



# Non-Polar Aluminum Electrolytic Capacitors

# NPAL Series



RoHS Compliant

## FEATURES

- Non-polarized, suitable for use in circuits whose polarity is sometimes reversed or unknown
- The leakage current and dissipation factor have been improved
- Close tolerance
- Excellent frequency characteristics in the audio range
- RoHS compliant



## CHARACTERISTICS

Item	Characteristics									
Operating Temperature Range	-40°C ~ +85°C									
Capacitance Tolerance	±10% at +20°C, 120Hz									
Leakage Current	I = 0.03CWV or 3μA whichever is greater after 2 minutes of applied rated DC working voltage at 20°C Where: C = rated capacitance in μF; WV = rated DC working voltage									
Dissipation Factor (Tan δ, at +20°C 120Hz)	Working voltage (WV)	6.3	10	16	25	35	50	63	100	
	Tan δ	0.25	0.22	0.19	0.16	0.14	0.12	0.10	0.09	
For capacitors whose capacitance exceeds 1,000μF, the specification of tan δ is increased by 0.02 for every addition of 1,000μF.										
Surge Voltage	Working voltage (WV)	6.3	10	16	25	35	50	63	100	
	Surge voltage (SV)	8	13	20	32	44	63	79	125	
Low Temperature Characteristics	Working voltage (WV)	6.3	10	16	25	35	50	63	100	
	Impedance ratio	Z-25°C/Z+20°C	4	3	3	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	6	4	4	3	3	3
Life Test	When returned to +20°C after 1,000 hours application of working voltage with the polarity inverted every 250 hours at +85°C, the capacitor will meet the following limits: Capacitance change is ≤±20% of initial value; tan δ is < 200% of initial specified value; leakage current is ≤ initial specified value									
Shelf Test	When returned to +20°C after 1,000 hours +85°C with no voltage applied, the capacitor will meet the following limits: Capacitance change is ≤±20% of initial value; tan δ is < 200% of initial specified value; leakage current is ≤ initial specified value									

## PART NUMBERING SYSTEM

1 4 0

Prefix

N P A L

Series

5 0 V

Voltage  
Actual Value

2 2 0

Capacitance (μF)  
Actual Value

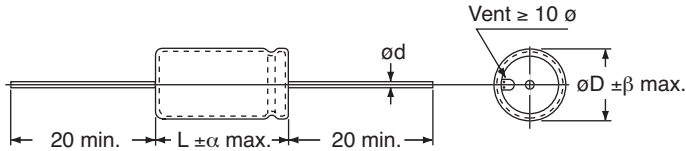
- R C

Suffix  
(RoHS  
compliant)

Specifications are subject to change without notice. No liability or warranty implied by this information. Environmental compliance based on producer documentation.



## ■ DIMENSIONS AND PERMISSIBLE RIPPLE CURRENT



Lead Dimensions (mm)

øD	6.3	8	10	13	16	18
ød	0.6	0.6	0.6	0.6	0.8	0.8
β	1.5	1.5	2.0	2.0	2.0	2.0
α	0.5	0.5	1.0	1.0	1.0	1.0

Value (μF)	Working Voltage (WV); Dimensions: øD x L (mm); Ripple Current: mA/RMS @ 120Hz, 85°C																	
	6.3		10		16		25		35		50		63		100			
	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA		
0.1													6.3 x 12	5	6.3 x 13	5	6.3 x 12	5
0.22													6.3 x 12	7	6.3 x 13	8	6.3 x 12	8
0.33													6.3 x 12	9	6.3 x 13	10	6.3 x 12	10
0.47													6.3 x 12	10	6.3 x 13	12	6.3 x 12	12
1													6.3 x 12	16	6.3 x 13	18	6.3 x 12	18
2.2													6.3 x 12	23	6.3 x 13	27	6.3 x 12	27
3.3													6.3 x 12	29	6.3 x 12	31	6.3 x 12	35
4.7													6.3 x 12	34	6.3 x 13	40	6.3 x 14	42
10									6.3 X 13	46	6.3 x 14	54	8 x 13	59	8 x 16	69		
15											8 x 13	71	8 x 16	97				
22					6.3 x 13	61	6.3 x 12	69	6.3 x 13	74	8 x 16	89	8 x 16	97	10 x 21	120		
33			6.3 x 13	71	6.3 x 13	80	8 x 13	85	8 x 16	101	10 x 17	109	10 x 17	139	10 x 21	153		
47			6.3 x 12	85	8 X 13	95	8 x 13	113	8 X 16	120	10 x 17	152	10 x 21	174	13 x 22	203		
100	6.3 x 16	118	8 x 13	147	8 x 16	155	10 x 17	192	10 x 17	205	10 x 21	232	13 x 22	269	16 x 28	317		
220	8 x 16	195	8 x 16	254	10 x 17	268	10 x 21	298	13 x 22	338	10 x 27	381	16 x 27	447	16 x 36	501		
330	8 x 16	239	10 x 17	312	10 x 21	344	13 x 22	387	13 X 27	433	16 x 28	500	16 x 33	567				
470	10 x 17	333	10 x 21	389	13 x 22	436	13 x 27	483	16 x 28	552	16 x 33	668	18 x 42	792				
1000	13 x 22	508	13 x 22	603	13 X 27	664	16 x 28	781	16 x 37	857	18 x 42	1054						
2200	13 x 27	836	16 x 28	1000	16 X 36	1121	18 x 42	1355										

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