WPSPG Spark Gap Protectors – L Series

Part Numbering System

WPSPG	-	20	L	200	TA
(1)		(2)	(3)	(4)	(5)

(1) World Products Spark Gap Protector

(2) DC Spark-over Voltage
Tolerance: (Example: 20=20% tolerance)

(3) Series Type
L= Low Current

(4) DC Spark-over Voltage:
(Example: 200 = 200V)

(5) Packaging:
Nil = Bulk
TA = Taped/Ammo Box

FEATURES:

1. RoHS Compliant and Halogen Free
2. UL497B – PENDING
3. Fast Responding
4. Low Capacitance and High Isolation
5. Zero leakage current
6. Stable electrical characteristics over time
7. Can withstand repeated surges
8. Bilateral Symmetrical
9. Less decay at on/off state
10. Temperature, humidity and lightness insensitive
11. Operating temperature: -40ºC – +85ºC
12. Storage temperature: -40ºC – +125ºC
13. Meets MSL level 1, per J-STD-020

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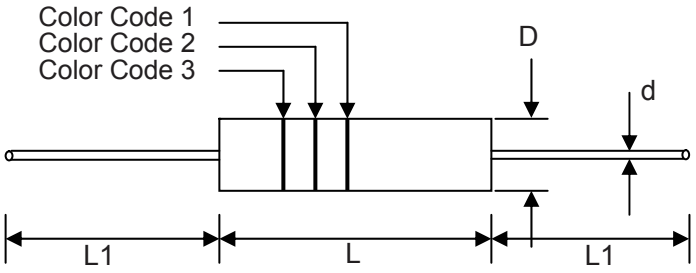
DIMENSIONS in mm.



Item	
L	4.0 ± 0.5
L1	28.0 ± 3.0
D	2.0 ± 0.5
d	0.5 ± 0.05

ELECTRICAL CHARACTERISTICS

Part Number	DC Spark-Over Voltage Vs (V)	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V$_{MAX}$) C (pf)	Surge current capacity (8/20μs)	Surge Life Test (8/20μs)
		Test Voltage (V)	IR OHM (MΩ)			
WPSPG-XXL 140	140	50	100	0.8	>500A	100A >150 times
WPSPG-XXL 200	200	100	100	0.8		
WPSPG-XXL 220	220	100	100	0.8		
WPSPG-XXL 300	300	100	100	0.8		
WPSPG-XXL 400	400	250	100	0.8		
WPSPG-XXL 500	500	250	100	0.8		
WPSPG-XXL 600	600	250	100	0.8		
WPSPG-XXL 700	700	250	100	0.8		
WPSPG-XXL 1000	1000	500	100	0.8		
WPSPG-XXL 1500	1500	500	100	0.8		

Note: Vs±XX% (DC Spark-over Voltage Tolerance 30% and 20%),140V device is only available in 30% tolerance.

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COLOR CODE

Part Number	Color Code 1	Color Code 2	Color Code 3
WPSPG-XXL140	Black	Yellow	—
WPSPG-XXL200	Red	—	—
WPSPG-XXL220	Red	Red	—
WPSPG-XXL300	Orange	Orange	—
WPSPG-XXL400	Yellow	—	—
WPSPG-XXL500	Green	—	—
WPSPG-XXL600	Blue	—	—
WPSPG-XXL700	White	Brown	—
WPSPG-XXL1000	Black	—	—
WPSPG-XXL1500	Brown	Green	Red

TEST METHODS AND RESULTS

ITEM	TEST METHOD	STANDARD
DC Spark over Voltage(Vs)	Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within as follow condition. Vs <1000V: 100V/second Vs >1000V: 500V/second	Meet specified value.
Insulation Resistance(IR)	Measure the insulation resistance across the terminal at regular voltage. But the test voltage doesn't go beyond 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 ≤30%. Characteristics of other items must meet the specified value.
Surge Current Capacity	The following impulse current for specified current applied ± 5 times at 60 seconds intervals. Thereafter, outer appearance shall be visually examined. Vs < 400V: 1.2/50μs & 8/20μs, 500A Vs > 400V: 1.2/50μs & 8/20μs, 500A, electrically connected with a resistor (1~2 Ω).	No crack and no failures.
Cold Resistance	Measurement after -40ºC/1000 HRS & normal temperature/2 HRS.	Features are conformed to rated spec.
Heat Resistance	Measurement after 125ºC/1000 HRS & normal temperature/2 HRS.	
Humidity Resistance	Measurement after humidity 90~95%(45ºC) /1000 HRS & normal temperature/2 HRS.	
Temperature Cycle	10 times repetition of cycle -40ºC/30min normal, temp/2 min 125ºC/30min, measurement after normal temp/2 HRS.	
Solder Ability	Apply flux and immerse in molten solder 230± 5ºC 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± 5ºC solder for 10sec.	Conformed to rated spec.
Pull Strength	Apply 0.5kg load for 10sec.	Lead shall not pull out or 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.	

