

# Supercapacitor selection guide



## Applications

	Computing				Energy				Industrial					Medical			Transportation						
	Servers	Storage	Wireless communication	Datacenter UPS	Microgrid/renewables	Utility T&D	Metering	Wind pitch control	Manufacturing automation	Material handling	Building & home control	Marine and harbor crane	Mission critical power	IoT	Personal	Critical power UPS	Equipment peak power	Hospital systems	Safety systems	xEV Powertrain	Rail & traction	Asset tracking	Marine powertrain
Small cylindrical	B						x				x		x	x				x				x	
	HB		x				x				x		x	x				x	x			x	
	HV		x				x		x		x		x	x				x	x			x	
	TV(A)		x				x		x		x		x	x				x	x			x	
	XB									x													
Large cells	XV								x	x							x						
	XT								x	x							x						
	XL60		x			x	x				x									x	x		x
Packs	PB						x												x				
	PHB						x												x				
	PHV						x			x					x								
	PHVL						x							x								x	
	PTV						x				x				x								
Coin cells	KR	x	x	x		x				x	x							x					
	KW	x	x	x		x				x	x							x					
Modules	XVM-16															x							
	XTM-18															x							
	XLM				x	x	x									x	x						
	XLR				x	x										x	x			x	x		x
Hybrid	XVM PCBAs	x			x	x				x	x					x							
	HS/HSL		x				x							x	x				x			x	

# EATON

Powering Business Worldwide

# Small cylindrical

## Features




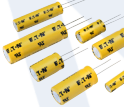

- Low resistance (ESR)
- Wide operating temperatures
- Extended operating temperature up to +85 °C with linear derating\*
- Fast charge/discharge
- Highest power density

## Benefits

- Long lifetimes, up to 20 years\*
- Maintenance free operation
- Low total cost of ownership

## Applications

- Smart utility meters
- GPS and asset tracking devices
- RF radios
- Storage servers
- Industrial backup/ride through
- Automotive safety devices (emergency door locks, e-call)

