

# Surface Mount Aluminum Electrolytic Capacitors

NAZH Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- REDUCED SIZE
- AVAILABLE WITH ANTI-VIBRATION TERMINATIONS (6.3, 8 & 10mm DIAMETER)
- SUIT FOR HIGH TEMPERATURE REFLOW SOLDERING (UP TO 260°C)
- 2,000 HOUR LOAD LIFE @ +105°C
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING
- **MEETS THE REQUIREMENTS OF AEC-Q200\***

\*Contact NIC for supporting test data

SAC Alloy Compatible  
260°C



**RoHS Compliant**  
includes all homogeneous materials

## CHARACTERISTICS

\*See Part Number System for Details

Rated Voltage Rating	6.3 ~ 50Vdc						
Rated Capacitance Range	10 ~ 2,200µF						
Operating Temp. Range	-55 ~ +105°C						
Capacitance Tolerance	±20% (M)						
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3µA whichever is greater						
Tan δ @ 120Hz/20°C	W.V. (Vdc)	6.3	10	16	25	35	50
	S.V. (Vdc)	8.0	13	20	32	44	63
Low Temperature Stability Impedance Ratio @ 120Hz	Tan δ @ 120Hz/20°C	0.26	0.19	0.16	0.14	0.12	0.10
	W.V. (Vdc)	6.3	10	16	25	35	50
	Z-25°C/Z+20°C	2	2	2	2	2	2
	Z-40°C/Z+20°C	3	3	3	3	3	3
Load Life Test @ 105°C All Case Sizes = 2,000 hours	Z-55°C/Z+20°C	4	4	4	3	3	3
	Capacitance Change	Within ±30% of initial measured value					
	Tan δ	Less than ±200% of the specified maximum value					
	Leakage Current	Less than the specified maximum value					

## STANDARD VALUES AND CASE SIZES (mm)

Cap. (µF)	Code	Working Voltage (Vdc)						
		6.3	10	16	25	35	50	
10	100	-	-	-	-	-	-	4x6.1 5x6.1
22	220	-	-	-	4x6.1	4x6.1	5x6.1	5x6.1
33	330	-	-	-	4x6.1	5x6.1	5x6.1	-
47	470	-	-	4x6.1	5x6.1	5x6.1	5x6.1	6.3x6.1
68	680	-	4x6.1	5x6.1	5x6.1	5x6.1	6.3x6.1	-
100	101	4x6.1	-	5x6.1	6.3x6.1	6.3x6.1	6.3x6.1	6.3x8
150	151	-	5x6.1	6.3x6.1	6.3x8	6.3x8	6.3x8	-
220	221	5x6.1	6.3x6.1	6.3x6.1	6.3x8	-	-	8x10.5
330	331	6.3x6.1	6.3x8	6.3x8	-	8x10.5	10x10.5	10x10.5
390	391	-	-	-	-	8x10.5	-	-
470	471	6.3x8	6.3x8	-	8x10.5	-	-	-
560	561	-	-	-	8x10.5	10x10.5	-	-
680	681	6.3x8	-	8x10.5	-	10x10.5	-	-
820	821	-	-	8x10.5	10x10.5	-	-	-
1000	102	-	8x10.5	10x10.5	10x10.5	-	-	-
1200	122	8x10.5	-	10x10.5	-	-	-	-
1500	152	8x10.5	10x10.5	-	-	-	-	-
2200	222	10x10.5	-	-	-	-	-	-

