

GS20 DIP Series

Spark Gap



Description

SPG (Spark Gap Protectors) is a discharge micro gap obtained by the distance between electrodes. The tube is filled with inert gas and sealed with glass tube and Du magnesium wire. When the voltage at both ends of SPG increases, the nearby gas is ionized and discharge phenomena begin to occur at the micro gap. As the voltage drop between the two poles gradually increases, the discharge current also increases, and its ionization zone expands. At this time, the discharge current flows through the gas ionization zone to the other pole. When the current continues to increase to a certain extent, there is a transition from glow discharge to arc discharge inside the tube, and the product enters a low resistance state from a high resistance state. The voltage at both ends of the SPG also decreases, thus protecting the subsequent circuit. After the abnormal voltage disappears, the product returns to a high resistance state.

Additional Information



Resources



Accessories



Samples

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 ($\geq 100\text{M}\Omega$)
- Bilateral symmetrical
- Temperature, humidity and lightness insensitive
- RoHS compliant
- Meets MSL level 1, per J-STD-020
- Operating temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Storage temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

Application

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

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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part Number	DC Spark-over Voltage	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V _{max})	Surge Current Capacity	Surge Voltage Capacity
	V _s (V)	Test Voltage	R (MΩ)	C(pF)	@8/20μs (A)	@10/700μs (V)
GS20-141NL	140±30%	50VDC	100	0.8	500	2000
GS20-201ML	200±20%	100VDC	100	0.8	500	2000
GS20-301ML	300±20%	100VDC	100	0.8	500	2000
GS20-401ML	400±20%	250VDC	100	0.8	500	2000
GS20-501ML	500±20%	250VDC	100	0.8	500	2000
GS20-601ML	600±20%	250VDC	100	0.8	500	2000
GS20-701ML	700±20%	250VDC	100	0.8	500	2000

Test Methods and Results

Items	Test Method	Standard
DC Spark-over Voltage	the DC spark-over voltage ascend up within 500V/s. Test current is 0.5mA max.	Meet specified value
Minimum Insulation Resistance	across the terminal at regular voltage. But the test voltage doesn't over the DC spark-over voltage.	Meet specified value
Maximum Capacitance	by applying a voltage of less than 6V (at 1KHz) between terminals.	Meet specified value
Surge Current Capacity	1.2/50μs & 8/20μs, 500A, ±5 times, interval 60s.	No crack and no failures
Surge Voltage Capacity	10/700μs, 2000V, ±5 times, interval 60s.	No crack and no failures
Cold Resistance	-40±3°C(1000hrs) / room temp., normal humidity(4hrs) , measure the properties.	Features are conformed to rated spec.
Heat Resistance	125±2°C(1000hrs) / room temp., normal humidity(4hrs) , measure the properties.	Features are conformed to rated spec.
Humidity Resistance	After 85±2°C, 85% RH (1000hrs)/room temp., normal humidity(4hrs) cycle, measure the properties.	Features are conformed to rated spec.
Temperature Cycle	25 times repetition of cycle -40±3°C(30Min.), room temp., (4 Min.), 125±2°C(30 Min.), room temp., normal humidity (4hrs) .	Features are conformed to rated spec.
Solder Ability	Apply flux and immerse in molten solder, up to the point of 3mm from the body, for 5 sec. (265±5°C). Wash the lead wire and check for soldering adhesion.	Lead wire is evenly covered by solder
Solder Heat	Lead wire is dipped up to the point of 2mm from the body, into 265±5°C solder for 10±1 sec. And measure the properties.	Conformed to rated spec.
Pull Strength	Apply 2.5kg load for 10sec.	Lead shall not pull out to snap
Flexural Strength	Bend lead wire at the point of 2mm from body under 0.25 load and back to its original point. Repeat 1 time.	Lead shall not pull out to snap

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Recommended Soldering Conditions

Flow Soldering

Air Preheat Soldering Cooling

Temperature(°C)

260°C

150-180°C

60-120sec 3-4sec

General attention to soldering

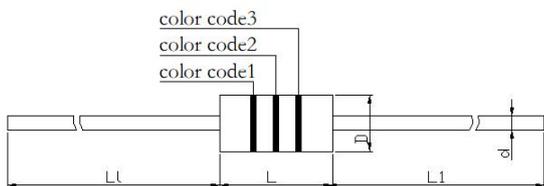
- High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
- For soldering, please refer to the soldering curves. However, please keep exposures to temperatures exceeding 200°C to fewer than 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.
- Time shown in the figures is measured from the point when chip surface reaches temperature.
- Temperature difference in high temperature part should be within 110°C.
- After soldering, do not force cool, allow the parts to cool gradually.

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.

Dimensions



Symbol	Millimeters	Inches
L	4.0±0.5	0.157±0.020
L1	28.0±3.0	1.102±0.118
D	2.0±0.5	0.079±0.020
d	0.5±0.05	0.020±0.002

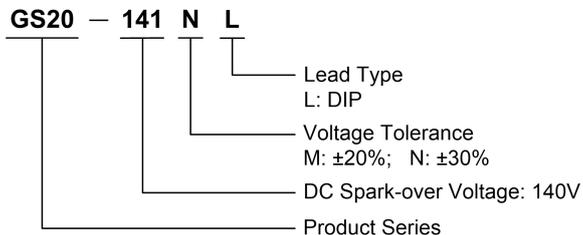
Color Code

Part Number	Color Code 1	Color Code 2	Color Code 3
GS20-141NL	Black	Yellow	-
GS20-201ML	Red	-	-
GS20-301ML	Orange	-	-
GS20-401ML	Yellow	-	-
GS20-501ML	Green	-	-
GS20-601ML	Blue	-	-
GS20-701ML	Purple	-	-

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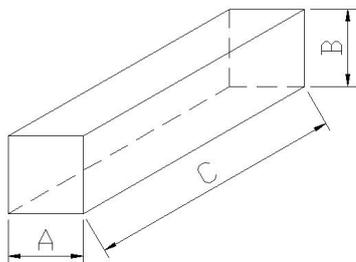
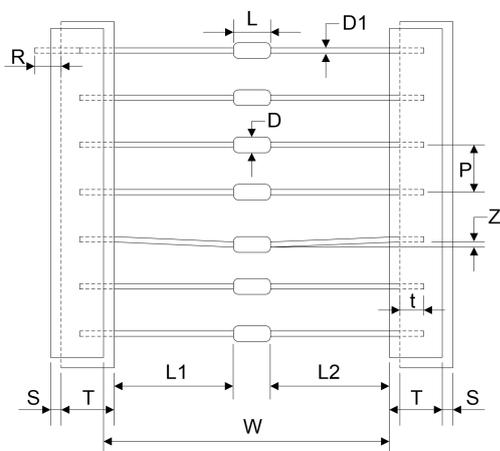
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Part Numbering System



Packaging Specification

Part number	Quantity	Packaging Option
GS20-xxxXL	4000	Tape & Box



Symbol	Millimeters	Inches
W	52.0±1.5	2.047±0.059
P	5.0±0.5	0.197±0.020
L1-L2	1.0 max.	0.039 max.
T	6.0±1.0	0.236±0.039
Z	1.2 max.	0.047 max.
R	Terminals must not project from tape	Terminals must not project from tape
t	3.2 max.	0.126 max.
S	0.8 max.	0.031 max.
D	Φ2.5 max.	0.098 max.
D1	Φ0.5±0.05	0.197±0.002
L	4.5 max.	0.177 max.
A	74.0±5.0	2.913±0.197
B	77.0±5.0	3.031±0.197
C	252.0±5.0	9.921±0.197

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