Type AFC, -55°C to 105°C

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Low Impedance and Long-Life for Filtering, Bypassing, Power Supply Decoupling

Type AFC Capacitors are the choice for high-frequency filtering. At 100 kHz, most ratings can handle more than twice the ripple current of type AHA. With solid performance at temperatures down to -55°C, Type AFC has more than 90% capacitance retention at -20°C and 1 kHz. Type AFC large can capacitors expand the AFC product line from 1500 to 6800 µF and from 50 to 100 Vdc. With low impedance to beyond 100 kHz, it is ideal for higher power DC/DC converters. The vertical cylindrical cases make for easy automatic mounting and reflow soldering, and offer big savings and higher capacitance compared to tantalum capacitors.

Highlights

- +105°C, Up to 5000 Hour Load Life
- Capacitance Range: 1 µF to 6800 µF
- Voltage Range: 6.3 Vdc to 100 Vdc

Specifications

Operating Temperature: -55°C to +105°C, 4 - 10 mm / -40°C to +105°C, 12.5 - 18 mm
Rated Voltage: 6.3, 10, 16, 25, 50, 63 & 100 Vdc
Capacitance: 1.0 µF to 6800 µF
Capacitance Tolerance: ±20% @ 120 Hz and +20°C
Leakage Current: 0.01 CV or 3 µA @ +20°C, after two minutes (whichever is greater)
Ripple Current Multiplier: **Frequency**

50/60 Hz	120 Hz	1 kHz	10 kHz	100 kHz
0.7	0.75	0.9	0.95	1.0

Dissipation Factor: See Ratings Table

Load Life: 1000 h @ +105°C, 4 - 10 mm
5000 h @ +105°C, 12.5 - 18 mm
Δ Capacitance ± 20%
DF: ≤200% of limit
DCL: ≤100% of limit

Shelf Life: 1000 h @ +105°C
Δ Capacitance ± 20%
DF: ≤200% of limit
DCL: ≤100% of limit

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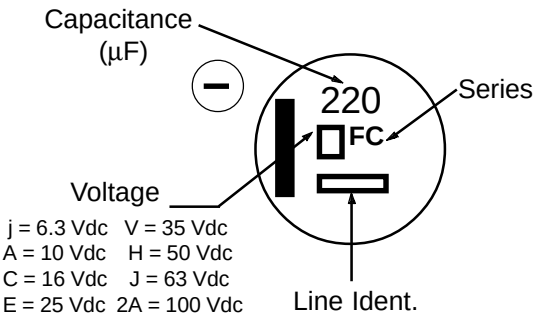
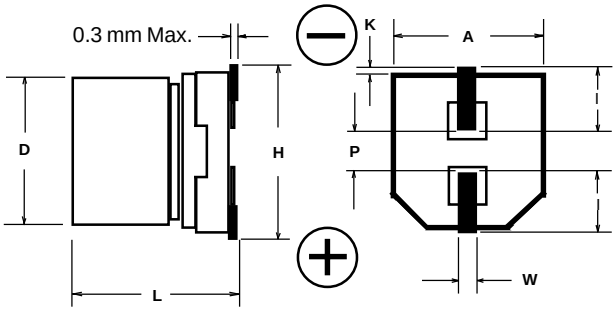
Type AFC, -55°C to 105°C

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

AFC Series Marking



Outline Drawing



Case Dimensions

Case Code	D ± 0.5	L	A ± 0.2	H (max)	I (ref)	W	P (ref)	K
B	4.0	5.4 +.1,-.2	4.3	5.5	1.8	0.65 ± 0.1	1.0	0.35 + 0.15/-0.20
C	5.0	5.4 +.1,-.2	5.3	6.5	2.2	0.65 ± 0.1	1.5	0.35 + 0.15/-0.20
D	6.3	5.4 +.1,-.2	6.6	7.8	2.4	0.65 ± 0.1	1.8	0.35 + 0.15/-0.20
E	8.0	6.2 ±.3	8.3	9.5	3.4	0.65 ± 0.1	2.2	0.35 + 0.15/-0.20
F	8.0	10.2 ±.3	8.3	10	3.4	0.90 ± 0.2	3.2	0.70 ± 0.20
G	10.0	10.2 ±.3	10.3	12	3.5	0.90 ± 0.2	4.6	0.70 ± 0.20
L	12.5	16.5 ± .5	13.5	15.0	4.7	0.90 ± 0.3	4.4	0.70 ± 0.3
P	16.0	16.5 ± .5	17.0	19.0	5.5	1.2 ± 0.3	6.7	0.70 ± 0.3
R	18.0	16.5 ± .5	17.0	19.0	5.5	1.2 ± 0.3	6.7	0.70 ± 0.3
S	18.0	21.5 ± .5	19.0	21.0	6.5	1.2 ± 0.3	6.7	0.70 ± 0.3

