Innovative Service Around the Globe YAGEO

DATA SHEET

SPARK GAP PROTECTORS
POWER SUPPLIES

BK3 series

RoHS compliant & Halogen free



Product specification– May 06, 2022 V.2

Spark Gap (SPG) Data Sheet

Features

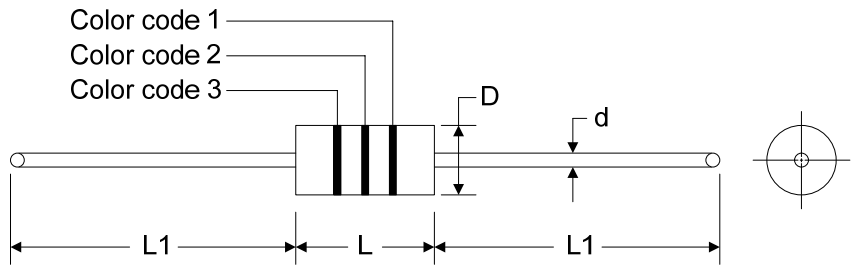


- Approximately zero leaking current before clamping voltage
- Less decay at on/off state.
- High capability to withstand repeated lightning strikes.
- Low electrode capacitance(≤0.8pF) and high isolation(≥100MΩ).
- RoHS compliant.
- Bilateral symmetrical.
- Temperature, humidity and lightness insensitive.
- Operating temperature: -40℃ ~ +85℃
- Storage temperature: -40℃ ~ +125℃
- Meets MSL level 1, per J-STD-020
- Safety certification: UL

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	4.0±0.5
L1	28.0±3.0
D	Φ2.0±0.5
d	Φ0.5±0.05

Electrical Characteristics

Part Number	DC Spark-over Voltage	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V_{MAX})	Surge Current Capacity (8/20μs)	Surge Life Test
	Vs(V)	Test Voltage(V)	IR_{OHM}(MΩ)	C(pf)		8/20μs,100A
BK33000702	140±30%	50	100	0.8	500A	150 times
BK32001002	200±20%	100	100	0.8	500A	150 times
BK32001102	220±20%	100	100	0.8	500A	150 times
BK32001502	300±20%	100	100	0.8	500A	150 times
BK33001502	300±30%	100	100	0.8	500A	150 times
BK32002002	400±20%	250	100	0.8	500A	150 times
BK32002502	500±20%	250	100	0.8	500A	150 times
BK32003002	600±20%	250	100	0.8	500A	150 times
BK32003502	700±20%	250	100	0.8	500A	150 times

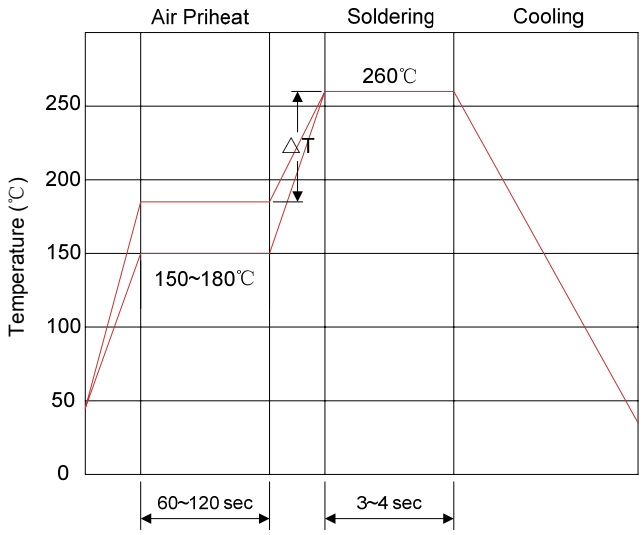
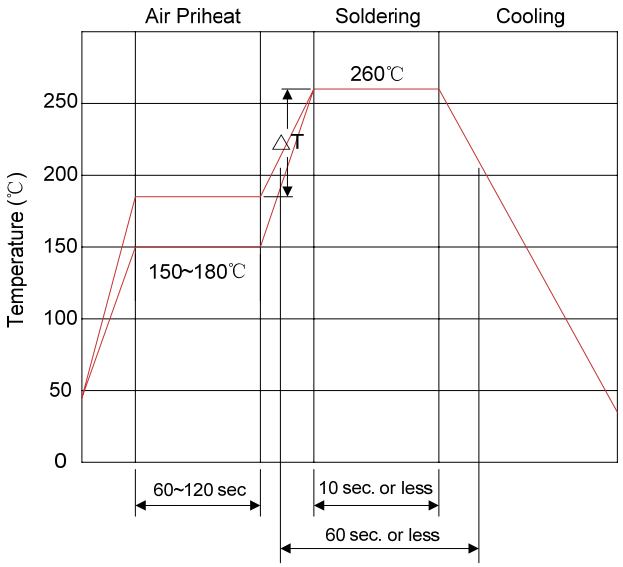
Color Code

Part Number	Color Code 1	Color Code 2	Color Code 3
BK33000702	Black	Yellow	-
BK32001002	Red	-	-
BK32001102	Red	Red	-
BK32001502	Orange	-	-
BK33001502	Orange	Orange	-
BK32002002	Yellow	-	-
BK32002502	Green	-	-
BK32003002	Blue	-	-
BK32003502	White	Brown	-

