

# Surface Mount Aluminum Electrolytic Capacitors NAWE Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- SUIT FOR HIGH TEMPERATURE REFLOW SOLDERING (UP TO 260°C)
- 1,000 HOUR LOAD LIFE @ +105°C
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

SAC Alloy Compatible  
230°C ~ 260°C

**RoHS**  
**Compliant**  
includes all homogeneous materials



## CHARACTERISTICS

|                                                |                                       |
|------------------------------------------------|---------------------------------------|
| Rated Voltage Rating                           | 6.3 ~ 50Vdc                           |
| Rated Capacitance Range                        | 1.0 ~ 470μF                           |
| 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 |

\*See Part Number System for Details

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

|                                                         |                               |                                                |      |      |      |      |
|---------------------------------------------------------|-------------------------------|------------------------------------------------|------|------|------|------|
| Tan δ @ 120Hz/20°C                                      | W.V. (Vdc)                    | 6.3                                            | 16   | 25   | 35   | 50   |
|                                                         | S.V. (Vdc)                    | 8.0                                            | 20   | 32   | 44   | 63   |
|                                                         | 4mm, 5mm diameter & 6.3x6.1mm | 0.30                                           | 0.20 | 0.16 | 0.14 | 0.12 |
|                                                         | 6.3x8mm & 8mm diameter        | 0.35                                           | 0.24 | 0.18 | 0.14 | 0.12 |
| Low Temperature<br>Stability<br>Impedance Ratio @ 120Hz | W.V. (Vdc)                    | 6.3                                            | 16   | 25   | 35   | 50   |
|                                                         | Z-25°C/Z+20°C                 | 4                                              | 2    | 2    | 2    | 2    |
|                                                         | Z-40°C/Z+20°C                 | 8                                              | 4    | 4    | 3    | 3    |
| Load Life Test @ 105°C<br>All Case Sizes = 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          |      |      |      |      |

## STANDARD VALUES AND CASE SIZES (mm)

| Cap.<br>(μF) | Code | Working Voltage (Vdc) |         |         |         |         |
|--------------|------|-----------------------|---------|---------|---------|---------|
|              |      | 6.3                   | 16      | 25      | 35      | 50      |
| 1.0          | 1R0  | -                     | -       | -       | -       | 4x5.5   |
| 2.2          | 2R2  | -                     | -       | -       | -       | 4x5.5   |
| 3.3          | 3R3  | -                     | -       | -       | -       | 4x5.5   |
| 4.7          | 4R7  | -                     | -       | -       | 4x5.5   | 5x5.5   |
| 10           | 100  | -                     | 4x5.5   | -       | 5x5.5   | 6.3x5.5 |
| 22           | 220  | 4x5.5                 | 5x5.5   | -       | 6.3x5.5 | -       |
| 33           | 330  | -                     | -       | 6.3x5.5 | -       | -       |
| 47           | 470  | -                     | 6.3x5.5 | -       | -       | -       |
| 100          | 101  | 6.3x5.5               | 6.3x5.5 | -       | -       | 8x10.5  |
| 220          | 221  | -                     | -       | 8x10.5  | -       | -       |
| 330          | 331  | -                     | 8x10.5  | -       | -       | -       |
| 470          | 471  | 8x10.5                | -       | -       | -       | -       |

