

MINIATURE, EXTENDED LOAD LIFE, RADIAL LEADS, POLARIZED

### FEATURES

- HIGH RIPPLE CURRENT
- LONG LIFE AT HIGH TEMPERATURE (UP TO 12,000 Hours @ +105°C)

### CHARACTERISTICS

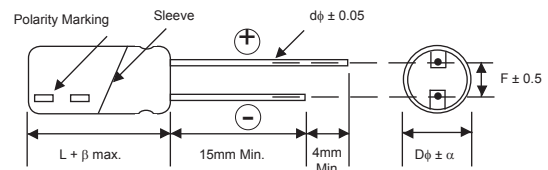
|                                                                               |               |                                           |     |     |     |     |     |      |      |
|-------------------------------------------------------------------------------|---------------|-------------------------------------------|-----|-----|-----|-----|-----|------|------|
| Rated Voltage Range                                                           |               | 160 ~ 450VDC                              |     |     |     |     |     |      |      |
| Capacitance Range                                                             |               | 10 ~ 820μF                                |     |     |     |     |     |      |      |
| Operating Temperature Range                                                   |               | -40°C ~ +105°C                            |     |     |     |     |     |      |      |
| Capacitance Tolerance                                                         |               | ±20% (M)                                  |     |     |     |     |     |      |      |
| Maximum Leakage Current @ +20°C                                               |               | 3x √CV after 5 minute at rated voltage    |     |     |     |     |     |      |      |
| Max. Tan δ at 120Hz/20°C                                                      | W.V. (Vdc)    | 160                                       | 200 | 220 | 250 | 350 | 400 | 420  | 450  |
|                                                                               | S.V. (Vdc)    | 200                                       | 250 | 270 | 300 | 400 | 450 | 470  | 500  |
|                                                                               | Tan δ         | 0.2                                       | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 |
| Low Temperature Stability<br>Impedance Ratio @ 120Hz                          | W.V. (Vdc)    | 160                                       | 200 | 220 | 250 | 350 | 400 | 420  | 450  |
|                                                                               | Z-25°C/Z+20°C | 3                                         | 3   | 3   | 3   | 5   | 5   | 6    | 6    |
|                                                                               | Z-40°C/Z+20°C | 6                                         | 6   | 6   | 6   | 6   | 6   | 10   | 10   |
| Load Life at W.V. & 105°C<br>L ≤ 20mm: 10,000 Hours<br>L ≥ 25mm: 12,000 Hours | Δ Capacitance | Within ±20% of initial measured value     |     |     |     |     |     |      |      |
|                                                                               | Δ Tan δ       | Less than 200% of specified maximum value |     |     |     |     |     |      |      |
|                                                                               | Δ LC          | Less than specified maximum value         |     |     |     |     |     |      |      |



### LEAD SPACING AND DIAMETER (mm)

|                  |     |      |      |     |    |
|------------------|-----|------|------|-----|----|
| Case Dia. (Dφ)   | 10  | 12.5 | 14.5 | 16  | 18 |
| Lead Dia. (dφ)   | 0.6 |      |      | 0.8 |    |
| Lead Spacing (F) | 5.0 |      |      | 7.5 |    |
| Dim. α           |     |      | 0.5  |     |    |
| Dim. β           |     |      | 2.0  |     |    |

### DIMENSIONS (mm)



### PART NUMBER SYSTEM

NRB-XZ 101 M 250V 12.5X30 TB E

- NRB-XZ: Series
- 101: Capacitance Code: First 2 characters significant, third character is multiplier
- M: Tolerance Code (M=20%)
- 250V: Working Voltage (Vdc)
- 12.5X30: Case Size (DφxL)
- TB: TB = Tape & Box Packaging (see pages 8 & 9)
- E: RoHS Compliant

