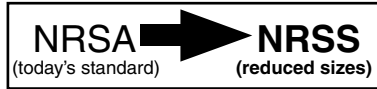


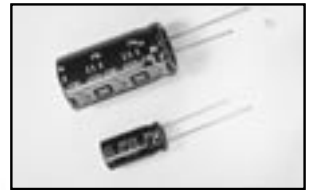
Miniature Aluminum Electrolytic Capacitors

NRSS Series

RADIAL LEADS, POLARIZED, NEW REDUCED CASE SIZING (FURTHER REDUCED FROM NRSA SERIES) EXPANDED TAPING AVAILABILITY



RoHS Compliant
includes all homogeneous materials



CHARACTERISTICS

*See Part Number System for Details

| | | | | | | | | | |
|---|------------------------|--|------|------|------|------|------|------|------|
| Rated Voltage Range | | 6.3 ~ 100 VDC | | | | | | | |
| Capacitance Range | | 10 ~ 10,000 μ F | | | | | | | |
| Operating Temperature Range | | -40 ~ +85°C | | | | | | | |
| Capacitance Tolerance | | \pm 20% | | | | | | | |
| Max. Leakage Current @ (20°C) | After 1 min. | 0.03CV or 4 μ A , whichever is greater | | | | | | | |
| | After 2 min. | 0.01CV or 3 μ A , whichever is greater | | | | | | | |
| Max. Tan δ @ 120Hz/20°C | W.V. (Vdc) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| | S.V. (Vdc) | 8 | 13 | 20 | 32 | 44 | 63 | 79 | 125 |
| | C \leq 1,000 μ F | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 |
| | C = 2,200 μ F | 0.30 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | | |
| | C = 3,300 μ F | 0.32 | 0.28 | 0.24 | 0.20 | 0.18 | 0.18 | | |
| | C = 4,700 μ F | 0.34 | 0.30 | 0.26 | 0.22 | 0.20 | | | |
| | C = 6,800 μ F | 0.36 | 0.32 | 0.28 | 0.24 | | | | |
| Low Temperature Stability Impedance Ratio @ 120Hz | Z-25°C/Z+20°C | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 |
| | Z-40°C/Z+20°C | 12 | 10 | 8 | 5 | 4 | 4 | 4 | 4 |
| Load Life Test at Rated W.V. 85°C 2,000 Hours | Capacitance Change | Within \pm 20% of initial measured value | | | | | | | |
| | Tan δ | Less than 200% of specified maximum value | | | | | | | |
| | Leakage Current | Less than specified maximum value | | | | | | | |
| Shelf Life Test 85°C 1,000 Hours No Load | Capacitance Change | Within \pm 20% of initial measured value | | | | | | | |
| | Tan δ | Less than 200% of specified maximum value | | | | | | | |
| | Leakage Current | Less than specified maximum value | | | | | | | |

PERMISSIBLE RIPPLE CURRENT (mA rms AT 120Hz AND 85°C)

| Cap (μ F) | Working Voltage (Vdc) | | | | | | | |
|----------------|-----------------------|------|------|------|------|------|------|------|
| | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| 10 | - | - | - | - | - | - | - | 65 |
| 22 | - | - | - | - | - | - | 100 | 130 |
| 33 | - | - | - | - | - | 120 | - | 180 |
| 47 | - | - | - | - | 130 | - | 170 | 230 |
| 100 | - | - | 160 | - | 210 | - | 270 | 370 |
| 220 | - | 220 | 260 | - | 350 | 410 | 470 | 620 |
| 330 | - | 290 | 370 | 390 | 470 | 520 | 710 | 760 |
| 470 | 320 | 350 | 440 | 520 | 580 | 650 | 900 | 1000 |
| 1,000 | 540 | 620 | 710 | 830 | 1000 | 1100 | 1300 | - |
| 2,200 | 900 | 970 | 1150 | 1300 | 1550 | 1700 | - | - |
| 3,300 | 1050 | 1250 | 1400 | 1650 | 1950 | 2200 | - | - |
| 4,700 | 1350 | 1500 | 1700 | 2050 | 2400 | - | - | - |
| 6,800 | 1600 | 1850 | 2150 | 2550 | - | - | - | - |
| 10,000 | 2000 | 2350 | 2700 | - | - | - | - | - |

