

NR SERIES ▪ STANDARD, BI-POLAR, AUDIO 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ THT type
- Endurance: 85°C ▪ 2 000 hours
- Bi-Polar, Non-polarized type
- Excellent frequency characteristics
- Especially for audio applications



SPECIFICATIONS

| Items | | Performance Characteristics | | | | | | | | |
|--|--|---|--|----|----|----|----|----|----|-----|
| Operating Temperature Range | | -40 ~ +85°C | | | | | | | | |
| Rated Voltage Range | V_R | 6.3 ~ 100V DC | | | | | | | | |
| Surge Voltage | V_S | $V_S = 1.15 \cdot V_R$ | | | | | | | | |
| Capacitance Range | C_R | 1 ~ 1000 μ F | | | | | | | | |
| Cap. Tolerance | ΔC | $\pm 20\%$ (120Hz ▪ 20°C) | | | | | | | | |
| Leakage Current (20°C ▪ V_R applied) | I_{LEAK} | $\leq 0.03 \cdot C_R \cdot V_R$ or 3 μ A, whichever is greater ▪ After 1 minute [I_{LEAK} (μ A) ; C_R (μ F) ; V_R (V)] | | | | | | | | |
| Dissipation Factor % (20°C ▪ 120Hz) | tan δ | V_R (V DC) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| | | tan δ (%) | 24 | 20 | 16 | 16 | 14 | 12 | 10 | 10 |
| | | For $C_R > 1000\mu$ F, add 2% per every multiple 1000 μ F of rated capacitance value | | | | | | | | |
| Low Temperature Characteristics at 120Hz | Z ratio max. | V_R (V DC) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| | | Z-25°C/Z+20°C | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Z-40°C/Z+20°C | 8 | 6 | 4 | 4 | 3 | 3 | 3 | 3 |
| | | For capacitance > 1000 μ F | | | | | | | | |
| | | Z-25°C/Z+20°C | Add 0.5 for every multiple 1000 μ F of rated capacitance value | | | | | | | |
| Z-40°C/Z+20°C | Add 1 for every multiple 1000 μ F of rated capacitance value | | | | | | | | | |

| Lifetime Test | | | |
|---------------------------------------|--|---|--|
| Endurance 85°C (V_R applied) | Test | 2 000 hours | |
| | $\Delta C/C_R$ | $\leq \pm 20\%$ of initial measured value | |
| | tan δ | $\leq 200\%$ of initial specified value | |
| | I_{Leak} | \leq the initial specified value | |
| Shelf Life 85°C ($V_R = 0$) | Test | 1 000 hours | |
| | $\Delta C/C_R$ | $\leq \pm 20\%$ of initial measured value | |
| | tan δ | $\leq 200\%$ of initial specified value | |
| | I_{Leak} | \leq the initial specified value | |
| | Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4 | | |

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

| C_R (μ F) / Frequency (Hz) | 50/60 | 100/120 | 400 | 1k | 10k | 50k - 100k |
|-----------------------------------|-------|---------|------|------|------|------------|
| $C_R \leq 10$ | 0.8 | 1 | 1.3 | 1.45 | 1.65 | 1.7 |
| $10 < C_R \leq 100$ | 0.8 | 1 | 1.23 | 1.36 | 1.48 | 1.53 |
| $100 < C_R \leq 1000$ | 0.8 | 1 | 1.16 | 1.25 | 1.35 | 1.38 |

