

# KR Supercapacitors

## Coin cells



### Features and benefits

- High specific capacitance
- Low leakage current
- Long cycle life
- Eco-friendly

### Applications

- Computers and peripherals
- Network switches and routers
- Utility meters
- HVAC Controls
- Appliances and white goods
- Real-time clock backup
- Office equipment

### Description

Eaton supercapacitors are high reliability, high power, ultra-high capacitance energy storage devices utilizing electrochemical 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.



*Powering Business Worldwide*

## Specifications

|                                      |                                                            |
|--------------------------------------|------------------------------------------------------------|
| Capacitance                          | 0.1 F to 1.5 F                                             |
| Maximum working voltage              | 5.5 V                                                      |
| Surge voltage                        | 6.3 V                                                      |
| Capacitance tolerance                | -20% to +80% +20 °C                                        |
| Operating temperature range          | -25 °C to +70 °C                                           |
| Extended operating temperature range | -25 °C to +85 °C (with voltage derating to 3.6 V @ +85 °C) |

## Standard Product

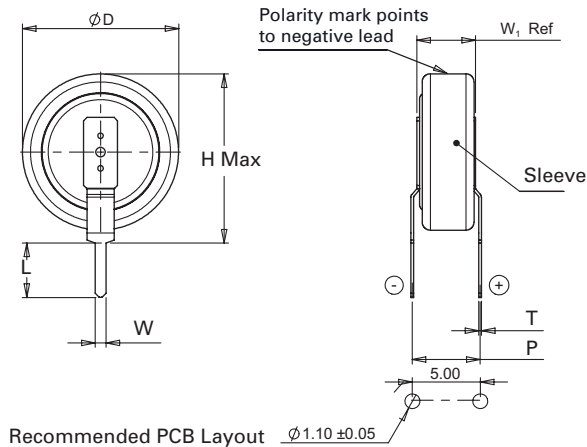
| Capacitance (F) | Part number   | Type        | Lead length | Max. initial DC ESR ( $\Omega$ ) (Equivalent Series Resistance) measured @ 1kHz | Typical mass (g) |
|-----------------|---------------|-------------|-------------|---------------------------------------------------------------------------------|------------------|
| 0.1             | KR-5R5V104-R  | Vertical    | Standard    | 75                                                                              | 1.4              |
| 0.1             | KR-5R5H104-R  | Horizontal  | Standard    | 75                                                                              | 1.4              |
| 0.1             | KR-5R5C104-R  | Cylindrical | Standard    | 75                                                                              | 3.3              |
| 0.1             | KR-5R5C104H-R | Cylindrical | Short       | 75                                                                              | 3.3              |
| 0.22            | KR-5R5V224-R  | Vertical    | Standard    | 75                                                                              | 1.4              |
| 0.22            | KR-5R5H224-R  | Horizontal  | Standard    | 75                                                                              | 1.4              |
| 0.22            | KR-5R5C224-R  | Cylindrical | Standard    | 75                                                                              | 3.3              |
| 0.22            | KR-5R5C224H-R | Cylindrical | Short       | 75                                                                              | 3.3              |
| 0.33            | KR-5R5V334-R  | Vertical    | Standard    | 50                                                                              | 1.4              |
| 0.33            | KR-5R5H334-R  | Horizontal  | Standard    | 50                                                                              | 1.4              |
| 0.33            | KR-5R5C334-R  | Cylindrical | Standard    | 50                                                                              | 3.3              |
| 0.33            | KR-5R5C334H-R | Cylindrical | Short       | 50                                                                              | 3.3              |
| 0.47            | KR-5R5V474-R  | Vertical    | Standard    | 50                                                                              | 1.4              |
| 0.47            | KR-5R5H474-R  | Horizontal  | Standard    | 50                                                                              | 1.4              |
| 0.47            | KR-5R5C474-R  | Cylindrical | Standard    | 50                                                                              | 3.3              |
| 0.47            | KR-5R5C474H-R | Cylindrical | Short       | 50                                                                              | 3.3              |
| 1.0             | KR-5R5V105-R  | Vertical    | Standard    | 30                                                                              | 4.2              |
| 1.0             | KR-5R5H105-R  | Horizontal  | Standard    | 30                                                                              | 4.2              |
| 1.0             | KR-5R5C105-R  | Cylindrical | Standard    | 30                                                                              | 9.1              |
| 1.0             | KR-5R5C105H-R | Cylindrical | Short       | 30                                                                              | 9.1              |
| 1.5             | KR-5R5V155-R  | Vertical    | Standard    | 30                                                                              | 4.2              |
| 1.5             | KR-5R5H155-R  | Horizontal  | Standard    | 30                                                                              | 4.2              |
| 1.5             | KR-5R5C155-R  | Cylindrical | Standard    | 30                                                                              | 9.1              |
| 1.5             | KR-5R5C155H-R | Cylindrical | Short       | 30                                                                              | 9.1              |

