

# DATA SHEET

## SPARK GAP PROTECTORS POWER SUPPLIES

BK3-M series

RoHS compliant & Halogen free



Product specification— November 06, 2018 V.0



## Spark Gap (SPG) Data Sheet

### Features

- Approximately zero leaking current before clamping voltage
- Less decay at on/off state.
- High capability to withstand repeated lightning strikes.
- Low electrode capacitance( $\leq 0.8\text{pF}$ ) and high isolation( $\geq 100\text{M}\Omega$ ).
- RoHS compliant.
- Bilateral symmetrical.
- Temperature, humidity and lightness insensitive.
- Operating temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Storage temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Applications

- Power Supplies
- Motor sparks eliminating
- Relay switching spark absorbing
- Data line pulse guarding
- Electronic devices requiring UL497A and UL497B compliant
- Telephone/Fax/Modem
- High frequency signal transmitters/receivers
- Satellite antenna
- Radio amplifiers
- Alarm systems
- Cathode ray tubes in Monitors/TVs

### Dimensions

|  | Symbol | Dimension (mm)    |
|--|--------|-------------------|
|  | L      | $3.4\pm 0.5$      |
|  | D      | $\Phi 1.4\pm 0.5$ |
|  | d      | $\Phi 1.3\pm 0.5$ |
|  | t      | $0.4\pm 0.1$      |

## Electrical Characteristics

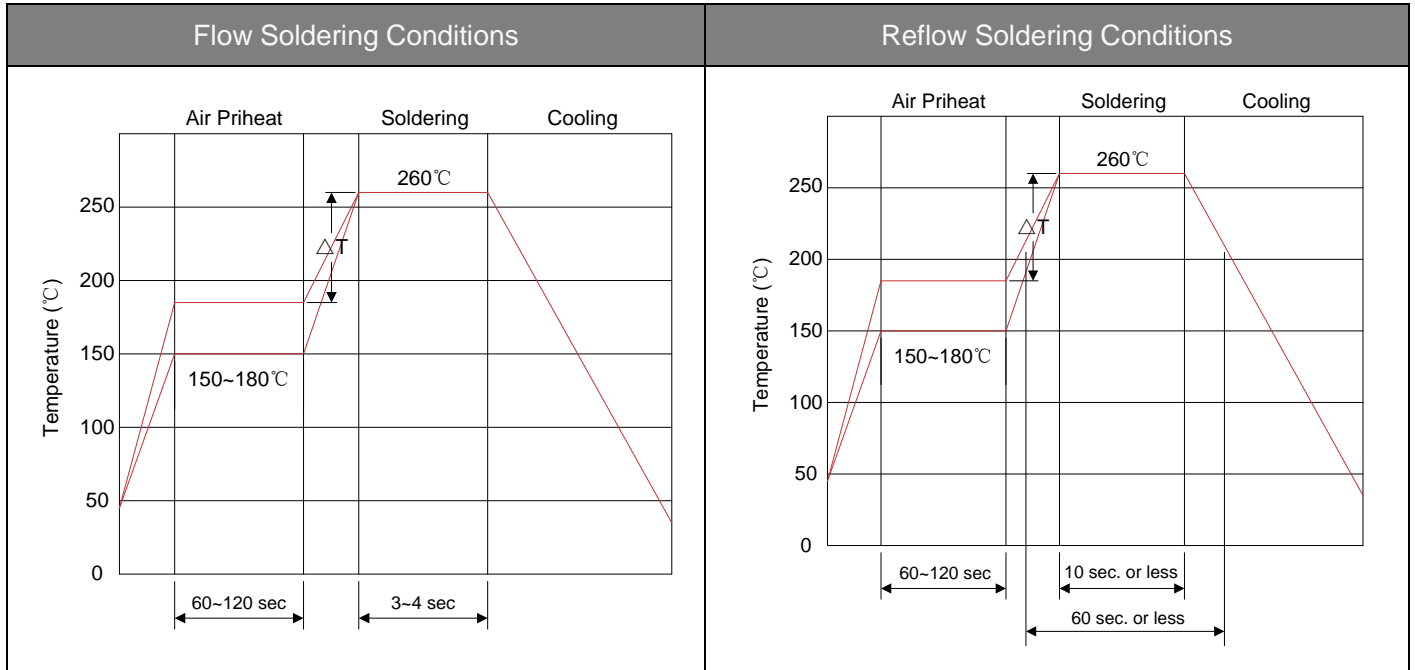
| Part Number  | DC Spark-over Voltage | Minimum Insulation Resistance |                        | Maximum Capacitance (1KHz-6V <sub>MAX</sub> ) | Surge current capacity (8/20μs) |
|--------------|-----------------------|-------------------------------|------------------------|---|---------------------------------|
|              | V <sub>s</sub> (V)    | Test Voltage(V)               | IR <sub>OHM</sub> (MΩ) | C(pf)   |                                 |
| BK3XX00702-M | 140                   | 50                            | 100                    | 0.8   | 300A                            |
| BK3XX01002-M | 200                   | 100                           | 100                    | 0.8   | 300A                            |
| BK3XX01502-M | 300                   | 100                           | 100                    | 0.8   | 300A                            |

