



# Datasheet

## Switching Spark Gap (SSG)

|                 |                                |
|-----------------|--------------------------------|
| Series / Models | 2RK-8 Series                   |
| Product Code    | 10.12.84.XXXX<br>10.12.85.XXXX |
| Version         | A3                             |
| Date            | 2026-03-02                     |
| File Number     | SP-SSG-004                     |

# Switching Spark Gap (SSG)

2RK-8 Series

## Version History

| Version | Date       | Page         | Description                                                                        | Author    |
|---------|------------|--------------|------------------------------------------------------------------------------------|-----------|
| A0      | 2016-06-25 | /            | Initial draft                                                                      | George Hu |
| A1      | 2023-02-07 | Page 4,5     | Update Electrical Characteristics                                                  | George Hu |
| A2      | 2025-06-13 | Page 1,2,3,4 | 1. Add cover and version history<br>2. Update Description<br>3. Delete some models | Xia Wu    |
| A3      | 2026-03-02 | All          | Update file number                                                                 | Xia Wu    |

## Switching Spark Gap (SSG)

## 2RK-8 Series

### Description

The principle of gas discharge is used not only for overvoltage protection but also in switching applications. Ignition performance is determined to a large degree by the properties of the switching component. An extremely fast switch is called for, which operates virtually without loss and with high insulation resistance in the non-conducting state. It should also be as compact as possible, rugged, highly reliable, and capable of operating over a wide temperature range.

The 2RK-8 series switching spark gap (SSG) is a device that offers axial leads or surface mount packaging. It is not only small in size and easy to install on various compact printed circuit boards (PCBs), but also has excellent performance. Unlike gas discharge tubes, switching spark gaps (SSGs) are active components that work reliably even after igniting hundreds of thousands of times. They can be used in all applications where high voltage pulses are generated, for example to ignite modern high-pressure gas discharge lamps such as xenon lamps in automotive headlights.



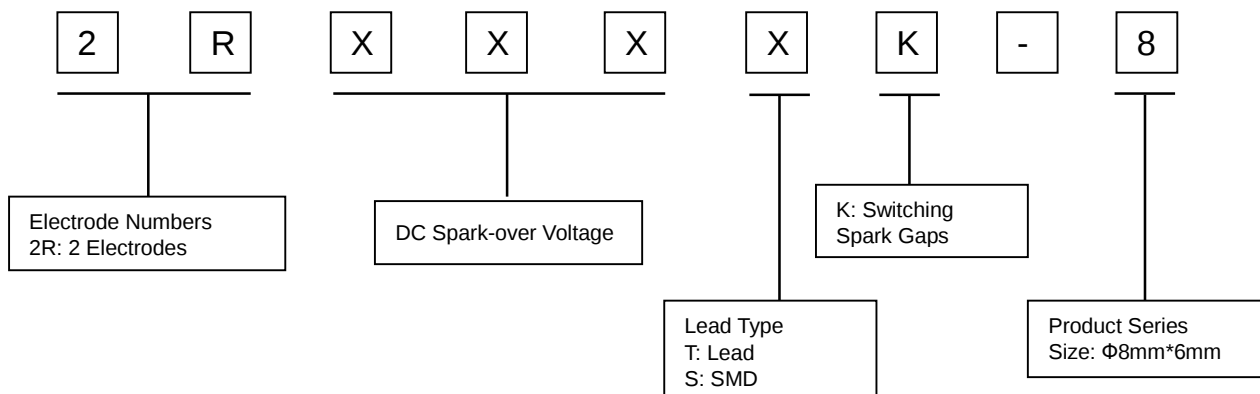
### Features

- I Extremely long life time
- I Stable performance over life
- I Insensitive performance against variations in temperature
- I Low switching losses
- I Very short breakdown time
- I High reliability by robust design
- I Non-Radioactive

