

SURMOUNT Low Barrier 0201 Silicon Schottky Diode

Rev. V3

Features

- Extremely Low Parasitic Capacitance and Inductance.
- Extremely Small 0201 (600x300um) Footprint
- Surface Mountable in Microwave Circuits. No Wire bonds Required.
- Rugged HMIC Construction with Polyimide Scratch Protection
- Reliable, Multilayer Metalization with a Diffusion Barrier, 100% Stabilization Bake (300°C, 16 hours)
- Available in Pocket Tape and Reel

Description and Applications

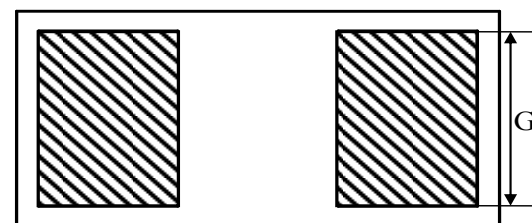
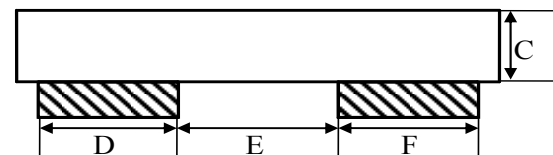
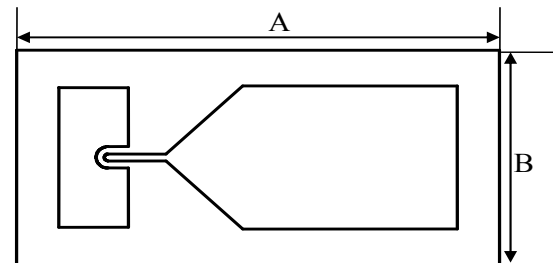
The MA4E2501L-1290 SURMOUNT Diodes are Silicon Low Barrier Schottky Devices fabricated with the patented Heterolithic Microwave Integrated Circuit (HMIC) process. HMIC circuits consist of Silicon pedestals which form diodes or via conductors embedded in a glass dielectric, which acts as the low dispersion, microstrip transmission medium. The combination of silicon and glass allows HMIC devices to have excellent loss and power dissipation characteristics in a low profile, reliable device.

The Surmount Schottky devices are excellent choices for circuits requiring the small parasitics of a beam lead device coupled with the superior mechanical performance of a chip. The SURMOUNT structure employs very low resistance silicon vias to connect the Schottky contacts to the metalized mounting pads on the bottom surface of the chip. These devices are reliable, repeatable, and a lower cost performance solution to conventional devices.

The multi-layer metalization employed in the fabrication of the Surmount Schottky junctions includes a platinum diffusion barrier, which permits all devices to be subjected to a 16-hour non-operating stabilization bake at 300°C.

The extremely small “ 0201 ” outline allows for Surface Mount placement and multi-functional polarity orientations.

The MA4E2501L-1290 SURMOUNT Low Barrier Schottky diode is recommended for use in microwave circuits through Ku band frequencies for lower power applications such as mixers, sub-harmonic mixers, detectors and limiters



Cathode

Anode

Chip Dimensions

dim.	in		mm	
	min.	max.	min.	max.
A	0.023	0.025	0.575	0.625
B	0.011	0.013	0.275	0.325
C	0.004	0.008	0.102	0.203
D	0.006	0.008	0.150	0.200
E	0.007	0.009	0.175	0.225
F	0.006	0.008	0.150	0.200
G	0.009	0.011	0.220	0.270

Electrical Specifications @ + 25 °C

Parameters and Test Conditions	Symbol	Units			
			Min.	Typ.	Max.
Total Capacitance at 0V at 1 MHz	Ct	pF		0.10	0.12
Dynamic Resistance at 9.5 - 10.5mA	Rd	Ohms		10	14
Forward Voltage at +1mA	Vf	Volts		.300	.330
Reverse Breakdown Voltage at -10uA	Vb	Volts	3.0	5	

Absolute Maximum Ratings ¹

Parameter	Absolute Maximum
Operating Temperature	-40 °C to +150 °C
Storage Temperature	-40 °C to +150 °C
Forward Current	20 mA
Reverse Voltage	5 volts.
RF CW Incident Power	+ 20 dBm
RF+DC Dissipated Power	50 mW
Electrostatic Discharge (ESD) Classification ²	Class 0

1. Operation of this device above any one of these parameters may cause permanent damage.

2. Human Body Model

Ordering Information

Part Number	Package	Standard Quantity
MA4E2501L-1290	Die in Carrier	100
MADS-002501-1290LP	Pocket Tape and Reel	3000

Die Bonding

Die attach for these devices is made simple through the use of surface mount die attach technology. Mounting pads are conveniently located on the bottom surface of these devices, and are opposite the active junction. The devices are well suited for high temperature solder attachment onto hard substrates. 80Au/20Sn and Sn63/Pb37 solders are acceptable for usage. Die attach with electrically conductive silver epoxy is not recommended.

For hard substrates, we recommend using a vacuum tip and a force of 60 to 100 grams applied uniformly to the top surface of the device using a hot gas bonder with equal heat applied across the bottom mounting pads of the device. When soldering to soft substrates, it is recommended to use a lead-tin interface at the circuit board mounting pads. Position the die so that its mounting pads are aligned with the circuit board mounting pads. Re-flow the paste by applying equal heat to the circuit at both die mounting pads. The solder joint must not be made one at a time creating unequal heat flow and thermal stress. Solder reflow should not be performed by causing heat to flow through the top surface of the die. Since the HMIC glass is transparent, the edges of the mounting pads can be visually inspected through the die after die attach is completed. Reference M/A-Com application note M538 which can be found @ www.macomtech.com for additional surface mounting information.

Handling Procedures

The following precautions should be observed to avoid damaging these chips:

Cleanliness: The chips should be handled in a clean environment.
Do not attempt to clean die after installation.

Static Sensitivity: Schottky barrier diodes are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.

General Handling: The protective polymer coating on the active areas of these die provides scratch protection, particularly for the metal air bridge which contacts the anode. The use of plastic tipped tweezers or vacuum pickups is strongly recommended. These die are also suitable for automatic pick and place equipment.

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