NESSCAP ULTRACAPACITORS
A Maxwell Technologies Company

XP™ 2.7V 3F

BCAP0003 P270 X01

ESHSR-0003C0-002R7UC

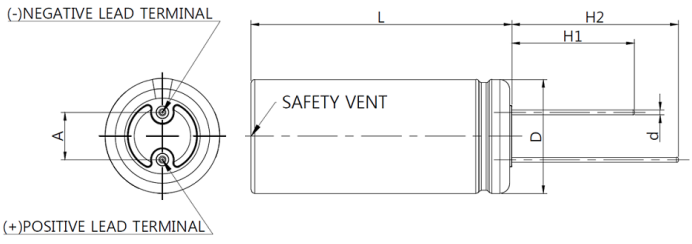
Datasheet

FEATURES

- Enhanced performance under adverse environmental conditions
- Patent pending improvements both in structure and in sealing
- Long lifetimes with up to 500,000 duty cycles*
- Compliant with UL, RoHS, and REACH requirements
- Recommended Application:

  Actuators, Emergency Lighting, Telematics, Automotive, Security Equipment, Backup System, Smoke Detectors, Advanced Metering, and Others

See Note on Mounting Recommendations[10]



ELECTRICAL SPECIFICATIONS

Rated Voltage, V_R		**2.7 VDC**
Surge Voltage[1]		2.85 VDC
Rated Capacitance, C[2]		**3 F**
Capacitance Tolerance	Min. / Max. Average[4]	-10% /+20% +5% /+10%
Initial DC-ESR, R_{DC}[3]	Max. Average[4]	70 mΩ **55 mΩ**
Maximum Leakage Current[5]		5 µA
Maximum Peak Current, Non-repetitive[6]		3.3 A

TYPICAL LIFETIME CHARACTERISTICS*

Projected DC Life at Room Temperature[8] (Continuous charging at V_R and 25 ± 10 °C)	10 years
DC Life at Standard High Temperature[8] (Continuous charging at V_R and 65°C)	1,500 hours
DC Life at De-Rated Voltage & Higher Temp.[8] (Continuous charging at 2.3V and 85°C)	1,500 hours
Projected Cycle Life at Room Temperature[8] (Constant current charge-discharge from V_R to 1/2V_R at 25 ± 10 °C)	500,000 cycles
Biased Humidity Life (Continuous charging at V_R, 60°C, and 90% RH)	**2,000 hours**
Shelf Life (Stored without charge at 25 ± 10 °C)	4 years

TYPICAL THERMAL CHARACTERISTICS

Thermal Resistance, R_{th} (Housing)	67 °C/W
Thermal Capacitance, C_{th}	1.3 J/°C
Usable Continuous Current (ΔT = 15°C)[9]	1.8 A
Usable Continuous Current (ΔT = 40°C)[9]	2.9 A

DIMENSION & WEIGHT

D (+0.5)	8.0 mm	H1 (Min.)	15.0 mm
L (±1.0)	19.5 mm	H2 (Min.)	19.0 mm
d (±0.05)	0.6 mm	A (±0.5)	3.5 mm
Nominal Weight		1.4 g	

SAFETY & ENVIRONMENTAL

RoHS & REACH & UL	Compliant

OPERATING ENVIRONMENT / POWER & ENERGY

Operating Temperature Range	***Standard (-40°C to 65°C)***		***Extended (-40°C to 85°C)***	
Maximum Stored Energy, E_{max}[7]	at 2.7V	3.0 mWh	at 2.3V	2.2 mWh
Gravimetric Specific Energy[7]	at 2.7V	2.1 Wh/kg	at 2.3V	1.5 Wh/kg
Usable Specific Power[7]	at 2.7V	8.9 kW/kg	at 2.3V	6.4 kW/kg
Impedance Match Specific Power[7]	at 2.7V	18.6 kW/kg	at 2.3V	13.4 kW/kg

*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.

XP™ 2.7V 3F

BCAP0003 P270 X01

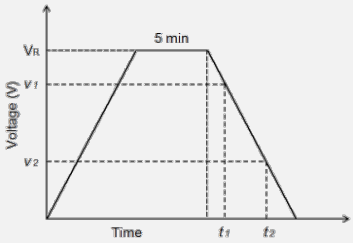
NOTE

1. Surge Voltage

> Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.

2. Rated Capacitance (Measurement Method)

> Constant current charge with 10 mA per farad to V_R.
*e.g. In case of 2.7V 3F cell, 10 * 3 = 30 mA*
> Constant voltage charge at V_R for 5 min.
> Constant current discharge with 10 mA per farad to 0.1V.

