

## RADIAL LEADS NON-POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

### FEATURES

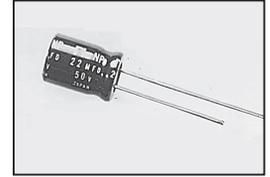
- DESIGNED FOR APPLICATIONS WITH REVERSIBLE POLARITY
- LOW AC VOLTAGE CAN BE SUPERIMPOSED WITHIN THE LIMITED RIPPLE CURRENT

### CHARACTERISTICS

|   |                     |  |      |      |      |      |      |
|---|---------------------|--|------|------|------|------|------|
| Rated Voltage Range   | 10 ~ 100Vdc         |  |      |      |      |      |      |
| Capacitance Range   | 1.0 ~ 1,000 $\mu$ F |  |      |      |      |      |      |
| Operating Temperature Range   | -40 ~ +85°C         |  |      |      |      |      |      |
| Capacitance Tolerance   | $\pm$ 20%(M)        |  |      |      |      |      |      |
| Max. Leakage Current After 5 minutes At +20°C   | 0.03CV +8 $\mu$ A   |  |      |      |      |      |      |
| Surge Voltage & Max. Tan $\delta$ @ 120Hz/+20°C   | W.V. (Vdc)          | 10   | 16   | 25   | 35   | 50   | 100  |
|   | S.V. (Vdc)          | 13   | 20   | 32   | 44   | 63   | 125  |
|   | Tan $\delta$        | 0.20                                       | 0.18 | 0.14 | 0.13 | 0.09 | 0.10 |
| Low Temperature Stability (Impedance Ratio @ 120Hz)   | Z-25°C/Z+20°C       | 3  | 2    | 2    | 2    | 2    | 2    |
|   | Z-40°C/Z+20°C       | 8  | 6    | 4    | 3    | 3    | 3    |
| Load Life Test at Rated W.V. & +85°C 2,000 Hours (Polarity Shall Be Reversed Every 250 Hours) | Capacitance Change  | Within $\pm$ 25% of initial measured value |      |      |      |      |      |
|   | Tan $\delta$        | Less than 200% of specified maximum value  |      |      |      |      |      |
|   | Leakage Current     | Less than specified maximum value          |      |      |      |      |      |

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



### STANDARD PRODUCTS AND

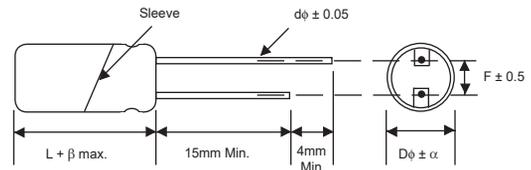
#### CASE SIZE TABLE D $\phi$ x L (mm)

| Cap. ( $\mu$ F) | Working Voltage (Vdc) |         |         |         |         |         |
|-----------------|-----------------------|---------|---------|---------|---------|---------|
|                 | 10                    | 16      | 25      | 35      | 50      | 100     |
| 1.0             | -                     | -       | -       | -       | 5x11    | 5x11    |
| 2.2             | -                     | -       | -       | -       | 5x11    | 5x11    |
| 3.3             | -                     | -       | -       | -       | 5x11    | 6.3x11  |
| 4.7             | -                     | -       | 5x11    | 5x11    | 5x11    | 6.3x11  |
| 10              | -                     | 5x11    | 5x11    | 5x11    | 6.3x11  | 8x12.5  |
| 22              | 5x11                  | 5x11    | 5x11    | 6.3x11  | 8x11.5  | 10x16   |
| 33              | 5x11                  | 5x11    | 6.3x11  | 6.3x11  | 8x11.5  | 10x20   |
| 47              | 5x11                  | 6.3x11  | 6.3x11  | 8x11.5  | 10x12.5 | 12.5x25 |
| 100             | 6.3x11                | 8x11.5  | 8x11.5  | 10x12.5 | 10x20   | -       |
| 220             | 8x12.5                | 10x12.5 | 10x16   | 10x20   | 12.5x25 | -       |
| 330             | 10x12.5               | 10x16   | 10x20   | 12.5x25 | -       | -       |
| 470             | 10x16                 | 10x20   | 12.5x20 | 12.5x25 | -       | -       |
| 1000            | 12.5x20               | 12.5x25 | -       | -       | -       | -       |