### 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 VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>( $\mu$ F) | Vdc | Dissipation Factor<br>+20°C/120Hz | Max. ESR ( $\Omega$ )<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------------|-----|-----------------------------------|--------------------------------------|-------------------------------------|--------|-------------------------------|
|                        |                    |     |                                   |                                      | 120Hz                               | 100KHz |                               |
| NRB-XZ470M160V10X16F   | 47                 | 160 | 0.2                               | 7.06                                 | 0.260                               | 0.650  | 10000                         |
| NRB-XZ680M160V10X20F   | 68                 |     | 0.2                               | 4.88                                 | 0.320                               | 0.800  | 10000                         |
| NRB-XZ820M160V16X16F   | 82                 |     | 0.2                               | 4.05                                 | 0.540                               | 1.350  | 10000                         |
| NRB-XZ101M160V10X25F   | 100                |     | 0.2                               | 3.32                                 | 0.530                               | 1.193  | 12000                         |
| NRB-XZ101M160V12.5X20F | 100                |     | 0.2                               | 3.32                                 | 0.600                               | 1.350  | 10000                         |
| NRB-XZ101M160V18X16F   | 100                |     | 0.2                               | 3.32                                 | 0.690                               | 1.553  | 10000                         |
| NRB-XZ121M160V10X30F   | 120                |     | 0.2                               | 2.76                                 | 0.620                               | 1.395  | 12000                         |
| NRB-XZ151M160V10X35F   | 150                |     | 0.2                               | 2.21                                 | 0.700                               | 1.575  | 12000                         |
| NRB-XZ151M160V12.5X25F | 150                |     | 0.2                               | 2.21                                 | 0.730                               | 1.643  | 12000                         |
| NRB-XZ151M160V14.5X20F | 150                |     | 0.2                               | 2.21                                 | 0.800                               | 1.800  | 10000                         |
| NRB-XZ181M160V10X40F   | 180                |     | 0.2                               | 1.84                                 | 0.800                               | 1.800  | 12000                         |
| NRB-XZ181M160V12.5X30F | 180                |     | 0.2                               | 1.84                                 | 0.870                               | 1.958  | 12000                         |
| NRB-XZ181M160V16X20F   | 180                |     | 0.2                               | 1.84                                 | 0.800                               | 1.800  | 10000                         |
| NRB-XZ221M160V10X50F   | 220                |     | 0.2                               | 1.51                                 | 1.000                               | 2.250  | 12000                         |
| NRB-XZ221M160V12.5X35F | 220                |     | 0.2                               | 1.51                                 | 1.000                               | 2.250  | 12000                         |
| NRB-XZ221M160V14.5X25F | 220                |     | 0.2                               | 1.51                                 | 0.890                               | 2.003  | 12000                         |
| NRB-XZ221M160V18X20F   | 220                |     | 0.2                               | 1.51                                 | 0.990                               | 2.228  | 10000                         |
| NRB-XZ271M160V12.5X40F | 270                |     | 0.2                               | 1.23                                 | 1.120                               | 2.240  | 12000                         |
| NRB-XZ271M160V14.5X30F | 270                |     | 0.2                               | 1.23                                 | 1.100                               | 2.200  | 12000                         |
| NRB-XZ271M160V16X25F   | 270                |     | 0.2                               | 1.23                                 | 1.000                               | 2.000  | 12000                         |
| NRB-XZ331M160V12.5X45F | 330                |     | 0.2                               | 1.01                                 | 1.240                               | 2.480  | 12000                         |
| NRB-XZ331M160V14.5X35F | 330                |     | 0.2                               | 1.01                                 | 1.220                               | 2.440  | 12000                         |
| NRB-XZ331M160V16X30F   | 330                |     | 0.2                               | 1.01                                 | 1.200                               | 2.400  | 12000                         |
| NRB-XZ331M160V18X25F   | 330                |     | 0.2                               | 1.01                                 | 1.180                               | 2.360  | 12000                         |
| NRB-XZ391M160V14.5X40F | 390                |     | 0.2                               | 0.85                                 | 1.380                               | 2.760  | 12000                         |
| NRB-XZ391M160V16X35F   | 390                |     | 0.2                               | 0.85                                 | 1.380                               | 2.760  | 12000                         |
| NRB-XZ471M160V14.5X45F | 470                |     | 0.2                               | 0.71                                 | 1.520                               | 3.040  | 12000                         |
| NRB-XZ471M160V16X40F   | 470                |     | 0.2                               | 0.71                                 | 1.550                               | 3.100  | 12000                         |
| NRB-XZ471M160V18X30F   | 470                |     | 0.2                               | 0.71                                 | 1.550                               | 3.100  | 12000                         |
| NRB-XZ561M160V16X45F   | 560                |     | 0.2                               | 0.59                                 | 1.760                               | 3.520  | 12000                         |
| NRB-XZ561M160V18X35F   | 560                |     | 0.2                               | 0.59                                 | 1.740                               | 3.480  | 12000                         |
| NRB-XZ681M160V18X40F   | 680                |     | 0.2                               | 0.49                                 | 2.000                               | 4.000  | 12000                         |
| NRB-XZ821M160V18X50F   | 820                |     | 0.2                               | 0.40                                 | 2.230                               | 4.460  | 12000                         |
| NRB-XZ330M200V10X16F   | 33                 | 200 | 0.2                               | 10.05                                | 0.260                               | 0.650  | 10000                         |
| NRB-XZ470M200V10X20F   | 47                 |     | 0.2                               | 7.06                                 | 0.320                               | 0.800  | 10000                         |
| NRB-XZ560M200V16X16F   | 56                 |     | 0.2                               | 5.92                                 | 0.540                               | 1.350  | 10000                         |
| NRB-XZ680M200V10X25F   | 68                 |     | 0.2                               | 4.88                                 | 0.430                               | 1.075  | 12000                         |
| NRB-XZ680M200V12.5X20F | 68                 |     | 0.2                               | 4.88                                 | 0.540                               | 1.350  | 10000                         |
| NRB-XZ820M200V10X30F   | 82                 |     | 0.2                               | 4.05                                 | 0.500                               | 1.250  | 12000                         |
| NRB-XZ820M200V18X16F   | 82                 |     | 0.2                               | 4.05                                 | 0.620                               | 1.550  | 10000                         |
| NRB-XZ101M200V10X35F   | 100                |     | 0.2                               | 3.32                                 | 0.640                               | 1.440  | 12000                         |
| NRB-XZ101M200V14.5X20F | 100                |     | 0.2                               | 3.32                                 | 0.580                               | 1.305  | 10000                         |
| NRB-XZ121M200V10X40F   | 120                |     | 0.2                               | 2.76                                 | 0.740                               | 1.665  | 12000                         |
| NRB-XZ121M200V12.5X25F | 120                |     | 0.2                               | 2.76                                 | 0.650                               | 1.463  | 12000                         |
| NRB-XZ121M200V16X20F   | 120                |     | 0.2                               | 2.76                                 | 0.800                               | 1.800  | 10000                         |
| NRB-XZ151M200V10X45F   | 150                |     | 0.2                               | 2.21                                 | 0.780                               | 1.755  | 12000                         |
| NRB-XZ151M200V12.5X30F | 150                |     | 0.2                               | 2.21                                 | 0.800                               | 1.800  | 12000                         |
| NRB-XZ151M200V14.5X25F | 150                |     | 0.2                               | 2.21                                 | 0.790                               | 1.778  | 12000                         |
| NRB-XZ181M200V12.5X35F | 180                |     | 0.2                               | 1.84                                 | 0.920                               | 2.070  | 12000                         |
| NRB-XZ181M200V14.5X30F | 180                |     | 0.2                               | 1.84                                 | 0.950                               | 2.138  | 12000                         |
| NRB-XZ181M200V16X25F   | 180                |     | 0.2                               | 1.84                                 | 0.900                               | 2.025  | 12000                         |
| NRB-XZ181M200V18X20F   | 180                |     | 0.2                               | 1.84                                 | 1.000                               | 2.250  | 10000                         |
| NRB-XZ221M200V12.5X40F | 220                |     | 0.2                               | 1.51                                 | 1.050                               | 2.363  | 12000                         |
| NRB-XZ221M200V14.5X35F | 220                |     | 0.2                               | 1.51                                 | 1.090                               | 2.453  | 12000                         |
| NRB-XZ221M200V16X30F   | 220                |     | 0.2                               | 1.51                                 | 1.080                               | 2.430  | 12000                         |
| NRB-XZ271M200V12.5X50F | 270                |     | 0.2                               | 1.23                                 | 1.260                               | 2.520  | 12000                         |
| NRB-XZ271M200V14.5X40F | 270                |     | 0.2                               | 1.23                                 | 1.260                               | 2.520  | 12000                         |
| NRB-XZ271M200V16X30F   | 270                |     | 0.2                               | 1.23                                 | 1.180                               | 2.360  | 12000                         |
| NRB-XZ271M200V18X25F   | 270                |     | 0.2                               | 1.23                                 | 1.100                               | 2.200  | 12000                         |
| NRB-XZ331M200V14.5X45F | 330                |     | 0.2                               | 1.01                                 | 1.370                               | 2.740  | 12000                         |
| NRB-XZ331M200V16X40F   | 330                |     | 0.2                               | 1.01                                 | 1.430                               | 2.860  | 12000                         |



### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>( $\mu$ F) | Vdc | Dissipation Factor<br>+20°C/120Hz | Max. ESR ( $\Omega$ )<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------------|-----|-----------------------------------|--------------------------------------|-------------------------------------|--------|-------------------------------|
|                        |                    |     |                                   |                                      | 120Hz                               | 100KHz |                               |
| NRB-XZ331M200V18X30F   | 330                | 200 | 0.2                               | 1.01                                 | 1.300                               | 2.600  | 12000                         |
| NRB-XZ391M200V14.5X50F | 390                |     | 0.2                               | 0.85                                 | 1.480                               | 2.960  | 12000                         |
| NRB-XZ391M200V16X45F   | 390                |     | 0.2                               | 0.85                                 | 1.550                               | 3.100  | 12000                         |
| NRB-XZ391M200V18X35F   | 390                |     | 0.2                               | 0.85                                 | 1.430                               | 2.860  | 12000                         |
| NRB-XZ471M200V16X50F   | 470                |     | 0.2                               | 0.71                                 | 1.680                               | 3.360  | 12000                         |
| NRB-XZ471M200V18X40F   | 470                |     | 0.2                               | 0.71                                 | 1.620                               | 3.240  | 12000                         |
| NRB-XZ561M200V18X45F   | 560                |     | 0.2                               | 0.59                                 | 1.770                               | 3.540  | 12000                         |
| NRB-XZ330M220V10X16F   | 33                 | 220 | 0.2                               | 10.05                                | 0.240                               | 0.600  | 10000                         |
| NRB-XZ470M220V10X20F   | 47                 |     | 0.2                               | 7.06                                 | 0.300                               | 0.750  | 10000                         |
| NRB-XZ560M220V10X25F   | 56                 |     | 0.2                               | 5.92                                 | 0.400                               | 1.000  | 12000                         |
| NRB-XZ680M220V12.5X20F | 68                 |     | 0.2                               | 4.88                                 | 0.480                               | 1.200  | 10000                         |
| NRB-XZ821M220V10X30F   | 82                 |     | 0.2                               | 4.05                                 | 0.500                               | 1.250  | 12000                         |
| NRB-XZ101M220V10X35F   | 100                |     | 0.2                               | 3.32                                 | 0.640                               | 1.440  | 12000                         |
| NRB-XZ101M220V12.5X25F | 100                |     | 0.2                               | 3.32                                 | 0.620                               | 1.395  | 12000                         |
| NRB-XZ101M220V14.5X20F | 100                |     | 0.2                               | 3.32                                 | 0.600                               | 1.350  | 10000                         |
| NRB-XZ121M220V10X45F   | 120                |     | 0.2                               | 2.76                                 | 0.750                               | 1.688  | 12000                         |
| NRB-XZ121M220V12.5X30F | 120                |     | 0.2                               | 2.76                                 | 0.740                               | 1.665  | 12000                         |
| NRB-XZ121M220V14.5X25F | 120                |     | 0.2                               | 2.76                                 | 0.750                               | 1.688  | 12000                         |
| NRB-XZ121M220V16X20F   | 120                |     | 0.2                               | 2.76                                 | 0.680                               | 1.530  | 10000                         |
| NRB-XZ151M220V12.5X35F | 150                |     | 0.2                               | 2.21                                 | 0.880                               | 1.980  | 12000                         |
| NRB-XZ151M220V18X20F   | 150                |     | 0.2                               | 2.21                                 | 0.830                               | 1.868  | 10000                         |
| NRB-XZ181M220V12.5X40F | 180                |     | 0.2                               | 1.84                                 | 1.020                               | 2.295  | 12000                         |
| NRB-XZ181M220V14.5X30F | 180                |     | 0.2                               | 1.84                                 | 0.910                               | 2.048  | 12000                         |
| NRB-XZ181M220V16X25F   | 180                |     | 0.2                               | 1.84                                 | 0.900                               | 2.025  | 12000                         |
| NRB-XZ221M220V12.5X45F | 220                |     | 0.2                               | 1.51                                 | 1.050                               | 2.363  | 12000                         |
| NRB-XZ221M220V14.5X35F | 220                |     | 0.2                               | 1.51                                 | 1.040                               | 2.340  | 12000                         |
| NRB-XZ221M220V16X30F   | 220                |     | 0.2                               | 1.51                                 | 1.030                               | 2.318  | 12000                         |
| NRB-XZ221M220V18X25F   | 220                |     | 0.2                               | 1.51                                 | 0.990                               | 2.228  | 12000                         |
| NRB-XZ271M220V14.5X45F | 270                |     | 0.2                               | 1.23                                 | 1.300                               | 2.600  | 12000                         |
| NRB-XZ271M220V16X35F   | 270                |     | 0.2                               | 1.23                                 | 1.190                               | 2.380  | 12000                         |
| NRB-XZ271M220V18X30F   | 270                |     | 0.2                               | 1.23                                 | 1.170                               | 2.340  | 12000                         |
| NRB-XZ331M220V14.5X50F | 330                |     | 0.2                               | 1.01                                 | 1.410                               | 2.820  | 12000                         |
| NRB-XZ331M220V16X40F   | 330                |     | 0.2                               | 1.01                                 | 1.360                               | 2.720  | 12000                         |
| NRB-XZ331M220V18X35F   | 330                |     | 0.2                               | 1.01                                 | 1.350                               | 2.700  | 12000                         |
| NRB-XZ391M220V16X45F   | 390                |     | 0.2                               | 0.85                                 | 1.480                               | 2.960  | 12000                         |
| NRB-XZ391M220V18X40F   | 390                |     | 0.2                               | 0.85                                 | 1.550                               | 3.100  | 12000                         |
| NRB-XZ471M220V18X45F   | 470                |     | 0.2                               | 0.71                                 | 1.690                               | 3.380  | 12000                         |
| NRB-XZ561M220V18X50F   | 560                |     | 0.2                               | 0.59                                 | 1.800                               | 3.600  | 12000                         |
| NRB-XZ270M250V10X16F   | 27                 | 250 | 0.2                               | 12.29                                | 0.260                               | 0.650  | 10000                         |
| NRB-XZ390M250V10X20F   | 39                 |     | 0.2                               | 8.51                                 | 0.320                               | 0.800  | 10000                         |
| NRB-XZ470M250V10X25F   | 47                 |     | 0.2                               | 7.06                                 | 0.390                               | 0.975  | 12000                         |
| NRB-XZ470M250V16X16F   | 47                 |     | 0.2                               | 7.06                                 | 0.540                               | 1.350  | 10000                         |
| NRB-XZ560M250V12.5X20F | 56                 |     | 0.2                               | 5.92                                 | 0.540                               | 1.350  | 10000                         |
| NRB-XZ560M250V18X16F   | 56                 |     | 0.2                               | 5.92                                 | 0.620                               | 1.550  | 10000                         |
| NRB-XZ680M250V10X30F   | 68                 |     | 0.2                               | 4.88                                 | 0.500                               | 1.250  | 12000                         |
| NRB-XZ820M250V10X35F   | 82                 |     | 0.2                               | 4.05                                 | 0.570                               | 1.425  | 12000                         |
| NRB-XZ820M250V12.5X25F | 82                 |     | 0.2                               | 4.05                                 | 0.570                               | 1.425  | 12000                         |
| NRB-XZ820M250V14.5X20F | 82                 |     | 0.2                               | 4.05                                 | 0.500                               | 1.250  | 10000                         |
| NRB-XZ101M250V10X45F   | 100                |     | 0.2                               | 3.32                                 | 0.720                               | 1.620  | 12000                         |
| NRB-XZ101M250V12.5X30F | 100                |     | 0.2                               | 3.32                                 | 0.690                               | 1.553  | 12000                         |
| NRB-XZ101M250V16X20F   | 100                |     | 0.2                               | 3.32                                 | 0.800                               | 1.800  | 10000                         |
| NRB-XZ121M250V10X50F   | 120                |     | 0.2                               | 2.76                                 | 0.780                               | 1.755  | 12000                         |
| NRB-XZ121M250V12.5X35F | 120                |     | 0.2                               | 2.76                                 | 0.790                               | 1.778  | 12000                         |
| NRB-XZ121M250V14.5X25F | 120                |     | 0.2                               | 2.76                                 | 0.750                               | 1.688  | 12000                         |
| NRB-XZ121M250V18X20F   | 120                |     | 0.2                               | 2.76                                 | 1.000                               | 2.250  | 10000                         |
| NRB-XZ151M250V12.5X40F | 150                |     | 0.2                               | 2.21                                 | 0.920                               | 2.070  | 12000                         |
| NRB-XZ151M250V14.5X30F | 150                |     | 0.2                               | 2.21                                 | 0.830                               | 1.868  | 12000                         |
| NRB-XZ151M250V16X25F   | 150                |     | 0.2                               | 2.21                                 | 0.840                               | 1.890  | 12000                         |
| NRB-XZ181M250V12.5X45F | 180                |     | 0.2                               | 1.84                                 | 0.970                               | 2.183  | 12000                         |
| NRB-XZ181M250V14.5X35F | 180                |     | 0.2                               | 1.84                                 | 0.960                               | 2.160  | 12000                         |
| NRB-XZ181M250V16X30F   | 180                |     | 0.2                               | 1.84                                 | 0.950                               | 2.138  | 12000                         |



### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>( $\mu$ F) | Vdc | Dissipation Factor<br>+20°C/120Hz | Max. ESR ( $\Omega$ )<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------------|-----|-----------------------------------|--------------------------------------|-------------------------------------|--------|-------------------------------|
|                        |                    |     |                                   |                                      | 120Hz                               | 100KHz |                               |
| NRB-XZ181M250V18X25F   | 180                | 250 | 0.2                               | 1.84                                 | 0.920                               | 2.070  | 12000                         |
| NRB-XZ221M250V14.5X40F | 220                |     | 0.2                               | 1.51                                 | 1.110                               | 2.498  | 12000                         |
| NRB-XZ221M250V16X35F   | 220                |     | 0.2                               | 1.51                                 | 1.100                               | 2.475  | 12000                         |
| NRB-XZ221M250V18X30F   | 220                |     | 0.2                               | 1.51                                 | 1.100                               | 2.475  | 12000                         |
| NRB-XZ271M250V14.5X50F | 270                |     | 0.2                               | 1.23                                 | 1.300                               | 2.600  | 12000                         |
| NRB-XZ271M250V16X40F   | 270                |     | 0.2                               | 1.23                                 | 1.270                               | 2.540  | 12000                         |
| NRB-XZ271M250V18X35F   | 270                |     | 0.2                               | 1.23                                 | 1.260                               | 2.520  | 12000                         |
| NRB-XZ331M250V16X50F   | 330                |     | 0.2                               | 1.01                                 | 1.480                               | 2.960  | 12000                         |
| NRB-XZ331M250V18X40F   | 330                |     | 0.2                               | 1.01                                 | 1.450                               | 2.900  | 12000                         |
| NRB-XZ391M250V18X45F   | 390                |     | 0.2                               | 0.85                                 | 1.590                               | 3.180  | 12000                         |
| NRB-XZ471M250V18X50F   | 470                |     | 0.2                               | 0.71                                 | 1.830                               | 3.660  | 12000                         |
| NRB-XZ180M350V10X16F   | 18                 | 350 | 0.2                               | 18.43                                | 0.160                               | 0.400  | 10000                         |
| NRB-XZ220M350V10X20F   | 22                 |     | 0.2                               | 15.08                                | 0.200                               | 0.500  | 10000                         |
| NRB-XZ270M350V16X16F   | 27                 |     | 0.2                               | 12.29                                | 0.310                               | 0.775  | 10000                         |
| NRB-XZ330M350V10X25F   | 33                 |     | 0.2                               | 10.05                                | 0.330                               | 0.825  | 12000                         |
| NRB-XZ330M350V12.5X20F | 33                 |     | 0.2                               | 10.05                                | 0.340                               | 0.850  | 10000                         |
| NRB-XZ330M350V18X16F   | 33                 |     | 0.2                               | 10.05                                | 0.380                               | 0.950  | 10000                         |
| NRB-XZ390M350V10X30F   | 39                 |     | 0.2                               | 8.51                                 | 0.390                               | 0.975  | 12000                         |
| NRB-XZ470M350V10X35F   | 47                 |     | 0.2                               | 7.06                                 | 0.450                               | 1.125  | 12000                         |
| NRB-XZ470M350V12.5X25F | 47                 |     | 0.2                               | 7.06                                 | 0.450                               | 1.125  | 12000                         |
| NRB-XZ470M350V14.5X20F | 47                 |     | 0.2                               | 7.06                                 | 0.420                               | 1.050  | 10000                         |
| NRB-XZ560M350V10X40F   | 56                 |     | 0.2                               | 5.92                                 | 0.520                               | 1.300  | 12000                         |
| NRB-XZ560M350V12.5X30F | 56                 |     | 0.2                               | 5.92                                 | 0.550                               | 1.375  | 12000                         |
| NRB-XZ560M350V16X20F   | 56                 |     | 0.2                               | 5.92                                 | 0.480                               | 1.200  | 10000                         |
| NRB-XZ680M350V10X50F   | 68                 |     | 0.2                               | 4.88                                 | 0.600                               | 1.500  | 12000                         |
| NRB-XZ680M350V12.5X35F | 68                 |     | 0.2                               | 4.88                                 | 0.610                               | 1.525  | 12000                         |
| NRB-XZ680M350V14.5X25F | 68                 |     | 0.2                               | 4.88                                 | 0.560                               | 1.400  | 12000                         |
| NRB-XZ820M350V12.5X40F | 82                 |     | 0.2                               | 4.05                                 | 0.710                               | 1.775  | 12000                         |
| NRB-XZ820M350V14.5X30F | 82                 |     | 0.2                               | 4.05                                 | 0.670                               | 1.675  | 12000                         |
| NRB-XZ820M350V16X25F   | 82                 |     | 0.2                               | 4.05                                 | 0.650                               | 1.625  | 12000                         |
| NRB-XZ820M350V18X20F   | 82                 |     | 0.2                               | 4.05                                 | 0.520                               | 1.300  | 10000                         |
| NRB-XZ101M350V12.5X45F | 100                |     | 0.2                               | 3.32                                 | 0.790                               | 1.778  | 12000                         |
| NRB-XZ101M350V14.5X35F | 100                |     | 0.2                               | 3.32                                 | 0.780                               | 1.755  | 12000                         |
| NRB-XZ101M350V16X30F   | 100                |     | 0.2                               | 3.32                                 | 0.770                               | 1.733  | 12000                         |
| NRB-XZ101M350V18X25F   | 100                |     | 0.2                               | 3.32                                 | 0.760                               | 1.710  | 12000                         |
| NRB-XZ121M350V12.5X50F | 120                |     | 0.2                               | 2.76                                 | 0.850                               | 1.913  | 12000                         |
| NRB-XZ121M350V14.5X40F | 120                |     | 0.2                               | 2.76                                 | 0.900                               | 2.025  | 12000                         |
| NRB-XZ121M350V16X35F   | 120                |     | 0.2                               | 2.76                                 | 0.890                               | 2.003  | 12000                         |
| NRB-XZ151M350V14.5X45F | 150                |     | 0.2                               | 2.21                                 | 0.970                               | 2.183  | 12000                         |
| NRB-XZ151M350V16X40F   | 150                |     | 0.2                               | 2.21                                 | 1.000                               | 2.250  | 12000                         |
| NRB-XZ151M350V18X30F   | 150                |     | 0.2                               | 2.21                                 | 0.900                               | 2.025  | 12000                         |
| NRB-XZ181M350V16X45F   | 180                |     | 0.2                               | 1.84                                 | 1.120                               | 2.520  | 12000                         |
| NRB-XZ181M350V18X35F   | 180                |     | 0.2                               | 1.84                                 | 1.040                               | 2.340  | 12000                         |
| NRB-XZ221M350V18X40F   | 220                |     | 0.2                               | 1.51                                 | 1.200                               | 2.700  | 12000                         |
| NRB-XZ271M350V18X50F   | 270                |     | 0.2                               | 1.23                                 | 1.400                               | 2.800  | 12000                         |
| NRB-XZ120M400V10X16F   | 12                 | 400 | 0.2                               | 27.65                                | 0.160                               | 0.400  | 10000                         |
| NRB-XZ180M400V10X20F   | 18                 |     | 0.2                               | 18.43                                | 0.220                               | 0.550  | 10000                         |
| NRB-XZ180M400V16X16F   | 18                 |     | 0.2                               | 18.43                                | 0.230                               | 0.575  | 10000                         |
| NRB-XZ220M400V10X25F   | 22                 |     | 0.2                               | 15.08                                | 0.240                               | 0.600  | 12000                         |
| NRB-XZ270M400V10X25F   | 27                 |     | 0.2                               | 12.29                                | 0.290                               | 0.725  | 12000                         |
| NRB-XZ270M400V12.5X20F | 27                 |     | 0.2                               | 12.29                                | 0.340                               | 0.850  | 10000                         |
| NRB-XZ270M400V18X16F   | 27                 |     | 0.2                               | 12.29                                | 0.380                               | 0.950  | 10000                         |
| NRB-XZ330M400V10X30F   | 33                 |     | 0.2                               | 10.05                                | 0.340                               | 0.850  | 12000                         |
| NRB-XZ390M400V10X35F   | 39                 |     | 0.2                               | 8.51                                 | 0.390                               | 0.975  | 12000                         |
| NRB-XZ390M400V12.5X25F | 39                 |     | 0.2                               | 8.51                                 | 0.390                               | 0.975  | 12000                         |
| NRB-XZ390M400V14.5X20F | 39                 |     | 0.2                               | 8.51                                 | 0.360                               | 0.900  | 10000                         |
| NRB-XZ470M400V10X40F   | 47                 |     | 0.2                               | 7.06                                 | 0.440                               | 1.100  | 12000                         |
| NRB-XZ470M400V12.5X30F | 47                 |     | 0.2                               | 7.06                                 | 0.455                               | 1.138  | 12000                         |
| NRB-XZ470M400V16X20F   | 47                 |     | 0.2                               | 7.06                                 | 0.470                               | 1.175  | 10000                         |
| NRB-XZ560M400V10X45F   | 56                 |     | 0.2                               | 5.92                                 | 0.500                               | 1.250  | 12000                         |
| NRB-XZ560M400V12.5X30F | 56                 |     | 0.2                               | 5.92                                 | 0.495                               | 1.238  | 12000                         |

### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>( $\mu$ F) | Vdc  | Dissipation Factor<br>+20°C/120Hz | Max. ESR ( $\Omega$ )<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------------|------|-----------------------------------|--------------------------------------|-------------------------------------|--------|-------------------------------|
|                        |                    |      |                                   |                                      | 120Hz                               | 100KHz |                               |
| NRB-XZ560M400V12.5X35F | 56                 | 400V | 0.2                               | 5.92                                 | 0.525                               | 1.313  | 12000                         |
| NRB-XZ560M400V14.5X25F | 56                 |      | 0.2                               | 5.92                                 | 0.495                               | 1.238  | 12000                         |
| NRB-XZ560M400V16X20F   | 56                 |      | 0.2                               | 5.92                                 | 0.480                               | 1.200  | 10000                         |
| NRB-XZ560M400V18X20F   | 56                 |      | 0.2                               | 5.92                                 | 0.520                               | 1.300  | 10000                         |
| NRB-XZ680M400V12.5X35F | 68                 |      | 0.2                               | 4.88                                 | 0.570                               | 1.425  | 12000                         |
| NRB-XZ680M400V12.5X40F | 68                 |      | 0.2                               | 4.88                                 | 0.600                               | 1.500  | 12000                         |
| NRB-XZ680M400V14.5X30F | 68                 |      | 0.2                               | 4.88                                 | 0.585                               | 1.463  | 12000                         |
| NRB-XZ680M400V16X25F   | 68                 |      | 0.2                               | 4.88                                 | 0.570                               | 1.425  | 12000                         |
| NRB-XZ680M400V18X20F   | 68                 |      | 0.2                               | 4.88                                 | 0.530                               | 1.325  | 10000                         |
| NRB-XZ820M400V12.5X40F | 82                 |      | 0.2                               | 4.05                                 | 0.650                               | 1.625  | 12000                         |
| NRB-XZ820M400V12.5X45F | 82                 |      | 0.2                               | 4.05                                 | 0.680                               | 1.700  | 12000                         |
| NRB-XZ820M400V14.5X35F | 82                 |      | 0.2                               | 4.05                                 | 0.670                               | 1.675  | 12000                         |
| NRB-XZ820M400V16X30F   | 82                 |      | 0.2                               | 4.05                                 | 0.670                               | 1.675  | 12000                         |
| NRB-XZ820M400V18X25F   | 82                 |      | 0.2                               | 4.05                                 | 0.640                               | 1.600  | 12000                         |
| NRB-XZ101M400V12.5X50F | 100                |      | 0.2                               | 3.32                                 | 0.760                               | 1.710  | 12000                         |
| NRB-XZ101M400V14.5X40F | 100                |      | 0.2                               | 3.32                                 | 0.760                               | 1.710  | 12000                         |
| NRB-XZ101M400V14.5X45F | 100                |      | 0.2                               | 3.32                                 | 0.785                               | 1.766  | 12000                         |
| NRB-XZ101M400V16X30F   | 100                |      | 0.2                               | 3.32                                 | 0.710                               | 1.598  | 12000                         |
| NRB-XZ101M400V16X35F   | 100                |      | 0.2                               | 3.32                                 | 0.760                               | 1.710  | 12000                         |
| NRB-XZ101M400V18X25F   | 100                |      | 0.2                               | 3.32                                 | 0.710                               | 1.598  | 12000                         |
| NRB-XZ121M400V14.5X45F | 120                |      | 0.2                               | 2.76                                 | 0.840                               | 1.890  | 12000                         |
| NRB-XZ121M400V14.5X50F | 120                |      | 0.2                               | 2.76                                 | 0.875                               | 1.969  | 12000                         |
| NRB-XZ121M400V16X35F   | 120                |      | 0.2                               | 2.76                                 | 0.810                               | 1.823  | 12000                         |
| NRB-XZ121M400V16X40F   | 120                |      | 0.2                               | 2.76                                 | 0.860                               | 1.935  | 12000                         |
| NRB-XZ121M400V18X30F   | 120                |      | 0.2                               | 2.76                                 | 0.840                               | 1.890  | 12000                         |
| NRB-XZ121M400V18X35F   | 120                |      | 0.2                               | 2.76                                 | 0.870                               | 1.958  | 12000                         |
| NRB-XZ151M400V16X45F   | 150                |      | 0.2                               | 2.21                                 | 0.950                               | 2.138  | 12000                         |
| NRB-XZ151M400V16X50F   | 150                |      | 0.2                               | 2.21                                 | 0.995                               | 2.239  | 12000                         |
| NRB-XZ151M400V18X35F   | 150                |      | 0.2                               | 2.21                                 | 0.920                               | 2.070  | 12000                         |
| NRB-XZ151M400V18X40F   | 150                |      | 0.2                               | 2.21                                 | 0.985                               | 2.216  | 12000                         |
| NRB-XZ181M400V16X50F   | 180                |      | 0.2                               | 1.84                                 | 1.070                               | 2.408  | 12000                         |
| NRB-XZ181M400V18X40F   | 180                |      | 0.2                               | 1.84                                 | 1.040                               | 2.340  | 12000                         |
| NRB-XZ181M400V18X45F   | 180                |      | 0.2                               | 1.84                                 | 1.095                               | 2.464  | 12000                         |
| NRB-XZ221M400V18X50F   | 220                |      | 0.2                               | 1.51                                 | 1.220                               | 2.745  | 12000                         |
| NRB-XZ150M420V10X20F   | 15                 | 420  | 0.25                              | 27.65                                | 0.190                               | 0.475  | 10000                         |
| NRB-XZ180M420V10X25F   | 18                 |      | 0.25                              | 23.04                                | 0.230                               | 0.575  | 12000                         |
| NRB-XZ220M420V10X25F   | 22                 |      | 0.25                              | 18.85                                | 0.250                               | 0.625  | 12000                         |
| NRB-XZ270M420V10X30F   | 27                 |      | 0.25                              | 15.36                                | 0.290                               | 0.725  | 12000                         |
| NRB-XZ270M420V12.5X20F | 27                 |      | 0.25                              | 15.36                                | 0.300                               | 0.750  | 10000                         |
| NRB-XZ270M420V12.5X25F | 27                 |      | 0.25                              | 15.36                                | 0.340                               | 0.850  | 12000                         |
| NRB-XZ330M420V10X35F   | 33                 |      | 0.25                              | 12.57                                | 0.340                               | 0.850  | 12000                         |
| NRB-XZ330M420V12.5X25F | 33                 |      | 0.25                              | 12.57                                | 0.350                               | 0.875  | 12000                         |
| NRB-XZ330M420V12.5X30F | 33                 |      | 0.25                              | 12.57                                | 0.400                               | 1.000  | 12000                         |
| NRB-XZ330M420V14.5X20F | 33                 |      | 0.25                              | 12.57                                | 0.350                               | 0.875  | 10000                         |
| NRB-XZ390M420V10X40F   | 39                 |      | 0.25                              | 10.63                                | 0.390                               | 0.975  | 12000                         |
| NRB-XZ390M420V14.5X25F | 39                 |      | 0.25                              | 10.63                                | 0.435                               | 1.088  | 12000                         |
| NRB-XZ390M420V16X20F   | 39                 |      | 0.25                              | 10.63                                | 0.400                               | 1.000  | 10000                         |
| NRB-XZ470M420V10X45F   | 47                 |      | 0.25                              | 8.82                                 | 0.440                               | 1.100  | 12000                         |
| NRB-XZ470M420V12.5X30F | 47                 |      | 0.25                              | 8.82                                 | 0.440                               | 1.100  | 12000                         |
| NRB-XZ470M420V12.5X35F | 47                 |      | 0.25                              | 8.82                                 | 0.505                               | 1.263  | 12000                         |
| NRB-XZ470M420V14.5X25F | 47                 |      | 0.25                              | 8.82                                 | 0.450                               | 1.125  | 12000                         |
| NRB-XZ470M420V16X25F   | 47                 |      | 0.25                              | 8.82                                 | 0.440                               | 1.100  | 12000                         |
| NRB-XZ560M420V12.5X35F | 56                 |      | 0.25                              | 7.40                                 | 0.510                               | 1.275  | 12000                         |
| NRB-XZ560M420V12.5X40F | 56                 |      | 0.25                              | 7.40                                 | 0.570                               | 1.425  | 12000                         |
| NRB-XZ560M420V14.5X30F | 56                 |      | 0.25                              | 7.40                                 | 0.560                               | 1.400  | 12000                         |
| NRB-XZ560M420V16X25F   | 56                 |      | 0.25                              | 7.40                                 | 0.510                               | 1.275  | 12000                         |
| NRB-XZ560M420V18X20F   | 56                 |      | 0.25                              | 7.40                                 | 0.480                               | 1.200  | 10000                         |
| NRB-XZ680M420V12.5X45F | 68                 |      | 0.25                              | 6.10                                 | 0.600                               | 1.500  | 12000                         |
| NRB-XZ680M420V12.5X50F | 68                 |      | 0.25                              | 6.10                                 | 0.670                               | 1.675  | 12000                         |
| NRB-XZ680M420V14.5X35F | 68                 |      | 0.25                              | 6.10                                 | 0.640                               | 1.600  | 12000                         |
| NRB-XZ680M420V16X30F   | 68                 |      | 0.25                              | 6.10                                 | 0.560                               | 1.400  | 12000                         |



### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>(μF) | Vdc | Dissipation Factor<br>+20°C/120Hz | Max. ESR (Ω)<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------|-----|-----------------------------------|-----------------------------|-------------------------------------|--------|-------------------------------|
|                        |              |     |                                   |                             | 120Hz                               | 100KHz |                               |
| NRB-XZ680M420V18X25F   | 68           | 420 | 0.25                              | 6.10                        | 0.615                               | 1.538  | 12000                         |
| NRB-XZ820M420V12.5X50F | 82           |     | 0.25                              | 5.06                        | 0.690                               | 1.725  | 12000                         |
| NRB-XZ820M420V14.5X40F | 82           |     | 0.25                              | 5.06                        | 0.680                               | 1.700  | 12000                         |
| NRB-XZ820M420V14.5X45F | 82           |     | 0.25                              | 5.06                        | 0.750                               | 1.875  | 12000                         |
| NRB-XZ820M420V16X30F   | 82           |     | 0.25                              | 5.06                        | 0.640                               | 1.600  | 12000                         |
| NRB-XZ820M420V16X35F   | 82           |     | 0.25                              | 5.06                        | 0.690                               | 1.725  | 12000                         |
| NRB-XZ820M420V18X25F   | 82           |     | 0.25                              | 5.06                        | 0.640                               | 1.600  | 12000                         |
| NRB-XZ820M420V18X30F   | 82           |     | 0.25                              | 5.06                        | 0.730                               | 1.825  | 12000                         |
| NRB-XZ101M420V14.5X45F | 100          |     | 0.25                              | 4.15                        | 0.790                               | 1.778  | 12000                         |
| NRB-XZ101M420V14.5X50F | 100          |     | 0.25                              | 4.15                        | 0.845                               | 1.901  | 12000                         |
| NRB-XZ101M420V16X35F   | 100          |     | 0.25                              | 4.15                        | 0.730                               | 1.643  | 12000                         |
| NRB-XZ101M420V16X40F   | 100          |     | 0.25                              | 4.15                        | 0.800                               | 1.800  | 12000                         |
| NRB-XZ101M420V18X30F   | 100          |     | 0.25                              | 4.15                        | 0.780                               | 1.755  | 12000                         |
| NRB-XZ101M420V18X35F   | 100          |     | 0.25                              | 4.15                        | 0.835                               | 1.879  | 12000                         |
| NRB-XZ121M420V16X40F   | 120          |     | 0.25                              | 3.46                        | 0.840                               | 1.890  | 12000                         |
| NRB-XZ121M420V16X45F   | 120          |     | 0.25                              | 3.46                        | 0.920                               | 2.070  | 12000                         |
| NRB-XZ121M420V18X35F   | 120          |     | 0.25                              | 3.46                        | 0.850                               | 1.913  | 12000                         |
| NRB-XZ121M420V18X40F   | 120          |     | 0.25                              | 3.46                        | 0.930                               | 2.093  | 12000                         |
| NRB-XZ151M420V16X50F   | 150          |     | 0.25                              | 2.76                        | 0.940                               | 2.115  | 12000                         |
| NRB-XZ151M420V18X40F   | 150          |     | 0.25                              | 2.76                        | 1.000                               | 2.250  | 12000                         |
| NRB-XZ151M420V18X45F   | 150          |     | 0.25                              | 2.76                        | 1.060                               | 2.385  | 12000                         |
| NRB-XZ181M420V18X45F   | 180          |     | 0.25                              | 2.30                        | 1.100                               | 2.475  | 12000                         |
| NRB-XZ100M450V10X16F   | 10           | 450 | 0.25                              | 41.47                       | 0.130                               | 0.325  | 10000                         |
| NRB-XZ150M450V10X20F   | 15           |     | 0.25                              | 27.65                       | 0.190                               | 0.475  | 10000                         |
| NRB-XZ150M450V16X16F   | 15           |     | 0.25                              | 27.65                       | 0.210                               | 0.525  | 10000                         |
| NRB-XZ180M450V10X25F   | 18           |     | 0.25                              | 23.04                       | 0.230                               | 0.575  | 12000                         |
| NRB-XZ220M450V10X30F   | 22           |     | 0.25                              | 18.85                       | 0.270                               | 0.675  | 12000                         |
| NRB-XZ220M450V12.5X20F | 22           |     | 0.25                              | 18.85                       | 0.280                               | 0.700  | 10000                         |
| NRB-XZ220M450V18X16F   | 22           |     | 0.25                              | 18.85                       | 0.340                               | 0.850  | 10000                         |
| NRB-XZ270M450V10X35F   | 27           |     | 0.25                              | 15.36                       | 0.320                               | 0.800  | 12000                         |
| NRB-XZ270M450V12.5X25F | 27           |     | 0.25                              | 15.36                       | 0.340                               | 0.850  | 12000                         |
| NRB-XZ270M450V14.5X20F | 27           |     | 0.25                              | 15.36                       | 0.335                               | 0.838  | 10000                         |
| NRB-XZ330M450V10X40F   | 33           |     | 0.25                              | 12.57                       | 0.360                               | 0.900  | 12000                         |
| NRB-XZ330M450V12.5X25F | 33           |     | 0.25                              | 12.57                       | 0.360                               | 0.900  | 12000                         |
| NRB-XZ330M450V12.5X30F | 33           |     | 0.25                              | 12.57                       | 0.400                               | 1.000  | 12000                         |
| NRB-XZ330M450V14.5X25F | 33           |     | 0.25                              | 12.57                       | 0.400                               | 1.000  | 12000                         |
| NRB-XZ390M450V10X45F   | 39           |     | 0.25                              | 10.63                       | 0.410                               | 1.025  | 12000                         |
| NRB-XZ390M450V12.5X30F | 39           |     | 0.25                              | 10.63                       | 0.430                               | 1.075  | 12000                         |
| NRB-XZ390M450V12.5X35F | 39           |     | 0.25                              | 10.63                       | 0.460                               | 1.150  | 12000                         |
| NRB-XZ390M450V14.5X25F | 39           |     | 0.25                              | 10.63                       | 0.430                               | 1.075  | 12000                         |
| NRB-XZ390M450V16X20F   | 39           |     | 0.25                              | 10.63                       | 0.400                               | 1.000  | 10000                         |
| NRB-XZ470M450V12.5X35F | 47           |     | 0.25                              | 8.82                        | 0.480                               | 1.200  | 12000                         |
| NRB-XZ470M450V12.5X40F | 47           |     | 0.25                              | 8.82                        | 0.525                               | 1.313  | 12000                         |
| NRB-XZ470M450V14.5X30F | 47           |     | 0.25                              | 8.82                        | 0.515                               | 1.288  | 12000                         |
| NRB-XZ470M450V16X25F   | 47           |     | 0.25                              | 8.82                        | 0.500                               | 1.250  | 12000                         |
| NRB-XZ470M450V18X20F   | 47           |     | 0.25                              | 8.82                        | 0.460                               | 1.150  | 10000                         |
| NRB-XZ560M450V12.5X40F | 56           |     | 0.25                              | 7.40                        | 0.540                               | 1.350  | 12000                         |
| NRB-XZ560M450V12.5X45F | 56           |     | 0.25                              | 7.40                        | 0.590                               | 1.475  | 12000                         |
| NRB-XZ560M450V14.5X30F | 56           |     | 0.25                              | 7.40                        | 0.540                               | 1.350  | 12000                         |
| NRB-XZ560M450V14.5X35F | 56           |     | 0.25                              | 7.40                        | 0.580                               | 1.450  | 12000                         |
| NRB-XZ560M450V16X25F   | 56           |     | 0.25                              | 7.40                        | 0.530                               | 1.325  | 12000                         |
| NRB-XZ560M450V16X30F   | 56           |     | 0.25                              | 7.40                        | 0.585                               | 1.463  | 12000                         |
| NRB-XZ560M450V18X25F   | 56           |     | 0.25                              | 7.40                        | 0.560                               | 1.400  | 12000                         |
| NRB-XZ680M450V12.5X45F | 68           |     | 0.25                              | 6.10                        | 0.610                               | 1.525  | 12000                         |
| NRB-XZ680M450V12.5X50F | 68           |     | 0.25                              | 6.10                        | 0.670                               | 1.675  | 12000                         |
| NRB-XZ680M450V14.5X35F | 68           |     | 0.25                              | 6.10                        | 0.620                               | 1.550  | 12000                         |
| NRB-XZ680M450V14.5X40F | 68           |     | 0.25                              | 6.10                        | 0.660                               | 1.650  | 12000                         |
| NRB-XZ680M450V16X30F   | 68           |     | 0.25                              | 6.10                        | 0.610                               | 1.525  | 12000                         |
| NRB-XZ680M450V16X35F   | 68           |     | 0.25                              | 6.10                        | 0.660                               | 1.650  | 12000                         |
| NRB-XZ680M450V18X25F   | 68           |     | 0.25                              | 6.10                        | 0.610                               | 1.525  | 12000                         |
| NRB-XZ820M450V14.5X40F | 82           |     | 0.25                              | 5.06                        | 0.670                               | 1.675  | 12000                         |



### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

| Part Number            | Cap.<br>( $\mu$ F) | Volt. | Dissipation Factor<br>+20°C/120Hz | Max. ESR ( $\Omega$ )<br>+20°C/120Hz | Ripple Current Rating (Arms) +105°C |        | Load Life<br>(Hours @ +105°C) |
|------------------------|--------------------|-------|-----------------------------------|--------------------------------------|-------------------------------------|--------|-------------------------------|
|                        |                    |       |                                   |                                      | 120Hz                               | 100KHz |                               |
| NRB-XZ820M450V14.5X45F | 82                 | 450   | 0.25                              | 5.06                                 | 0.740                               | 1.850  | 12000                         |
| NRB-XZ820M450V16X35F   | 82                 |       | 0.25                              | 5.06                                 | 0.690                               | 1.725  | 12000                         |
| NRB-XZ820M450V16X40F   | 82                 |       | 0.25                              | 5.06                                 | 0.750                               | 1.875  | 12000                         |
| NRB-XZ820M450V18X30F   | 82                 |       | 0.25                              | 5.06                                 | 0.730                               | 1.825  | 12000                         |
| NRB-XZ101M450V14.5X50F | 100                |       | 0.25                              | 4.15                                 | 0.810                               | 1.823  | 12000                         |
| NRB-XZ101M450V16X40F   | 100                |       | 0.25                              | 4.15                                 | 0.770                               | 1.733  | 12000                         |
| NRB-XZ101M450V16X45F   | 100                |       | 0.25                              | 4.15                                 | 0.840                               | 1.890  | 12000                         |
| NRB-XZ101M450V18X30F   | 100                |       | 0.25                              | 4.15                                 | 0.750                               | 1.688  | 12000                         |
| NRB-XZ101M450V18X35F   | 100                |       | 0.25                              | 4.15                                 | 0.835                               | 1.879  | 12000                         |
| NRB-XZ121M450V16X45F   | 120                |       | 0.25                              | 3.46                                 | 0.880                               | 1.980  | 12000                         |
| NRB-XZ121M450V18X35F   | 120                |       | 0.25                              | 3.46                                 | 0.860                               | 1.935  | 12000                         |
| NRB-XZ121M450V18X40F   | 120                |       | 0.25                              | 3.46                                 | 0.930                               | 2.093  | 12000                         |
| NRB-XZ151M450V18X45F   | 150                |       | 0.25                              | 2.76                                 | 1.000                               | 2.250  | 12000                         |
| NRB-XZ151M450V18X50F   | 150                |       | 0.25                              | 2.76                                 | 1.060                               | 2.385  | 12000                         |
| NRB-XZ181M450V18X50F   | 180                |       | 0.25                              | 2.30                                 | 1.100                               | 2.475  | 12000                         |

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR (160V ~ 450V)

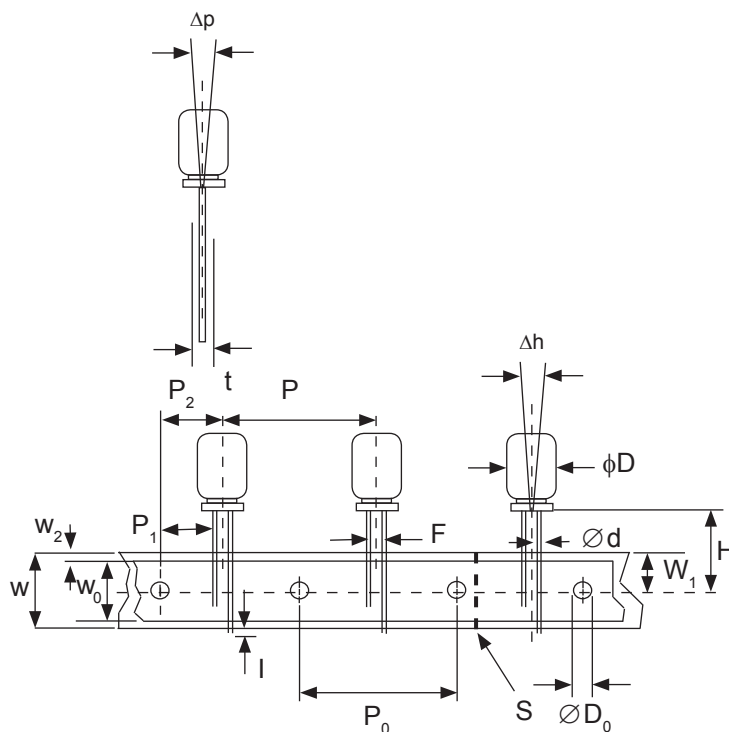
| Cap. ( $\mu$ F) | 60 (50)Hz | 120Hz | 500Hz | 1KHz | 10KHz | 100KHz |
|-----------------|-----------|-------|-------|------|-------|--------|
| 10 ~ 82         | 0.80      | 1.00  | 1.30  | 1.50 | 2.10  | 2.50   |
| 100 ~ 220       | 0.80      | 1.00  | 1.30  | 1.50 | 2.00  | 2.25   |
| 270 ~ 820       | 0.80      | 1.00  | 1.30  | 1.50 | 1.90  | 2.00   |

