

# XVH Supercapacitors

## High density snap-in and lug cylindrical cells



Photo is representative

### Description

Eaton high density 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 with approximately 20% higher energy density. This combination of advanced technologies allows Eaton to offer a wide variety of capacitor solutions tailored to applications IoT, metering, communications, memory cache to flash, industrial controls and many more applications requiring long life, wide temperature range energy storage. There are also new sizes and capacitance to meet specific design requirements. Eaton high density supercapacitors are maintenance-free with design lifetimes up to 20 years\* and operating temperatures down to -40 °C and up to +85 °C.

### Features

- 20% high energy density – smaller size or more energy in the same size
- Long life time – 500k charge/discharge cycles
- Longer backup times, higher power
- UL recognized

### Applications

- Mesh networks
- Industrial backup/ridethrough
- Flash server
- RAID storage
- Solar capture
- Automotive pulse power

### Environmental compliance



### Agency information



\* 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	120 F to 600 F
Maximum working voltage	2.7 V
Surge voltage	2.85 V
Operating temperature range	-40 °C to +70 °C
Extended temperature range	-40 °C to +85 °C (with linear voltage derating to 2.3 V @ +85 °C)

**Specifications**

Capacitance <sup>1</sup> (F)	Capacitance tolerance	Part number	Maximum DC ESR @ +25 °C <sup>1</sup> (mΩ)	Maximum ESR, 1 kHz @ +25 °C <sup>1</sup> (mΩ)	Maximum leakage current <sup>1,2</sup> (mA)	Stored energy <sup>3</sup> (Wh)	Peak power <sup>4</sup> (W)	Continuous current <sup>6</sup> (A)	Pulse current <sup>5</sup> (A)	Short circuit current <sup>7</sup> (A)
120.0	-10%/+30%	XVH2245-2R7127-R	11.6	8.0	0.25	0.1215	157.1	6.85	67.7	232.8
200.0	-10%/+30%	XVH2555-2R7207-R	9.4	6.5	0.47	0.2025	193.9	8.89	93.6	287.2
300.0	-10%/+30%	XVH3055-2R7307-R	8.0	5.5	0.6	0.3038	227.8	10.7	119.1	337.5
360.0	-10%/+30%	XVH3550-2R7367-R	7.0	5.0	0.8	0.3645	260.4	11.96	138.1	385.7
400.0	-10%/+30%	XVH3555-2R7407-R	6.3	4.5	1.0	0.4050	289.3	13.1	153.4	428.6
470.0	-10%/+30%	XVH3560-2R7477-R	5.6	4.0	1.2	0.4759	325.5	14.4	174.7	482.1
500.0	-10%/+30%	XVH3566-2R7507-R	4.9	3.5	1.4	0.5063	371.9	16.1	195.7	551.0
600.0	-10%/+30%	XVH3570-2R7607-R	4.5	3.2	1.6	0.6075	405	17.2	219.6	600
360.0	-10%/+30%	XVH3550-2R7367Q-R	7.0	5.0	0.8	0.3645	260.4	11.96	138.1	385.7
400.0	-10%/+30%	XVH3555-2R7407Q-R	6.3	4.5	1.0	0.4050	289.3	13.1	153.4	428.6
470.0	-10%/+30%	XVH3560-2R7477Q-R	5.6	4.0	1.2	0.4759	325.5	14.4	174.7	482.1
500.0	-10%/+30%	XVH3566-2R7507Q-R	4.9	3.5	1.4	0.5063	371.9	16.1	195.7	551.0
600.0	-10%/+30%	XVH3570-2R7607Q-R	4.5	3.2	1.6	0.6075	405	17.2	219.6	600
300.0	-10%/+30%	XVH3055-2R7307L-R	8.0	5.5	0.6	0.3038	227.8	10.7	119.1	337.5
360.0	-10%/+30%	XVH3550-2R7367L-R	7.0	5.0	0.8	0.3645	260.4	11.96	138.1	385.7
400.0	-10%/+30%	XVH3555-2R7407L-R	6.3	4.5	1.0	0.4050	289.3	13.1	153.4	428.6
470.0	-10%/+30%	XVH3560-2R7477L-R	5.6	4.0	1.2	0.4759	325.5	14.4	174.7	482.1
500.0	-10%/+30%	XVH3566-2R7507L-R	4.9	3.5	1.4	0.5063	371.9	16.1	195.7	551.0
600.0	-10%/+30%	XVH3570-2R7607L-R	4.5	3.2	1.6	0.6075	405	17.2	219.6	600

1. Capacitance, Equivalent series resistance (ESR) and Leakage current are measured according to internal specifications.

