

XLR-LV Supercapacitor

Low voltage, 500 F Module



Description

Eaton supercapacitors are high reliability, high power, ultra-high capacitance energy storage devices utilizing electric double layer capacitor (EDLC) construction combined with proprietary materials and processes. This combination of advanced technologies allows Eaton to offer a wide variety of capacitor solutions tailored to applications for backup power, pulse power and hybrid power systems.

They can be applied as the sole energy storage or in combination with batteries to optimize cost, life time and run time. System requirements can range from a few microwatts to megawatts. All products feature low ESR for high power density with environmentally friendly materials for a green power solution.

Eaton supercapacitors are maintenance-free with design lifetimes up to 20 years* and operating temperatures down to -40 °C and up to +65 °C.

Features and benefits

- Long life energy storage, up to 20 years*
- Very low Equivalent Series Resistance (ESR)
- Wide operating temperature range
- Cost effective backup power and large energy recapture
- High reliability, environmentally friendly solution
- Low operating costs and maintenance free
- IP65 rating

Applications

- Industrial backup power
- Pulse power
- Engine starting
- Material handling
- For 12 V or 24 V systems
- LEDs and switches

Environmental compliance



*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

Ratings

Capacitance	500 F
Maximum operating voltage	See specifications table
Surge voltage	105% of maximum working voltage
Capacitance tolerance	-5% to +20%
Operating temperature range	-40 °C to +65 °C (Cell temperature)

Specifications

Capacitance ¹ (F)	Part number	Maximum working voltage (V)	Maximum initial ESR ¹ (mΩ)	Leakage current ^{1, 2} (mA)	Stored energy ³ (Wh)	Peak power ⁵ (kW)	Pulse current ⁴ (A)	Continuous current ⁶ (A)	Typical thermal resistance ⁷ Rth (°C/W)	Short circuit current ⁸ (A)
500	XLR-16R2507B-R	16.2	1.7	5.2	18.2	38.6	2189	121	0.6	9600
500	XLR-18R0507B-R	18.0	1.7	8.0	22.5	47.6	2430	121	0.6	10600

Performance

Parameter	Capacitance Change (% of initial value)	ESR (% of initial maximum value)
Lifetime: (XLR-16; 1500 hours at maximum temperature and voltage) (XLR-18; 1000 hours at maximum temperature and voltage)	≤ 20%	≤ 200%
Charge/Discharge Cycles ⁹ (1,000,000 at +25 °C)	≤ 20%	≤ 200%
Storage: (3 years, uncharged, < +35 °C)	≤ 5%	≤ 10%

1. Capacitance, Equivalent Series Resistance (ESR) and Leakage current are measured according to IEC62391-1 with current in milliamps (mA) = $8 \times C \times V$.

2. Leakage current at +20 °C after 72 hour charge and hold at < 97% of rated voltage. Leakage current at full rated voltage will be higher due to the cell voltage management system.

3. Stored Energy (Wh) = $0.5 \times C \times \frac{V^2}{3600}$

4. Pulse current for 1 second from full rate voltage to half voltage. (A) = $0.5 \times V \times C \times \frac{1}{1 + ESR \times C}$

5. Peak Power (W) = $\frac{V^2}{4 \times ESR}$

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

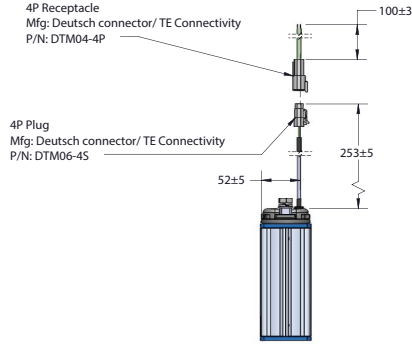
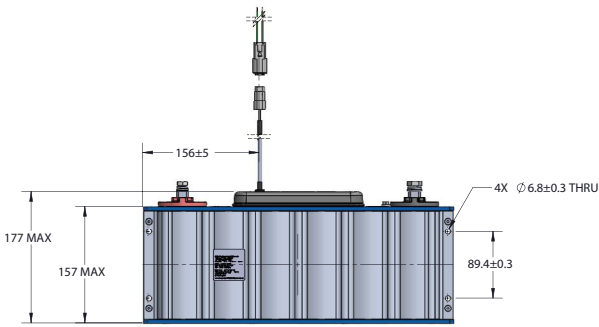
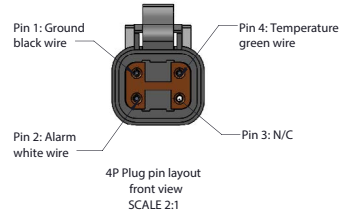
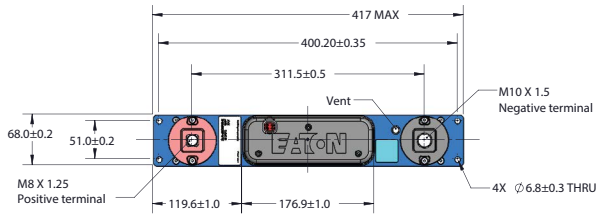
9. Cycling between rated voltage and half voltage, 3 second rest at +25 °C.

10. Testing and verification of product under end application conditions is recommended

Safety and certifications

Agency information	UL810a
Shock and vibrations	SAE J2464 & J2380
Environmental	RoHS, CE, IP65
Shipping	No restrictions, per UN3499 ship with shorting wire

Dimensions (mm)



Typical Mass: 5.7 kg

Part numbering system

XLR	-16R2	50	7	B	-R
Family code	Voltage (V) R = decimal	Capacitance (µF) Value	Multiplier	Cell balancing	Standard product
XLR=Family Code	16R2 = 16.2 V	Example 507 = 5.0x10 ⁷ µF or 500 F		B= Shunt	

Packaging information

- Standard packaging: Bulk, 1 piece per box

Part Marking

- Manufacturer
- Capacitance (F)
- Module operating voltage (V)
- Family code or part number

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