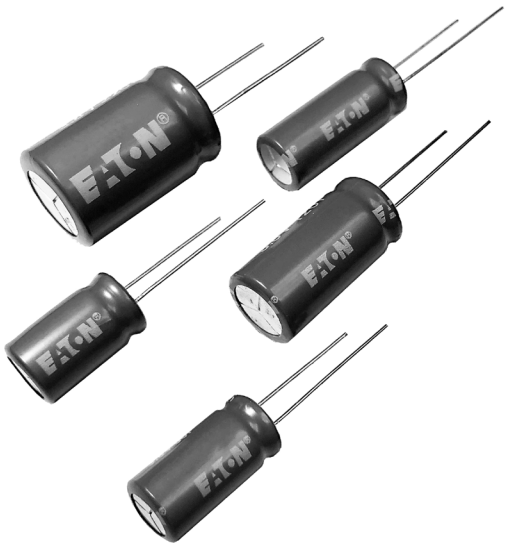
Hybrid high energy density supercapacitors for energy and industrial applications



Product description

Eaton HS, HSL, and HSH hybrid supercapacitors are compact, high-power energy storage devices suitable for a range of energy and industrial applications. HS and HSH supercapacitors comprise new proprietary materials. Each supercapacitor has two electrodes, one similar to that of a battery and one a standard supercapacitor electrode. Consequently, their energy densities are closer to those of batteries and up to 10 times higher than conventional supercapacitors. HS, HSL, and HSH supercapacitors are maintenance-free with lifetimes of up to 10 years*.

The HS / HSL hybrid cylindrical cells offer capacitance values between 5 F and 220 F, while the HSH series offers higher capacitance from 3.0 F to 1400 F. Both products offer a maximum working voltage of 3.8 V, an operating temperature range from -25 °C to +70 °C / +85°C (3.5V), and low ESR. HS, HSL, and HSH supercapacitors can be utilized as sole energy storage or combined with batteries to optimize system cost, lifetimes, and runtimes.

Features and benefits

- High power and ultra-high capacitance
- A wide variety of compact designs for optimal space utilization
- Surge voltage up to 4.2 V
- Cycling durability up to 250,000 cycles (for HSL and HSH) and 500,000 cycles (for HS) at +20 °C
- Low self-discharge, which is ideal for IoT, medical, and backup power applications
- Wide range of operating temperatures
  - HS: -15 °C to +70 °C / +85°C (3.5V)
  - HSL / HSH: -25 °C to +70 °C
- Reduced ESR and leakage current to enhance power efficiency
- Lead- and halogen-free, RoHS and REACH compliant, UL-recognized

*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.