### RADIAL TAPING SPECIFICATIONS FOR 10mm & 12.5mm DIAMETER NRB-XZ PARTS PART NUMBER SUFFIX "TB"

#### TAPING DIMENSIONS (mm)

| Case Dia. ( $\phi$ ) | 10.0                        | 12.5        |
|----------------------|-----------------------------|-------------|
| L max.               | 18.0 ~ 27.0                 | 22.0 ~ 42.0 |
| $d\phi \pm 0.05$     | 0.6                         |             |
| $H \pm 0.75/-0.5$    | 18.5                        |             |
| $F \pm 0.8$          | 5.0                         |             |
| $P \pm 1.0$          | 12.7                        | 15.0        |
| $P_0 \pm 0.2$        | 12.7                        | 15.0        |
| $P_1 \pm 0.5$        | 3.85                        | 5.0         |
| $P_2 \pm 1.0$        | 6.35                        | 7.5         |
| $W \pm 0.3$          | 18.0                        |             |
| $W_0$ min.           | 5.0                         |             |
| $W_1 \pm 0.5$        | 9.0                         |             |
| $W_2$ max.           | 1.5                         |             |
| I max.               | 0.5                         |             |
| $D_0 \phi \pm 0.2$   | 4.0                         |             |
| $\Delta h$ max.      | 1.0 (off alignment of body) |             |
| $\Delta p$ max.      | 1.0 (off alignment of body) |             |
| $t \pm 0.3$          | 0.6 (not including lead)    |             |

**NOTE:** Anode (+) lead feeds off first.



#### Ammo Box (Tape & Box) TB

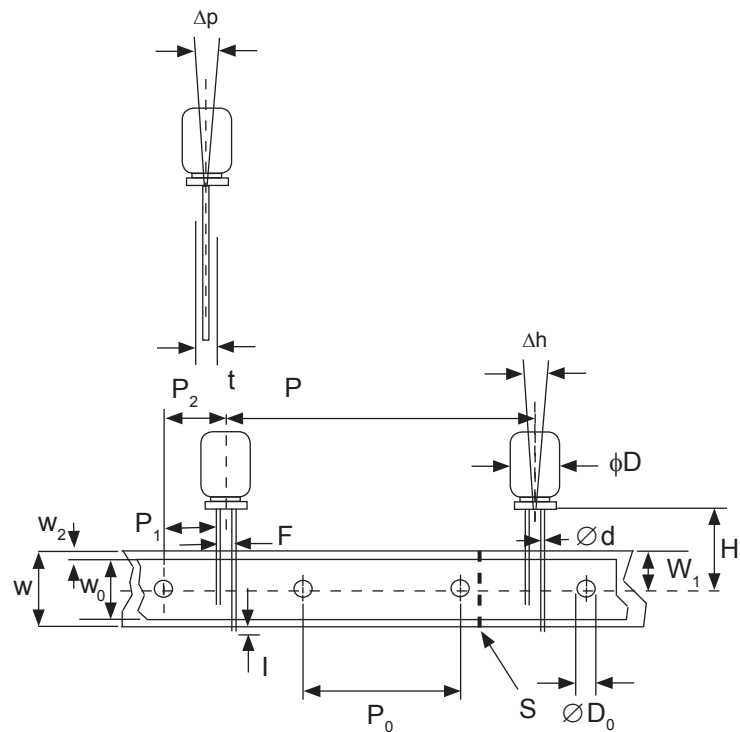
Size of box and component quantity

| Case Size             | Q'ty per Box (pcs) | Dim. L | Dim. H | Dim. W |
|-----------------------|--------------------|--------|--------|--------|
| $\phi 10 \times 16$   | 500                | 340    | 330    | 65     |
| $\phi 10 \times 20$   | 500                | 340    | 330    | 70     |
| $\phi 10 \times 25$   | 500                | 340    | 330    | 70     |
| $\phi 12.5 \times 20$ | 500                | 340    | 330    | 70     |
| $\phi 12.5 \times 25$ | 500                | 340    | 330    | 70     |
| $\phi 12.5 \times 30$ | 500                | 340    | 330    | 80     |
| $\phi 12.5 \times 35$ | 500                | 340    | 330    | 80     |
| $\phi 12.5 \times 40$ | 500                | 340    | 330    | 85     |

### RADIAL TAPING SPECIFICATIONS FOR 16mm & 18mm DIAMETER NRB-XZ PARTS PART NUMBER SUFFIX "TBST"

#### TAPING DIMENSIONS (mm)

| Case Dia. ( $\phi$ ) | 16.0                        | 18.0 |
|----------------------|-----------------------------|------|
| L max.               | 18.0 ~ 42.0                 |      |
| $d\phi \pm 0.05$     | 0.8                         |      |
| $H \pm 0.75/-0.5$    | 18.5                        |      |
| $F \pm 0.8$          | 7.5                         |      |
| $P \pm 1.0$          | 30.0                        |      |
| $P_0 \pm 0.3$        | 15.0                        |      |
| $P_1 \pm 0.5$        | 3.75                        |      |
| $P_2 \pm 1.0$        | 7.5                         |      |
| $W \pm 0.3$          | 18.0                        |      |
| $W_0$ min.           | 5.0                         |      |
| $W_1 \pm 0.5$        | 9.0                         |      |
| $W_2$ max.           | 1.5                         |      |
| I max.               | 0.5                         |      |
| $D_0 \phi \pm 0.2$   | 4.0                         |      |
| $\Delta h$ max.      | 1.0 (off alignment of body) |      |
| $\Delta p$ max.      | 1.0 (off alignment of body) |      |
| $t \pm 0.3$          | 0.6 (not including lead)    |      |



**NOTE:** Anode (+) lead feeds off first.

#### Ammo Box (Tape & Box) TBST

Size of box and component quantity

| Case Size           | Q'ty per Box (pcs) | Dim. L | Dim. H | Dim. W |
|---------------------|--------------------|--------|--------|--------|
| $\phi 16 \times 16$ | 250                | 340    | 330    | 65     |
| $\phi 16 \times 20$ | 250                | 340    | 330    | 65     |
| $\phi 16 \times 25$ | 250                | 340    | 330    | 75     |
| $\phi 16 \times 30$ | 250                | 340    | 330    | 85     |
| $\phi 16 \times 35$ | 250                | 340    | 330    | 85     |
| $\phi 16 \times 40$ | 250                | 340    | 330    | 85     |
| $\phi 18 \times 16$ | 250                | 340    | 330    | 70     |
| $\phi 18 \times 20$ | 250                | 340    | 330    | 70     |
| $\phi 18 \times 25$ | 250                | 340    | 330    | 75     |
| $\phi 18 \times 30$ | 250                | 340    | 330    | 85     |
| $\phi 18 \times 35$ | 250                | 340    | 330    | 85     |
| $\phi 18 \times 40$ | 250                | 340    | 330    | 85     |

#### Ammo Box Dimensions (mm)

