

# Surface Mount Aluminum Electrolytic Capacitors NAWS Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- LOW PROFILE 4MM HEIGHT
- LOAD LIFE (1,000 HOURS @ +105°C)
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

SAC Alloy Compatible  
240°C

**RoHS  
Compliant**  
includes all homogeneous materials



## CHARACTERISTICS

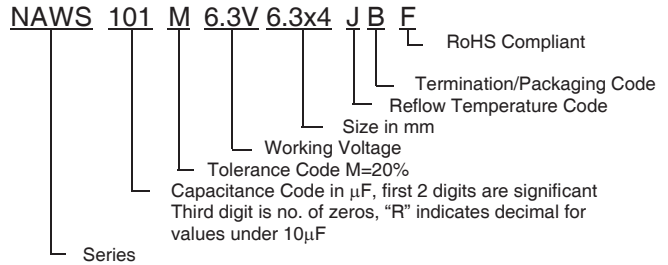
Rated Voltage Rating	6.3 ~ 50Vdc						
Rated Capacitance Range	1.0 ~ 100μF						
Operating Temp. Range	-40 ~ +105°C						
Capacitance Tolerance	±20% (M)						
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3μA whichever is greater						
Dissipation Factor	W.V. (Vdc)	6.3	10	16	25	35	50
	S.V. (Vdc)	8.0	13	20	32	44	63
	Tan δ @ 120Hz/20°C	0.38	0.32	0.20	0.16	0.14	0.14
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 1,000 hours	Capacitance Change	Within ±30% of initial measured value					
	Tan δ	Less than ±300% of the specified maximum value					
	Leakage Current	Less than the specified maximum value					

\*See Part Number System for Details

Cap. (μF)	Code	Working Voltage (Vdc)					
		6.3	10	16	25	35	50
1.0	1R0	-----					5X4
2.2	2R2	-----					5X4
3.3	3R3	-----					5X4
4.7	4R7	-	-	-	5X4	5X4	5X4
10	100	-	-	5X4	5X4	5X4	6.3X4
22	220	5X4	5X4	5X4	6.3X4	6.3X4	-
				6.3X4			
33	330	5X4	5X4	6.3X4	6.3X4	-	-
			6.3X4				
47	470	5X4	6.3X4	6.3X4	-	-	-
		6.3X4					
68	680	6.3X4	-----				
100	101	6.3X4	-----				

## STANDARD VALUES AND CASE SIZES (mm)

### PART NUMBER SYSTEM



### PEAK REFLOW TEMPERATURE CODES

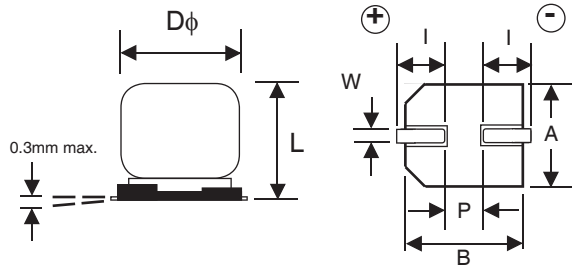
Code	Peak Reflow Temperature
J	240°C

### TERMINATION FINISH & PACKAGING OPTIONS CODES

Code	Finish & Reel Size
B	Sn-Bi Finish & 13" Reel

## DIMENSIONS (mm) AND REEL QUANTITIES

Case Size	φD±0.5	L max.	A±0.2	B±0.2	I±0.3	W	P±0.2	Qty/Reel
5x4	5.0	4.0	5.3	5.3	2.3	0.5 ~ 0.8	1.4	1,000
6.3x4	6.3	4.0	6.6	6.6	2.6	0.5 ~ 0.8	2.2	1,000



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## STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. ESR (Ω) 120Hz, +20°C	Max. Ripple Current (mA) +105°C, 120Hz	Load Life Hours @ +105°C
NAWS220M6.3V5X4JBF	22	6.3	0.38	28.65	23	1000
NAWS330M6.3V5X4JBF	33		0.38	19.10	28	1000
NAWS470M6.3V5X4JBF	47		0.38	13.41	34	1000
NAWS470M6.3V6.3X4JBF			0.38	13.41	42	1000
NAWS680M6.3V6.3X4JBF	68		0.38	9.27	49	1000
NAWS101M6.3V6.3X4JBF	100		0.38	6.30	52	1000
NAWS220M10V5X4JBF	22	10	0.32	24.13	25	1000
NAWS330M10V5X4JBF	33		0.32	16.08	30	1000
NAWS330M10V6.3X4JBF			0.32	16.08	35	1000
NAWS470M10V6.3X4JBF	47		0.32	11.29	38	1000
NAWS100M16V5X4JBF	10	16	0.20	33.17	18	1000
NAWS220M16V5X4JBF	22		0.20	15.08	26	1000
NAWS220M16V6.3X4JBF			0.20	15.08	31	1000
NAWS330M16V6.3X4JBF	33		0.20	10.05	35	1000
NAWS470M16V6.3X4JBF	47		0.20	7.06	38	1000
NAWS4R7M25V5X4JBF	4.7		25	0.16	56.47	13
NAWS100M25V5X4JBF	10	0.16		26.54	21	1000
NAWS220M25V6.3X4JBF	22	0.16		12.06	35	1000
NAWS330M25V6.3X4JBF	33	0.16		8.04	42	1000
NAWS4R7M35V5X4JBF	4.7	35	0.14	49.41	13	1000
NAWS100M35V5X4JBF	10		0.14	23.22	22	1000
NAWS220M35V6.3X4JBF	22		0.14	10.56	34	1000
NAWS1R0M50V5X4JBF	1.0		50	0.14	232.22	6
NAWS2R2M50V5X4JBF	2.2	0.14		105.55	10	1000
NAWS3R3M50V5X4JBF	3.3	0.14		70.37	12	1000
NAWS4R7M50V5X4JBF	4.7	0.14		49.41	16	1000
NAWS100M50V6.3X4JBF	10	0.14		23.22	23	1000

## RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

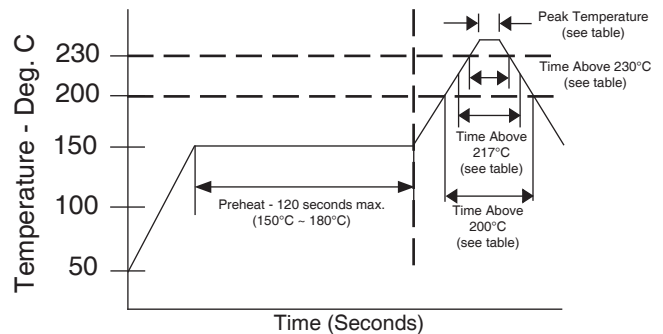
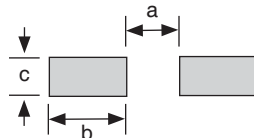
Frequency	120Hz	1KHz	10KHz	100KHz ~
1.0 ~ 3.3μF	1.0	1.30	1.50	1.80
>4.7 ~ 33μF	1.0	1.20	1.30	1.45
>33μF	1.0	1.10	1.20	1.30

## PEAK REFLOW TEMPERATURE, DURATION AND NUMBER OF REFLOW PASSES ALLOWED

Diameter	Peak Temperature	Duration	Time above 200°C	Time above 217°C	Time above 230°C	Number of Reflow Passes
5 ~ 6.3mm φ	+240°C	Time ≥ 240°C 5 sec.	50 sec.	40 sec.	20 sec.	2

## RECOMMENDED LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
5x4	1.4	3.0	1.8
6x3x4	1.8	3.6	1.8



## 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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## CARRIER TAPE

Case Size	A ±0.2	B ±0.2	C ±0.3	D ±0.1	P ±0.1	T ±0.2
5X4	5.7	5.7	12.0	5.5	12.0	4.5
6.3X4	7.0	7.0	16.0	7.5	12.0	4.5

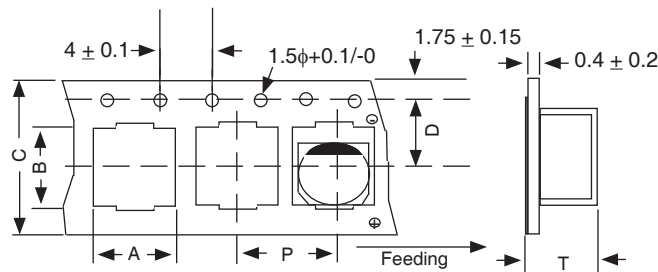
## TR13 330mm (13") REEL

Case Size	W ±1.0	Quantity Per Reel
		13" Reel
5X4	14.0	1,000 pcs
6.3X4	18.0	1,000 pcs

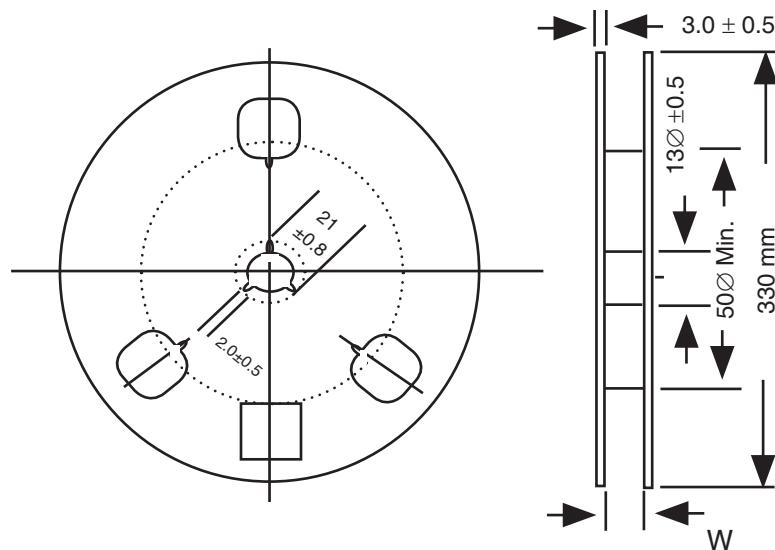
## TAPING SPECIFICATIONS (mm)

- Both Leader and Trailer tape: Minimum 10 empty pockets and 20cm of cover tape.
- Connection: Maximum 3 connections (slices) per reel.

### CARRIER



### REEL



Review & Compare Reflow Soldering Heat Limits  
 V-chip SMT Aluminum Electrolytic Capacitors  
[www.niccomp.com/RSL](http://www.niccomp.com/RSL)