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Specifications

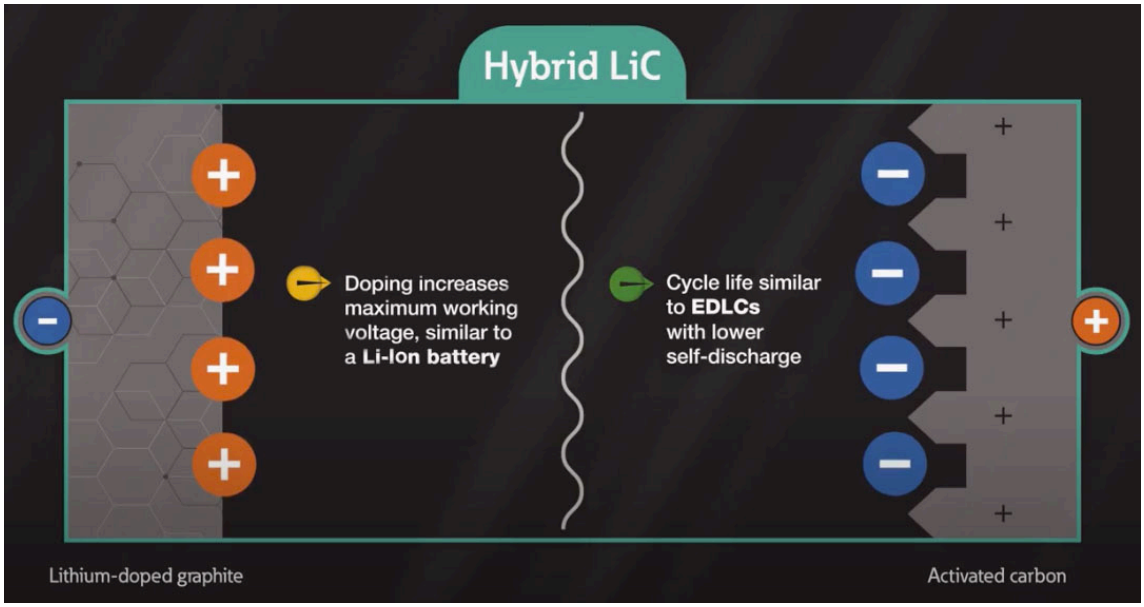
Part number	Capacitance (F)	Maximum DC ESR @ +25 °C (mΩ)	Maximum ESR, 1 kHz @ +25 °C (mΩ)	Maximum leakgage current (µA) HS/HSL	Stored energy (mWh)	Peak power (W)	Peak current (A)	Maximum charge/ discharge current (A)	Short circuit current (A)
HSH0512-3R8305-R	3.0	9000	4000	1.8	4.0	0.4	0.20	0.1	0.4
HS/HSL0612-3R8505-R	5.0	6000	2000	2.0/2.5	6.67	0.6	0.26	0.15	0.63
HS/HSL0814-3R8106-R	10	1500		2.0/3.0	13.3	2.4	1.0	0.05	2.5
HSH0612-3R8805-R	8.0	2600	1200	2.0	10.7	1.4	0.6	0.25	1.5
HS/HSL0820-3R8256-R	25	650		2.5/3.3	33.3	5.5	2.3	0.08	5.8
HSH0622-3R8226-R	22	1000	450	3.5	29.3	3.6	1.5	0.7	3.8
HSH0814-3R8256-R	25	900	400	2.5	33.3	4.0	1.7	0.8	4.2
HS/HSL1016-3R8306-R	30	550		3.0/4.0	40	6.6	2.7	1.0	7.0
HSH0820-3R8406-R	40	550	250	3.2	53.3	6.6	2.8	1.2	6.9
HS/HSL1020-3R8506-R	50	450		4.0/5.0	67	8.0	3.4	2.0	9.0
HSH0825-3R8556-R	55	450	200	5.0	73.3	8.0	3.4	1.8	8.4
HSH1016-3R8556-R	55	450	200	5.0	73.3	8.0	3.4	1.8	8.4
HS/HSL1025-3R8706-R	70	250		5.0/8.0	93	14.0	6.1	3.0	15
HSH1020-3R8856-R	85	250	120	8.0	113	14.4	6.1	3.5	15.2
HS/HSL1225-3R8127-R	120	200		7.0/12	160	18.0	7.7	5.0	19
HSH1025-3R8117-R	110	220	90	9.0	147	16.4	7.0	4.0	17.3
HS/HSL1040-3R8157-R	150	140		9.0/16	200	25.8	10.9	6.0	27
HSH1030-3R8157-R	150	140	70	15	200	25.8	10.9	6.0	27.1
HS/HSL1625-3R8227-R	220	100		12/25	293	36.0	15.3	8.0	38
HSH1040-3R8207-R	200	120	60	22	267	30.1	12.8	7.0	31.7
HSH1225-3R8207-R	200	135	65	18	267	26.7	11.4	6.0	28.1
HSH1235-3R8307-R	300	100	50	30	400	36.1	15.5	10	38
HSH1240-3R8357-R	350	90	45	35	467	40.1	17.2	11	42.2
HSH1245-3R8407-R	400	80	45	70	533	45.1	19.4	12	47.5
HSH1630-3R8457-R	450	60	40	70	600	60.2	25.7	15	63.3
HSH1840-3R8857-R	850	70	35	70	1133	51.6	22.5	28	54.3
HSH1850-3R8108-R	1000	65	30	100	1333	55.5	24.2	30	58.5
HSH1860-3R8148-R	1400	50	28	120	1867	72.2	31.5	31	76