2. Leakage current at +25 °C after 72 hour charge and hold.

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

4. Peak power (W) =  $\frac{V^2}{4 \times \text{DC ESR}}$

5. Pulse current in Amps (A), 1 second discharge from rated voltage to half rated voltage =  $\frac{1/2 \times C \times V}{(1 + \text{DC ESR} \times C)}$

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

7. Short circuit current is for safety information only. Do not use as operating current.

Testing and verification of product under end application conditions is recommended

**Performance**

Parameter	Capacitance change (% of rated value)	ESR AC (% of maximum initial value)
Life (1000 hours @ +70 °C/2.7 Vdc)	≥ 70%	≤ 200%
Life (1000 hrs @ +85 °C/2.3 Vdc)	≥ 70%	≤ 300%
Charge/Discharge cycles (500,000 cycles @+25°C)*	≥ 70%	≤ 200%
Low temperature @ -40 °C	≥ 70%	≤ 200%
High temperature @ +70 °C	≥ 70%	≤ 200%
Humidity, 240 hours @ +40 °C/90% RH	≥ 70%	≤ 200%
Storage, uncharged, 1000 hours @ +75 °C	≥ 70%	≤ 200%
Shelf life, uncharged, @ +25 °C, <50% RH) 3 years		

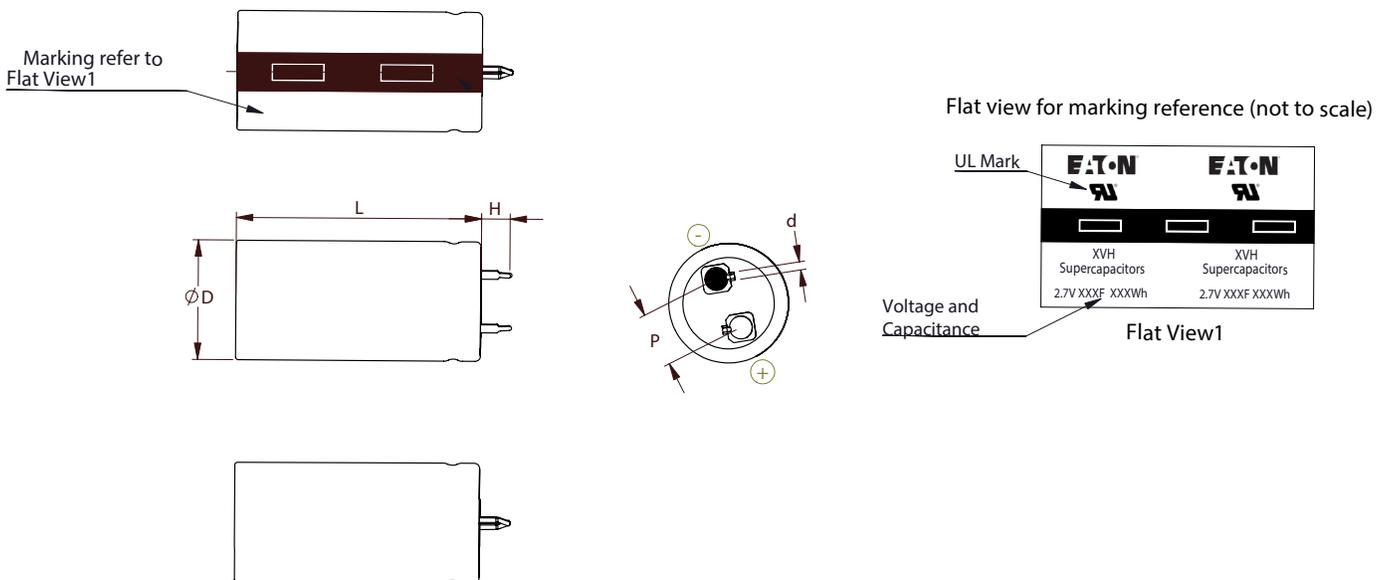
\* Cycle: 2.7 V to 1.35 V, 1s rest @ +25 °C.

