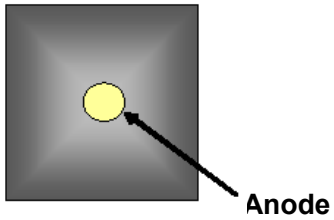
MADP-007320-0DIEWN

Rev. V2

Features

- Low Capacitance
- Fast Switching
- Passivated Mesa Construction
- 100% Tested Bare Die
- RoHS* Compliant



Description

The MADP-007320-0DIEWN is a silicon PIN diode featuring a fully passivated mesa design with tri-metallization for reliable operation under the most demanding conditions. This diode provides low capacitance and fast switching for switches, phase shifters, modulators and high speed attenuators.

Nominal Characteristics (mils.)

Anode Diameter ± 1	Chip Size ± 2	Chip Thickness ± 1
3	15 x 15	5

Electrical Specifications

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Reverse Voltage	V_R = <10 µA	V_{DC}	150	—	—
Reverse Current	V_R = 120 V	nA	—	—	100
Capacitance	C_J @ -10 V, 1 MHz	pF	—	—	0.03
Series Resistance	R_S @ 10 mA, 500 MHz	Ω	—	—	4
Nominal Carrier Lifetime	—	ns	—	120	—
Nominal Theta	—	°C/W	—	60	—

Absolute Maximum Ratings[1,2]

Parameter	Absolute Maximum
Power Dissipation (W)	175°C – T_A°C Theta
Junction Temperature	+175°C
Operating Temperature	-55°C to +175°C
Storage Temperature	-55°C to +200°C
Mounting Temperature	+320°C for 10 seconds

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
MADP-007320-0DIEWN	DIE in waffle pack

Die Handling and Bonding Information:

Handling:

All semiconductor chips should be handled with care to avoid damage or contamination from perspiration, salts, and skin oils. The use of plastic tipped tweezers or vacuum pickup is strongly recommended for the handling and placing of individual components. Bulk handling should ensure that abrasion and mechanical shock are minimized.

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Die Attach Surface:

Die can be mounted with an 80Au/Sn20, eutectic solder preform, RoHS compliant solders or electrically conductive silver epoxy. The metal RF and DC ground plane mounting surface must be free of contamination and should have a surface flatness of < ±0.002”.

Eutectic Die Attachment Using Hot Gas Die Bonder:

A work surface temperature of +255°C is recommended. When hot forming gas (95%N/5%H) is applied, the work area temperature should be approximately +290°C. The chip should not be exposed to temperatures greater than +320°C for more than 10 seconds.

Eutectic Die Attachment Using Reflow Oven:

For recommended reflow profile refer to Application Note 538 “Surface Mounting Instructions”.

Electrically Conductive Epoxy Die Attachment:

A controlled amount of electrically conductive, silver epoxy, approximately 1 - 2 mils in thickness, should be used to minimize ohmic and thermal resistance. 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. Typically +150°C for 1 hour.

Wire and Ribbon Bonding:

The die anode bond pads have a Ti-Pt-Au metallization scheme, with a final gold thickness of 1.0 micron. Thermo-compression or thermo-sonic wedge bonding of either gold wire or ribbon is recommended. A bonder heat stage temperature setting of +200°C, tool tip temperature of +150°C and a force of 18 to 50 grams is suggested. Ultrasonic energy may also be used but should be adjusted to the minimum amplitude required to achieve an acceptable bond. Excessive energy may cause the anode metallization to separate from the chip. Automatic ball or wedge bonding may also be used.

For more detailed handling and assembly instructions, see Application Note M541, “Bonding and Handling Procedures for Chip Diode Devices”.