

Surface Mount Aluminum Electrolytic Capacitors NAWR Series

FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- LOW PROFILE 4.6MM HEIGHT
- LOAD LIFE (2,000 ~ 3,000 HOURS @ +105°C)
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

SAC Alloy Compatible
245°C

RoHS
Compliant
includes all homogeneous materials



CHARACTERISTICS

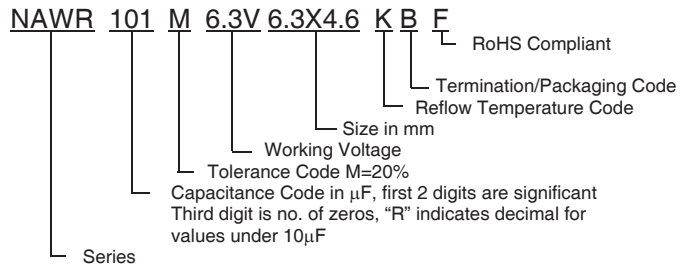
| | | | | | | | |
|--|------------------------------------|--|------|------|------|------|------|
| Rated Voltage Rating | 6.3 ~ 50Vdc | | | | | | |
| Rated Capacitance Range | 0.47 ~ 100μF | | | | | | |
| Operating Temp. Range | -40 ~ +105°C | | | | | | |
| Capacitance Tolerance | ±20% (M) | | | | | | |
| 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 | 0.35 | 0.30 | 0.20 | 0.16 | 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 | 10 | 8 | 6 | 4 | 4 | 4 |
| Load Life Test @ 105°C D ≤ 5mm: 2,000 hours D = 6.3mm: 3,000 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

STANDARD VALUES AND CASE SIZES (mm)

| Cap. (μF) | Code | Working Voltage (Vdc) | | | | | |
|-----------|------|-----------------------|---------|---------|---------|---------|---------|
| | | 6.3 | 10 | 16 | 25 | 35 | 50 |
| 0.47 | R47 | - | - | - | - | - | 4X4.6 |
| 1.0 | 1R0 | - | - | - | - | - | 4X4.6 |
| 2.2 | 2R2 | - | - | - | - | - | 4X4.6 |
| 3.3 | 3R3 | - | - | - | - | - | 4X4.6 |
| 4.7 | 4R7 | - | - | - | 4X4.6 | 4X4.6 | 5X4.6 |
| 10 | 100 | - | - | 4X4.6 | 5X4.6 | 5X4.6 | 6.3X4.6 |
| 22 | 220 | 4X4.6 | 5X4.6 | 5X4.6 | 6.3X4.6 | 6.3X4.6 | - |
| 33 | 330 | 5X4.6 | 5X4.6 | 6.3X4.6 | 6.3X4.6 | - | - |
| 47 | 470 | 5X4.6 | 6.3X4.6 | 6.3X4.6 | 6.3X4.6 | - | - |
| 100 | 101 | 6.3X4.6 | 6.3X4.6 | - | - | - | - |

PART NUMBER SYSTEM



PEAK REFLOW TEMPERATURE CODES

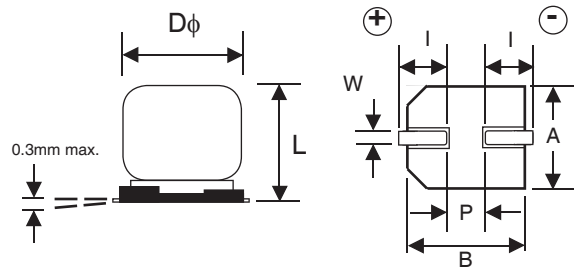
| Code | Peak Reflow Temperature |
|------|-------------------------|
| K | 245°C |

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 |
|-----------|--------|--------|-------|-------|-------|-----------|-------|----------|
| 4X4.6 | 4.0 | 4.6 | 4.3 | 4.3 | 2.0 | 0.5 ~ 0.8 | 1.0 | 1,500 |
| 5X4.6 | 5.0 | 4.6 | 5.3 | 5.3 | 2.3 | 0.5 ~ 0.8 | 1.4 | 1,000 |
| 6.3X4.6 | 6.3 | 4.6 | 6.6 | 6.6 | 2.6 | 0.5 ~ 0.8 | 2.2 | 1,000 |