**Safety and certifications**

Regulatory	UL810a, UL recognized file number MH46887
Environmental	RoHS, REACH, Halogen free, Lead free
Warnings	Do not overvoltage, do not reverse polarity
Shipping	UN3499, <10 watt-hours, Non-hazardous goods

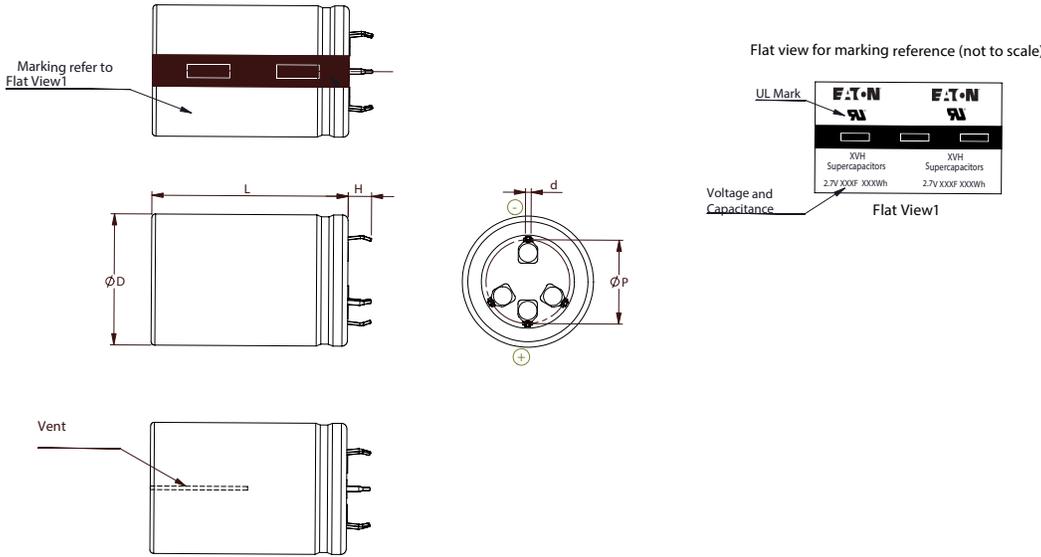
**Dimensions (mm) and mass (g)**

Part number	ØD +1.5	L ±2.0	P ±0.5	Ød ±0.1	H ±0.5	Voltage/Capacitance marking	Mass (g typical)
XVH2245-2R7127-R	22	47	10	1.5	5.7	2.7V 120F 0.12Wh	24.8
XVH2555-2R7207-R	25	57	10	1.5	5.7	2.7V 200F 0.20Wh	30
XVH3055-2R7307-R	30	57	10	1.5	5.7	2.7V 300F 0.30Wh	54
XVH3550-2R7367-R	35	52	10	1.5	5.7	2.7V 360F 0.36Wh	60
XVH3555-2R7407-R	35	57	10	1.5	5.7	2.7V 400F 0.41Wh	68
XVH3560-2R7477-R	35	62	10	1.5	5.7	2.7V 470F 0.48Wh	75
XVH3566-2R7507-R	35	68	10	1.5	5.7	2.7V 500F 0.50Wh	85
XVH3570-2R7607-R	35	72	10	1.5	5.7	2.7V 600F 0.60Wh	90



