

# Surface Mount Aluminum Electrolytic Capacitors NACEW Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION
- WIDE TEMPERATURE -55 ~ +105°C
- ANTI-SOLVENT (2 MINUTES)
- DESIGNED FOR REFLOW SOLDERING

## RoHS Compliant

includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

|                                                   |                                                                                         |                    |      |      |                                        |      |      |      |      |  |
|---------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------|------|------|----------------------------------------|------|------|------|------|--|
| Rated Voltage Range                               | 6.3 ~ 100Vdc**                                                                          |                    |      |      |                                        |      |      |      |      |  |
| Rate Capacitance Range                            | 0.1 ~ 6,800µF                                                                           |                    |      |      |                                        |      |      |      |      |  |
| Operating Temp. Range                             | -55°C ~ +105°C (100V -40°C ~ +105 °C)                                                   |                    |      |      |                                        |      |      |      |      |  |
| Capacitance Tolerance                             | ±20% (M), ±10% (K)*                                                                     |                    |      |      |                                        |      |      |      |      |  |
| Max. Leakage Current After 2 Minutes @ 20°C       | 0.01CV or 3µA whichever is greater                                                      |                    |      |      |                                        |      |      |      |      |  |
| Max. Tan δ @ 120Hz/20°C                           | W.V. (Vdc)                                                                              | 6.3                | 10   | 16   | 25                                     | 35   | 50   | 63   | 100  |  |
|                                                   | S.V. (Vdc)                                                                              | 8                  | 13   | 20   | 32                                     | 44   | 63   | 79   | 125  |  |
|                                                   | 4 ~ 6.3mm Dia.                                                                          | 0.24               | 0.20 | 0.16 | 0.14                                   | 0.12 | 0.10 | 0.12 | 0.10 |  |
|                                                   | 8 & larger                                                                              | 0.28               | 0.24 | 0.20 | 0.16                                   | 0.14 | 0.12 | 0.12 | 0.10 |  |
| Low Temperature Stability Impedance Ratio @ 120Hz | W.V. (Vdc)                                                                              | 6.3                | 10   | 16   | 25                                     | 35   | 50   | 63   | 100  |  |
|                                                   | Z-40°C/Z+20°C                                                                           | 3                  | 3    | 2    | 2                                      | 2    | 2    | 2    | 2    |  |
|                                                   | Z-55°C/Z+20°C                                                                           | 8                  | 6    | 4    | 4                                      | 3    | 3    | 3    | -    |  |
| Load Life Test                                    | 4 ~ 6.3mm Dia. & 10x8mm<br>+105°C 1,000 hours<br>+95°C 2,000 hours<br>+85°C 4,000 hours | Capacitance Change |      |      | Within ± 25% of initial measured value |      |      |      |      |  |
|                                                   | 8 ~ 16mm Dia.<br>+105°C 2,000 hours<br>+95°C 4,000 hours<br>+85°C 8,000 hours           | Tan δ              |      |      | Less than 200% of specified max. value |      |      |      |      |  |
|                                                   |                                                                                         | Leakage Current    |      |      | Less than specified max. value         |      |      |      |      |  |

\* Optional ± 10% (K) Tolerance - see case size chart.\*\*

For higher voltages, 200V and 400V, see NACV series.

## MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA rms AT 120Hz AND 105°C)

| Cap. (µF) | Working Voltage (Vdc) |     |     |     |     |     |     |     |
|-----------|-----------------------|-----|-----|-----|-----|-----|-----|-----|
|           | 6.3                   | 10  | 16  | 25  | 35  | 50  | 63  | 100 |
| 0.1       | -                     | -   | -   | -   | -   | 0.7 | 0.7 | -   |
| 0.22      | -                     | -   | -   | -   | -   | 1.6 | 1.6 | -   |
| 0.33      | -                     | -   | -   | -   | -   | 2.5 | 2.5 | -   |
| 0.47      | -                     | -   | -   | -   | -   | 3.5 | 3.5 | -   |
| 1.0       | -                     | -   | -   | -   | -   | 7.0 | 7.0 | 7.0 |
| 2.2       | -                     | -   | -   | -   | -   | 11  | 11  | 14  |
| 3.3       | -                     | -   | -   | -   | -   | 13  | 14  | 20  |
| 4.7       | -                     | -   | -   | 13  | 14  | 16  | 16  | 25  |
| 10        | -                     | -   | 18  | 20  | 21  | 24  | 24  | 35  |
| 22        | 22                    | 25  | 27  | 36  | 38  | 32  | 49  | 84  |
| 33        | 27                    | 30  | 40  | 44  | 42  | 60  | 112 | 133 |
| 47        | 33                    | 41  | 48  | 48  | 49  | 63  | 119 | 240 |
| 100       | 50                    | -   | 60  | 91  | 84  | 140 | 196 | -   |
| 150       | 55                    | 62  | 95  | 140 | 155 | -   | -   | 500 |
| 220       | 67                    | 105 | 105 | 175 | 190 | 220 | 287 | -   |
| 330       | 105                   | 195 | 195 | 220 | 300 | -   | -   | -   |
| 470       | 210                   | 210 | 230 | 300 | 410 | -   | 630 | -   |
| 1000      | 280                   | 310 | -   | 460 | -   | 655 | -   | -   |
| 1500      | 310                   | -   | 500 | -   | 740 | -   | -   | -   |
| 2200      | -                     | 510 | -   | 805 | -   | -   | -   | -   |
| 3300      | 520                   | -   | 840 | -   | -   | -   | -   | -   |
| 4700      | -                     | 880 | -   | -   | -   | -   | -   | -   |
| 6800      | 930                   | -   | -   | -   | -   | -   | -   | -   |

