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	4.0 ± 0.3 (.157 ± .012)	2.4 (.094)	1.3 (.051)



**Table 1 – Ratings & Part Number Reference**

Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp
				$\mu$ Amps @ +20°C max/5min	+20°C 120Hz % Max	mOhms @ +20°C 100kHz	(mAmps)@ 100kHz T=+20°C@ -55°C to 125°C	Reflow Temp ≤260°C	(°C)
VDC	120Hz $\mu$ F	KEMET/EIA	(See below for part options)						
2	100	W/7343-15	A700W107M002ATE009	12	6	9	5300	3	125
2	100	W/7343-15	A700W107M002ATE016	12	6	16	4000	3	125
2	100	V/7343-20	A700V107M002ATE018	12	6	18	3900	3	125
2	100	V/7343-20	A700V107M002ATE025	12	6	25	3300	3	125
2	100	V/7343-20	A700V107M002ATE028	12	6	28	3100	3	125
2	120	V/7343-20	A700V127M002ATE018	14	6	18	3900	3	125
2	120	V/7343-20	A700V127M002ATE025	14	6	25	3300	3	125
2	120	V/7343-20	A700V127M002ATE028	14	6	28	3100	3	125
2	150	V/7343-20	A700V157M002ATE009	18	6	9	5500	3	125
2	150	V/7343-20	A700V157M002ATE015	18	6	15	4200	3	125
2	150	V/7343-20	A700V157M002ATE018	18	6	18	3900	3	125
2	150	V/7343-20	A700V157M002ATE025	18	6	25	3300	3	125
2	150	V/7343-20	A700V157M002ATE028	18	6	28	3100	3	125
2	180	D/7343-31	A700D187M002ATE015	22	6	15	4100	3	125
2	180	D/7343-31	A700D187M002ATE018	22	6	18	3700	3	125
2	220	V/7343-20	A700V227M002ATE009	26	6	9	5500	3	125
2	220	V/7343-20	A700V227M002ATE015	26	6	15	4200	3	125
2	220	V/7343-20	A700V227M002ATE018	26	6	18	3900	3	125
2	220	D/7343-31	A700D227M002ATE009	26	6	9	5300	3	125
2	220	D/7343-31	A700D227M002ATE015	26	6	15	4100	3	125
2	220	D/7343-31	A700D227M002ATE018	26	6	18	3700	3	125
2	270	D/7343-31	A700D277M002ATE012	32	6	12	4600	3	125
2	270	X/7343-43	A700X277M002ATE010	32	6	10	4700	3	125
2	270	X/7343-43	A700X277M002ATE012	32	6	12	4300	3	125
2	270	X/7343-43	A700X277M002ATE015	32	6	15	3900	3	125
2	330	V/7343-20	A700V337M002ATE006	40	6	6	6700	3	125
2	330	V/7343-20	A700V337M002ATE009	40	6	9	5500	3	125
2	330	D/7343-31	A700D337M002ATE006	40	6	6	6500	3	125
2	330	D/7343-31	A700D337M002ATE007	40	6	7	6000	3	125
2	330	D/7343-31	A700D337M002ATE009	40	6	9	5300	3	125
2	330	D/7343-31	A700D337M002ATE012	40	6	12	4600	3	125
2	330	X/7343-43	A700X337M002ATE010	40	6	10	4700	3	125
2	330	X/7343-43	A700X337M002ATE015	40	6	15	3900	3	125
2	390	X/7343-43	A700X397M002ATE010	47	6	10	4700	3	125
2	390	X/7343-43	A700X397M002ATE015	47	6	15	3900	3	125
2	470	D/7343-31	A700D477M002ATE005	56	6	5	7100	3	125
2	470	X/7343-43	A700X477M002ATE007	56	6	7	5700	3	125
2	470	X/7343-43	A700X477M002ATE010	56	6	10	4700	3	125
2	470	X/7343-43	A700X477M002ATE015	56	6	15	3900	3	125
2	560	X/7343-43	A700X567M002ATE005	67	6	5	6700	3	125
2.5	82	V/7343-20	A700V826M2R5ATE018	12	6	18	3900	3	125
2.5	82	V/7343-20	A700V826M2R5ATE025	12	6	25	3300	3	125
2.5	82	V/7343-20	A700V826M2R5ATE028	12	6	28	3100	3	125
2.5	150	D/7343-31	A700D157M2R5ATE015	23	6	15	4100	3	125
2.5	150	D/7343-31	A700D157M2R5ATE018	23	6	18	3700	3	125
2.5	180	D/7343-31	A700D187M2R5ATE015	27	6	15	4100	3	125
2.5	180	D/7343-31	A700D187M2R5ATE018	27	6	18	3700	3	125
2.5	220	X/7343-43	A700X227M2R5ATE010	33	6	10	4700	3	125
2.5	220	X/7343-43	A700X227M2R5ATE015	33	6	15	3900	3	125
2.5	330	X/7343-43	A700X337M2R5ATE010	50	6	10	4700	3	125
2.5	330	X/7343-43	A700X337M2R5ATE015	50	6	15	3900	3	125
2.5	470	X/7343-43	A700X477M2R5ATE010	71	6	10	4700	3	125
VDC	$\mu$ F 120Hz	KEMET/EIA	(See below for part options)	$\mu$ Amps @ +20°C max/5min	+20°C 120Hz % Max	mOhms @ +20°C 100kHz	(mAmps)@ 100kHz T=+20°C@ -55°C to 125°C	Reflow Temp ≤260°C	(°C)
Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp

