MADS-011010-1419

MACOM

Schottky Zero Bias Detector Diode Chip

Rev. V2

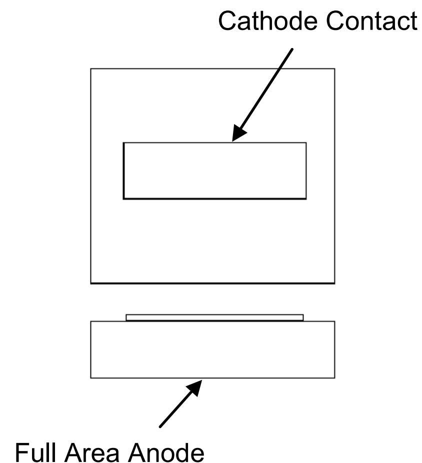
Features

- P-Type Schottky Diode
- Can be used Without External DC Bias
- Large Bondable Contact
- RoHS Compliant
- Available in Chip Form (ODS-1419)
- Can be Mounted with Solder or Conductive Epoxy

Description

The MADS-011010-1419 Zero Bias Detector diode (ZBD) is suitable for use in microstrip or stripline detector circuits. These chips can be used in automatic assembly processes due to their 2.6 x 5.7 mil rectangular gold contact and sturdy construction.

Chip Layout (ODS-1419)



Electrical Specifications @ T_A = +25°C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Breakdown Voltage	I_R = 100 mA	V	1.5	—	—
Forward Voltage	I_F = 0.1 mA	mV	60	—	120
Forward Voltage	I_F = 1 mA	mV	150	—	220
Total Capacitance	V_R = 0.5 V, f = 1 MHz	pF	—	0.15	—
Dynamic Resistance	I_F = 9.5 -10.5 mA	Ω	—	—	40

Absolute Maximum Ratings[1,2]

Parameter	Absolute Maximum
Reverse Voltage	1.5 V
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +150°C
Mounting Temperature	+320°C for 10 seconds
ESD Classification	HBM Class 0

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

Ordering Information

Part Number	Package
MADS-011010-14190G	Gel Pack

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Die Handling and Mounting Information

Handling:
All semiconductor chips should be handled with care in order to avoid damage or contamination from perspiration, salts, and skin oils. For individual die, the use of plastic tipped tweezers or vacuum pick up tools is strongly recommended. Bulk handling should ensure that abrasion and mechanical shock are minimized.

Die Attach:
The die have Ti-Pt-Au back metal and gold plated contact metal. Die can be mounted with a gold-tin, eutectic solder preform or conductive silver epoxy.

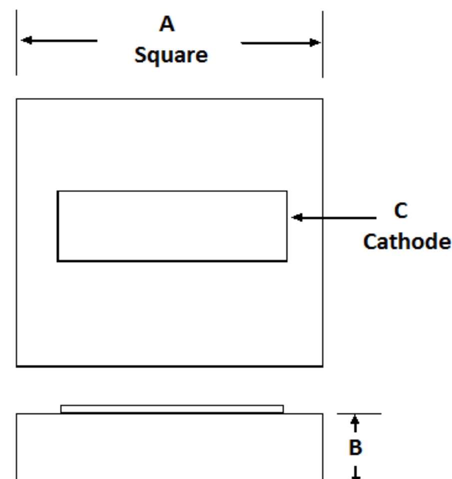
Eutectic Die Attachment Using Hot Gas Die Bonder:
An 80/20, gold tin eutectic solder perform is recommended with a work surface temperature of 255°C and a tool tip temperature of 220°C. When the hot gas is applied, the temperature at the tool tip should be approximately 290°C. The chip should not be exposed to temperature greater than 320°C for more than 10 seconds.

Eutectic Die Attachment Using Reflow Oven:
See Application Note M541, "Bonding and Handling Procedures for Chip Diode Devices". for more detailed handling and assembly instructions.

Epoxy Die Attachment:
A thin, controlled amount of electrically conductive silver epoxy should be applied at approximately 1-2 mils thickness to minimize ohmic and thermal resistances. A thin epoxy fillet should be visible around the perimeter of the chip after placement to ensure full area coverage. Cure conductive epoxy per manufacturer's schedule.

Wire Bonding:
0.001" diameter gold wire is recommended with a stage temperature of 150°C and minimal force. Ultrasonic energy should be adjusted to the minimum required. Automatic ball bonding can also be used.

Chip Outline (ODS-1419)



Chip Dimensions (ODS-1419)[3,4]

Dimension	Mils	mm
A	10.5 +/- 1.0	0.266 +/- 0.025
B	7 +/- 1.0	0.177 +/- 0.025
C	2.6 x 5.7	0.066 x 0.144

3. Topside metal (cathode contact) thickness: 10 microns Au.
4. Backside metal (anode contact) thickness: 0.1 micron Au.

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