

### Ratings

Capacitance	0.1 F to 3.0 F
Maximum working voltage	5.0 V
Surge voltage	5.5 V
Capacitance tolerance	-20% to +80% (+20 °C)
Operating temperature range	-40 °C to +60 °C
Extended temperature range	-40 °C to +85 °C (Maximum working voltage 3.9 V)

### Specifications

Capacitance (F)	Vertical part number	Horizontal part number	Nominal ESR ( $\Omega$ ) (Equivalent Series Resistance)		Nominal leakage current ( $\mu$ A) after 100 hours @ 5.0 V, +20 °C	Nominal dimensions (mm)	Typical mass (grams/piece)
			1 kHz	100 Hz			
0.1	PM-5ROV104-R	PM-5ROH104-R	2.0	2.0	3	5.5 x 10.8 x 12.5	1.1
0.47	PM-5ROV474-R	PM-5ROH474-R	0.42	0.50	8	8.5 x 16.8 x 14.0	2.4
1.0	PM-5ROV105-R	PM-5ROH105-R	0.15	0.20	10	8.5 x 16.8 x 21.5	3.5
1.5	PM-5ROV155-R	PM-5ROH155-R	0.07	0.10	15	10.5 x 20.8 x 22.5	5.4
3.0	PM-5ROV305-R	PM-5ROH305-R	0.05	0.07	20	10.5 x 20.8 x 32	7.8

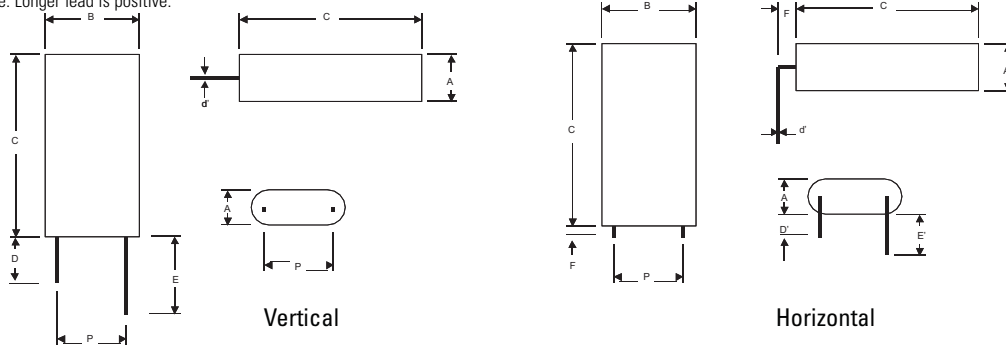
### Performance

Parameter	Capacitance change (% of initial value)	ESR (% of max. initial value)
Life (1000 hours @ +60 °C @ 5 Vdc)	$\leq 30\%$	$\leq 200\%$
Storage - Low and High Temperature (1000 hours @ -40 °C and +60 °C)	$\leq 30\%$	$\leq 200\%$

### Dimensions (mm)

Vertical part number	Horizontal part number	A	B	C	d'	D	D'	E	E'	F	P
PM-5ROV104-R	PM-5ROH104-R	6.0	11.3	13.0	0.5	20	15	25	20	2.0	7.3
PM-5ROV474-R	PM-5ROH474-R	9.0	17.3	14.5	0.5	2.0	15	25	20	2.0	11.8
PM-5ROV105-R	PM-5ROH105-R	9.0	17.3	22.0	0.5	20	15	25	20	2.0	11.8
PM-5ROV155-R	PM-5ROH155-R	11.0	21.3	23.0	0.6	20	15	25	20	2.0	5.3
PM-5ROV305-R	PM-5ROH305-R	11.0	21.3	32.5	0.6	20	15	25	20	2.0	5.3
<b>Tolerances</b>		<b>Maximum</b>			<b><math>\pm 0.02</math></b>	<b>Minimum</b>			<b><math>\pm 0.5</math></b>		

Note: Longer lead is positive.



### Part marking

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

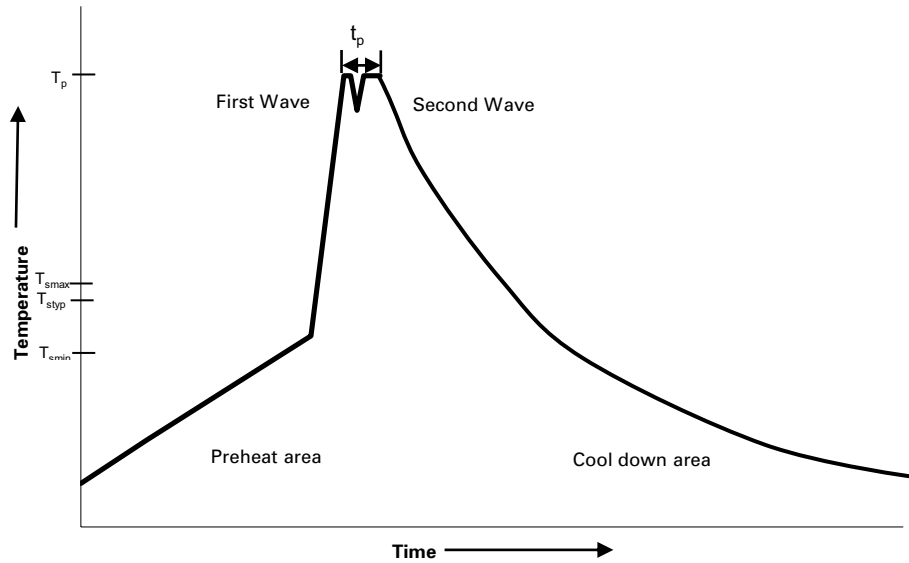
### Part numbering system

P	M	5	R	0	V	47	R
Family code		Voltage (V) R = Decimal	Configuration	Capacitance ( $\mu$ F)		Standard product	
				Value	Multiplier		
P = Pack	M = Version	5R0 = 5.0 V	V = Vertical H = Horizontal	Example: 474 = 47 x 10 <sup>4</sup> $\mu$ F or 0.47F			

### Packaging information

- Standard packaging: Bulk, 100 units per package
- Large, bulk packages available on request

**Wave solder profile**



Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and soak	• Temperature max. ( $T_{smax}$ ) • Time max.	100 °C 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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