Other part number options:

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 con't**

Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp
				$\mu\text{Amps @ } +20^\circ\text{C max/5min}$	$+20^\circ\text{C } 120\text{Hz } \% \text{ Max}$	$\text{mOhms @ } +20^\circ\text{C } 100\text{kHz}$	$(\text{mAmps})@ 100\text{kHz } T=+20^\circ\text{C@ } -55^\circ\text{C to } 125^\circ\text{C}$	Reflow Temp $\leq 260^\circ\text{C}$	$(^\circ\text{C})$
VDC	120Hz $\mu\text{F}$	KEMET/EIA	(See below for part options)						
4	68	V/7343-20	A700V686M004ATE020	16	6	20	3700	3	125
4	68	V/7343-20	A700V686M004ATE028	16	6	28	3100	3	125
4	82	V/7343-20	A700V826M004ATE025	20	6	25	3300	3	125
4	82	V/7343-20	A700V826M004ATE028	20	6	28	3100	3	125
4	120	D/7343-31	A700D127M004ATE015	29	6	15	4100	3	125
4	120	D/7343-31	A700D127M004ATE018	29	6	18	3700	3	125
4	150	D/7343-31	A700D157M004ATE015	36	6	15	4100	3	125
4	150	D/7343-31	A700D157M004ATE018	36	6	18	3700	3	125
4	180	D/7343-31	A700D187M004ATE015	43	6	15	4100	3	125
4	180	D/7343-31	A700D187M004ATE018	43	6	18	3700	3	125
4	180	X/7343-43	A700X187M004ATE010	43	6	10	4700	3	125
4	180	X/7343-43	A700X187M004ATE015	43	6	15	3900	3	125
4	180	X/7343-43	A700X187M004ATE018	43	6	18	3500	3	125
4	220	D/7343-31	A700D227M004ATE009	53	6	9	5300	3	125
4	220	D/7343-31	A700D227M004ATE010	53	6	10	5000	3	125
4	220	D/7343-31	A700D227M004ATE015	53	6	15	4100	3	125
4	220	X/7343-43	A700X227M004ATE010	53	6	10	4700	3	125
4	220	X/7343-43	A700X227M004ATE015	53	6	15	3900	3	125
4	270	X/7343-43	A700X277M004ATE010	65	6	10	4700	3	125
4	270	X/7343-43	A700X277M004ATE015	65	6	15	3900	3	125
4	330	X/7343-43	A700X337M004ATE010	79	6	10	4700	3	125
4	330	X/7343-43	A700X337M004ATE015	79	6	15	3900	3	125
6.3	10	V/7343-20	A700V106M006ATE055	3	6	55	2200	3	125
6.3	22	V/7343-20	A700V226M006ATE028	6	6	28	3100	3	125
6.3	22	V/7343-20	A700V226M006ATE045	6	6	45	2400	3	125
6.3	33	V/7343-20	A700V336M006ATE018	8	6	18	3900	3	125
6.3	33	V/7343-20	A700V336M006ATE025	8	6	25	3300	3	125
6.3	33	V/7343-20	A700V336M006ATE028	8	6	28	3100	3	125
6.3	47	V/7343-20	A700V476M006ATE018	12	6	18	3900	3	125
6.3	47	V/7343-20	A700V476M006ATE025	12	6	25	3300	3	125
6.3	47	V/7343-20	A700V476M006ATE028	12	6	28	3100	3	125
6.3	56	V/7343-20	A700V566M006ATE018	14	6	18	3900	3	125
6.3	56	V/7343-20	A700V566M006ATE025	14	6	25	3300	3	125
6.3	56	V/7343-20	A700V566M006ATE028	14	6	28	3100	3	125
6.3	68	V/7343-20	A700V686M006ATE018	17	6	18	3900	3	125
6.3	68	V/7343-20	A700V686M006ATE025	17	6	25	3300	3	125
6.3	68	V/7343-20	A700V686M006ATE028	17	6	28	3100	3	125
6.3	82	V/7343-20	A700V826M006ATE018	21	6	18	3900	3	125
6.3	82	V/7343-20	A700V826M006ATE025	21	6	25	3300	3	125
6.3	82	V/7343-20	A700V826M006ATE028	21	6	28	3100	3	125
6.3	100	V/7343-20	A700V107M006ATE015	25	6	15	4200	3	125
6.3	100	V/7343-20	A700V107M006ATE018	25	6	18	3900	3	125
6.3	100	V/7343-20	A700V107M006ATE025	25	6	25	3300	3	125
6.3	100	D/7343-31	A700D107M006ATE015	25	6	15	4100	3	125
6.3	100	D/7343-31	A700D107M006ATE018	25	6	18	3700	3	125
6.3	120	D/7343-31	A700D127M006ATE012	30	6	12	4600	3	125
6.3	120	D/7343-31	A700D127M006ATE015	30	6	15	4100	3	125
6.3	120	D/7343-31	A700D127M006ATE018	30	6	18	3700	3	125
6.3	150	D/7343-31	A700D157M006ATE010	38	6	10	5000	3	125
6.3	150	D/7343-31	A700D157M006ATE012	38	6	12	4600	3	125
6.3	150	D/7343-31	A700D157M006ATE015	38	6	15	4100	3	125
6.3	150	X/7343-43	A700X157M006ATE010	38	6	10	4700	3	125
6.3	150	X/7343-43	A700X157M006ATE012	38	6	12	4300	3	125
VDC	$\mu\text{F}$ 120Hz	KEMET/EIA	(See below for part options)	$\mu\text{Amps @ } +20^\circ\text{C max/5min}$	$+20^\circ\text{C } 120\text{Hz } \% \text{ Max}$	$\text{mOhms @ } +20^\circ\text{C } 100\text{kHz}$	$(\text{mAmps})@ 100\text{kHz } T=+20^\circ\text{C@ } -55^\circ\text{C to } 125^\circ\text{C}$	Reflow Temp $\leq 260^\circ\text{C}$	$(^\circ\text{C})$
Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp

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Also available on large (13 inch) reels. Add 7280 to the end of the part number.

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**Table 1 – Ratings & Part Number Reference con't**

Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp
				$\mu\text{Amps @ } +20^\circ\text{C max/5min}$	$+20^\circ\text{C } 120\text{Hz } \% \text{ Max}$	$\text{mOhms @ } +20^\circ\text{C } 100\text{kHz}$	$(\text{mAmps})@ 100\text{kHz } T=+20^\circ\text{C@ } -55^\circ\text{C to } 125^\circ\text{C}$	Reflow Temp $\leq 260^\circ\text{C}$	$(^\circ\text{C})$
VDC	120Hz $\mu\text{F}$	KEMET/EIA	(See below for part options)						
6.3	150	X/7343-43	A700X157M006ATE015	38	6	15	3900	3	125
6.3	180	X/7343-43	A700X187M006ATE010	45	6	10	4700	3	125
6.3	180	X/7343-43	A700X187M006ATE015	45	6	15	3900	3	125
6.3	220	X/7343-43	A700X227M006ATE015	55	6	15	3900	3	125
8	10	V/7343-20	A700V106M008ATE055	3	6	55	2200	3	125
8	22	V/7343-20	A700V226M008ATE028	7	6	28	3100	3	125
8	22	V/7343-20	A700V226M008ATE045	7	6	45	2400	3	125
8	33	V/7343-20	A700V336M008ATE018	11	6	18	3900	3	125
8	33	V/7343-20	A700V336M008ATE025	11	6	25	3300	3	125
8	33	V/7343-20	A700V336M008ATE028	11	6	28	3100	3	125
8	56	D/7343-31	A700D566M008ATE015	18	6	15	4100	3	125
8	56	D/7343-31	A700D566M008ATE018	18	6	18	3700	3	125
8	68	D/7343-31	A700D686M008ATE015	22	6	15	4100	3	125
8	68	D/7343-31	A700D686M008ATE018	22	6	18	3700	3	125
8	100	X/7343-43	A700X107M008ATE010	32	6	10	4700	3	125
8	100	X/7343-43	A700X107M008ATE012	32	6	12	4300	3	125
8	100	X/7343-43	A700X107M008ATE015	32	6	15	3900	3	125
10	10	V/7343-20	A700V106M010ATE055	4	6	55	2200	3	125
10	22	V/7343-20	A700V226M010ATE028	9	6	28	3100	3	125
10	33	V/7343-20	A700V336M010ATE018	13	6	18	3900	3	125
10	33	V/7343-20	A700V336M010ATE025	13	6	25	3300	3	125
10	33	V/7343-20	A700V336M010ATE028	13	6	28	3100	3	125
10	47	V/7343-20	A700V476M010ATE028	19	6	28	3100	3	125
10	56	D/7343-31	A700D566M010ATE015	22	6	15	4100	3	125
10	56	D/7343-31	A700D566M010ATE018	22	6	18	3700	3	125
10	68	D/7343-31	A700D686M010ATE015	27	6	15	4100	3	125
10	68	D/7343-31	A700D686M010ATE018	27	6	18	3700	3	125
10	100	X/7343-43	A700X107M010ATE010	40	6	10	4700	3	125
10	100	X/7343-43	A700X107M010ATE015	40	6	15	3900	3	125
10	120	X/7343-43	A700X127M010ATE010	48	6	10	4700	3	125
10	120	X/7343-43	A700X127M010ATE015	48	6	15	3900	3	125
10	150	X/7343-43	A700X157M010ATE010	60	6	10	4700	3	125
10	150	X/7343-43	A700X157M010ATE015	60	6	15	3900	3	125
12.5	10	V/7343-20	A700V106M12RATE040	5	6	40	2600	3	125
12.5	10	V/7343-20	A700V106M12RATE060	5	6	60	2100	3	125
12.5	15	V/7343-20	A700V156M12RATE040	8	6	40	2600	3	125
12.5	22	V/7343-20	A700V226M12RATE030	11	6	30	3000	3	125
12.5	47	D/7343-31	A700D476M12RATE020	24	6	20	3500	3	125
12.5	47	D/7343-31	A700D476M12RATE025	24	6	25	3200	3	125
12.5	100	X/7343-43	A700X107M12RATE015	50	6	15	3900	3	125
16	6.8	V/7343-20	A700V685M016ATE070	4	6	70	2000	3	125
16	8.2	V/7343-20	A700V825M016ATE045	5	6	45	2400	3	125
16	10	V/7343-20	A700V106M016ATE045	6	6	45	2400	3	125
16	10	V/7343-20	A700V106M016ATE060	6	6	60	2100	3	125
16	15	V/7343-20	A700V156M016ATE040	10	6	40	2600	3	125
16	22	D/7343-31	A700D226M016ATE018	14	6	18	3700	3	125
16	22	D/7343-31	A700D226M016ATE025	14	6	25	3200	3	125
16	22	D/7343-31	A700D226M016ATE030	14	6	30	2900	3	125
VDC	$\mu\text{F}$ 120Hz	KEMET/EIA	(See below for part options)	$\mu\text{Amps @ } +20^\circ\text{C max/5min}$	$+20^\circ\text{C } 120\text{Hz } \% \text{ Max}$	$\text{mOhms @ } +20^\circ\text{C } 100\text{kHz}$	$(\text{mAmps})@ 100\text{kHz } T=+20^\circ\text{C@ } -55^\circ\text{C to } 125^\circ\text{C}$	Reflow Temp $\leq 260^\circ\text{C}$	$(^\circ\text{C})$
Rated Voltage	Rated Cap	Case Code/ Case Size	KEMET Part Number	DC Leakage	DF	ESR	Ripple Current	Moisture Sensitivity	Rated Temp