## MAXIMUM ESR (Ω AT 120Hz AND 20°C)

| Cap. (µF) | Working Voltage (Vdc) |      |      |      |      |      |      |      |
|-----------|-----------------------|------|------|------|------|------|------|------|
|           | 6.3                   | 10   | 16   | 25   | 35   | 50   | 63   | 100  |
| 0.1       | -                     | -    | -    | -    | -    | 1660 | 1990 | -    |
| 0.22      | -                     | -    | -    | -    | -    | 754  | 905  | -    |
| 0.33      | -                     | -    | -    | -    | -    | 503  | 604  | -    |
| 0.47      | -                     | -    | -    | -    | -    | 353  | 424  | -    |
| 1.0       | -                     | -    | -    | -    | -    | 166  | 199  | 166  |
| 2.2       | -                     | -    | -    | -    | -    | 75.4 | 90.5 | 75.4 |
| 3.3       | -                     | -    | -    | -    | -    | 50.3 | 60.3 | 50.3 |
| 4.7       | -                     | -    | -    | 49.4 | 42.3 | 35.3 | 42.3 | 35.3 |
| 10        | -                     | -    | 26.5 | 23.2 | 19.9 | 16.6 | 19.9 | 16.6 |
| 22        | 18.1                  | 15.1 | 12.1 | 10.6 | 9.05 | 7.64 | 9.04 | 7.64 |
| 33        | 12.1                  | 10.1 | 8.04 | 7.04 | 6.04 | 5.03 | 6.03 | 5.03 |
| 47        | 8.47                  | 7.06 | 5.65 | 4.95 | 4.24 | 3.53 | 4.24 | 3.53 |
| 100       | 3.98                  | -    | 2.66 | 2.32 | 2.32 | 1.99 | 1.99 | -    |
| 150       | 2.66                  | 2.21 | 1.77 | 1.77 | 1.55 | -    | -    | 1.10 |
| 220       | 1.81                  | 1.51 | 1.21 | 1.21 | 1.06 | 0.91 | 0.91 | -    |
| 330       | 1.21                  | 1.21 | 1.00 | 0.80 | 0.70 | -    | -    | -    |
| 470       | 0.99                  | 0.85 | 0.71 | 0.57 | 0.49 | -    | 0.42 | -    |
| 1000      | 0.46                  | 0.40 | -    | 0.27 | -    | 0.20 | -    | -    |
| 1500      | 0.31                  | -    | 0.23 | -    | 0.15 | -    | -    | -    |
| 2200      | -                     | 0.18 | -    | 0.14 | -    | -    | -    | -    |
| 3300      | 0.14                  | -    | 0.12 | -    | -    | -    | -    | -    |
| 4700      | -                     | 0.11 | -    | -    | -    | -    | -    | -    |
| 6800      | 0.093                 | -    | -    | -    | -    | -    | -    | -    |

## 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](http://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](mailto:tpmg@niccomp.com)

## RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

| Frequency (Hz)    | f ≤ 100 | 100 > f ≤ 1K | 1K > f ≤ 10K | f ≥ 100K |
|-------------------|---------|--------------|--------------|----------|
| Correction Factor | 0.8     | 1.0          | 1.3          | 1.5      |



# Surface Mount Aluminum Electrolytic Capacitors NACEW Series

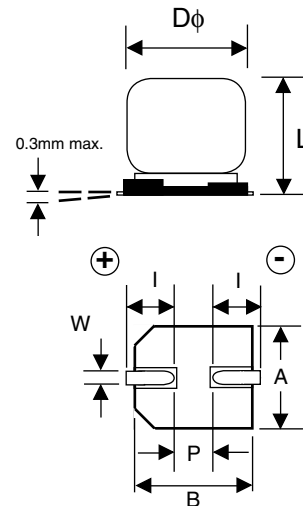
## STANDARD PRODUCT AND CASE SIZE TABLE DφxL (mm)