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Type AFC, -55°C to 105°C

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Ratings Table

Cap µF	Catalog Number	Max. DCL (µA/2 min)	Max. Dissipation Factor @ 120 Hz 20 °C	Max. ESR @ 120 Hz 20 °C (Ω)	Impedance @ 100 kHz 20 °C (Ω)	Max. Ripple Current @ 105°C 100 kHz (mA)	Case Code	Size (mm) D x L	Quantity per Reel
6.3 Vdc (8 Vdc Surge)									
22	AFC226M06B12T	3.0	0.26	19.6	3.0	60	B	4x5.4	2000
47	AFC476M06C12T	3.0	0.26	9.2	1.8	95	C	5x5.4	1000
100	AFC107M06D16T	6.3	0.26	4.3	1.0	140	D	6.3x5.4	1000
220	AFC227M06E16T	13.9	0.26	2.0	0.4	230	E	8x6.2	1000
330	AFC337M06F24T	20.8	0.26	1.3	0.3	450	F	8x10.2	500
1000	AFC108M06G24T	63.0	0.26	0.43	0.15	670	G	10x10.2	500
1500	AFC158M06G24T	94.5	0.26	0.29	0.15	670	G	10x10.2	500
2200	AFC228M06P44T	139	0.24	0.18	0.043	1690	P	16x16.5	125
3300	AFC338M06R44T	208	0.26	0.13	0.038	2000	R	18x16.5	125
4700	AFC478M06S44T	296	0.28	0.10	0.028	2205	S	18x21.5	75
6800	AFC688M06S44T	428	0.32	0.08	0.028	2490	S	18x21.5	75
10 Vdc (13 Vdc Surge)									
33	AFC336M10C12T	3.3	0.19	9.6	1.8	95	C	5x5.4	1000
100	AFC107M10E16T	10.0	0.19	3.2	0.4	230	E	8x6.2	1000
150	AFC157M10E16T	15.0	0.19	2.1	0.4	230	E	8x6.2	1000
220	AFC227M10F24T	22.0	0.19	1.4	0.3	450	F	8x10.2	500
470	AFC477M10G24T	47.0	0.19	0.67	0.15	670	G	10x10.2	500
1000	AFC108M10G24T	100.0	0.22	0.36	0.15	670	G	10x10.2	500
1000	AFC108M10L32T	100	0.19	0.31	0.065	1205	L	12.5x16.5	150
2200	AFC228M10P44T	220	0.21	0.16	0.043	1690	P	16x16.5	125
3300	AFC338M10R44T	330	0.23	0.12	0.038	2000	R	18x16.5	125
4700	AFC478M10S44T	470	0.25	0.09	0.028	2490	S	18x21.5	75
6800	AFC688M10S44T	680	0.29	0.07	0.028	2490	S	18x21.5	75
16 Vdc (20 Vdc Surge)									
10	AFC106M16B12T	3.0	0.16	26.5	3.0	60	B	4x5.4	2000
22	AFC226M16C12T	3.5	0.16	12.1	1.8	95	C	5x5.4	1000
47	AFC476M16D16T	7.5	0.16	5.7	1.0	140	D	6.3x5.4	1000
68	AFC686M16E16T	10.9	0.16	3.9	0.4	230	E	8x6.2	1000
100	AFC107M16E16T	16.0	0.16	2.7	0.4	230	E	8x6.2	1000
220	AFC227M16G24T	35.2	0.16	1.2	0.15	670	G	10x10.2	500
330	AFC337M16G24T	52.8	0.16	0.8	0.15	670	G	10x10.2	500
470	AFC477M16G24T	75.2	0.16	0.6	0.15	670	G	10x10.2	500
680	AFC687M16G24T	108.8	0.16	0.4	0.15	670	G	10x10.2	500
1000	AFC108M16P44T	160	0.16	0.27	0.043	1690	P	16x16.5	125
2200	AFC228M16R44T	352	0.18	0.14	0.038	2000	R	18x16.5	125
3300	AFC338M16S44T	528	0.20	0.10	0.028	2490	S	18x21.5	75
25 Vdc (31 Vdc Surge)									
6.8	AFC685M25B12T	3.0	0.14	34.1	3.0	60	B	4x5.4	2000
22	AFC226M25D16T	5.5	0.14	10.6	1.0	140	D	6.3x5.4	1000
33	AFC336M25D16T	8.3	0.14	7.0	1.0	140	D	6.3x5.4	1000
47	AFC476M25E16T	11.8	0.14	4.9	0.4	230	E	8x6.2	1000
68	AFC686M25F24T	17.0	0.14	3.4	0.3	450	F	8x10.2	500
100	AFC107M25F24T	25.0	0.14	2.3	0.3	450	F	8x10.2	500
220	AFC227M25G24T	55.0	0.14	1.1	0.15	670	G	10x10.2	500
330	AFC337M25G24T	82.5	0.14	0.7	0.15	670	G	10x10.2	500
470	AFC477M25G24T	117.5	0.14	0.5	0.15	670	G	10x10.2	500
470	AFC477M25L32T	118	0.14	0.49	0.065	1205	L	12.5x16.5	150
1000	AFC108M25R44T	250	0.14	0.23	0.038	2000	R	18x16.5	125
2200	AFC228M25S44T	550	0.16	0.12	0.028	2490	S	18x21.5	75