Other part number options:

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	Max Recommended Steady State Voltage	Max Recommended Transient Voltage (1ms - 1μs)
	-55°C to 125°C	
$2V \leq V_r \leq 16V$	$V_r$	$V_r$

$V_r$  = 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

- The positive peak AC voltage plus the DC bias voltage, if any, must not exceed the DC voltage rating of the capacitor.
- 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.

Case Code		Maximum Power Dissipation (Pmax) mWatts @ 25°C w/+20°C Rise
KEMET	EIA	
A700W	7343-15	290
A700V	7343-20	270
A700D	7343-31	250
A700X	7343-43	225

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

$$I(max) = \sqrt{P_{max}/R}$$

$$E(max) = \sqrt{P_{max} \cdot R}$$

$I$  = rms ripple current (amperes)

$E$  = rms ripple voltage (volts)

$P_{max}$  = maximum power dissipation(watts)

$R$  = ESR at specified frequency (ohms)

Refer to part number listings for permissible 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**

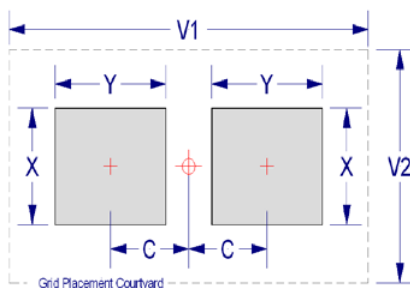
KEMET	Metric Size Code	Density Level A: Maximum (Most) Land Protrusion (mm)					Density Level B: Median (Nominal) Land Protrusion (mm)					Density Level C: Minimum (Least) Land Protrusion (mm)				
		X	Y	C	V1	V2	X	Y	C	V1	V2	X	Y	C	V1	V2
D	7343-31	2.55	3.75	2.70	10.20	5.50	2.45	3.35	2.60	9.10	5.00	2.35	2.95	2.50	8.20	4.70
V	7343-20	2.55	3.75	2.70	10.20	5.50	2.45	3.35	2.60	9.10	5.00	2.35	2.95	2.50	8.20	4.70
W	7343-15	2.55	3.75	2.70	10.20	5.50	2.45	3.35	2.60	9.10	5.00	2.35	2.95	2.50	8.20	4.70
X <sup>1</sup>	7343-43	2.55	3.75	2.70	10.20	5.50	2.45	3.35	2.60	9.10	5.00	2.35	2.95	2.50	8.20	4.70

*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).*

<sup>1</sup> Height of these chips may create problems in wave soldering.



## 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.

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.

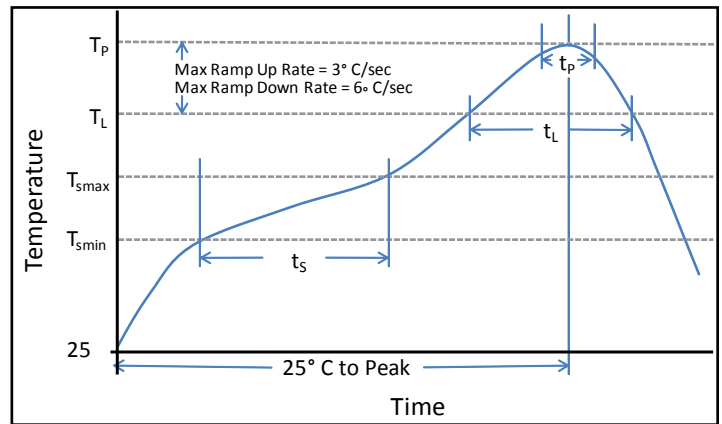
Hand soldering should be performed with care due to the difficulty in process control. If performed, care should be taken to avoid contact of the soldering iron to the molded case. The iron should be used to heat the solder pad, applying solder between the pad and the termination, until reflow occurs. Once reflow occurred, 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 Min ( $T_{smin}$ )	100°C	150°C
Temperature Max ( $T_{smax}$ )	150°C	200°C
Time ( $t_s$ ) from $T_{smin}$ to $T_{smax}$	60-120 sec	60-120 sec
Ramp-up Rate ( $T_L$ to $T_p$ )	3°C/sec max	3°C/sec max
Liquidous Temperature ( $T_L$ )	183°C	217°C
Time Above Liquidous ( $t_L$ )	60-150 sec	60-150 sec
Peak Temperature ( $T_p$ )	220°C* 235°C**	250°C* 260°C**
Time within 5°C of Max Peak Temperature ( $t_p$ )	20 sec max	30 sec max
Ramp-down Rate ( $T_p$ to $T_L$ )	6°C/sec max	6°C/sec max
Time 25°C to Peak Temperature	6 minutes max	8 minutes max