## Performance

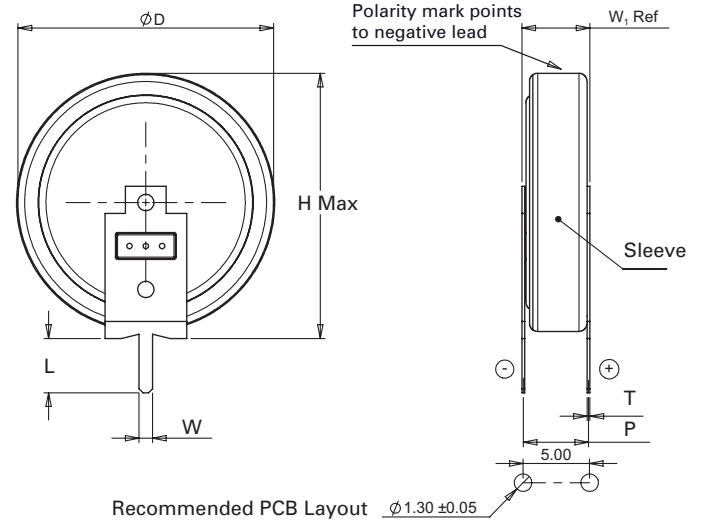
| Parameter                                   | Capacitance Change (% of initial value) | ESR (% of max. initial value) |
|---------------------------------------------|-----------------------------------------|-------------------------------|
| Life — +70 °C @ 5.5 Vdc, 1000 hours         | ≤ 30%                                   | ≤ 400%                        |
| Life — +85 °C @ 3.6 Vdc, 2000 hours         | ≤ 30%                                   | ≤ 400%                        |
| Storage Life — -25 °C to +70 °C, 1000 hours | ≤ 30%                                   | ≤ 400%                        |

Dimensions (mm)

KR-5R5V104/224/334/474-R

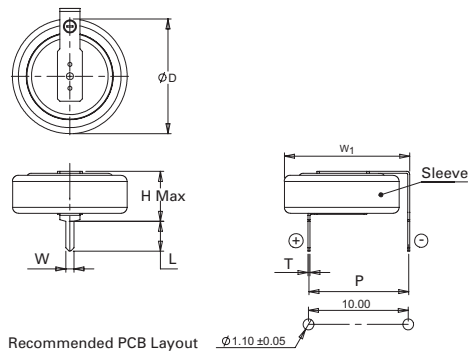


R-5R5V105/155-R

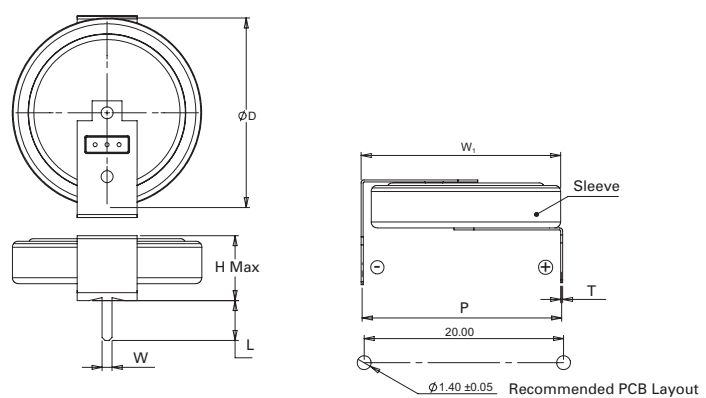


| Part Number  | $\phi D \pm 0.2$ | H Max | $L \pm 0.1$ | $P \pm 0.3$ | T   | $W \pm 0.1$ | $W_1$ Ref. |
|--------------|------------------|-------|-------------|-------------|-----|-------------|------------|
| KR-5R5V104-R | 11.5             | 12.7  | 4.0         | 5.0         | 0.2 | 0.8         | 4.3        |
| KR-5R5V224-R | 11.5             | 12.7  | 4.0         | 5.0         | 0.2 | 0.8         | 4.3        |
| KR-5R5V334-R | 11.5             | 12.7  | 4.0         | 5.0         | 0.2 | 0.8         | 4.3        |
| KR-5R5V474-R | 11.5             | 12.7  | 4.0         | 5.0         | 0.2 | 0.8         | 4.3        |
| KR-5R5V105-R | 19.0             | 19.7  | 4.0         | 5.0         | 0.2 | 1.0         | 5.0        |
| KR-5R5V155-R | 19.0             | 19.7  | 4.0         | 5.0         | 0.2 | 1.0         | 5.0        |