STANDARD RATINGS

Part number shows bulk version with straight leads

| V_R (V) | C_R (μ F) | ϕ D (mm) | L (mm) | I_R - Max. Ripple Current +85°C • 120Hz (mA rms) | CapXon Part Number |
|--------------|---------------------|------------------|-----------|---|--------------------|
| 6.3 | 33 | 5 | 11 | 62 | NR330M6R3C110A |
| | 47 | 6.3 | 11 | 76 | NR470M6R3E110A |
| | 100 | 8 | 11.5 | 154 | NR101M6R3F115A |
| | 220 | 10 | 12.5 | 245 | NR221M6R3G125A |
| | 330 | 10 | 16 | 330 | NR331M6R3G160A |
| | 470 | 10 | 20 | 360 | NR471M6R3G200A |
| | 1000 | 13 | 25 | 910 | NR102M6R3I250A |
| 10 | 22 | 5 | 11 | 60 | NR220M010C110A |
| | 33 | 6.3 | 11 | 70 | NR330M010E110A |
| | 47 | 6.3 | 11 | 95 | NR470M010E110A |
| | 100 | 10 | 12.5 | 188 | NR101M010G125A |
| | 220 | 10 | 16 | 294 | NR221M010G160A |
| | 330 | 10 | 20 | 360 | NR331M010G200A |
| | 470 | 13 | 20 | 538 | NR471M010I200A |
| 16 | 1000 | 16 | 25 | 940 | NR102M010J250A |
| | 10 | 5 | 11 | 43 | NR100M016C110A |
| | 22 | 6.3 | 11 | 71 | NR220M016E110A |
| | 33 | 6.3 | 11 | 90 | NR330M016E110A |
| | 47 | 8 | 11.5 | 122 | NR470M016F115A |
| | 100 | 10 | 12.5 | 208 | NR101M016G125A |
| | 220 | 10 | 20 | 360 | NR221M016G200A |
| | 330 | 13 | 20 | 480 | NR331M016I200A |
| 25 | 470 | 13 | 25 | 638 | NR471M016I250A |
| | 1000 | 16 | 31.5 | 1090 | NR102M016J315A |
| | 4.7 | 5 | 11 | 26 | NR4R7M025C110A |
| | 10 | 5 | 11 | 44 | NR100M025C110A |
| | 22 | 6.3 | 11 | 71 | NR220M025E110A |
| | 33 | 8 | 11.5 | 110 | NR330M025F115A |
| | 47 | 10 | 12.5 | 150 | NR470M025G125A |
| | 100 | 10 | 16 | 250 | NR101M025G160A |
| | 220 | 13 | 25 | 478 | NR221M025I250A |
| 35 | 330 | 13 | 25 | 615 | NR331M025I250A |
| | 470 | 16 | 25 | 720 | NR471M025J250A |
| | 4.7 | 5 | 11 | 34 | NR4R7M035C110A |
| | 10 | 6.3 | 11 | 48 | NR100M035E110A |
| | 22 | 8 | 11.5 | 96 | NR220M035F115A |
| | 33 | 10 | 12.5 | 135 | NR330M035G125A |
| | 47 | 10 | 12.5 | 154 | NR470M035G125A |
| | 100 | 10 | 20 | 275 | NR101M035G200A |
| 35 | 220 | 13 | 25 | 560 | NR221M035I250A |
| | 330 | 16 | 25 | 670 | NR331M035J250A |

See "PACKAGING INFORMATION" to taped or formed products.