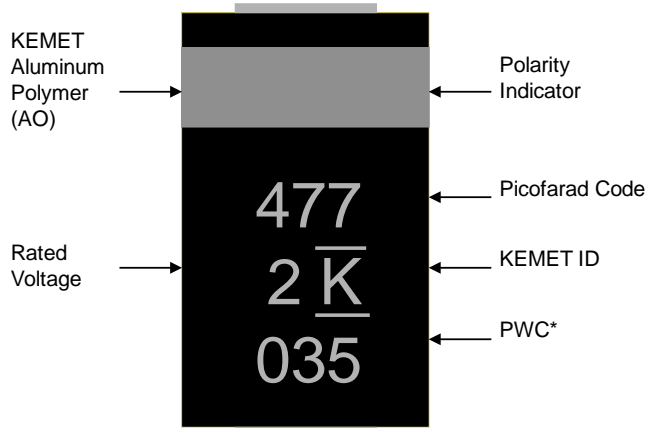
Note: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow.

\*Case Size D, E, P, Y and X

\*\*Case Size A, B, C, H, I, K, M, R, S, T, U, V, W and Z



## Capacitor Marking



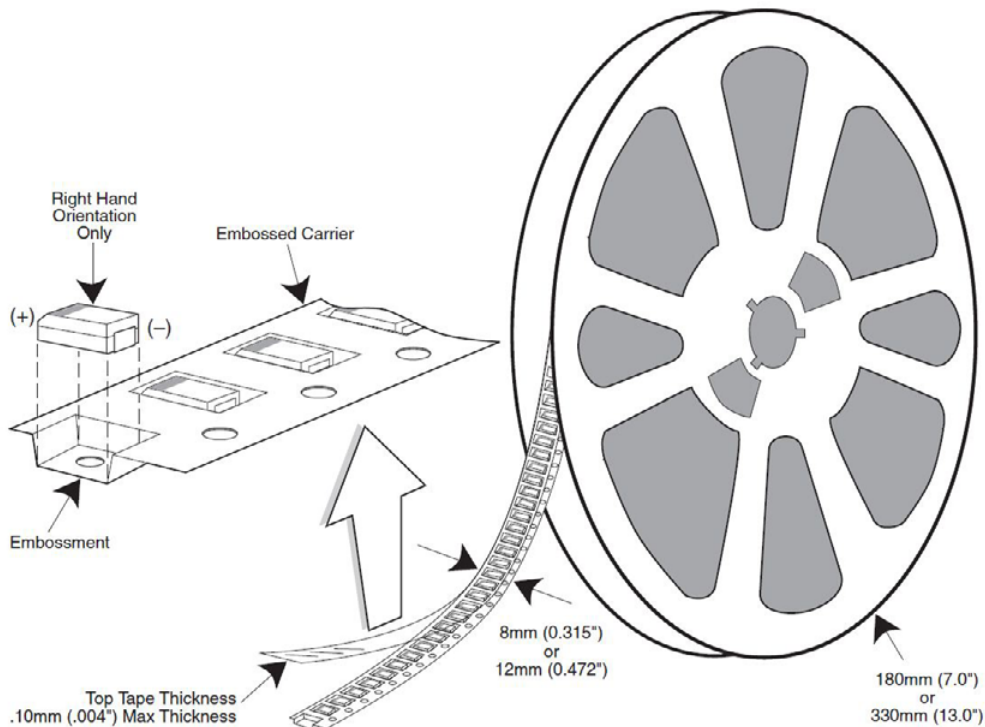
\* 035 = 35<sup>th</sup> week of 2010

## Storage

All AO-CAP series are shipped in moisture barrier bags with a desiccant and moisture indicator card. These series are classified as MSL3 (Moisture Sensitivity Level 3). Product contained within the moisture barrier bags should be stored in normal working environments with temperatures not to exceed 40°C and humidity not in excess of 60% RH.

## Tape & Reel Packaging Information

KEMET’s Molded Tantalum and Aluminum Chip Capacitor families are packaged in 8 mm and 12 mm plastic tape on 7" and 13" reels, in accordance with EIA Standard 481-1: Taping of Surface Mount Components for Automatic Handling. This packaging system is compatible with all tape fed automatic pick and place systems.