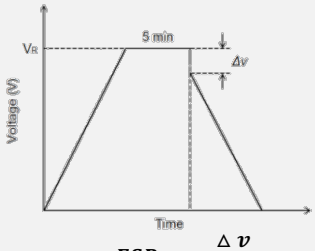


$$C = \frac{I \times (t_2 - t_1)}{v_1 - v_2}$$

where C is the capacitance (F);
I is the absolute value of the discharge current (A);
v_1 is the measurement starting voltage, 0.8 x V_R (V);
v_2 is the measurement end voltage, 0.4 x V_R (V);
t_1 is the time from discharge start to reach v_1 (s);
t_2 is the time from discharge start to reach v_2 (s)

3. Initial DC-ESR (Measurement Method)

> Constant current charge with 10 mA per farad to V_R.
> Constant voltage charge at V_R for 5 min.
> Constant current discharge with 40 * C * V_R [mA] to 0.1V.
*e.g. In case of 2.7V 3F cell, 40 * 3 * 2.7 = 324 mA*



$$ESR_{DC} = \frac{\Delta v}{I}$$

where ESR_{DC} is the DC-ESR (Ω);
Δv is the voltage drop during first 10ms of discharge (V);
I is the absolute value of the discharge current (A)

4. Average

> Typical percentage spread that may be present in one shipment.

5. Maximum Leakage Current (Measurement Method)

> The capacitor is charged to its rated voltage V_R at 25°C.
> Leakage current is the amount of current measured after 72 hours of continuous holding of the capacitor at V_R.

6. Maximum Peak Current

> Current that can be used for 1-second discharging from the rated voltage to the half-rated voltage under the constant current discharging mode.

$$I = \frac{½V_R}{\Delta t / C + ESR_{DC}}$$

where I 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 is the rated capacitance (F);
ESR_{DC} is the maximum DC-ESR (Ω)

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

7. Energy & Power (Based on IEC 62391-2)

> Maximum Stored Energy, E_{max} (Wh) = $\frac{½CV_R^2}{3600}$
> Gravimetric Specific Energy (Wh/kg) = $\frac{E_{Max}}{Weight}$
> Usable Specific Power (W/kg) = $\frac{0.12V_R^2}{ESR_{DC} \times Weight}$
> Impedance Match Specific Power (W/kg) = $\frac{0.25V_R^2}{ESR_{DC} \times Weight}$

8. DC Life and Cycle Life Test

> End-of-Life (EOL) Conditions:
- Capacitance: -20% from the rated minimum value
- DC-ESR: +100% from the specified maximum initial value
> Capacitance and ESR measurements are taken at 25°C.

9. Usable Continuous Current

> Maximum current which can be used within the allowed temperature range under the constant current discharging mode.

$$I = \sqrt{\frac{\Delta T}{R_{th} \times ESR_{DC}}}$$

where I is the maximum continuous current (A);
ΔT is the change in temperature (°C);
R_{th} is the thermal resistance (°C/W);
ESR_{DC} is the maximum DC-ESR (Ω)

10. Mounting Recommendations

> Provide properly spaced holes for mounting according to the specified cell dimension in order to minimize the terminal leads of the cell being mechanically stressed.
> Do not place any through-holes directly underneath the cell or in the close proximity of the cell. Allow at least 5mm distance from any point on the outer diameter of the cell to the outer diameter of any through-hole.
> Protective coating of components on the PCB is strongly recommended in order to reduce the risk of the components being damaged in an event of electrolyte leakage.
> The recommended mounting orientation is with the terminal leads pointing upward.
> Provide at least 2mm clearance from the safety vent and do not position anything near the safety vent that may be damaged by the vent rupture.
> Assemble the cell on the PCB taking into account that the cell may not be completely hermetic during its lifetime. Electrolyte vapor and gases generated during normal operation may escape the package.
> Soldering guide for small and medium size cells is available and can be found at www.nesscap.com under Support -> Download.

When ordering, please reference the Maxwell Model Number below.

Maxwell Model Number:	Maxwell Part Number:	Nesscap Model Number:
BCAP0003 P270 X01	133513	ESHSR-0003C0-002R7UC

Maxwell Technologies, Inc.
Global Headquarters
3888 Calle Fortunada
San Diego, CA 92123
USA
Tel: +1 (858) 503-3300
Fax: +1 (858) 503-3301

Maxwell Technologies SA
Route de Montena 65
CH-1728 Rossens
Switzerland
Tel: +41 (0)26 411 85 00
Fax: +41 (0)26 411 85 05

Maxwell Technologies, GmbH
Leopoldstrasse 244
80807 Munich
Germany
Tel: +49 (0)89 4161403 0
Fax: +49 (0)89 4161403 99

Maxwell Technologies
Shanghai Trading Co., Ltd
Room 1005, 1006, 1007
No. 1898, Gonghexin Road,
Jing An District, Shanghai 200072
P.R. China
Tel: +86 21 3680 4600
Fax: +86 21 3680 4699

Nesscap Co., Ltd.
17, Dongtangiheung-ro 681beon-gil,
Giheung-gu, Yongin-si,
Gyeonggi-do
17102
Republic of Korea
Tel: +82 31 289 0721
Fax: +82 31 286 6767

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9