

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 | 0.1 ~ 1,000µF | | | | | | |
| 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 |
| | 4mm, 5mm diameter & 6.3x6.1mm | 0.30 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 |
| | 6.3x8mm & 8~10mm diameter | 0.35 | 0.26 | 0.24 | 0.18 | 0.14 | 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 | 8 | 8 | 4 | 4 | 3 | 3 |
| Load Life Test @ 105°C 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 | | | | | |

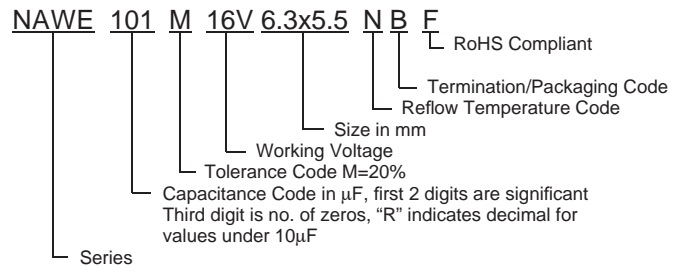
*See Part Number System for Details

LOW ESR COMPONENT
LIQUID ELECTROLYTE
For Performance Data see www.LowESR.com

STANDARD VALUES AND CASE SIZES (mm)

| Cap. (µF) | Code | Working Voltage (Vdc) | | | | | |
|-----------|------|-----------------------|---------|---------|---------|---------|---------|
| | | 6.3 | 10 | 16 | 25 | 35 | 50 |
| 0.1 | R10 | - | - | - | - | - | 4x5.5 |
| 0.22 | R22 | - | - | - | - | - | 4x5.5 |
| 0.33 | R33 | - | - | - | - | - | 4x5.5 |
| 0.47 | R47 | - | - | - | - | - | 4x5.5 |
| 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 | - | 5x5.5 | - | 6.3x5.5 | - | 8x10.5 |
| 47 | 470 | 5x5.5 | - | 6.3x5.5 | - | - | 8x10.5 |
| | | | | | | | 10x10.5 |
| 100 | 101 | 6.3x5.5 | - | 6.3x5.5 | 8x10.5 | 8x10.5 | 8x10.5 |
| | | | | | | 10x10.5 | 10x10.5 |
| 220 | 221 | - | - | 8x10.5 | 8x10.5 | 10x10.5 | - |
| | | | | | 10x10.5 | - | |
| 330 | 331 | - | 8x10.5 | 8x10.5 | 10x10.5 | - | - |
| | | | | 10x10.5 | - | | |
| 470 | 471 | 8x10.5 | 8x10.5 | 10x10.5 | - | - | - |
| | | | 10x10.5 | - | | | |
| 1000 | 102 | 10x10.5 | - | - | - | - | - |

PART NUMBER SYSTEM



PEAK REFLOW TEMPERATURE CODES

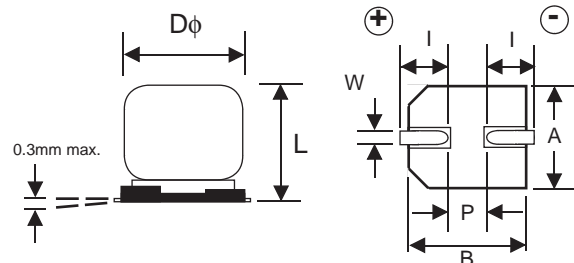
| Code | Peak Reflow Temperature |
|------|-------------------------|
| N | 260°C |
| L | 250°C |

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 |

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 | 1.3 | 1000 |
| 6.3x5.5 | 6.3 | 5.5 | 6.6 | 6.6 | 2.7 | 0.5~0.8 | 1.8 | 1000 |
| 8x10.5 | 8.0 | 10.5 | 8.3 | 8.3 | 2.9 | 0.8~1.1 | 3.1 | 300 |
| 10x10.5 | 10.0 | 10.5 | 10.3 | 10.3 | 3.2 | 0.8~1.1 | 4.5 | 300 |



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
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: tpmg@niccomp.com



