## Specifications[1]

| | |
|---|---|
| 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[2] | -25 °C to +70 °C |
| Extended operating temperature range[2] | -25 °C to +85 °C (with voltage derating to 3.6 V @ +85 °C) |

## Standard Product

| Capacitance (F) | Part number | Type | Lead length | Maximum initial ESR (Ω) (Equivalent series resistance) measured @ 1 kHz | 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

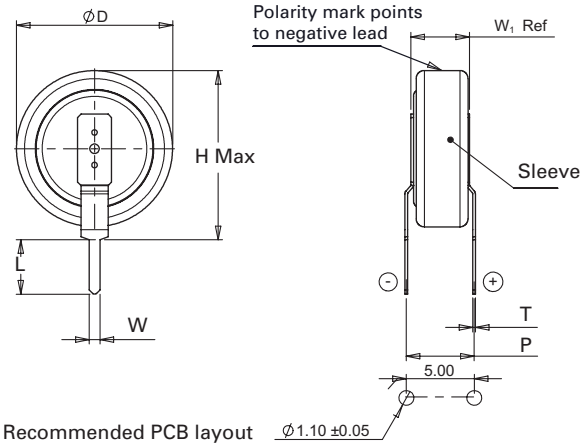
| Parameter | Capacitance change (% of initial value) | ESR (% of maximum initial value) |
|---|---|---|
| Life — +70 °C @ 5.5 Vdc, 1000 hours | ≤ 30% | ≤ 400% |
| Life — +85 °C @ 3.6 Vdc, 2000 hours | ≤ 30% | ≤ 400% |
| Storage Life — -25 °C to +70 °C, 1000 hours | ≤ 30% | ≤ 400% |

1. Testing and verification of product under end application conditions is recommended
2. Not recommended for +85 °C/85% RH applications

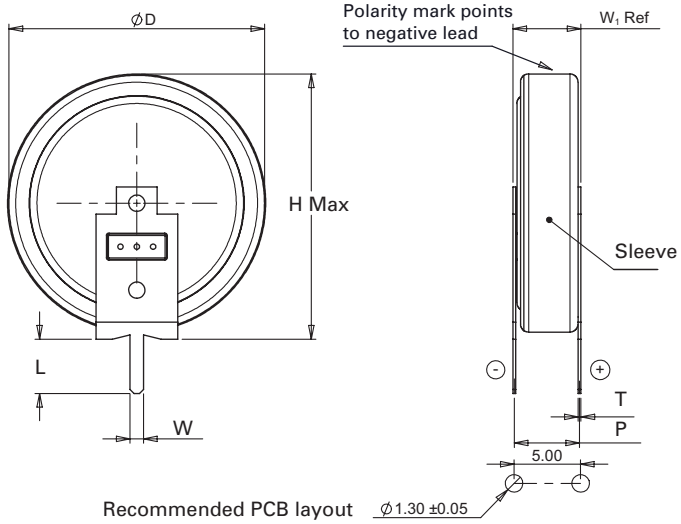
## Dimensions (mm)

### V Type (Vertical)

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



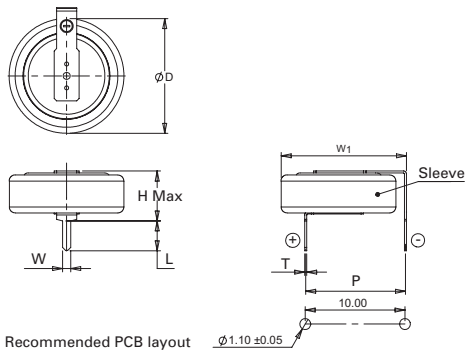

R-5R5V105/155-R



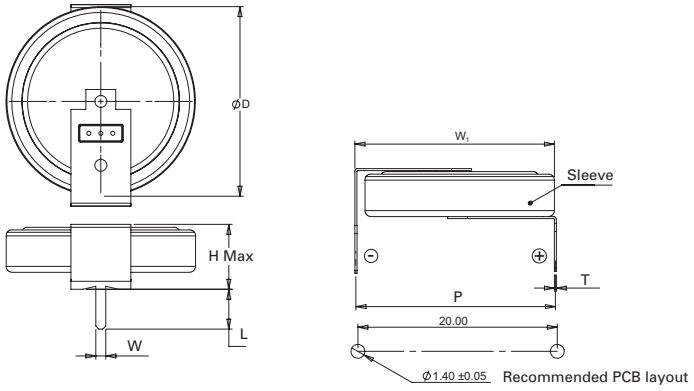

| Part Number | Ø D ±0.2 | H Max | L ±0.1 | P ±0.3 | T | W±0.1 | W1 Ref. |
|---|---|---|---|---|---|---|---|
| KR-5R5V104-R | 11.5 | 12.7 | 4.0 | 5.0 | 0.2 | 0.8 | 4.3 |
| KR-5R5V224-R | 11.5 | 12.7 | 4.0 | 5.0 | 0.2 | 0.8 | 4.3 |
| KR-5R5V334-R | 11.5 | 12.7 | 4.0 | 5.0 | 0.2 | 0.8 | 4.3 |
| KR-5R5V474-R | 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 |

