

X=1800µm Y=1500µm

Features

- ◆ RF Frequency: 22 to 26.5 GHz
- ◆ LO Frequency: 11 to 13.25 GHz
- ◆ Conversion loss: 9 dB, (typ.)*
- ◆ Image Rejection: 20 dB
- ◆ No External Bias Required
- ◆ Die Size: 2.7 sq. mm

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

Specification	Min	Typ	Max	Unit
RF Frequency	22		26.5	GHz
LO Frequency	11		13.25	GHz
IF Frequency	DC		1	GHz
LO Power		11		dBm
Input P1 dB		0		dBm
Input IP3		9		dBm
Downconverter conversion loss *		9	11	dB
Upconverter conversion loss *		8	10	dB
Image Rejection		20		dB
I/Q Phase Balance		5		Deg
I/Q Amp. Balance		1		dB
RF Return Loss		12		dB
IF Return Loss		12		dB
Isolation				
LO-RF		20		dB
LO-IF		30		dB

* With 90 deg. Hybrid

Applications

- ◆ Point-to-Point Digital Radios
- ◆ Point-to-Multipoint Digital Radios
- ◆ VSAT

Product Description

The MDB224 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)

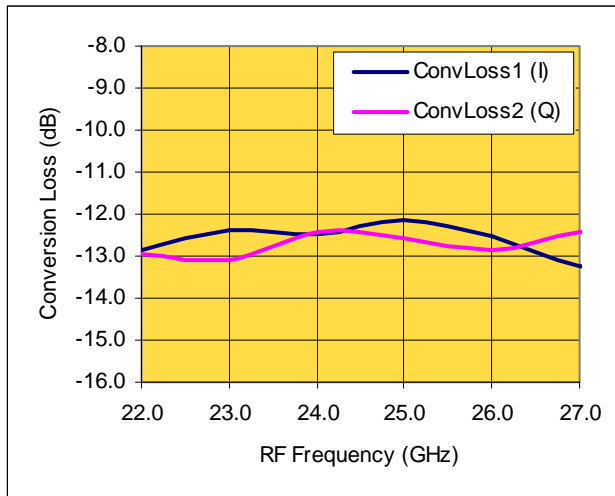
Parameter	Min	Max	Unit
Assy. Temperature (60 seconds)		300	°C

Note: The data contained in this document is for information only. Northrop Grumman reserves the right to change without notice the specifications, designs, prices or conditions of sale, as they apply to this product. The product represented by this datasheet is subject to U.S. Export Law as contained in ITAR or the EAR regulations.



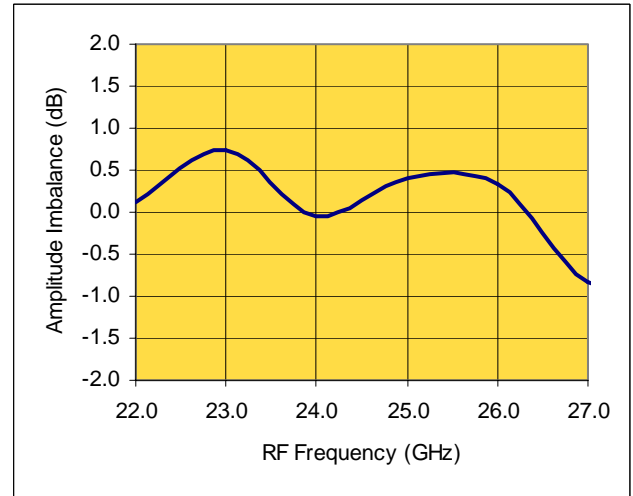
Measured Performance Characteristics ($T_{OP} = 25^{\circ}C$)

