

WPSPG Spark Gap Protectors – M Series

Part Numbering System

<u>WPSPG</u>	-	<u>20</u>	<u>M</u>	<u>200</u>	<u>TA</u>
(1)		(2)	(3)	(4)	(5)

(1) World Products Spark Gap Protector

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

(3) Series Type
M = Medium Current

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



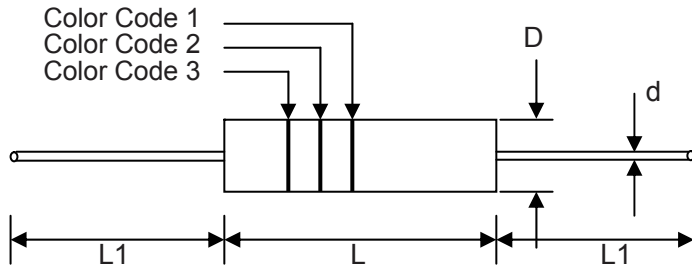
(5) Packaging:
Nil = Bulk
TA = Taped/Ammo Box

FEATURES:

1. RoHS Compliant and Halogen Free
2. UL497B – File #E135015 (see specific voltage values)
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: -40°C – +85°C
12. Storage temperature: -40°C – +125°C
13. Meets MSL level 1, per J-STD-020

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DIMENSIONS in mm.



Item	
L	4.3 ± 0.5
L1	28.0 ± 3.0
D	$\phi 2.6 \pm 0.5$
d	$\phi 0.5 \pm 0.05$

ELECTRICAL CHARACTERISTICS

Part Number	DC Spark-Over Voltage V_s (V)	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V _{MAX}) C (pf)	Surge current capacity (8/20 μ s)	Surge Life Test (8/20 μ s)
		Test Voltage (V)	IR OHM (M Ω)			
*WPSPG-XXM140	140	50	100	0.8	>1000A	100A >200 times
*WPSPG-XXM200	200	100	100	0.8		
*WPSPG-XXM220	220	100	100	0.8		
*WPSPG-XXM300	300	100	100	0.8		
*WPSPG-XXM400	400	250	100	0.8		
*WPSPG-XXM500	500	250	100	0.8		
WPSPG-XXM600	600	250	100	0.8		
WPSPG-XXM700	700	250	100	0.8		
WPSPG-XXM1000	1000	500	100	0.8		
WPSPG-XXM1500	1500	500	100	0.8		

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

*UL 497B recognized (30% tolerance only).

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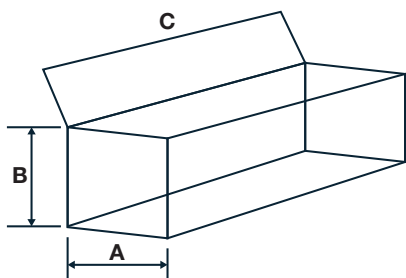
COLOR CODE

Part Number	Color Code 1	Color Code 2	Color Code 3
WPSPG-XXM140	Black	Yellow	—
WPSPG-XXM200	Red	—	—
WPSPG-XXM220	Red	Red	—
WPSPG-XXM300	Orange	—	—
WPSPG-XXM400	Yellow	—	—
WPSPG-XXM500	Green	—	—
WPSPG-XXM600	Blue	—	—
WPSPG-XXM700	Purple	—	—
WPSPG-XXM1000	Black	—	—
WPSPG-XXM1500	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. <table><tr><td>Vs <1000V</td><td>100V/second</td></tr><tr><td>Vs >1000V</td><td>500V/second</td></tr></table>	Vs <1000V	100V/second	Vs >1000V	500V/second	Meet specified value		
Vs <1000V	100V/second							
Vs >1000V	500V/second							
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. <table><tr><td>Type</td><td>Impulse current</td></tr><tr><td>Vs < 400V</td><td>1.2/50μs & 8/20μs, 1000A</td></tr><tr><td>Vs > 400V</td><td>1.2/50μs & 8/20μs, 1000A, electrically connected with a resistor (1~2 Ω).</td></tr></table>	Type	Impulse current	Vs < 400V	1.2/50μs & 8/20μs, 1000A	Vs > 400V	1.2/50μs & 8/20μs, 1000A, electrically connected with a resistor (1~2 Ω).	No crack and no failures
Type	Impulse current							
Vs < 400V	1.2/50μs & 8/20μs, 1000A							
Vs > 400V	1.2/50μs & 8/20μs, 1000A, electrically connected with a resistor (1~2 Ω).							
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% (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.						
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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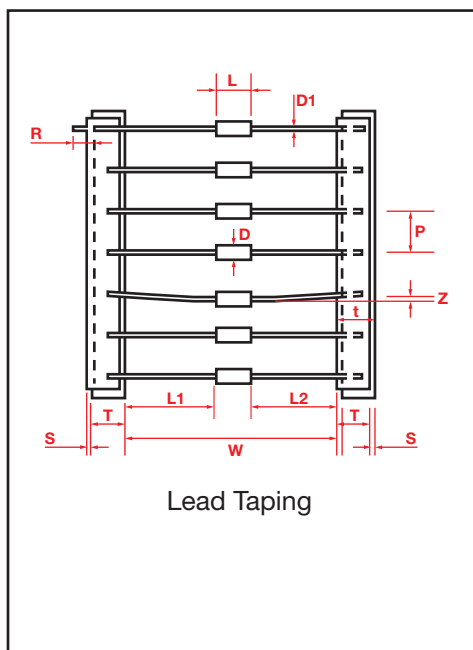


