

# Type AVE $-40\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$ General Purpose SMT Capacitors

## Aluminum Electrolytic Capacitors for Filtering and Bypass



Type AVE capacitors are a great value for filter and bypass applications not requiring wide temperature performance or high ripple current. Their vertical cylindrical cases facilitate automatic mounting and reflow soldering and offer a significant savings over tantalum capacitors.

### Highlights

- $+85\text{ }^{\circ}\text{C}$ , Up to 2000 Hour Load Life
- Low Impedance
- Voltage Range: 4 Vdc to 100 Vdc

### Specifications

**Operating Temperature:**  $-40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$

**Rated Voltage:** 4, 6.3, 10, 16, 25, 35, 50, 63 & 100 Vdc

**Capacitance:**  $0.1\text{ }\mu\text{F}$  to  $1500\text{ }\mu\text{F}$

**Capacitance Tolerance:**  $\pm 20\%$  @ 120 Hz and  $+20\text{ }^{\circ}\text{C}$

**Leakage Current:** 0.01 CV or  $3\text{ }\mu\text{A}$  @  $+20\text{ }^{\circ}\text{C}$ , after two minutes (whichever is greater)

**Dissipation Factor:**

4V	6.3V	10 V	16 V	25 V	35 V	50 V	63 V	100 V
0.42	0.28	0.24	0.20	0.14	0.12	0.10	0.10	0.10

**Low Temperature Characteristics @ 120 Hz:**

Rated Voltage (Vdc)		4	6.3	10	16	25	35	50	63	100
Impedance	Z(-25°C)/Z(+20°C)	7	4	3	2	2	2	2	2	2
	Ratio	Z(-40°C)/Z(+20°C)	15	8	5	4	3	3	3	3

**Ripple Current Multipliers:**

Frequency	50 Hz	120 Hz	1 kHz	10 kHz up
Vdc (V)	Multiplier			
$\leq 16$	0.80	1.00	1.15	1.25
25 - 35	0.80	1.00	1.25	1.40
50 - 63	0.80	1.00	1.35	1.50
100	0.70	1.00	1.35	1.50

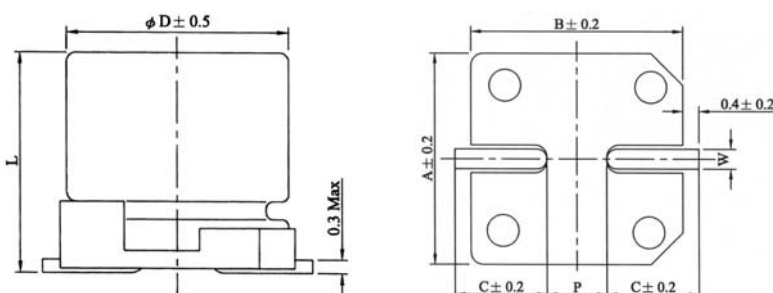


Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

**Life Test:** 2000 h @  $85\text{ }^{\circ}\text{C}$   
 $\Delta$  Capacitance  $\pm 20\%$  (4 WV:  $\pm 30\%$ )  
 DF:  $\leq 200\%$  of limit (4 WV:  $\pm 30\%$ )  
 DCL:  $\leq 100\%$  of limit

**Shelf Test:** 1000 h @  $85\text{ }^{\circ}\text{C}$   
 $\Delta$  Capacitance  $\pm 20\%$  (4 WV:  $\pm 30\%$ )  
 DF:  $\leq 200\%$  of limit (4 WV:  $\pm 30\%$ )

### Outline Drawing



Case Code	Dimensions in millimeters (mm)						
	$\phi D$	L	A	B	C	W	P $\pm 0.2$
A	3	$5.3 \pm 0.2$	3.3	3.3	1.5	.45 ~ 0.75	0.8
B	4	$5.3 \pm 0.2$	4.3	4.3	2.0	0.5 to 0.8	1.0
C	5	$5.3 \pm 0.2$	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
E	8	$6.5 \pm 0.3$	8.4	8.4	3.4	0.5 to 0.8	2.3
F	8	$10 \pm 0.5$	8.4	8.4	3.0	0.7 to 1.1	3.1
G	10	$10 \pm 0.5$	10.4	10.4	3.3	0.7 to 1.1	4.7

