

X=2200 μm Y=2000 μm

Features

- ◆ RF Frequency: 19 to 33 GHz
- ◆ Conversion loss: 8 dB, (typ.)
- ◆ Image Rejection: 25 dB
- ◆ No External Bias Required
- ◆ Star mixer topology
- ◆ Die Size: 4.4 sq. mm

Performance Characteristics (T_{OP} = 25°C)

Specification	Min	Typ	Max	Unit
RF Frequency	19		33	GHz
LO Frequency	19		33	GHz
IF Frequency	DC		5	GHz
LO Power		16		dBm
Input P1 dB		8		dBm
Input IP3		17		dBm
Downconverter conversion loss		8	11	dB
Image Rejection	20	25		dB
RF Return Loss	10	12		dB
IF Return Loss	10	12		dB
Isolation				
LO-RF	30	35		dB
LO-IF	18	23		dB
RF-IF	19	25		dB

Applications

- ◆ Point-to-Point Digital Radios
- ◆ Point-to-Multipoint Digital Radios
- ◆ Radar

Product Description

The MDB172 is a monolithic HBT schottky diode image-reject mixer designed for use in commercial digital radios and wireless LANs. The mixer requires a 90° off-chip hybrid to achieve signal image rejection, and no external bias is needed. To ensure rugged and reliable operation, HBT devices are fully passivated. Both bond pad and backside metallization are Ti/Au, which is compatible with conventional die attach, thermocompression, and thermosonic wire bonding assembly techniques.

Absolute Maximum Ratings (T_{OP} = 25°C)

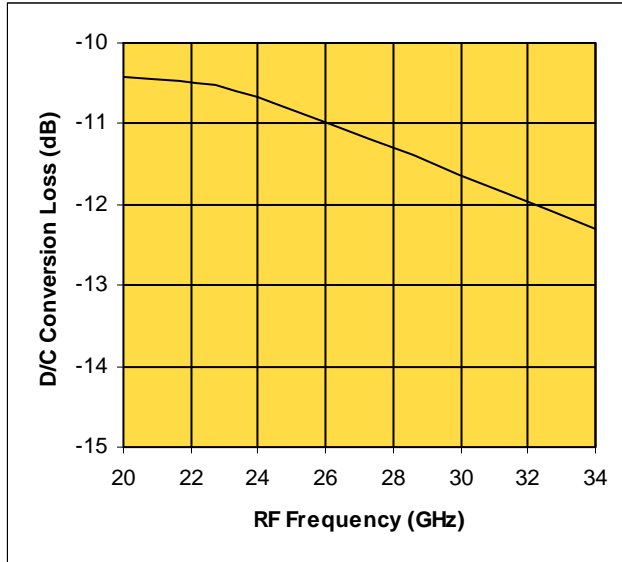
Parameter	Min	Max	Unit
Assy. Temperature (60 seconds)		300	°C

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Measured Performance Characteristics ($T_{OP} = 25^{\circ}C$)

