

# XLR-51 Supercapacitor

## 51 V, 188 F Rugged module



### Description

Eaton supercapacitors are high reliability, high power, ultra-high capacitance energy storage devices utilizing electrochemical 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 back up 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 micro-amps 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\*.

### Features

- Ultra low ESR provides high efficiency, high power
- Industry standard form factor for easy integration
- High power density to optimize system size and low operating costs
- Millions of charge/discharge cycles for life of application
- No heavy metals, RoHS compliant, non-hazardous energy storage
- Heavy duty metal housing for high vibration, high current applications
- IP65 environmental rating for high dust areas and water jet washable

### Applications

- Hybrid and electric vehicles
- Grid storage
- Commercial vehicles: trucks, mining, construction
- Automated guided vehicle (AGV)
- Trolley, subway
- Marine

\*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	188 F
Maximum working voltage	51.3 V
Surge voltage	54.0 V
Capacitance tolerance	0% to +20% (+20 °C)
Operating temperature range	-40 °C to +65 °C
Extended temperature range	-40 °C to +85 °C (with linear derating to 41.0 V @ +85 °C)

## Specifications

Capacitance (F)	Part number	Maximum initial ESR <sup>1</sup> (mΩ)	Nominal leakage current <sup>2</sup> (mA)	Stored energy <sup>3</sup> (Wh)	Peak power <sup>4</sup> (kW)	Pulse current <sup>5</sup> (A)	Continuous current <sup>6</sup> (A)	Typical thermal resistance Rth (°C/W) <sup>7</sup>	Short circuit current <sup>8</sup> (A)
188	XLR-51R3187-R	5.0	8.0	68.7	131.6	2485	86	0.4	10200

## Performance

Parameter (F)	Capacitance change (% of initial value)	ESR (% of maximum initial value)
Life (1500 hours @ +65 °C/51.3 Vdc)	≤ 20%	≤ 200%
Storage – 3 years (uncharged, +30 °C)	≤ 5%	≤ 10%
Cycling life <sup>9</sup> (1,000,000 cycles)	≤ 20%	≤ 200%

1. Capacitance, Equivalent Series Resistance (ESR) measured according to IEC62391-1 at +20 °C, with current in millamps (mA) =  $8 \times C \times V$

2. Leakage current at +20 °C after 72 hour charge and hold.

3. Energy (Wh) =  $0.5 \times C \times V^2 / 3600$

4. Peak Power (W) =  $V^2 / 4 \times ESR$

5. Pulse current in Amps (A), 1 second discharge from maximum working voltage to half rated voltage. =  $0.5 \times V \times C / (1 + ESR \times C)$

6. Continuous current with a 15 °C temperature rise. Continuous current (A) =  $\sqrt{\frac{AV}{ESR \times Rth}}$

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.

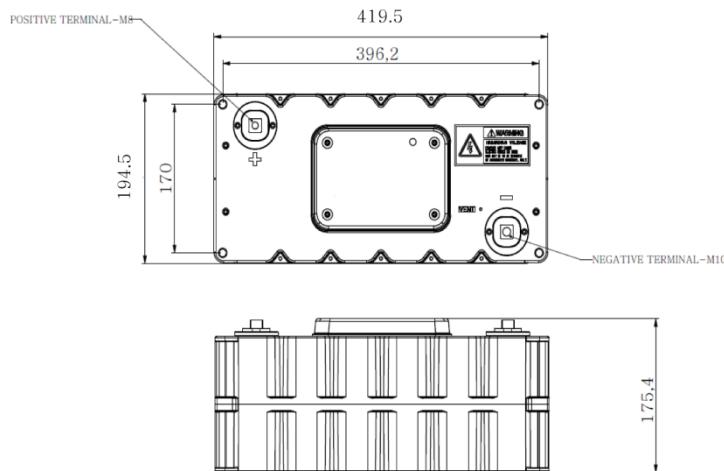
9. Cycling between maximum working voltage and half voltage with 3 seconds rest at +25 °C.

## Standards and certifications

Regulatory	E-mark (UN-ECE Regulation 10 - Rev. 5 & UN-ECE Regulation 100 - Rev. 2)
Shock and vibration	IEC 61373 Cat. 1, Class B, SAE J2380, ISO16750-3 Table 14, SAE J2464
Warnings	Do not overvoltage, do not reverse polarity.
Environmental	IP65, RoHS
Shipping	UN3499, <10 Wh, Non-hazardous when shipped with shorting wire.

### Dimensions (mm) and Mass (kg)

Part Number	W (max)	L (max)	H (max)	Typical Mass (kg)
XLR-51R3187-R	177	421	196	14.7



### Part numbering system

XLM	- 51R3	18	7	-R
Family Code	Voltage (V) R= decimal	Capacitance ( $\mu$ F)		
XLR = Family code	51R3= 51.3 V	Example 188=18 x $10^7$ $\mu$ F or 188 F		Standard product

### Packaging information

- Standard packaging: 1 piece per box

### Part marking

- Manufacturer
- Capacitance (F)
- Maximum operating voltage (V)
- Part number
- Polarity
- Serial number

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

**Eaton**  
**Electronics Division**  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
[www.eaton.com/electronics](http://www.eaton.com/electronics)

© 2019 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. 10765 BU-MC19011  
July 2019

Eaton is a registered trademark.

All other trademarks are property  
of their respective owners.

Follow us on social media to get the  
latest product and support information.





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

#### Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помошь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помошь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: [org@eplast1.ru](mailto:org@eplast1.ru)

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.