# B Supercapacitors
## Cylindrical cells



### Features

- High specific capacitance
- Very low ESR
- Low leakage currents
- Long cycle life
- UL Recognized

### Applications

- Main power
- Hybrid battery packs
- Hold-up power
- 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 milliseconds.

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## Ratings

| | |
|---|---|
| Capacitance | 0.22 F to 2.2 F |
| Maximum working voltage | 2.5 V |
| Surge voltage | 3.0 V |
| Capacitance tolerance | -20% to +80% (+20 °C) |
| Operating temperature range | -25 °C to +70 °C |

## Specifications

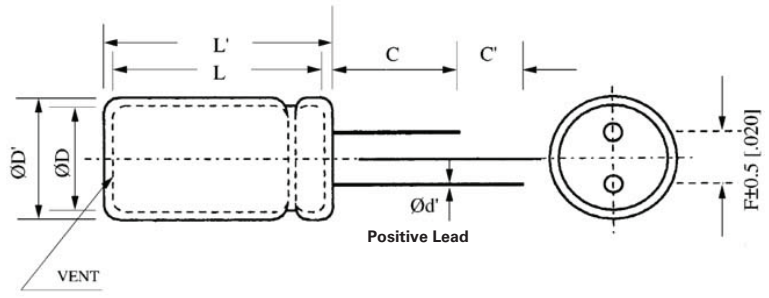
| Capacitance (F) | Part Number | Maximum ESR (Ω) (Equivalent Series Resistance) Measured @ 100 Hz | Nominal leakage current (uA) after 72 hours @ +20 °C | Nominal dimensions (mm) (diameter x length) | | Typical Mass (grams/piece) |
|---|---|---|---|---|---|---|
| 0.22 | B0510-2R5224-R | 2.0 | 2.0 | 5 | 11 | 0.54 |
| 1.0 | B0810-2R5105-R | 0.50 | 4.0 | 8 | 13 | 1.2 |
| 1.5 | B1010-2R5155-R | 0.30 | 7.0 | 10 | 14 | 1.9 |
| 2.2 | B0820-2R5225-R | 0.20 | 9.0 | 8 | 20 | 1.5 |

## Performance

| Parameter | Capacitance change (% of initial value) | ESR (% of max. initial value) |
|---|---|---|
| Life (1000 hours @ +70 °C @ 2.5 Vdc) | ≤ 30% | ≤ 300% |
| Storage - Low and High Temperature (1000 hours @ -25 °C and +70 °C) | ≤ 30% | ≤ 300% |

## Dimensions (mm)

| Part Number | D | D' | L | L' | F | d' | C | C' |
|---|---|---|---|---|---|---|---|---|
| B0510-2R5224-R | 5.0 | 5.5 | 11.5 | 12.0 | 2.0 | 0.50 | 20.0 | 5.0 |
| B0810-2R5105-R | 8.0 | 8.5 | 13.0 | 13.5 | 3.5 | 0.50 | 20.0 | 5.0 |
| B1010-2R5155-R | 10.0 | 10.5 | 14.3 | 14.8 | 5.0 | 0.60 | 20.0 | 5.0 |
| B0820-2R5225-R | 8.0 | 8.5 | 20.5 | 21.0 | 3.5 | 0.50 | 20.0 | 5.0 |
| ***Tolerances*** | **Maximum** | | | | **±0.5** | **±0.02** | **Minimum** | |




### Part marking

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

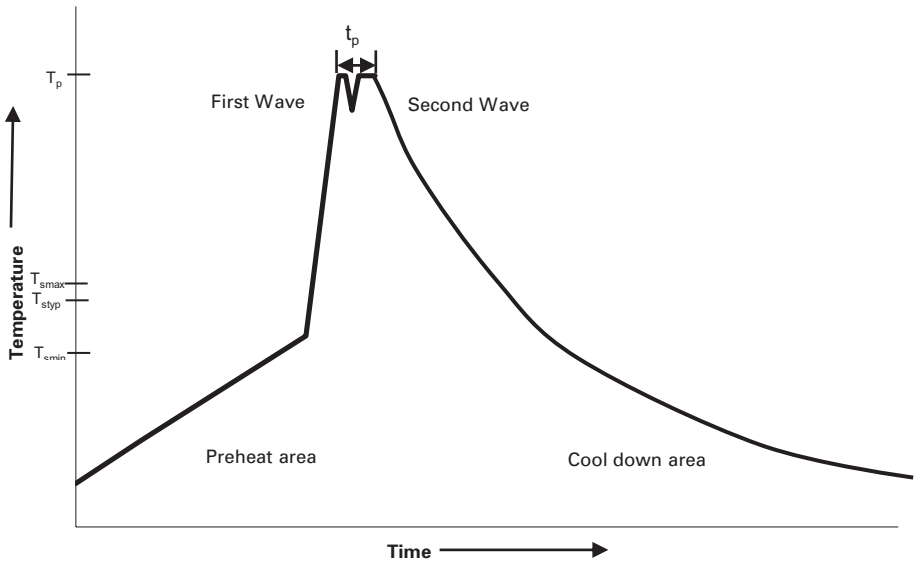
## Part numbering system

| B | 1010 | | — | 2R5 | 15 | | 5 | -R |
|---|---|---|---|---|---|---|---|---|
| Family Code | Size reference (mm) | | | Voltage (V) R = Decimal | Capacitance (µF) | | | |
| | | | | | Value | Multiplier | | Standard product |
| B Family | Diameter = 10 | Length = 10 | | 2R5 = 2.5 V | Example: 155 = 15 x $10^5$ µF or 1.5 F | | | |

## Packaging information

- Standard packaging: Bulk, 100 units per bag
- Larger bulk packages available on request

## Wave solder profile




| Profile Feature | | Standard SnPb Solder | Lead (Pb) Free Solder |
|---|---|---|---|
| Preheat and soak | • Temperature max. ($T_{smax}$) | 100 °C | 100 °C |
| | • Time max. | 60 seconds | 60 seconds |
| Δ preheat to max Temperature | | 160 °C max. | 160 °C max. |
| Peak temperature (Tp)* | | 220 °C – 260 °C | 250 °C – 260 °C |
| Time at peak temperature ($t_p$) | | 10 seconds max<br>5 seconds max each wave | 10 seconds max<br>5 seconds max each wave |
| Ramp-down rate | | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max | ~ 2 K/s min<br>~3.5 K/s typ<br>~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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