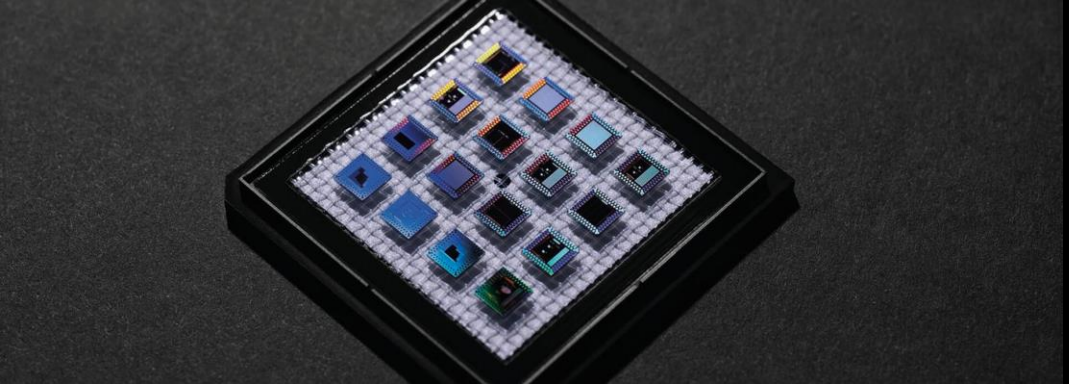


MDJ187
40-76 GHz
InP Schottky Diode Mixer

PRODUCT DESCRIPTION

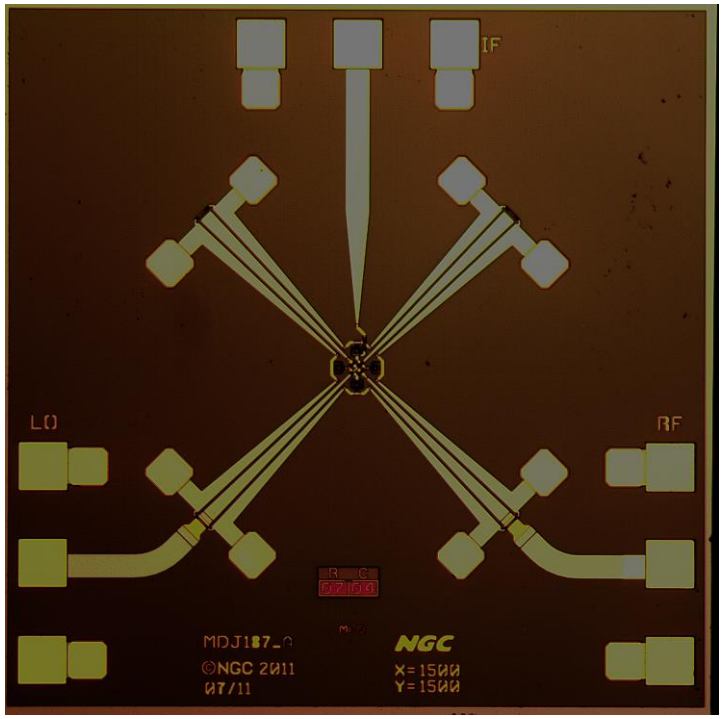
The MDJ187 is a V & E-Band monolithic InP Schottky diode, double balanced mixer designed for use in commercial digital radios, wireless LANs. Radar, Satcom & Test Equipment. The design requires no external bias and can be used as an upconverter and as a downconverter. To ensure rugged and reliable operation, the InP Schottky 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.

APPLICATIONS

- Short Haul / High Capacity Radios
- Point-to-Multi-Point Equipment
- Military Radar, ECM & EW
- SATCOM
- E-Band Radio Links & Automotive Radar
- E-Band Test equipment and sensors

PRODUCT FEATURES

- Passive Double Balanced Mixer
- RF/LO: 40-76 GHz
- IF: DC-25 GHz (min)
- Upconverter Conversion Loss < 7.5 dB
- Downconverter Conversion Loss < 9 dB
- IP1dB =<2 dBm @ Pin=9 dBm
- LO Input Power 7-11 dBm
- RF & LO ports are interchangeable.
- Chip Size: 1.5 mm x 1.5 mm



X=1.5 mm; y=1.5 mm

EXPORT INFORMATION

ECCN: 5A991.h

HTS (Schedule B) code: 8542.39

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

NORTHROP GRUMMAN

MDJ187
40 – 76 GHz
InP Schottky Diode Mixer

ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Unit
Input LO Power	13	dBm
Assy. Temperature (30 sec)	300	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Value	Unit
Input LO Power	7-11	dBm