unit: mm

Item	Dimensions
A	78
B	78
C	255

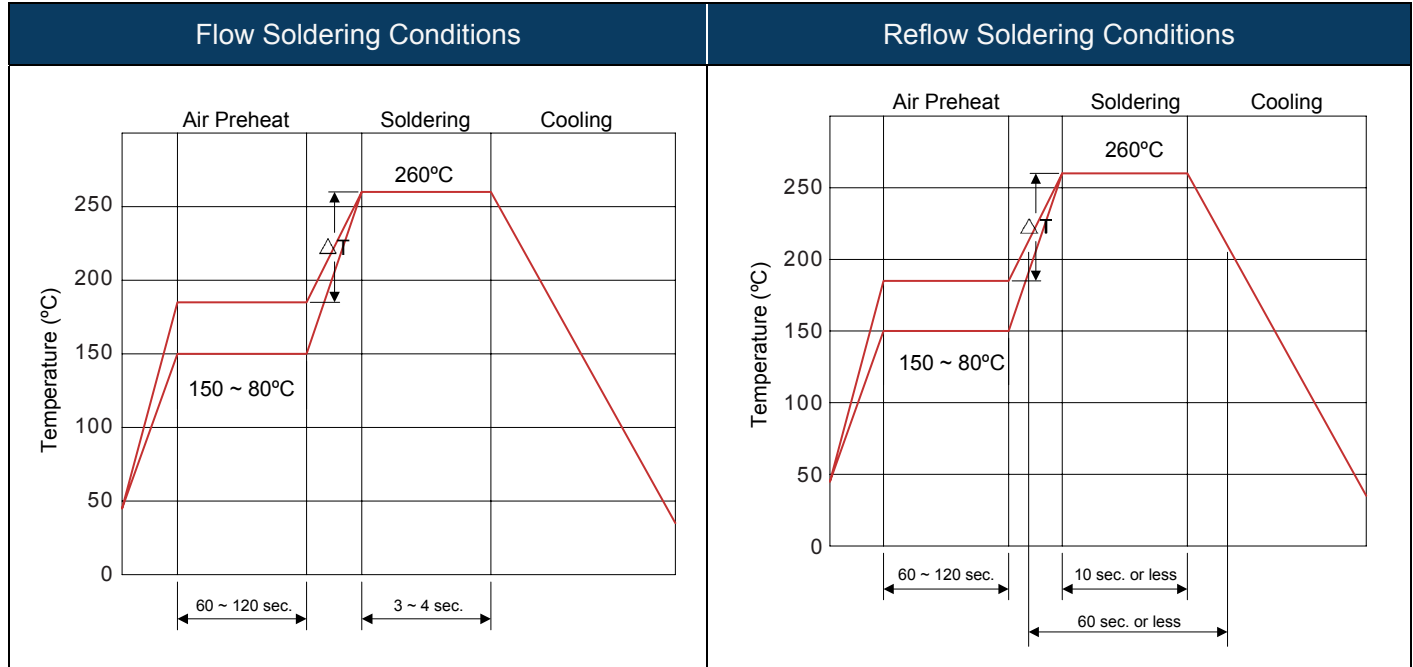
SERIES	Minimum Package Quantity
L	5000 pcs
M	2500 pcs
H	1500 pcs

INNER BOX DIMENSIONS



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	3.1 max.
D1	0.5 ± .05
L	4.8 max.
L1 & L2	1 max

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% CI). 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.