GaAs Solder Bump Flip Chip Schottky Diode

MADS-001317-1320AG
V1

Features

- Low Series Resistance, 4 Ω
- Low Capacitance, 45 fF
- High Cutoff Frequency
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Solderable Bump Die Attach

Mounting Side with Solder Bumps

Description

M/A-COM's MADS-001317-1320AG is a Gallium Arsenide Flip-Chip Schottky diode with solder bumps.These devices are fabricated on OMCVD epitaxial wafers using a process designed for high device uniformity and extremely low parasitics. This device can be used up to 80 GHz. This diode is fully passivated with silicon nitride and has an additional layer of a polymer for scratch protection. The protective coatings prevent damage to the junction during handling and circuit attachment.

Applications

The high cutoff frequency of this device allows use through millimeter wave frequencies. Typical applications include single and double balanced mixers in PCN tranceivers, radios, police radar detectors and automotive radar detectors

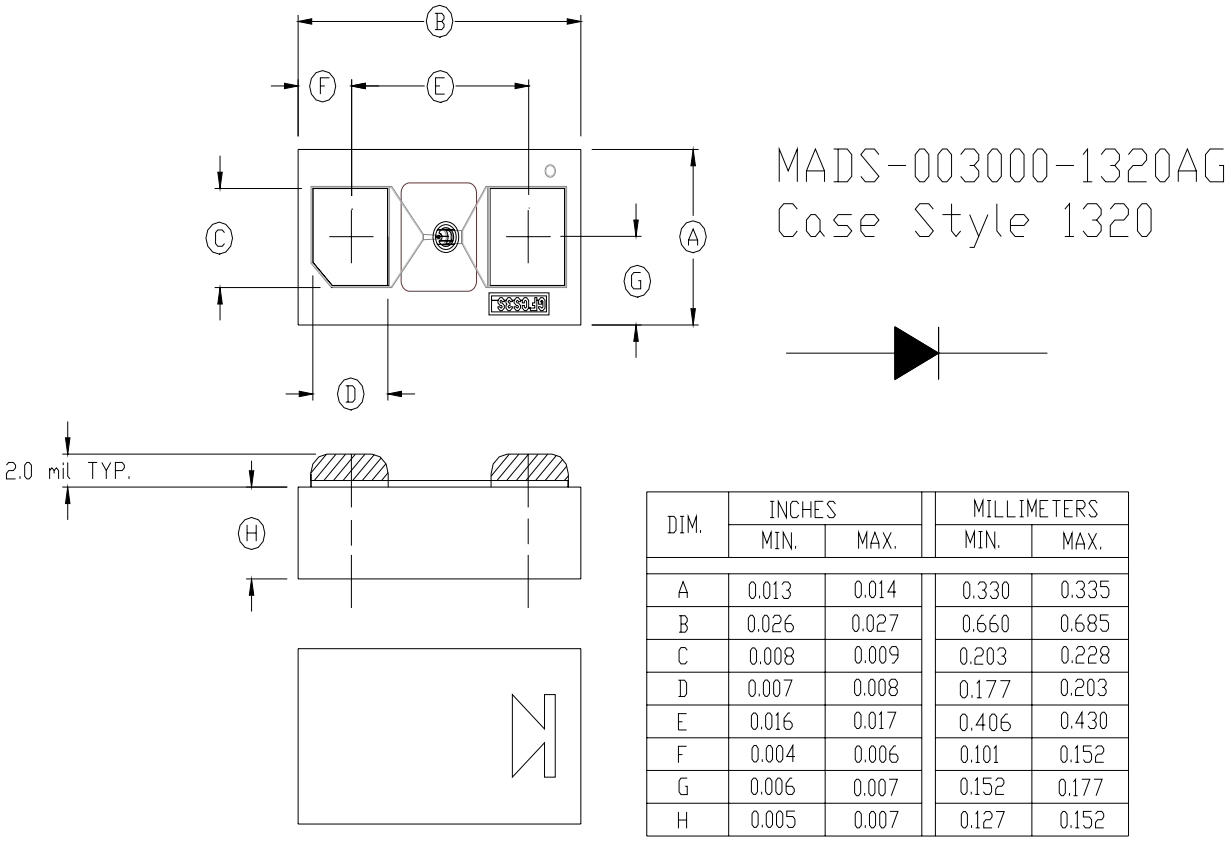
Electrical Specifications T_A = 25 °C

Parameters and Test Conditions	Symbol	Units	MADS-0001317-1320AG		
			Min	Typ.	Max
Junction Capacitance at 0V at 1 MHz	Ct	pF		.020	0.030
Total Capacitance at 0V at 1 MHz[1]	Rs	Ω	.030	.045	.060
Dynamic Resistance at 9.5 mA – 10.5 mA	Vf	Volts		4	7
Reverse Breakdown Voltage at 10uA	Vb	Volts	4.5	7	