### Applications

- I Igniters for architectural and automotive Xenon discharge lamps
- I Electronic igniters for gas heating and gas domestic appliances, e.g., cookers
- I Ignition of ultra-high pressure gas discharge lamps for data and video projectors

### Part Number Code



## Switching Spark Gap (SSG)

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## Electrical Characteristics

| Part Number                                                   | 2R230TK-8<br>2R230SK-8 | 2R300TK-8<br>2R300SK-8 | 2R350TK-8<br>2R350SK-8 | 2R400TK-8<br>2R400SK-8 | Units         |
|---------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|---------------|
| Initial Values                                                |                        |                        |                        |                        |               |
| Static Breakdown Voltage V <sub>S</sub> @100V/S <sup>1)</sup> |                        |                        |                        |                        |               |
| First ignition Value after 24 hours in darkness               | <275                   | <360                   | <420                   | <470                   | V             |
| Following Ignition Values                                     | 207~253                | 270~330                | 315~385                | 360~440                | V             |
| Electrical Life Time                                          |                        |                        |                        |                        |               |
| Breakdown Voltage V <sub>B</sub> <sup>2)</sup>                |                        |                        |                        |                        |               |
| First ignition Value after 24 hours in darkness               | <285                   | <370                   | <435                   | <500                   | V             |
| Following Ignition Values                                     | 196~265                | 255~350                | 300~405                | 340~460                | V             |
| Switching Operations @ +25°C                                  | 2×10 <sup>5</sup>      | 2×10 <sup>5</sup>      | 2×10 <sup>5</sup>      | 2×10 <sup>5</sup>      | Ignitions     |
| Breakdown Time                                                | <50                    | <50                    | <50                    | <50                    | ns            |
| Maximum Switching Frequency                                   | 100                    | 200                    | 200                    | 200                    | Hz            |
| Test Circuit Parameters                                       |                        |                        |                        |                        |               |
| Open Circuit Voltage V <sub>0</sub>                           | 230 V <sub>AC</sub>    | 400                    | 450                    | 520                    | V             |
| Loading Resistance R                                          | 15                     | 10                     | 10                     | 10                     | KΩ            |
| Discharge Capacitance C                                       | 2200                   | 680                    | 680                    | 680                    | nF            |
| Inductance L                                                  | 10                     | 0.5                    | 0.5                    | 0.5                    | μH            |
| Discharge Peak Current I <sub>P</sub>                         | ~300                   | ~500                   | ~500                   | ~500                   | A             |
| Insulation Resistance @100 V                                  | >10 <sup>8</sup>       | >10 <sup>8</sup>       | >10 <sup>8</sup>       | >10 <sup>8</sup>       | Ω             |
| Capacitance @1MHz                                             | <1.5                   | <1.5                   | <1.5                   | <1.5                   | pF            |
| Weight                                                        | DIP                    | ~1.50                  | ~1.50                  | ~1.50                  | g             |
|                                                               | SMD                    | ~1.25                  | ~1.25                  | ~1.25                  | g             |
| Operation and storage temperature                             |                        | -40~+125               | -40~+125               | -40~+125               | °C            |
| Climatic category (IEC60068-1)                                |                        | 40/125/21              | 40/125/21              | 40/125/21              |               |
| Marking, red negative                                         |                        | RUILON 230K Y          | RUILON 300K Y          | RUILON 350K Y          | RUILON 400K Y |
| Surface treatment                                             | DIP                    | Nickel Plated          |                        |                        |               |
|                                                               | SMD                    | Matte-tin plated       |                        |                        |               |
| Moisture sensitivity level <sup>3)</sup>                      |                        | 1                      |                        |                        |               |

