

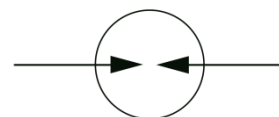
# Spark Gap 1.4x3.4mm SMD

MSA3-MM series

MERITEK

## FEATURES

- Operating Temperature: -40°C ~ +85°C
- Low Electrode Capacitance( $\leq 0.8\text{pf}$ ) And High Isolation( $\geq 100\text{m}\Omega$ )
- Approximately Zero Leaking Current Before Clamping Voltage
- Less Decay At On/Off State
- Temperature, Humidity and Lightness Insensitive
- Meets MSL Level 1, Per J-Std-020
- Compliant with ANSI/UL497B Standard
- UL Safety Approved Certification No: E244458



## APPLICATIONS

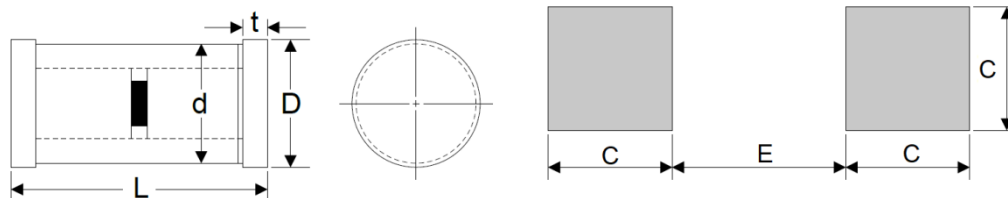
- Telephone/Fax/Modem, Satellite Antenna
- High Frequency Signal Transmitters/Receivers
- Radio Amplifiers, Alarm System, Cathode Ray Tubes in Monitor/TV
- Relay Line Pulse Guarding
- Motor Spark Eliminating



## ELECTRICAL CHARACTERISTICS

MSA3 series	DC Spark-over Voltage	Minimum Insulation Resistance		Maximum Capacitance	Surge Current Capacity
	Vs	VT	IR	1KHz 6V	8/20 $\mu$ s
1.4x3.4mm	(V <sub>bc</sub> )	(V <sub>bc</sub> )	(M $\Omega$ )	(pF)	(A)
MSA33000702MM	140 $\pm$ 30%	50	100	0.8	300
MSA32001002MM	200 $\pm$ 20%	100	100	0.8	300
MSA32001102MM	300 $\pm$ 20%	100	100	0.8	300

## DIMENSIONS



Series	D	d	L	t	C	E
MSA3-MM	1.4 $\pm$ 0.5	1.3 $\pm$ 0.05	3.4 $\pm$ 0.5	0.4 $\pm$ 0.1	1.2	2.0

Unit: mm

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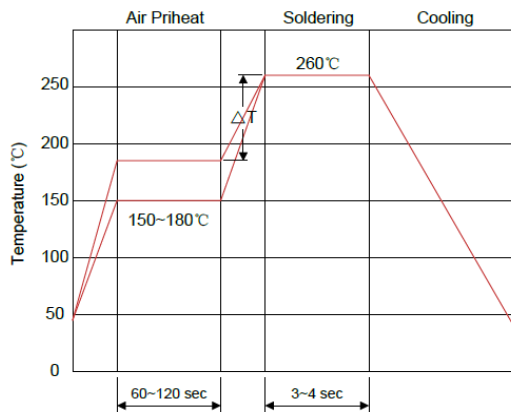
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## TEST METHODS AND RESULTS

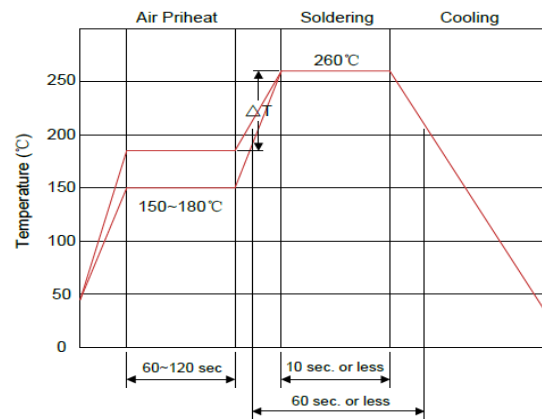
Item	Condition	Requirement
DC Spark-over Voltage	Measure starting discharge voltage (Vs) by gradually increasing applied DC voltage. Test current is 0.5mA max. And the DC voltage ascends up within 100V/s	
Insulation Resistance	Measure the insulation resistance across the terminal at regular voltage. But the test voltage doesn't over the DC spark-over voltage.	Meet specified value.
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%
Surge Current Capacity	1.2/50μs & 8/20μs, 300A, electrically connected with a resistor (2~4Ω), ±5 times, each time interval 60 seconds.	No crack and no failures
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°C (45°C) /1000 HRS & normal temperature/2hrs.	
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.	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 10 seconds.	Conformed to rated spec.

## RECOMMENDED SOLDERING CONDITION

### 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

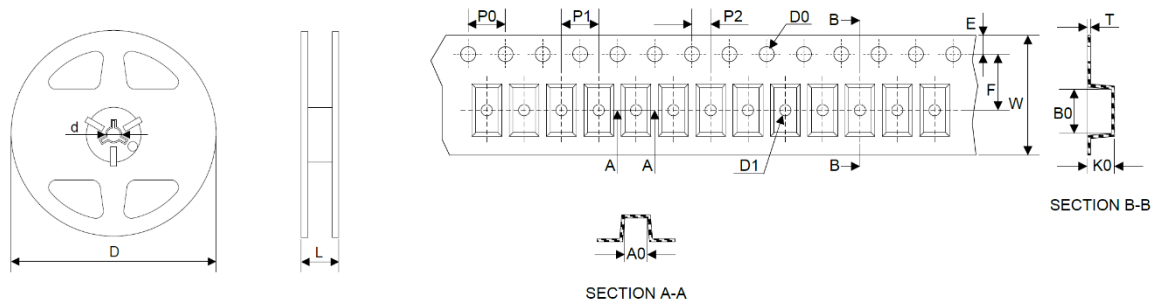
Solder iron temperature: 350±5°C, Heating time: 3 seconds max

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## PACKAGING SPECIFICATION



Item	D ±3	d ±1	L ±3	W ±0.3	P0 ±0.1	P1 ±0.1	P2 ±0.1	D0 ±0.1	D1 ±0.1	E ±0.1	F ±0.1	A0 ±0.1	B0 ±0.1	K0 ±0.1	T ±0.1	PCS
Size	178	13	11	8.0	4.0	4.0	2.0	1.5	1.0	1.5	3.4	1.6	4.0	1.6	0.2	3000

## APPENDIX

### 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 (constraining 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: 40 kHz max
- Output power: 20 W/liter
- Cleaning time: 5 minutes