

# Surface Mount Aluminum Electrolytic Capacitors NAZK Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- SUIT FOR HIGH TEMPERATURE REFLOW SOLDERING (UP TO 260°C)
- LOW IMPEDANCE AND HIGH RIPPLE CURRENT
- 2,000 HOUR LOAD LIFE @ +105°C
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

See **NAZT** for  
New Designs

**RoHS  
Compliant**

includes all homogeneous materials



## CHARACTERISTICS

|                                                         |                                       |                                                |      |      |      |      |
|---------------------------------------------------------|---------------------------------------|------------------------------------------------|------|------|------|------|
| Rated Voltage Rating                                    | 6.3 ~ 35Vdc                           |                                                |      |      |      |      |
| Rated Capacitance Range                                 | 4.7 ~ 1,000μF                         |                                                |      |      |      |      |
| Operating Temp. Range                                   | -55 ~ +105°C                          |                                                |      |      |      |      |
| Capacitance Tolerance                                   | ±20% (M)                              |                                                |      |      |      |      |
| Max. Leakage Current<br>After 2 Minutes @ 20°C          | 0.01CV or 3μA<br>whichever is greater |                                                |      |      |      |      |
| Tan δ @ 120Hz/20°C                                      | W.V. (Vdc)                            | 6.3                                            | 10   | 16   | 25   | 35   |
|                                                         | S.V. (Vdc)                            | 8.0                                            | 13   | 20   | 32   | 44   |
|                                                         | Tan δ                                 | 0.26                                           | 0.19 | 0.16 | 0.14 | 0.12 |
| Low Temperature<br>Stability<br>Impedance Ratio @ 120Hz | W.V. (Vdc)                            | 6.3                                            | 10   | 16   | 25   | 35   |
|                                                         | Z-40°C/Z+20°C                         | 3                                              | 3    | 3    | 3    | 3    |
|                                                         | Z-55°C/Z+20°C                         | 4                                              | 4    | 4    | 3    | 3    |
| Load Life Test @ 105°C<br>All Case Sizes = 2,000 hours  | 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          |      |      |      |      |

\*See Part Number System for Details

**SAC Alloy Compatible**  
230°C ~ 260°C

**LOW ESR COMPONENT**  
LIQUID ELECTROLYTE  
For Performance Data  
see [www.LowESR.com](http://www.LowESR.com)

## PART NUMBER SYSTEM

NAZK 101 M 16V 6.3x8 N B P F

NAZK: Series  
 101: Capacitance Code in μF, first 2 digits are significant  
 M: Tolerance Code M=20%  
 16V: Working Voltage  
 6.3x8: Size in mm  
 N: Reflow Temperature Code  
 B: Termination/Packaging Code  
 P: Optional plastic reel (standard material is cardboard). See page 3 & 4  
 F: RoHS Compliant

## DIMENSIONS (mm) AND REEL QUANTITIES

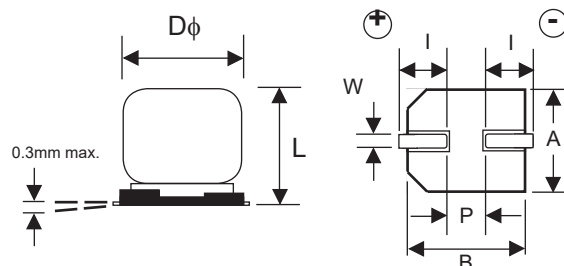
| Case Size | φD±0.5 | L max. | A±0.2 | B±0.2 | I±0.3 | W       | P±0.3 |
|-----------|--------|--------|-------|-------|-------|---------|-------|
| 4x6.1     | 4      | 6.1    | 4.3   | 4.3   | 1.8   | 0.5~0.8 | 1.0   |
| 5x6.1     | 5      | 6.1    | 5.3   | 5.3   | 2.2   | 0.5~0.8 | 1.3   |
| 6.3x6.1   | 6.3    | 6.1    | 6.6   | 6.6   | 2.7   | 0.5~0.8 | 1.8   |
| 6.3x8     | 6.3    | 8.0    | 6.6   | 6.6   | 2.5   | 0.5~0.8 | 2.2   |
| 8x10.5    | 8.0    | 10.5   | 8.3   | 8.3   | 2.9   | 0.7~1.1 | 3.2   |
| 10x10.5   | 10.0   | 10.5   | 10.3  | 10.3  | 3.2   | 0.7~1.4 | 4.6   |

