

Type AVRF $-55\text{ }^{\circ}\text{C}$ to $105\text{ }^{\circ}\text{C}$

SMT Aluminum Electrolytic Capacitors - Lowest E.S.R., $105\text{ }^{\circ}\text{C}$

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



Type AVRF Capacitors are the best and by a wide margin. With 40% to 60% lower impedance, 30% to 50% smaller case size and more than twice the life compared to low-ESR type AFC, the Type AVRF also excels at cold performance down to $-55\text{ }^{\circ}\text{C}$. In addition, this terrific low-impedance performance, approaching low-ESR tantalum capacitors, is at a significant cost savings compared to tantalum. 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.

Highlights

- $+105\text{ }^{\circ}\text{C}$, Up to 5000 Hour Load Life
- Ultra-low Impedance
- Voltage Range: 6.3 Vdc to 35 Vdc

Specifications

Operating Temperature: $-55\text{ }^{\circ}\text{C}$ to $+105\text{ }^{\circ}\text{C}$
Rated Voltage: 6.3, 10, 16, 25, 35 Vdc
Capacitance: 4.7 μF to 1500 μF
Capacitance Tolerance: $\pm 20\%$ @ 120 Hz and $+20\text{ }^{\circ}\text{C}$
Leakage Current: 0.01 CV or 3 μA @ $+20\text{ }^{\circ}\text{C}$, after two minutes (whichever is greater)



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).

Low Temperature Characteristics @ 120 Hz:

Rated Voltage (Vdc)		6.3	10	16	25	35
Impedance Ratio	Z($-25\text{ }^{\circ}\text{C}$)/Z($+20\text{ }^{\circ}\text{C}$)	2	2	2	2	2
	Z($-40\text{ }^{\circ}\text{C}$)/Z($+20\text{ }^{\circ}\text{C}$)	3	3	3	3	3
	Z($-55\text{ }^{\circ}\text{C}$)/Z($+20\text{ }^{\circ}\text{C}$)	4	4	4	3	3

Dissipation Factor:

6.3V	10 V	16 V	25 V	35 V
0.26	0.19	0.16	0.14	0.12

Life Test: 2000 h @ $105\text{ }^{\circ}\text{C}$, 4.0 — 6.3 mm dia.
5000 h @ $105\text{ }^{\circ}\text{C}$, 8.0 — 10.0 mm dia.
 Δ Capacitance $\pm 30\%$ (10 mm Dia.: $\pm 35\%$)
DF: $\leq 200\%$ of limit (10 mm Dia.: $\leq 300\%$)
DCL: $\leq 100\%$ of limit

Shelf Test: 1000 h @ $105\text{ }^{\circ}\text{C}$
 Δ Capacitance $\pm 30\%$ (10 mm Dia.: $\pm 35\%$)
DF: $\leq 200\%$ of limit (10 mm Dia.: $\leq 300\%$)
DCL: $\leq 100\%$ of limit

Part Numbering System

AVRF	106	M	16	B	12T	-F
Type	Capacitance	Capacitance Tolerance	Voltage Code	Case Code	Packaging Code	RoHS Compliant
AVRF	475 = 4.7 μF 106 = 10.0 μF 107 = 100.0 μF 108 = 1000.0 μF	M = $\pm 20\%$	06 = 6.3 Vdc 10 = 10 Vdc 16 = 16 Vdc	25 = 25 Vdc 35 = 35 Vdc	12 = Carrier tape Width (mm) T = Tape & Reel	Compliant

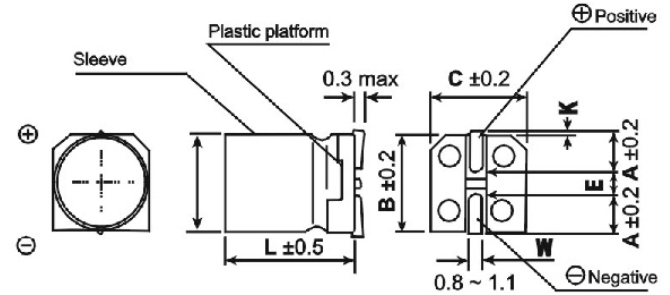
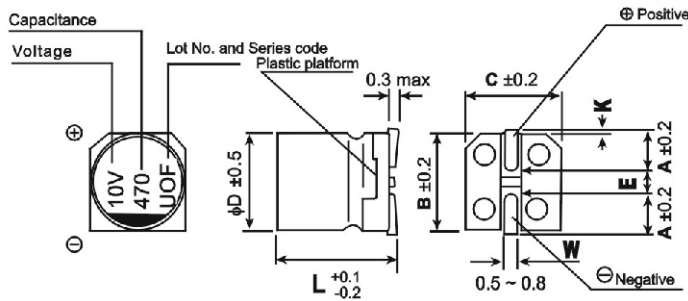
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Outline Drawing & Marking

(4.0 - 6.3 mm Dia.)

(8.0 - 10.0 mm Dia.)