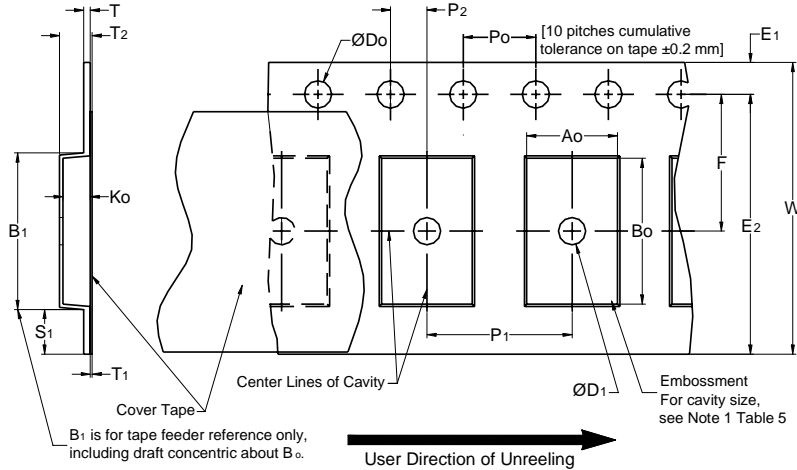


**Table 3 – Packaging Quantity**

Case Code		Tape Width-mm	7" Reel*	13" Reel*
KEMET	EIA			
R	2012-12	8	2,500	10,000
I	3216-10	8	3,000	12,000
S	3216-12	8	2,500	10,000
T	3528-12	8	2,500	10,000
M	3528-15	8	2,000	8,000
U	6032-15	12	1,000	5,000
L	6032-19	12	1,000	5,000
W	7343-15	12	1,000	3,000
Z	7343-17	12	1,000	3,000
V	7343-20	12	1,000	3,000
A	3216-18	8	2,000	9,000
B	3528-21	8	2,000	8,000
C	6032-28	12	500	3,000
D	7343-31	12	500	2,500
Y	7343-40	12	500	2,000
X	7343-43	12	500	2,000
E	7260-38	12	500	2,000

\* 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	$D_0$	$D_1$ Min. Note 1	$E_1$	$P_0$	$P_2$	R Ref. Note 2	$S_1$ Min. Note 3	T Max.	$T_1$ Max.
8mm	$1.5 +0.10/-0.0$ (0.059 +0.004/-0.0)	1.0 (0.039)	$1.75 \pm 0.10$ (0.069 ± 0.004)	$4.0 \pm 0.10$ (0.157 ± 0.004)	$2.0 \pm 0.05$ (0.079 ± 0.002)	25.0 (0.984)	0.600 (0.024)	0.600 (0.024)	0.100 (0.004)
12mm		1.5 (0.059)				30 (1.181)			
16mm									
Variable Dimensions — Millimeters (Inches)									
Tape Size	Pitch	$B_1$ Max. Note 4	$E_2$ Min.	F	$P_1$	$T_2$ Max	W Max	$A_0, B_0$ & $K_0$	
8mm	Single (4mm)	4.35 (0.171)	6.25 (0.246)	$3.5 \pm 0.05$ (0.138 ± 0.002)	$4.0 \pm 0.10$ (0.157 ± 0.004)	2.5 (0.098)	8.3 (0.327)	Note 5	
12mm	Single (4mm) & Double (8mm)	8.2 (0.323)	10.25 (0.404)	$5.5 \pm 0.05$ (0.217 ± 0.002)	$8.0 \pm 0.10$ (0.315 ± 0.004)	4.6 (0.181)	12.3 (0.484)		
16mm	Triple (12mm)	12.1 (0.476)	14.25 (0.561)	$5.5 \pm 0.05$ (0.217 ± 0.002)	$8.0 \pm 0.10$ (0.315 ± 0.004)	4.6 (0.181)	16.3 (0.642)		

- 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.
- The tape with or without components shall pass around R without damage (see Figure 5).
- If  $S_1 < 1.0$  mm, there may not be enough area for cover tape to be properly applied (see EIA Document 481 paragraph 4.3 (b)).
- $B_1$  dimension is a reference dimension for tape feeder clearance only.
- The cavity defined by  $A_0$ ,  $B_0$  and  $K_0$  shall surround the component with sufficient clearance that:
  - the component does not protrude above the top surface of the carrier tape.
  - the component can be removed from the cavity in a vertical direction without mechanical restriction, after the top cover tape has been removed.
  - rotation of the component is limited to 20° maximum for 8 and 12mm tapes and 10° maximum for 16mm tapes (see Figure 3).
  - lateral movement of the component is restricted to 0.5 mm maximum for 8mm and 12mm wide tape and to 1.0mm maximum for 16mm tape (see Figure 4).
  - see Addendum in EIA Document 481 for standards relating to more precise taping requirements.