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| Part Number                                          | 2R470TK-8<br>2R470SK-8 | 2R500TK-8<br>2R500SK-8 | 2R600TK-8<br>2R600SK-8 | 2R800TK-8<br>2R800SK-8 | Units     |
|------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|-----------|
| Initial Values                                       |                        |                        |                        |                        |           |
| Static Breakdown Voltage $V_S$ @100V/S <sup>1)</sup> |                        |                        |                        |                        |           |
| First ignition Value after 24 hours in darkness      | <560                   | <600                   | <720                   | <950                   | V         |
| Following Ignition Values                            | 423~517                | 450~550                | 540~660                | 720~880                | V         |
| Electrical Life Time                                 |                        |                        |                        |                        |           |
| Breakdown Voltage $V_B$ <sup>2)</sup>                |                        |                        |                        |                        |           |
| First ignition Value after 24 hours in darkness      | <585                   | <625                   | <750                   | <1000                  | V         |
| Following Ignition Values                            | 400~540                | 425~575                | 510~690                | 680~920                | V         |
| Switching Operations @ +25°C                         | $2 \times 10^5$        | $2 \times 10^5$        | $2 \times 10^5$        | $2 \times 10^5$        | Ignitions |
| Breakdown Time                                       | <50                    | <50                    | <50                    | <50                    | ns        |
| Maximum Switching Frequency                          | 200                    | 200                    | 200                    | 200                    | Hz        |
| Test Circuit Parameters                              |                        |                        |                        |                        |           |
| Open Circuit Voltage $V_0$                           | 600                    | 630                    | 750                    | 1000                   | V         |
| Loading Resistance R                                 | 10                     | 13                     | 13                     | 68                     | KΩ        |
| Discharge Capacitance C                              | 680                    | 470                    | 470                    | 100                    | nF        |
| Inductance L                                         | 0.5                    | 0.1                    | 0.1                    | 0.5                    | μH        |
| Discharge Peak Current $I_P$                         | ~500                   | ~600                   | ~600                   | ~400                   | A         |
| Insulation Resistance @100 V                         | >10 <sup>8</sup>       | >10 <sup>8</sup>       | >10 <sup>8</sup>       | >10 <sup>8</sup>       | Ω         |
| Capacitance @1MHz                                    | <1.5                   | <1.5                   | <1.5                   | <1.5                   | pF        |
| Weight                                               | DIP                    | ~1.50                  | ~1.50                  | ~1.50                  | g         |
|                                                      | SMD                    | ~1.25                  | ~1.25                  | ~1.25                  | g         |
| Operation and storage temperature                    |                        |                        |                        |                        |           |
| Climatic category (IEC60068-1)                       |                        |                        |                        |                        |           |
| Marking, red negative                                |                        |                        |                        |                        |           |
| Surface treatment                                    |                        |                        |                        |                        |           |
| Moisture sensitivity level <sup>3)</sup>             |                        |                        |                        |                        |           |

<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859.

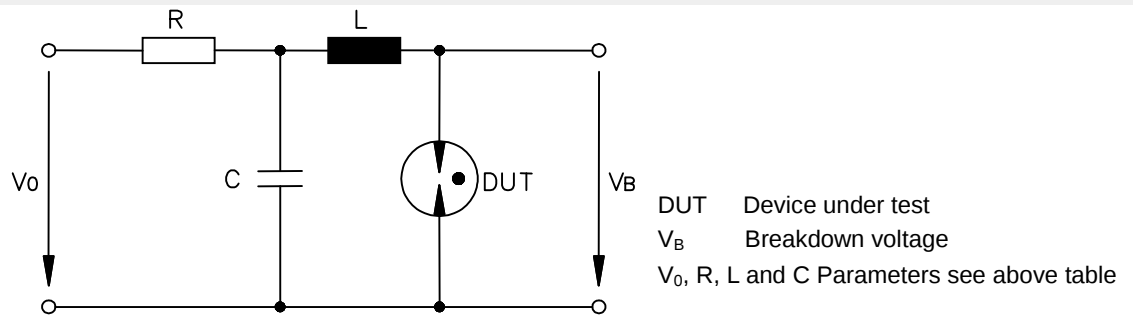
<sup>2)</sup> Fig. 1.