Family	Capacitance (F)	Part number	ESR (mohm)	Nominal voltage (V)	Leakage current (µA)	Operating temperature	Size (mm)	
<b>B</b> 	0.22	B0510-2R5224-R	2000	2.5	2	-25 °C to +70 °C	5 x 11	
	1.00	B0810-2R5105-R	500	2.5	4	-25 °C to +70 °C	8 x 13	
	1.50	B1010-2R5155-R	300	2.5	7	-25 °C to +70 °C	10 x 14	
	2.20	B0820-2R5225-R	200	2.5	9	-25 °C to +70 °C	8 x 20	
<b>HB</b> 	3	HB0820-2R5305-R	155	2.5	7	-25 °C to +70 °C	8 x 20	
	5	HB1020-2R5505-R	95	2.5	11	-25 °C to +70 °C	10 x 20	
	6	HB0830-2R5605-R	95	2.5	11	-25 °C to +70 °C	8 x 30	
	10	HB1030-2R5106-R	60	2.5	20	-25 °C to +70 °C	10 x 30	
	15	HB1325-2R5156-R	45	2.5	22	-25 °C to +70 °C	13 x 26	
	25	HB1625-2R5256-R	36	2.5	28	-25 °C to +70 °C	16 x 25	
	35	HB1635-2R5356-R	28	2.5	32	-25 °C to +70 °C	16 x 35	
	60	HB1840-2R5606-R	23	2.5	47	-25 °C to +70 °C	18 x 40	
	110	HB1860-2R5117-R	18	2.5	180	-25 °C to +70 °C	18 x 60	
	<b>HV</b> 	1	HV0810-2R7105-R	200	2.7	10	-40 °C to +65 °C	8 x 10
3		HV0820-2R7305-R	80	2.7	15	-40 °C to +65 °C	8 x 20	
5		HV1020-2R7505-R	40	2.7	20	-40 °C to +65 °C	10 x 20	
6		HV0830-2R7605-R	40	2.7	20	-40 °C to +65 °C	8 x 30	
10		HV1030-2R7106-R	34	2.7	23	-40 °C to +65 °C	10 x 30	
15		HV1325-2R7156-R	30	2.7	23	-40 °C to +65 °C	13 x 26	
25		HV1625-2R7256-R	27	2.7	45	-40 °C to +65 °C	16 x 25	
35		HV1635-2R7356-R	24	2.7	51	-40 °C to +65 °C	16 x 35	
35		HV1245-2R7356-R	20	2.7	51	-40 °C to +65 °C	12 x 45	
60		HV1840-2R7606-R	18	2.7	110	-40 °C to +65 °C	18 x 40	
100		HV1860-2R7107-R	12	2.7	260	-40 °C to +65 °C	18 x 60	
<b>TV</b> 		3.3	TV0820-3R0335-R	75	3.0	15	-40 °C to +65 °C	8 x 20
		6	TV1020-3R0605-R	35	3.0	13	-40 °C to +65 °C	10 x 20
	10	TV1030-3R0106-R	26	3.0	25	-40 °C to +65 °C	10 x 30	
	15	TV1325-3R0156-R	24	3.0	35	-40 °C to +65 °C	13 x 25	
	25	TV1625-3R0256-R	18	3.0	60	-40 °C to +65 °C	16 x 25	
	34	TV1245-3R0346-R	16	3.0	75	-40 °C to +65 °C	12 x 45	
	35	TV1635-3R0356-R	15	3.0	90	-40 °C to +65 °C	16 x 35	
	60	TV1840-3R0606-R	13	3.0	135	-40 °C to +65 °C	18 x 40	
	100	TV1860-3R0107-R	11	3.0	225	-40 °C to +65 °C	18 x 60	
<b>TVA</b> 	25	TVA1625-3R0256-R	18	3.0	60	-40 °C to +65 °C	16 x 25	
	35	TVA1635-3R0356-R	15	3.0	90	-40 °C to +65 °C	16 x 35	
	60	TVA1840-3R0606-R	13	3.0	135	-40 °C to +65 °C	18 x 40	
	100	TVA1860-3R0107-R	11	3.0	225	-40 °C to +65 °C	18 x 60	

# Hybrid supercapacitors

## Features


- High power and ultra-high capacitance
- Small footprints for space-saving (10.5 mm x 18 mm to 16.5 mm x 27 mm package sizes)
- Wide range of operating temperatures (-25 °C to +70 °C)

## Benefits

- Low ESR and leakage current to minimize power wastage
- Lead and halogen-free, RoHS and REACH compliant, UL recognized

## Applications

- Industrial backup/ride through
- Backup for storage servers
- Water and gas smart meters
- IoT energy storage
- Medical backup power/alarm
- Commercial trucks/containers asset tracking

Family	Capacitance (F)	Part number	Maximum initial ESR	Continuous current	Peak current (A)	Nominal leakage current	Peak power (W)
 HS/HSL	10	HS/HSL0814-3R8106-R	1500	0.075	1.0	2.0/3.0	2.4
	25	HS/HSL0820-3R8256-R	650	0.125	2.3	2.5/3.3	5.5
	30	HS/HSL1016-3R8306-R	550	0.15	2.7	3.0/4.0	6.6
	50	HS/HSL1020-3R8506-R	450	0.25	3.4	4.0/5.0	8.0
	70	HS/HSL1025-3R8706-R	250	0.35	6.1	5.0/8.0	14
	120	HS/HSL1225-3R8127-R	200	0.6	7.7	7.0/12	18
	150	HS/HSL1040-3R8157-R	140	0.75	10.9	0.9/16	26
	220	HS/HSL1625-3R8227-R	100	1.1	15.3	12/25	36

# Cylindrical packs

## Features







- Integrated cell management/balancing built-in
- Low resistance (ESR)
- Wide operating temperatures
- Extended operating temperature up to +85 °C with linear derating\*
- Fast charge/discharge
- High power density

## Benefits

- Long lifetimes, up to 20 years\*
- Maintenance free operation
- Low total cost of ownership

## Applications

- Smart utility meters
- GPS and asset tracking devices
- RF radios
- Storage servers
- Industrial backup/ride through
- Automotive safety devices (emergency door locks, e-call)