#### LEAD SPACING AND DIAMETER (mm)

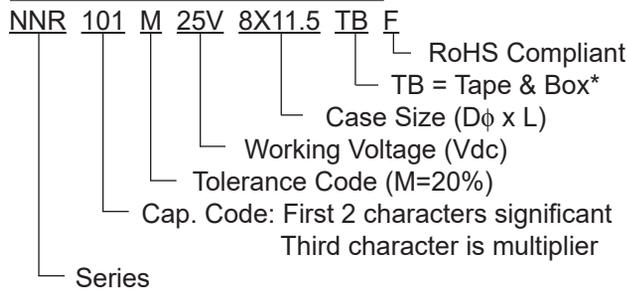
| Case Dia. (D $\phi$ ) | 5   | 6.3 | 8   | 10  | 12.5 |
|-----------------------|-----|-----|-----|-----|------|
| Lead Dia. (d $\phi$ ) | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  |
| Lead Space (F)        | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  |
| Dim. $\alpha$         | 0.5 | 0.5 | 0.5 | 0.5 | 0.5  |
| Dim. $\beta$          | 1.5 | 1.5 | 1.5 | 1.5 | 1.5  |

#### DIMENSIONS (mm)



Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

#### PART NUMBERING SYSTEM



\*see taping specifications for details

#### 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)



## STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D $\phi$ x L (mm)

| Part Number         | Cap. ( $\mu$ F) | W.V. (Vdc) | Dissipation Factor +20°C/120Hz | Ripple Current Rating (mA) +85°C/120Hz | Max. ESR ( $\Omega$ ) +20°C/120Hz | Load Life Hours @ +85°C |
|---------------------|-----------------|------------|--------------------------------|--|-----------------------------------|-------------------------|
| NNR220M10V5x11F     | 22              | 10         | 0.20                           | 38                                     | 15.08                             | 2,000                   |
| NNR330M10V5x11F     | 33              |            | 0.20                           | 58                                     | 10.05                             | 2,000                   |
| NNR470M10V5x11F     | 47              |            | 0.20                           | 70                                     | 7.06                              | 2,000                   |
| NNR101M10V6.3x11F   | 100             |            | 0.20                           | 125                                    | 3.32                              | 2,000                   |
| NNR221M10V8x12.5F   | 220             |            | 0.20                           | 225                                    | 1.51                              | 2,000                   |
| NNR331M10V10x12.5F  | 330             |            | 0.20                           | 295                                    | 1.01                              | 2,000                   |
| NNR471M10V10x16F    | 470             |            | 0.20                           | 390                                    | 0.71                              | 2,000                   |
| NNR102M10V12.5x20F  | 1000            |            | 0.20                           | 620                                    | 0.33                              | 2,000                   |
| NNR100M16V5x11F     | 10              | 16         | 0.18                           | 28                                     | 29.86                             | 2,000                   |
| NNR220M16V5x11F     | 22              |            | 0.18                           | 50                                     | 13.57                             | 2,000                   |
| NNR330M16V5x11F     | 33              |            | 0.18                           | 60                                     | 9.05                              | 2,000                   |
| NNR470M16V6.3x11F   | 47              |            | 0.18                           | 85                                     | 6.35                              | 2,000                   |
| NNR101M16V8x11.5F   | 100             |            | 0.18                           | 165                                    | 2.99                              | 2,000                   |
| NNR221M16V10x12.5F  | 220             |            | 0.18                           | 260                                    | 1.36                              | 2,000                   |
| NNR331M16V10x16F    | 330             |            | 0.18                           | 360                                    | 0.90                              | 2,000                   |
| NNR471M16V10x20F    | 470             |            | 0.18                           | 420                                    | 0.64                              | 2,000                   |
| NNR102M16V12.5x25F  | 1000            | 0.18       | 740                            | 0.30                                   | 2,000                             |                         |
| NNR4R7M25V5x11F     | 4.7             | 25         | 0.14                           | 25                                     | 56.47                             | 2,000                   |
| NNR100M25V5x11F     | 10              |            | 0.14                           | 40                                     | 26.54                             | 2,000                   |
| NNR220M25V5x11F     | 22              |            | 0.14                           | 60                                     | 12.06                             | 2,000                   |
| NNR330M25V6.3x11F   | 33              |            | 0.14                           | 80                                     | 8.04                              | 2,000                   |
| NNR470M25V6.3x11F   | 47              |            | 0.14                           | 90                                     | 5.65                              | 2,000                   |
| NNR101M25V8x11.5F   | 100             |            | 0.14                           | 180                                    | 2.65                              | 2,000                   |
| NNR221M25V10x16F    | 220             |            | 0.14                           | 320                                    | 1.21                              | 2,000                   |