<sup>3)</sup> Tests according to JEDEC J-STD-020.

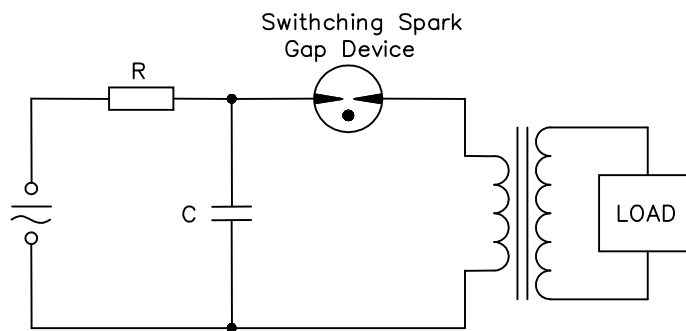
## Switching Spark Gap (SSG)

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Test Circuit Fig. 1

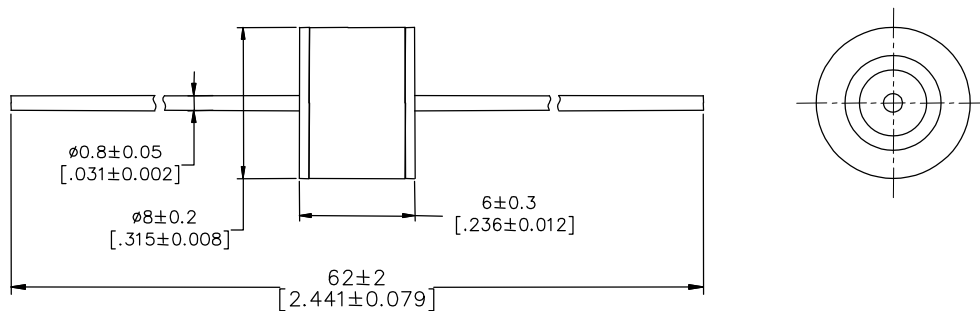


Basic Application Circuit Fig. 2

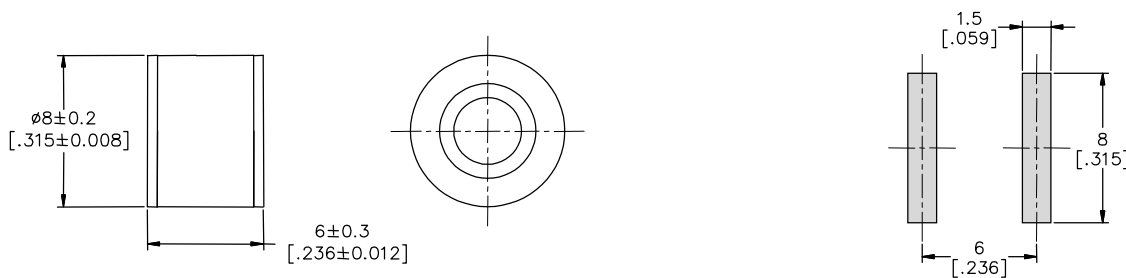


### Dimensions (Unit: mm/inch)

#### DIP axial leads series (2RxxxTK-8)



#### SMD Series (2RxxxSK-8)



#### Recommended Soldering Pad Layout

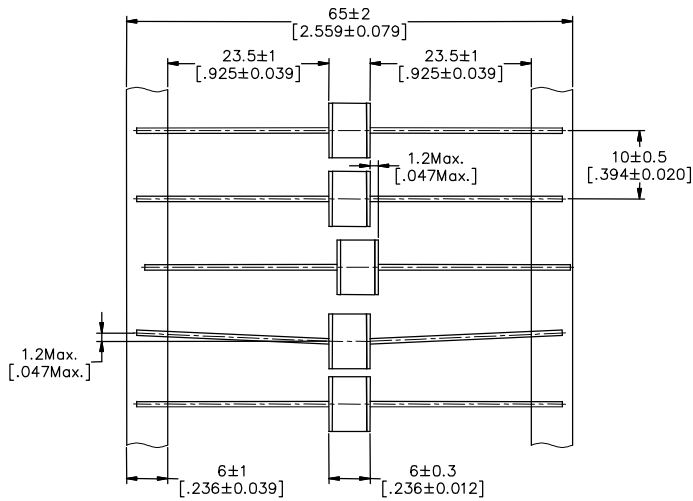
# Switching Spark Gap (SSG)

