

2.7V 100F CUSTOM ULTRACAPACITOR CELL BCAP0100 P270 S19

FEATURES AND BENEFITS

- High performance product with low ESR
- Exceptional shock and vibration resistance
- Long lifetimes with up to 500,000 duty cycles*
- Compliant with UL, RoHS and REACH requirements

TYPICAL APPLICATIONS

- Actuators
- Emergency Lighting
- Telematics
- Automotive
- Security Equipment
- Backup System
- UPS System



PRODUCT SPECIFICATIONS

ELECTRICAL

Rated Voltage, V_R	2.7 VDC
Surge Voltage ¹	2.85 VDC
Rated Capacitance, C_R , BOL ^{2,8}	100 F
Min. / Max. Capacitance, BOL ⁸	100 F / 120 F
Typical Capacitance, BOL ^{2,8}	106 F
Maximum ESR _{DC} , R_S , BOL ^{2,8}	12 mΩ
Typical ESR _{DC} , BOL ^{2,8}	8 mΩ
Maximum Leakage Current ³	0.26 mA
Maximum Peak Current, Non-repetitive, BOL ^{4,8}	61 A

PHYSICAL

Nominal Mass	21.1 g
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TEMPERATURE, POWER & ENERGY

Operating Temp. Range	Standard (-40°C to 65°C) at 2.7 V	Extended (-40°C to 85°C) at 2.3 V
Maximum Stored Energy, $E_{MAX}^{5,9}$	0.10 Wh	0.07 Wh
Gravimetric Specific Energy, E_d^5	4.8 Wh/kg	3.4 Wh/kg
Usable Specific Power, P_d^5	3.4 kW/kg	2.5 kW/kg
Impedance Match Specific Power, P_{MAX}^5	7.2 kW/kg	5.2 kW/kg

SAFETY

Certifications	RoHS, REACH, UL 810A
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TYPICAL CHARACTERISTICS

THERMAL

Typical Thermal Resistance, R_{th} (Case to ambient) ⁷	11.6°C/W
Typical Thermal Capacitance, C_{th}	34.5 J/°C
Maximum Continuous Current, BOL ($\Delta T = 15^\circ C$) ^{7,8}	10 A
Maximum Continuous Current, BOL ($\Delta T = 40^\circ C$) ^{7,8}	17 A

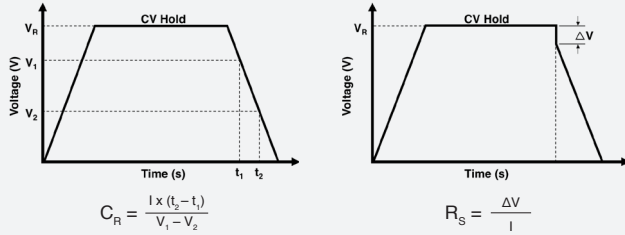
LIFE*

Projected DC Life at Room Temperature (At 2.7V _R and 25°C, EOL) ⁸	10 years
DC Life at High Temperature (At 2.7V _R and 65°C, EOL) ⁸	1,500 hours
DC Life at De-rated Voltage & Higher Temperature (At 2.3V and 85°C, EOL) ⁸	1,000 hours
Projected Cycle Life at Room Temperature (Constant current charge-discharge from V _R to 1/2V _R at 25°C, EOL) ^{6,8}	500,000 cycles
Shelf Life (Stored uncharged at 25°C, ≤ 50% RH)	4 years

*Results may vary. Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the warranty details for applicable operating and use requirements.

NOTES

- Surge Voltage**
Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.
- Rated Capacitance & ESR_{DC} (Measurement Method)**
 - Capacitance: Constant current charge (10mA/F) to V_R, 5 min hold at V_R, constant current discharge (10mA/F) to 0.1V.
 - ESR_{DC}: Constant current charge (10mA/F) to V_R, 5 min hold at V_R, constant current discharge (40 * C_R * V_R [mA]) to 0.1V.



where C_R is the capacitance (F);
I is the absolute value of the discharge current (A);
V_R is the rated voltage (V);
V₁ is the measurement starting voltage, 0.8 X V_R (V);
V₂ is the measurement end voltage, 0.4 X V_R (V);
t₁ is the time from discharge start to reach V₁ (s);
t₂ is the time from discharge start to reach V₂ (s);
R_S is the DC equivalent series resistance (Ω);
ΔV is the voltage drop during first 10ms of discharge (V).

