# Type 944U Polypropylene, DC Filter Capacitors

## High Current, Low Profile for Inverter Applications

Type 944U is specifically designed for use in high power DC filtering applications. The low inductance internal construction utilizes low loss metallized polypropylene for high ripple current capability. Male or female terminal options offer design flexibility in a rugged UL 94VO rated flame retardant plastic case and resin fill. High current ratings and robust mounting flanges make the 944U suited for inverter applications in electric vehicle power inverters, wind power inverters and motor drives.

## Highlights

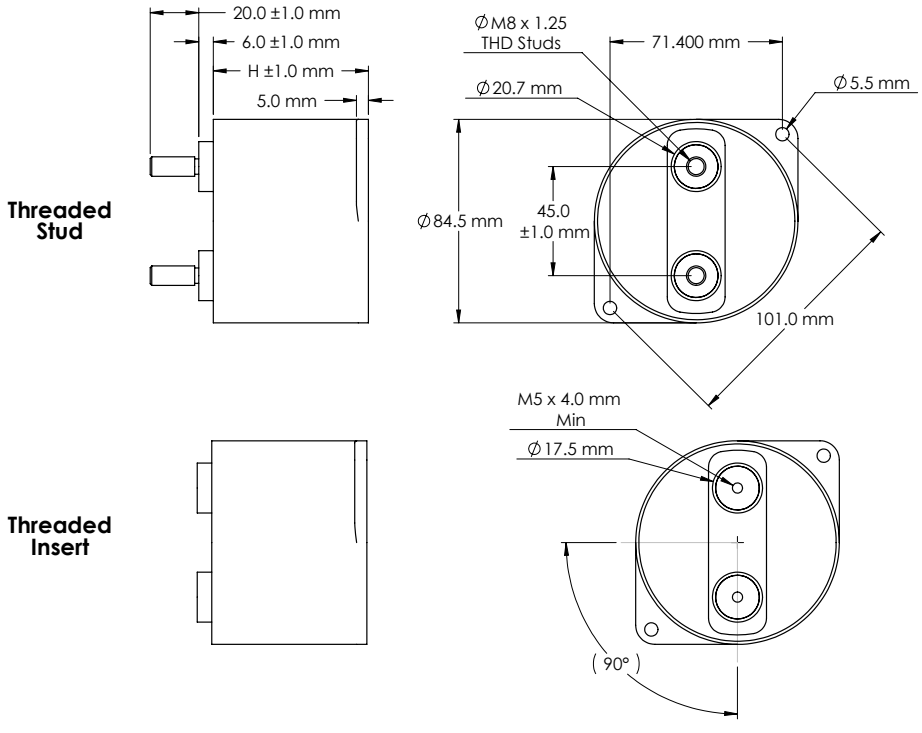
- Low Inductance
- Low Profile
- Low ESR
- High Ripple Current
- High Voltage Ratings

## Specifications

| | |
|---|---|
| **Capacitance Range** | 33 to 220 µF |
| **Capacitance Tolerance** | ±10% standard |
| **Rated Voltage** | 800 to 1400 Vdc |
| **Operating Temperature Range with Ripple** | -40 ºC to 85 ºC |
| **Maximum rms Current** | 74A @ 55 ºC |
| **Maximum rms Voltage** | 230 Vac |
| **Test Voltage between Terminal @ 25ºC** | 150% rated DC voltage for 10 s |
| **Test Voltage between Terminals & Case @ 25ºC** | 4 kVac @ 50/60 Hz for 60 s |
| **Life Test** | 5000 h @ 85 ºC, rated voltage |
| **RoHS Compliant** | |

## Dimensions

| Construction Details | |
|---|---|
| Case Material | Plastic UL94V-0 |
| Resin Material | Dry Resin UL94V-0 |
| Terminal Material | Tin Plated Brass |



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## Part Numbering System

| 944U | 101 | K | 801 | A | A | M |
|---|---|---|---|---|---|---|
| **Type** | **Capacitance** | **Tolerance** | **Voltage** | **Diameter D (mm)** | **Height H (mm)** | **Terminal** |
| 944U | 101 = 100 µF | K = ±10% | 801 = 800 Vdc | A = 84.5 | A = 40 | M = M8 Thd Stud |
| | 700 = 70 µF | | 102 = 1000 Vdc | | B = 51 | I = M5 Thd Insert |
| | 470 = 47 µF | | 122 = 1200 Vdc | | C = 64 | |
| | | | 142 = 1400 Vdc | | | |

