XL60 Supercapacitors

Cylindrical cells

Description

Eaton supercapacitors are unique, ultra-high capacitance devices utilizing electric double layer capacitor (EDLC) construction combined with new, high performance materials.This combination of advanced technologies allows Eaton to offer a wide variety of capacitor solutions tailored to specific applications. The XL60 supercapacitor cells offers high energy and power in a standardized form factor. Terminal design is optimized for high reliability and low contact resistance.

Features and benefits

- Long life energy storage, up to 20 years*
- Ultra low ESR for very high power density
- Wide operating temperature range
- Maintenance free
- Cost effective backup power and large energy recapture
- Low operating costs
- High efficiency (>98%) under broad environmental conditions
- High reliability, green solution
- UL recognized (3000 F/2.7 V)

Applications

- Backup power
- Peak power shaving, pulse power
- Engine starting
- Energy capture and re-use (Hybrids) for automotive, trucks, mining and construction, equipment, cranes
- Remote power for sensors, LEDs, switches

* Supercapacitor lifetimes vary based on charge voltage and temperature. See Eaton's application guidelines or contact your local Eaton sales representative for more information on lifetime estimates

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Ratings[10]

Capacitance	3000 F to 3400 F
Maximum working voltage	2.70 V / 2.85 V / 3.00 V
Surge voltage	2.85 V / 3.00 V / 3.20 V
Capacitance tolerance	0% to +20%
Operating temperature range	-40 °C to +65 °C
Extended operating temperature range	-40 °C to +85 °C (with voltage derating to 2.3 V / 2.4 V / na V @ +85 °C)

Specifications

Capacitance[1] (F)	Part number	Maximum working voltage (V)	Maximum initial ESR[1] (mΩ)	Nominal leakage current[2] (mA)	Stored energy[3] (Wh)	Peak power[4] (W)	Pulse current[5] (A)	Continuous current[6] (A)	Typical thermal resistance[7] Rth (°C/W)	Short circuit current[8] (A)
3000	XL60-2R7308W-R	2.70	0.23	5.0	3.0	7,900	2,400	143	3.2	11,700
3000	XL60-2R7308T-R	2.70	0.23	5.0	3.0	7,900	2,400	143	3.2	11,700
3400	XL60-2R9348W-R	2.85	0.23	8.0	3.8	8,800	2,700	143	3.2	12,400
3400	XL60-2R9348T-R	2.85	0.23	8.0	3.8	8,800	2,700	143	3.2	12,400
3000	XL60-3R0308W-R	3.00	0.23	7.0	3.8	9,700	2,400	143	3.2	13,000
3000	XL60-3R0308T-R	3.00	0.23	7.0	3.8	9,700	2,400	143	3.2	13,000

Performance

Parameter	Capacitance change (% of initial value)	ESR (% of initial maximum value)
Lifetime — 1,500 hours at maximum rated voltage and operating temperature	≤ 20%	≤ 200%
Lifetime — 1,000 hours at maximum rated voltage and operating temperature (3.0 V/3000 F)	≤ 20%	≤ 200%
Charge/discharge cycling[9] — 1 million at +25 °C	≤ 20%	≤ 200%
Storage, uncharged, up to +35 °C — 3 years	≤ 5%	≤ 10%

1. Capacitance, Equivalent series resistance (ESR) and leakage current are measured according to IEC62391-1 with current in milliamps (mA) = 8 x C x V.
2. Leakage current at +20 °C after 72 hour charge and hold.
3. Stored energy (Wh) = $\frac{0.5 \times C \times V^2}{3600}$
4. Peak power (W) = $\frac{V^2}{4 \times ESR}$
5. Pulse current for 1 second from full rate voltage to half voltage.(A) = $\frac{0.5 \times V \times C}{(1 + ESR \times C)}$
6. Continuous current with a 15 °C temperature rise. Continuous current (A) = $\sqrt{\frac{\Delta T}{ESR \times Rth}}$
7. Thermal resistance (Rth) cell body temperature to ambient in open air in degrees C per Watt (°C/W).
8. Short circuit current is for safety information only. Do not use as operating current.
9. Cycling between maximum working voltage and half voltage with 3 seconds rest at +25 °C, 100 A.
10. Testing and verification of product under end application conditions is recommended

Safety and certifications

Agency information	UL Recognized (3000 F/2.7 V), Guide BBBG2, File MH46887
Shock and vibration	IEC 61373 Category 1, Class B, IEC 60068-2-6
Safety	UL 810A
Environmental	RoHS compliant, lead free, halogen free
Altitude, Operating	10,000 ft
Altitude, Non-operating	40,000 ft