## PEAK REFLOW TEMPERATURE CODES

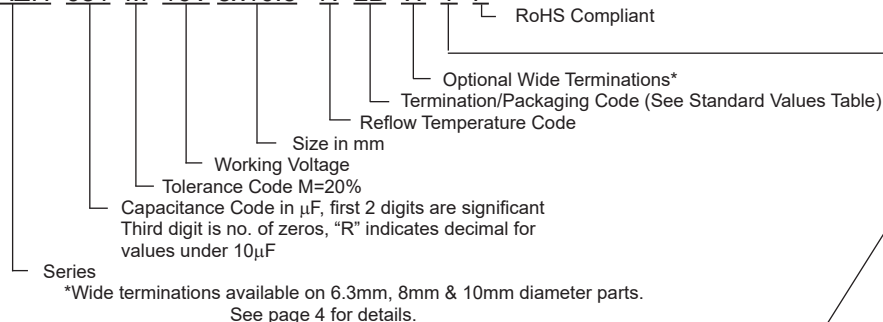
Code	Peak Reflow Temperature
N	260°C

## TERMINATION FINISH & PACKAGING OPTIONS CODES

Code	Finish & Reel Size
B	Sn-Bi Finish & 13" Reel
LB	Sn-Bi Finish & 15" Reel

## PART NUMBER SYSTEM

NAZH 681 M 16V 8x10.5 N LB W Y E



Optional: Suitable for automotive equipment, sourced to special production and inspection at IATF-16949 certified production site



# Surface Mount Aluminum Electrolytic Capacitors NAZH Series

## STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. ESR (Ω) +20°C/100KHz	Max. Ripple Current (mA) +105°C/100KHz	Load Life Hours @ +105°C	
NAZH101M6.3V4X6.1NBF	100	6.3	0.26	0.85	160	2,000	
NAZH221M6.3V5X6.1NBF	220		0.26	0.36	240	2,000	
NAZH331M6.3V6.3X6.1NBF	330		0.26	0.26	300	2,000	
NAZH471M6.3V6.3X8NLF	470		0.26	0.16	600	2,000	
NAZH681M6.3V6.3X8NLF	680		0.26	0.16	600	2,000	
NAZH122M6.3V8X10.5NBF	1200		0.26	0.08	850	2,000	
NAZH152M6.3V8X10.5NLF	1500		0.26	0.08	850	2,000	
NAZH222M6.3V10X10.5NLF	2200		0.28	0.06	1190	2,000	
NAZH680M10V4X6.1NBF	68	10	0.19	0.85	160	2,000	
NAZH151M10V5X6.1NBF	150		0.19	0.36	240	2,000	
NAZH221M10V6.3X6.1NLF	220		0.19	0.26	300	2,000	
NAZH331M10V6.3X8NLF	330		0.19	0.16	600	2,000	
NAZH471M10V6.3X8NLF	470		0.19	0.16	600	2,000	
NAZH102M10V8X10.5NLF	1000		0.19	0.08	850	2,000	
NAZH152M10V10X10.5NLF	1500		0.19	0.06	1190	2,000	
NAZH470M16V4X6.1NBF	47		16	0.16	0.85	160	2,000
NAZH680M16V5X6.1NBF	68	0.16		0.36	240	2,000	
NAZH101M16V5X6.1NBF	100	0.16		0.36	240	2,000	
NAZH151M16V6.3X6.1NLF	150	0.16		0.26	300	2,000	
NAZH221M16V6.3X6.1NLF	220	0.16		0.26	300	2,000	
NAZH331M16V6.3X8NLF	330	0.16		0.16	600	2,000	
NAZH681M16V8X10.5NLF	680	0.16		0.08	850	2,000	
NAZH821M16V8X10.5NLF	820	0.16		0.08	850	2,000	
NAZH102M16V10X10.5NLF	1000	0.16		0.06	1190	2,000	
NAZH122M16V10X10.5NLF	1200	0.16		0.06	1190	2,000	
NAZH220M25V4X6.1NBF	22	25		0.14	0.85	160	2,000
NAZH330M25V4X6.1NBF	33			0.14	0.85	160	2,000
NAZH470M25V5X6.1NBF	47		0.14	0.36	240	2,000	
NAZH680M25V5X6.1NBF	68		0.14	0.36	240	2,000	
NAZH101M25V6.3X6.1NLF	100		0.14	0.26	300	2,000	
NAZH151M25V6.3X8NLF	150		0.14	0.16	600	2,000	
NAZH221M25V6.3X8NLF	220		0.14	0.16	600	2,000	
NAZH471M25V8X10.5NLF	470		0.14	0.08	850	2,000	
NAZH561M25V8X10.5NLF	560		0.14	0.08	850	2,000	
NAZH821M25V10X10.5NLF	820		0.14	0.06	1190	2,000	
NAZH102M25V10X10.5NLF	1000		0.14	0.06	1190	2,000	
NAZH220M35V4X6.1NBF	22		35	0.12	0.85	160	2,000
NAZH330M35V5X6.1NBF	33	0.12		0.36	240	2,000	
NAZH470M35V5X6.1NBF	47	0.12		0.36	240	2,000	
NAZH680M35V6.3X6.1NLF	68	0.12		0.26	300	2,000	
NAZH101M35V6.3X6.1NLF	100	0.12		0.26	300	2,000	
NAZH151M35V6.3X8NLF	150	0.12		0.16	600	2,000	
NAZH331M35V8X10.5NLF	330	0.12		0.08	850	2,000	
NAZH391M35V8X10.5NLF	390	0.12		0.08	850	2,000	
NAZH561M35V10X10.5NLF	560	0.12		0.06	1190	2,000	
NAZH681M35V10X10.5NLF	680	0.12		0.06	1190	2,000	
NAZH100M50V4X6.1NBF	10	50		0.1	2.3	85	2,000
NAZH100M50V5X6.1NBF	10			0.1	0.88	165	2,000
NAZH220M50V5X6.1NBF	22		0.1	0.88	165	2,000	
NAZH470M50V6.3X6.1NBF	47		0.1	0.68	195	2,000	
NAZH101M50V6.3X8NLF	100		0.1	0.34	350	2,000	
NAZH221M50V8X10.5NLF	220		0.1	0.18	670	2,000	
NAZH331M50V10X10.5NLF	330		0.1	0.12	900	2,000	

## RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

Frequency	120Hz	1KHz	10KHz	100KHz~
All Values	0.50	0.75	0.95	1.00

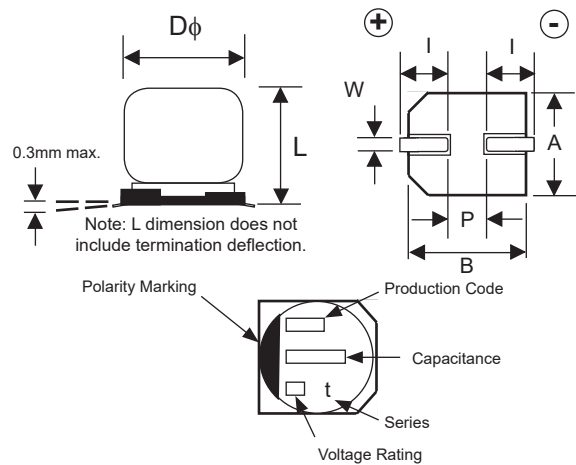


# Surface Mount Aluminum Electrolytic Capacitors NAZH Series

## COMPONENT DIMENSIONS (mm)

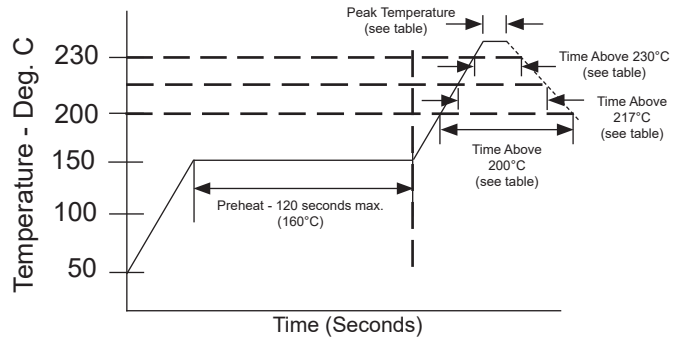
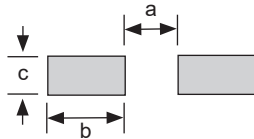
Case Size	$\phi D \pm 0.5$	L max.	A $\pm 0.2$	B $\pm 0.2$	I $\pm 0.3$	W	P $\pm 0.3$
4x6.1	4.0	6.1	4.3	4.3	1.8	0.5~0.8	1.0
5x6.1	5.0	6.1	5.3	5.3	2.2	0.5~0.8	1.5
6.3x6.1	6.3	6.1	6.6	6.6	2.6	0.5~0.8	1.8
6.3x8	6.3	8	6.6	6.6	2.6	0.5~0.8	1.8
8x10.5*	8.0	10.5	8.3	8.3	3.4	0.7~1.1	3.1
10x10.5*	10.0	10.5	10.3	10.3	3.5	0.7~1.4	4.6

\*See page 4 wide termination component dimensions.