Case Dimensions

Case Code	D ± 0.05 (mm)	L (mm)	B, C (mm)	A (ref)	W (mm)	E (ref)	K (mm)
B	4.0	5.4 ± 0.2	4.3	1.8	0.65 ± 0.1	1.0	0.35 +0.15/-0.20
C	5.0	5.4 ± 0.3	5.3	2.2	0.65 ± 0.1	1.5	0.35 +0.15/-0.20
D	6.3	5.4 ± 0.2	6.6	2.6	0.65 ± 0.1	1.8	0.35 +0.15/-0.20
F	8.0	10.2 ± 0.5	8.3	3.4	0.90 ± 0.2	3.1	0.70 ± 0.20
G	10.0	10.2 ± 0.5	10.3	3.5	0.90 ± 0.2	4.6	0.70 ± 0.20

Ratings

Cap. (μF)	Catalog Part Number	Max. DCL 2 min. (μA)	Max. DF @ 120Hz/20°C (%)	Max. E.S.R. @ 100kHz/20°C (Ω)	Max. Impedance @ 100kHz/20°C (Ω)	Max. Ripple Current @ 100kHz/105°C (mA)	Case Code	Size DxL (mm)	Quantity /Reel (Ea)
6.3 Vdc									
22	AVRF226M06B12T-F	3.0	0.26	1.65	1.65	70	B	4x5.4	2000
47	AVRF476M06B12T-F	3.0	0.26	1.65	1.65	70	B	4x5.4	2000
100	AVRF107M06C12T-F	6.3	0.26	0.90	0.90	100	C	5x5.4	1000
220	AVRF227M06D16T-F	13.9	0.26	0.50	0.50	160	D	6.3x5.4	1000
470	AVRF477M06F24T-F	29.6	0.26	0.16	0.16	600	F	8x10.2	500
1000	AVRF108M06F24T-F	63.0	0.26	0.16	0.16	600	F	8x10.2	500
1500	AVRF158M06G24T-F	94.5	0.26	0.08	0.08	850	G	10x10.2	500
10 Vdc									
22	AVRF226M10B12T-F	3.0	0.19	1.65	1.65	70	B	4x5.4	2000
33	AVRF336M10B12T-F	3.3	0.19	1.65	1.65	70	B	4x5.4	2000
150	AVRF157M10D16T-F	15.0	0.19	0.50	0.50	160	D	6.3x5.4	1000
330	AVRF337M10F24T-F	33.0	0.19	0.16	0.16	600	F	8x10.2	500
470	AVRF477M10F24T-F	47.0	0.19	0.16	0.16	600	F	8x10.2	500
1000	AVRF108M10G24T-F	100.0	0.19	0.08	0.08	850	G	10x10.2	500

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Cap. (μF)	Catalog Part Number	Max. DCL 2 min. (μA)	Max. DF @ 120Hz/20 $^{\circ}\text{C}$ (%)	Max. E.S.R. @ 100kHz/20 $^{\circ}\text{C}$ (Ω)	Max. Impedance @ 100kHz/20 $^{\circ}\text{C}$ (Ω)	Max. Ripple Current @ 100kHz/105 $^{\circ}\text{C}$ (mA)	Case Code	Size DxL (mm)	Quantity /Reel (Ea)
16 Vdc									
10	AVRF106M16B12T-F	3.0	0.16	1.65	1.65	70	B	4x5.4	2000
22	AVRF226M16B12T-F	3.5	0.16	1.65	1.65	70	B	4x5.4	2000
47	AVRF476M16C12T-F	7.5	0.16	0.90	0.90	100	C	5x5.4	1000
68	AVRF686M16D16T-F	10.9	0.16	0.50	0.50	160	D	6.3x5.4	1000
330	AVRF337M16F24T-F	52.8	0.16	0.16	0.16	600	F	8x10.2	500
470	AVRF477M16F24T-F	75.2	0.16	0.16	0.16	600	F	8x10.2	500
25 Vdc									
10	AVRF106M25B12T-F	3.0	0.14	1.65	1.65	70	B	4x5.4	2000
22	AVRF226M25C12T-F	5.5	0.14	0.90	0.90	100	C	5x5.4	1000
33	AVRF336M25D16T-F	8.3	0.14	0.50	0.50	160	D	6.3x5.4	1000
47	AVRF476M25D16T-F	11.8	0.14	0.50	0.50	160	D	6.3x5.4	1000
68	AVRF686M25D16T-F	17.0	0.14	0.50	0.50	160	D	6.3x5.4	1000
150	AVRF157M25F24T-F	37.5	0.14	0.16	0.16	600	F	8x10.2	500
220	AVRF227M25F24T-F	55.0	0.14	0.16	0.16	600	F	8x10.2	500
330	AVRF337M25F24T-F	82.5	0.14	0.16	0.16	600	F	8x10.2	500
470	AVRF477M25G24T-F	117.5	0.14	0.08	0.08	850	G	10x10.2	500
35 Vdc									
4.7	AVRF475M35B12T-F	3.0	0.12	1.65	1.65	70	B	4x5.4	2000
10	AVRF106M35C12T-F	3.5	0.12	0.90	0.90	100	C	5x5.4	1000
22	AVRF226M35D16T-F	7.7	0.12	0.50	0.50	160	D	6.3x5.4	1000
33	AVRF336M35D16T-F	11.6	0.12	0.50	0.50	160	D	6.3x5.4	1000
47	AVRF476M35F24T-F	16.5	0.12	0.16	0.16	600	F	8x10.2	500
100	AVRF107M35F24T-F	35.0	0.12	0.16	0.16	600	F	8x10.2	500
150	AVRF157M35F24T-F	52.5	0.12	0.16	0.16	600	F	8x10.2	500
220	AVRF227M35F24T-F	77.0	0.12	0.16	0.16	600	F	8x10.2	500
330	AVRF337M35G24T-F	115.5	0.12	0.08	0.08	850	G	10x10.2	500