## Packaging Information Performance Notes

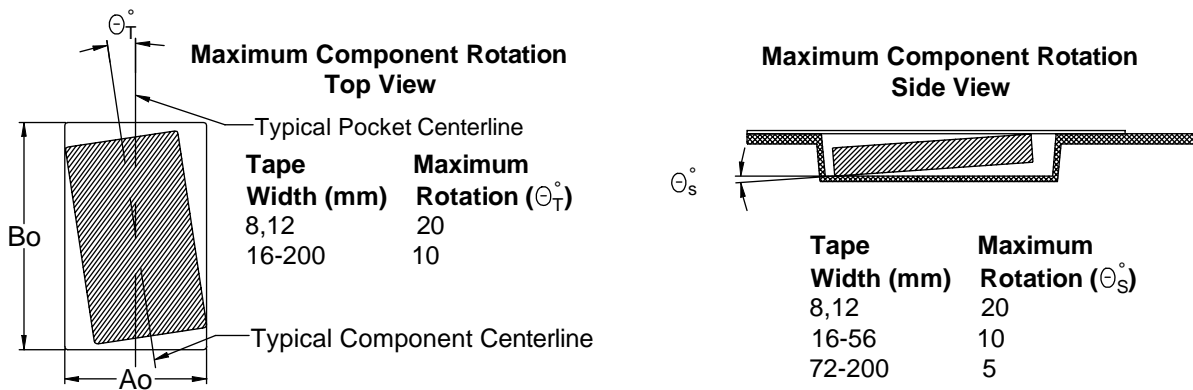
1. **Cover Tape Break Force:** 1.0 Kg minimum.
2. **Cover Tape Peel Strength:** The total peel strength of the cover tape from the carrier tape shall be:

Tape Width	Peel Strength
8mm	0.1 Newton to 1.0 Newton (10gf to 100gf)
12mm & 16mm	0.1 Newton to 1.3 Newton (10gf to 130gf)

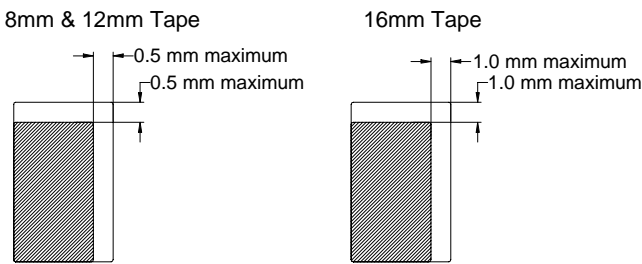
The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300±10 mm/minute.

3. **Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556 and EIA-624.

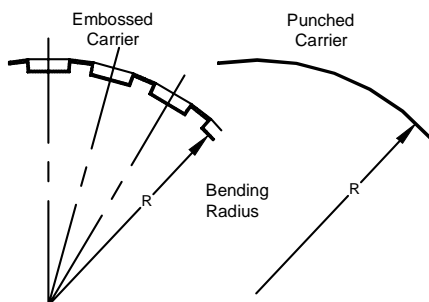
## Figure 2 – Maximum Component Rotation