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Type AFC, -55°C to 105°C

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Ratings Table

Cap µF	Catalog Number	Max. DCL (µA/2 min)	Max. Dissipation Factor @ 120 Hz 20 °C	Max. ESR @ 120 Hz 20 °C (Ω)	Impedance @ 100 kHz 20 °C (Ω)	Max. Ripple Current @ 105°C 100 kHz (mA)	Case Code	Size (mm) D x L	Quantity per Reel
35 Vdc (44 Vdc Surge)									
1	AFC105M35B12T	3.0	0.12	199	3.0	60	B	4x5.4	2000
2.2	AFC225M35B12T	3.0	0.12	90.4	3.0	60	B	4x5.4	2000
3.3	AFC335M35B12T	3.0	0.12	60.3	3.0	60	B	4x5.4	2000
4.7	AFC475M35B12T	3.0	0.12	42.4	3.0	60	B	4x5.4	2000
6.8	AFC685M35C12T	3.0	0.12	29.3	1.8	95	C	5x5.4	1000
10	AFC106M35C12T	3.5	0.12	19.9	1.8	95	C	5x5.4	1000
22	AFC226M35D16T	7.7	0.12	9.1	1.0	140	D	6.3x5.4	1000
33	AFC336M35E16T	11.6	0.12	6.0	0.4	230	E	8x6.2	1000
47	AFC476M35E16T	16.5	0.12	4.2	0.4	230	E	8x6.2	1000
100	AFC107M35G24T	35.0	0.12	2.0	0.2	670	G	10x10.2	500
220	AFC227M35G24T	77.0	0.12	0.9	0.15	670	G	10x10.2	500
330	AFC337M35G24T	115.5	0.12	0.6	0.15	670	G	10x10.2	500
330	AFC337M35L32T	116	0.12	0.60	0.065	1205	L	12.5x16.5	150
470	AFC477M35P44T	165	0.12	0.42	0.043	1690	P	16x16.5	125
1000	AFC108M35R44T	350	0.12	0.20	0.038	2000	R	18x16.5	125
2200	AFC228M35S44T	770	0.14	0.11	0.028	2490	S	18x21.5	75
50 Vdc (63 vdc Surge)									
1	AFC105M50B12T	3.0	0.12	199	5.0	30	B	4x5.4	2000
2.2	AFC225M50B12T	3.0	0.12	90.5	5.0	30	B	4x5.4	2000
3.3	AFC335M50B12T	3.0	0.12	60.3	5.0	30	B	4x5.4	2000
4.7	AFC475M50C12T	3.0	0.12	42.4	3.0	50	C	5x5.4	1000
10	AFC106M50D16T	5.0	0.12	19.9	2.0	70	D	6.3x5.4	1000
22	AFC226M50E16T	11.0	0.12	9.1	0.7	120	E	8x6.2	1000
33	AFC336M50F24T	16.5	0.12	6.0	0.6	300	F	8x10.2	500
47	AFC476M50G24T	23.5	0.12	4.2	0.3	500	G	10x10.2	500
100	AFC107M50G24T	50.0	0.12	2.0	0.3	500	G	10x10.2	500
220	AFC227M50G24T	110.0	0.12	0.9	0.3	500	G	10x10.2	500
220	AFC227M50L32T	110	0.10	0.75	0.110	1150	L	12.5x16.5	150
330	AFC337M50P44T	165	0.10	0.50	0.080	1610	P	16x16.5	125
470	AFC477M50R44T	235	0.10	0.35	0.680	1900	R	18x16.5	125
1000	AFC108M50S44T	500	0.10	0.17	0.420	2420	S	18x21.5	75
63 Vdc (75 Vdc Surge)									
68	AFC686M63L32T	43	0.08	1.95	0.150	1020	L	12.5x16.5	150
100	AFC107M63L32T	63	0.08	1.33	0.150	1020	L	12.5x16.5	150
220	AFC227M63P44T	139	0.08	0.60	0.090	1410	P	16x16.5	125
330	AFC337M63R44T	208	0.08	0.40	0.086	1690	R	18x16.5	125
470	AFC477M63S44T	296	0.08	0.28	0.055	2290	S	18x21.5	75
100 Vdc (125 Vdc Surge)									
47	AFC476M2AL32T	47	0.07	2.47	0.300	511	L	12.5x16.5	150
68	AFC686M2AL32T	68	0.07	1.71	0.300	511	L	12.5x16.5	150
100	AFC107M2AP44T	100	0.07	1.16	0.180	793	P	16x16.5	125
220	AFC227M2AR44T	220	0.07	0.53	0.155	917	R	18x16.5	125
330	AFC337M2AS44T	330	0.07	0.35	0.083	1230	S	18x21.5	75

Part Numbering System

AFC — **Type**

106 — **Capacitance**

105 = 1.0 µF
106 = 10 µF
107 = 100 µF
108 = 1000 µF

M — **Capacitance Tolerance**

M = ±20%

16 — **Voltage**

10 = 10 Vdc **50** = 50 Vdc
16 = 16 Vdc **63** = 63 Vdc
25 = 25 Vdc **2A** = 100 Vdc
35 = 35 Vdc

B — **Case Code**

12T — **Packaging Information**

12 = Carrier Tape Width (mm)
T = Tape & Reel
B = Bulk

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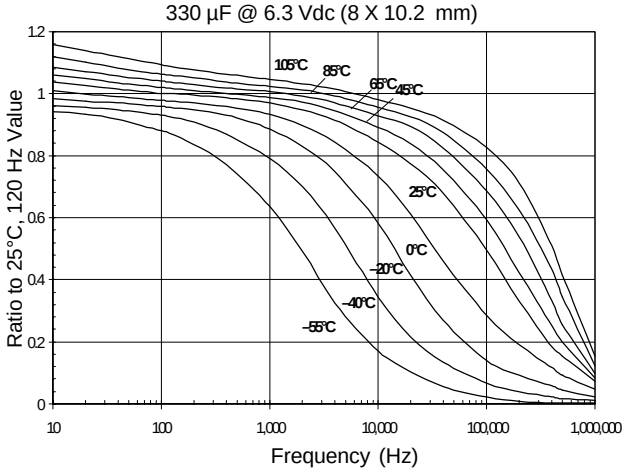
Type AFC, -55°C to 105°C

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Typical Performance Curves

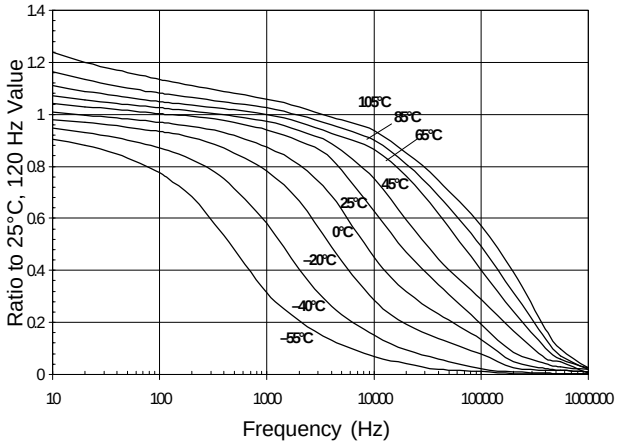
Capacitance vs. Temperature & Frequency

330 µF @ 6.3 Vdc (8 X 10.2 mm)