ELECTRICAL SPECIFICATIONS

Parameter	Min	Typical	Max	Unit
Operational LO Frequency *	40		76	GHz
Operational RF Frequency *	40		76	GHz
Operational IF Frequency	DC		25	GHz
Performance @ LO Power = 9 dBm				
DownConverter Conversion Loss		8	9	dB
UpConverter Conversion Loss		6.5	7.5	dB
LO to RF Isolation	20	30		dB
LO to IF Isolation	14			dB
RF to IF Isolation	18	22		dB
IF to RF Isolation	20			dB

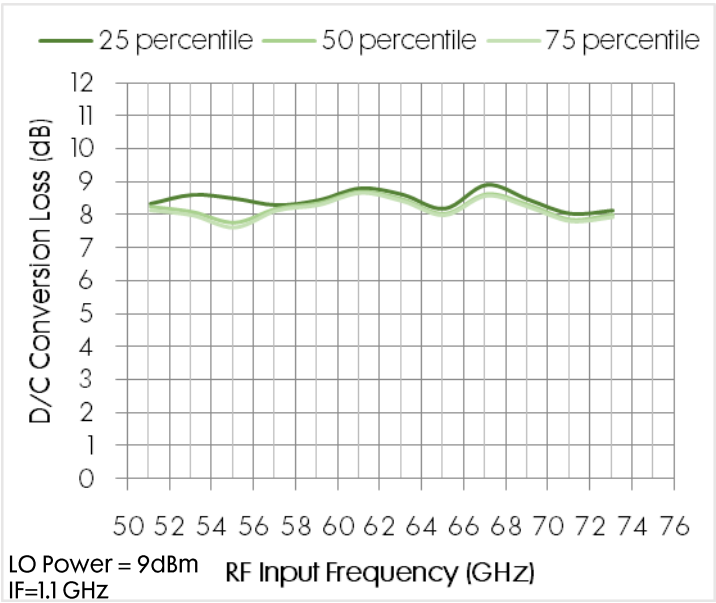
www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

NORTHROP GRUMMAN

MDJ187
40 – 76 GHz
InP Schottky Diode Mixer

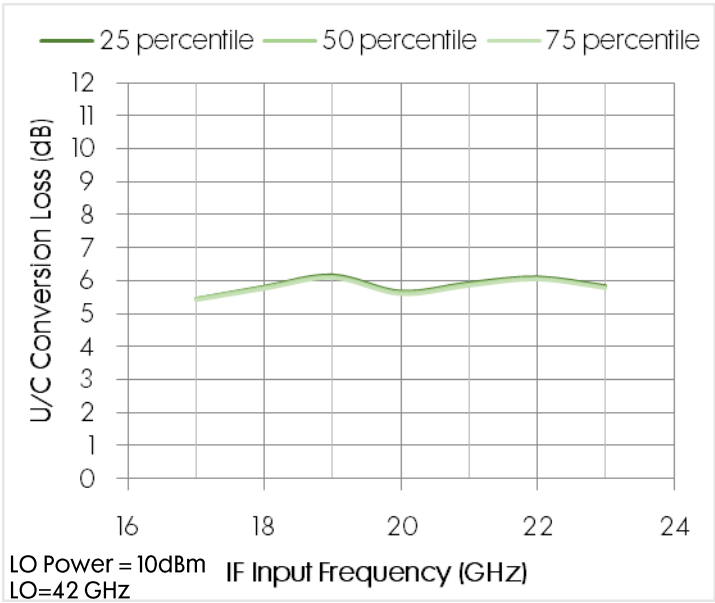
On-wafer measured Upconverter & Downconverter Performance Characteristics (Typical Performance at 25°C)

