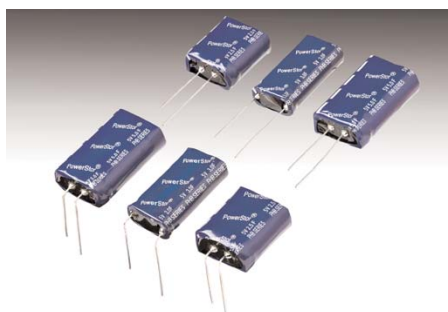


PHB Supercapacitors

Cylindrical pack



Features

- Large capacitance for high energy density
- Low ESR for high power density

Applications

- Bridging or hold-up power
- Memory back-up
- Battery Swap out

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.



Powering Business Worldwide

Ratings

Capacitance	1.5 F to 5.0 F
Maximum working voltage	5.0 V
Surge voltage	5.5 V
Capacitance tolerance	-10% to +30% (+20 °C)
Operating temperature range	-25 °C to +70 °C
Extended operating temperature range	-25 °C to +85 °C (with linear derating to 4.0 V @ +85 °C)

Specifications

Nominal Capacitance (F)	Vertical Part Number	Horizontal Part Number	Maximum ESR (Ω) (Equivalent Series Resistance) Measured @ 1 kHz	Maximum ESR (Ω) Measured 100 Hz	Nominal leakage current (μA) after 100 hours @ 5 V, +20 °C	Nominal dimensions (mm)	Typical mass (grams/piece)
1.5	PHB-5R0V155-R	PHB-5R0H155-R	0.31	0.33	10	8.5 x 16.8 x 21.5	3.3
2.5	PHB-5R0V255-R	PHB-5R0H255-R	0.19	0.20	14	10.5 x 20.8 x 22.5	5.0
3.0	PHB-5R0V305-R	PHB-5R0H305-R	0.19	0.20	16	8.5 x 16.8 x 31.5	5.3
5.0	PHB-5R0V505-R	PHB-5R0H505-R	0.12	0.13	25	10.5 x 20.8 x 32	7.5

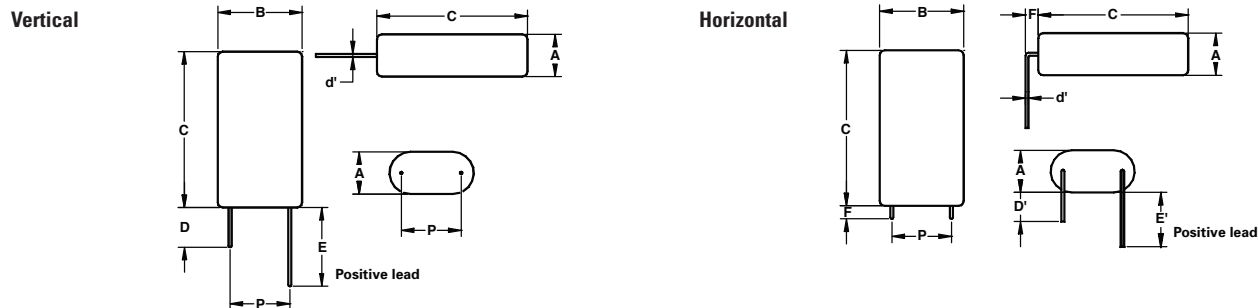
Performance

Parameter	Capacitance change (% of initial value)	ESR (% of max. initial value)
Life (1000 hours @ +70 °C @ 5.0 Vdc)	≤ 30%	≤ 200%
Storage - Low and High Temperature (1000 hours @ -25 °C and +85 °C)	≤ 30%	≤ 200%

Dimensions (mm)

Vertical Part Number	Horizontal Part Number	A	B	C	d'	D	D'	E	E'	F	P
PHB-5R0V155-R	PHB-5R0H155-R	9.0	17.3	22.0	0.5	20	15	25	20	2.0	11.8
PHB-5R0V255-R	PHB-5R0H255-R	11.0	21.3	23.0	0.6	20	15	25	20	2.0	5.3
PHB-5R0V305-R	PHB-5R0H305-R	9.0	17.3	32.5	0.5	20	15	25	20	2.0	11.8
PHB-5R0V505-R	PHB-5R0H505-R	11.0	21.3	32.5	0.6	20	15	25	20	2.0	5.3
Tolerances		Maximum			± 0.02	Minimum				± 0.5	

Note: Longer lead is positive.



Part numbering system

P	HB	—	5R0	V	15	5	-R
Family Code	Version		Voltage (V) R = Decimal	Configuration	Capacitance (μF)		
					Value	Multiplier	Standard product
P= Pack			5R0 = 5.0 V	V = Vertical H = Horizontal	Example: 155 = 15 x 10 ⁵ or 1.5 F		

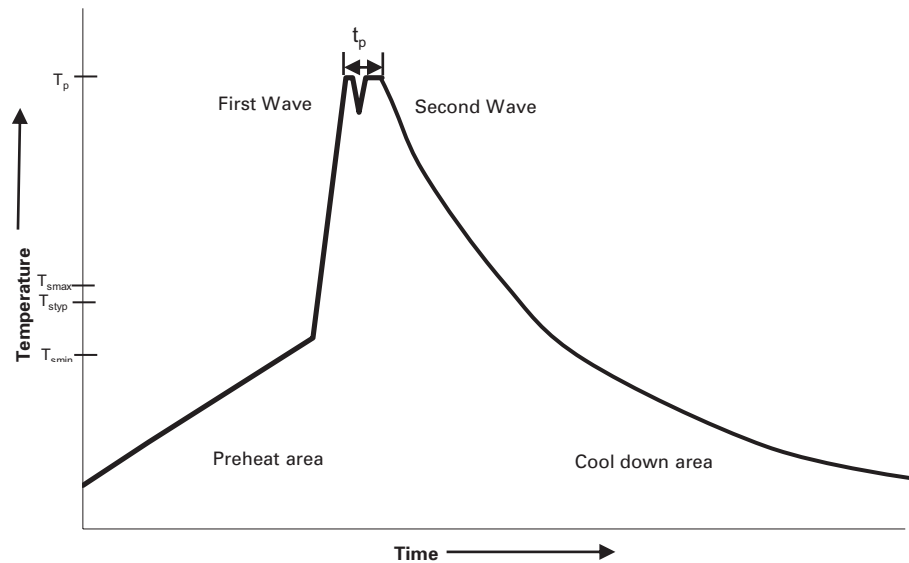
Packaging information

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

Part marking

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

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 (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.

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.

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