

# Surface Mount Aluminum Electrolytic Capacitors NACL Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION
- LOW LEAKAGE CURRENT (0.5 $\mu$ A TO 2.0 $\mu$ A max.)
- LOW COST TANTALUM REPLACEMENT
- DESIGNED FOR REFLOW SOLDERING

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

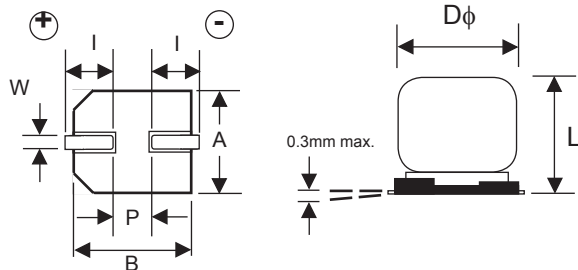
Rated Voltage Rating	6.3 ~ 50Vdc						
Rated Capacitance Range	1.0 ~ 100 $\mu$ F						
Operating Temperature Range	-40° ~ +85°C						
Capacitance Tolerance	$\pm$ 20%(M)						
Max. Leakage Current After 2 Minutes at 20°C	0.002CV or 0.5 $\mu$ A, whichever is greater						
Surge Voltage & Max. Tan $\delta$	W.V. (Vdc)	6.3	10	16	25	35	50
	S.V. (Vdc)	8.0	13	20	32	44	63
	Tan $\delta$ @ 120Hz/20°C	0.24	0.20	0.18	0.14	0.12	0.10
Low Temperature Stability (Impedance Ratio @ 120Hz)	W.V. (Vdc)	6.3	10	16	25	35	50
	Z-40°C/Z +20°C	4	3	2	2	2	2
	Z-55°C/Z +20°C	8	8	4	4	4	4
Load Life Test at Rated W.V. 85°C 2,000 Hours	Capacitance Change	Within $\pm$ 25% of initial measured value					
	Tan $\delta$	Less than 200% of specified value					
	Leakage Current	Less than specified value					

## STANDARD PRODUCT AND CASE SIZE D $\phi$ xL (mm)

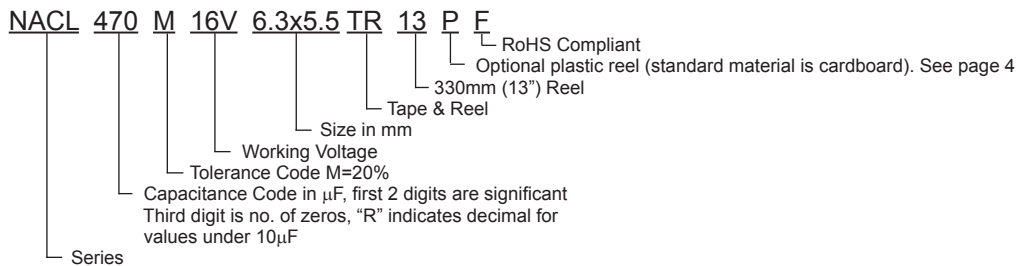
Cap. ( $\mu$ F)	Working Voltage (Vdc)					
	6.3	10	16	25	35	50
1.0	-	-	-	-	-	4x5.5
2.2	-	-	-	-	-	4x5.5
3.3	-	-	-	-	-	4x5.5
4.7	-	-	-	4x5.5	4x5.5	5x5.5
10	-	-	4x5.5	5x5.5	5x5.5	6.3x5.5
22	4x5.5	5x5.5	5x5.5	6.3x5.5	6.3x5.5	-
33	5x5.5	5x5.5	6.3x5.5	6.3x5.5	-	-
47	5x5.5	6.3x5.5	6.3x5.5	-	-	-
100	5x5.5	6.3x5.5	-	-	-	-

## DIMENSIONS (mm)

Case Size	D $\phi$ $\pm$ 0.5	L $\pm$ 0.1	A/B $\pm$ 0.2	I $\pm$ 0.2	W	P $\pm$ 0.2
4x5.5	4.0	5.5	4.3	1.8	0.5 ~ 0.8	1.0
5x5.5	5.0	5.5	5.3	2.1	0.5 ~ 0.8	1.4
6.3x5.5	6.3	5.5	6.6	2.5	0.5 ~ 0.8	2.2



