MA4E1310

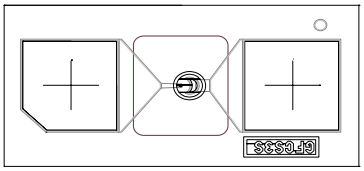
GaAs Flip Chip Schottky Barrier Diode

M/A-COM Products
Rev. V2

Features

- Low Series Resistance
- Low Capacitance
- High Cutoff Frequency
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Designed for Easy Circuit Insertion

Case Style ODS-1278



Description

M/A-COM's MA4E1310 is a gallium arsenide flip chip Schottky barrier diode. This diode is fabricated on a OMCVD epitaxial wafer using a process designed for high device uniformity and extremely low parasitics. This device is fully passivated with silicon nitride and has an additional layer of polyimide for scratch protection. The protective coatings prevent damage to the junction during automated or manual handling. The flip chip configuration is suitable for pick and place insertion.

Applications

The high cutoff frequency of this diode allows use through millimeter wave frequencies. Typical applications include single and double balanced mixers in PCN transceivers and radios, police radar detectors, automotive radar detectors, etc. This device can be used through 110 GHz.

.

ADVANCED: Data Sheets contain information regarding a product MA-COM Technical Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product MA-COM Technical Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
  Visit www.macom.com for additional data sheets and product information.

MA-COM Technical Solutions and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

Electrical Specifications @ + 25 °C

Parameters and Test Conditions	Symbol	Units	MA4E1310		
			Min.	Typ.	Max.
Junction Capacitance at 0V at 1 MHz	Cj	pF		.010	
Total Capacitance at 0V at 1 MHz[1]	Ct	pF	.025	.040	.045
Slope Resistance [2]	Rd	Ohms		7	9
Forward Voltage at 1mA	Vf1	Volts	.60	.70	.80
Reverse Breakdown Voltage at @ 10uA	Vbr	Volts	4.5	7	
SSB Noise Figure (Estimated)	NF	dB		6.5	

Notes:

1. Total capacitance is equivalent to the sum of junction capacitance Cj and parasitic capacitance Cp.
2. Slope Resistance = (Vf1 - Vf2) / (10.5mA - 9.5mA)

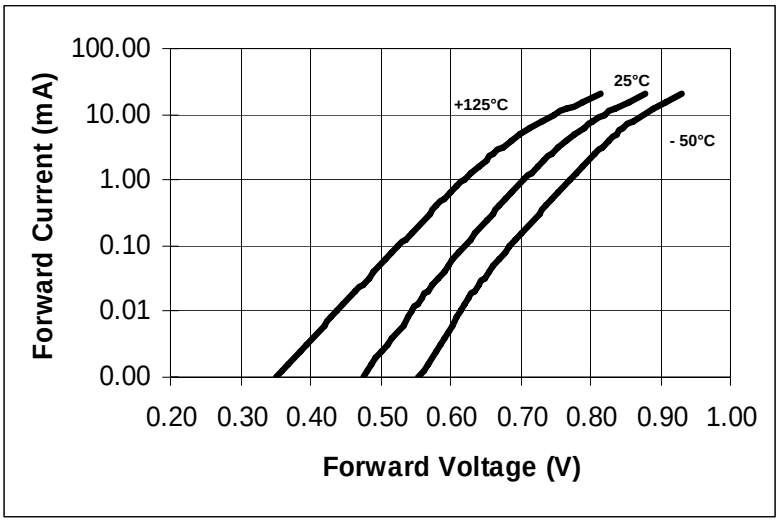
ADVANCED: Data Sheets contain information regarding a product MA-COM Technical Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product MA-COM Technical Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

MA-COM Technical Solutions and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

Forward Current vs Temperature



Absolute Maximum Ratings [1]

Parameter	Absolute Maximum
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	+235°C for 10 seconds
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

ADVANCED: Data Sheets contain information regarding a product MA-COM Technical Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product MA-COM Technical Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

MA-COM Technical Solutions and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

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. Die can be handled with tweezers or vacuum pickups and are suitable for use with automatic pick-and-place equipment.

Mounting Techniques

This device is designed to be inserted onto hard or soft substrates with the junction side down. It can be mounted with conductive epoxy or with a low temperature solder preform. The die can also be assembled with the junction side up, and wire or ribbon bonds made to the pads.

Solder Die Attach:

Solder which does not scavenge gold, such as Indalloy # 2, is recommended. Sn-Pb based solders are not recommended due to solder embrittlement. Do not expose die to a temperature greater than 235°C, or greater than 200°C for longer than 10 seconds. No more than three seconds of scrubbing should be required for attachment.

Epoxy Die Attach:

Assembly can be preheated to 125 - 150 C. Use a minimum amount of epoxy. Cure epoxy as per manufacturer's schedule. For extended cure times, temperatures should be kept below 200 C.

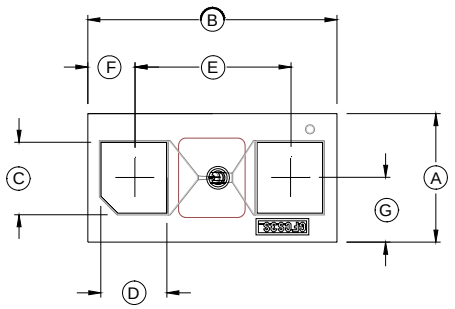
ADVANCED: Data Sheets contain information regarding a product MA-COM Technical Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product MA-COM Technical Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

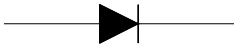
Visit www.macom.com for additional data sheets and product information.

MA-COM Technical Solutions and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

Flip Chip Outline Drawing



MA4E1310
Case Style 1278



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	0.0075	0.0085	0.190	0.216

ADVANCED: Data Sheets contain information regarding a product MA-COM Technical Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product MA-COM Technical Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
  Visit www.macom.com for additional data sheets and product information.

MA-COM Technical Solutions and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.