## PEAK REFLOW TEMPERATURE CODES

| Code | Peak Reflow Temperature |
|------|-------------------------|
| N    | 260°C                   |
| L    | 250°C                   |

## TERMINATION FINISH & PACKAGING OPTIONS CODES

| Code | Finish & Reel Size        |
|------|---------------------------|
| B    | Sn-Bi Finish & 13" Reel   |
| LB   | Sn-Bi Finish & 15" Reel   |
| S    | 100% Sn Finish & 13" Reel |
| LS   | 100% Sn Finish & 15" Reel |



## 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 NAZK Series

## STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

| NIC Part Number        | Cap.<br>( $\mu$ F) | W.V.<br>(Vdc) | Dissipation Factor<br>(Tan $\delta$ ) | Max. Impedance ( $\Omega$ )<br>+20°C/100KHz | Max. Ripple Current (mA)<br>+105°C/100KHz | Load Life Hours<br>@ +105°C |
|------------------------|--------------------|---------------|---------------------------------------|---------------------------------------------|-------------------------------------------|-----------------------------|
| NAZK220M6.3V4X6.1NBF   | 22                 | 6.3           | 0.26                                  | 1.35                                        | 90                                        | 2,000                       |
| NAZK470M6.3V4X6.1NBF   | 47                 |               | 0.26                                  | 1.35                                        | 90                                        | 2,000                       |
| NAZK470M6.3V5X6.1NBF   | 47                 |               | 0.26                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK101M6.3V5X6.1NBF   | 100                |               | 0.26                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK101M6.3V6.3X6.1NBF | 100                |               | 0.26                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK221M6.3V6.3X6.1NBF | 220                |               | 0.26                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK221M6.3V6.3X8NBF   | 220                |               | 0.26                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK331M6.3V6.3X8NBF   | 330                |               | 0.26                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK102M6.3V8X10.5LBF  | 1000               |               | 0.26                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK330M10V4X6.1NBF    | 33                 | 10            | 0.19                                  | 1.35                                        | 90                                        | 2,000                       |
| NAZK221M10V6.3X8NBF    | 220                |               | 0.19                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK471M10V8X10.5LBF   | 470                |               | 0.19                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK681M10V8X10.5LBF   | 680                |               | 0.19                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK102M10V10X10.5LBF  | 1000               |               | 0.19                                  | 0.08                                        | 850                                       | 2,000                       |
| NAZK100M16V4X6.1NBF    | 10                 | 16            | 0.16                                  | 1.35                                        | 90                                        | 2,000                       |
| NAZK220M16V4X6.1NBF    | 22                 |               | 0.16                                  | 1.35                                        | 90                                        | 2,000                       |
| NAZK220M16V5X6.1NBF    | 22                 |               | 0.16                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK330M16V5X6.1NBF    | 33                 |               | 0.16                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK470M16V5X6.1NBF    | 47                 |               | 0.16                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK470M16V6.3X6.1NBF  | 47                 |               | 0.16                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK101M16V6.3X6.1NBF  | 100                |               | 0.16                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK101M16V6.3X8NBF    | 100                |               | 0.16                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK221M16V6.3X8NBF    | 220                |               | 0.16                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK331M16V8X10.5LBF   | 330                |               | 0.16                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK471M16V8X10.5LBF   | 470                |               | 0.16                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK681M16V10X10.5LBF  | 680                |               | 0.16                                  | 0.08                                        | 850                                       | 2,000                       |
| NAZK330M25V5X6.1NBF    | 33                 | 25            | 0.14                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK330M25V6.3X6.1NBF  | 33                 |               | 0.14                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK470M25V6.3X6.1NBF  | 47                 |               | 0.14                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK101M25V6.3X8NBF    | 100                |               | 0.14                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK221M25V8X10.5LBF   | 220                |               | 0.14                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK331M25V8X10.5LBF   | 330                |               | 0.14                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK471M25V10X10.5LBF  | 470                |               | 0.14                                  | 0.09                                        | 850                                       | 2,000                       |
| NAZK4R7M35V4X6.1NBF    | 4.7                | 35            | 0.12                                  | 1.45                                        | 90                                        | 2,000                       |
| NAZK100M35V4X6.1NBF    | 10                 |               | 0.12                                  | 1.45                                        | 90                                        | 2,000                       |
| NAZK100M35V5X6.1NBF    | 10                 |               | 0.12                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK220M35V5X6.1NBF    | 22                 |               | 0.12                                  | 0.70                                        | 170                                       | 2,000                       |
| NAZK220M35V6.3X6.1NBF  | 22                 |               | 0.12                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK330M35V6.3X6.1NBF  | 33                 |               | 0.12                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK470M35V6.3X6.1NBF  | 47                 |               | 0.12                                  | 0.36                                        | 250                                       | 2,000                       |
| NAZK470M35V6.3X8NBF    | 47                 |               | 0.12                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK101M35V6.3X8NBF    | 100                |               | 0.12                                  | 0.34                                        | 300                                       | 2,000                       |
| NAZK101M35V8X10.5LBF   | 100                |               | 0.12                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK221M35V8X10.5LBF   | 220                |               | 0.12                                  | 0.16                                        | 600                                       | 2,000                       |
| NAZK331M35V10X10.5LBF  | 330                |               | 0.12                                  | 0.09                                        | 850                                       | 2,000                       |

## RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

| Frequency          | 120Hz | 1KHz | 10KHz | 100KHz |
|--------------------|-------|------|-------|--------|
| 4.7 $\mu$ F        | 0.42  | 0.60 | 0.80  | 1.00   |
| 10 ~ 33 $\mu$ F    | 0.45  | 0.75 | 0.90  | 1.00   |
| 47 ~ 100 $\mu$ F   | 0.50  | 0.80 | 0.95  | 1.00   |
| 220 ~ 1000 $\mu$ F | 0.60  | 0.85 | 0.95  | 1.00   |

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

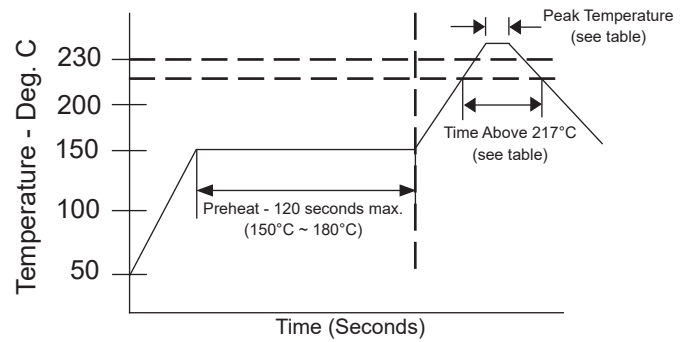


# Surface Mount Aluminum Electrolytic Capacitors NAZK Series

## PEAK REFLOW TEMPERATURE AND DURATION

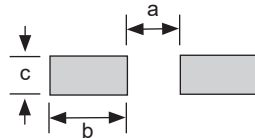
| Diameter        | Time above 217°C | Peak Temperature 5 seconds |
|-----------------|------------------|----------------------------|
| 6.3mm $\phi$    | 60 sec. max.     | 260°C                      |
| 8 ~ 10mm $\phi$ | 60 sec. max.     | 250°C                      |

Capacitors can withstand two times reflow at the above conditions. Second reflow shall be at least one hour after natural cool to room temperature.



## RECOMMENDED LAND PATTERN DIMENSIONS (mm)

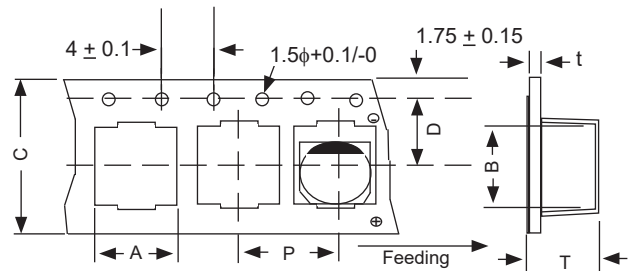
| Case Size | a   | b   | c   |
|-----------|-----|-----|-----|
| 4x6.1     | 1.0 | 2.6 | 1.6 |
| 5x6.1     | 1.4 | 3.0 | 1.6 |
| 6.3x6.1   | 2.1 | 3.5 | 1.6 |
| 6.3x8     | 2.1 | 3.5 | 1.8 |
| 8x10.5    | 2.8 | 4.1 | 2.1 |
| 10x10.5   | 4.3 | 4.4 | 2.5 |