### H Type (Horizontal)

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




KR-5R5H105/155-R

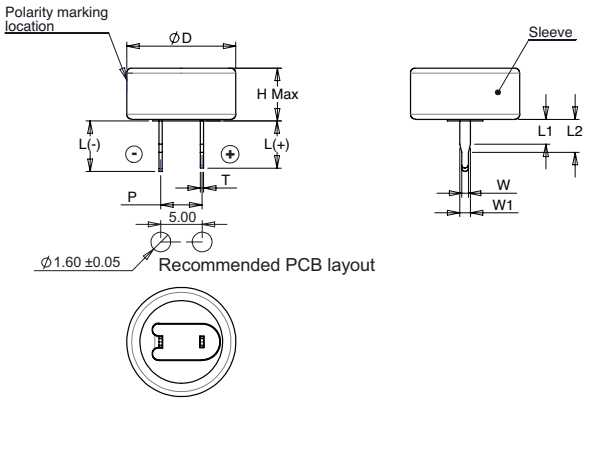



| Part Number | Ø D ±0.2 | H Max | L ±0.1 | P | T | W±0.1 | W1 ±0.5. |
|---|---|---|---|---|---|---|---|
| KR-5R5H104-R | 11.5 | 5.2 | 3.0 | 10.0±0.3 | 0.2 | 0.8 | 12.4 |
| KR-5R5H224-R | 11.5 | 5.2 | 3.0 | 10.0±0.3 | 0.2 | 0.8 | 12.4 |
| KR-5R5H334-R | 11.5 | 5.2 | 3.0 | 10.0±0.3 | 0.2 | 0.8 | 12.4 |
| KR-5R5H474-R | 11.5 | 5.2 | 3.0 | 10.0±0.3 | 0.2 | 0.8 | 12.4 |
| KR-5R5H105-R | 19.0 | 6.7 | 4.0 | 20.0±0.5 | 0.2 | 1.0 | 20.0 |
| KR-5R5H155-R | 19.0 | 6.7 | 4.0 | 20.0±0.5 | 0.2 | 1.0 | 20.0 |

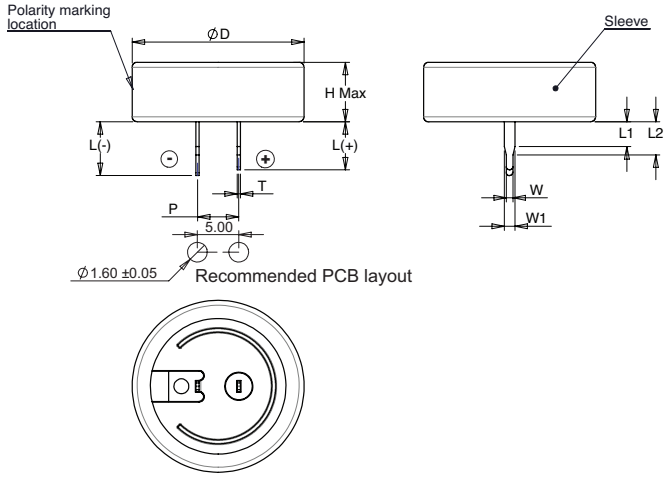
## Dimensions (mm)

### C Type (cylindrical)

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




KR-5R5C105/155-R




| Part Number | Ø D Max | H Max | L (-) ±0.2 | L (+) ±0.2 | P ±0.3 | T ±0.05 | L1 ±0.10 | L2 ±0.10 | W ±0.06 | W1 ±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 point | | | Configuration | Capacitance (µF) | | | Short lead length | Standard product |
| | | | | | | Value | | Multiplier | | |
| | | 5R5 = 5.5 V | | | V = Vertical<br>H = Horizontal<br>C=Cylindrical | Example: 474 = 47 x $10^4$ 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.

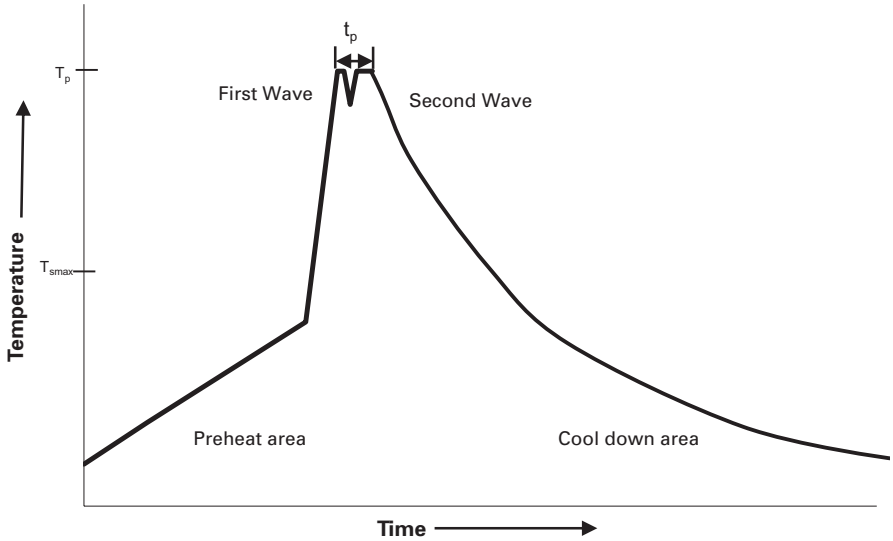
## Packaging information

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

## Part marking

- Manufacturer
- Capacitance (F)
- Maximum 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 |
| Δ preheat to max temperature | | 160 °C max. | 160 °C max. |
| Peak temperature (Tp)* | | 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.



**Eaton**
**Electronics Division**
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics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