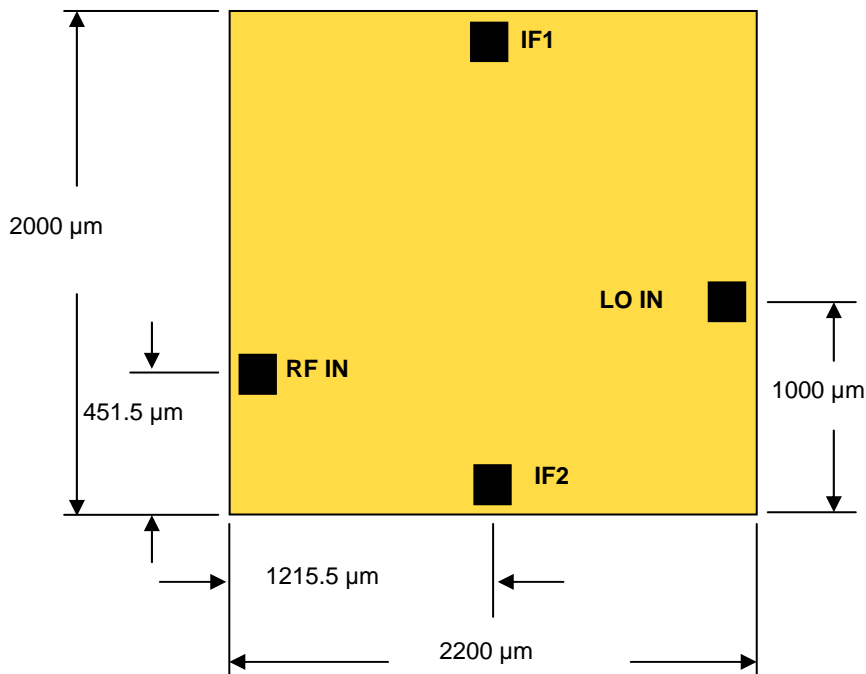
Downconverter Conversion Loss



Single side band measurement without 90° hybrid, and second IF port terminated.

RF=20-34 GHz
LO=17-31 GHz
IF=3 GHz
PLO=+16 dBm
PRF=-20 dBm

Die Size and Bond Pad Locations



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Mixer With a 90 degree Hybrid Application Note

Figure 1 shows the mixer equivalent circuit. Figure 2 depicts the mixer with a 90° hybrid used to achieve signal image rejection. All RF parameters are specified with an ideal 90° hybrid on IF output ports. Conversion loss is measured (on wafer) at IF1 and/or IF2 (figure 1) with the second IF port terminated into 50 ohms. Three dB is then added to compensate for an ideal hybrid. The IP3 is stated as an input IP3 number and is obtained via a two-tone measurement.

Figure 1

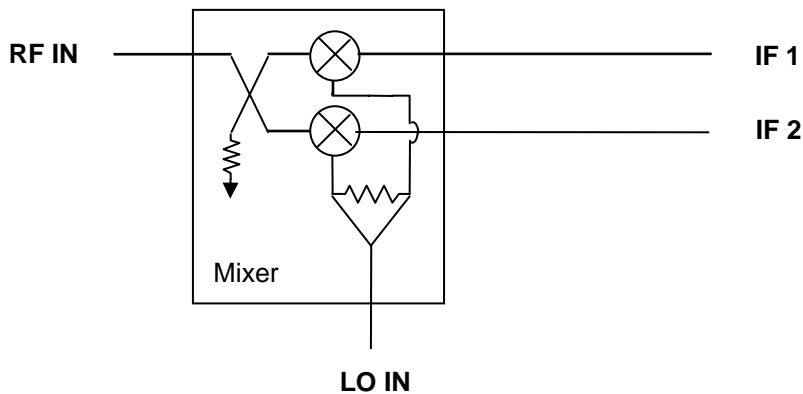
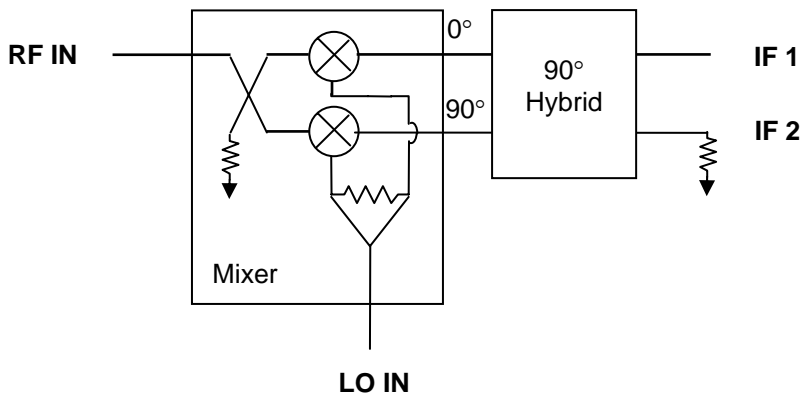


Figure 2



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