## PART NUMBER SYSTEM



## PRECAUTIONS

Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog.  
Also found at [www.niccomp.com/precautions](http://www.niccomp.com/precautions)  
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)



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## STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

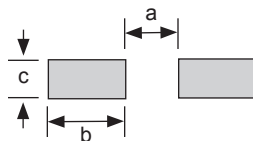
NIC Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. Ripple Current (mA) +85°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @ +85°C
NACL220M6.3V4X5.5TR13F	22	6.3	0.24	31	18.1	2,000
NACL330M6.3V5X5.5TR13F	33		0.24	39	12.6	2,000
NACL470M6.3V5X5.5TR13F	47		0.24	47	8.47	2,000
NACL101M6.3V5X5.5TR13F	100		0.24	71	3.98	2,000
NACL220M10V5X5.5TR13F	22	10	0.20	35	15.1	2,000
NACL330M10V5X5.5TR13F	33		0.20	43	10.1	2,000
NACL470M10V6.3X5.5TR13F	47		0.20	59	7.06	2,000
NACL101M10V6.3X5.5TR13F	100		0.20	76	3.32	2,000
NACL100M16V4X5.5TR13F	10	16	0.18	25	26.5	2,000
NACL220M16V5X5.5TR13F	22		0.18	39	12.1	2,000
NACL330M16V6.3X5.5TR13F	33		0.18	57	8.04	2,000
NACL470M16V6.3X5.5TR13F	47		0.18	68	5.65	2,000
NACL4R7M25V4X5.5TR13F	4.7	25	0.14	18	49.5	2,000
NACL100M25V5X5.5TR13F	10		0.14	28	23.2	2,000
NACL220M25V6.3X5.5TR13F	22		0.14	52	10.6	2,000
NACL330M25V6.3X5.5TR13F	33		0.14	63	7.04	2,000
NACL4R7M35V4X5.5TR13F	4.7	35	0.12	20	42.3	2,000
NACL100M35V5X5.5TR13F	10		0.12	30	19.9	2,000
NACL220M35V6.3X5.5TR13F	22		0.12	54	9.05	2,000
NACL1R0M50V4X5.5TR13F	1.0		50	0.10	10	166
NACL2R2M50V4X5.5TR13F	2.2	0.10		15	75.4	2,000
NACL3R3M50V4X5.5TR13F	3.3	0.10		18	50.3	2,000
NACL4R7M50V5X5.5TR13F	4.7	0.10		23	35.3	2,000
NACL100M50V6.3X5.5TR13F	10	0.10		34	16.6	2,000

## RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency (Hz)	f ≤ 100	100 > f ≤ 1K	1K > f ≥ 10KHz	f ≥ 100K
Correction Factor	0.8	1.0	1.3	1.5

## RECOMMENDED LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
4 φ	1.0	2.6	1.8
5 φ	1.4	3.0	1.8
6.3 φ	2.1	3.5	1.8



# Surface Mount Aluminum Electrolytic Capacitors NACL Series

## CARRIER TAPE

Case Size	A ±0.2	B ±0.2	C ±0.3	D ±0.1	P ±0.1	T ±0.2
4 x 5.5	4.7	4.7	12.0	5.5	8.0	5.8
5 x 5.5	5.7	5.7	12.0	5.5	12.0	5.8
6.3 x 5.5	7.0	7.0	16.0	7.5	12.0	5.8

## TR13 330mm (13") CARDBOARD REEL

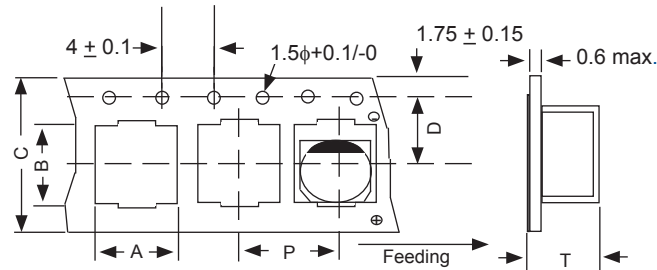
(See page 4 for plastic reel dimensions)

Case Size	W ±1	Quantity Per Reel
		13" Reel
4 x 5.5	14.0	1,500 pcs
5 x 5.5	14.0	1,000 pcs
6.3 x 5.5	18.0	1,000 pcs

