Datasheet - 2.7V / 360F Cell

POWERED TO MOVE

FEATURES

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

** Image is not to scale*

SPECIFICATIONS

ELECTRICAL		ESHSR-0360C0-002R7A
Rated Voltage (V_R) at 65°C		**2.7 VDC**
Rated Voltage (V_R) at 85°C		2.3 VDC
Surge Voltage[1]		2.85 VDC
Rated Capacitance[2]		**360 F**
Capacitance Tolerance	Max.	0% / +20%
	Avg.[4]	0% / +10%
DC-ESR (Equivalent Series Resistance)[3]	Max.	3.2 mΩ
	Avg.[4]	2.9 mΩ
Maximum Leakage Current[5]		0.75 mA
Maximum Peak Current, Non-repetitive[6]	at 65°C	220 A
	at 85°C	190 A
Maximum Stored Energy, E_{max}[7]	at 65°C	0.36 Wh
	at 85°C	0.26 Wh
Gravimetric Specific Energy[7]	at 65°C	5.4 Wh/kg
	at 85°C	3.9 Wh/kg
Usable Specific Power[7]	at 65°C	4.0 kW/kg
	at 85°C	2.9 kW/kg
Impedance Match Specific Power[7]	at 65°C	8.5 kW/kg
	at 85°C	6.1 kW/kg

TEMPERATURE	
Operating Temperature Range	-40 ~ 65°C (up to 85°C with de-rated voltage) (ΔCAP<5% and ΔESR<100% of initial values measured at 25°C, with linear voltage de-rating to 2.3V at 85°C)
Storage Temperature Range	-40 ~ 70°C (storage without charge)

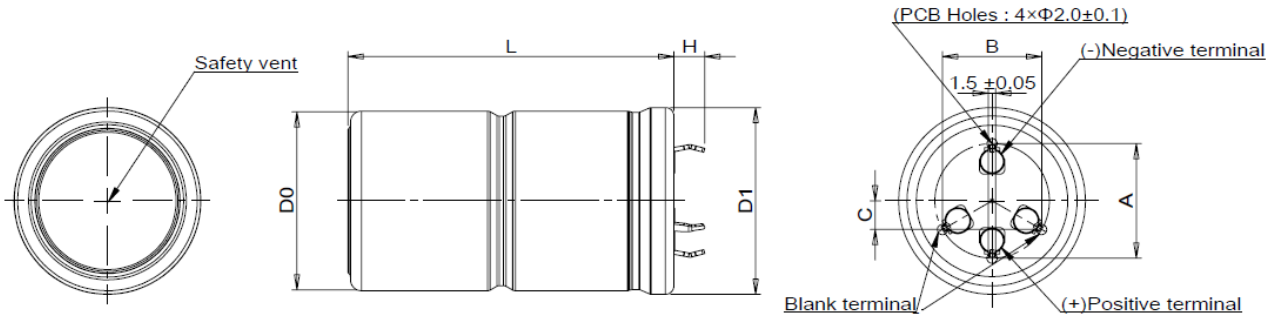
LIFE		
Endurance[8]	at 2.7V, 65°C	1,500 hours
	at 2.3V, 85°C	1,000 hours
Room Temperature (at 2.7V and 25°C)[8]	10 years	
Cycle Life (at 25°C)[9]	500,000 cycles	
Shelf Life	2 years (Stored without charge at under 70°C and 40% RH)	

PHYSICAL	
RoHS	Compliant
REACH	Compliant
UL	Complies to 810A, Certificate No.: BBBG2.MH46340

SPECIFICATIONS (Cont'd)

THERMAL	
Typical Thermal Resistance, R_{th} (Housing)	8.8 °C/W
Typical Thermal Capacitance, C_{th}	75.6 J/°C
Maximum Continuous Current (ΔT = 15°C)	23 A
Maximum Continuous Current (ΔT = 40°C)	37 A

DRAWING



See Note on Mounting[10]

