CAPACITECH

DATASHEET

1.6V | 3F | CABLE-BASED CAPACITOR

CBC-3-A-0016-120

OVERVIEW

The Cable-Based Capacitor (CBC) is a flexible, wire-shape supercapacitor. Its unique form factor offers space and aesthetic advantages through its ability to be used as a part of a product or system's wiring infrastructure to add redundancy, or to offset components from printed circuit boards.

FEATURES AND BENEFITS

- Flexible & wire-shape form factor
- Use as part of wiring infrastructure
- Cable-based backup power
- Cable-based boost power
- Size, space, aesthetic advantages
- Electronics miniaturization

TYPICAL APPLICATIONS

- Peak Power Complement
- Emergency Lighting
- Renewable Energy Systems
- Automotive Systems
- IoT, Automation, & Security Devices
- Backup System
- Energy Harvesting
- Advanced and Smart Metering

SAFETY

Pending Certifications	UL Listing

PHYSCIAL

Nominal Mass	7.5g

PRODUCT SPECIFICATIONS

ELECTRICAL

Rated Voltage, V_R	1.6 VDC
Surge Voltage, Non-repetitive	2.0 VDC
Rated Capacitance, C	3 F
Min. / Max. Capacitance	2.4 / 6 F
Current Rating	1.25A
Peak Current Rating, Non-repetitive	2A
Max ESR_{DC}	0.20 Ω
Maximum Leakage Current	0.3mA

POWER & ENERGY

Maximum Stored Energy, E_{max}	1.07 mWh
Energy Density	0.20 Wh/kg
Power Density	205 W/kg
Impedance Match Specific Power	427 W/kg

LIFE

Cycle Life for 0.1V to V_R at Room Temperature	>40,000 cycles
Expected Shelf Life (Stored uncharged at 25°C)	4 years
Temperature Range	0C to 70C
Capacitance end of life value	>2.5F
ESR_{DC} end of life value	<0.4 Ω

*Results may vary depending on testing/application conditions. Specifications listed are initial, beginning of life performance values. Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the warranty details for applicable operating and use requirements.

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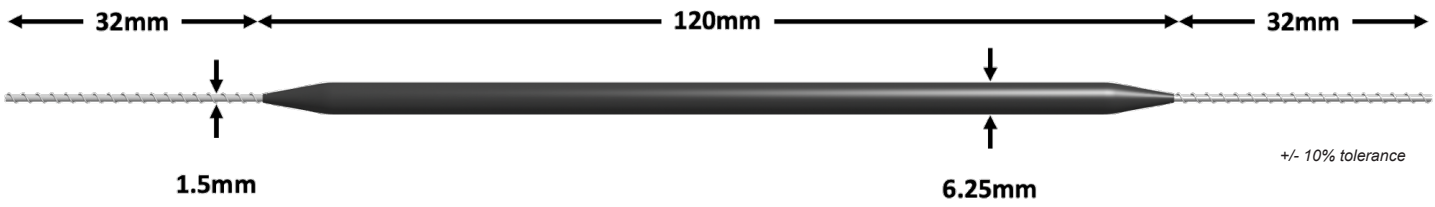
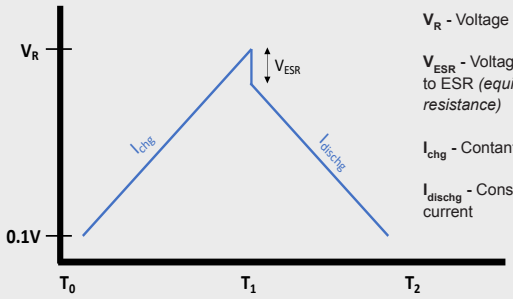


+/- 10% tolerance

Rated Capacitance & Max ESR$_{DC}$ (measure method)
- Capacitance: Constant current charge of 50mA from 0.1V to V_R, constant current discharge of 50mA from V_R to 0.1V.
- Max ESR$_{DC}$: Constant current charge of 50mA from 0.1V to V_R and constant current discharge of 50mA.



V_R - Voltage Rating

V_{ESR} - Voltage Drop due to ESR *(equivilant series resistance)*

I_{chg} - Contant charging current

I_{dischg} - Constant discharging current

$$\text{Capacitacnce (F)} = \frac{I_{dischg} * (T_2 - T_1)}{((V_R - V_{ESR}) - 0.1)} \qquad \text{Max ESR}_{DC}\ (\Omega) = \frac{V_{ESR}}{2 * I_{dischg}}$$

Leakage Current
- Current measured after 72 hrs at rated voltage and 25°C. Initial leakage current can be higher.
- If applicable, module leakage current is the sum of cell and balancing circuit leakage currents.

Surge Voltage
Absolute maximum voltage, non-repetitive. Duration not to exceed 1 second.

Non-Repetitive, Maximum Peak Current
- Current needed to discharge cell/module from rated voltage to half-rated voltage in 1 second.

$$I = \frac{(0.5) * V_R}{1 / C + ESR_{DC}}$$

Energy & Power (Based on ICE 62391-2)

- Maximum Stored Energy, Emax (Whr) = $\frac{(0.5) * C * V_R^2}{3{,}600}$
- Energy Density (Whr/kg) = $\frac{E_{max}}{mass}$
- Power Density (W/kg) = $\frac{(0.12) * V_R^2}{ESR_{DC} * mass}$
- Impedance Match Specific Power (W/kg) = $\frac{(0.25) * V_R^2}{ESR_{DC} * mass}$
- Presented power and energy values are calculated based on the rated capacitance and Max ESR initial, begining of life, values.

Cycle Life Test Profile
Cycle life determined by cycling from 0.1V to the rated voltage. Cycle life varies depending upon application specific characteristics. Actual results will vary.

Per United Nations material classification UN3499, all Capacitech Energy, Inc. ultracapacitors have less than 10 Wh capacity to meet the requirements of Special Provisions 361. Both individual ultracapacitors and modules composed of those ultracapacitors shipped by Capacitech Energy, Inc. can be transported without being treated as dangerous goods (hazardous materials) under transportation regulations.

When ordering, please reference the Capacitech Model Number below.

Capacitech Part Number:

CBC-3-A-0016-120

SAFTEY INFORMATION:

The supercapacitor casing is an uninsulated live parts and that it is to be enclosed and securely mounted to maintain the appropriate spacings in the end use application.

To Avoid Short Circuit, after usage or test, supercapacitor voltage needs to discharge to ≤ 0.1V.
• Do not Apply Overvoltage, Reverse Charge, Burn or Heat Higher than 70°C.
• Do not Press, Damage, puncture, or disassemble the supercapacitor
• Housing could heat to high temperature causing burns.
• If you observe Overheating or Burning Smell from the supercapacitor disconnect Power immediately, and do not touch.

If Housing is Leaking:
• Skin Contact: Use soap and water thoroughly to wash the area of the skin.
• Eye Contact: Flush with flowing water or saline, and immediately seek medical treatment.
• Ingestion: Immediately wash with water and seek medical treatment.

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