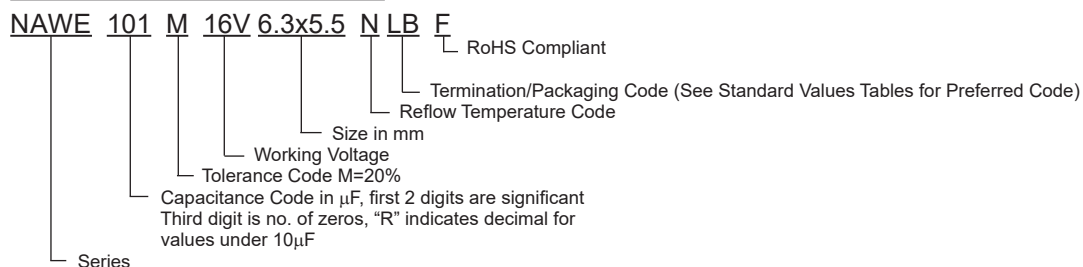
## PEAK REFLOW TEMPERATURE CODES

| Code | Peak Reflow<br>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 |

## PART NUMBER SYSTEM



# Surface Mount Aluminum Electrolytic Capacitors NAWE Series

## 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 | Load Life Hours @ +105°C |
|------------------------|-----------|------------|----------------------------|---------------------------------------|--------------------------|
| NAWE220M6.3V4X5.5N_F   | 22        | 6.3        | 0.30                       | 23                                    | 1,000                    |
| NAWE101M6.3V6.3X5.5NBF | 100       |            | 0.30                       | 57                                    | 1,000                    |
| NAWE471M6.3V8X10.5L_F  | 470       |            | 0.35                       | 210                                   | 1,000                    |
| NAWE100M16V4X5.5N_F    | 10        | 16         | 0.20                       | 20                                    | 1,000                    |
| NAWE220M16V5X5.5NBF    | 22        |            | 0.20                       | 31                                    | 1,000                    |
| NAWE470M16V6.3X5.5NBF  | 47        |            | 0.20                       | 56                                    | 1,000                    |
| NAWE101M16V6.3X5.5NBF  | 100       |            | 0.20                       | 65                                    | 1,000                    |
| NAWE331M16V8X10.5L_F   | 330       |            | 0.20                       | 195                                   | 1,000                    |
| NAWE330M25V6.3X5.5NBF  | 33        | 25         | 0.16                       | 48                                    | 1,000                    |
| NAWE221M25V8X10.5L_F   | 220       |            | 0.16                       | 190                                   | 1,000                    |
| NAWE4R7M35V4X5.5N_F    | 4.7       | 35         | 0.14                       | 14                                    | 1,000                    |
| NAWE100M35V5X5.5NBF    | 10        |            | 0.14                       | 24                                    | 1,000                    |
| NAWE220M35V6.3X5.5NBF  | 22        |            | 0.14                       | 46                                    | 1,000                    |
| NAWE1R0M50V4X5.5N_F    | 1.0       | 50         | 0.12                       | 8.0                                   | 1,000                    |
| NAWE2R2M50V4X5.5N_F    | 2.2       |            | 0.12                       | 11                                    | 1,000                    |
| NAWE3R3M50V4X5.5N_F    | 3.3       |            | 0.12                       | 13                                    | 1,000                    |
| NAWE4R7M50V5X5.5NBF    | 4.7       |            | 0.12                       | 18                                    | 1,000                    |
| NAWE100M50V6.3X5.5NBF  | 10        |            | 0.12                       | 28                                    | 1,000                    |
| NAWE101M50V8X10.5L_F   | 100       |            | 0.12                       | 200                                   | 1,000                    |

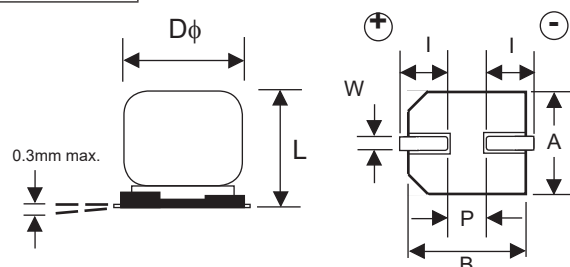
Part Number Suffix Where \_ \_ : Preferred (15" reel) = LB, Legacy (13" reel) = B (check with NIC for availability)

## RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

| Frequency   | 50/60Hz | 120Hz | 500Hz | 1KHz | 10KHz |
|-------------|---------|-------|-------|------|-------|
| 1μF         | 0.5     | 1.00  | 1.20  | 1.30 | 1.50  |
| 2.2 ~ 4.7μF | 0.65    | 1.00  | 1.20  | 1.30 | 1.50  |
| 10 ~ 47μF   | 0.80    | 1.00  | 1.20  | 1.30 | 1.50  |
| 100 ~ 470μF | 0.80    | 1.00  | 1.10  | 1.15 | 1.20  |

