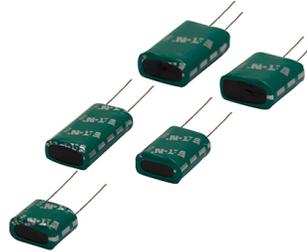


# PHV Supercapacitors

## Cylindrical pack



### Features

- Large capacitance for high energy density
- Ultra-low ESR for high power density

### Applications

- Pulse Power
- Bridging or hold-up power

### Environmental compliance



### Description

Eaton supercapacitors are unique, ultra-high capacitance devices utilizing electric 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	0.5 F to 5.0 F
Maximum working voltage	5.4 V
Surge voltage	6.0 V
Capacitance tolerance	-10% to +30% (+20 °C)
Operating temperature range	-40 °C to +65 °C
Extended operating temperature range	-40 °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 ( $\Omega$ ) (Equivalent series resistance) Measured @ 1 kHz		Nominal leakage current ( $\mu$ A) after 100 hours @ 5 V, +20°C	Nominal dimensions (mm)	Typical mass (grams/piece)
			Vertical	Horizontal			
0.5	PHV-5R4V474-R	PHV-5R4H474-R	0.300	0.40	13	8.5 x 16.8 x 14.0	2.6
1.5	PHV-5R4V155-R	PHV-5R4H155-R	0.120	0.16	18	8.5 x 16.8 x 21.5	3.0
2.5	PHV-5R4V255-R	PHV-5R4H255-R	0.075	0.08	24	10.5 x 20.8 x 22.5	4.5
3.0	PHV-5R4V305-R	PHV-5R4H305-R	0.075	0.08	25	8.5 x 16.8 x 31.5	4.8
5.0	PHV-5R4V505-R	PHV-5R4H505-R	0.065	0.07	28	10.5 x 20.8 x 32	6.8

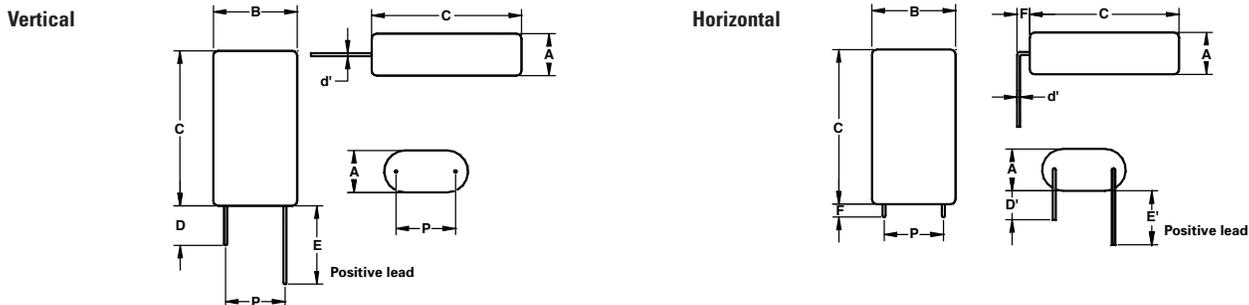
### Performance

Parameter	Capacitance change (% of initial value)	ESR (% of max. initial value)
Life (1000 hours @ +65 °C @ 5.4 Vdc)	$\leq 30\%$	$\leq 200\%$
Storage - Low and high temperature (1000 hours @ -40 °C and +85 °C)	$\leq 30\%$	$\leq 200\%$

### Dimensions (mm)

Vertical part number	Horizontal part number	A	B	C	d'	D	D'	E	E'	F	P
PHV-5R4V474-R	PHV-5R4H474-R	9.0	17.3	14.5	0.5	20	15	25	20	2.0	11.8
PHV-5R4V155-R	PHV-5R4H155-R	9.0	17.3	22.0	0.5	20	15	25	20	2.0	11.8
PHV-5R4V255-R	PHV-5R4H255-R	11.0	21.3	23.0	0.6	20	15	25	20	2.0	5.3
PHV-5R4V305-R	PHV-5R4H305-R	9.0	17.3	32.5	0.5	20	15	25	20	2.0	11.8
PHV-5R4V505-R	PHV-5R4H505-R	11.0	21.3	32.5	0.6	20	15	25	20	2.0	5.3
<b>Tolerances</b>		<b>Maximum</b>			$\pm 0.02$	<b>Minimum</b>			$\pm 0.5$		

Note: Longer lead is positive.



### Part numbering system

P	HV	—	5R4	V	15	5	-R
Family Code	Version		Voltage (V) R = Decimal	Configuration	Capacitance ( $\mu$ F)		Standard product
					Value	Multiplier	
P= Pack			5R4 = 5.4 V	V = Vertical H = Horizontal	Example: 155 = 15 x 10 <sup>5</sup> or 1.5 F		

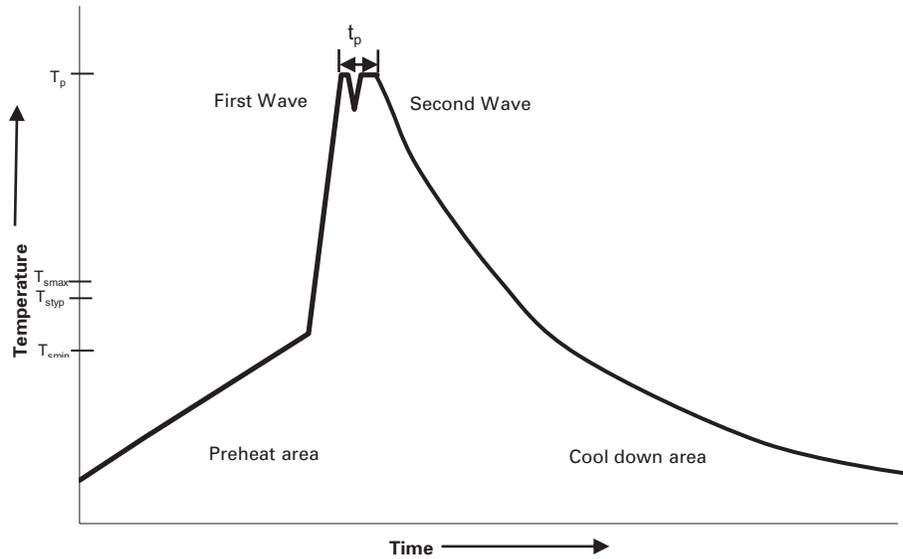
### Packaging information

- 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	<ul style="list-style-type: none"> <li>• Temperature max. (<math>T_{smax}</math>)</li> <li>• Time max.</li> </ul>	<ul style="list-style-type: none"> <li>100 °C</li> <li>60 seconds</li> </ul>
$\Delta$ 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.

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  
Eaton.com/electronics

© 2022 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. 4403  
February 2022

Eaton is a registered trademark.  
All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.