| Cap. (μF) | Code | Working Voltage (Vdc) |          |          |          |          |          |          |          |
|-----------|------|-----------------------|----------|----------|----------|----------|----------|----------|----------|
|           |      | 6.3                   | 10       | 16       | 25       | 35       | 50       | 63       | 100      |
| 0.1       | R10  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | -        |
| 0.22      | R22  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | -        |
| 0.33      | R33  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | -        |
| 0.47      | R47  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | -        |
| 1.0       | 1R0  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | 4x6.3*   |
| 2.2       | 2R2  | -                     | -        | -        | -        | -        | 4x5.5*   | 4x5.5*   | 6.3x6.3* |
| 3.3       | 3R3  | -                     | -        | -        | -        | -        | 4x5.5*   | 5x5.5*   | 6.3x6.3* |
| 4.7       | 4R7  | -                     | -        | -        | 4x5.5*   | 4x5.5*   | 5x5.5*   | 5x5.5*   | 6.3x6.3* |
| 10        | 100  | -                     | -        | 4x5.5*   | 5x5.5*   | 5x5.5*   | 6.3x5.5* | 6.3x5.5* | 6.3x8*   |
| 22        | 220  | 4x5.5*                | 5x5.5*   | 5x5.5*   | 6.3x5.5* | 6.3x5.5* | 6.3x6.3* | 6.3x8*   | 8x10.5*  |
| 33        | 330  | 5x5.5*                | 5x5.5*   | 6.3x5.5* | 6.3x5.5* | 6.3x6.3* | 6.3x8*   | 8x10.5*  | 10x10.5* |
| 47        | 470  | 5x5.5*                | 6.3x5.5* | 6.3x5.5* | 6.3x6.3* | 6.3x6.3* | 6.3x8*   | 8x10.5*  | 12.5x14  |
| 100       | 101  | 6.3x5.5*              | -        | 6.3x5.5* | 6.3x8*   | 6.3x8    | 8x10.5*  | 10x10.5* | -        |
| 150       | 151  | 6.3x5.5*              | 6.3x6.3* | 6.3x8*   | 8x10.5*  | 8x10.5*  | 10x8*    | -        | 16x17    |
| 220       | 221  | 6.3x6.3*              | 6.3x8*   | 6.3x8*   | 8x10.5*  | 8x10.5   | 10x10.5  | 12.5x14  | -        |
| 330       | 331  | 6.3x8*                | 8x10.5*  | 8x10.5*  | 10x8*    | 10x10.5  | -        | -        | -        |
| 470       | 471  | 8x10.5                | 8x10.5   | 8x10.5   | 10x10.5* | 12.5x14  | -        | 16x17    | -        |
| 1000      | 102  | 8x10.5*               | 10x10.5* | -        | 12.5x14  | -        | 16x17    | -        | -        |
| 1500      | 152  | 10x10.5*              | -        | 12.5x14  | -        | 16x17    | -        | -        | -        |
| 2200      | 222  | -                     | 12.5x14  | -        | 16x17    | -        | -        | -        | -        |
| 3300      | 332  | 12.5x14               | -        | 16x17    | -        | -        | -        | -        | -        |
| 4700      | 472  | -                     | 16x17    | -        | -        | -        | -        | -        | -        |
| 6800      | 682  | 16x17                 | -        | -        | -        | -        | -        | -        | -        |

\*Denotes values available in 10% tolerance

## DIMENSIONS (mm)

| Case Size | Dφ ±0.5 | L max. | A ±0.2 | B ±0.2 | I ±0.2 | W         | P ±0.2 |
|-----------|---------|--------|--------|--------|--------|-----------|--------|
| 4 x 5.5   | 4.0     | 5.5    | 4.3    | 4.3    | 1.8    | 0.5 ~ 0.8 | 1.0    |
| 5 x 5.5   | 5.0     | 5.5    | 5.3    | 5.3    | 2.1    | 0.5 ~ 0.8 | 1.4    |
| 6.3 x 5.5 | 6.3     | 5.5    | 6.6    | 6.6    | 2.5    | 0.5 ~ 0.8 | 2.2    |
| 6.3 x 6.3 | 6.3     | 6.3    | 6.6    | 6.6    | 2.5    | 0.5 ~ 0.8 | 2.2    |
| 6.3 x 8   | 6.3     | 8.0    | 6.6    | 6.6    | 2.5    | 0.5 ~ 0.8 | 2.2    |
| 8 x 6.5   | 8.0     | 6.5    | 8.3    | 8.3    | 3.4    | 0.5 ~ 0.8 | 2.2    |
| 8 X 10.5  | 8.0     | 10.5   | 8.3    | 8.3    | 2.9    | 0.7 ~ 1.0 | 3.2    |
| 10 x 8    | 10.0    | 8.0    | 10.3   | 10.3   | 3.2    | 0.7 ~ 1.4 | 4.6    |
| 10 x 10.5 | 10.0    | 10.5   | 10.3   | 10.3   | 3.2    | 0.7 ~ 1.4 | 4.6    |
| 12.5 x 14 | 12.5    | 14.0   | 12.8   | 12.8   | 4.5    | 0.6 ~ 1.4 | 4.6    |
| 16 x 17   | 16.0    | 17.5   | 17.0   | 17.0   | 5.5    | 0.9 ~ 1.5 | 6.7    |



## PART NUMBER SYSTEM

