

Type AVES -55°C to $+105^{\circ}\text{C}$

Low Profile SMT Aluminum Electrolytic Capacitors

For Filtering, Bypassing and Power Supply Decoupling



Type AVES Capacitors are rated for 1000 hours at 105°C with low impedance characteristics. They are ideal for high density PC board packaging. The Type AVES 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 AVES is RoHS compliant.

Highlights

- $+105^{\circ}\text{C}$, Up to 1000 Hours Load Life
- Capacitance Range: $0.1\text{ }\mu\text{F}$ to $100\text{ }\mu\text{F}$
- Voltage Range: 6.3 Vdc to 50 Vdc

Specifications

Operating Temperature: -55°C to $+105^{\circ}\text{C}$

Rated Voltage: 6.3, 10, 16, 25, 35, 50 Vdc

Capacitance: $0.1\mu\text{F}$ to $100\text{ }\mu\text{F}$

Capacitance Tolerance: $\pm20\%$ @ 120 Hz and $+20^{\circ}\text{C}$

Leakage Current: $I = 0.01\text{ CV}$ or $3\text{ }(\mu\text{A})$ whichever is greater after 2 minutes
 C = rated capacitance in μF , V = rated DC working voltage

Ripple Current Multiplier:

Vdc \ Freq. (Hz)	50, 60	120	1 k	10 k up
Under 16	0.8	1.00	1.15	1.25
25 ~ 35	0.8	1.00	1.25	1.40
50	0.8	1.00	1.35	1.50

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

Rated Voltage	6.3	10	16	25	35	50
$\text{Tan } \delta$ Max	0.30	0.26	0.22	0.16	0.13	0.12

Low Temperature Characteristic (at 120 Hz):

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



Load Life Test:

Test Time	1,000 Hours						
Capacitance Change	Within $\pm20\%$ of initial value						
Dissipation Factor	Less than 200% of specified value						
Leakage Current	Within specified value						

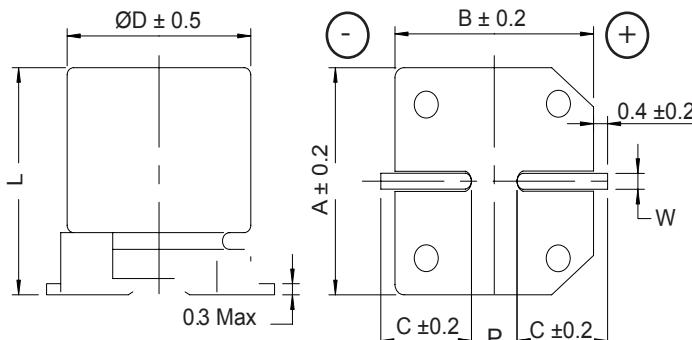
* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hrs at 105°C

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

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Outline Drawing, Case Code & Dimensions Table



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

Part Numbering System

AVES	106	M	16	B	12T	- F
Series	Capacitance	Capacitance	Voltage	Case	Packaging	RoHS
AVES	104 = $0.1 \mu\text{F}$	M	06 = 6.3 Vdc	B	12 = Carrier Tape	
	105 = $1.0 \mu\text{F}$	Tolerance	10 = 10 Vdc	B = B		
	106 = $10.0 \mu\text{F}$	M = $\pm 20\%$	16 = 16 Vdc			Width (mm)
	107 = $100.0 \mu\text{F}$		25 = 25 Vdc			T = Tape & Reel
	108 = $1000.0 \mu\text{F}$		50 = 50 Vdc			

Ratings

Cap (µF)	Catalog Part Number	Max DCL 2 min.	Max DF 120 Hz 20 °C	Max ESR 120 Hz 20 °C (ohms)	Max Ripple Current 120 Hz 105 °C (mA)	Case Code	Size D x L (mm)	Quantity per Reel (each)
6.3 Vdc (8 Vdc Surge)								
22	AVES226M06B12T-F	3.0	0.30	22.6	21	B	4 x 5.3	2000
33	AVES336M06C12T-F	3.0	0.30	15.1	30	C	5 x 5.3	1000
47	AVES476M06C12T-F	3.0	0.30	10.6	46	C	5 x 5.3	1000
100	AVES107M06D16T-F	6.3	0.30	5.0	61	D	6.3 x 5.3	1000
10 Vdc (13 Vdc Surge)								
10	AVES106M10B12T-F	3.0	0.26	43.1	15	B	4 x 5.3	2000
22	AVES226M10C12T-F	3.0	0.26	19.6	25	C	5 x 5.3	1000
33	AVES336M10C12T-F	3.3	0.26	13.1	31	C	5 x 5.3	1000
47	AVES476M10D16T-F	4.7	0.26	9.2	43	D	6.3 x 5.3	1000
100	AVES107M10D16T-F	10.0	0.26	4.3	65	D	6.3 x 5.3	1000