Family	Capacitance (F)	Part number	ESR (mohm)	Nominal voltage (V)	Leakage current (µA)	Operating temperature	Size (mm)
 PB	0.1	PB-5R0 <sup>(1)</sup> 104-R	4000	5.0	3	-25 °C to +70 °C	5.5 x 10.8 x 12.5
	0.47	PB-5R0 <sup>(1)</sup> 474-R	1000	5.0	7	-25 °C to +70 °C	8.5 x 16.8 x 14
	1.0	PB-5R0 <sup>(1)</sup> 105-R	500	5.0	12	-25 °C to +70 °C	8.5 x 16.8 x 21.5
 PHB	1.5	PHB-5R0 <sup>(1)</sup> 155-R	310	5.0	10	-25 °C to +70 °C	8.5 x 16.8 x 21.5
	2.5	PHB-5R0 <sup>(1)</sup> 255-R	190	5.0	14	-25 °C to +70 °C	10.5 x 20.8 x 22.5
	3.0	PHB-5R0 <sup>(1)</sup> 305-R	190	5.0	16	-25 °C to +70 °C	8.5 x 16.8 x 31.5
	5.0	PHB-5R0 <sup>(1)</sup> 505-R	120	5.0	25	-25 °C to +70 °C	10.5 x 20.8 x 32
 PHV	0.47	PHV-5R4 <sup>(1)</sup> 474-R	300	5.4	13	-40 °C to +65 °C	8.5 x 16.8 x 14
	1.5	PHV-5R4 <sup>(1)</sup> 155-R	100	5.4	18	-40 °C to +65 °C	8.5 x 16.8 x 21.5
	2.5	PHV-5R4 <sup>(1)</sup> 255-R	70	5.4	24	-40 °C to +65 °C	10.5 x 20.8 x 22.5
	3.0	PHV-5R4 <sup>(1)</sup> 305-R	70	5.4	25	-40 °C to +65 °C	8.5 x 16.8 x 31.5
	5.0	PHV-5R4 <sup>(1)</sup> 505-R	65	5.4	28	-40 °C to +65 °C	10.5 x 20.8 x 32
 PHVL	0.47	PHVL-3R9 <sup>(1)</sup> 474-R	400	3.9	1	-40 °C to +65 °C	8.5 x 16.8 x 14
	1.5	PHVL-3R9 <sup>(1)</sup> 155-R	160	3.9	2	-40 °C to +65 °C	8.5 x 16.8 x 21.5
	2.5	PHVL-3R9 <sup>(1)</sup> 255-R	80	3.9	4	-40 °C to +65 °C	10.5 x 20.8 x 22.5
	3.0	PHVL-3R9 <sup>(1)</sup> 305-R	80	3.9	4	-40 °C to +65 °C	8.5 x 16.8 x 31.5
	5.0	PHVL-3R9 <sup>(1)</sup> 505-R	70	3.9	5	-40 °C to +65 °C	10.5 x 20.8 x 32
 PM	0.47	PM-5R0 <sup>(1)</sup> 474-R	420	5.0	8	-40 °C to +60 °C	8.5 x 16.8 x 14
	1.0	PM-5R0 <sup>(1)</sup> 105-R	150	5.0	10	-40 °C to +60 °C	8.5 x 16.8 x 21.5
	1.5	PM-5R0 <sup>(1)</sup> 155-R	70	5.0	15	-40 °C to +60 °C	10.5 x 20.8 x 22.5
	3.0	PM-5R0 <sup>(1)</sup> 305-R	50	5.0	20	-40 °C to +60 °C	10.5 x 20.8 x 32
 PTV	3.0	PTV-6R0305-R	100	6.0	25	-40 °C to +65 °C	10.5 x 20.8 x 22.5
	5.0	PTV-6R0505-R	72	6.0	80	-40 °C to +65 °C	10.5 x 20.8 x 32

1: "V" for straight leads, "H" for 90 degree bent leads

# Coin cells

## Features

- Multiple footprint configurations
- Fully rated industrial operating temperature (KW family)
- Eco-friendly

