

# XLR-16 Supercapacitor

## 16.2 V, 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 efficiency (> 98%) under broad operating conditions
- High reliability, green solution
- Low operating costs and maintenance free

### Applications

- Backup power
- Peak power shaving, pulse power
- Engine starting
- Regenerative energy capture for transportation
- Remote power for sensors, LEDs and 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

## Ratings

|                             |                  |
|-----------------------------|------------------|
| Capacitance                 | 500 F            |
| Maximum operating voltage   | 16.2 V           |
| Surge voltage               | 17.1 V           |
| Capacitance tolerance       | -5% to +20%      |
| Operating temperature range | -40 °C to +65 °C |

## Specifications

| Capacitance <sup>1</sup> (F) | Part number   | Maximum working voltage (V) | Maximum initial ESR <sup>1</sup> (mΩ) | Leakage current <sup>1, 2</sup> (mA) | Stored energy <sup>3</sup> (Wh) | Peak power <sup>5</sup> (kW) | Pulse current <sup>4</sup> (A) | Continuous current <sup>6</sup> (A) |
|------------------------------|---------------|-----------------------------|---------------------------------------|--------------------------------------|---------------------------------|------------------------------|--------------------------------|-------------------------------------|
| 500                          | XLR-16R2507-R | 16.2                        | 1.7                                   | 5                                    | 18.2                            | 38.6                         | 2189.2                         | 122                                 |

## Performance

| Parameter  | Capacitance Change (% of initial value) | ESR (% of initial maximum value) |
|--|---|----------------------------------|
| Lifetime: (1500 hours at maximum temperature and voltage)  | ≤ 20%                                   | ≤ 200%                           |
| Charge/Discharge Cycles <sup>7</sup> (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 rated voltage.

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

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

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

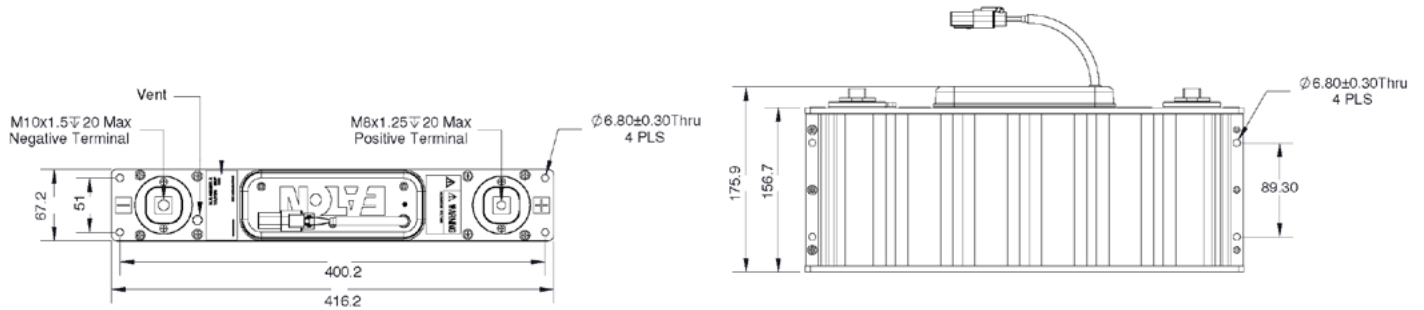
6. Continuous current with a 15 °C temperature rise.

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

## Safety and Certifications

|                      |   |
|----------------------|---|
| Agency information   | UL810a (cells)                                      |
| Shock and vibrations | SAE J2464 & J2380                                   |
| Environmental        | RoHS, HF  |
| Shipping             | No restrictions, per UN3499 ship with shorting wire |

**Dimensions (mm)**



**Part numbering system**

**Typical Mass:** 5.7 kg

| <b>XLR</b>      | <b>-16R2</b>               | <b>50</b>                                     | <b>7</b>   | <b>-R</b>        |
|-----------------|----------------------------|---|------------|------------------|
| Family code     | Voltage (V)<br>R = decimal | Capacitance (µF)<br>Value                     | Multiplier | Standard product |
| XLR=Family Code | 16R2 = 16.2 V              | Example 507 = 5.0x10 <sup>7</sup> µF or 500 F |            |                  |

**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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