Surface Mount Aluminum Electrolytic Capacitors NAWR Series

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 |
|------------------------|-----------|------------|----------------------------|---------------------------|--|--------------------------|
| NAWR220M6.3V4X4.6KBF | 22 | 6.3 | 0.35 | 26.39 | 20 | 2000 |
| NAWR330M6.3V5X4.6KBF | 33 | | 0.35 | 17.59 | 26 | 2000 |
| NAWR470M6.3V5X4.6KBF | 47 | | 0.35 | 12.35 | 32 | 2000 |
| NAWR101M6.3V6.3X4.6KBF | 100 | 10 | 0.35 | 5.81 | 49 | 3000 |
| NAWR220M10V5X4.6KBF | 22 | | 0.3 | 22.62 | 24 | 2000 |
| NAWR330M10V5X4.6KBF | 33 | | 0.3 | 15.08 | 29 | 2000 |
| NAWR470M10V6.3X4.6KBF | 47 | | 0.3 | 10.59 | 38 | 3000 |
| NAWR101M10V6.3X4.6KBF | 100 | 16 | 0.3 | 4.98 | 52 | 3000 |
| NAWR100M16V4X4.6KBF | 10 | | 0.2 | 33.17 | 17 | 2000 |
| NAWR220M16V5X4.6KBF | 22 | | 0.2 | 15.08 | 26 | 2000 |
| NAWR330M16V6.3X4.6KBF | 33 | | 0.2 | 10.05 | 36 | 3000 |
| NAWR470M16V6.3X4.6KBF | 47 | 25 | 0.2 | 7.06 | 43 | 3000 |
| NAWR4R7M25V4X4.6KBF | 4.7 | | 0.16 | 56.47 | 12 | 2000 |
| NAWR100M25V5X4.6KBF | 10 | | 0.16 | 26.54 | 19 | 2000 |
| NAWR220M25V6.3X4.6KBF | 22 | | 0.16 | 12.06 | 33 | 3000 |
| NAWR330M25V6.3X4.6KBF | 33 | 35 | 0.16 | 8.04 | 40 | 3000 |
| NAWR470M25V6.3X4.6KBF | 47 | | 0.16 | 5.65 | 44 | 3000 |
| NAWR4R7M35V4X4.6KBF | 4.7 | | 0.14 | 49.41 | 13 | 2000 |
| NAWR100M35V5X4.6KBF | 10 | | 0.14 | 23.22 | 24 | 2000 |
| NAWR220M35V6.3X4.6KBF | 22 | 50 | 0.14 | 10.56 | 35 | 3000 |
| NAWR47M50V4X4.6KBF | 0.47 | | 0.12 | 423.50 | 2.8 | 2000 |
| NAWR1R0M50V4X4.6KBF | 1 | | 0.12 | 199.04 | 5.9 | 2000 |
| NAWR2R2M50V4X4.6KBF | 2.2 | | 0.12 | 90.47 | 10 | 2000 |
| NAWR3R3M50V4X4.6KBF | 3.3 | 50 | 0.12 | 60.32 | 12 | 2000 |
| NAWR4R7M50V5X4.6KBF | 4.7 | | 0.12 | 42.35 | 15 | 2000 |
| NAWR100M50V6.3X4.6KBF | 10 | | 0.12 | 19.90 | 24 | 3000 |

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

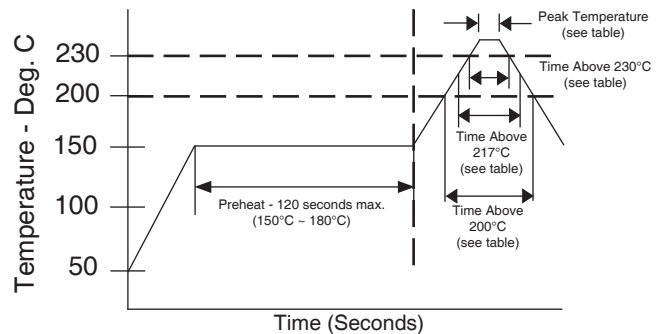
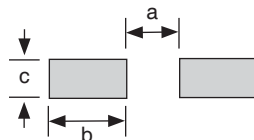
| Frequency | 120Hz | 1KHz | 10KHz | 100KHz ~ |
|-------------|-------|------|-------|----------|
| 1.0 ~ 3.3μF | 1.0 | 1.30 | 1.50 | 1.80 |
| >4.7 ~ 33μF | 1.0 | 1.20 | 1.30 | 1.45 |
| >33μF | 1.0 | 1.10 | 1.20 | 1.30 |