Dimensions (mm)

Part number	ØD maximum	L maximum	F ±0.5	Ød ±0.05	C minimum	C′ minimum
HSH0512-3R8305-R	5.0	12.0±2.0	2.0	0.5	27.0	22.0
HS/HSL0612-3R8505-R	6.8	12.2	2.6	0.5	27.0	22.0
HS/HSL0814-3R8106-R	8.5	15.5	3.5	0.6	19	22
HSH0612-3R8805-R	6.3	12.0±2.0	2.6	0.5	27.0	22.0
HS/HSL0820-3R8256-R	8.5	22	3.5	0.6	19	22
HSH0622-3R8226-R	6.3	22.0±2.0	2.6	0.5	27.0	22.0
HSH0814-3R8256-R	8.0	14.0±1.5	3.5	0.6	27.0	22.0
HS/HSL1016-3R8306-R	10.5	18	5	0.6	22	27
HSH0820-3R8406-R	8.0	20.0±2.0	3.5	0.6	27.0	22.0
HS/HSL1020-3R8506-R	10.5	22	5	0.6	22	27
HSH0825-3R8556-R	8.0	25.0±2.0	3.5	0.6	27.0	22.0
HS/HSL1025-3R8706-R	10.5	27	5	0.6	22	27
HSH1016-3R8556-R	10.0	16.0±2.0	5.0	0.6	27.0	22.0
HSH1020-3R8856-R	10.0	20.0±2.0	5.0	0.6	27.0	22.0
HS/HSL1225-3R8127-R	12.9	27	5	0.6	22	27
HSH1025-3R8117-R	10.0	25.0±2.0	5.0	0.6	27.0	22.0
HS/HSL1040-3R8157-R	10.5	42	5	0.6	19	22
HSH1030-3R8157-R	10.0	30.0±2.0	5.0	0.6	27.0	22.0
HS/HSL1625-3R8227-R	16.5	27	7.5	0.8	22	27
HSH1040-3R8207-R	10.0	40.0±2.0	5.0	0.6	27.0	22.0
HSH1225-3R8207-R	12.5	25.0±2.0	5.0	0.6	27.0	22.0
HSH1235-3R8307-R	12.5	35.0±2.0	5.0	0.6	27.0	22.0
HSH1240-3R8357-R	12.5	40.0±2.0	5.0	0.6	27.0	22.0
HSH1245-3R8407-R	12.5	45.0±2.0	5.0	0.6	27.0	22.0
HSH1630-3R8457-R	16.0	30.0±2.0	7.5	0.8	27.0	22.0
HSH1840-3R8857-R	18.0	40.0±2.0	7.5	0.8	27.0	22.0
HSH1850-3R8108-R	18.0	50.0±2.0	7.5	0.8	27.0	22.0

Part numbering system

HS/HSL/HSH	0820	-3R8	50	6	-R
Family code	Size reference (mm)	Voltage (V) R = decimal	Capacitance (µF) Value	Multiplier	
HS/HSL = Hybrid supercapacitor (original series) HSH = Hybrid supercapacitor (extended capacitance series)	HS/HSL: Diameter = 8.5 - 16.5 mm Length = 15.5 - 42 mm HSH: Diameter = 5.0 - 18.0 mm Length = 12.0 - 60.0 mm	3R8 = 3.8 V	Example 506 = 50 x 10^6 µF or 50 F		Standard product



Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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