KR-5R5H104/224/334/474-R



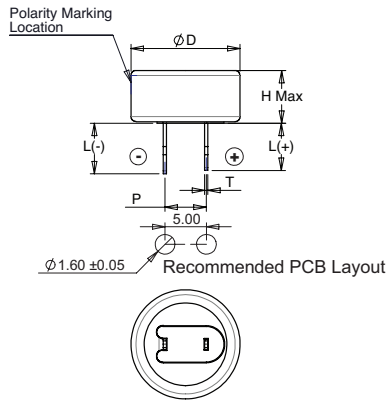
KR-5R5H105/155-R



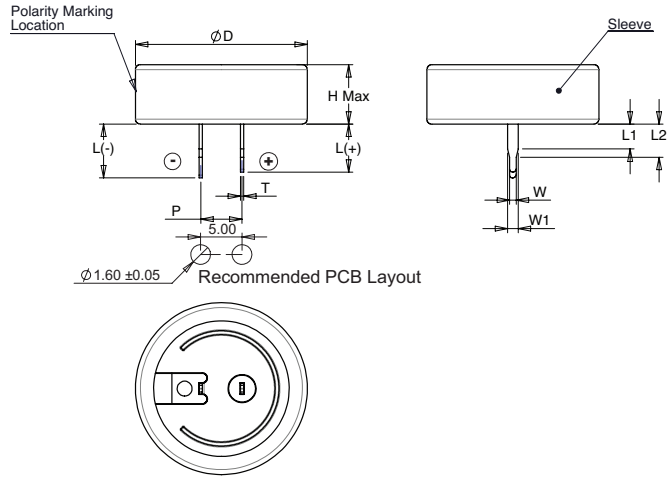
| Part Number  | $\phi D \pm 0.2$ | H Max | $L \pm 0.1$ | P              | T   | $W \pm 0.1$ | $W_1 \pm 0.5$ |
|--------------|------------------|-------|-------------|----------------|-----|-------------|---------------|
| KR-5R5H104-R | 11.5             | 5.2   | 3.0         | $10.0 \pm 0.3$ | 0.2 | 0.8         | 12.4          |
| KR-5R5H224-R | 11.5             | 5.2   | 3.0         | $10.0 \pm 0.3$ | 0.2 | 0.8         | 12.4          |
| KR-5R5H334-R | 11.5             | 5.2   | 3.0         | $10.0 \pm 0.3$ | 0.2 | 0.8         | 12.4          |
| KR-5R5H474-R | 11.5             | 5.2   | 3.0         | $10.0 \pm 0.3$ | 0.2 | 0.8         | 12.4          |
| KR-5R5H105-R | 19.0             | 6.7   | 4.0         | $20.0 \pm 0.5$ | 0.2 | 1.0         | 20.0          |
| KR-5R5H155-R | 19.0             | 6.7   | 4.0         | $20.0 \pm 0.5$ | 0.2 | 1.0         | 20.0          |

## Dimensions (mm)

KR-5R5C104/224/334/474-R



KR-5R5C105/155-R



## C Type (cylindrical)

| Part Number   | Ø D<br>Max | H<br>Max | L (-)<br>±0.2 | L (+)<br>±0.2 | P<br>±0.3 | T<br>±0.05 | L1<br>±0.10 | L2<br>±0.10 | W<br>±0.06 | W1<br>±0.06 |
|---------------|------------|----------|---------------|---------------|-----------|------------|-------------|-------------|------------|-------------|
| KR-5R5C104-R  | 13.5       | 6.5      | 6.1           | 5.7           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C104H-R | 13.5       | 6.5      | 3.3           | 3.3           | 5.0       | 0.4        | 0.9         | 1.9         | 0.8        | 1.3         |
| KR-5R5C224-R  | 13.5       | 6.5      | 6.1           | 5.7           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C224H-R | 13.5       | 6.5      | 3.3           | 3.3           | 5.0       | 0.4        | 0.9         | 1.9         | 0.8        | 1.3         |
| KR-5R5C334-R  | 13.5       | 6.5      | 6.1           | 5.7           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C334H-R | 13.5       | 6.5      | 3.3           | 3.3           | 5.0       | 0.4        | 0.9         | 1.9         | 0.8        | 1.3         |
| KR-5R5C474-R  | 13.5       | 6.5      | 6.1           | 5.7           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C474H-R | 13.5       | 6.5      | 3.3           | 3.3           | 5.0       | 0.4        | 0.9         | 1.9         | 0.8        | 1.3         |
| KR-5R5C105-R  | 21.5       | 7.1      | 6.5           | 5.8           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C105H-R | 21.5       | 7.1      | 3.3           | 3.3           | 5.0       | 0.4        | 0.8         | 1.8         | 0.8        | 1.3         |
| KR-5R5C155-R  | 21.5       | 7.1      | 6.5           | 5.8           | 5.0       | 0.4        | 3.0         | 4.0         | 0.8        | 1.3         |
| KR-5R5C155H-R | 21.5       | 7.1      | 3.3           | 3.3           | 5.0       | 0.4        | 0.8         | 1.8         | 0.8        | 1.3         |