## 2RK-8 Series

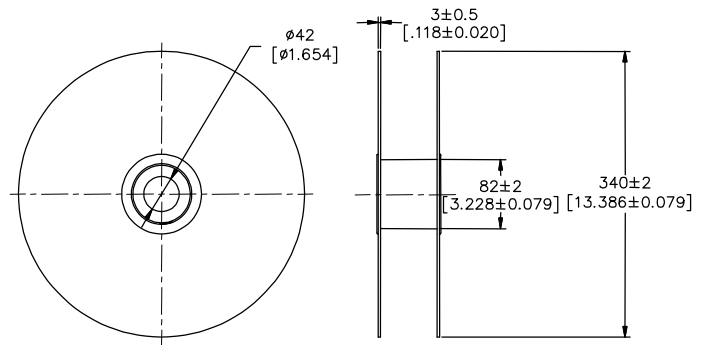
### Packaging Information (Unit: mm/inch)

#### DIP axial leads series packaging (Default packaging)

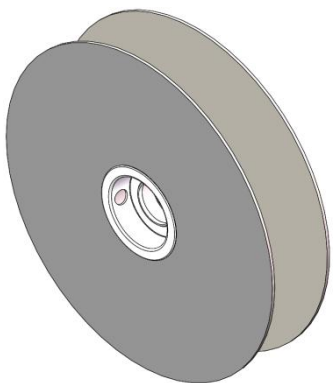
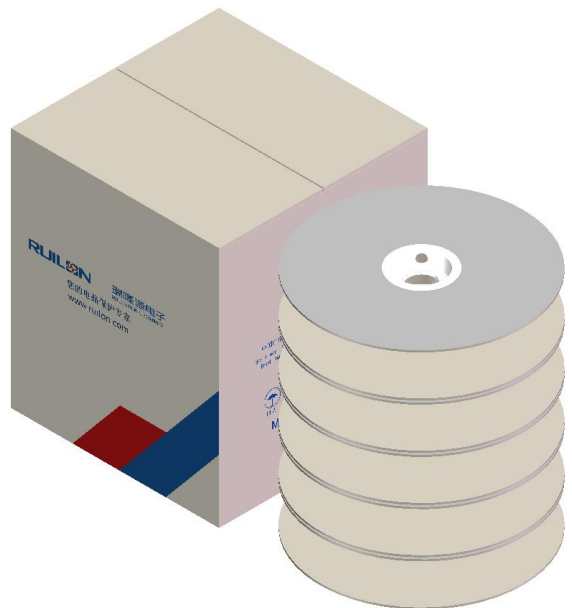
##### Tape



##### Reel



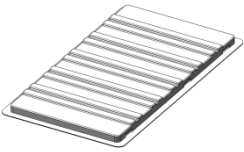
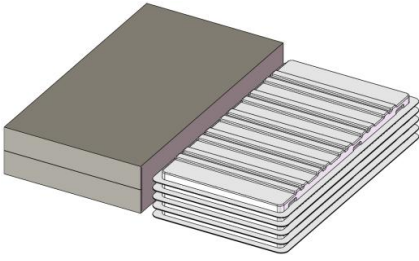
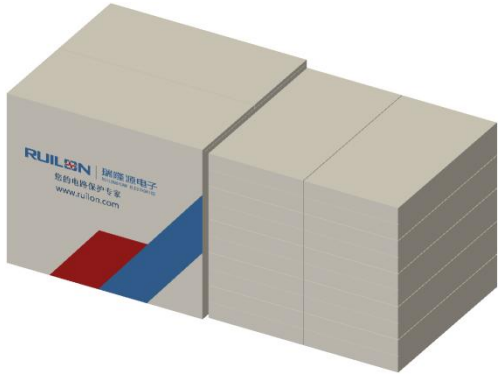
According to IEC 60286-1