## 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.

| Case Size | A         | B         | C         | D         | P         | T         | t         |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | $\pm 0.5$ | $\pm 0.5$ | $\pm 0.3$ | $\pm 0.1$ | $\pm 0.1$ | $\pm 0.2$ | $\pm 0.1$ |
| 4x6.1     | 4.7       | 4.7       | 12.0      | 5.5       | 8.0       | 6.4       | 0.4       |
| 5x6.1     | 5.7       | 5.7       | 12.0      | 5.5       | 12.0      | 6.4       | 0.4       |
| 6.3x6.1   | 7.0       | 7.0       | 16.0      | 7.5       | 12.0      | 6.4       | 0.4       |
| 6.3x8     | 7.0       | 7.0       | 16.0      | 7.5       | 12.0      | 8.2       | 0.4       |
| 8x10.5    | 8.7       | 8.7       | 24.0      | 11.5      | 16.0      | 11.0      | 0.4       |
| 10x10.5   | 10.7      | 10.7      | 24.0      | 11.5      | 16.0      | 11.0      | 0.4       |

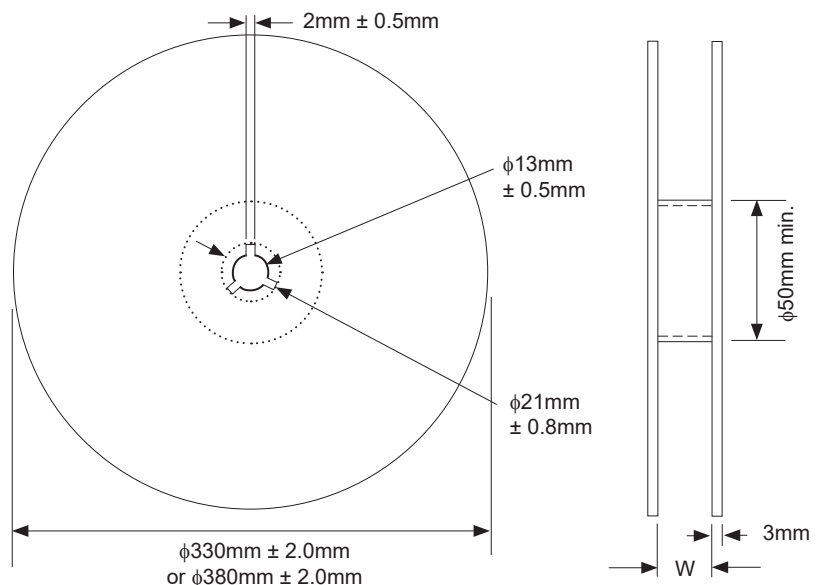


## B suffix 330mm (13") CARDBOARD REEL

## LB suffix 380mm (15") CARDBOARD REEL

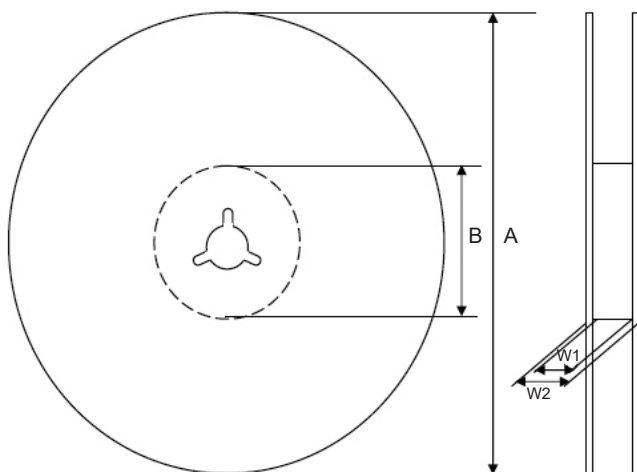
(See page 6 for plastic reel dimensions)

| Case Size | W<br>$\pm 1.0$ | Qty per Reel |             |
|-----------|----------------|--------------|-------------|
|           |                | 13" (330mm)  | 15" (380mm) |
| 4x6.1     | 14             | 1,200        | 2,000       |
| 5x6.1     | 14             | 800          | 1,000       |
| 6.3x6.1   | 18             | 800          | 1,000       |
| 6.3x8     | 18             | 500          | 900         |
| 8x10.5    | 26             | 300          | 500         |
| 10x10.5   | 26             | 300          | 500         |