Test Methods and Results

<table>
<tr><th>Items</th><th>Test Method</th><th>Standard</th></tr>
<tr><td>DC Spark-over Voltage</td><td>Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within 100V/s(Vs＜1000V) or 500V/s(Vs≥1000V).</td><td rowspan="3">Meet specified value.</td></tr>
<tr><td>Insulation Resistance</td><td>Measure the insulation resistance across the terminal at regular voltage. But the test voltage doesn’t over the DC spark-over voltage.</td></tr>
<tr><td>Capacitance</td><td>Measure the electrostatic capacitance by applying a voltage of less than 6V (at 1KHz) between terminals.</td></tr>
<tr><td>Static Life</td><td>10KV with 1500pf condenser is discharged through 0Ω resistor. 200 times at an interval of 10sec.</td><td>｜△Vs/Vs｜≤30%
Characteristics of other items must meet the specified value.</td></tr>
<tr><td>Surge Current Capacity</td><td>The following impulse current for specified current applied ±5 times, each time interval 60 seconds. Thereafter, outer appearance shall be visually examined.
<table>
<tr><th>Type</th><th>Impulse current</th></tr>
<tr><td>Vs < 400V</td><td>1.2/50μs & 8/20μs, 500A</td></tr>
<tr><td>Vs ≥ 400V</td><td>1.2/50μs & 8/20μs, 500A, electrically connected with a resistor (1~2 Ω).</td></tr>
</table></td><td>No crack and no failures</td></tr>
<tr><td>Cold Resistance</td><td>Measurement after -40℃/1000 HRS & normal temperature/2 HRS.</td><td rowspan="4">Features are conformed to rated spec.</td></tr>
<tr><td>Heat Resistance</td><td>Measurement after 125℃/1000 HRS & normal temperature/2 HRS.</td></tr>
<tr><td>Humidity Resistance</td><td>Measurement after humidity 90~95℃(45℃) /1000 HRS & normal temperature/2 HRS.</td></tr>
<tr><td>Temperature Cycle</td><td>10 times repetition of cycle -40℃/30min →normal, temp/2 min →125℃/30min, measurement after normal temp/2 HRS.</td></tr>
<tr><td>Solder Ability</td><td>Apply flux and immerse in molten solder 230±5℃ for 3sec up to the point of 1.5mm from body. Check for solder adhesion.</td><td>Lead wire is evenly covered by solder.</td></tr>
<tr><td>Solder Heat</td><td>Measurement after lead wire is dipped up to the point of 1.5mm from body into 260±5℃ solder for 10sec.</td><td>Conformed to rated spec.</td></tr>
<tr><td>Pull Strength</td><td>Apply 0.5kg load for 10sec.</td><td rowspan="2">Lead shall not pull out to snap.</td></tr>
<tr><td>Flexural Strength</td><td>Bend lead wire at the point of 2mm from body under 0.25 load and back to its original point. Repeat 1 time.</td></tr>
</table>

Recommended Soldering Conditions

Flow Soldering Conditions	Reflow 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℃.
3) After soldering, do not force cool, allow the parts to cool gradually.

Hand Soldering

Solder iron temperature: 350±5℃
Heating time: 3 seconds max.

General attention to soldering

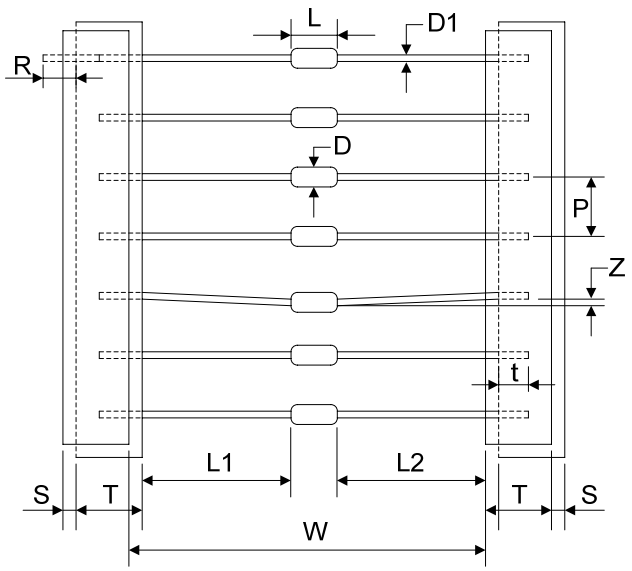
● High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
● For soldering, please refer to the soldering curves above. However, please keep exposures to temperatures exceeding 200℃ to fewer 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.

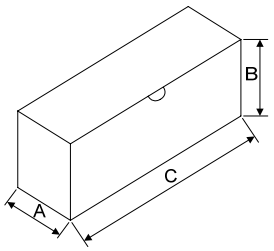
Packaging

Tape



Symbol	Dimension (mm)
W	52.0±1.5
P	5.0±0.5
L1-L2	1.0max.
T	6.0±1.0
Z	1.2max.
R	Terminals must not project from tape.
t	3.2max.
S	0.8max.
D	Φ2.5max.
D1	Φ0.5±0.05
L	4.5max.

Inner Box



A	74.0±5.0
B	77.0±5.0
C	252.0±5.0
Quantity: 5000PCS	