DIMENSION & WEIGHT	
D0 (±0.3)	35.5 mm
D1 (±0.3)	35.7 mm
L (±0.5)	63.5 mm
H (±0.1)	5.6 mm
A (±0.1)	22.5 mm
B (±0.1)	19.5 mm
C (±0.1)	5.6 mm
Nominal Weight	67.0 g

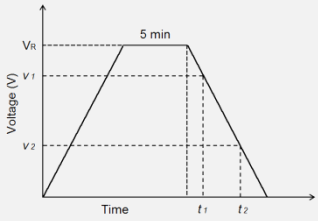
NOTE

1. Surge Voltage

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

2. Rated Capacitance (Measurement Method)

> Constant current charge with 4CV [mA] to V_R.
> Constant voltage charge at V_R for 5min.
> Constant current discharge with 4CV [mA] to 0.1V.

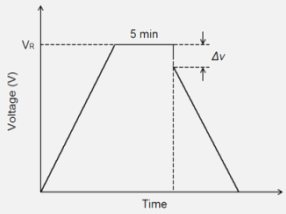


$$C = \frac{I \times (t_2 - t_1)}{v_1 - v_2}$$

where C is the capacitance (F);
I is the absolute value of the discharge current (A);
v_1 is the measurement starting voltage, $0.8 \times V_R$ (V);
v_2 is the measurement end voltage, $0.4 \times V_R$ (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. DC-ESR (Measurement Method)

> Constant current charge with 4CV [mA] to to V_R.
> Constant voltage charge at V_R for 5min.
> Constant current discharge with 40CV [mA] to 0.1V.



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

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 value or percentage spread that may be present in one Shipment

5. Maximum Leakage Current (Measurement Method)

> The capacitor is charged to the rated voltage at 25°C.
> Leakage current is the current after 72 hours that is required to keep the capacitor charged at the rated voltage

6. Maximum Peak Current

> Current 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

> 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. Endurance and Room Temperature DC Life

> Test Conditions:
- Temperature: 65 ± 2°C, 85 ± 2°C, 25 ± 2°C
- Applied Voltage: V_R ± 0.02V

> End-of-Life Conditions:
- Capacitance: -30% from the rated minimum value
- DC-ESR: +100% from the rated maximum value

> Capacitance and ESR measurements are taken at 25°C

9. Cycle Life

> Obtained or projected from cycling the capacitor from V_R to $1/2V_R$ using constant current equal to 100mA/F with 10 second rest period between charge and discharge steps

10. Mounting Recommendations

> Provide properly spaced holes for mounting according to the cell dimensions in order to prevent the terminal leads from being mechanically stressed.
> Do not place any copper patterns, including the ground pattern or through-hole via underneath the cell or on the underside of the PCB (if a double-sided PCB is used) as the electrolyte inside the cell, should it leak, can corrode, short-circuit the patterns, or damage other components nearby. Spacing of 1mm or more should be provided in between the footprint of the cell and the nearest copper pattern.
> Provide at least 2mm clearance above the safety vent and do not position anything above the safety vent that may be damaged by an event of vent rupture.

Nesscap Energy Inc.	Nesscap Energy Inc.	Nesscap Co., Ltd.	Nesscap China	Nesscap Energy EASTERN EUROPE	Nesscap Energy GmbH
Suite 3800, Royal Bank Plaza, South Tower, 200 Bay Street, P.O. Box 84, Toronto, Ontario, M5J 2Z4	S24040 Camino Del Avion #A118, Monarch Beach, California, 92629	17, Dongtangiheung-ro 681beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do	Room 1608, Block N, Cangson Building, Chegonmiao, Futian District, Shenzhen City, P.R.C	10A, prospect 60-letiya Oktyabrya Moscow, 117036	Beerengarten 4 D-86938 Schondorf
CANADA	USA	REPUBLIC OF KOREA	CHINA	RUSSIA	GERMANY
marketing@nesscap.com				info@nesscap-energy.de	