|          | Reel                                                                                | Carton                                                                               |
|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Size     | 340×78mm                                                                            | 350×350×407mm                                                                        |
| Quantity | MPQ/MOQ: 1 reel=800pcs                                                              | 1 Carton=5 reels =4,000pcs                                                           |
| Photos   |  |  |

# Switching Spark Gap (SSG)

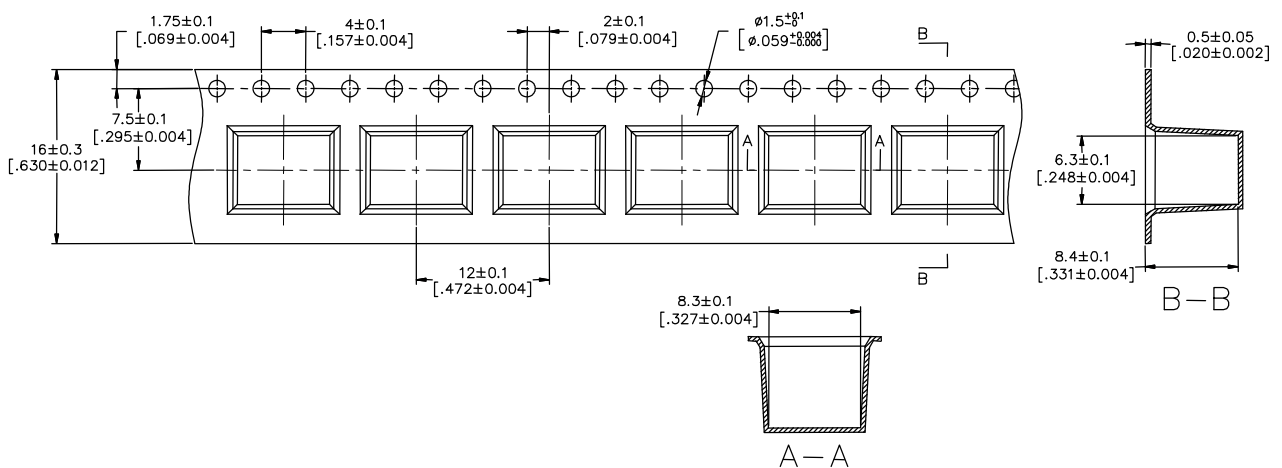
## 2RK-8 Series

### DIP axial leads series packaging (Bulk)

|          | PVC tray                                                                          | Inner Box                                                                         | Carton                                                                              |
|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Size     | 265×148×10mm                                                                      | 275×150×50mm                                                                      | 315×290×272mm                                                                       |
| Quantity | MPQ: 1 tray=100pcs                                                                | MOQ: 1 Inner Box=5 trays=500pcs                                                   | 1 Carton=10 Inner boxes=5,000pcs                                                    |
| Photos   |  |  |  |

