

WPSPG Spark Gap Protectors – LS Series

Part Numbering System

WPSPG - 20 LS 200 M
(1) (2) (3) (4) (5)

(1) World Products Spark Gap Protector

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

(3) Series Type
LS= Low Current Surface Mount Series

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

(5) Nil = Standard Package
M = Mini Melf Package

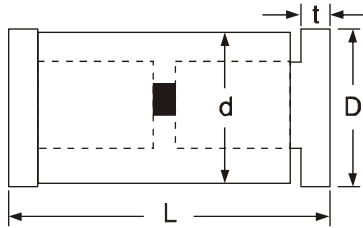


FEATURES:

1. RoHS Compliant and Halogen Free
2. UL497B – PENDING
3. Fast Responding
4. Low Capacitance
5. Zero leakage current
6. Stable electrical characteristics over time
7. Can withstand repeated surges
8. Symmetrical

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DIMENSION in mm.



Item	Standard	Mini Melf
L	4.0 ± 0.5	3.4 ± 0.5
D	2.1 ± 0.5	1.4 ± 0.5
d	2.0 ± 0.5	1.3 ± 0.5
t	0.4 ± 0.1	0.4 ± 0.1

ELECTRICAL CHARACTERISTICS

STANDARD Series

Part Number	DC Spark-Over Voltage	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V _{MAX})	Surge current capacity (8/20μs)
	V _s (V)	Test Voltage(V)	I _{ROHM} (MΩ)	C(pf)	(A)
WPSPG-XXLS140	140	50	100	0.8	500
WPSPG-XXLS200	200	100	100	0.8	500
WPSPG-XXLS220	220	100	100	0.8	500
WPSPG-XXLS300	300	100	100	0.8	500
WPSPG-XXLS400	400	250	100	0.8	500
WPSPG-XXLS500	500	250	100	0.8	500
WPSPG-XXLS600	600	250	100	0.8	500
WPSPG-XXLS700	700	250	100	0.8	500
WPSPG-XXLS1000	1000	500	100	0.8	500

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

MINI MELF Series

Part Number	DC Spark-Over Voltage	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V _{MAX})	Surge current capacity (8/20μs)
	V _s (V)	Test Voltage(V)	I _{ROHM} (MΩ)	C(pf)	(A)
WPSPG-XXLS140M	140	50	100	0.8	300
WPSPG-XXLS200M	200	100	100	0.8	300
WPSPG-XXLS300M	300	100	100	0.8	300

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

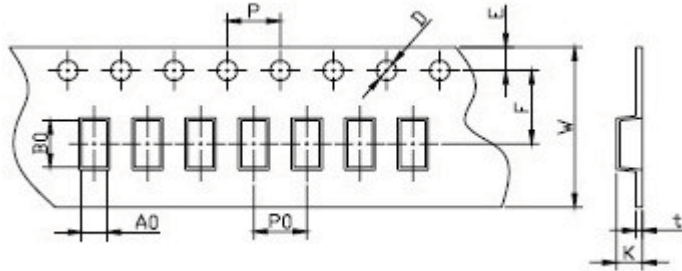
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TEST METHODS AND RESULTS

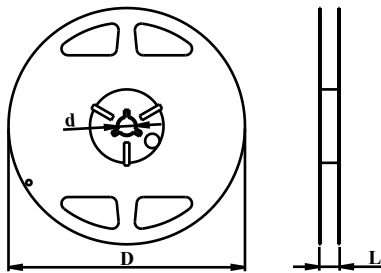
ITEM	TEST METHOD	STANDARD						
DC Spark over Voltage(Vs)	<p>Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within as follow condition.</p> <table border="1"> <tr> <td>Vs <1000V</td> <td>100V/second</td> </tr> <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	<p>The following impulse current for specified current applied ± 5 times at 60 seconds intervals. Thereafter, outer appearance shall be visually examined.</p> <table border="1"> <tr> <td>Type</td> <td>Impulse current</td> </tr> <tr> <td>Mini Melf</td> <td>1.2/50μs & 8/20μs, 300A</td> </tr> <tr> <td>Standard</td> <td>1.2/50μs & 8/20μs, 500A</td> </tr> </table>	Type	Impulse current	Mini Melf	1.2/50μs & 8/20μs, 300A	Standard	1.2/50μs & 8/20μs, 500A	No crack and no failures
Type	Impulse current							
Mini Melf	1.2/50μs & 8/20μs, 300A							
Standard	1.2/50μs & 8/20μs, 500A							
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 end surface of the electrodes. Check for solder adhesion.	The end surface is evenly covered by solder.						
Solder Heat	Measurement after the end surface of the electrodes is dipped up to into 260±5°C solder for 10sec.	Conformed to rated spec.						