Note: ① V<sub>s</sub>±XX%

## Test Methods and Results

| Items                  | Test Method  | Standard  |
|------------------------|--|---|
| DC Spark-over Voltage  | Measure starting discharge voltage (V <sub>s</sub> ) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within 100V/s. | Meet specified value.   |
| Insulation Resistance  | Measure the insulation resistance across the terminal at regular voltage. But the test voltage doesn't over the DC spark-over voltage.                                   |   |
| Capacitance            | Measure the electrostatic capacitance by applying a voltage of less than 6V (at 1KHz) between terminals.   |   |
| Static Life            | 10KV with 1500pf condenser is discharged through 0Ω resistor. 200 times at an interval of 10sec.   | Rate-of-change, within ±30% insulation resistance & capacitance, conformed to rated spec. |
| Surge Current Capacity | 1.2/50μs & 8/20μs, 300A, ±5 times, each time interval 60 seconds. Thereafter, outer appearance shall be visually examined.   | No crack and no failures  |
| Cold Resistance        | Measurement after -40°C/1000 HRS & normal temperature/2 HRS.   | Features are conformed to rated spec.   |
| Heat Resistance        | Measurement after 125°C/1000 HRS & normal temperature/2 HRS.   |   |
| Humidity Resistance    | Measurement after humidity 90~95°C(45°C) /1000 HRS & normal temperature/2 HRS.   |   |
| Temperature Cycle      | 10 times repetition of cycle -40°C/30min → normal, temp/2 min → 125°C/30min, measurement after normal temp/2 HRS.  |   |
| Solder Ability         | Apply flux and immerse in molten solder 230±5°C for 3sec up to the point of 1.5mm from body. Check for solder adhesion.  | Lead wire is evenly covered by solder.  |
| Solder Heat            | Measurement after lead wire is dipped up to the point of 1.5mm from body into 260±5°C solder for 10sec.  | Conformed to rated spec.  |

**Recommended Soldering Conditions**



- 1) Time shown in the above figures is measured from the point when chip surface reaches temperature.
- 2) Temperature difference in high temperature part should be within 110°C.
- 3) After soldering, do not force cool, allow the parts to cool gradually.

**Hand Soldering**

Solder iron temperature: 350±5°C

Heating time: 3 seconds max.

**General attention to soldering**

- High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
- For soldering, please refer to the soldering curves above. However, please keep exposures to temperatures exceeding 200°C to fewer than 50 seconds.
- Please use a mild flux (containing less than 0.2wt% Cl). Also, if the flux is water soluble, be sure to wash thoroughly to remove any residue from the underside of components that could affect resistance.

**Cleaning**

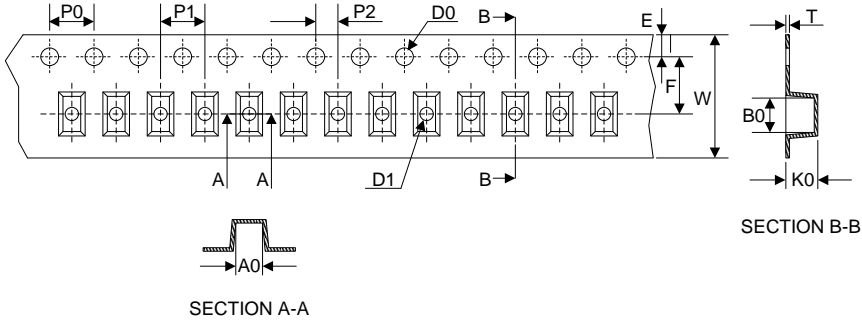
When using ultrasonic cleaning, the board may resonate if the output power is too high. Since this vibration can cause cracking or a decrease in the adherence of the termination, we recommend that you use the conditions below.

Frequency: 40kHz max.

Output power: 20W/liter

Cleaning time: 5 minutes max.

**Packaging**

|  | Symbol | Dimension (mm) |
|--|--------|----------------|
| <p><b>Tape</b></p>  | W      | 8.00±0.30      |
|  | P0     | 4.00±0.10      |
|  | P1     | 4.00±0.10      |
|  | P2     | 2.00±0.10      |
|  | D0     | Φ1.5±0.10      |
|  | D1     | Φ1.0±0.10      |
|  | E      | 1.50±0.10      |
|  | F      | 3.40±0.10      |
|  | A0     | 1.60±0.10      |
|  | K0     | 1.60±0.10      |
|  | B0     | 4.00±0.10      |
|  | T      | 0.20±0.10      |
|  | D      | 178.0          |
|  | d      | 13.0           |
| L  | 11.0   |                |
| Quantity: 3000PCS  |        |                |