# Surface Mount Aluminum Electrolytic Capacitors NAZK Series

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

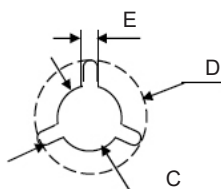


### Dimensions (mm)

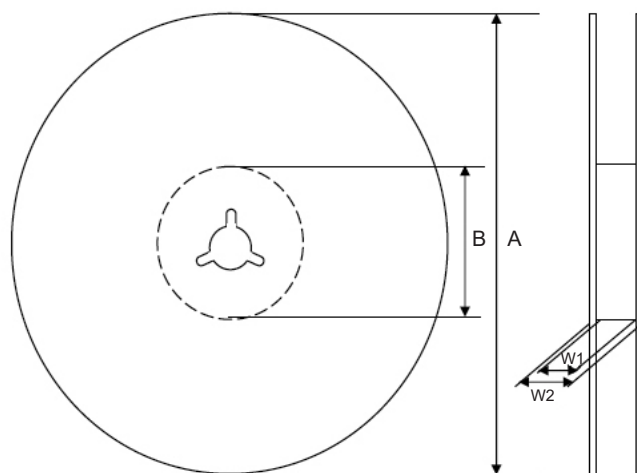
| Case Size       | Tape Width | W1          | W2          |
|-----------------|------------|-------------|-------------|
| 4x6.1, 5x6.1    | 12.0       | 12.4 ~ 14.4 | 15.5 ~ 20.0 |
| 6.3x6.1, 6.3x8  | 16.0       | 16.4 ~ 18.4 | 19.5 ~ 24.0 |
| 8x10.5, 10x10.5 | 24.0       | 24.4 ~ 26.4 | 27.5 ~ 32.0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

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

| Color         |
|---------------|
| Black or Blue |



## Optional V-Chip 15" (380mm) Plastic Reels (LBP suffix)

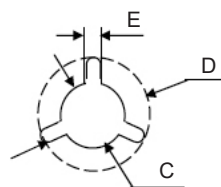


### Dimensions (mm)

| Case Size       | Tape Width | W1          | W2          |
|-----------------|------------|-------------|-------------|
| 4x6.1, 5x6.1    | 12.0       | 12.5 ~ 14.0 | 15.5 ~ 20.0 |
| 6.3x6.1, 6.3x8  | 16.0       | 16.5 ~ 18.0 | 19.5 ~ 24.0 |
| 8x10.5, 10x10.5 | 24.0       | 24.5 ~ 26.0 | 27.5 ~ 32.0 |

| Case Size       | Tape Width | A                     | B                  | C                      | D                      | E                |
|-----------------|------------|-----------------------|--------------------|------------------------|------------------------|------------------|
| 4x6.1, 5x6.1    | 12.0       | $\phi 380$<br>$\pm 2$ | $\phi 80 \sim 105$ | $\phi 13$<br>$\pm 0.5$ | $\phi 21$<br>$\pm 1.0$ | 2.0<br>$\pm 0.5$ |
| 6.3x6.1, 6.3x8  | 16.0       |                       |                    |                        |                        |                  |
| 8x10.5, 10x10.5 | 24.0       |                       |                    |                        |                        |                  |

| Color         |
|---------------|
| Black or Blue |



| Case Size | Qty per Reel |             |
|-----------|--------------|-------------|
|           | 13" (330mm)  | 15" (380mm) |
| 4x6.1     | 1,200        | 2,000       |
| 5x6.1     | 800          | 1,000       |
| 6.3x6.1   | 800          | 1,000       |
| 6.3x8     | 500          | 900         |
| 8x10.5    | 300          | 500         |
| 10x10.5   | 300          | 500         |

