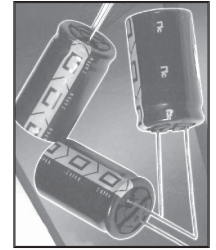


HIGH TEMPERATURE, EXTENDED LOAD LIFE, RADIAL LEADS, POLARIZED

### FEATURES

- HIGH RIPPLE CURRENT AT HIGH TEMPERATURE (105°C)
- IDEAL FOR HIGH VOLTAGE LIGHTING BALLAST
- REDUCED SIZE (FROM NRBX)



### CHARACTERISTICS

|                                                                                                                             |               |                                                      |      |      |                                                        |      |      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------|------|------|--------------------------------------------------------|------|------|
| Rated Voltage Range                                                                                                         |               | 160 ~ 450VDC                                         |      |      |                                                        |      |      |
| Capacitance Range                                                                                                           |               | 1.0 ~ 220μF                                          |      |      |                                                        |      |      |
| Operating Temperature Range                                                                                                 |               | -25°C ~ +105°C                                       |      |      |                                                        |      |      |
| Capacitance Tolerance                                                                                                       |               | ±20% (M)                                             |      |      |                                                        |      |      |
| Maximum Leakage Current @ +20°C                                                                                             |               | CV ≤ 1,000μF                                         |      |      | CV > 1,000μF                                           |      |      |
|                                                                                                                             |               | 0.1CV + 40μA (1 minute)<br>0.03CV + 15μA (5 minutes) |      |      | 0.04CV + 100μA (1 minute)<br>0.02CV + 25μA (5 minutes) |      |      |
| Max. Tan δ at 120Hz/20°C                                                                                                    | W.V. (Vdc)    | 160                                                  | 200  | 250  | 350                                                    | 400  | 450  |
|                                                                                                                             | S.V. (Vdc)    | 200                                                  | 250  | 300  | 400                                                    | 450  | 500  |
|                                                                                                                             | Tan δ         | 0.15                                                 | 0.15 | 0.15 | 0.20                                                   | 0.20 | 0.20 |
| Low Temperature Stability Impedance Ratio @ 120Hz                                                                           | Z-25°C/Z+20°C | 3                                                    | 3    | 3    | 6                                                      | 6    | 6    |
| Load Life at W.V. & 105°C<br>8x11.5mm, 10x12.5mm: 5,000 Hours<br>10x16mm, 10x20mm: 8,000 Hours<br>φD ≥ 12.5mm: 10,000 Hours | Δ Capacitance | Within ±20% of initial measured value                |      |      |                                                        |      |      |
|                                                                                                                             | Δ Tan δ       | Less than 200% of specified value                    |      |      |                                                        |      |      |
|                                                                                                                             | Δ LC          | Less than specified value                            |      |      |                                                        |      |      |

### MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA AT 100KHz AND 105°C)

| Cap. (μF) | Working Voltage (Vdc) |      |      |      |      |      |
|-----------|-----------------------|------|------|------|------|------|
|           | 160                   | 200  | 250  | 350  | 400  | 450  |
| 1.0       | -                     | -    | -    | -    | 60   | -    |
|           |                       |      |      |      | 70   |      |
| 1.5       | -                     | -    | -    | -    | 90   | -    |
|           |                       |      |      |      | 100  |      |
| 1.8       | -                     | -    | -    | -    | 95   | -    |
|           |                       |      |      |      | 120  |      |
| 2.2       | -                     | -    | -    | -    | 95   | -    |
|           |                       |      |      |      | 140  |      |
| 3.3       | -                     | -    | -    | -    | 150  | -    |
|           |                       |      |      |      | 180  |      |
| 4.7       | -                     | -    | 160  | 150  | 220  | 220  |
| 5.6       | -                     | -    | -    | 180  | 250  | 250  |
| 6.8       | -                     | -    | 250  | 280  | 280  | 280  |
| 10        | 320                   | 320  | 320  | 350  | 350  | 450  |
| 15        | -                     | -    | -    | -    | 550  | 600  |
| 22        | 500                   | 500  | 500  | 650  | 760  | 730  |
| 33        | 650                   | 650  | 800  | 900  | 900  | 980  |
| 47        | 750                   | 980  | 980  | 1080 | 1180 | 1200 |
| 68        | 1180                  | 1300 | 1300 | 1470 | 1470 | -    |
| 82        | -                     | 1380 | 1380 | 1530 | -    | -    |
| 100       | 1420                  | 1420 | 1530 | -    | -    | -    |
| 150       | 1890                  | 1890 | 1940 | -    | -    | -    |
| 220       | 2370                  | -    | -    | -    | -    | -    |

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

| Cap. (μF) | 120Hz | 1KHz | 10KHz | 100KHz ~ up |
|-----------|-------|------|-------|-------------|
| 1 ~ 4.7   | 0.2   | 0.4  | 0.8   | 1.0         |
| 6.8 ~ 15  | 0.3   | 0.6  | 0.9   | 1.0         |
| 22 ~ 82   | 0.4   | 0.7  | 0.9   | 1.0         |
| 100 ~ 220 | 0.45  | 0.75 | 0.9   | 1.0         |