Downconverter Conversion Loss



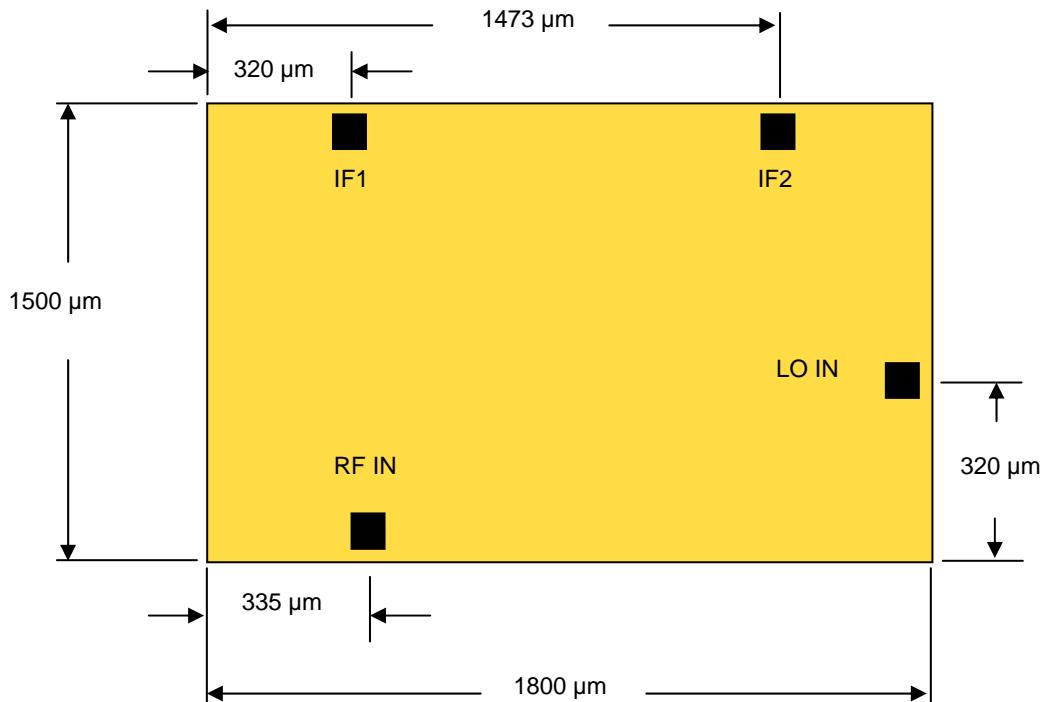
Single Ended measurements without 90° hybrid, and second IF port terminated.

Port to Port Amplitude Imbalance



IF=1 GHz
LO=10.5-13 GHz
PRF=-20 dBm
PLO=+11 dBm

Die Size and Bond Pad Locations



Note: The data contained in this document is for information only. Northrop Grumman reserves the right to change without notice the specifications, designs, prices or conditions of sale, as they apply to this product. The product represented by this datasheet is subject to U.S. Export Law as contained in ITAR or the EAR regulations.



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

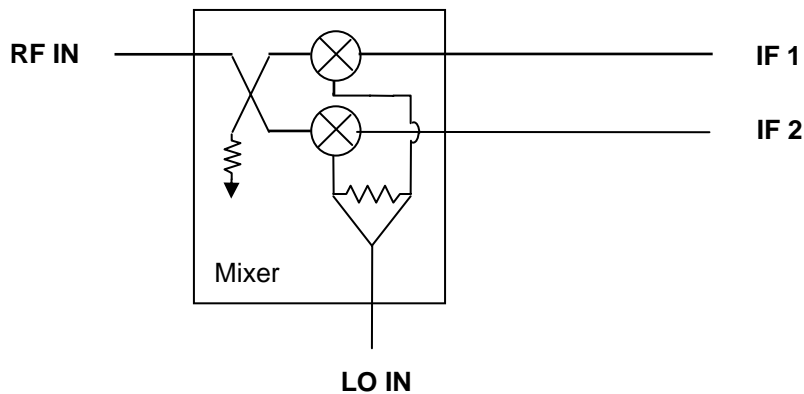
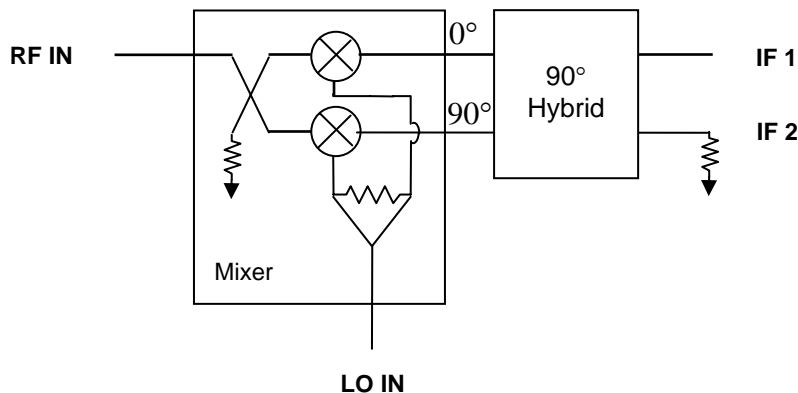


Figure 2



Note: The data contained in this document is for information only. Northrop Grumman reserves the right to change without notice the specifications, designs, prices or conditions of sale, as they apply to this product. The product represented by this datasheet is subject to U.S. Export Law as contained in ITAR or the EAR regulations.