## Benefits

- Ultra low leakage current
- Lower total install cost vs batteries with holders
- Low total cost of ownership

## Applications

- Real-time clock
- Memory backup
- Utility meters
- Medical devices
- Industrial controls

Family	Capacitance (F)	Part number	ESR (ohms)	Nominal voltage (V)	Leakage current (µA)	Operating temperature	Size (mm)
KR (cylindrical mounting)	0.1	KR-5R5C104-R	75	5.5	0.6	-25 °C to +70 °C	13.5 x 7.5
	0.22	KR-5R5C224-R	75	5.5	1.3	-25 °C to +70 °C	13.5 x 7.5
	0.33	KR-5R5C334-R	50	5.5	2	-25 °C to +70 °C	13.5 x 7.5
	0.47	KR-5R5C474-R	50	5.5	2.8	-25 °C to +70 °C	13.5 x 7.5
	1.0	KR-5R5C105-R	30	5.5	6	-25 °C to +70 °C	21.5 x 7.5
1.5	KR-5R5C155-R	30	5.5	9	-25 °C to +70 °C	21.5 x 7.5	
KR (vertical mounting)	0.1	KR-5R5V104-R	75	5.5	0.6	-25 °C to +70 °C	11.5 x 12.5
	0.22	KR-5R5V224-R	75	5.5	1.3	-25 °C to +70 °C	11.5 x 12.5
	0.33	KR-5R5V334-R	50	5.5	2	-25 °C to +70 °C	11.5 x 12.5
	0.47	KR-5R5V474-R	50	5.5	2.8	-25 °C to +70 °C	11.5 x 12.5
	1.0	KR-5R5V105-R	30	5.5	6	-25 °C to +70 °C	19 x 19.5
1.5	KR-5R5V155-R	30	5.5	9	-25 °C to +70 °C	19 x 19.5	
KR (horizontal mounting)	0.1	KR-5R5H104-R	75	5.5	0.6	-25 °C to +70 °C	11.5 x 5
	0.22	KR-5R5H224-R	75	5.5	1.3	-25 °C to +70 °C	11.5 x 5
	0.33	KR-5R5H334-R	50	5.5	2	-25 °C to +70 °C	11.5 x 5
	0.47	KR-5R5H474-R	50	5.5	2.8	-25 °C to +70 °C	11.5 x 5
	1.0	KR-5R5H105-R	30	5.5	6	-25 °C to +70 °C	19 x 6.5
1.5	KR-5R5H155-R	30	5.5	9	-25 °C to +70 °C	19 x 6.5	
KW (cylindrical mounting)	0.1	KW-5R5C104-R	50	5.5	0.6	-40 °C to +85 °C	13.5 x 8.3
	0.22	KW-5R5C224-R	50	5.5	1.3	-40 °C to +85 °C	13.5 x 8.3
	0.33	KW-5R5C334-R	50	5.5	2	-40 °C to +85 °C	13.5 x 8.3
	0.68	KW-5R5C684-R	30	5.5	2.8	-40 °C to +85 °C	21.5 x 9.0
	1.0	KW-5R5C105-R	30	5.5	6	-40 °C to +85 °C	21.5 x 9.0

# Large cells

## Features

- Low resistance (ESR), high power
- Wide operating temperatures
- Extend operating temperature up to +85 °C with linear derating\*
- Highest energy storage power density

## Benefits

- Long lifetimes, up to 20 years\*
- Maintenance free operation
- Low total cost of ownership
- No C-rate charge/discharge limitations

## Applications

- Engine and generator starting
- Automotive active suspension
- X-ray peak power
- Material handling systems
- Rail/Traction energy regeneration
- Industrial backup power/UPS

