UNB Series

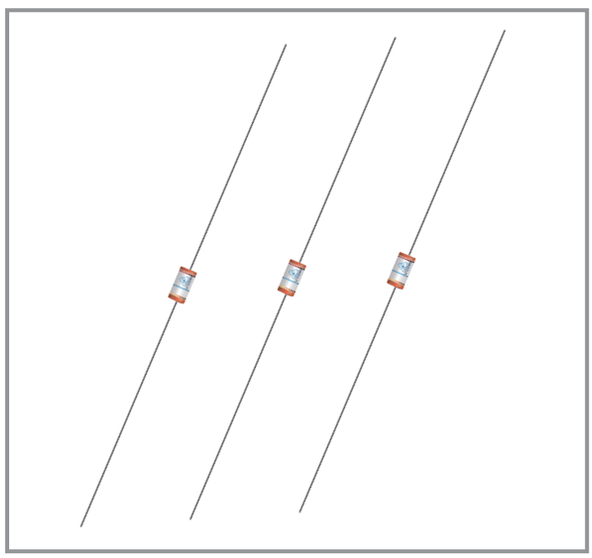
ROHS

Spark Gap Protectors (SPG)

www.unsemi.com.tw

Features

- Approximately zero leaking current before clamping voltage
- Less decay at on/off state.
- High capability to withstand repeated lightning strikes.
- Low electrode capacitance(≤1.0pF) 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



Applications

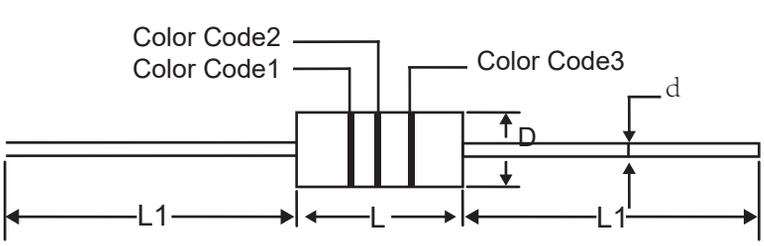
- Power Supplies
- Motor sparks eliminating
- Relay switching spark absorbing
- Data line pulse guarding
- Electronic devices requiring UL497A and UL497B compliant
- Telephone/Fax/Modem
- High frequency signal transmitters/receivers
- Satellite antenna
- Radio amplifiers
- Alarm systems
- Cathode ray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

Part Numbering

UNB - **201** **M**
(1) (2) (3)

(1) Series
(2) VS Voltage, e.g. 201=20X10¹ =200V
(3) VS Voltage tolerance: L - ±15%, M - ±20%, N - ±30%

Dimensions



Symbol	Inches	Dimension (mm)
L1	1.102±0.118	28.0±3.0
L	0.157±0.012	4.0±0.3
d	0.020±0.002	0.5±0.05
D	0.102±0.012	2.6±0.3

Electrical Characteristics

Part Number	DC Spark-over Voltage	Minimum Insulation Resistance		Maximum Capacitance 1KHZ-6Vmax C (pF)	Surge Current Capacity (8/20μ S)	Surge Life Test
		Test Voltage(V)	IROHM (MΩ)			
UNB-141N	140(98~182)	50	100	1.0	1000A	10KV / 150A, >200T
UNB-181N	180(126~234)	50	100	1.0	1000A	10KV / 150A, >200T
UNB-201M	200(160~240)	100	100	1.0	1000A	10KV / 150A, >200T
UNB-251M	250(200~300)	100	100	1.0	1000A	10KV / 150A, >200T
UNB-301M	300(240~360)	100	100	1.0	1000A	10KV / 150A, >200T
UNB-401M	400(320~480)	250	100	1.0	1000A	10KV / 150A, >200T
UNB-501M	500(400~600)	250	100	1.0	1000A	10KV / 150A, >200T
UNB-601M	600(480~720)	250	100	1.0	1000A	10KV / 150A, >200T
UNB-102M	1000(800~1200)	500	100	1.0	1000A	10KV / 150A, >200T
UNB-152M	1500(1200~1800)	500	100	1.0	1000A	10KV / 150A, >200T

Color Code

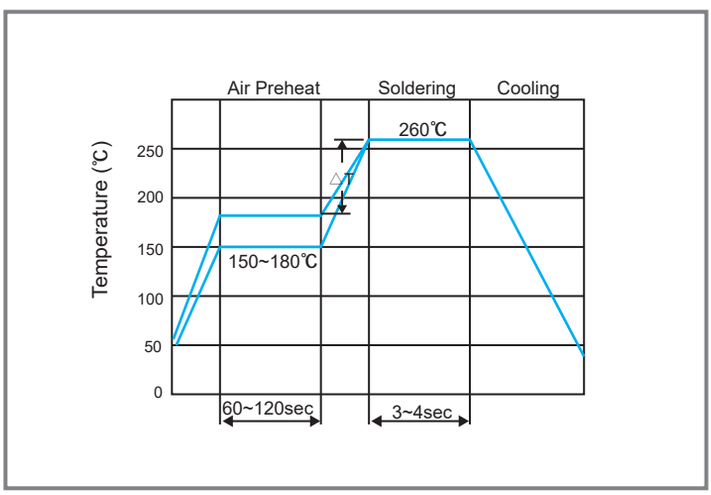
Part Number	Color Code1	Color Code2	Color Code3
UNB-141N	Black	Yellow	-
UNB-181N	Gray	-	-
UNB-201M	Red	-	-
UNB-301M	Brown	-	-
UNB-401M	Yellow	-	-
UNB-501M	Green	-	-
UNB-601M	Blue	-	-
UNB-102M	Black	-	-
UNB-152M	Black	Green	Red