### SMD Packaging (Tape & Reel)

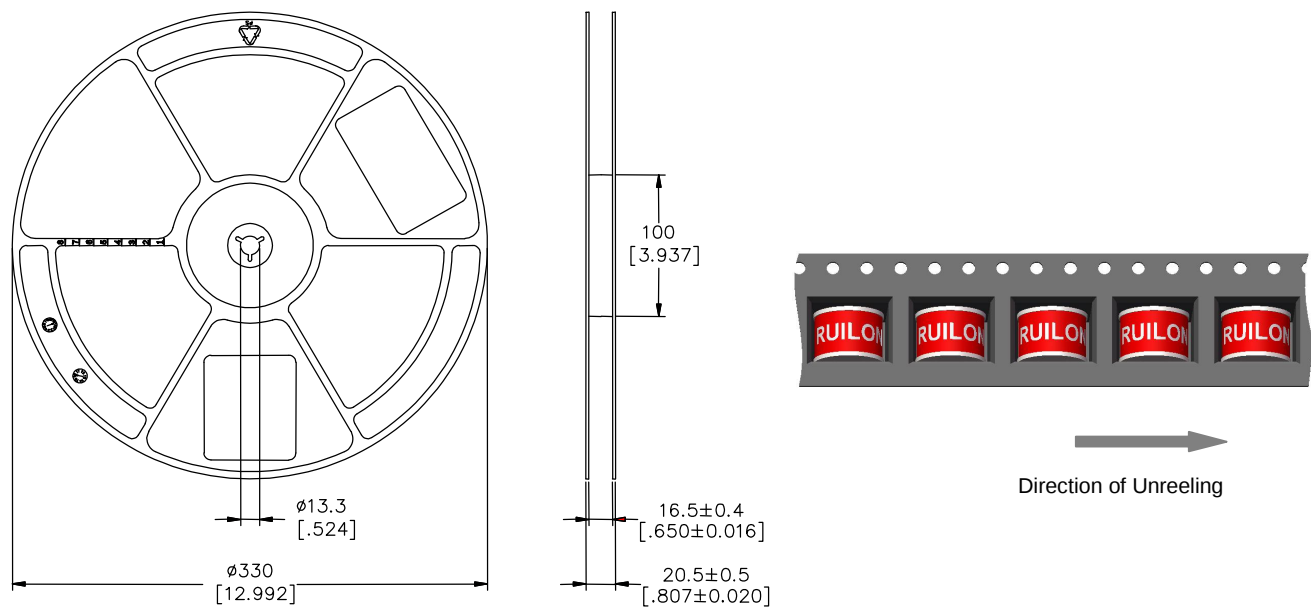
#### Tape

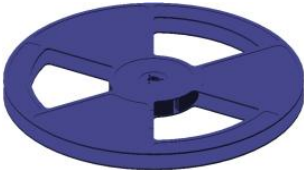
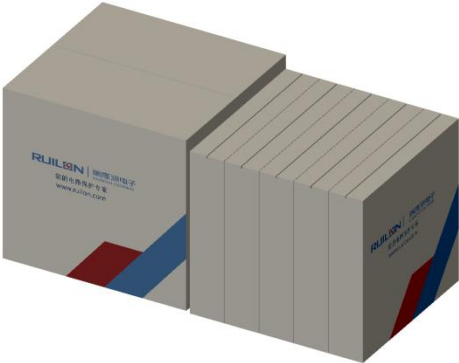


Switching Spark Gap (SSG)