## Part numbering system

| KR          | — | 5                          | R                                               | 5                                    | □          | □                 | □              | □ | H* | -R |
|-------------|---|----------------------------|-------------------------------------------------|--------------------------------------|------------|-------------------|----------------|---|----|----|
| Family Code |   | Voltage (V)<br>R = Decimal | Configuration                                   | Capacitance (µF)                     |            | Short lead length | RoHS Compliant |   |    |    |
|             |   |                            |                                                 | Value                                | Multiplier |                   |                |   |    |    |
|             |   | 5R5 = 5.5 V                | V = Vertical<br>H = Horizontal<br>C=Cylindrical | Example: 474 = 47 x 104 µF or 0.47 F |            |                   |                |   |    |    |

\* Applies to cylindrical part numbers only. If ordering vertical or horizontal types, or standard lead length on cylindrical type, omit "H" from part number.

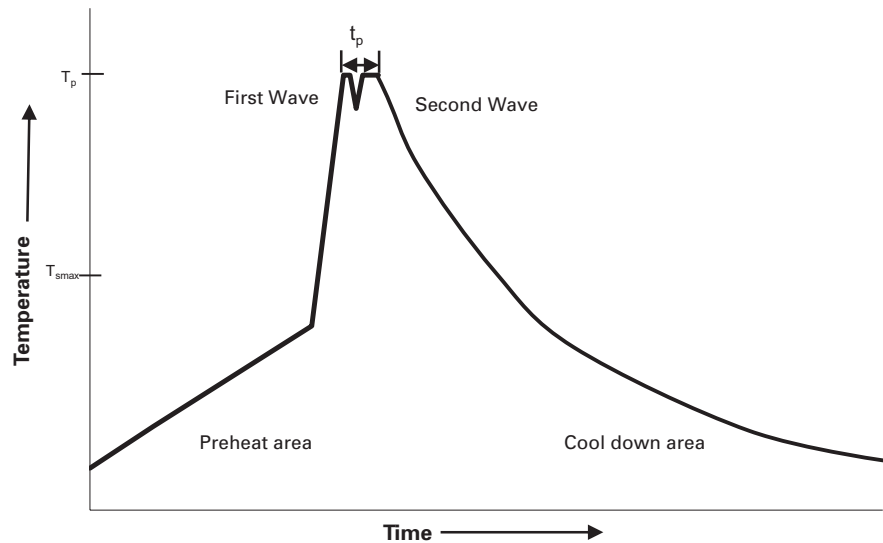
## Packaging information

- Standard packaging: 500 pieces per package
- For 0.1 F to 0.47 F, 500 pieces per bag
- For 1.0 F to 1.5 F, 100 pieces per tray, 5 trays per box

## Part marking

- Manufacturer
- Capacitance (F)
- Max operating voltage (V)
- Polarity

## 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 ( $T_p$ )*         | 235 °C – 260 °C                           | 250 °C – 260 °C                           |
| Time at peak temperature ( $t_p$ )  | 10 seconds max<br>5 seconds max each wave | 10 seconds max<br>5 seconds max each wave |
| Ramp-down rate                      | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max |
| Time 25 °C to 25 °C                 | 4 minutes                                 | 4 minutes                                 |

## Manual solder

Do not touch the supercapacitor's external sleeve with the soldering rod or the sleeve will melt or crack. The recommended temperature of the soldering rod tip is less than 260 °C (maximum: 350 °C) and the soldering duration should be less than 5 seconds. Minimize the time that the soldering iron is in direct contact with the terminals of the supercapacitor as excessive heating of the leads may lead to higher equivalent series resistance (ESR).

## 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  
[www.eaton.com/electronics](http://www.eaton.com/electronics)

© 2016 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. 4327  
September 2016



**Стандарт  
Электрон  
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331