Test Methods and Results

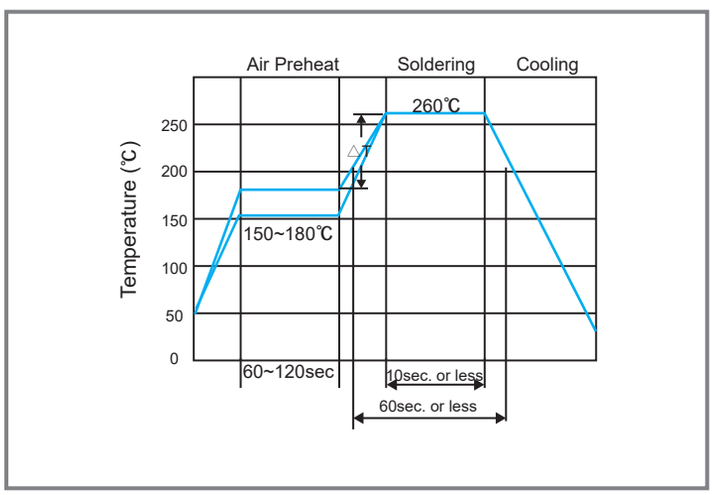
Items	Test Method	Standard
DC Spark-over Voltage	Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within 100V/s(Vs＜1000V) or 500V/s(Vs≥1000V).	Rate-of-change, within±30% insulation resistance & capacitance, conformed to rated spec.
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 2KΩ resistor. 200 times at an interval of 10sec.	|△| Vs/Vs ≤30% Characteristics of other items must meet the specified value
Surge Current Capacity	1.2/50μs & 8/20μs, 500A, electrically connected with a resistor (1~2 Ω), ±5 times, each time interval 60 seconds. Thereafter, outer appearanceshall be visually examined.	No crack and no failures
Cold Resistance	Measurement after -40℃/1000 HRS & normal temperature/2 HRS	Features are conformed to rated spec.
Heat Resistance	Measurement after 125℃/1000 HRS & normal temperature/2 HRS	
Humidity Resistance	Measurement after humidity 90~95℃(45℃) /1000 HRS & normal temperature/2 HRS.	
Temperature Cycle	10 times repetition of cycle -40℃/30min →normal, temp/2 min →125℃/30min, measurement after normal temp/2 HRS.	
Solder Ability	Apply flux and immerse in molten solder 230±5℃ 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℃ solder for 10sec.	Conformed to rated spec.
Pull Strength	Apply 0.5kg 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.	

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

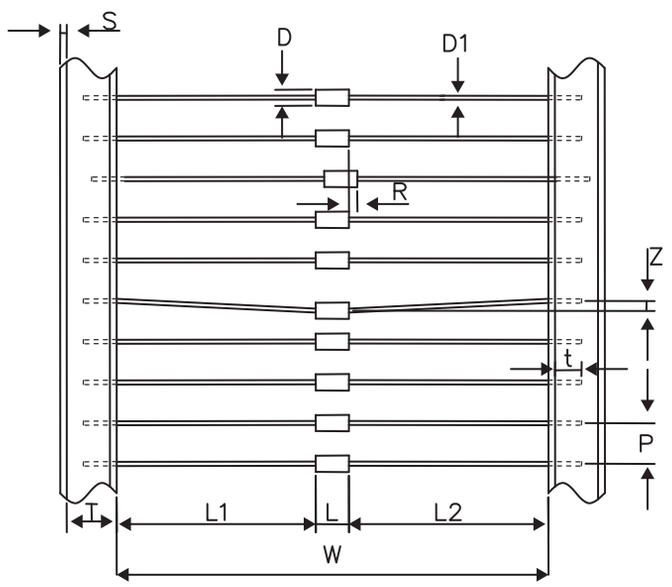
◆ High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
◆ For soldering, please refer to the soldering curves above. However, please keep exposures to temperatures exceeding 200℃ to fewer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

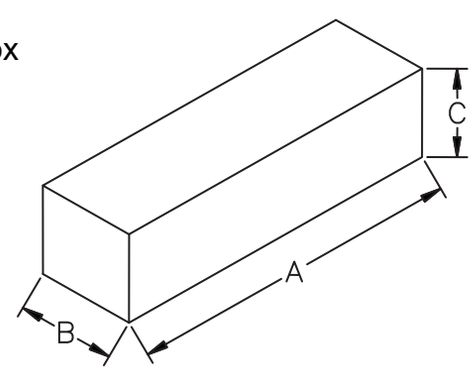
Package

Tape



Symbol	Dimension (mm)
W	52+2.0/-1.0
P	5.0±0.5
T	6.0±1.0
Z	1.2 Max
L1-L2	1.0 Max
S	0.8 Max
t	3.2 Max
L	4.0±0.4
D1	∅0.5±0.05
D	∅2.6±0.3
R	1.0 Max

Inner Box



Item	Description
Length	A=255 mm
Width	B=75 mm
Height	C=68 mm
Quantity	2000 PCS
Package	There are upper and bottom board to protect the parts from damage.

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ROHS

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