# Type AVE -40 °C to 85 °C General Purpose SMT Capacitors

## Aluminum Electrolytic Capacitors for Filtering and Bypass

### Part Numbering System

AVE	106	M	16	B	12T	-F
<b>Type</b>	<b>Capacitance</b>	<b>Capacitance</b>	<b>Voltage</b>	<b>Case</b>	<b>Packaging</b>	<b>RoHS</b>
	<b>104</b> = 0.1 µF	<b>Tolerance</b>	<b>04</b> = 4 Vdc <b>06</b> = 6.3 Vdc	<b>Code</b>	<b>Information</b>	<b>Compliant</b>
	<b>105</b> = 1.0 µF	<b>M</b> = ±20%	<b>10</b> = 10 Vdc <b>16</b> = 16 Vdc	<b>B</b> = B	<b>12</b> = Carrier Tape	
	<b>106</b> = 10.0 µF		<b>25</b> = 25 Vdc <b>35</b> = 35 Vdc		Width (mm)	
	<b>107</b> = 100.0 µF		<b>50</b> = 50 Vdc <b>63</b> = 63 Vdc		<b>T</b> = Tape & Reel	
	<b>108</b> = 1000.0 µF		<b>2A</b> = 100 Vdc			

### Ratings

Cap (µF)	Catalog Part Number	Max. DCL 2 min. (µA)	Max. DF @120Hz/20°C (%)	Max. E.S.R. @120Hz/20°C (Ω)	Max. Ripple Current @120Hz/85°C (mA)	Case Code	Size D x L (mm)	Qty. Per Reel (Each)
<b>4 Vdc ( 5 Vdc Surge )</b>								
22	AVE226M04A12T-F	3	0.42	31.65	14	A	3x5.3	2000
33	AVE336M04B12T-F	3	0.42	21.10	31	B	4x5.3	2000
47	AVE476M04B12T-F	3	0.42	14.81	37	B	4x5.3	2000
68	AVE686M04C12T-F	3	0.42	10.24	63	C	5x5.3	1000
100	AVE107M04D16T-F	4	0.42	6.96	110	D	6.3x5.3	1000
<b>6.3 Vdc ( 8 Vdc Surge )</b>								
22	AVE226M06B12T-F	3	0.28	21.10	23	B	4x5.3	2000
33	AVE336M06B12T-F	3	0.28	14.07	31	B	4x5.3	2000
47	AVE476M06C12T-F	3	0.28	9.88	52	C	5x5.3	1000
68	AVE686M06D16T-F	4.3	0.28	6.83	89	D	6.3x5.3	1000
100	AVE107M06D16T-F	6.3	0.28	4.64	120	D	6.3x5.3	1000
220	AVE227M06X16T-F	13.9	0.28	2.11	123	X	6.3x7.7	1000
220	AVE227M06E16T-F	13.9	0.28	2.11	155	E	8x6.5	1000
330	AVE337M06X16T-F	20.8	0.28	1.41	139	X	6.3x7.7	1000
330	AVE337M06E16T-F	20.8	0.28	1.41	155	E	8x6.5	1000
470	AVE477M06F24T-F	29.6	0.28	0.99	252	F	8x10	500
1000	AVE108M06G24T-F	63.0	0.28	0.46	458	G	10x10	500
1500	AVE158M06G24T-F	94.5	0.28	0.31	458	G	10x10	500
<b>10 Vdc ( 13 Vdc Surge )</b>								
10	AVE106M10B12T-F	3	0.24	39.79	23	B	4x5.3	2000
22	AVE226M10C12T-F	3	0.24	18.09	39	C	5x5.3	1000
33	AVE336M10C12T-F	3.3	0.24	12.06	48	C	5x5.3	1000
47	AVE476M10D16T-F	4.7	0.24	8.47	67	D	6.3x5.3	1000
68	AVE686M10D16T-F	6.8	0.24	5.85	98	D	6.3x5.3	1000
100	AVE107M10X16T-F	10	0.24	3.98	108	X	6.3x7.7	1000
100	AVE107M10E16T-F	10	0.24	3.98	155	E	8x6.5	1000
220	AVE227M10X16T-F	22	0.24	1.81	130	X	6.3x7.7	1000
220	AVE227M10E16T-F	22	0.24	1.81	155	E	8x6.5	1000
330	AVE337M10F24T-F	33	0.24	1.21	252	F	8x10	500
470	AVE477M10G24T-F	47	0.24	0.85	458	G	10x10	500
1000	AVE108M10G24T-F	100	0.24	0.40	458	G	10x10	500