### MAXIMUM ESR (Ω AT 120Hz AND 20°C)

| Cap. (μF) | Working Voltage (Vdc) |      |      |      |      |      |
|-----------|-----------------------|------|------|------|------|------|
|           | 160                   | 200  | 250  | 350  | 400  | 450  |
| 1.0       | -                     | -    | -    | -    | 332  | -    |
| 1.5       | -                     | -    | -    | -    | 221  | -    |
| 1.8       | -                     | -    | -    | -    | 184  | -    |
| 2.2       | -                     | -    | -    | -    | 151  | -    |
| 3.3       | -                     | -    | -    | -    | 101  | -    |
| 4.7       | -                     | -    | 52.9 | 70.6 | 70.6 | 70.6 |
| 5.6       | -                     | -    | -    | 59.2 | 59.2 | 59.2 |
| 6.8       | -                     | -    | 36.6 | 48.8 | 48.8 | 48.8 |
| 10        | 24.9                  | 24.9 | 24.9 | 33.2 | 33.2 | 33.2 |
| 15        | -                     | -    | -    | -    | 22.1 | 22.1 |
| 22        | 11.3                  | 11.3 | 11.3 | 15.1 | 15.1 | 15.1 |
| 33        | 7.54                  | 7.54 | 7.54 | 10.1 | 10.1 | 10.1 |
| 47        | 5.29                  | 5.29 | 5.29 | 7.06 | 7.06 | 7.06 |
| 68        | 3.66                  | 3.66 | 3.66 | 4.88 | 4.88 | -    |
| 82        | -                     | 3.03 | 3.03 | 4.05 | -    | -    |
| 100       | 2.49                  | 2.49 | 2.49 | -    | -    | -    |
| 150       | 1.66                  | 1.66 | 1.66 | -    | -    | -    |
| 220       | 1.13                  | -    | -    | -    | -    | -    |

### PART NUMBER SYSTEM

NRB-XS 1R0 M 400V 8X11.5 F

Series: NRB-XS  
Capacitance Code: First 2 characters significant, third character is multiplier (1R0)  
Tolerance Code (M=20%)  
Working Voltage (Vdc): 400V  
Case Size (Dφ x L): 8X11.5 F  
RoHS Compliant

### 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)

**STANDARD PRODUCT AND CASE SIZE TABLE D  $\phi$  x L (mm)**

| Cap. ( $\mu$ F) | Code | Working Voltage (Vdc) |                  |         |         |                   |         |
|-----------------|------|-----------------------|------------------|---------|---------|-------------------|---------|
|                 |      | 160                   | 200              | 250     | 350     | 400               | 450     |
| 1.0             | 1R0  | -                     | -                | -       | -       | 8X11.5<br>10X12.5 | -       |
| 1.5             | 1R5  | -                     | -                | -       | -       | 8X11.5<br>10X12.5 | -       |
| 1.8             | 1R8  | -                     | -                | -       | -       | 8X11.5<br>10X12.5 | -       |
| 2.2             | 2R2  | -                     | -                | -       | -       | 8X11.5<br>10X12.5 | -       |
| 3.3             | 3R3  | -                     | -                | -       | -       | 10X12.5<br>10X16  | -       |
| 4.7             | 4R7  | -                     | -                | 8X11.5  | 10X12.5 | 10X16             | 10X20   |
| 5.6             | 5R6  | -                     | -                | -       | 10X12.5 | 10X16             | 10X20   |
| 6.8             | 6R8  | -                     | -                | 10X12.5 | 10X16   | 10X16             | 10X20   |
| 10              | 100  | 10X16                 | 10X16            | 10X16   | 10X20   | 10X20             | 12.5X20 |
| 15              | 150  | -                     | -                | -       | -       | 12.5X20           | 12.5X25 |
| 22              | 220  | 10X20                 | 10X20            | 10X20   | 12.5X20 | 12.5X25<br>16X20  | 16X20   |
| 33              | 330  | 10X20                 | 10X20            | 12.5X20 | 16X20   | 16X20             | 16X25   |
| 47              | 470  | 10X20                 | 12.5X20          | 12.5X20 | 16X20   | 16X25<br>18X20    | 18X25   |
| 68              | 680  | 12.5x20               | 12.5x25<br>16x20 | 16x20   | 18x25   | 18x25             | -       |
| 82              | 820  | -                     | 16x20            | 16x20   | 18x25   | -                 | -       |
| 100             | 101  | 12.5x25<br>16x20      | 16x20            | 16x25   | -       | -                 | -       |
| 150             | 151  | 16x25                 | 16x25            | 18x25   | -       | -                 | -       |
| 220             | 221  | 18x25                 | -                | -       | -       | -                 | -       |

**LEAD SPACING AND DIAMETER (mm)**

| Case Dia. (D $\phi$ ) | 8   | 10  | 12.5 | 16  | 18  |
|-----------------------|-----|-----|------|-----|-----|
| Lead Dia. (D $\phi$ ) | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| Lead Spacing (F)      | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| Dim. $\alpha$         | 0.5 | 0.5 | 0.5  | 0.5 | 0.5 |
| Dim. $\beta$          | 2.0 | 2.0 | 2.0  | 2.0 | 2.0 |