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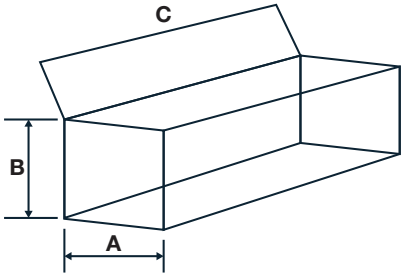
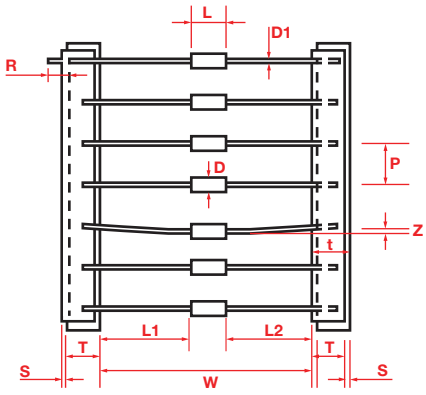


unit: mm

Item	Dimensions
A	78
B	78
C	255

SERIES	Minimum Package Quantity
L	5000 pcs
M	2500 pcs
H	1500 pcs

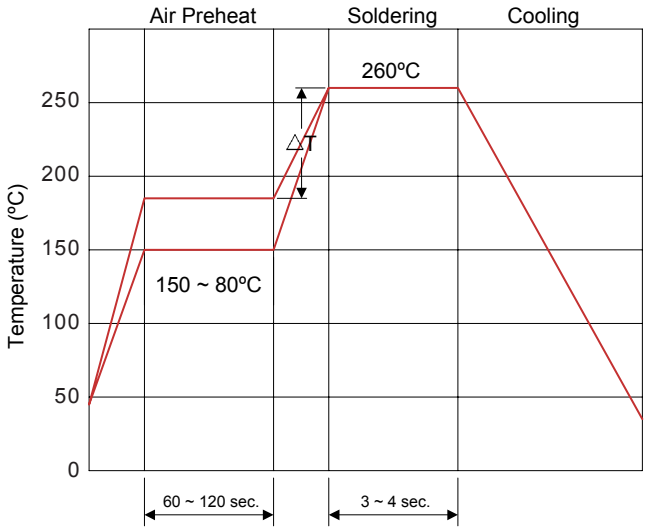
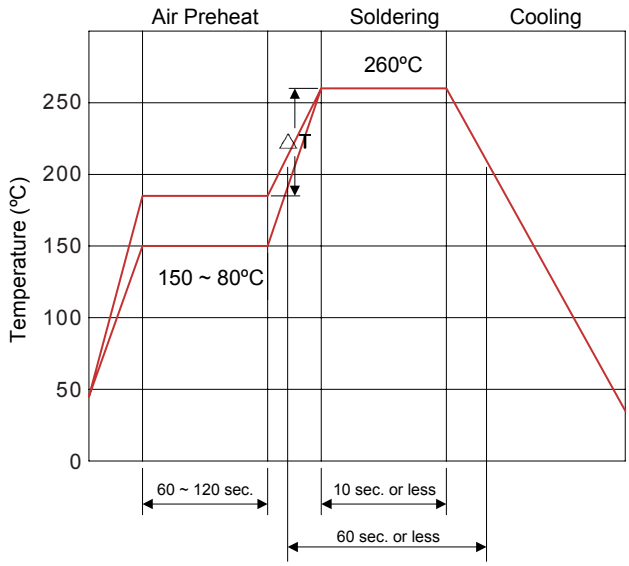
INNER BOX DIMENSIONS



Lead Taping

ITEM	Dimensions (mm)
W	52 ± 1.5
P	5.0 ± 0.5
T	6.0 ± 1.0
Z	1.2 max.
R	Leads cannot extend beyond tape.
t	3.2 max.
S	0.8 max.
D	2.5 max.
D1	0.5 ± .05
L	4.5 max
L1 & L2	1 max

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 110ºC.
3) After soldering, do not force cool, allow the parts to cool gradually.

Hand Soldering

Solder iron temperature: 350±5ºC
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 200ºC 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.