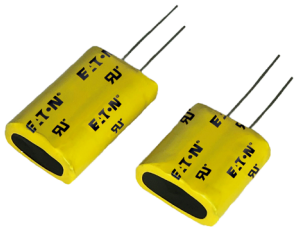
PTV Supercapacitors

Cylindrical packs



Features and benefits

- 6.0 V operating voltage for high power and energy
- Ultra low ESR for very high power density
- Large capacitance for high energy density
- UL recognized: File MH46887

Applications

- Industrial backup/ride through
- RF radio pulse power
- Automotive pulse power
- Valves and actuators power

Environmental compliance

Agency information

Description

Eaton supercapacitors are high reliability, high power, ultra-high capacitance energy storage devices utilizing electric double layer capacitor (EDLC) construction combined with proprietary materials and processes. This combination of advanced technologies allows Eaton to offer a wide variety of capacitor solutions tailored to applications for backup power, pulse power and hybrid power systems.

They can be applied as the sole energy storage or in combination with batteries to optimize cost, life time and run time. System requirements can range from a few microwatts to megawatts.

All products feature low ESR for high power density with environmentally friendly materials for a green power solution. Eaton supercapacitors are maintenance-free with design lifetimes up to 20 years* and operating temperatures down to -40 °C and up to +85 °C.

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*Supercapacitor lifetimes vary based on charge voltage and temperature. See Eaton's application guidelines or contact your local Eaton sales representative for more information on lifetime estimates

Powering Business Worldwide

Ratings

Capacitance	1.65 F to 5.0 F
Working voltage[9]	6.0 V
Surge voltage[9]	6.3 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 voltage derating to 5.0 V @ +85 °C)

Specifications

Capacitance[1] (F)	Vertical part number	Horizontal part number	Maximum initial ESR[1] (mΩ)	Continuous current[6] (A)	Peak current[5] (A)	Nominal leakage current[2] (µA)	Peak power[4] (W)	Stored energy[3] (mWh)	Short circuit current**[7] (A)
1.65	PTV-6R0V165-R	PTV-6R0H165-R	150	1.6	3.9	18	56	8.3	38
3.0	PTV-6R0V305-R	PTV-6R0H305-R	100	2.4	6.9	25	90	15	60
5.0	PTV-6R0V505-R	PTV-6R0H505-R	72	3.7	11.0	80	125	25	83

** Repeated short circuit current will permanently damage the leads.

Performance

Parameter	Capacitance change (% of initial value)	ESR (% of maximum initial value)
Lifetime: (1000 hours, maximum rated voltage, maximimum operating temperature)	≤ 30%	≤ 200%
Charge/Discharge Cycles[8]: (500,000 at +20 °C)	≤ 30%	≤ 200%
Storage: (3 years, uncharged, <+35 °C)	≤ 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) $= \frac{0.5 \times V^2 \times C}{3600} \times 1000$
4. Peak Power (W) $= \frac{V^2}{4 \times ESR}$
5. Pulse current for 1 second from full rate voltage to half voltage.(A) $= \frac{0.5 \times V \times C}{(1 + ESR \times C)}$
6. Continuous current with a 15 °C temperature rise. Continuous current (A) $= \sqrt{\frac{\Delta T}{ESR \times Rth}}$
7. Short circuit current is for safety information only. Do not use as operating current.
8. Cycling between rated voltage and half voltage, 3 second rest at +20 °C.
9. Voltage testing and verification of product under end application conditions is recommended

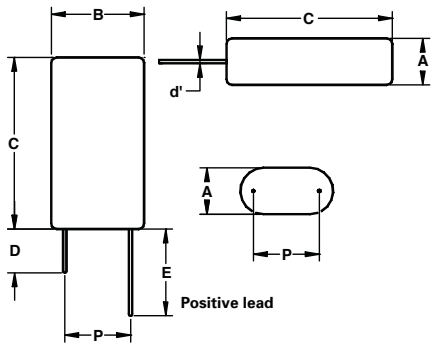
Safety and certifications

Agency information	UL recognized: File MH46887
Shock and vibration	MIL-STD 202G
Environmental compliance	RoHS, REACH, lead free, halogen free
Warnings	Do not overvolatgae, do not reverse polarity
Shipping	No restrictions, per UN3499 with all cells <10 watt-hours

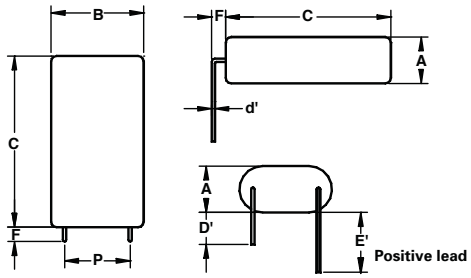
Dimensions- mm

Vertical part number	Horizontal part number	A	B	C	d'	D	D'	E	E'	F	P
PTV-6R0V165-R	PTV-6R0H165-R	9.0	17.3	22	0.5	20	15	25	20	2.0	11.8
PTV-6R0V305-R	PTV-6R0H305-R	11	21.3	23	0.6	20	15	25	20	2.0	5.3
PTV-6R0V505-R	PTV-6R0H505-R	11	21.3	32.5	0.6	20	15	25	20	2.0	5.3
Tolerances		**Maximum**			± 0.02	**Minimum**				± 0.5	

Vertical



Horizontal



Part numbering system

PTV		–6R0	V	30	5	-R
Type	Family code	Voltage (V) R = decimal	Configuration	Capacitance (µF) Value	Multiplier	Standard product
P = Pack	TV= Product family	6R0 = 6.0 V	V= Vertical H= Horizontal	Example 305= 30 x 10^5 µF or 3.0 F		

Packaging information

- Standard packaging: Bulk, 20 parts per box

Part marking

- Manufacturer
- Capacitance value (F)
- Working voltage (V)
- Family code or part number
- Polarity mark
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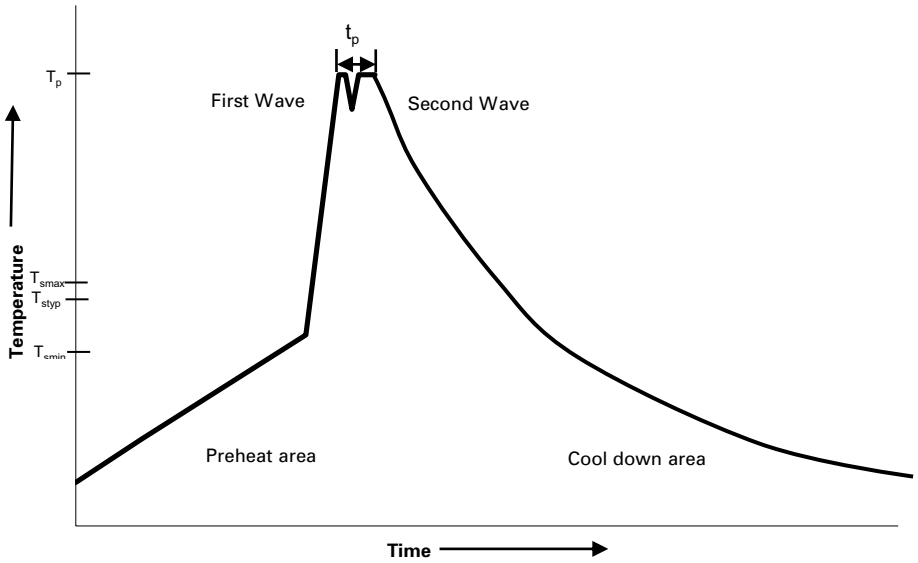
Wave solder profile



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

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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