MAXIMUM E.S.R. (Ω AT 120HZ AND 20°C)

| Cap (μ F) | Working Voltage (Vdc) | | | | | | | |
|----------------|-----------------------|-------|-------|-------|-------|-------|------|------|
| | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| 10 | - | - | - | - | - | - | - | 13.3 |
| 22 | - | - | - | - | - | - | 7.54 | 6.03 |
| 33 | - | - | - | - | - | 6.03 | - | 4.02 |
| 47 | - | - | - | - | 4.94 | - | 3.53 | 2.82 |
| 100 | - | - | 3.32 | - | 2.32 | - | 1.66 | 1.33 |
| 220 | - | 1.81 | 1.51 | - | 1.06 | 0.90 | 0.75 | 0.60 |
| 330 | - | 1.21 | 1.01 | 0.80 | 0.70 | 0.60 | 0.50 | 0.40 |
| 470 | 0.99 | 0.85 | 0.71 | 0.56 | 0.49 | 0.42 | 0.35 | 0.28 |
| 1,000 | 0.46 | 0.40 | 0.33 | 0.27 | 0.23 | 0.20 | 0.17 | - |
| 2,200 | 0.23 | 0.20 | 0.16 | 0.14 | 0.12 | 0.11 | - | - |
| 3,300 | 0.16 | 0.14 | 0.12 | 0.10 | 0.090 | 0.080 | - | - |
| 4,700 | 0.12 | 0.11 | 0.092 | 0.078 | 0.071 | - | - | - |
| 6,800 | 0.088 | 0.078 | 0.068 | 0.059 | - | - | - | - |
| 10,000 | 0.063 | 0.056 | 0.050 | - | - | - | - | - |

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

| Frequency (Hz) | 50 | 120 | 300 | 1K | 10K |
|-------------------|------|------|------|------|------|
| ~ 47 μ F | 0.75 | 1.00 | 1.35 | 1.57 | 2.00 |
| 100 ~ 470 μ F | 0.80 | 1.00 | 1.23 | 1.34 | 1.50 |
| 1000 μ F ~ | 0.85 | 1.00 | 1.10 | 1.13 | 1.15 |

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
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: tpmg@niccomp.com



STANDARD PRODUCT AND CASE SIZE TABLE D ϕ x L (mm)

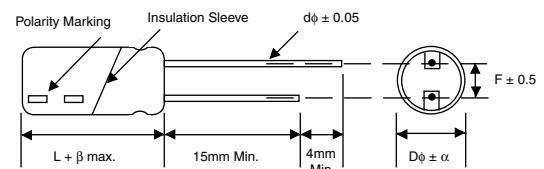
| Cap(μ F) | Code | Working Voltage (WVDC) | | | | | | | |
|---------------|------|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| 10 | 100 | - | - | - | - | - | - | - | 6.3 x 11 |
| 22 | 220 | - | - | - | - | - | - | 5 x 11 | 8 x 11.5 |
| 33 | 330 | - | - | - | - | SEE NRSA | 5 x 11 | SEE NRSA | 8 x 12.5 |
| 47 | 470 | - | - | - | SEE NRSA | 5 x 11 | SEE NRSA | 6.3 x 11 | 10 x 12.5 |
| 100 | 101 | - | - | 5 x 11 | SEE NRSA | 6.3 x 11 | SEE NRSA | 8 x 11.5 | 10 x 20 |
| 220 | 221 | - | 5 x 11 | 6.3 x 11 | SEE NRSA | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 12.5 x 25 |
| 330 | 331 | - | 6.3 x 11 | SEE NRSA | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 25 |
| 470 | 471 | 6.3 x 11 | 6.3 x 11 | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 20 | 16 x 25 |
| 1000 | 102 | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | - |
| 2200 | 222 | 10 x 16 | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31 | - | - |
| 3300 | 332 | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31 | 18 x 36 | - | - |
| 4700 | 472 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31 | 18 x 36 | - | - | - |
| 6800 | 682 | 12.5 x 25 | 16 x 25 | 16 x 31 | 18 x 36 | - | - | - | - |
| 10,000 | 103 | 16 x 25 | 16 x 31 | 18 x 36 | - | - | - | - | - |

LEAD SPACING AND DIAMETER (mm)

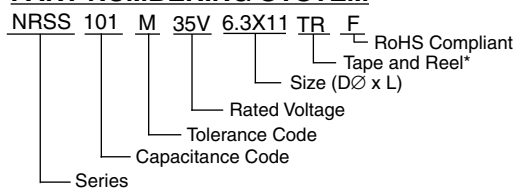
| Case Dia. (D ϕ) | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 | 22 |
|------------------------|-----|-----|-----|-----|------|-----|-----|-----|
| Leads Dia. (d ϕ) | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 0.8 |
| Lead Spacing (F) | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 | 10 |
| Dim. α | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 1.0 |

$$\beta = L < 20\text{mm} = 1.5\text{mm}, L \geq 20\text{mm} = 2.0\text{mm}$$

DIMENSIONS (mm)



PART NUMBERING SYSTEM



*see tape specification for details