High Barrier Silicon Schottky Diodes: Bridge Octoquad

V 2.00

MA4E2099-1284

Features

- Designed for High Dynamic Range Applications
- Low Parasitic Capitance and Inductance
- Low Parasitic Resistance
- Recommended for DC-12GHz
- Uniform Electrical Characteristics with Each Junction
- Rugged HMIC Construction with Polyimide Scratch Protection

Description

The MA4E2099-1284 Bridge Octoquad is offered for high dynamic range applications. This device is constructed with Silicon High Barrier Schottky Diodes fabricated with the patented Heterolithic Microwave Integrated Circuit (HMIC) process to ensure electrical characteristics uniformity for each junction. HMIC circuits consist of Silicon pedestals which form diodes or via conductors embedded in a glass dielectric, which acts as the low dispersion, low loss, 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.

Applications

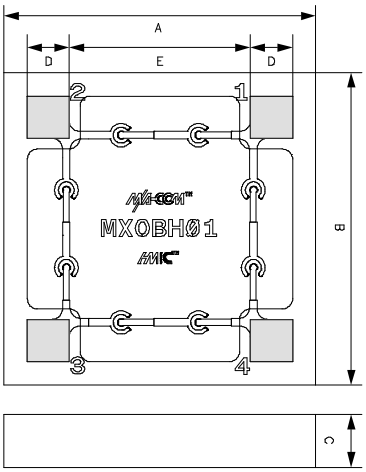
The devices can be used in higher power mixer, detector, and limiter circuits through 12 GHz.

Absolute Maximum Ratings[1] @ +25 °C

Parameter	Value
Operating Temperature	-55 °C to +150 °C
Storage Temperature	-55 °C to +150 °C
Forward Current	20 mA
Reverse Voltage	I -9 V I
RF C.W. Incident Power	+ 25 dBm
RF & DC Dissipated Power	100 mW

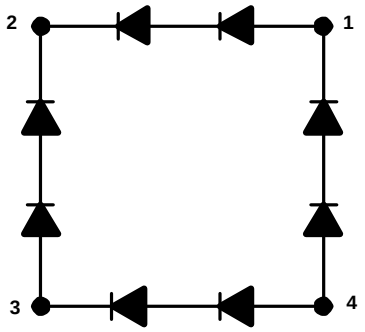
1. Exceeding any of these values may result in permanent damage

ODS-1284 Outline (Topview)



Dim	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	0.0285	0.0297	0.725	0.755
B	0.0285	0.0297	0.725	0.755
C	0.0040	0.0060	0.102	0.153
D Sq.	0.0035	0.0043	0.090	0.110
E	0.0165	0.0173	0.420	0.440

Equivalent Circuit



Electrical Specifications @ 25 °C (Measured at Adjacent Ports: 1-2, 2-3, 3-4, 4-1)

Part Number	Vf @ 1 mA (V)		Vf @ 10 mA (V)		Ct @ 0V (pF)	Vb @10 mA (V)	Rt Slope Resistance (Vf1 - Vf2) / (10.5 mA-9.5 mA) (Ω)
	Min	Max	Min	Max	Typ	Min	Max
MA4E2099-1284	1.08	1.24	1.32	1.52	0.16	9	16

Rt is the dynamic slope resistance where Rt = Rs + Rj, where Rj = 26 / Idc (Idc is in mA) and Rs is the Ohmic Resistance.

Handling

All semiconductor chips should be handled with care to avoid damage or contamination from perspiration and skin oils. The use of plastic tipped tweezers or vacuum pickups is strongly recommended for individual components. The top surface of the die has a protective polyimide coating to minimize damage. Bulk handling should insure that abrasion and mechanical shock are minimized.

The rugged construction of these HMIC devices allows the use of standard handling and die attach techniques. It is important to note however that industry standard electrostatic discharge (ESD) control is required at all times, due to the sensitive nature of Schottky devices having a Class 0 rating.

Die Attach

Die attach for these devices is made through the use of conventional gold plated die attach technology. A vacuum collet or plastic tweezers are recommended for device placement onto the circuit or ground plane. The device backside metal consists of approximately 0.3 um Ti-Pt-Au. This metallization scheme allows for die attach to hard and soft substrates (for via grounding) and Au plated metal ground planes with 80Au/20Sn and Sn63/Pb37 solders. The maximum time-temperature profile is 300 °C for 5 sec. Attachment of die to circuit medium with electrically conductive silver epoxies is also acceptable.

Die Bonding

Wire and ribbon bonding from the topside bond pads to the circuit can be accomplished with 1 mil dia. gold wire or ¼ x 3 mil sq. gold ribbon. Ball bonding, wedge bonding, or thermo-compression bonding are all acceptable. The topside of the die is protected with a durable polymer for impact and scratch protection.

- **North America:** Tel. (800) 366-2266
- **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
- **Europe:** Tel. +44 (1908) 574 200, Fax+44 (1908) 574 300

MA4E2099-1284 High Barrier SPICE PARAMETERS (per Diode)

Is (nA)	Rs (W)	N	Cj0 (pF)	M	Ik (mA)	Vj (V)	FC	BV (V)	IBV (mA)
5.7 E-2	6	1.20	2.4 E-1	0.5	4	8.0 E-2	0.5	5.0	1.0 E-2

Ordering Information

Part Number	Package
MA4E2099-1284W	Wafer on Frame
MA4E2099-1284	Die in Carrier
MA4E2099-1284T	Tape/Reel

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