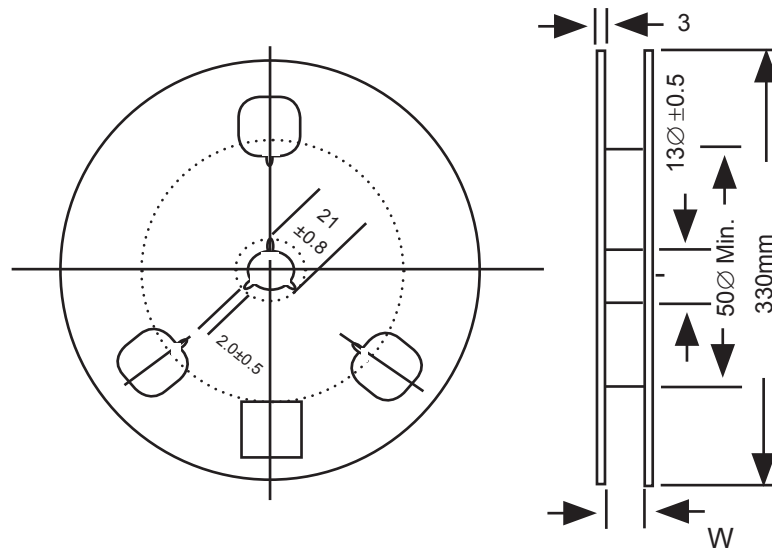
## TAPING SPECIFICATIONS (mm)

- Both Leader and Trailer tape: Minimum 40mm (1.57") empty carrier tape pockets.
- Leader tape: Approximately 20cm of cover tape at leader.
- Connection: Maximum 3 connections (slices) per reel.

## CARRIER

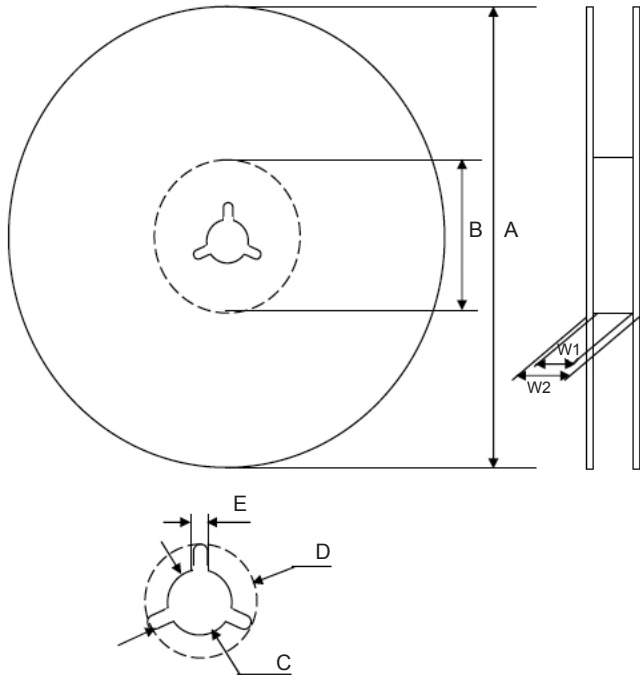


## STANDARD REEL (CARDBOARD)



# Surface Mount Aluminum Electrolytic Capacitors NACL Series

Optional V-Chip 13" (330mm) Plastic Reels (TR13PF suffix)



## Dimensions (mm)

Case Size	Tape Width	W1	W2
4x5.5, 5x5.5	12.0	12.4 ~ 14.4	15.5 ~ 20.0
6.3x5.5	16.0	16.4 ~ 18.4	19.5 ~ 24.0

Case Size	Tape Width	A	B	C	D	E
4x5.5, 5x5.5	12.0	$\phi 330$	$\phi 50 \sim 105$	$\phi 13$	$\phi 21$	2.0
6.3x5.5	16.0	$\pm 2.0$		$\pm 0.5$	$\pm 1.0$	$\pm 0.5$

Color
Black or Blue

## TR13PF 330mm (13") PLASTIC REEL

(See page 4 for plastic reel dimensions)

Case Size	W $\pm 1$	Quantity Per Reel
		13" Reel
4 x 5.5	14.0	1,500 pcs
5 x 5.5	14.0	1,000 pcs
6.3 x 5.5	18.0	1,000 pcs