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 |
|------------------------|-----------|------------|----------------------------|---------------------------------------|--------------------------|
| NAWE220M6.3V4X5.5NBF | 22 | 6.3 | 0.30 | 23 | 1,000 |
| NAWE470M6.3V5X5.5NBF | 47 | | 0.30 | 37 | 1,000 |
| NAWE101M6.3V6.3X5.5NBF | 100 | | 0.30 | 57 | 1,000 |
| NAWE471M6.3V8X10.5LBF | 470 | | 0.35 | 210 | 1,000 |
| NAWE102M6.3V10X10.5LBF | 1000 | | 0.35 | 480 | 1,000 |
| NAWE330M10V5X5.5NBF | 33 | 10 | 0.24 | 34 | 1,000 |
| NAWE331M10V8X10.5LBF | 330 | | 0.26 | 195 | 1,000 |
| NAWE471M10V8X10.5LBF | 470 | | 0.26 | 210 | 1,000 |
| NAWE470M10V10X10.5LBF | 470 | | 0.26 | 440 | 1,000 |
| NAWE100M16V4X5.5NBF | 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 |
| NAWE221M16V8X10.5LBF | 220 | | 0.20 | 185 | 1,000 |
| NAWE331M16V8X10.5LBF | 330 | | 0.20 | 195 | 1,000 |
| NAWE331M16V10X10.5LBF | 330 | | 0.20 | 440 | 1,000 |
| NAWE471M16V10X10.5LBF | 470 | | 0.20 | 460 | 1,000 |
| NAWE330M25V6.3X5.5NBF | 33 | | 25 | 0.16 | 48 |
| NAWE101M25V8X10.5LBF | 100 | 0.16 | | 180 | 1,000 |
| NAWE221M25V8X10.5LBF | 220 | 0.16 | | 190 | 1,000 |
| NAWE221M25V10X10.5LBF | 220 | 0.16 | | 353 | 1,000 |
| NAWE331M25V10X10.5LBF | 330 | 0.16 | | 450 | 1,000 |
| NAWE4R7M35V4X5.5NBF | 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 |
| NAWE101M35V8X10.5LBF | 100 | | 0.14 | 180 | 1,000 |
| NAWE101M35V10X10.5LBF | 100 | | 0.14 | 305 | 1,000 |
| NAWE221M35V10X10.5LBF | 220 | | 0.14 | 360 | 1,000 |
| NAWER10M50V4X5.5NBF | 0.1 | 50 | 0.12 | 1.0 | 1,000 |
| NAWER22M50V4X5.5NBF | 0.22 | | 0.12 | 2.0 | 1,000 |
| NAWER33M50V4X5.5NBF | 0.33 | | 0.12 | 3.0 | 1,000 |
| NAWER47M50V4X5.5NBF | 0.47 | | 0.12 | 4.0 | 1,000 |
| NAWE1R0M50V4X5.5NBF | 1.0 | | 0.12 | 8.0 | 1,000 |
| NAWE2R2M50V4X5.5NBF | 2.2 | | 0.12 | 11 | 1,000 |
| NAWE3R3M50V4X5.5NBF | 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 |
| NAWE330M50V8X10.5LBF | 33 | | 0.12 | 135 | 1,000 |
| NAWE470M50V8X10.5LBF | 47 | | 0.12 | 155 | 1,000 |
| NAWE470M50V10X10.5LBF | 47 | | 0.12 | 180 | 1,000 |
| NAWE101M50V8X10.5LBF | 100 | | 0.12 | 200 | 1,000 |
| NAWE101M50V10X10.5LBF | 100 | | 0.12 | 315 | 1,000 |

RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

| Frequency | 50/60Hz | 120Hz | 500Hz | 1KHz | 10KHz |
|--------------|---------|-------|-------|------|-------|
| 0.1 ~ 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 ~ 1000μF | 0.80 | 1.00 | 1.10 | 1.15 | 1.20 |

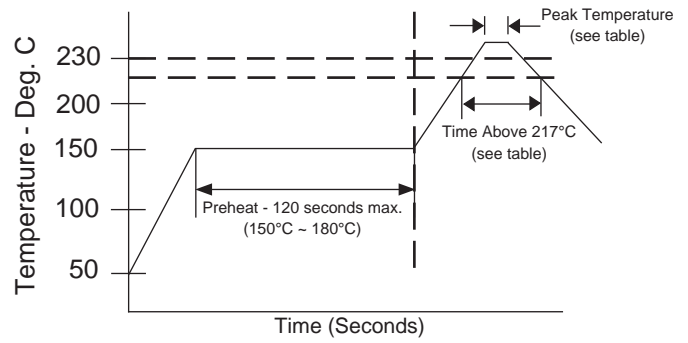


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PEAK REFLOW TEMPERATURE AND DURATION

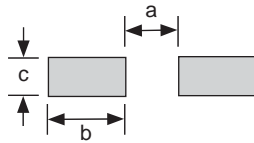
| Diameter | Time above 217°C | Peak Temperature 5 seconds |
|------------------|------------------|----------------------------|
| 4 ~ 6.3mm ϕ | 60 sec. max. | 260°C |
| 8 ~ 10mm ϕ | 60 sec. max. | 250°C |

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 | 1.6 |
| 5x5.5 | 1.4 | 3.0 | 1.6 |
| 6x3x5.5 | 2.1 | 3.5 | 1.6 |
| 8x10.5 | 3.0 | 4.1 | 2.2 |
| 10x10.5 | 4.5 | 4.3 | 2.2 |



Review & Compare Reflow Soldering Heat Limits
V-chip SMT Aluminum Electrolytic Capacitors
www.niccomp.com/RSL