

## Spark Gap Protectors (SPG)

### QXA-SMD Series

#### Feature

- ◆ 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 ( $\geq 100\text{M}\Omega$ ).
- ◆ RoHS compliant.
- ◆ Bilateral symmetrical.
- ◆ Temperature, humidity and lightness insensitive.
- ◆ Operating temperature:  $-40 \sim +85 \text{ }^\circ\text{C}$
- ◆ Storage temperature:  $-40^\circ\text{C} \sim +125^\circ\text{C}$
- ◆ 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

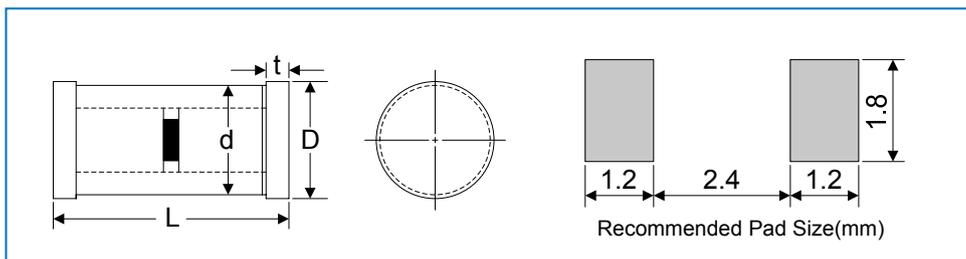
QXA - 201 N - SMD  
 (1) (2) (3) (4)

(1) Series

(2)  $V_s$  Voltage, e.g. 201=20X10 1 =200V

(3)  $V_s$  Voltage tolerance: L -  $\pm 15\%$ , M -  $\pm 20\%$ , N -  $\pm 30\%$

(4) Surface mount devices



Symbo	Dimension (mm)
L	$4.0 \pm 0.5$
D	$\Phi 2.1 \pm 0.5$
d	$\Phi 2.0 \pm 0.5$
T	$0.4 \pm 0.1$

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#### Electrical Characteristics

Part Number	DC Spark-over Voltage	Minimum Insulation Resistance		Maximum Capacitance (1KHz-6V MAX )	Surge Current Capacity (8/20 $\mu$ S)	Surge Voltage Capacity (10/700 $\mu$ s)
	Vs(V)	Test Voltage(V)	IR <sub>OHM</sub> (M $\Omega$ )	C(pf)		
QXA-141N-SMD	140	50	100	0.8	500A	6KV
QXA-201N-SMD	200	100	100	0.8	500A	6KV
QXA-221M-SMD	220	100	100	0.8	500A	6KV
QXA-301M-SMD	300	100	100	0.8	500A	6KV
QXA-401M-SMD	400	250	100	0.8	500A	6KV
QXA-501M-SMD	500	250	100	0.8	500A	6KV
QXA-601M-SMD	600	250	100	0.8	500A	6KV
QXA-701M-SMD	700	250	100	0.8	500A	6KV
QXA-102M-SMD	1000	250	100	0.8	500A	6KV