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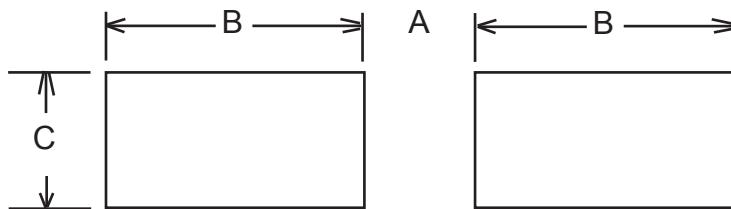
Cap (μF)	Catalog Part Number	Max DCL 2 min. (μA)	Max DF 120 Hz 20 $^{\circ}\text{C}$	Max ESR 120 Hz 20 $^{\circ}\text{C}$ (ohms)	Max Ripple Current 120 Hz 105 $^{\circ}\text{C}$ (mA)	Size D x L (mm)	Quantity per Reel (each)
16 Vdc (20 Vdc Surge)							
10	AVES106M16B12T-F	3.0	0.22	36.5	16	4 x 5.3	2000
22	AVES226M16C12T-F	3.5	0.22	16.6	28	5 x 5.3	1000
33	AVES336M16D16T-F	5.3	0.22	11.1	40	6.3 x 5.3	1000
47	AVES476M16D16T-F	7.5	0.22	7.8	47	6.3 x 5.3	1000
100	AVES107M16D16T-F	16.0	0.22	3.6	70	6.3 x 5.3	1000
25 Vdc (31 Vdc Surge)							
4.7	AVES475M25B12T-F	3.0	0.16	56.4	12	4 x 5.3	2000
10	AVES106M25C12T-F	3.0	0.16	26.5	21	5 x 5.3	1000
22	AVES226M25D16T-F	5.5	0.16	12.1	36	6.3 x 5.3	1000
33	AVES336M25D16T-F	8.3	0.16	8.0	44	6.3 x 5.3	1000
47	AVES476M25D16T-F	11.8	0.16	5.6	60	6.3 x 5.3	1000
35 Vdc (44 Vdc Surge)							
4.7	AVES475M35B12T-F	3.0	0.13	45.9	14	4 x 5.3	2000
10.0	AVES106M35C12T-F	3.5	0.13	21.6	23	5 x 5.3	1000
22.0	AVES226M35D16T-F	7.7	0.13	9.8	50	6.3 x 5.3	1000
50 Vdc (63 Vdc Surge)							
.10	AVES104M50B12T-F*	3.0	0.12	1989.4	2	4 x 5.3	2000
.22	AVES224M50B12T-F*	3.0	0.12	904.3	3	4 x 5.3	2000
.33	AVES334M50B12T-F*	3.0	0.12	602.8	4	4 x 5.3	2000
.47	AVES474M50B12T-F*	3.0	0.12	423.3	5	4 x 5.3	2000
1.0	AVES105M50B12T-F	3.0	0.12	198.9	7	4 x 5.3	2000
2.2	AVES225M50B12T-F	3.0	0.12	90.4	10	4 x 5.3	2000
3.3	AVES335M50B12T-F	3.0	0.12	60.3	12	4 x 5.3	2000
4.7	AVES475M50C12T-F	3.0	0.12	42.3	17	5 x 5.3	1000
10.0	AVES106M50D16T-F	5.0	0.12	19.9	26	6.3 x 5.3	1000
22.0	AVES226M50D16T-F	11.0	0.12	9.0	51	6.3 x 5.3	1000

*denotes discontinued part number

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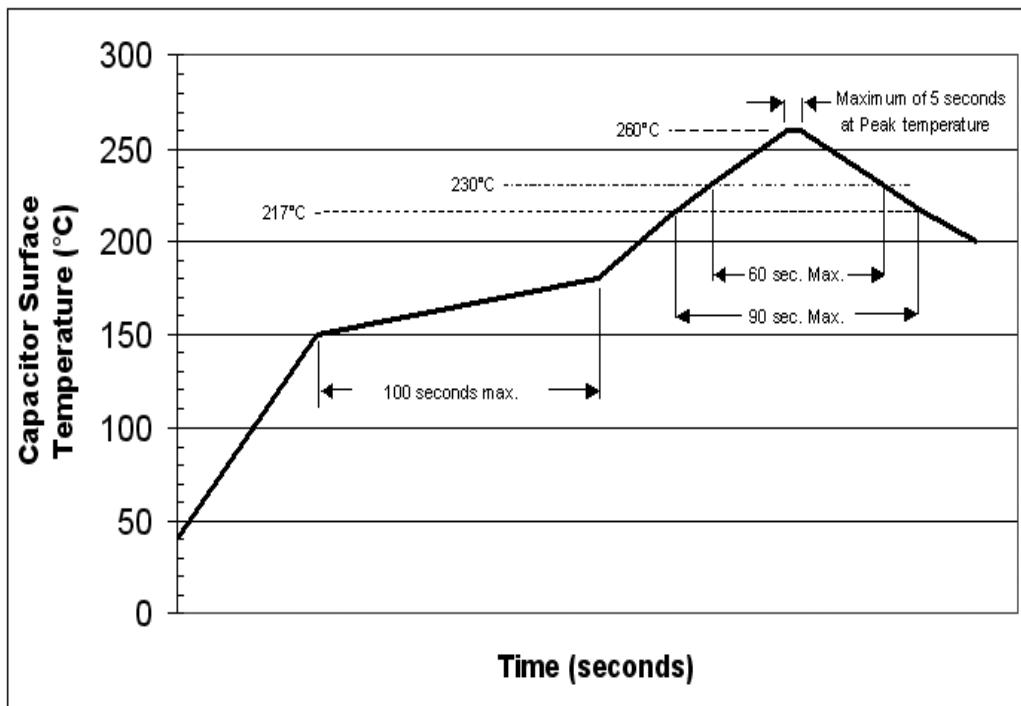
Recommended Land Patterns by case size for AVES series



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

Recommended Soldering Methods

Recommended Reflow Soldering Profile:



Parts should be subjected to just one reflow soldering process.

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

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