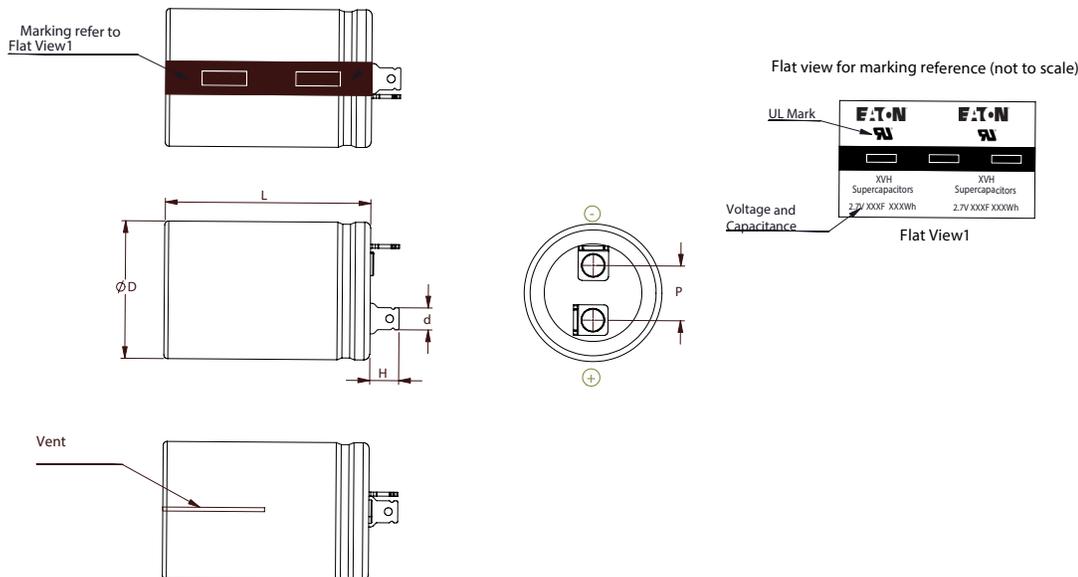
**Dimensions (mm) and mass (g)**

Part number	$\varnothing D \pm 1.5$	$L \pm 2.0$	$P \pm 0.5$	$\varnothing d \pm 0.1$	$H \pm 0.5$	Voltage/Capacitance marking	Mass (g typical)
XVH3550-2R7367Q-R	35	52	22.5	1.5	5.3	2.7V 360F 0.36Wh	60.5
XVH3555-2R7407Q-R	35	57	22.5	1.5	5.3	2.7V 400F 0.41Wh	68.5
XVH3560-2R7477Q-R	35	62	22.5	1.5	5.3	2.7V 470F 0.48Wh	75.5
XVH3566-2R7507Q-R	35	68	22.5	1.5	5.3	2.7V 500F 0.50Wh	85.5
XVH3570-2R7607Q-R	35	72	22.5	1.5	5.3	2.7V 600F 0.60Wh	90.5



**Dimensions (mm) and mass (g)**

Part number	$\varnothing D \pm 1.5$	$L \pm 2.0$	$P \pm 0.5$	$\varnothing d \pm 0.1$	$H \pm 0.5$	Voltage/Capacitance marking	Mass (g typical)
XVH3055-2R7307L-R	30	57	10	5	5.6	2.7V 300F 0.30Wh	54.5
XVH3550-2R7367L-R	35	52	14	5.7	7.5	2.7V 360F 0.36Wh	62.5
XVH3555-2R7407L-R	35	57	14	5.7	7.5	2.7V 400F 0.41Wh	70.5
XVH3560-2R7477L-R	35	62	14	5.7	7.5	2.7V 470F 0.48Wh	77.5
XVH3566-2R7507L-R	35	68	14	5.7	7.5	2.7V 500F 0.50Wh	87.5
XVH3570-2R7607L-R	35	72	14	5.7	7.5	2.7V 600F 0.60Wh	92.7



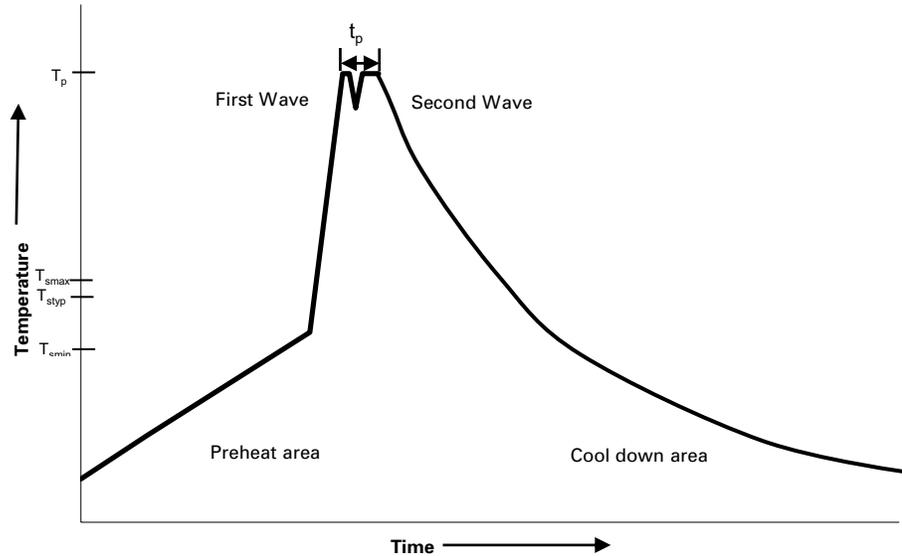
**Packaging information-(Bulk package)**

