

XVM-315 Supercapacitor PCBA 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 watts 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 +85 °C.

Features and benefits

- Energy storage module for ride-through power
- Long life energy storage, up to 20 years*
- Easy integration into rack based system
- Wide operating temperature range
- High voltage for maximum efficiency
- High efficiency (>98%) under broad operating conditions
- High reliability, green solution
- Low operating costs and maintenance free

Applications

- UPS Backup power
- Material handling systems
- Peak power shaving, pulse power

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	2.56 - 5.13 F
Maximum working voltage	315.9 V
Surge voltage	333.4 V
Capacitance tolerance	-5% to +20% (+20 °C)
Operating temperature range	-40 °C to +65 °C
Extended temperature range	-40 °C to +85 °C (with linear derating to 269.1 V @ +85 °C)

Specifications

Capacitance ¹ (F)	Part number	Maximum initial ESR ¹ (Ω)	Nominal leakage current ² (mA)	Stored energy ³ (Wh)	Peak power ⁴ (kW)	Pulse current ⁵ (A)
2.56	XVM-315R9255-R	0.53	23	35.5	47.1	171.6
3.42	XVM-315R9345-R	0.38	24	47.4	65.7	234.9
5.13	XVM-315R9515-R	0.32	25	71.1	78	306.7

Performance

Parameter (F)	Capacitance change (% of initial value)	ESR (% of maximum initial value)
Life (1500 hours at maximum temperature and voltage)	≤ 20%	≤ 200%
Storage – 3 years (uncharged, +35 °C)	≤ 5%	≤ 10%
Charge/Discharge Cycles (500,000 at +20 °C)	≤ 30%	≤ 200%

1. Capacitance, Equivalent series resistance (ESR) measured according to IEC62391-1 at +20 °C, with current in milliamps (mA) = 8°C*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. Peak power (W) = $\frac{V^2}{4 \times \text{ESR}}$

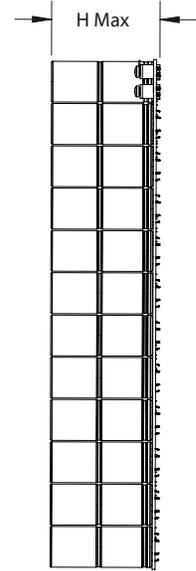
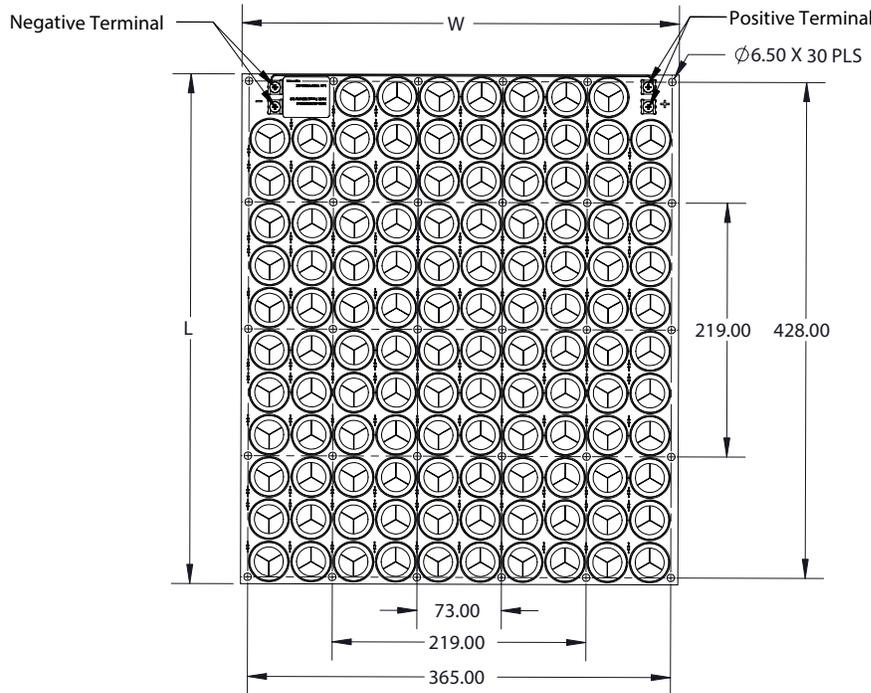
5. Pulse current in Amps (A), 1 second discharge from maximum working voltage to half rated voltage. = $\frac{0.5 \times V \times C}{(1 + \text{ESR} \times C)}$

Standards and certifications

Agency information	UL810a (cells)
Shock and vibration	MIL-STD 202G (Cells)
Environmental	RoHS, HF
Shipping	UN3499, <10 Wh, Non-hazardous when shipped with shorting wire

Dimensions (mm) and mass (kg)

Part number	L (maximum)	W (maximum)	H (maximum)	Mass (kg)
XVM-315R9255-R	440	377	60	8.6
XVM-315R9345-R	440	377	70	9.8
XVM-315R9515-R	440	377	95	13.5



- Terminal screws:
 - M5 Philslot
 - Nickel-plated brass
 - Maximum torque: 3.0 N-m
 - Typical torque: 2.2 N-m
- Mounting
 - 6 mm minimum spacer or insulating layer on bottom
 - Mounting screws: M5 or M6
 - Minimum length: 6 mm
 - Maximum head diameter: 12 mm

Part numbering system

XVM	-315R9	25	5	-R
Family Code	Voltage (V) R= decimal	Capacitance (μF)		
		Value	Multiplier	
XVM = Family code	315R9 = 315.9 V	Example 255 = $2.5 \times 10^5 \mu\text{F}$ or 2.5 F		Standard product

Packaging information

- Standard packaging: 1 piece per box

Part marking

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

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