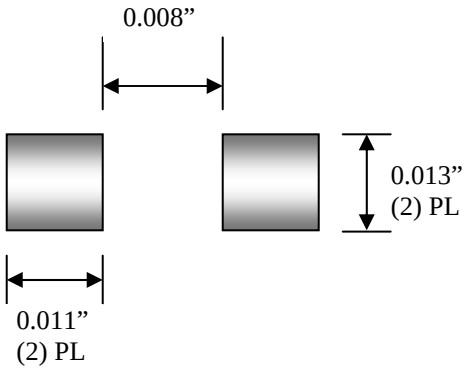
Notes:

1. Total capacitance is equivalent to the sum of junction capacitance Cj and parasitic capacitance Cp.

North America: Tel. (800) 366-2266 Fax (800) 618-8883 ■ Asia/Pacific: Tel. +85 2 2375 0618 Fax +85 2 2375 0350 ■ Europe: Tel. +44 (1344) 869 595 Fax +44 (1344) 300 020



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.013	0.014	0.330	0.335
B	0.026	0.027	0.660	0.685
C	0.008	0.009	0.203	0.228
D	0.007	0.008	0.177	0.203
E	0.016	0.017	0.406	0.430
F	0.004	0.006	0.101	0.152
G	0.006	0.007	0.152	0.177
H	0.005	0.007	0.127	0.152



Circuit Mounting Dimensions (Inches)

North America: Tel. (800) 366-2266 ■ Asia/Pacific: Tel. +85 2 2375 0618 ■ Europe: Tel. +44 (1344) 869 595
Fax (800) 618-8883 Fax +85 2 2375 0350 Fax +44 (1344) 300 020

Device Installation Procedures

The following guidelines should be observed to avoid damaging GaAs Flip-Chips.

Cleanliness

These devices should be handled in a clean environment. Do Not attempt to Clean Die After installation.

Static Sensitivity

Gallium arsenide Schottky diodes are ESD sensitive and can be damaged by static electricity. Since Schottky diodes are rated as Class 0, proper ESD techniques should be used when handling these devices.

General Handling

These devices have a polymer layer which provides scratch protection for the junction area and the anode air bridge. Die can be handled with plastic tweezers or picked and placed automatically with a #27 tip vacuum pencil.

Assembly Requirements using Tin Lead Solder

This Flip Chip Diode employs a 6um thick, Sn 63 / Pb 37 Solderable interface as part of the 50µm high solder bump. These chips are designed to be soldered onto hard or soft substrates with the junction side down. They should be mounted onto silkscreened circuits using 60/40 Sn/Pb solder paste. A typical profile for a Sn 63/ Pb 37 Soldering process is provided in **Application Note, M538 Surface Mounting Instructions** on the M/A-COM website www.macom.com

Typical SPICE PARAMETERS

Is (A)	Rs (Ω)	N	Ct0 (pF)	M	Ik (A)	Vj (V)	FC	BV (V)	IBV (A)
1.7E-14	4.6	1.08	.047	.38	.016	.86	.99	7	1.0E-5

Absolute Maximum Ratings @ 25°C[1]

Parameter	Maximum Ratings
Operating Temperature	-65 °C to +125 °C
Storage Temperature	-65 °C to +150 °C
Incident LO Power	+ 20 dBm
Incident RF Power	+ 20 dBm
Mounting Temperature	+300 °C for 10 seconds

Ordering Information

Part Number	Packaging
MADS-001317-1320AG	Gel Pack

Notes

1.Exceeding these limits may cause permanent damage.

North America: Tel. (800) 366-2266 ■ Asia/Pacific: Tel. +85 2 2375 0618 ■ Europe: Tel. +44 (1344) 869 595
Fax (800) 618-8883 Fax +85 2 2375 0350 Fax +44 (1344) 300 020