2RK-8 Series

Reel

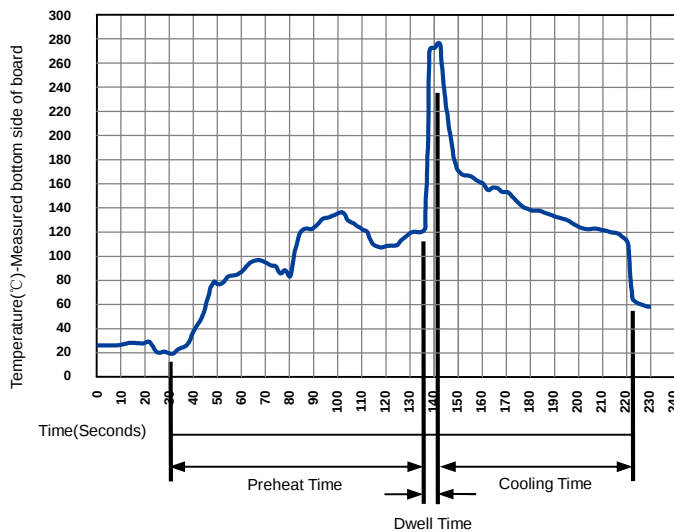


|          | Reel                                                                                | Inner Box                                                                           | Carton                                                                                |
|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Size     | 330×20.5mm                                                                          | 340×333×70mm                                                                        | 375×353×380mm                                                                         |
| Quantity | MPQ/MOQ: 1 reel=500pcs                                                              | 1 Inner Box=3 reels=1,500pcs                                                        | 1Carton=5 Inner boxes=7,500pcs                                                        |
| Photos   |  |  |  |

## Switching Spark Gap (SSG)

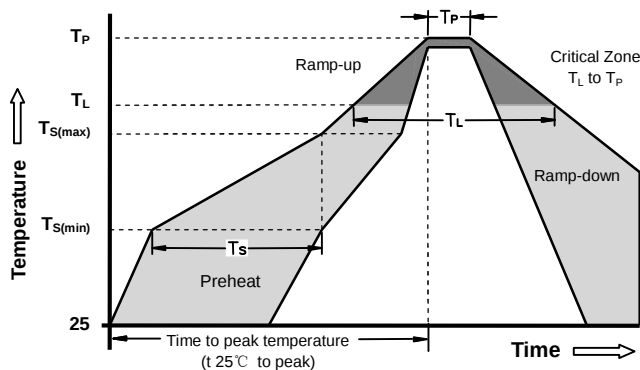
## 2RK-8 Series

### Soldering Parameters - Wave soldering (Thru-Hole Devices)



| Wave Soldering Condition |                   | Pb-Free assembly |
|--------------------------|-------------------|------------------|
| Preheat                  | Temperature Min   | 100°C            |
|                          | Temperature Max   | 150°C            |
|                          | Time (Min to Max) | 60-180 Seconds   |
| Solder Pot Temperature   |                   | 280°C Max        |
| Solder Dwell Time        |                   | 2-5 Seconds      |

### Soldering Parameters - Reflow Soldering (Surface Mount Devices)



| Reflow Condition                                             |                                           | Pb - Free assembly |
|--------------------------------------------------------------|-------------------------------------------|--------------------|
| Preheat                                                      | -Temperature Min (T <sub>s(min)</sub> )   | 150°C              |
|                                                              | -Temperature Max (T <sub>s(max)</sub> )   | 200°C              |
|                                                              | - Time (min to max) (t <sub>s</sub> )     | 60 -180 Seconds    |
| Average ramp up rate ( Liquids Temp T <sub>L</sub> ) to peak |                                           | 3°C/second max     |
| T <sub>S(max)</sub> to T <sub>L</sub> - Ramp-up Rate         |                                           | 5°C/second max     |
| Reflow                                                       | - Temperature (T <sub>L</sub> ) (Liquids) | 217°C              |
|                                                              | - Time (min to max) (t <sub>s</sub> )     | 60 -150 Seconds    |
| Peak Temperature (T <sub>P</sub> )                           |                                           | 260 +0/-5°C        |
| Time within 5°C of actual peak Temperature (t <sub>p</sub> ) |                                           | 10 - 30 Seconds    |
| Ramp-down Rate                                               |                                           | 6°C/second max     |
| Time 25°C to peak Temperature (T <sub>P</sub> )              |                                           | 8 minutes Max      |
| Do not exceed                                                |                                           | 260°C              |

## Cautions

- I Switching spark gaps may be used only within their specified values.
- I Damaged switching spark gaps must not be re-used.
- I The electrical characteristics described in this datasheet are only typical characteristics, and all of these characteristics have been confirmed through testing and inspection. If the customer's usage requirements are different from this or have special requirements, please contact Ruilongyuan Electronics Co., Ltd. If protection failure or circuit damage occurs as a result, our company is not responsible for it.
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