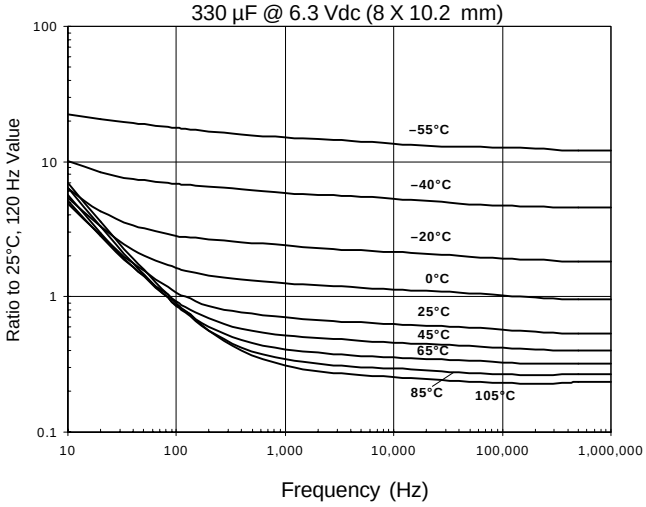
Capacitance vs. Temperature & Frequency

1500 µF @ 6.3 Vdc (10 X 10.2 mm)



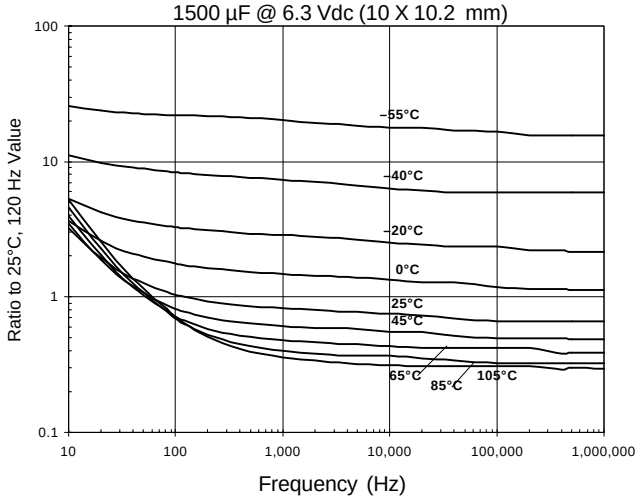
ESR vs. Temperature and Frequency

330 µF @ 6.3 Vdc (8 X 10.2 mm)



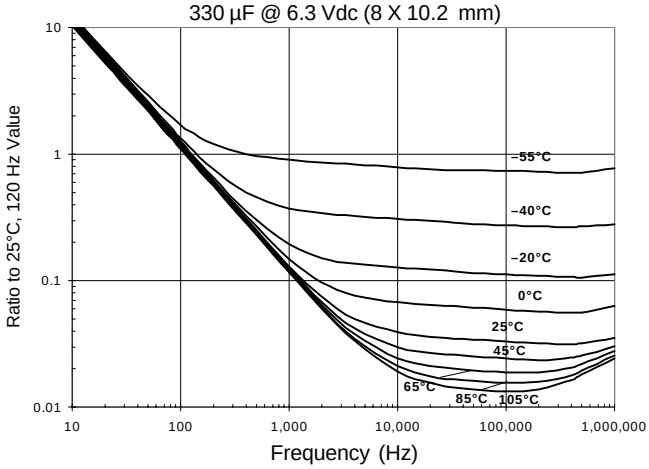
ESR vs. Temperature and Frequency

1500 µF @ 6.3 Vdc (10 X 10.2 mm)



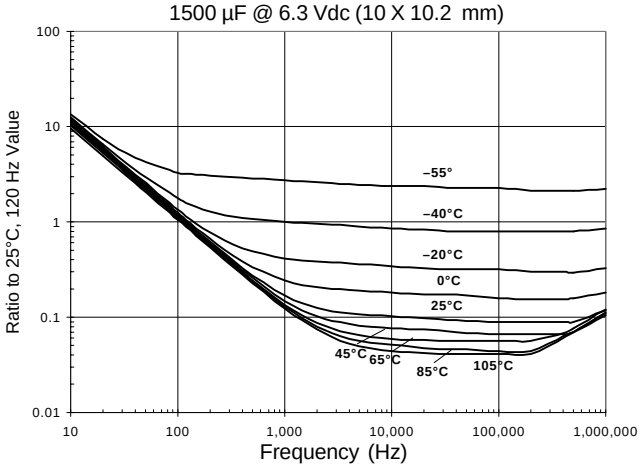
Impedance vs. Temperature and Frequency

330 µF @ 6.3 Vdc (8 X 10.2 mm)



Impedance vs. Temperature and Frequency

1500 µF @ 6.3 Vdc (10 X 10.2 mm)



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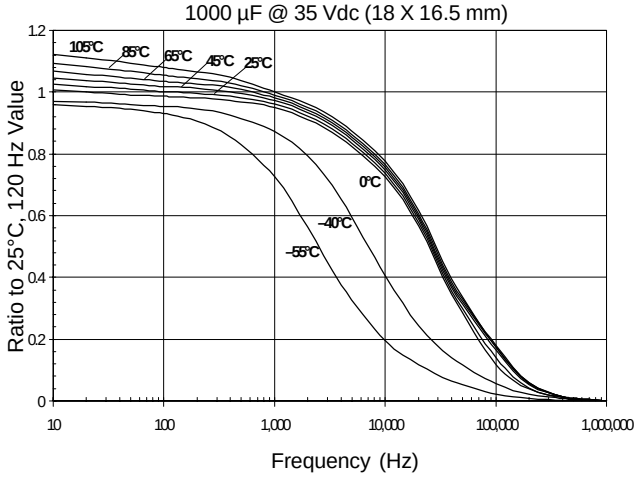
Type AFC

SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Typical Performance Curves

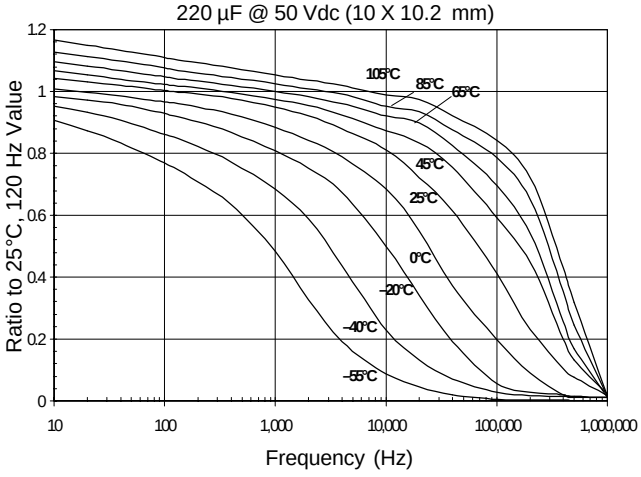
Capacitance vs. Temperature and Frequency

1000 µF @ 35 Vdc (18 X 16.5 mm)



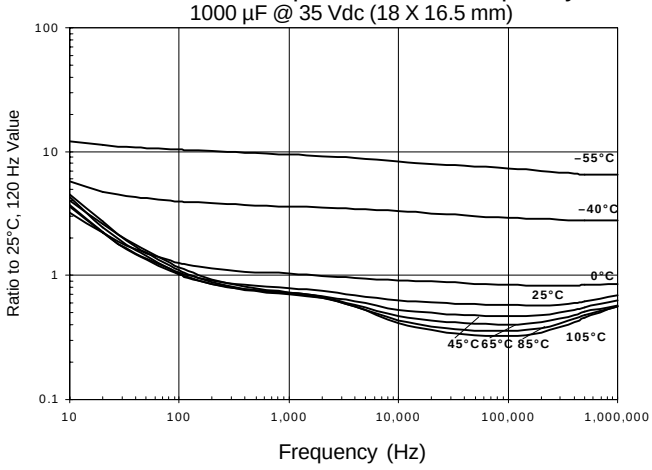
Capacitance vs. Temperature & Frequency

220 µF @ 50 Vdc (10 X 10.2 mm)



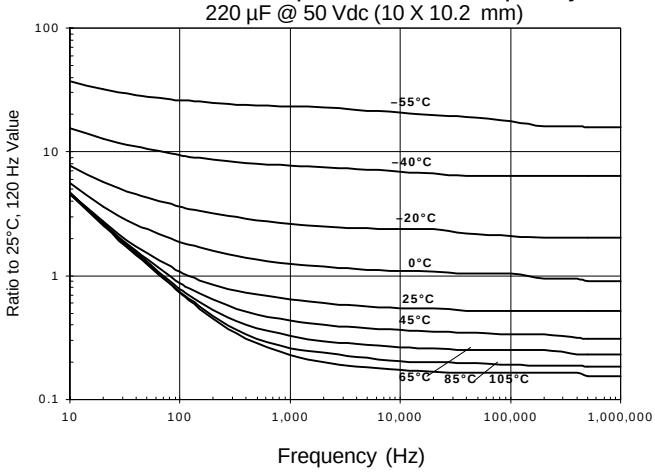
ESR vs. Temperature and Frequency

1000 µF @ 35 Vdc (18 X 16.5 mm)



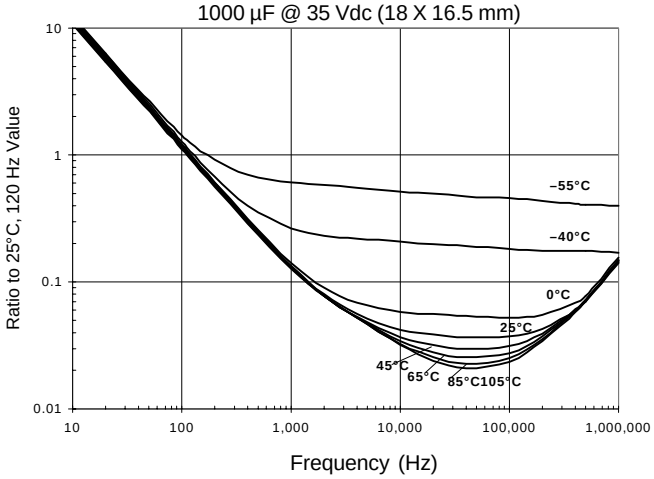
ESR vs. Temperature and Frequency

220 µF @ 50 Vdc (10 X 10.2 mm)



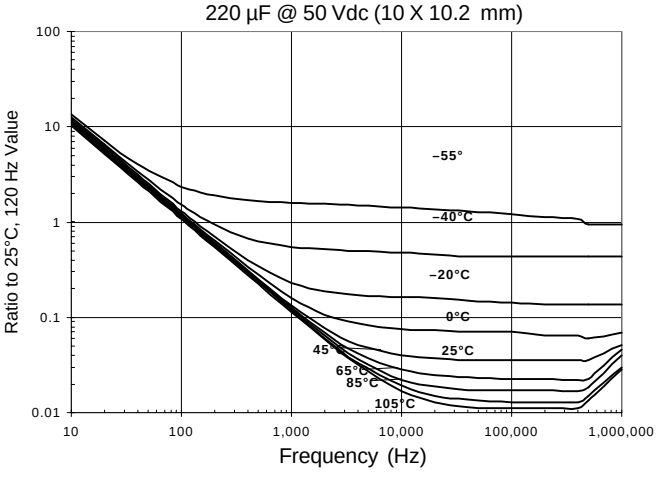
Impedance vs. Temperature and Frequency

1000 µF @ 35 Vdc (18 X 16.5 mm)



