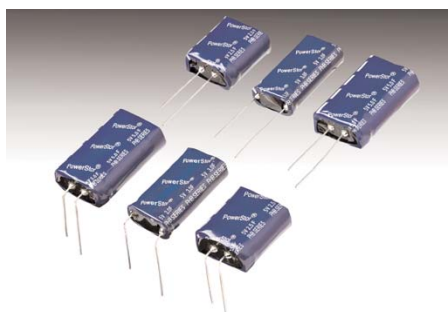


# PHB Supercapacitors

## Cylindrical pack



### 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.

### 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

## 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

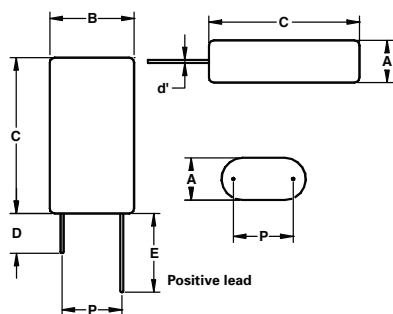
Parameter	Capacitance change (% of initial value)	ESR (% of max. initial value)
Life (1000 hours @ +70 °C @ 5.0 Vdc)	≤ 30%	≤ 200%
Storage - Low and High Temperature (1000 hours @ -25 °C and +85 °C)	≤ 30%	≤ 200%

## Dimensions (mm)

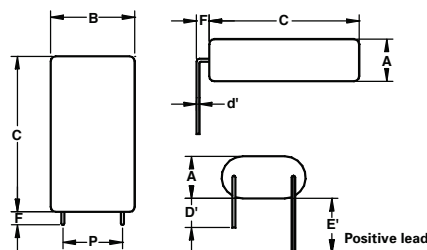
Vertical Part Number	Horizontal Part Number	A	B	C	d'	D	D'	E	E'	F	P
PHB-5R0V155-R	PHB-5R0H155-R	9.0	17.3	22.0	0.5	20	15	25	20	2.0	11.8
PHB-5R0V255-R	PHB-5R0H255-R	11.0	21.3	23.0	0.6	20	15	25	20	2.0	5.3
PHB-5R0V305-R	PHB-5R0H305-R	9.0	17.3	32.5	0.5	20	15	25	20	2.0	11.8
PHB-5R0V505-R	PHB-5R0H505-R	11.0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

Note: Longer lead is positive.

### Vertical



### Horizontal



## 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 <sup>5</sup> or 1.5 F		

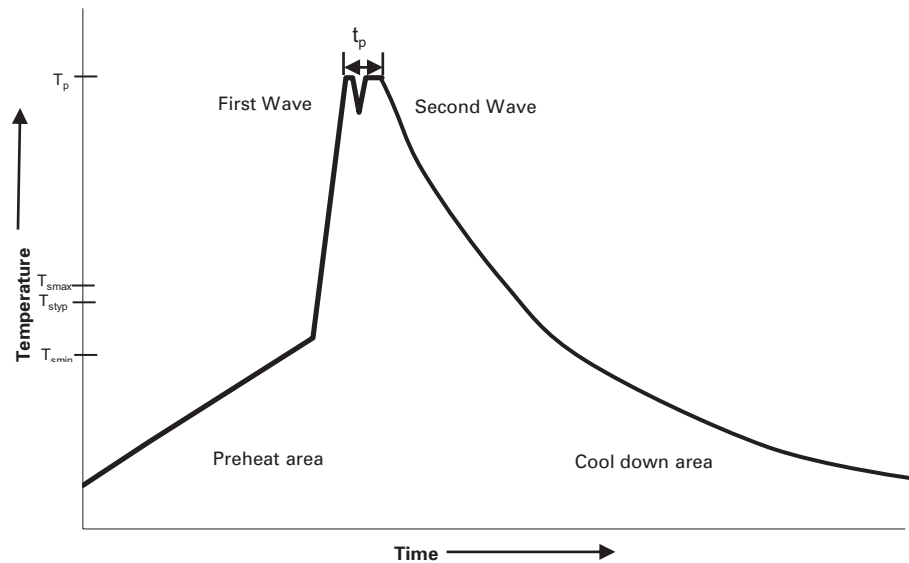
## Packaging information

- 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
$\Delta$ 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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Printed in USA  
Publication No. 4402 BU-SB11021  
June 2017