

## RADIAL LEADS NON-POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

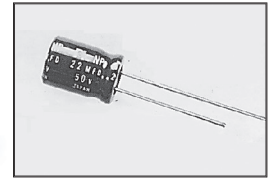
### FEATURES

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

**RoHS  
Compliant**

includes all homogeneous materials

\*See Part Number System for Details



### CHARACTERISTICS

|                                                                                                     |                    |                                           |      |      |      |      |      |
|-----------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------|------|------|------|------|------|
| Rated Voltage Range                                                                                 | 10 ~ 100Vdc        |                                           |      |      |      |      |      |
| Capacitance Range                                                                                   | 0.47 ~ 1,000μF     |                                           |      |      |      |      |      |
| Operating Temperature Range                                                                         | -40 ~ +85°C        |                                           |      |      |      |      |      |
| Capacitance Tolerance                                                                               | ±10% (K), ±20% (M) |                                           |      |      |      |      |      |
| Max. Leakage Current<br>After 5 minutes At +20°C                                                    | 0.03CV +8μA        |                                           |      |      |      |      |      |
| Surge Voltage &<br>Max. Tan δ @ 120Hz/+20°C                                                         | W.V. (Vdc)         | 10                                        | 16   | 25   | 35   | 50   | 100  |
|                                                                                                     | S.V. (Vdc)         | 13                                        | 20   | 32   | 44   | 63   | 125  |
|                                                                                                     | Tan δ              | 0.20                                      | 0.18 | 0.14 | 0.13 | 0.09 | 0.10 |
| Low Temperature Stability<br>(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<br>2,000 Hours (Polarity Shall Be<br>Reversed Every 250 Hours) | Capacitance Change | Within ±25% of initial measured value     |      |      |      |      |      |
|                                                                                                     | Tan δ              | Less than 200% of specified maximum value |      |      |      |      |      |
|                                                                                                     | Leakage Current    | Less than specified maximum value         |      |      |      |      |      |

### MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA rms AT 120HZ AND 85°C)

| Cap. (μF) | Working Voltage (Vdc) |     |     |     |     |     |
|-----------|-----------------------|-----|-----|-----|-----|-----|
|           | 10                    | 16  | 25  | 35  | 50  | 100 |
| 0.47      | -                     | -   | -   | -   | 5.0 | 8.0 |
| 1.0       | -                     | -   | -   | -   | 10  | 15  |
| 2.2       | -                     | -   | -   | -   | 20  | 25  |
| 3.3       | -                     | -   | -   | -   | 28  | 30  |
| 4.7       | -                     | -   | 25  | 30  | 38  | 46  |
| 10        | -                     | 28  | 40  | 45  | 50  | 70  |
| 22        | 38                    | 50  | 60  | 75  | 90  | 120 |
| 33        | 58                    | 60  | 80  | 90  | 110 | 170 |
| 47        | 70                    | 85  | 90  | 125 | 135 | 200 |
| 100       | 125                   | 165 | 180 | 200 | 250 | -   |
| 220       | 225                   | 260 | 320 | 350 | 410 | -   |
| 330       | 295                   | 360 | 425 | 440 | -   | -   |
| 470       | 390                   | 420 | 540 | 585 | -   | -   |
| 1000      | 620                   | 740 | -   | -   | -   | -   |

### MAXIMUM ESR (Ω AT 120HZ AND 20°C)

| Cap. (μF) | Working Voltage (Vdc) |       |       |       |        |        |
|-----------|-----------------------|-------|-------|-------|--------|--------|
|           | 10                    | 16    | 25    | 35    | 50     | 100    |
| 0.47      | -                     | -     | -     | -     | 458.79 | 317.62 |
| 1.0       | -                     | -     | -     | -     | 215.63 | 149.28 |
| 2.2       | -                     | -     | -     | -     | 98.01  | 67.86  |
| 3.3       | -                     | -     | -     | -     | 65.34  | 45.24  |
| 4.7       | -                     | -     | 56.47 | 49.41 | 45.88  | 31.76  |
| 10        | -                     | 29.86 | 26.54 | 23.22 | 21.56  | 14.93  |
| 22        | 15.08                 | 13.57 | 12.06 | 10.56 | 9.80   | 6.79   |
| 33        | 10.05                 | 9.05  | 8.04  | 7.04  | 6.53   | 4.52   |
| 47        | 7.06                  | 6.35  | 5.65  | 4.94  | 4.59   | 3.18   |
| 100       | 3.32                  | 2.99  | 2.65  | 2.32  | 2.16   | -      |
| 220       | 1.51                  | 1.36  | 1.21  | 1.06  | 0.98   | -      |
| 330       | 1.01                  | 0.90  | 0.80  | 0.70  | -      | -      |
| 470       | 0.71                  | 0.64  | 0.56  | 0.49  | -      | -      |
| 1000      | 0.33                  | 0.30  | -     | -     | -      | -      |

### STANDARD PRODUCTS AND

#### CASE SIZE TABLE D φ x L (mm)

| Cap. (μF) | Working Voltage (Vdc) |         |         |         |         |         |
|-----------|-----------------------|---------|---------|---------|---------|---------|
|           | 10                    | 16      | 25      | 35      | 50      | 100     |
| 0.47      | -                     | -       | -       | -       | 5x11    | 5x11    |
| 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  | 8x12.5  | 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 | -       | -       | -       | -       |

### PART NUMBERING SYSTEM

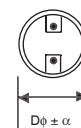
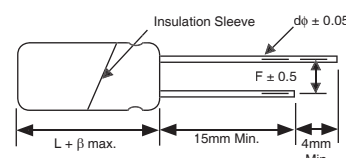
NNR 101 M 25V 8X11 F

RoHS Compliant  
Case Size (Dφ x L)  
Working Voltage (Vdc)  
Tolerance Code (M=20%)  
Cap. Code: First 2 characters significant  
Third character is multiplier

Series

### LEAD SPACING AND DIAMETER (mm)

| Case Dia. (Dφ) | 5   | 6.3 | 8   | 10  | 12.5 |
|----------------|-----|-----|-----|-----|------|
| Lead Dia. (dφ) | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  |
| Lead Space (F) | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  |
| Dim. α         | 0.5 | 0.5 | 0.5 | 0.5 | 0.5  |
| Dim. β         | 1.5 | 1.5 | 1.5 | 1.5 | 1.5  |



### 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)