## RECOMMENDED LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
4x6.1	1.0	2.5	1.6
5x6.1	1.5	2.8	1.6
6x3x6.1	1.8	3.2	1.6
6.3x8	1.8	3.2	1.6
8x10.5	2.8	4.1	2.1
10x10.5	4.3	4.4	2.5



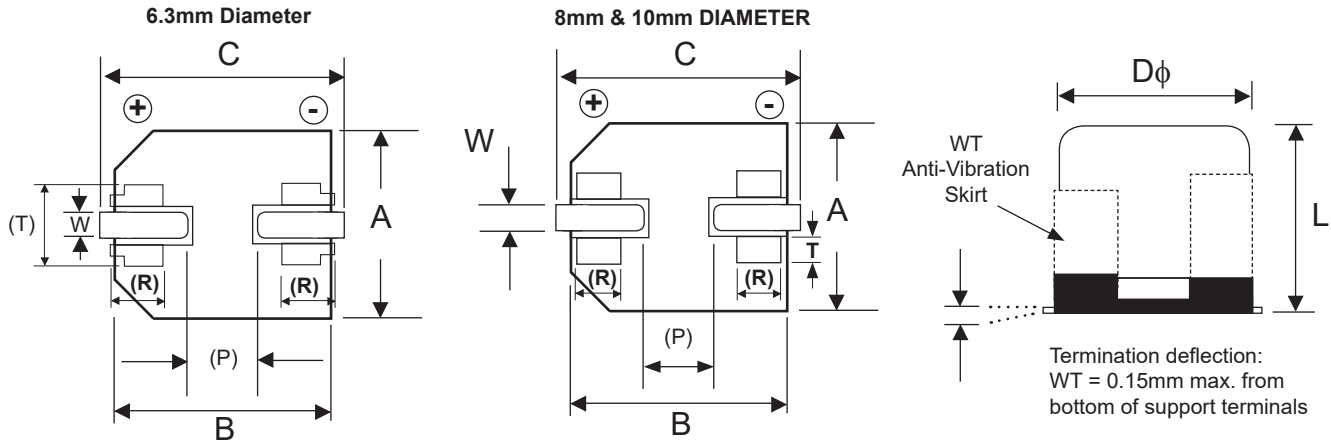
Review & Compare Reflow Soldering Heat Limits  
V-chip SMT Aluminum Electrolytic Capacitors  
[www.niccomp.com/RSL](http://www.niccomp.com/RSL)



# Surface Mount Aluminum Electrolytic Capacitors NAZH Series

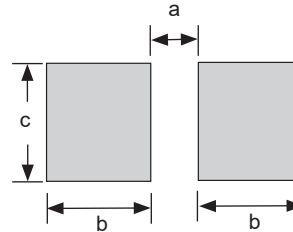
## WIDE TERMINATION (WT) DIM. (mm)

Case Size	D $\phi$ $\pm$ 0.5	L max.	A, B $\pm$ 0.2	C max.	P ref.	W	R $\pm$ 0.2	T $\pm$ 0.2
6.3x6.1	6.3	6.4	6.6	7.8	(2.2)	0.55 ~ 0.75	(1.3)	(3.0)
6.3x8	6.3	8.3	6.6	7.8	(2.2)	0.55 ~ 0.75	(1.3)	(3.0)
8x10.5	8.0	11.2	8.3	10.0	(3.1)	0.7 ~ 1.1	0.7	1.3
10x10.5	10.0	11.2	10.3	12.0	(4.6)	0.7 ~ 1.4	0.7	1.3