- Leakage Current (Measurement Method)**
 - Current measured after 72 hours of constant voltage hold at V_R and 25°C. Initial leakage current can be higher.
 - If applicable, module leakage current is the sum of cell leakage current and bypass current created by balancing circuit.

- Peak Current**
 - Current needed to discharge cell or module from V_R to 1/2V_R in 1 second.

$$I_{PEAK} = \frac{\frac{1}{2}V_R}{\Delta t / C_R + R_S}$$

where I_{PEAK} is the maximum peak current (A);
V_R is the rated voltage (V);
Δt is the discharge time (sec); Δt = 1 sec in this case;
C_R is the rated BOL capacitance (F);
R_S is the maximum BOL ESR_{DC} (Ω).

- The stated peak current should not be used in normal operation and is provided as a reference value only.

- Energy & Power (Based on IEC 62576)**

- Usable Specific Power, P_d (W/kg) = $\frac{0.12V_R^2}{R_S \times m}$
- Impedance Match Specific Power, P_{MAX} (W/kg) = $\frac{0.25V_R^2}{R_S \times m}$
- Gravimetric Specific Energy, E_d (Wh/kg) = $\frac{E_{MAX}}{m}$
- Stored Energy, E_{MAX} (Wh) = $\frac{\frac{1}{2}C_R \times V_R^2}{3.600}$

where V_R is the rated voltage (V);
R_S is the maximum BOL ESR_{DC} (Ω);
m is the typical mass (kg);
C_R is the rated BOL capacitance (F).

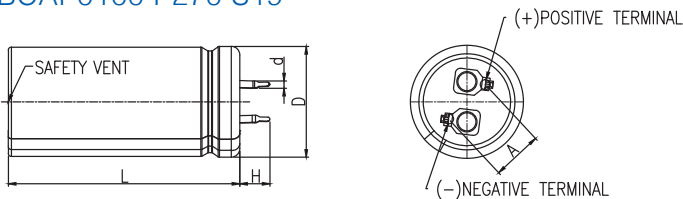
- Projected Cycle Life**
 - Constant current charge-discharge cycle from V_R to 1/2V_R at 25°C.
 - Cycle life is dependent upon application-specific characteristics. Actual results will vary.
- Continuous Current & Thermal Resistance**
 - Maximum current which can be used continuously within the allowed temperature range.

$$I_{MAX} = \sqrt{\frac{\Delta T}{R_{th} \times R_S}}$$

where I_{MAX} is the maximum continuous current (A);
ΔT is the change in temperature (°C);
R_{th} is the typical thermal resistance (°C/W);
R_S is the maximum BOL ESR_{DC} (Ω).

- BOL & EOL Conditions**
 - BOL (Beginning of Life): Rated/Initial product performance
 - EOL (End of Life):
 - Capacitance: 80% of min. BOL rating (0.8 x min. C_R)
 - ESR_{DC}: 200% of max. BOL rating (2 x max. R_S)
- Transportation Regulation**
 - Per United Nations material classification UN3499, all Maxwell ultracapacitor cells have less than 10Wh stored energy to meet the requirements of Special Provisions 361. Both individual ultracapacitors and modules composed of ultracapacitors shipped by Maxwell can be transported without being treated as dangerous goods (hazardous materials) under transportation regulations.

BCAP0100 P270 S19



RECOMMENDED PCB PATTERN HOLE SIZE : 2.0±0.1(mm)

When ordering, please reference the Maxwell Model Number below.

Maxwell Model Number: BCAP0100 P270 S19
Maxwell Part Number: 135806

Part Description	Dimensions (mm)				
	L (±1.0)	D (+1.0)	d (±0.1)	H (±0.7)	A (±0.2)
BCAP0100 P270 S19	46.0	22.0	1.5	4.4	10.0

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