

# NAWP Series

## Surface Mount Aluminum Electrolytic Capacitors



### FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- REDUCED CASE SIZE (SMALLER THAN NACEW)
- SUIT FOR HIGH TEMPERATURE REFLOW SOLDERING (UP TO 250°C)
- 1,000 HOUR LOAD LIFE @ +105°C
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING



### CHARACTERISTICS

Rated Voltage Rating	6.3 ~ 50Vdc						
Rated Capacitance Range	4.7 ~ 220 $\mu$ F						
Operating Temp. Range	-40 ~ +105°C						
Capacitance Tolerance	$\pm$ 20% (M)						
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3 $\mu$ A whichever is greater						
Tan $\delta$ @ 120Hz/20°C	W.V. (Vdc)	6.3	10	16	25	35	50
	S.V. (Vdc)	8.0	13	20	32	44	63
	Tan $\delta$	0.35	0.30	0.26	0.20	0.16	0.12
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	6.3	10	16	25	35	50
	Z-25°C/Z+20°C	4	3	2	2	2	2
	Z-40°C/Z+20°C	10	8	6	4	4	4
Load Life Test @ 105°C All Case Sizes = 1,000 hours	Capacitance Change	Within $\pm$ 25% of initial measured value (6.3V $\pm$ 30%)					
	Tan $\delta$	Less than $\pm$ 300% of the specified maximum value					
	Leakage Current	Less than the specified maximum value					

### STANDARD VALUES AND CASE SIZES (mm)

Cap. ( $\mu$ F)	Code	Working Voltage (Vdc)					
		6.3	10	16	25	35	50
4.7	4R7	-	-	-	-	-	4X5.5
10	100	-	-	-	4X5.5	4X5.5	5X5.5
22	220	-	4X5.5	4X5.5	5X5.5	5X5.5	6.3X5.5
33	330	4X5.5	4X5.5	5X5.5	5X5.5	6.3X5.5	-
47	470	4X5.5	5X5.5	5X5.5	6.3X5.5	-	-
100	101	5X5.5	5X5.5	-	-	-	-
220	221	6.3X5.5	-	-	-	-	-

### PEAK REFLOW TEMPERATURE CODES

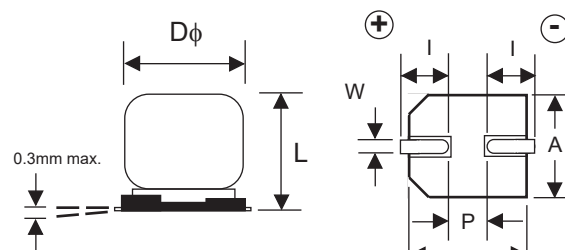
Code	Peak Reflow Temperature
L	250°C

### TERMINATION FINISH & PACKAGING OPTIONS CODES

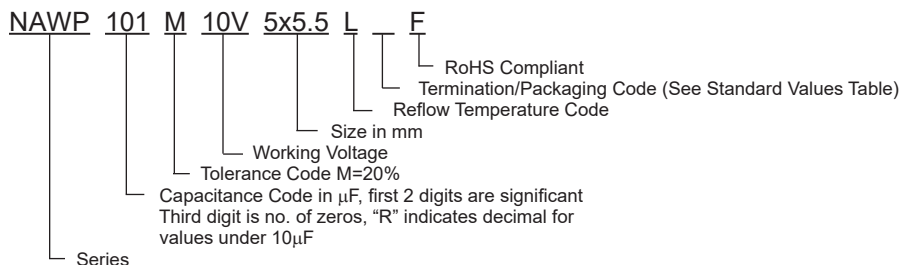
Code	Finish & Reel Size
B	Sn-Bi Finish & 13" Reel
LB	Sn-Bi Finish & 15" Reel (15" available for 4x5.5 case size only)

### CASE DIMENSIONS (mm)

Case Size	$\phi$ D $\pm$ 0.5	L max.	A $\pm$ 0.2	B $\pm$ 0.2	I $\pm$ 0.3	W	P $\pm$ 0.3
4x5.5	4.0	5.5	4.3	4.3	1.8	0.5~0.8	1.0
5x5.5	5.0	5.5	5.3	5.3	2.1	0.5~0.8	1.4
6.3x5.5	6.3	5.5	6.6	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 at <https://www.niccomp.com/resource/files/aluminum/AlumApplInfoCautions.pdf>  
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)

### STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

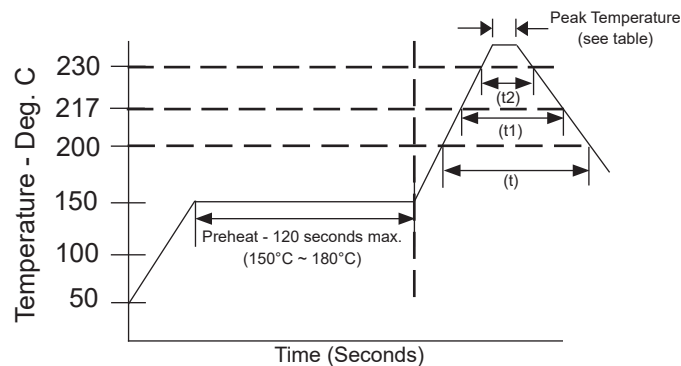
NIC Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. Ripple Current (mA) +105°C/120Hz	Maximum ESR (Ω) +20°C/120Hz	Load Life Hours @ +105°C
NAWP330M6.3V4X5.5LLBF	33	6.3	0.35	29	17.59	1,000
NAWP470M6.3V4X5.5LLBF	47		0.35	36	12.35	1,000
NAWP101M6.3V5X5.5LBF	100		0.35	47	5.81	1,000
NAWP151M6.3V6.3X5.5LBF	150		0.35	71	3.87	1,000
NAWP221M6.3V6.3X5.5LBF	220		0.35	74	2.64	1,000
NAWP220M10V4X5.5LLBF	22		10	0.30	28	22.62
NAWP330M10V4X5.5LLBF	33	0.30		29	15.08	1,000
NAWP470M10V5X5.5LBF	47	0.30		43	10.59	1,000
NAWP101M10V5X5.5LBF	100	0.30		47	4.98	1,000
NAWP151M10V6.3X5.5LBF	150	0.30		71	3.32	1,000
NAWP220M16V4X5.5LLBF	22	16		0.26	28	19.60
NAWP330M16V5X5.5LBF	33		0.26	35	13.07	1,000
NAWP470M16V5X5.5LBF	47		0.26	39	9.18	1,000
NAWP100M25V4X5.5LLBF	10	25	0.20	22	33.17	1,000
NAWP220M25V5X5.5LLBF	22		0.20	35	15.08	1,000
NAWP330M25V5X5.5LBF	33		0.20	45	10.05	1,000
NAWP470M25V6.3X5.5LBF	47		0.20	70	7.06	1,000
NAWP100M35V4X5.5LLBF	10	35	0.16	22	26.54	1,000
NAWP220M35V5X5.5LBF	22		0.16	35	12.06	1,000
NAWP330M35V6.3X5.5LBF	33		0.16	43	8.04	1,000
NAWP470M35V6.3X5.5LBF	47		0.16	43	8.04	1,000
NAWP100M50V5X5.5LBF	10	50	0.12	23	19.90	1,000
NAWP220M50V6.3X5.5LBF	22		0.12	35	9.05	1,000
NAWP470M50V4X5.5LLBF	47		0.12	16	42.35	1,000

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency Hz	100 ≤ f < 1K	1K ≤ f < 10K	10K ≤ f < 100K	100K ≤ f
C ≤ 4.7μF	1.00	1.30	1.50	1.80
4.7μF < C ≤ 33μF	1.00	1.20	1.30	1.45
33μF < C	1.00	1.10	1.20	1.30

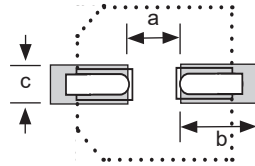
### REFLOW SOLDERING CONDITIONS

Diameter	Time above 200°C (t)	Time above 217°C (t1)	Time above 230°C (t2)	Peak Temperature 5 seconds
4 ~ 6.3mm φ	70 sec. max.	60 sec. max.	40 sec. max.	250°C