Impedance vs. Temperature and Frequency

220 µF @ 50 Vdc (10 X 10.2 mm)



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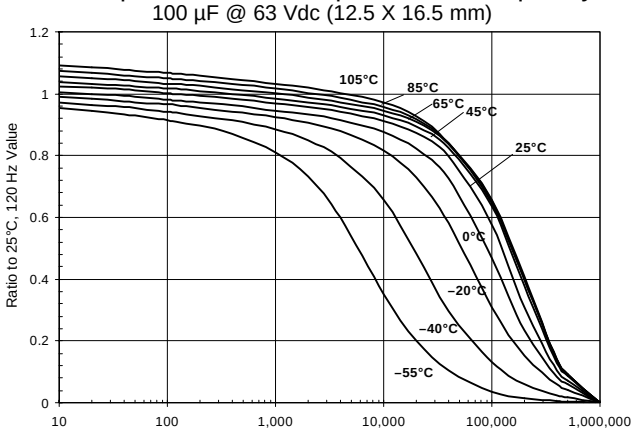
Your Source For Capacitor Solutions

Type AFC

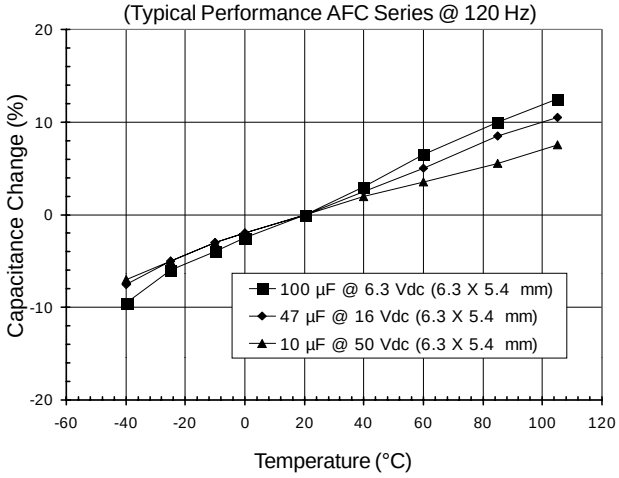
SMT Aluminum Electrolytic Capacitors - Low Impedance, 105°C

Typical Performance Curves

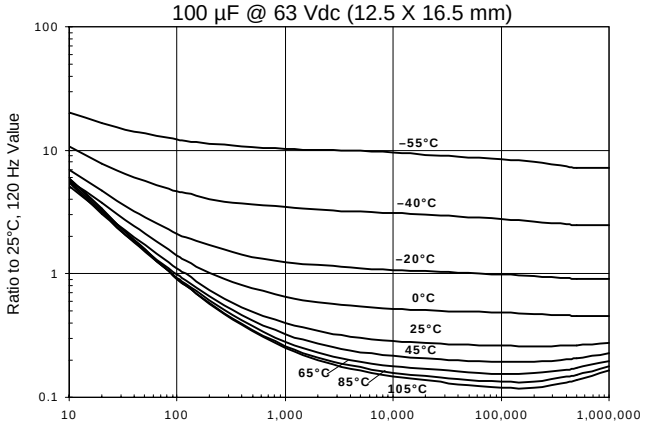
Capacitance vs. Temperature & Frequency
100 µF @ 63 Vdc (12.5 X 16.5 mm)



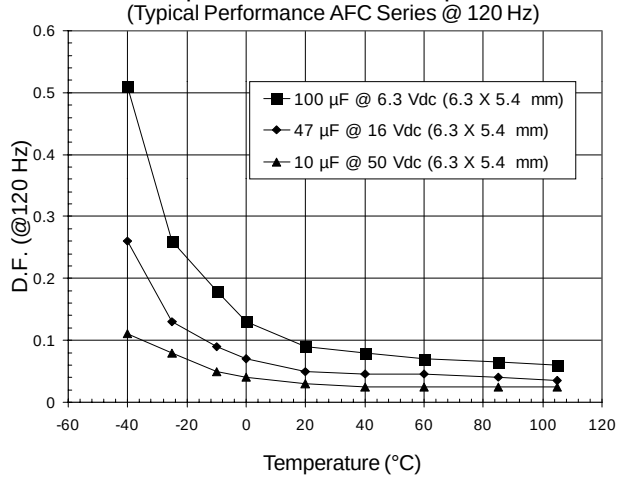
Capacitance Change with Temperature
(Typical Performance AFC Series @ 120 Hz)



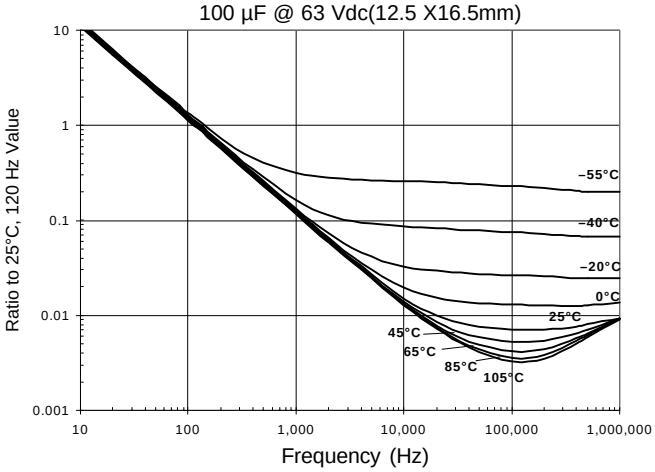
ESR vs. Temperature and Frequency
100 µF @ 63 Vdc (12.5 X 16.5 mm)