## WT LAND PATTERN DIM. (mm)

Case Size	a	b	c
6.3x6.1	1.2	3.6	3.2
6.3x8	1.2	3.6	3.2
8x10.5	2.5	4.5	4.7
10x10.5	3.8	4.8	4.7



W (Wide Terminations) Anti-Vibration Test	
Test Method	Direction: X, Y, Z axis Frequency & Duration: 5 to 2000Hz reciprocation for 20 minutes, 2 hours each direction Peak to Peak Amplitude: 5mm Peak Acceleration: 30G Sweep Type: Log
$\Delta$ Capacitance	Within $\pm$ 10% of initial value
Tangent of Loss	$\leq$ Specified value
Leakage Current	$\leq$ Specified value

### 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)



# Surface Mount Aluminum Electrolytic Capacitors NAZH Series

## PEAK REFLOW TEMPERATURE AND DURATION

Diameter	Peak Temperature	Duration	Time $\geq 230^{\circ}\text{C}$	Time $\geq 217^{\circ}\text{C}$	Time $\geq 200^{\circ}\text{C}$	Number of Reflow Passes*
4 ~ 6.3mm $\phi$	260 $^{\circ}\text{C}$	Time $\geq 250^{\circ}\text{C}$ , 5 sec.	30 sec.	40 sec.	70 sec.	2
	255 $^{\circ}\text{C}$	Time $\geq 250^{\circ}\text{C}$ , 10 sec.				
8 ~ 10mm $\phi$	260 $^{\circ}\text{C}$	Time $\geq 250^{\circ}\text{C}$ , 5 sec.				
	245 $^{\circ}\text{C}$	Time $\geq 240^{\circ}\text{C}$ , 10 sec.				1
						2

\*Second reflow shall be at least one hour after natural cool to room temperature.

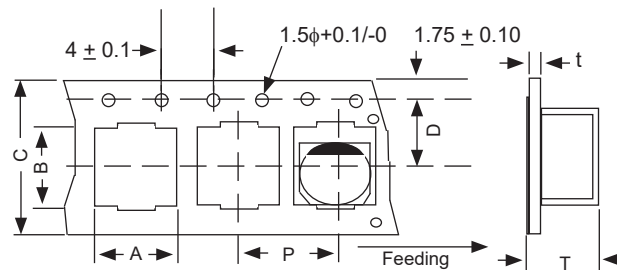
## RESISTANCE TO SOLDERING HEAT

Resistance to Soldering Heat	After reflow soldering the capacitor shall be stabilized at room temperature prior to measuring.	
	Capacitance Change	Within $\pm 10\%$ of initial measured value
	Tan $\delta$	Less than specified maximum value
	Leakage Current	Less than specified maximum value
	Appearance	No significant change can be observed

## CARRIER TAPE DIMENSIONS

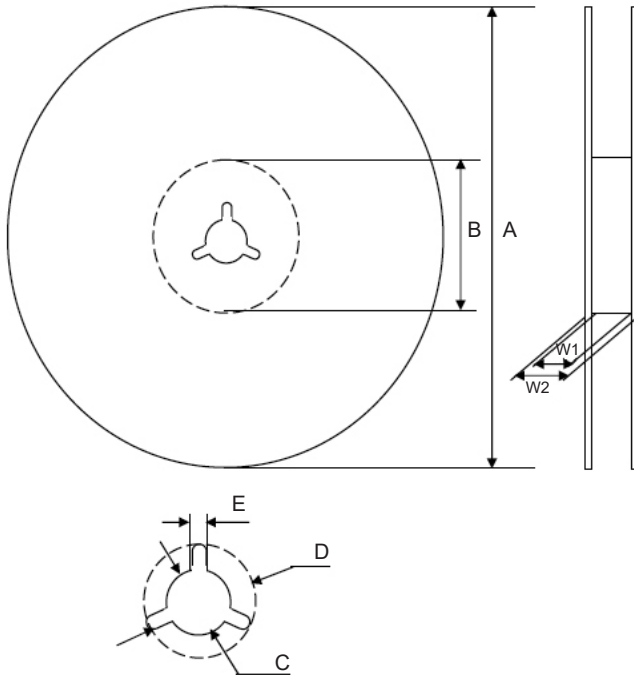
Case Size	A $\pm 0.2$	B $^{+0.3}/_{-0.2}$	C $\pm 0.3$	D $\pm 0.1$	P $\pm 0.1$	T $\pm 0.2$	t $\pm 0.1$
4x6.1	4.7	4.6 $^{+0.2}/_{-0.1}$	12.0	5.5	8.0	6.2	0.6
5x6.1	5.7	5.7	12.0	5.5	12.0	6.4	
6.3x6.1	7.0	7.0	16.0	7.5	12.0	6.4	
6.3x8	7.0	7.0	16.0	7.5	12.0	8.4	
8x10.5	8.7	8.7	24.0	11.5	16.0	11.1	
10x10.5	10.7	10.7	24.0	11.5	16.0	11.2	