| NNR331M25V10x20F    | 330             |            | 0.14                           | 425                                    | 0.80                              | 2,000                   |
| NNR471M25V12.5x20F  | 470             | 0.14       | 540                            | 0.56                                   | 2,000                             |                         |
| NNR4R7M35V5x11F     | 4.7             | 35         | 0.13                           | 30                                     | 49.41                             | 2,000                   |
| NNR100M35V5x11F     | 10              |            | 0.13                           | 45                                     | 23.22                             | 2,000                   |
| NNR220M35V6.3x11F   | 22              |            | 0.13                           | 75                                     | 10.56                             | 2,000                   |
| NNR330M35V6.3x11F   | 33              |            | 0.13                           | 90                                     | 7.04                              | 2,000                   |
| NNR470M35V8x11.5F   | 47              |            | 0.13                           | 125                                    | 4.94                              | 2,000                   |
| NNR101M35V10x12.5F  | 100             |            | 0.13                           | 200                                    | 2.32                              | 2,000                   |
| NNR221M35V10x20F    | 220             |            | 0.13                           | 350                                    | 1.06                              | 2,000                   |
| NNR331M35V12.5x25F  | 330             |            | 0.13                           | 440                                    | 0.70                              | 2,000                   |
| NNR471M35V12.5x25F  | 470             | 0.13       | 585                            | 0.49                                   | 2,000                             |                         |
| NNR1R0M50V5x11F     | 1.0             | 50         | 0.09                           | 10                                     | 215.63                            | 2,000                   |
| NNR2R2M50V5x11F     | 2.2             |            | 0.09                           | 20                                     | 98.01                             | 2,000                   |
| NNR3R3M50V5x11F     | 3.3             |            | 0.09                           | 28                                     | 65.34                             | 2,000                   |
| NNR4R7M50V5x11F     | 4.7             |            | 0.09                           | 38                                     | 45.88                             | 2,000                   |
| NNR100M50V6.3x11F   | 10              |            | 0.09                           | 50                                     | 21.56                             | 2,000                   |
| NNR220M50V8x11.5F   | 22              |            | 0.09                           | 90                                     | 9.80                              | 2,000                   |
| NNR330M50V8x11.5F   | 33              |            | 0.09                           | 110                                    | 6.53                              | 2,000                   |
| NNR470M50V10x12.5F  | 47              |            | 0.09                           | 135                                    | 4.59                              | 2,000                   |
| NNR101M50V10x20F    | 100             | 0.09       | 250                            | 2.16                                   | 2,000                             |                         |
| NNR221M50V12.5x25F  | 220             | 0.09       | 410                            | 0.98                                   | 2,000                             |                         |
| NNR1R0M100V5x11F    | 1.0             | 100        | 0.10                           | 15                                     | 149.28                            | 2,000                   |
| NNR2R2M100V5x11F    | 2.2             |            | 0.10                           | 25                                     | 67.86                             | 2,000                   |
| NNR3R3M100V6.3x11F  | 3.3             |            | 0.10                           | 30                                     | 45.24                             | 2,000                   |
| NNR4R7M100V6.3x11F  | 4.7             |            | 0.10                           | 46                                     | 31.76                             | 2,000                   |
| NNR100M100V8x12.5F  | 10              |            | 0.10                           | 70                                     | 14.93                             | 2,000                   |
| NNR220M100V10x16F   | 22              |            | 0.10                           | 120                                    | 6.79                              | 2,000                   |
| NNR330M100V10x20F   | 33              |            | 0.10                           | 170                                    | 4.52                              | 2,000                   |
| NNR470M100V12.5x25F | 47              |            | 0.10                           | 200                                    | 3.18                              | 2,000                   |