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Taping Specifications

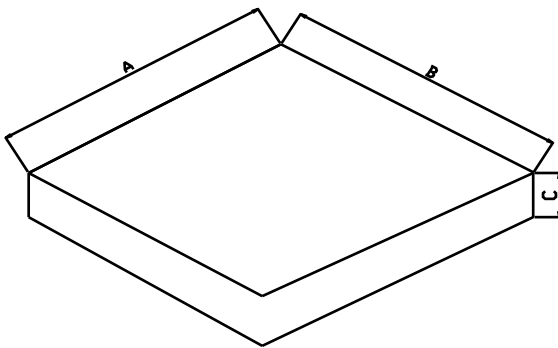


Item	Standard Series	Mini Melf Series
P	4.0 ± 0.1	4.0 ± 0.1
P0	4.0 ± 0.1	4.0 ± 0.1
W	12.0 ± 0.2	8.0 ± 0.3
F	5.5 ± 0.1	3.4 ± 0.1
E	1.75 ± 0.1	1.5 ± 0.1
D	Φ 1.5 ± 0.1	Φ 1.5 ± 0.1
K	2.5 ± 0.1	1.6 ± 0.1
t	0.25 ± 0.05	0.2 ± 0.1
A0	2.4 ± 0.1	1.6 ± 0.1
B0	4.5 ± 0.1	4.0 ± 0.1



Item	Standard Size	Mini Melf Series
D	178mm	178mm
d	13mm	13mm
L	15mm	11mm

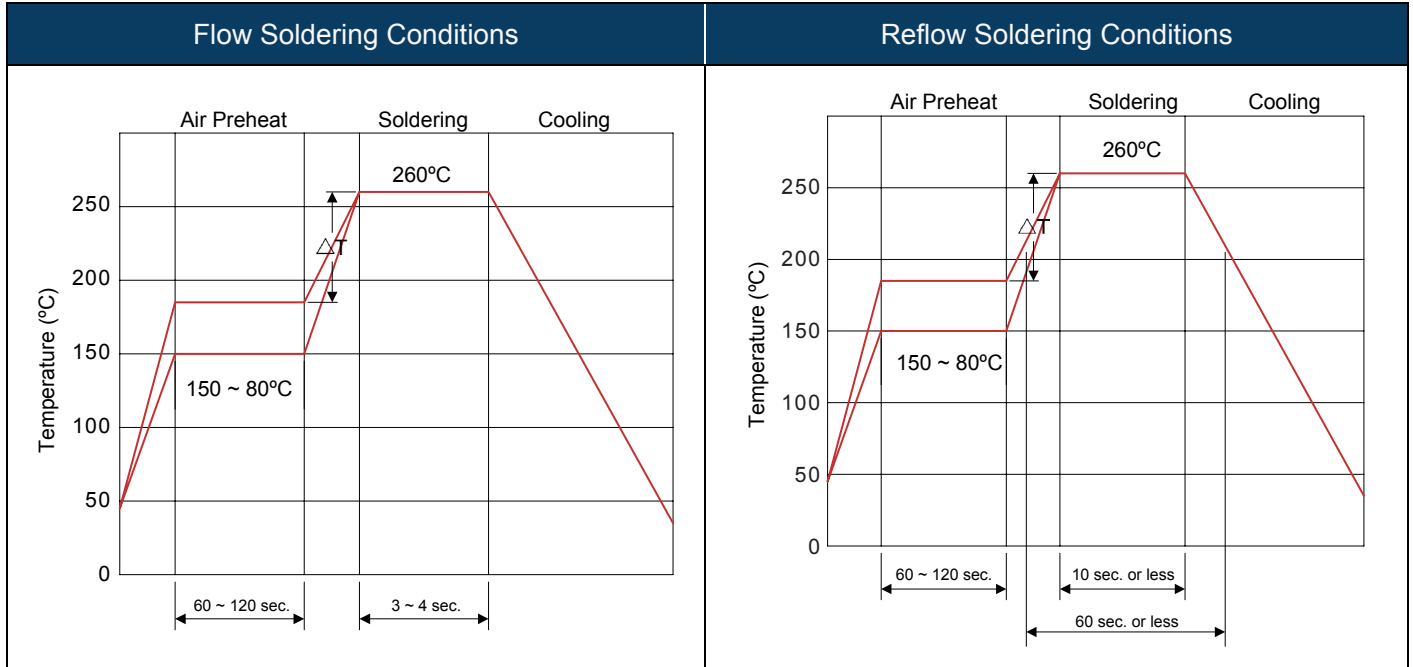
NOTE: 2000 pcs per reel (Std Series)
3000 pcs per reel (mini melf series)



Item	Size (mm)
A	185
B	179
C	67

Note: All dimensions (mm)

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% 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.