#### Test Methods and Results

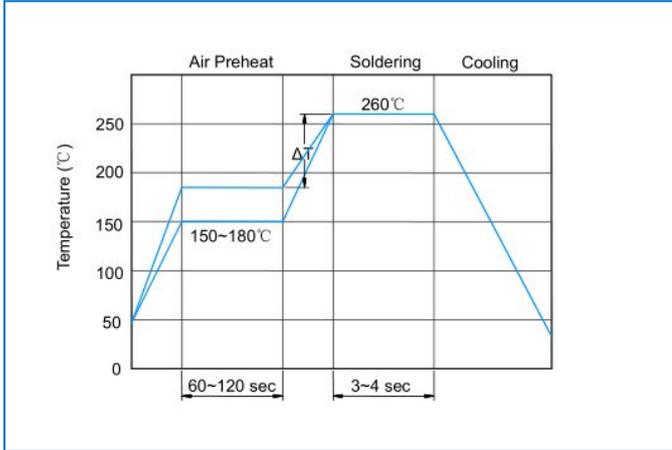
Items	Test Method	Standard
<b>DC Spark-over Voltage</b>	Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within 100V/s(Vs<1000V) or 500V/s(Vs $\geq$ 1000V).	Meet specified value.
<b>Insulation Resistance</b>	Measure the insulation resistance across the terminal at regular voltage. But the test voltage doesn't over the DC spark-over voltage.	
<b>Capacitance</b>	Measure the electrostatic capacitance by applying a voltage of less than 6V (at 1KHz) between terminals.	
<b>Static Life</b>	10KV with 1500pf condenser is discharged through 0 $\Omega$ resistor. 200 times at an interval of 10sec.	Rate-of-change, within $\pm$ 30% insulation resistance & capacitance, conformed to rated spec.
<b>Surge Current Capacity</b>	1.2/50 $\mu$ s & 8/20 $\mu$ s, 500A, $\pm$ 5 times, each time interval 60 seconds. Thereafter, outer appearance shall be visually examined.	No crack and no failures
<b>Cold Resistance</b>	Measurement after -40 $^{\circ}$ C/1000 HRS & normal temperature/2 HRS.	Features are conformed to rated spec.
<b>Heat Resistance</b>	Measurement after 125 $^{\circ}$ C/1000 HRS & normal temperature/2 HRS.	
<b>Humidity Resistance</b>	Measurement after humidity 90~95 $^{\circ}$ (45 $^{\circ}$ C) /1000 HRS & normal temperature/2 HRS.	
<b>Temperature Cycle</b>	10 times repetition of cycle -40 $^{\circ}$ C/30min $\rightarrow$ normal, temp/2 min $\rightarrow$ 125 $^{\circ}$ C/30min, measurement after normal temp/2 HRS.	
<b>Solder Ability</b>	Apply flux and immerse in molten solder 230 $\pm$ 5 $^{\circ}$ C for 3sec up to the point of 1.5mm from body. Check for solder adhesion.	Lead wire is evenly covered by solder.
<b>Solder Heat</b>	Measurement after lead wire is dipped up to the point of 1.5mm from body into 260 $\pm$ 5 $^{\circ}$ C solder for 10sec.	Conformed to rated spec.

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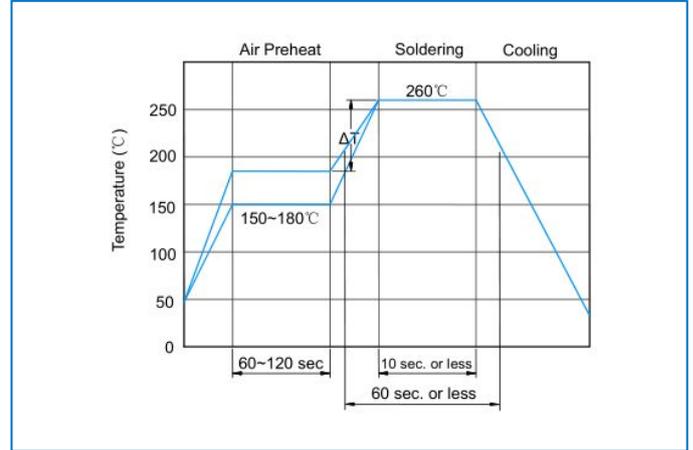
## QXA-SMD Series

### 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°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

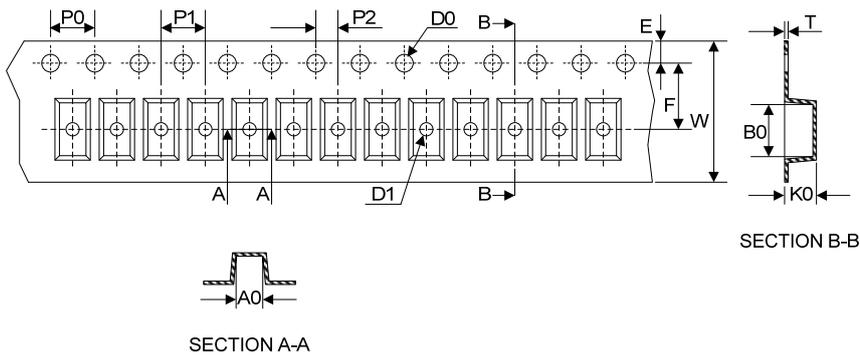
Cleaning time: 5 minutes max.

# Spark Gap Protectors (SPG)

## QXA-SMD Series

### Package Outline & Dimensions

Tape



Symbol	Dimension (mm)
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W	12.00±0.20
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P0	4.00±0.10
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P1	4.00±0.10
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P2	2.00±0.05
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D0	Φ1.5±0.05
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D1	Φ1.0±0.10
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E	1.75±0.10
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F	5.50±0.05
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A0	2.40±0.10
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B0	4.50±0.10
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K0	2.50±0.10
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T	0.25±0.05
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D	178.0
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d	13.0
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L	15.0
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Quantity: 3000PCS

Reel