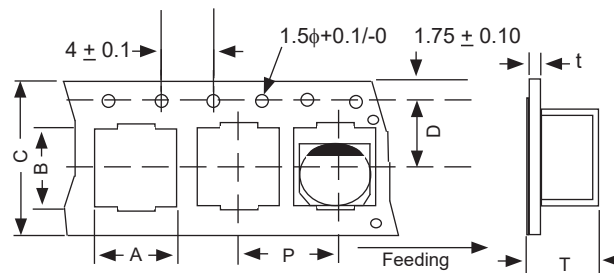
### RECOMMENDED LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
4x5.5	1.0	2.6	1.8
5x5.5	1.4	3.0	1.8
6.3x5.5	2.1	3.5	1.8



### CARRIER TAPE DIMENSIONS & REEL QTY

Case Size	A ±0.3	B ±0.3	C ±0.3	D ±0.1	P ±0.1	T ±0.2	t ±0.1
4x5.5	4.7	4.7	12.0	5.5	8.0	5.8	0.4
5x5.5	5.7	5.7	12.0	5.5	12.0	5.8	0.4
6.3x5.5	7.0	7.0	16.0	7.5	12.0	5.8	0.4

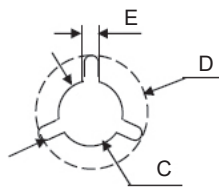
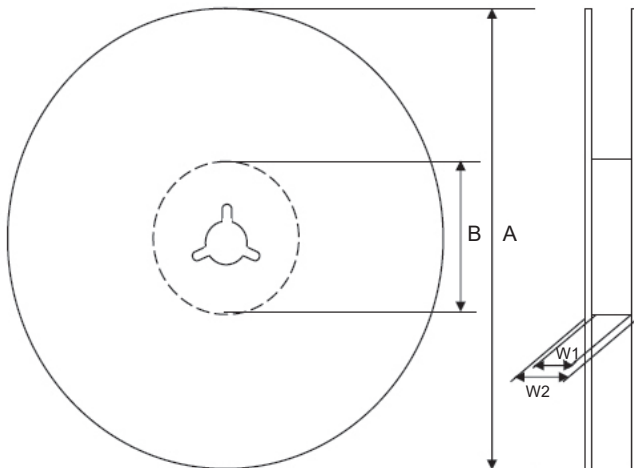


### V-Chip 15" (380mm) Reels (LB suffix)

#### Dimensions (mm)

Case Size	Tape Width	W1	W2
4x5.5	12.0	12.5 ~ 14.0	15.5 ~ 20.0

Case Size	Tape Width	A	B	C	D	E
4x5.5	12.0	φ380 ±2	φ80~105	φ13 ±0.5	φ21 ±1.0	2.0 ±0.5

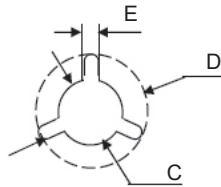
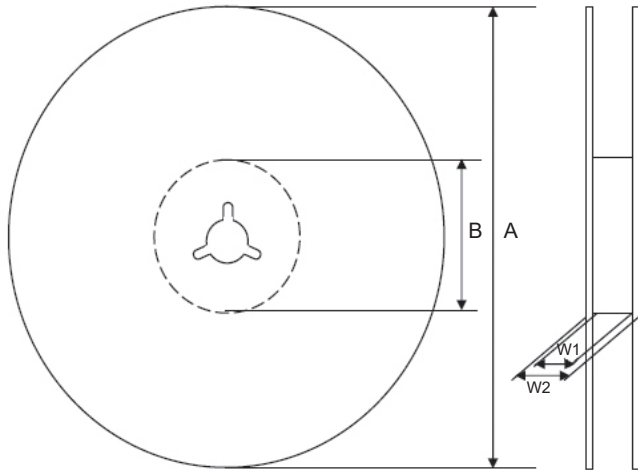


### V-Chip 13" (330mm) Reels (B suffix)

#### Dimensions (mm)

Case Size	Tape Width	W1	W2
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
5x5.5	12.0	$\phi 330$ $\pm 2.0$	$\phi 50 \sim 105$	$\phi 13$ $\pm 0.5$	$\phi 21$ $\pm 1.0$	2.0
6.3x5.5	16.0					$\pm 0.5$



Case Size	W $\pm 1.0$	Quantity	
		TR13 (330mm)	TR15 (380mm)
4x5.5	14	n/a	2000
5x5.5	14	1000	n/a
6.3x5.5	18	1000	n/a