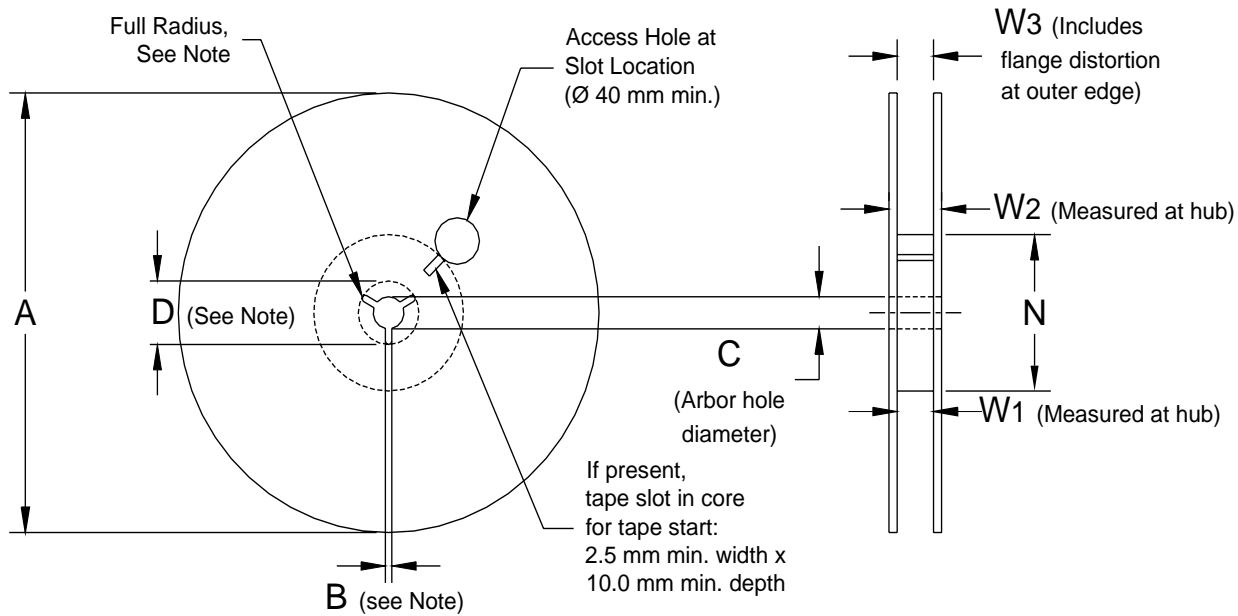
## Figure 3 – Maximum Lateral Movement



## Figure 4 – Bending Radius



**Figure 5 – Reel Dimensions**

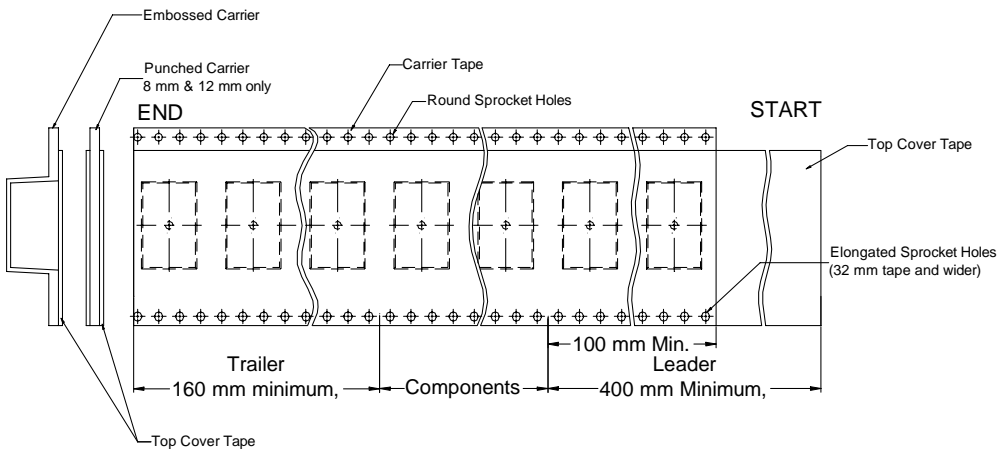


**Table 5 – Reel Dimensions**

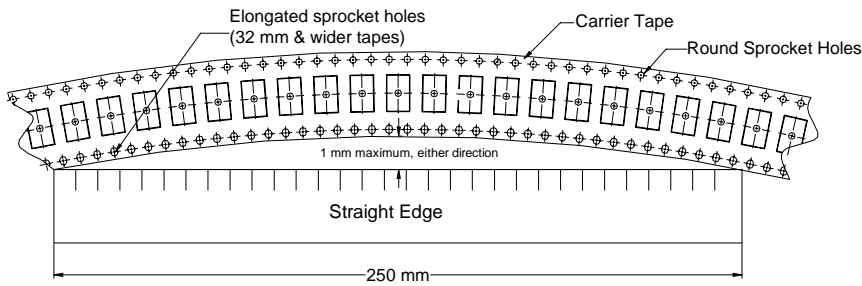
Metric will govern

Constant Dimensions — Millimeters (Inches)				
Tape Size	A	B Min	C	D Min
8mm	178 ± 0.20 (7.008 ± 0.008)	1.5 (0.059)	13.0 +0.5/-0.2 (0.521 +0.02/-0.008)	20.2 (0.795)
12mm	or			
16mm	330 ± 0.20 (13.000 ± 0.008)			
Variable Dimensions — Millimeters (Inches)				
Tape Size	N Min	W <sub>1</sub>	W <sub>2</sub> Max	W <sub>3</sub>
8mm	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
12mm		12.4 +2.0/-0.0 (0.488 +0.078/-0.0)	18.4 (0.724)	
16mm		16.4 +2.0/-0.0 (0.646 +0.078/-0.0)	22.4 (0.882)	

**Figure 6 – Tape Leader & Trailer Dimensions**



**Figure 7 – Maximum Camber**





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Rome, Italy  
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Färjestaden, Sweden  
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Beijing, China  
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Shanghai, China  
Tel: 86-21-6447-0707

Taipei, Taiwan  
Tel: 886-2-27528585

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Tel: 65-6586-1900

Penang, Malaysia  
Tel: 60-4-6430200

Bangalore, India  
Tel: 91-806-53-76817

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## Other KEMET Resources

Tools	
Resource	Location
Configure A Part: CapEdge	<a href="http://capacitoredge.kemet.com">http://capacitoredge.kemet.com</a>
SPICE & FIT Software	<a href="http://www.kemet.com/spice">http://www.kemet.com/spice</a>
Search Our FAQs: KnowledgeEdge	<a href="http://www.kemet.com/keask">http://www.kemet.com/keask</a>

Product Information	
Resource	Location
Products	<a href="http://www.kemet.com/products">http://www.kemet.com/products</a>
Technical Resources (Including Soldering Techniques)	<a href="http://www.kemet.com/technicalpapers">http://www.kemet.com/technicalpapers</a>
RoHS Statement	<a href="http://www.kemet.com/rohs">http://www.kemet.com/rohs</a>
Quality Documents	<a href="http://www.kemet.com/qualitydocuments">http://www.kemet.com/qualitydocuments</a>

Product Request	
Resource	Location
Sample Request	<a href="http://www.kemet.com/sample">http://www.kemet.com/sample</a>
Engineering Kit Request	<a href="http://www.kemet.com/kits">http://www.kemet.com/kits</a>

Contact	
Resource	Location
Website	<a href="http://www.kemet.com">www.kemet.com</a>
Contact Us	<a href="http://www.kemet.com/contact">http://www.kemet.com/contact</a>
Investor Relations	<a href="http://www.kemet.com/ir">http://www.kemet.com/ir</a>
Call Us	1-877-MyKEMET
Twitter	<a href="http://twitter.com/kemetcapacitors">http://twitter.com/kemetcapacitors</a>

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Although we design and manufacture our products to the most stringent quality and safety standards, given 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) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

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