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 |
|-------------|------------------|---------------------|------------------|------------------|------------------|-------------------------|
| 4 ~ 6.3mm φ | +245°C | Time ≥ 240°C 5 sec. | 60 sec. | 50 sec. | 30 sec. | 2 |

RECOMMENDED LAND PATTERN DIMENSIONS (mm)

| Case Size | a | b | c |
|-----------|-----|-----|-----|
| 4X4.6 | 1.0 | 2.6 | 1.8 |
| 5X4.6 | 1.4 | 3.0 | 1.8 |
| 6.3x4.6 | 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. If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: 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 |
|-----------|--------|--------|--------|--------|--------|--------|
| 4X4.6 | 4.7 | 4.7 | 12.0 | 5.5 | 8.0 | 5.0 |
| 5X4.6 | 5.7 | 5.7 | 12.0 | 5.5 | 12.0 | 5.0 |
| 6.3X4.6 | 7.0 | 7.0 | 16.0 | 7.5 | 12.0 | 5.1 |

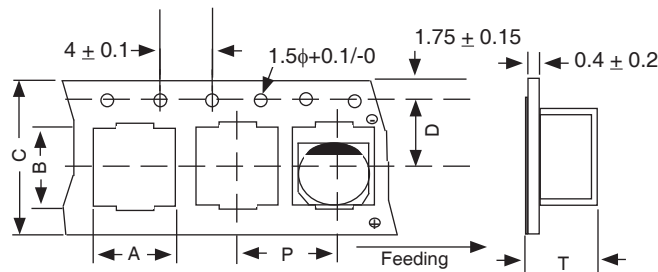
TR13 330mm (13") REEL

| Case Size | W ±1.0 | Quantity Per Reel |
|-----------|--------|-------------------|
| | | 13" Reel |
| 4X4.6 | 14.0 | 1,500 pcs |
| 5X4.6 | 14.0 | 1,000 pcs |
| 6.3X4.6 | 18.0 | 1,000 pcs |

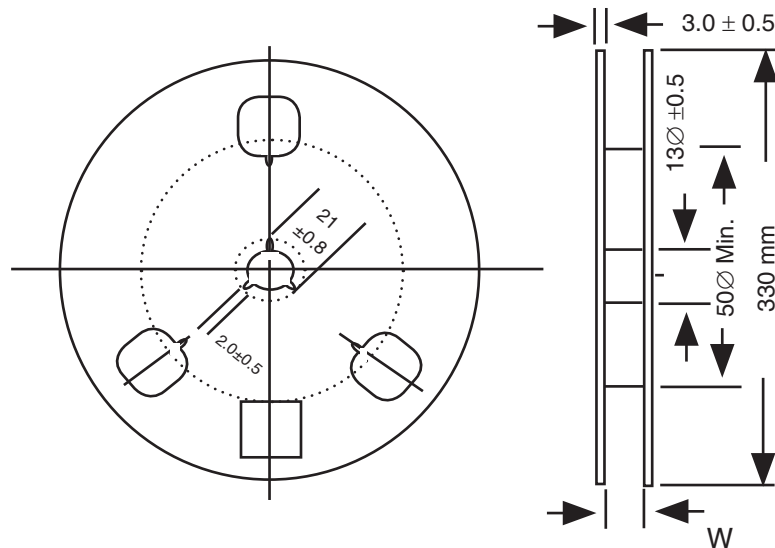
TAPING SPECIFICATIONS (mm)

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

CARRIER



REEL



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[515D477M035CG8PE3](#) [052687X](#) [EKMA500ELL4R7ME07D](#) [EKRG100ETC221MF09D](#) [NRE-S560M16V6.3X7TBSTF](#)
[ERZA630VHN182UP54N](#) [MAL214099813E3](#) [MAL211990518E3](#) [MAL204281229E3](#) [NEV680M35EF](#) [686KXM050M](#) [ERS1VM222L30OT](#)
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