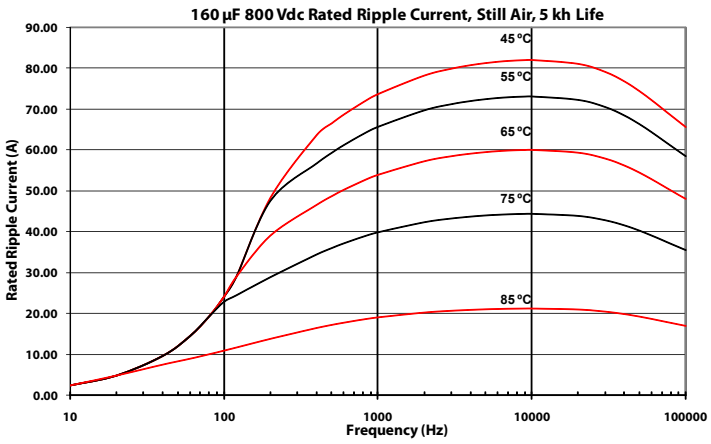
## Ratings

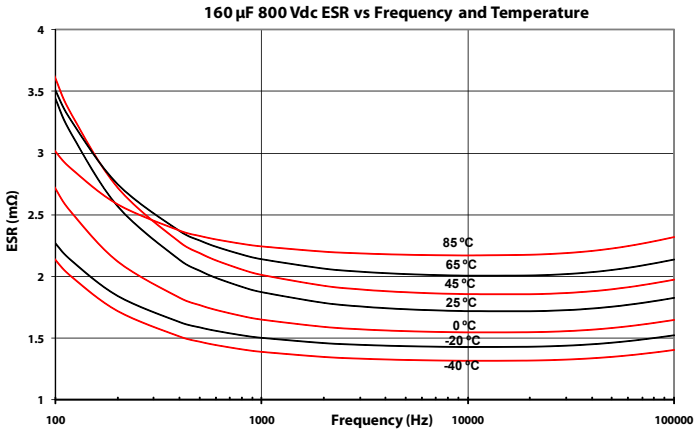
**NOTE:** Other ratings, sizes and performance specifications are available. Contact us.

| Catalog Part Number | Cap (µF) | Rated Voltage (Vdc) | H Height mm | Max ESR 10kHz (mΩ) | Typical ESL (nH) | Max Irms 55°C (A) | Thermal Resistance Θcc (°C/W) | Thermal Resistance Θca (°C/W) |
|---|---|---|---|---|---|---|---|---|
| 944U101K801AA* | 100 | 800 | 40 | 0.5 | 20 | 74 | 2.8 | 5.2 |
| 944U161K801AB* | 160 | 800 | 51 | 0.8 | 30 | 73 | 3.0 | 4.5 |
| 944U221K801AC* | 220 | 800 | 64 | 1.0 | 40 | 72 | 3.1 | 4.0 |
| 944U660K102AA* | 66 | 1000 | 40 | 0.6 | 20 | 70 | 2.8 | 5.2 |
| 944U101K102AB* | 100 | 1000 | 51 | 0.8 | 30 | 68 | 3.0 | 4.5 |
| 944U141K102AC* | 140 | 1000 | 64 | 1.0 | 40 | 65 | 3.1 | 4.0 |
| 944U470K122AA* | 47 | 1200 | 40 | 0.7 | 20 | 67 | 2.8 | 5.2 |
| 944U700K122AB* | 70 | 1200 | 51 | 1.0 | 30 | 65 | 3.0 | 4.5 |
| 944U101K122AC* | 100 | 1200 | 64 | 1.3 | 40 | 64 | 3.1 | 4.0 |
| 944U330K142AA* | 33 | 1400 | 40 | 0.8 | 20 | 64 | 2.8 | 5.2 |
| 944U520K142AB* | 52 | 1400 | 51 | 1.1 | 30 | 60 | 3.0 | 4.5 |
| 944U700K142AC* | 70 | 1400 | 64 | 1.4 | 40 | 59 | 3.1 | 4.0 |

*** M = M8 Stud  I = M5 Insert**

## Typical Performance Curves



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## Expected Lifetime Predictions

To use the Expected Lifetime curves calculate Va/Vr and core temperature T. Start by estimating:

Applied dc voltage Va
Ripple Current I
Ripple Frequency f
Ambient Temperature Ta
Airflow speed v

Units:

| | |
|---|---|
| $A=m^2$ | T, Ta & Tc=°C |
| C=µF | θ, θca & θcc =°C/W |
| ESR=mΩ | v=m/s |
| f=kHz | Va &Vr=Vdc |
| I=A | |

NOTE: The temperature rise in the 944U is $I^2$(ESR) times the thermal resistance θ. The ESR is mainly the metal resistance; the metal resistance is the 10 kHz ESR. For operation below 10kHz add the dielectric resistance. It is the dielectric dissipation factor—no more than 0.0002—times the capacitive reactance, i.e., 0.0002/(2πfC). That's equal to 31.83/(fC).