D/C Conversion Loss Vs. Frequency



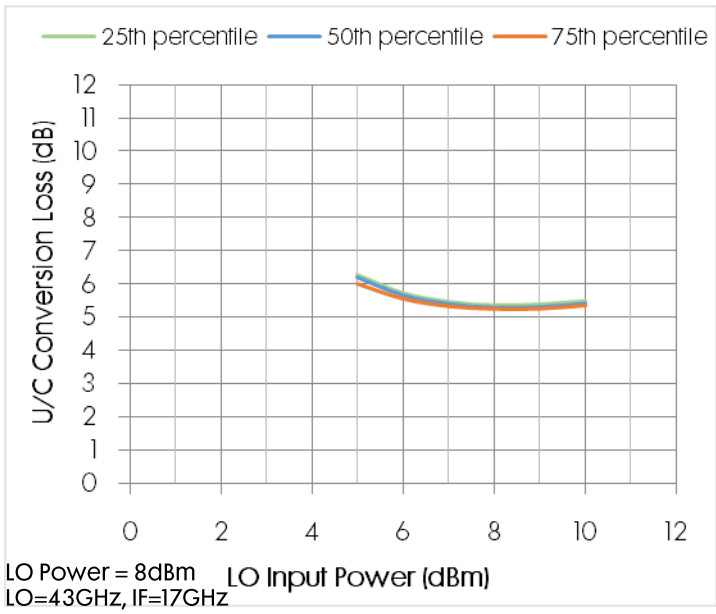
LO Power = 9dBm
IF=1.1 GHz

U/C Conversion Loss Vs. Frequency



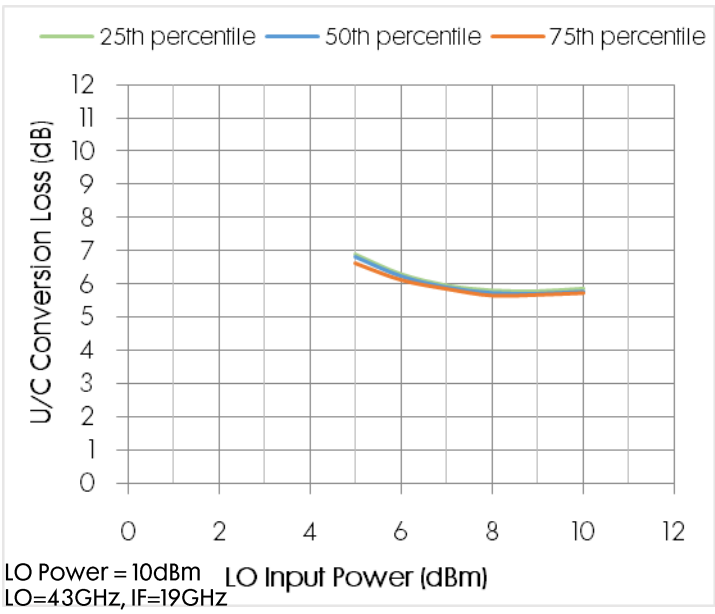
LO Power = 10dBm
LO=42 GHz

U/C Conversion Loss Vs. LO Power



LO Power = 8dBm
LO=43GHz, IF=17GHz

U/C Conversion Loss Vs. LO Power



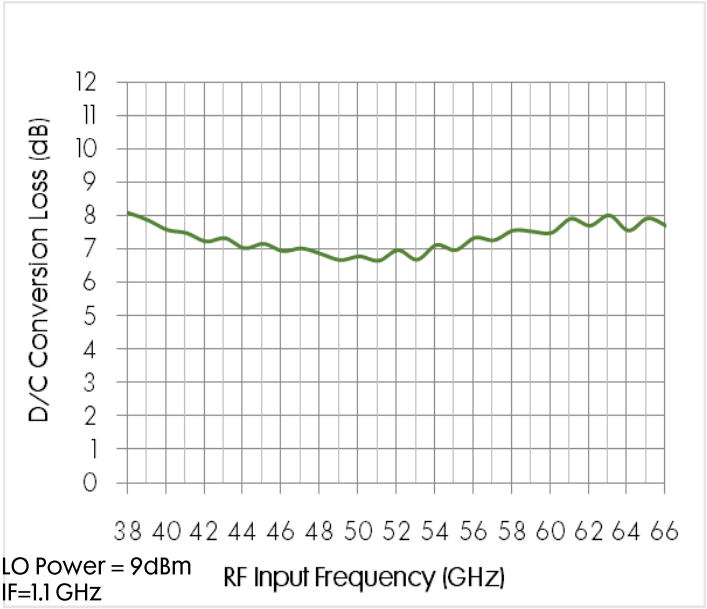
LO Power = 10dBm
LO=43GHz, IF=19GHz

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

MDJ187
40 – 76 GHz