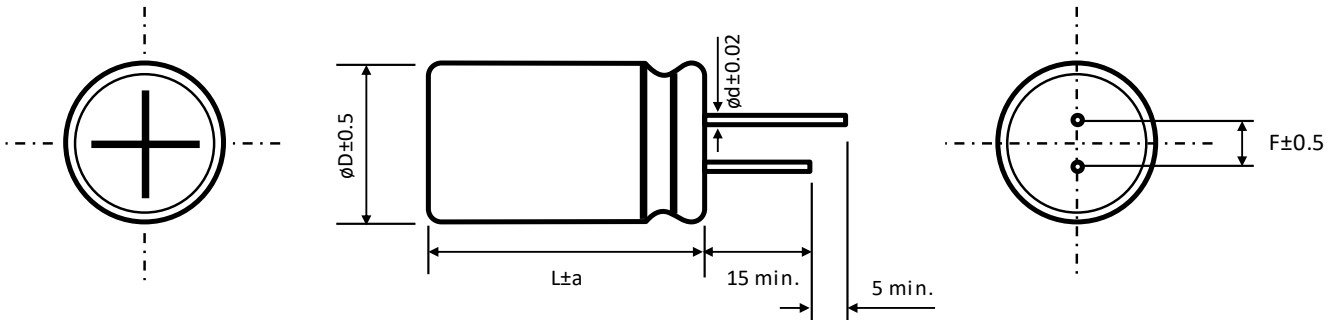
STANDARD RATINGS

Part number shows bulk version with straight leads

| V_R (V) | C_R (μ F) | ϕ D (mm) | L (mm) | I_R - Max. Ripple Current +85°C - 120Hz (mA rms) | CapXon Part Number |
|--------------|---------------------|------------------|-----------|---|--------------------|
| 50 | 1 | 5 | 11 | 18 | NR010M050C110A |
| | 1.8 | 5 | 11 | 22 | NR1R8M050C110A |
| | 2.2 | 5 | 11 | 27 | NR2R2M050C110A |
| | 3.3 | 5 | 11 | 29 | NR3R3M050C110A |
| | 4.7 | 6.3 | 11 | 42 | NR4R7M050E110A |
| | 10 | 8 | 11.5 | 65 | NR100M050F115A |
| | 22 | 10 | 12.5 | 118 | NR220M050G125A |
| | 33 | 10 | 16 | 155 | NR330M050G160A |
| | 47 | 10 | 20 | 200 | NR470M050G200A |
| | 100 | 13 | 25 | 370 | NR101M050I250A |
| | 220 | 16 | 25 | 645 | NR221M050J250A |
| 330 | 16 | 31.5 | 760 | NR331M050J315A | |
| 63 | 1 | 6.3 | 11 | 22 | NR010M063E110A |
| | 1.8 | 6.3 | 11 | 26 | NR1R8M063E110A |
| | 2.2 | 6.3 | 11 | 33 | NR2R2M063E110A |
| | 3.3 | 8 | 11.5 | 36 | NR3R3M063F115A |
| | 4.7 | 8 | 11.5 | 44 | NR4R7M063F115A |
| | 10 | 8 | 11.5 | 73 | NR100M063F115A |
| | 22 | 10 | 12.5 | 125 | NR220M063G125A |
| | 33 | 10 | 16 | 170 | NR330M063G160A |
| | 47 | 10 | 20 | 215 | NR470M063G200A |
| | 100 | 13 | 25 | 384 | NR101M063I250A |
| 100 | 1 | 6.3 | 11 | 25 | NR010M100E110A |
| | 1.8 | 6.3 | 11 | 32 | NR1R8M100E110A |
| | 2.2 | 6.3 | 11 | 39 | NR2R2M100E110A |
| | 3.3 | 8 | 11.5 | 49 | NR3R3M100F115A |
| | 4.7 | 10 | 12.5 | 60 | NR4R7M100G125A |
| | 10 | 10 | 16 | 98 | NR100M100G160A |
| | 22 | 10 | 20 | 165 | NR220M100G200A |
| | 33 | 13 | 20 | 275 | NR330M100I200A |

See "PACKAGING INFORMATION" to taped or formed products.





DIMENSIONS ▪ All dimensions in mm



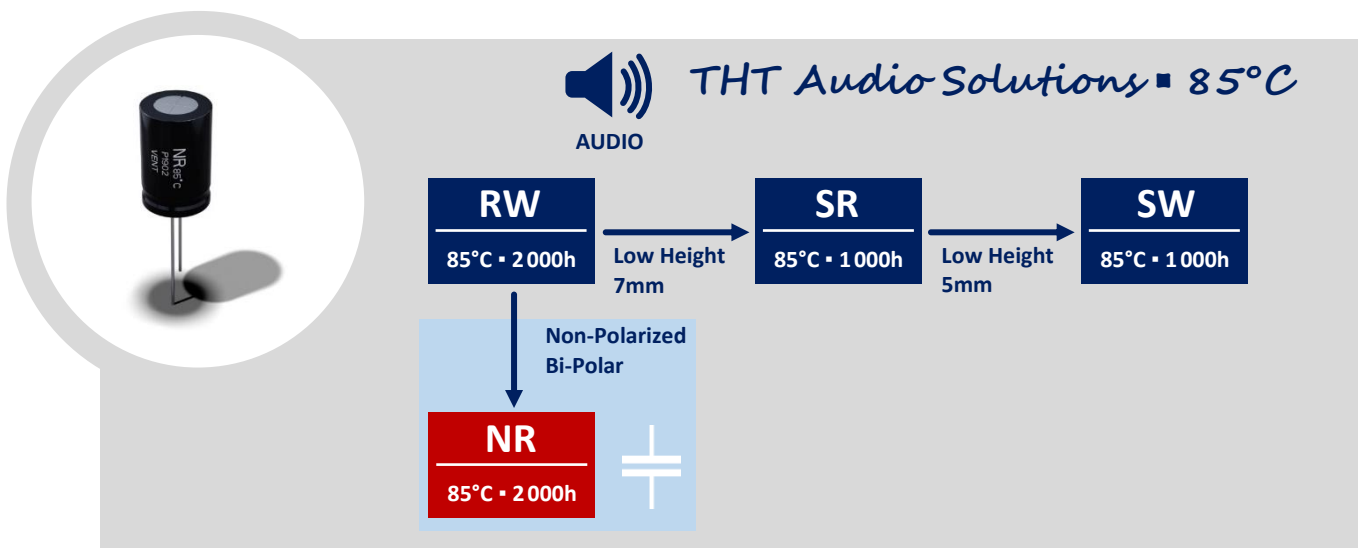
| ϕD | 5 | 6.3 | 8 | 10 | 13 | 16 |
|----------|-----|-----|-----|-----|----|-----|
| F | 2 | 2.5 | 3.5 | 5 | 5 | 7.5 |
| ϕd | 0.5 | | | 0.6 | | 0.8 |
| a | 1.5 | | | 1.5 | | 1.5 |

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following links in the table.

| | | | |
|---|---|--|---|
|  |  |  |  |
| General Precautions & Guidelines | Packaging Information | 3D Models | Reliability Tests |

GROUP CHART





DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

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