Part number	Unit pack (Inner box)				Shipping case (Carton)				QTY (pcs) Carton	Gross weight g
	External dimensions-mm			Package QTY pcs	External dimensions-mm			Box QTY (pcs)		
	L	W	H		L	W	H			
XVH2245-2R7127-R	195	155	100	42	330	280	215	5	210	6416
XVH2555-2R7207-R	195	155	100	30	330	280	215	5	150	5708
XVH3055-2R7307-R	195	155	100	20	330	280	215	5	100	6623
XVH3550-2R7367-R	195	155	100	20	330	280	215	5	100	7223
XVH3555-2R7407-R	195	155	100	20	330	280	215	5	100	8023
XVH3560-2R7477-R	195	155	100	20	330	280	215	5	100	8723
XVH3566-2R7507-R	195	155	130	20	330	280	215	4	80	7942
XVH3570-2R7607-R	195	155	130	20	330	280	215	4	80	8342
XVH3550-2R7367Q-R	195	155	100	20	330	280	215	5	100	7273
XVH3555-2R7407Q-R	195	155	100	20	330	280	215	5	100	8073
XVH3560-2R7477Q-R	195	155	100	20	330	280	215	5	100	8773
XVH3566-2R7507Q-R	195	155	130	20	330	280	215	4	80	7982
XVH3570-2R7607Q-R	195	155	130	20	330	280	215	4	80	8382
XVH3055-2R7307L-R	195	155	100	20	330	280	215	5	100	6673
XVH3550-2R7367L-R	195	155	100	20	330	280	215	5	100	7473
XVH3555-2R7407L-R	195	155	100	20	330	280	215	5	100	8273
XVH3560-2R7477L-R	195	155	100	20	330	280	215	5	100	8973
XVH3566-2R7507L-R	195	155	130	20	330	280	215	4	80	8142
XVH3570-2R7607L-R	195	155	130	20	330	280	215	4	80	8558

**Part numbering system**

<b>XVH</b>	<b>2245</b>	<b>-2R7</b>	<b>12</b>	<b>7</b>	<b>-R</b>		
Family code	Size reference (mm)		Voltage (V) R= decimal	Capacitance (µF) value	Multiplier	Terminal	Standard product
XVH = Family code	Diameter = 22	Length = 45	2R7=2.7 V	Example 127= 10 x 10 <sup>7</sup> µF or 120 F		Blank: 2 terminal snap-in Q= 4 terminal snap-in L= Lug	

### Wave solder profile



Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and soak		
• Temperature max. ( $T_{smax}$ )	100 °C	100 °C
• Time max.	60 seconds	60 seconds
$\Delta$ preheat to max temperature	160 °C max.	160 °C max.
Peak temperature ( $T_p$ )*	220 °C – 260 °C	250 °C – 260 °C
Time at peak temperature ( $t_p$ )	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to 25 °C	4 minutes	4 minutes

### Manual solder

+350 °C, 4-5 seconds. (by soldering iron), generally manual, hand soldering is not recommended.

### Cleaning/Washing

Avoid cleaning of circuit boards, however if the circuit board must be cleaned use static or ultrasonic immersion in a standard circuit board cleaning fluid for no more than 5 minutes and a maximum temperature of +60 °C. Afterwards thoroughly rinse and dry the circuit boards. In general, treat supercapacitors in the same manner you would an aluminum electrolytic capacitor.

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Printed in USA  
Publication No. ELX1541 BU-ELX22444  
Published: December 2025

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