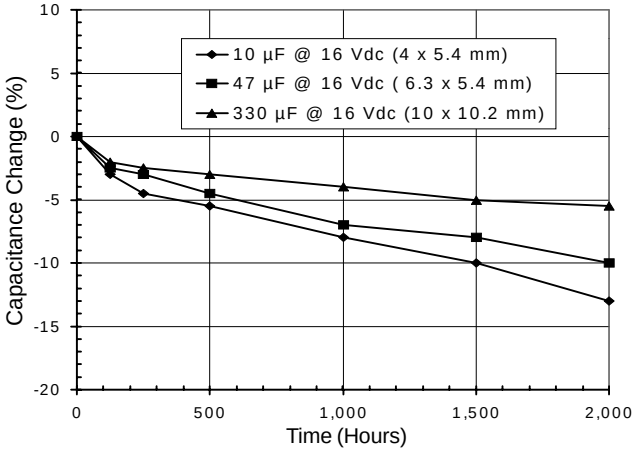
Dissipation Factor vs. Temperature
(Typical Performance AFC Series @ 120 Hz)



Impedance vs. Temperature and Frequency
100 µF @ 63 Vdc(12.5 X16.5mm)



Capacitance Change vs Time



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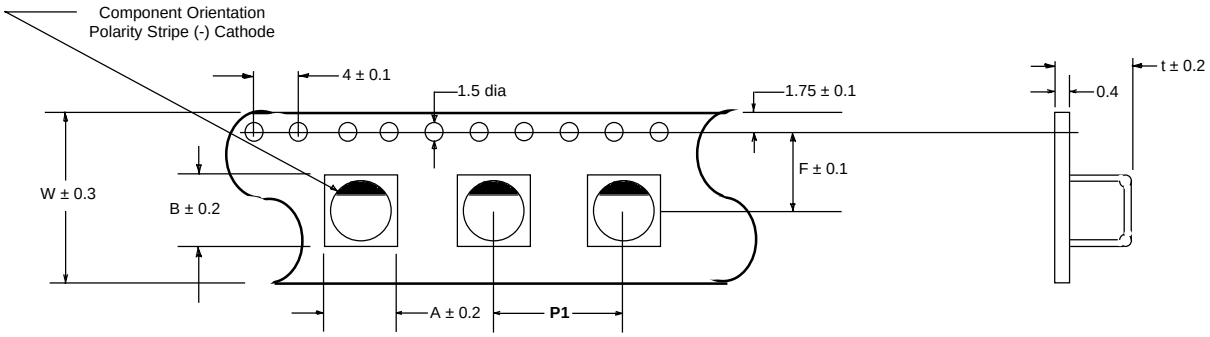
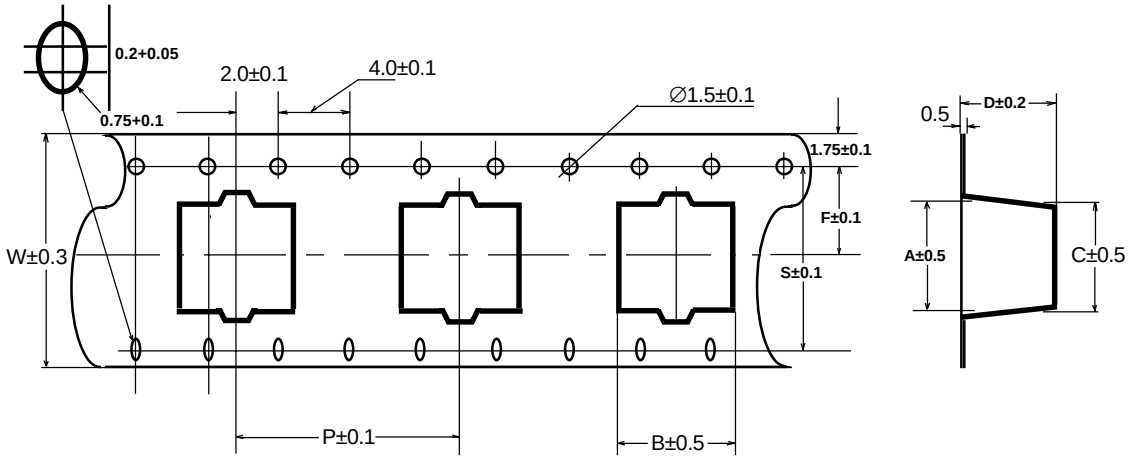
Type AVS, AHA, AFC, AFK, AHD Tape and Reel Specifications

Tape Specifications



Case Code	W	A	B	P1	F	t
A	12.0	3.4	3.5	8.0	5.5	5.8
B	12.0	4.7	4.6	8.0	5.5	5.8
C	12.0	6.0	6.0	12.0	5.5	5.8
D	16.0	7.0	7.0	12.0	7.5	5.8
X	16.0	7.0	7.0	12.0	7.5	8.4
E	16.0	8.7	8.7	12.0	7.5	6.8
F	24.0	8.7	8.7	16.0	11.5	11.0
G	24.0	10.7	10.7	16.0	11.5	11.0



Case Code	W	A	B	C	D	F	P	S
H	32.0	14.0	14.0	18.0	14.5	14.2	24.0	28.4
L	32.0	14.0	14.0	18.0	17.5	14.2	24.0	28.4
P	44.0	17.5	17.5	23.0	17.5	20.2	28.0	40.4
R	44.0	19.5	19.5	26.0	17.5	20.2	32.0	40.4
S	44.0	19.5	19.5	26.0	22.5	20.2	32.0	40.4

