

# XB Supercapacitors

## Cylindrical snap-in



### Features

- Over 10-year operating life at room temperature
- Low ESR for high power density
- Large capacitance for high energy density
- Long cycle life
- Environmentally friendly electrolyte
- UL Recognized

### Applications

- Hybrid battery or fuel cell systems
- High pulse current applications
- UPS / hold-up power

### Description

Eaton supercapacitors are unique, ultra-high capacitance devices utilizing electrochemical double layer capacitor (EDLC) construction combined with new, high performance materials. This combination of advanced technologies allows Eaton to offer a wide variety of capacitor solutions tailored to specific applications that range from a few micro-amps for several days to several amps for milliseconds.

## Ratings

Capacitance	300 F to 600 F
Maximum working voltage	2.5 V
Surge voltage	2.85 V
Capacitance tolerance	-10% to +10% (+20 °C)
Operating temperature range	-25 °C to +70 °C

## Specifications

Capacitance <sup>1</sup> (F)	Part Number	Maximum ESR <sup>1</sup> (mΩ) (Equivalent Series Resistance)	Max continuous current <sup>2</sup> (A)	Peak current <sup>3</sup> (A)	Max leakage current <sup>1,4</sup> (mA)	Max power <sup>5</sup> (W)	Stored energy <sup>6</sup> (Wh)	Typical mass (g)
300	XB3550-2R5307-R	7	15	120	0.30	220	0.26	69
400	XB3560-2R5407-R	4.5	19	180	0.45	350	0.35	80
600	XB3585-2R5607-R	3.7	29	235	0.70	420	0.52	122

1. Capacitance, ESR and Leakage current are all measured according to IEC 62391-1 at +20 °C
2. 15 °C Temperature Rise
3. Peak Current is for 1 second =  $\frac{1}{2}$  Working Voltage x Capacitance / (1 + ESR x Capacitance)
4. Leakage current measured after 72 hours, +20 °C
5. Max. Power = Working Voltage<sup>2</sup> / 4 / ESR
6. Stored energy =  $\frac{1}{2}$  Capacitance x Working Voltage<sup>2</sup> / 3600

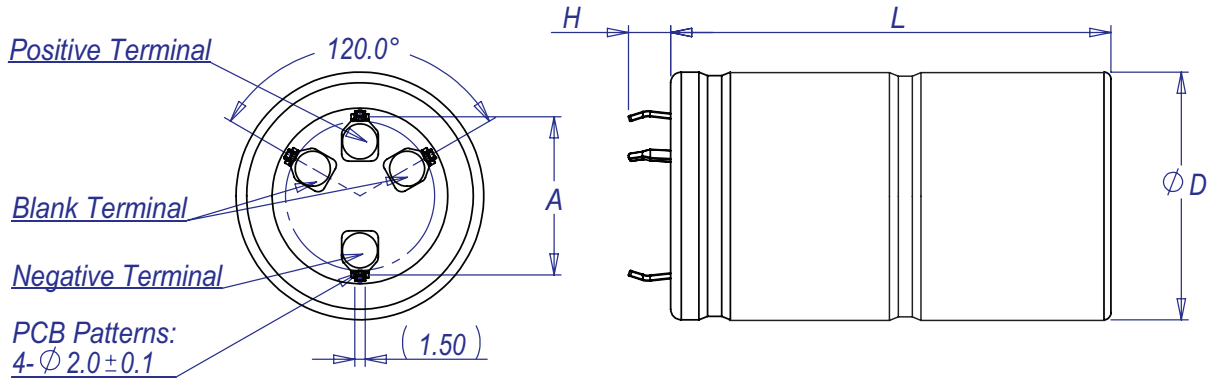
## Performance

Parameter		Capacitance change (% of initial value)	ESR (% of max. initial value)
Life			
@ Maximum operating voltage and temp)	1500 hours	≤ 20%	≤ 200%
Charge/discharge cycling <sup>1</sup>	500,000	≤ 20%	≤ 200%
Storage Life- uncharged			
-25 °C to +70 °C	1500 hours	≤ 20%	≤ 200%
≤ 30°C	3 years	≤ 5%	≤ 10%

1. Cycling between maximum operating and 50% of maximum operating voltage at room temperature

**Dimensions- mm**

**Dimensions - mm**



Part number	D $\pm 1.0$	L $\pm 1.0$	H $\pm 1.0$	A $\pm 0.1$
XB3550-2R5307-R	35	53	6	22.5
XB3560-2R5407-R	35	63	6	22.5
XB3585-2R5607-R	35	87.5	6	22.5

**Part numbering system**

<b>XB</b>	<b>3560</b>		<b>-2R5</b>	<b>40</b>	<b>7</b>	<b>-R</b>
Family Code	Size reference- mm		Voltage (V) R = Decimal	Capacitance ( $\mu$ F)		Standard product
	Diameter	Length		Value	Multiplier	
XB=Family Code	35	60	2R5 = 2.5 V	Example: 407 = 40 x 10 <sup>7</sup> $\mu$ F or 400 F		

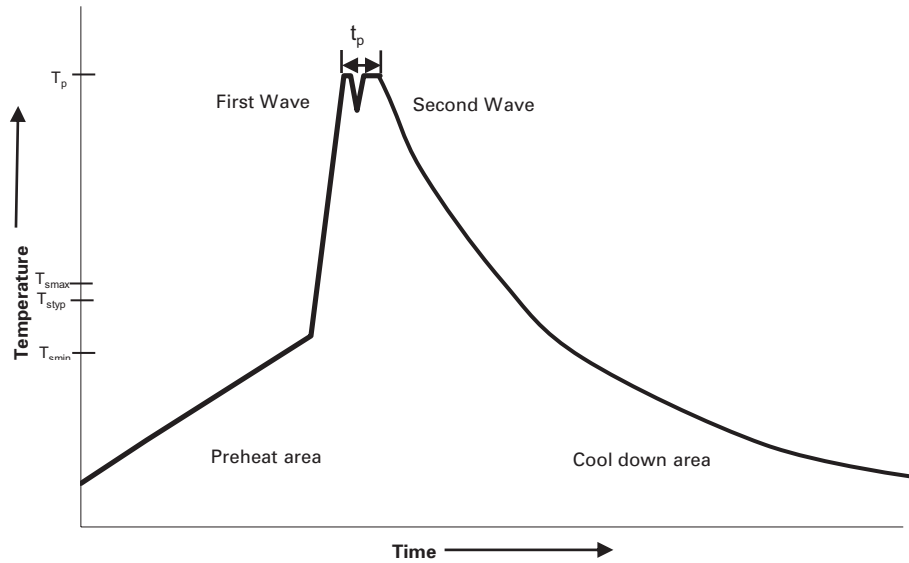
**Packaging information**

- Standard packaging: Bulk, 20 parts per box

**Part marking**

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

**Wave solder profile**



Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and soak	<ul style="list-style-type: none"> <li>• Temperature max. (<math>T_{smax}</math>)</li> <li>• Time max.</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature max. (<math>T_{smax}</math>)</li> <li>• Time max.</li> </ul>
$\Delta$ 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.

**Reflow soldering**

Do not use reflow soldering using infrared or convection oven heating methods.

**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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