1. Start with the 10 kHz ESR from the Ratings table. If frequency is less than 10 kHz, add 31.83/(fC).

2. Compute total thermal resistance θ as the sum of core-to-case thermal resistance θcc and case-to-ambient thermal resistance θca. Both are in the Ratings table but θca is for still air and θcc is for 10 kHz or less. For frequency > 10 kHz multiply θcc by [1+(f –10)/100], e.g., for 75 kHz multiply θcc by 1.65. For moving air use the capacitor surface area A and airflow speed v to calculate $\theta ca = 1/[A(5+17.5(v+0.1)^{0.66})]$.

3. Compute Va/Vr and the core temperature T.
$T = Ta + I^2(ESR)\theta$

4. Look up estimated lifetime from the Expected Lifetime curves.

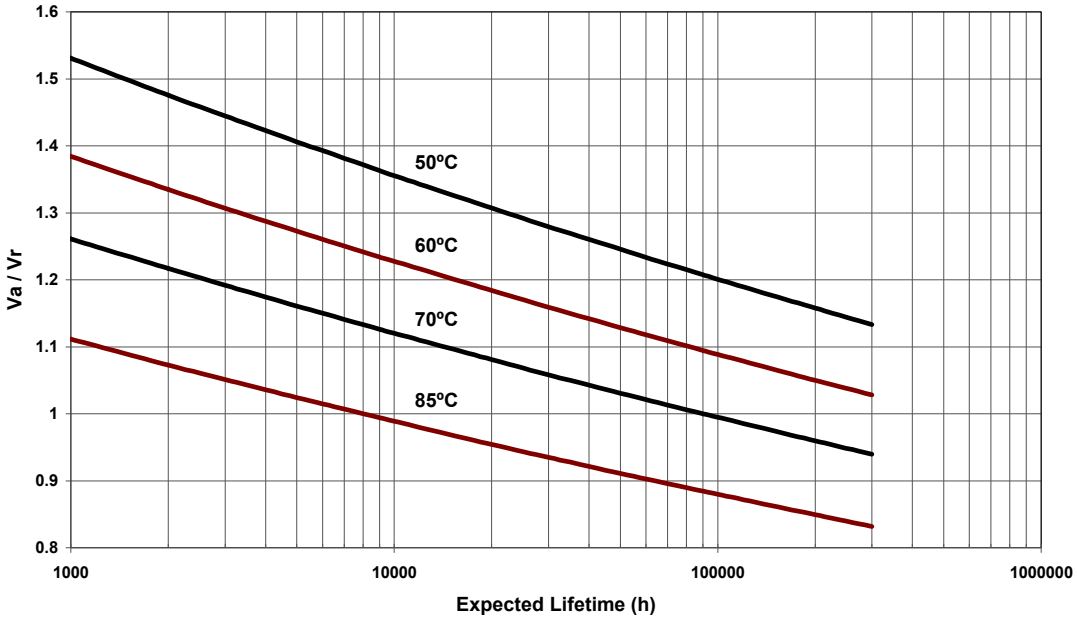
5. If you want a longer expected lifetime, choose a capacitor with higher voltage rating or consider using multiple capacitors in parallel to share the ripple current.

The expected lifetime predictions assume no exposure to overvoltage transients. Expected lifetime can be calculated for varying exposure to overvoltage transients. As an illustration at 50 °C the expected lifetime is 100,000 h with the 24-hour Va/Vr profile below:

| Va / Vr | Duration |
|---|---|
| 1.67 | 100 ms |
| 1.50 | 5 minutes |
| 1.30 | 2.5 hours |
| 1.10 | 9.6 hours |
| 1.00 | 11.9 hours |

For applications with more severe 24-hour profiles, contact us.

**Expected Lifetime vs Hot Spot Temperature and Applied DC Voltage**



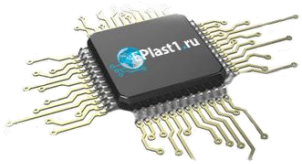
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.