## 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 | Qty/Reel |
|-----------|--------|--------|-------|-------|-------|---------|-------|----------|
| 4x5.5     | 4.0    | 5.5    | 4.3   | 4.3   | 1.8   | 0.5~0.8 | 1.0   | 1,500    |
| 5x5.5     | 5.0    | 5.5    | 5.3   | 5.3   | 2.2   | 0.5~0.8 | 1.4   | 1000     |
| 6.3x5.5   | 6.3    | 5.5    | 6.6   | 6.6   | 2.5   | 0.5~0.8 | 2.2   | 1000     |
| 8x10.5    | 8.0    | 10.5   | 8.3   | 8.3   | 2.9   | 0.7~1.1 | 3.2   | 300      |



## 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)

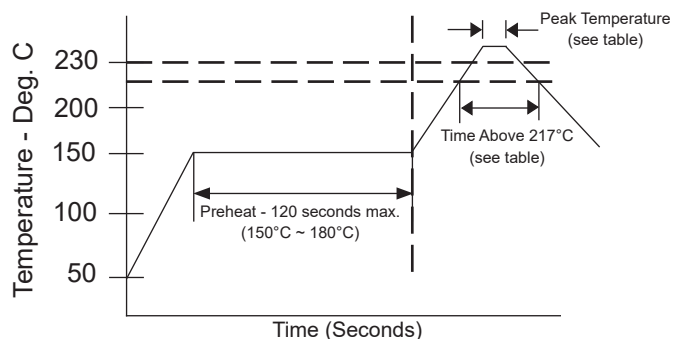


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## PEAK REFLOW TEMPERATURE AND DURATION

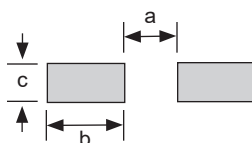
| Diameter         | Time above 217°C | Peak Temperature 5 seconds |
|------------------|------------------|----------------------------|
| 4 ~ 6.3mm $\phi$ | 60 sec. max.     | 260°C                      |
| 8mm $\phi$       | 60 sec. max.     | 250°C                      |

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   |
|-----------|-----|-----|-----|
| 4x5.5     | 1.0 | 2.6 | 1.8 |
| 5x5.5     | 1.4 | 3.0 | 1.8 |
| 6x3x5.5   | 1.8 | 3.6 | 1.8 |
| 8x10.5    | 2.8 | 4.1 | 2.2 |



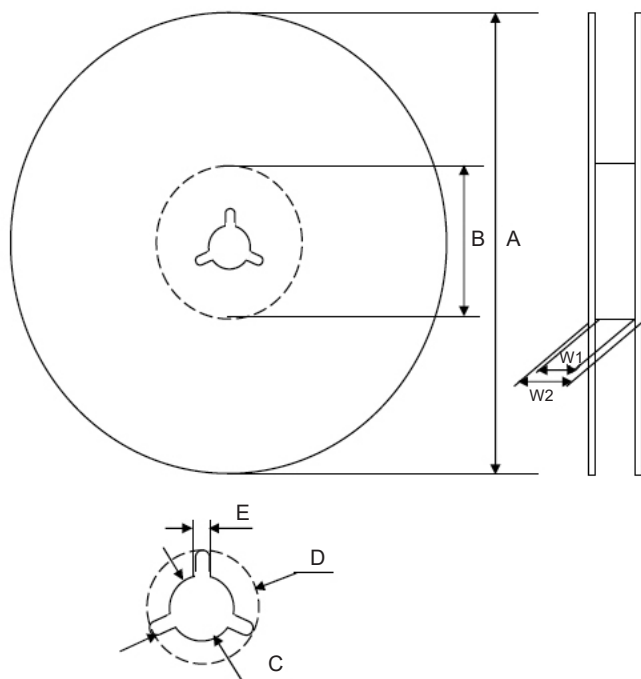
Review & Compare Reflow Soldering Heat Limits  
V-chip SMT Aluminum Electrolytic Capacitors  
[www.niccomp.com/RSL](http://www.niccomp.com/RSL)

