

# XT Supercapacitors

## Snap-in cylindrical cells



### Features and benefits

- 3.0 V operating voltage for high power and energy
- Ultra low ESR for very high power density
- Large capacitance for high energy density
- UL recognized

### Applications

- Industrial backup/ridethrough
- Energy storage for UPSs
- Automotive pulse power
- Medical equipment pulse 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 seconds.

The XT family advances the energy density by 20% and power density by 10%. These advances allow longer operating life and/or lower cost systems.



*Powering Business Worldwide*

## Ratings

Capacitance	275 F to 555 F
Working voltage	3.0 V
Surge voltage	3.3 V
Capacitance tolerance	-5% to +20% (+20 °C)
Operating temperature range	-40 °C to +65 °C
Extended operating temperature range	-40 °C to +85 °C (with linear voltage derating to 2.6 V @ +85 °C)

## Specifications

Capacitance <sup>1</sup> (F)	Part Number	Maximum initial ESR <sup>1</sup> (mΩ)	Continuous current <sup>5</sup> (A)	Peak current <sup>5</sup> (A)	Nominal leakage current <sup>2</sup> (mA)	Peak power <sup>4</sup> (W)	Stored energy <sup>3</sup> (mWh)	Typical thermal resistance <sup>7</sup> Rth (°C/W)	Short circuit current <sup>**8</sup> (A)
275	XT3550-3R0287-R	4.5	20.4	184	0.60	500	344	8	670
370	XT3560-3R0377-R	3.2	25.9	254	0.85	700	463	7	940
555	XT3585-3R0567-R	2.6	33.0	341	1.30	870	694	5	1150

\*\* Short circuit will cause permanent damage to the leads

## Performance

Parameter	Capacitance Change (% of initial value)	ESR (% of initial maximum value)
Lifetime — 1,500 hours at maximum rated voltage and operating temperature	≤ 20%	≤ 200%
Charge/discharge cycling <sup>9</sup> — 500,000 at +20 °C	≤ 20%	≤ 200%
Storage, uncharged, up to +35 °C — 3 years	≤ 5%	≤ 10%

1. Capacitance, Equivalent Series Resistance (ESR) and Leakage current are measured according to IEC62391-1.

2. Leakage current at +20 °C after 72 hour charge and hold.

3. Stored Energy (mWh) =  $\frac{0.5 \times C \times V^2 \times 1000}{3600}$

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

5. Peak current for 1 second from full rate voltage to half voltage.(A) =  $\frac{0.5 \times V \times C}{(1 + \text{ESR} \times C)}$

6. Continuous current with a 15 °C temperature rise. Continuous current (A) =  $\sqrt{\frac{\Delta T}{\text{ESR} \times \text{Rth}}}$

7. Thermal resistance (Rth) cell body temperature to ambient in open air in degrees C per Watt (°C/W).

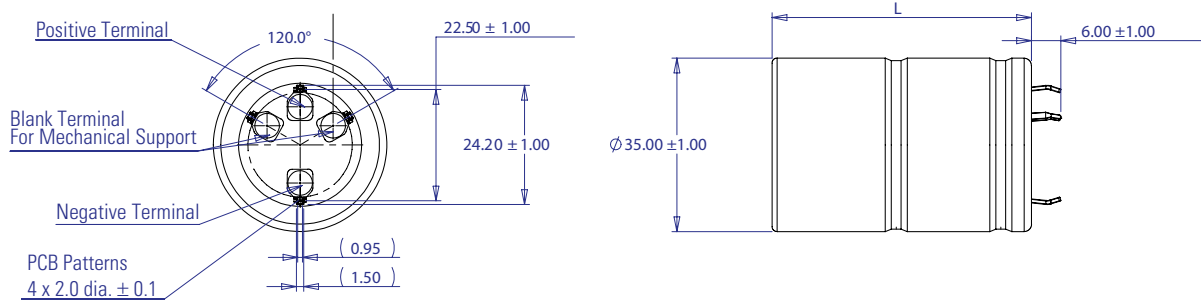
8. Short circuit current is for safety information only. Do not use as operating current.

9. Cycling between maximum working voltage and half voltage with 3 seconds rest at +20 °C.

## Safety and Certifications

Agency information	UL810a
Shock and vibration	MIL-STD-202G
Environmental	RoHS and REACH compliant, lead free, halogen free,
Warnings	Do not overvoltage, do not reverse polarity
Shipping	No restrictions, per UN3499 with all cells <10 watt-hours

**Dimensions (mm) and Mass (g)**



Part Number	L (±1.0)	Typical Mass (g)
XT3550-3R0287-R	53	62
XT3560-3R0377-R	63	72
XT3585-3R0567-R	87.5	108

**Part numbering system**

XT	3560	-3R0	37	7	-R	
Family code	Size reference (mm)		Voltage (V) R = decimal	Capacitance (µF) Value	Multiplier	Standard product
XT = Family Code	Diameter = 35	Length = 60	3R0 = 3.0 V	Example 377 = 37 x 10 <sup>7</sup> µF or 275 F		

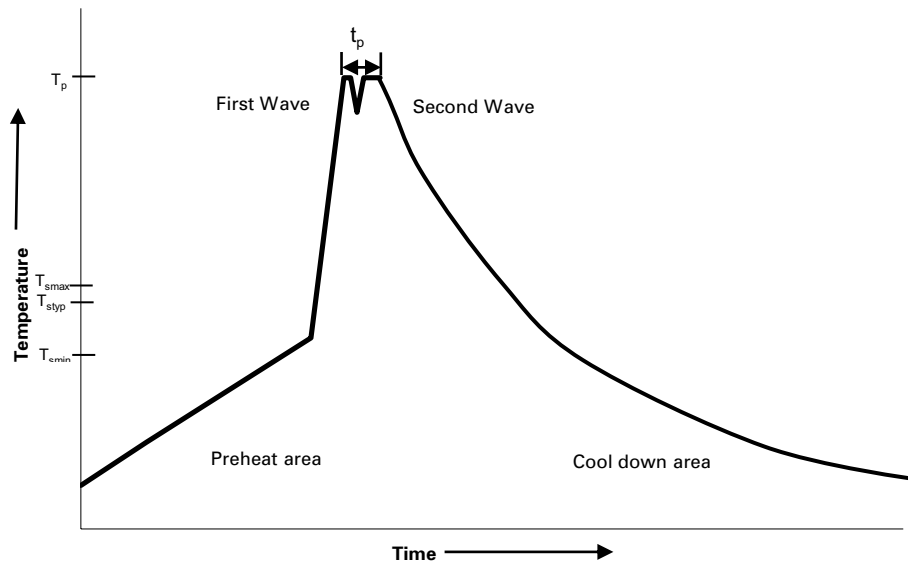
**Packaging information**

- Standard packaging: Bulk, 20 parts per box

**Part Marking**

- Manufacturer
- Capacitance (F)
- Maximum working voltage (V)
- Family code or part number
- Polarity
- 2D matrix serial code

### Wave solder profile



Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and soak	• Temperature max. ( $T_{smax}$ ) • Time max.	100 °C 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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin

**Eaton**  
**Electronics Division**  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
[www.eaton.com/electronics](http://www.eaton.com/electronics)

© 2018 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. 10762 BU-MC18002  
February 2018

Eaton is a registered trademark.

All other trademarks are property of their respective owners.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.