# Type AVE -40 °C to 85 °C General Purpose SMT Capacitors

## Aluminum Electrolytic Capacitors for Filtering and Bypass

### Ratings

Cap (µF)	Catalog Part Number	Max. DCL 2 min. (µA)	Max. DF @120Hz/20°C (%)	Max. E.S.R. @120Hz/20°C (Ω)	Max.	Case Code	Size D x L (mm)	Qty. Per Reel (Each)
					Ripple Current @120Hz/85°C (mA)			
<b>16 Vdc ( 20 Vdc Surge )</b>								
10	AVE106M16A12T-F	3.0	0.2	33.16	14	A	3x5.3	2000
10	AVE106M16B12T-F	3.0	0.2	33.16	26	B	4x5.3	2000
22	AVE226M16C12T-F	3.5	0.2	15.07	44	C	5x5.3	1000
33	AVE336M16D16T-F	5.3	0.2	10.05	63	D	6.3x5.3	1000
47	AVE476M16D16T-F	7.5	0.2	7.05	75	D	6.3x5.3	1000
68	AVE686M16D16T-F	10.9	0.2	4.88	103	D	6.3x5.3	1000
100	AVE107M16X16T-F	16.0	0.2	3.32	108	X	6.3x7.7	1000
100	AVE107M16E16T-F	16.0	0.2	3.32	155	E	8x6.5	1000
220	AVE227M16X16T-F	35.2	0.2	1.51	124	X	6.3x7.7	1000
220	AVE227M16F24T-F	35.2	0.2	1.51	252	F	8x10	500
330	AVE337M16F24T-F	52.8	0.2	1.00	252	F	8x10	500
470	AVE477M16G24T-F	75.2	0.2	0.71	458	G	10x10	500
<b>25 Vdc ( 31 Vdc Surge )</b>								
4.7	AVE475M25B12T-F	3.0	0.14	49.38	19	B	4x5.3	2000
10	AVE106M25C12T-F	3.0	0.14	23.21	32	C	5x5.3	1000
22	AVE226M25D16T-F	5.5	0.14	10.55	55	D	6.3x5.3	1000
33	AVE336M25D16T-F	8.3	0.14	7.03	67	D	6.3x5.3	1000
47	AVE476M25X16T-F	11.8	0.14	4.94	98	X	6.3x7.7	1000
47	AVE476M25E16T-F	11.8	0.14	4.94	155	E	8x6.5	1000
68	AVE686M25X16T-F	17.0	0.14	3.41	109	X	6.3x7.7	1000
68	AVE686M25E16T-F	17.0	0.14	3.41	155	E	8x6.5	1000
100	AVE107M25X16T-F	25.0	0.14	2.32	124	X	6.3x7.7	1000
100	AVE107M25E16T-F	25.0	0.14	2.32	155	E	8x6.5	1000
220	AVE227M25F24T-F	55.0	0.14	1.06	252	F	8x10	500
330	AVE337M25G24T-F	82.5	0.14	0.70	458	G	10x10	500
<b>35 Vdc ( 44 Vdc Surge )</b>								
3.3	AVE335M35A12T-F	3.0	0.12	60.28	8	A	3x5.3	2000
4.7	AVE475M35B12T-F	3.0	0.12	42.33	20	B	4x5.3	2000
10	AVE106M35C12T-F	3.5	0.12	19.89	34	C	5x5.3	1000
22	AVE226M35D16T-F	7.7	0.12	9.04	59	D	6.3x5.3	1000
33	AVE336M35X16T-F	11.6	0.12	6.03	85	X	6.3x7.7	1000
33	AVE336M35E16T-F	11.6	0.12	6.03	155	E	8x6.5	1000
47	AVE476M35X16T-F	16.5	0.12	4.23	98	X	6.3x7.7	1000
47	AVE476M35E16T-F	16.5	0.12	4.23	155	E	8x6.5	1000
68	AVE686M35X16T-F	23.8	0.12	2.93	109	X	6.3x7.7	1000
68	AVE686M35E16T-F	23.8	0.12	2.93	155	E	8x6.5	1000
100	AVE107M35F24T-F	35.0	0.12	1.99	252	F	8x10	500
220	AVE227M35G24T-F	77.0	0.12	0.90	458	G	10x10	500