## CARRIER TAPE DIMENSIONS & REEL QTY

| Case Size | A ±0.5 | B ±0.5 | 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    | 0.6    |
| 5x5.5     | 5.7    | 5.7    | 12.0   | 5.5    | 12.0   | 5.8    | 0.6    |
| 6.3x5.5   | 7.0    | 7.0    | 16.0   | 7.5    | 12.0   | 5.8    | 0.6    |
| 8x10.5    | 8.7    | 8.7    | 24.0   | 11.5   | 16.0   | 11.1   | 0.6    |

# Surface Mount Aluminum Electrolytic Capacitors NAWE Series

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



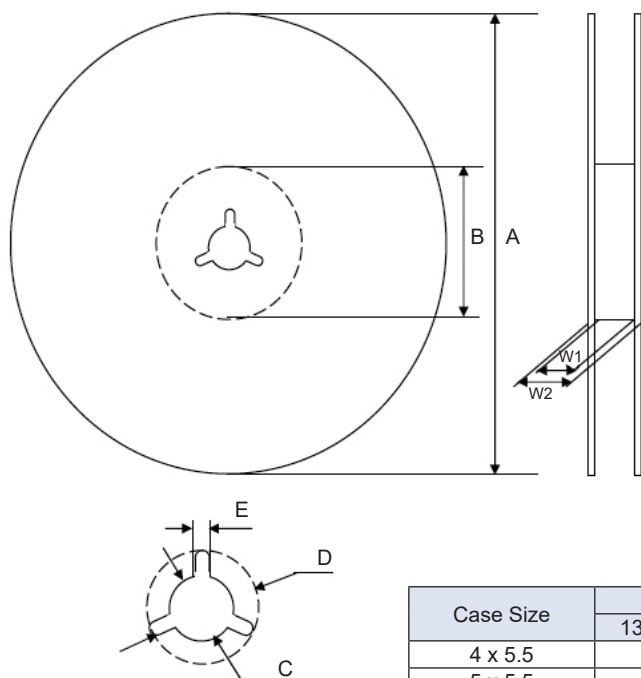
### Dimensions (mm)

| Case Size | Tape Width | W1          | W2          |
|-----------|------------|-------------|-------------|
| 4x5.5     | 12.0       | 12.5 ~ 14.0 | 15.5 ~ 20.0 |
| 8x10.5    | 24.0       | 24.5 ~ 26.0 | 27.5 ~ 32.0 |

| Case Size | Tape Width | A          | B                  | C                 | D                 | E         |
|-----------|------------|------------|--------------------|-------------------|-------------------|-----------|
| 4x5.5     | 12.0       | $\phi 380$ | $\phi 80 \sim 105$ | $\phi 13 \pm 0.5$ | $\phi 21 \pm 1.0$ | 2.0       |
| 8x10.5    | 24.0       | $\pm 2$    |                    |                   |                   | $\pm 0.5$ |

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

## Optional V-Chip 13" (330mm) Reels (B 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 |
| 8x10.5       | 24.0       | 24.4 ~ 26.4 | 27.5 ~ 32.0 |

| Case Size | Tape Width | A          | B                  | C                 | D                 | E         |
|-----------|------------|------------|--------------------|-------------------|-------------------|-----------|
| 4x5.5     | 12.0       | $\phi 330$ | $\phi 50 \sim 105$ | $\phi 13 \pm 0.5$ | $\phi 21 \pm 1.0$ | 2.0       |
| 6.3x5.5   | 16.0       | $\pm 2.0$  |                    |                   |                   | $\pm 0.5$ |
| 8x10.5    | 24.0       |            |                    |                   |                   |           |

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

| Case Size | Quantity Per Reel |                  |
|-----------|-------------------|------------------|
|           | 13" (330mm) Reel  | 15" (380mm) Reel |
| 4 x 5.5   | 1,500 pcs         | 2,000 pcs        |
| 5 x 5.5   | 1,000 pcs         | N/A              |
| 6.3 x 5.5 | 1,000 pcs         | N/A              |
| 8 x 10.5  | 300 pcs           | 500 pcs          |