1. Leader and trailer will have a minimum of 10 empty pockets and 20cm of extended cover tape.
2. A maximum of 3 connections (splices) per reel.



# Surface Mount Aluminum Electrolytic Capacitors NAZH Series

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



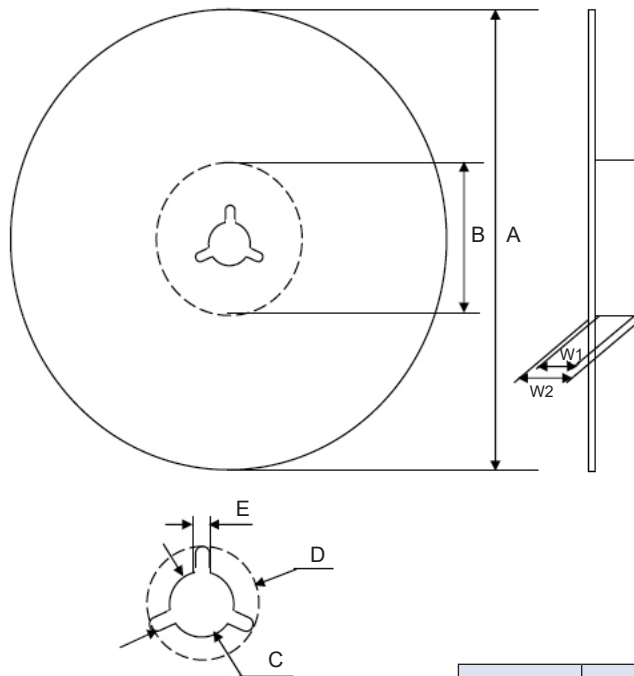
### Dimensions (mm)

Case Size	Tape Width	W1	W2
4x6.1, 5x6.1	12.0	12.4 ~ 14.4	15.5 ~ 20.0
6.3x6.1, 6.3x8	16.0	16.4 ~ 18.4	19.5 ~ 24.0
8x10.5, 10x10.5	24.0	24.4 ~ 26.4	27.5 ~ 32.0

Case Size	Tape Width	A	B	C	D	E
4x6.1, 5x6.1	12.0	$\phi 330$ $\pm 2.0$	$\phi 50 \sim 105$	$\phi 13$ $\pm 0.5$	$\phi 21$ $\pm 1.0$	2.0 $\pm 0.5$
6.3x6.1, 6.3x8	16.0					
8x10.5, 10x10.5	24.0					

Color
Black or Blue

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



### Dimensions (mm)

Case Size	Tape Width	W1	W2
8x10.5, 10x10.5	24.0	24.5 ~ 26.0	27.5 ~ 32.0

Case Size	Tape Width	A	B	C	D	E
8x10.5, 10x10.5	24.0	$\phi 380$ $\pm 2$	$\phi 80 \sim 105$	$\phi 13$ $\pm 0.5$	$\phi 21$ $\pm 1.0$	2.0 $\pm 0.5$

Color
Black or Blue

Case Size	Reel Quantity	
	13" (330mm)	15" (380mm)
4x6.1	1,200	-
5x6.1	800	-
6.3x6.1	800	1000
6.3x8	500	900
8x10.5	300	500
10x10.5	300	500