# Type AVE $-40\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$ General Purpose SMT Capacitors

## Aluminum Electrolytic Capacitors for Filtering and Bypass

### Ratings

Cap ( $\mu\text{F}$ )	Catalog Part Number	Max. DCL 2 min. ( $\mu\text{A}$ )	Max. DF @120Hz/20 $^{\circ}\text{C}$ (%)	Max. E.S.R. @120Hz/20 $^{\circ}\text{C}$ ( $\Omega$ )	Max.	Case Code	Size D x L (mm)	Qty. Per Reel (Each)
					Ripple Current @120Hz/85 $^{\circ}\text{C}$ (mA)			
<b>50 Vdc ( 63 Vdc Surge )</b>								
.10	AVE104M50B12T-F	3.0	0.1	1657.83	3	B	4x5.3	2000
.22	AVE224M50B12T-F	3.0	0.1	753.56	5	B	4x5.3	2000
.33	AVE334M50B12T-F	3.0	0.1	502.37	6	B	4x5.3	2000
.47	AVE474M50B12T-F	3.0	0.1	352.73	7	B	4x5.3	2000
1	AVE105M50B12T-F	3.0	0.1	165.78	10	B	4x5.3	2000
2.2	AVE225M50B12T-F	3.0	0.1	75.36	15	B	4x5.3	2000
3.3	AVE335M50B12T-F	3.0	0.1	50.24	19	B	4x5.3	2000
4.7	AVE475M50C12T-F	3.0	0.1	35.27	26	C	5x5.3	1000
10	AVE106M50D16T-F	5.0	0.1	16.58	44	D	6.3x5.3	1000
22	AVE226M50X16T-F	11.0	0.1	7.54	65	X	6.3x7.7	1000
22	AVE226M50E16T-F	11.0	0.1	7.54	155	E	8x6.5	1000
33	AVE336M50X16T-F	16.5	0.1	5.02	82	X	6.3x7.7	1000
33	AVE336M50E16T-F	16.5	0.1	5.02	155	E	8x6.5	1000
47	AVE476M50X16T-F	23.5	0.1	3.53	98	X	6.3x7.7	1000
47	AVE476M50F24T-F	23.5	0.1	3.53	252	F	8x10	500
68	AVE686M50F24T-F	34.0	0.1	2.44	252	F	8x10	500
100	AVE107M50F24T-F	50.0	0.1	1.66	252	F	8x10	500
220	AVE227M50G24T-F	110.0	0.1	0.75	458	G	10x10	500
<b>63 Vdc ( 75 Vdc Surge )</b>								
10	AVE106M63E16T-F	6.3	0.1	16.58	75	E	8x6.5	1000
22	AVE226M63F24T-F	13.9	0.1	7.54	139	F	8x10	500
33	AVE336M63F24T-F	20.8	0.1	5.02	139	F	8x10	500
47	AVE476M63G24T-F	29.6	0.1	3.53	226	G	10x10	500
68	AVE686M63G24T-F	42.8	0.1	2.44	226	G	10x10	500
100	AVE107M63G24T-F	63.0	0.1	1.66	226	G	10x10	500
<b>100 Vdc ( 125 Vdc Surge )</b>								
10	AVE106M2AF24T-F	10	0.1	16.58	94	F	8x10	500
22	AVE226M2AG24T-F	22	0.1	7.54	189	G	10x10	500
33	AVE336M2AG24T-F	33	0.1	5.02	189	G	10x10	500