

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 ¹ (F) | Part Number | Maximum ESR ¹ (mΩ) (Equivalent Series Resistance) | Max continuous current ² (A) | Peak current ³ (A) | Max leakage current ^{1,4} (mA) | Max power ⁵ (W) | Stored energy ⁶ (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 Voltage² / 4 / ESR
6. Stored energy = $\frac{1}{2}$ Capacitance x Working Voltage² / 3600

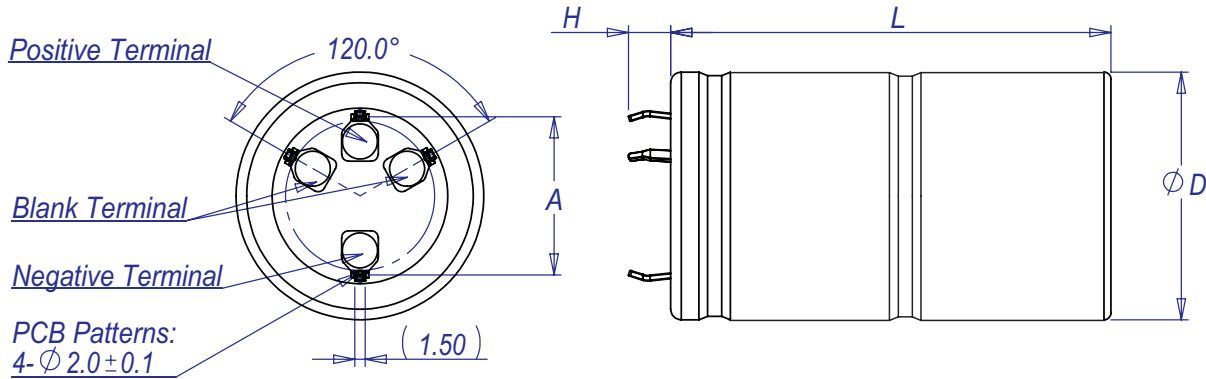
Performance

| Parameter | | Capacitance change (% of initial value) | ESR (% of max. initial value) |
|---------------------------------------|------------|--|----------------------------------|
| Life | | | |
| @ Maximum operating voltage and temp) | 1500 hours | ≤ 20% | ≤ 200% |
| Charge/discharge cycling ¹ | 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 ± 1.0 | L ± 1.0 | H ± 1.0 | A ± 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

| XB | 3560 | | -2R5 | 40 | 7 | -R |
|----------------|--------------------|--------|-------------------------|--|------------|------------------|
| Family Code | Size reference- mm | | Voltage (V) R = Decimal | Capacitance (μ F) | | Standard product |
| | Diameter | Length | | Value | Multiplier | |
| XB=Family Code | 35 | 60 | 2R5 = 2.5 V | Example: 407 = 40 x 10 ⁷ μ F or 400 F | | |

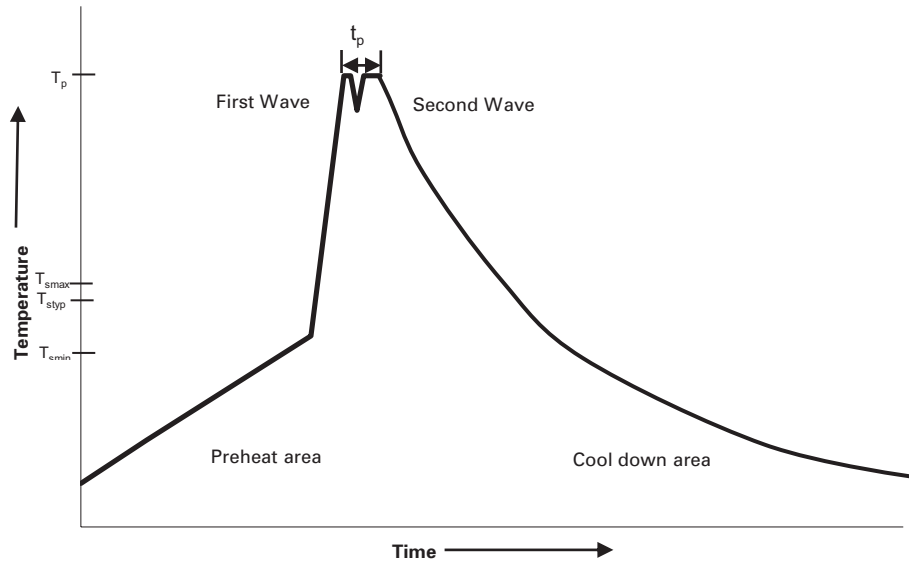
Packaging information

- 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"> • Temperature max. (T_{smax}) • Time max. | <ul style="list-style-type: none"> 100 °C 60 seconds |
| Δ 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) | <ul style="list-style-type: none"> 10 seconds max 5 seconds max each wave | <ul style="list-style-type: none"> 10 seconds max 5 seconds max each wave |
| Ramp-down rate | <ul style="list-style-type: none"> ~ 2 K/s min ~3.5 K/s typ ~5 K/s max | <ul style="list-style-type: none"> ~ 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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