Family	Capacitance (F)	Part number	ESR (mohm)	Nominal voltage (V)	Leakage current (µA)	Operating temperature	Size (mm)
XB	300	XB3550-2R5307-R	7.0	2.5	300	-25 °C to +70 °C	35 x 50
	400	XB3560-2R5407-R	4.5	2.5	400	-25 °C to +70 °C	35 x 60
	600	XB3585-2R5607-R	3.7	2.5	700	-25 °C to +70 °C	35 x 85
XV	300	XV3550-2R7307-R	4.5	2.7	480	-40 °C to +65 °C	35 x 50
	400	XV3560-2R7407-R	3.2	2.7	650	-40 °C to +65 °C	35 x 60
	600	XV3585-2R7607-R	2.6	2.7	1300	-40 °C to +65 °C	35 x 85
XT	275	XT3550-3R0287-R	4.5	3.0	600	-40 °C to +65 °C	36 x 54
	370	XT3560-3R0377-R	3.2	3.0	850	-40 °C to +65 °C	36 x 64
	555	XT3585-3R0567-R	2.6	3.0	1300	-40 °C to +65 °C	36 x 88.5
XL60	3000	XL60-2R7308W-R	0.23	2.7	5000	-40 °C to +65 °C	60 x 138
	3000	XL60-2R7308T-R	0.23	2.7	5000	-40 °C to +65 °C	60 x 138
	3400	XL60-2R9348W-R	0.23	2.85	8000	-40 °C to +65 °C	60 x 138
	3400	XL60-2R9348T-R	0.23	2.85	8000	-40 °C to +65 °C	60 x 138
	3000	XL60-3R0308W-R	0.23	3.0	7000	-40 °C to +65 °C	60 x 138
	3000	XL60-3R0308T-R	0.23	3.0	7000	-40 °C to +65 °C	60 x 138

# Modules

## Features

- Integrated cell balancing and management
- Wide operating temperatures
- Simply wire in series and/or parallel to meet load needs
- Highest energy storage power density

## Benefits

- Long lifetimes, up to 20 years\*
- Maintenance free operation
- Low total cost of ownership
- No C-rate type charge/discharge limitations

## Applications

- UPS backup power
- Grid services & renewable firming
- Commercial xEVs
- Large material handling systems
- Rail/Traction energy regeneration

Family	Capacitance (F)	Part number	ESR (mΩ)	Nominal voltage (V)	Leakage current (mA)	Operating temperature	Size (mm)
XVM-16	65	XVM-16R2656-R	22	16.2	23	-40 °C to +65 °C	236 x 46 x 78
XTM-18	62	XTM-18R0626-R	22	18.0	23	-40 °C to +65 °C	236 x 46 x 78
XLM	130	XLM-62R1137A-R	6.7	62.1	128	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-62R1137A-T	6.7	62.1	128	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-62R1137B-R	6.7	62.1	5.2	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-62R1137B-T	6.7	62.1	5.2	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-69R0137A-R	6.7	69	144	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-69R0137A-T	6.7	69	144	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-69R0137B-R	6.7	69	7.0	-40 °C to +65 °C	686 x 176 x 173
	130	XLM-69R0137B-T	6.7	69	7.0	-40 °C to +65 °C	686 x 176 x 173
XLR	166	XLR-48R6167-R	5.0	48.6	5.2	-40 °C to +65 °C	420 x 195 x 176
	188	XLR-51R3187-R	5.0	51.3	8.0	-40 °C to +65 °C	420 x 195 x 176
XLR-LV	500	XLR-16R2507-R	1.7	16.2	5.0	-40 °C to +65 °C	416 x 67 x 176
XVM PCBAs	4.17	XVM-259R2425-R	310	259.2	27	-40 °C to +65 °C	550 x 266 x 69
	6.25	XVM-259R2635-R	250	259.2	28	-40 °C to +65 °C	550 x 266 x 94
	2.56	XVM-315R9255-R	530	315.9	23	-40 °C to +65 °C	440 x 377 x 60
	3.42	XVM-315R9345-R	380	315.9	24	-40 °C to +65 °C	440 x 377 x 70
	5.13	XVM-315R9515-R	320	315.9	25	-40 °C to +65 °C	440 x 377 x 95

\* 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.

## Tools & resources

- [Webpage](#)
- [Supercapacitor calculator tool](#)
- [Parametric search tool](#)
- [Energy storage total cost of ownership \(TCO\) tool](#)

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