

Miniature Aluminum Electrolytic Capacitors

NAE Series

AXIAL LEADS, POLARIZED, GENERAL PURPOSE

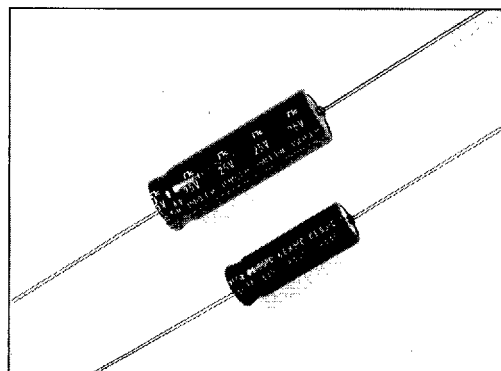
FEATURES

- ECONOMICALLY PRICED
- HIGH STABILITY OVER LONG LIFE

GENERAL PURPOSE, +85°C

NAE → **NASA** → **NASS**

(old sizes) (today's standard) (reduced sizes)



CHARACTERISTICS

Rated Working Voltage Range	6.3 ~ 100VDC
Rated Capacitance Range	0.47 ~ 2200 μ F
Operating Temperature Range	-40 ~ +85°C
Capacitance Tolerance	\pm 20% (M)
Max. Leakage Current (After 2 minutes 20°C)	0.02CV or 3 μ A, whichever is greater

Surge Voltage & Max. Dissipation Factor (Tangent Loss Angle Tan δ) At 120Hz, 25°C C = Capacitance	W.V. (Vdc)	6.3	10	16	25	35	50	63	100
	S.V. (Vdc)	8	13	20	32	44	63	79	125
	Tan δ C \leq 1,000 μ F	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.08
	Tan δ C = 1,500 μ F	0.22	0.19	0.16	0.14				
	Tan δ C = 2,200 μ F	0.24	0.21	0.18	0.16				

Low Temperature Stability (Impedance Ratio)	W.V. (Vdc)	6.3	10	16	25	35	50	63	100
	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2
		C \leq 1,000 μ F	8	6	4	4	4	4	4
	Z-40°C/Z+20°C	C = 1,500-2200 μ F	12	9	6	6			

Life Test 2,000 hours at 85°C	Capacitance Change	5 & 6.3 ϕ mm size	\pm 25% of initial measured value
		8 ϕ mm & over size	\pm 20% of initial measured value
	Dissipation Factor (tan δ)		Less than 150% of specified value
	Leakage Current		Less than specified maximum value

MAXIMUM RIPPLE CURRENT (mA rms At 120Hz AND 85°C) (peak voltage not to exceed rated DC voltage)

W.V. (Vdc) Cap(μ F)	6.3	10	16	25	35	50	63	100
0.47						9.0	9.0	10
1.0						12	12	15
2.2						18	18	22
3.3						23	23	31
4.7					25	27	30	37
10			31	33	36	39	50	68
15			38	41	50	55	68	83
22			46	56	60	74	94	105
33			57	69	83	103	116	134
47		62	77	92	115	123	138	184
100	95	115	142	152	180	194	251	
150	130	140	174	186	212	275	340	
220	180	194	211	244	305	332	413	
330	220	237	259	346	373	451		
470	263	283	386	412	557	610		
1000	480	516	621	752				
1500	588	699	861	999				
2200	819	908	1066	1291				

Ripple Current Correction Factor

1. Temperature Factor

Ambient Temperature (°C)	60	70	85
Correction Rate	1.5	1.30	1.0

2. Frequency Factor

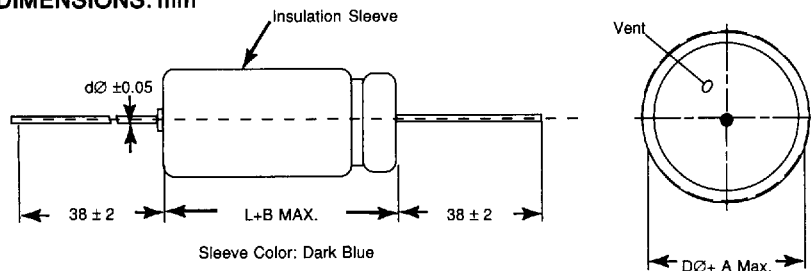
Frequency (Hz)	50	120	300	1K	10K	100K
0.47 ~ 3.3 μ F	0.65	1.0	1.35	1.75	2.30	2.50
4.7 ~ 33 μ F	0.75	1.0	1.25	1.50	1.75	1.80
47 ~ 1000 μ F	0.80	1.0	1.15	1.30	1.40	1.50
1500 ~ 2200 μ F	0.85	1.0	1.03	1.05	1.08	1.08



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DIMENSIONS: mm



LEAD SPACING AND DIAMETER m/m

Case Dia. ($D\varnothing$)	5-10	13
Lead Dia. ($d\varnothing$)	0.6	0.8
Dim. α	0.5	
Dim. β	1.0	

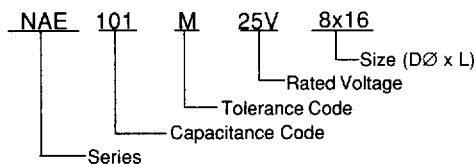
*VENTS ON CANS OVER 8mm DIAMETER.

STANDARD PRODUCTS AND CASE SIZE TABLE: $D\varnothing \times L$ mm

SEE NASA/NASS FOR HIGHER VALUES

W.V.		6.3	10	16	25	35	50	63	100
Cap μF	Code								
0.47	R47						5x13		5x13
1.0	1R0						5x13	5x13	5x13
2.2	2R2						5x13	5x13	6x13
3.3	3R3						5x13	5x13	6x13
4.7	4R7						5x13	6x13	6x13
10	100					5x13	6x13	6x13	6x16
15	150				5x13	6x13	6x13	6x13	8x16
22	220			5x13	6x13	6x13	6x16	6x16	8x16
33	330			5x13	6x13	6x16	6x16	8x16	8x20
47	470		5x13	6x13	6x13	6x16	8x16	8x16	10x20
100	101	6x13		6x16	8x16	8x16	8x20	10x16	10x25
150	151		6x16	8x16	8x16	8x20	10x16	10x20	13x25
220	221	6x16		8x16	8x20	10x16	10x20	10x25	(NASA)
330	331			8x16	10x16	10x20	10x25	(NASA)	(NASA)
470	471		8x16	10x16	10x20	10x25	13x25	(NASA)	(NASA)
1000	102		10x20	10x25	13x25	(NASA)	(NASA)	(NASA)	(NASA)
1500	152		10x25	13x25	13x30	(NASA)	(NASA)	(NASA)	(NASA)
2200	222		13x22	13x30	13x31	(NASA)	(NASA)	(NASA)	(NASA)

PART NUMBERING SYSTEM



See page 8 for complete part numbering system.