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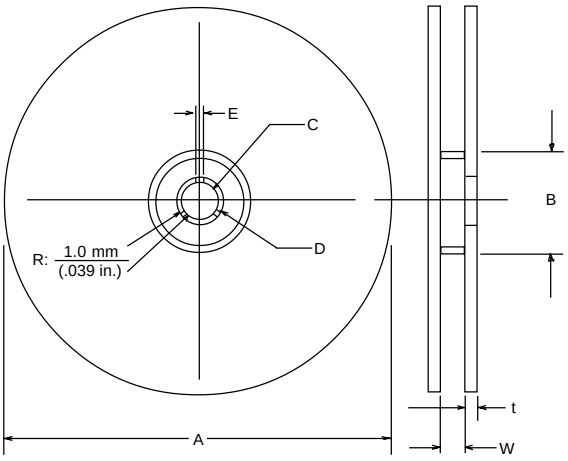
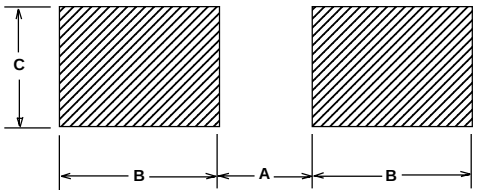
Reel Specifications



Case Code	A	B	C	D	E	W	t
A, B size	380±2	50 min	13.0±0.5	21.0±0.8	2.0±0.5	14±1	3.0
C, D, E, X size	380±2	50 min	13.0±0.5	21.0±0.8	2.0±0.5	18±1	3.0
F, G size	380±2	50 min	13.0±0.5	21.0±0.8	2.0±0.5	26±1	3.0
J, K, H, L size	330±2	50 min	13.0±0.5	21.0±0.8	2.0±0.5	34±1	3.0
P, R, S, U size	330±2	50 min	13.0±0.5	21.0±0.8	2.0±0.5	46±1	3.0

Land Pattern:



Case Code	A	B	C
A	0.6	2.2	1.5
B	1.0	2.5	1.6
C	1.5	2.8	1.6
D	2.2	3.0	1.6
E	2.2	4.5	1.6
F	3.2	4.0	2.0
G	4.6	4.3	2.0
J, K	4	4.5	2.0
H	4.0	5.7	2.0
L	4.0	5.7	2.0
P	6.0	6.5	2.5
R, U	6.0	6.5	2.5
S	6.0	7.5	2.5

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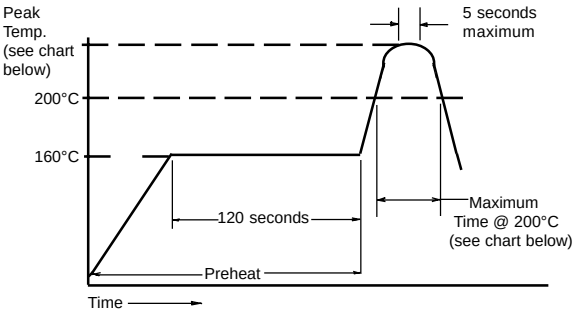
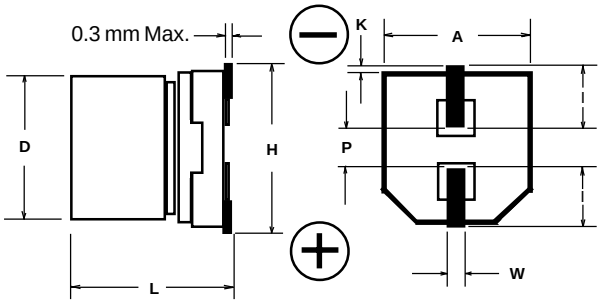
Type AVS, AHA, AFC, AFK, AHD Reflow Solder & Case Dimensions

Reflow Soldering Temperature Profile:



Case Code	Peak Temp (°C)	Max. Time @ 200°C (Sec.)
A, B, C, D, X	240	40
E, F, G, H J, K, L, P R, S, U	230	30

Outline Drawing



Case Dimensions

(mm)

Case Code	D ± 0.5	L	A ± 0.2	H (max)	I (ref)	W	P (ref)	K
A	3.0	5.4 +.1,-.2	3.3	4.5	1.5	0.55 ± 0.1	0.6	0.35 + 0.15/-0.20
B	4.0	5.4 +.1,-.2	4.3	5.5	1.8	0.65 ± 0.1	1.0	0.35 + 0.15/-0.20
C	5.0	5.4 +.1,-.2	5.3	6.5	2.2	0.65 ± 0.1	1.5	0.35 + 0.15/-0.20
D	6.3	5.4 +.1,-.2	6.6	7.8	2.4	0.65 ± 0.1	1.8	0.35 + 0.15/-0.20
X	6.3	7.9 ±.3	6.6	7.8	2.6	0.65 ± 0.1	1.8	0.35 + 0.15/-0.20
E	8.0	6.2 ±.3	8.3	9.5	3.4	0.65 ± 0.1	2.2	0.35 + 0.15/-0.20
F	8.0	10.2 ±.3	8.3	10	3.4	0.90 ± 0.2	3.2	0.70 ± 0.20
G	10.0	10.2 ±.3	10.3	13	3.5	0.90 ± 0.2	4.6	0.70 ± 0.20
H	12.5	13.5 ± .5	13.5	15	4.7	0.9 ±0.3	4.4	0.70 ± 0.30
J	10	13.5	10.3	12	3.5	0.9 ±0.2	4.6	0.70 ± 0.20
K	10	17.5	10.3	12	3.5	0.9 ±0.2	4.6	0.70 ± 0.20
L	12.5	16.5 ± .5	13.5	15.0	4.7	0.9±0.3	4.4	0.70 ± 0.30
P	16.0	16.5 ± .5	17.0	19.0	5.5	1.2±0.3	6.7	0.70 ± 0.30
R	18.0	16.5 ± .5	19.0	21.0	6.5	1.2±0.3	6.7	0.70 ± 0.30
S	18.0	21.5 ± .5	19.0	21.0	6.5	1.2±0.3	6.7	0.70 ± 0.30
U	16.0	21.5	17.0	19.0	6.7	1.2±0.3	6.7	0.70 ± 0.30

*5.8 +0.1,-0.2 for AFK and AHD Series

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