InP Schottky Diode Mixer

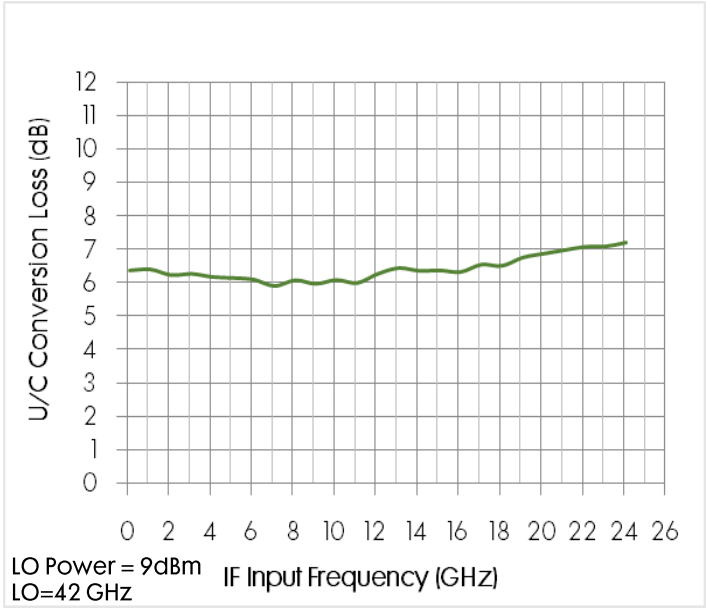
On-wafer measured Upconverter & Downconverter Performance Characteristics (Typical Performance at 25°C)

D/C Conversion Loss Vs. Frequency



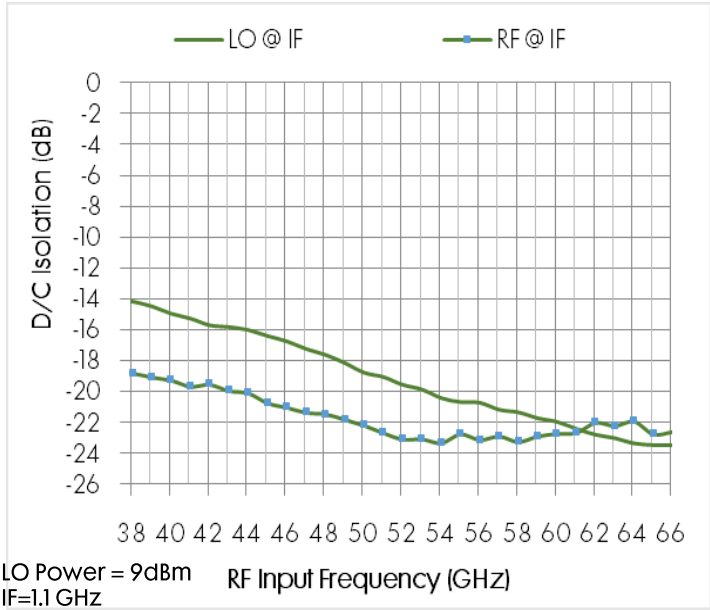
LO Power = 9dBm
IF=1.1 GHz

U/C Conversion Loss Vs. Frequency



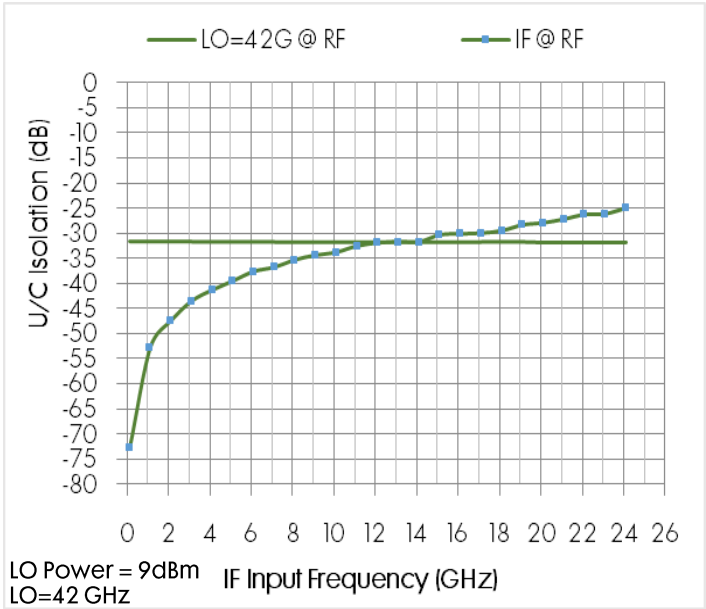
LO Power = 9dBm
LO=42 GHz

D/C Isolation Vs. Frequency



LO Power = 9dBm
IF=1.1 GHz

U/C Isolation Vs. Frequency

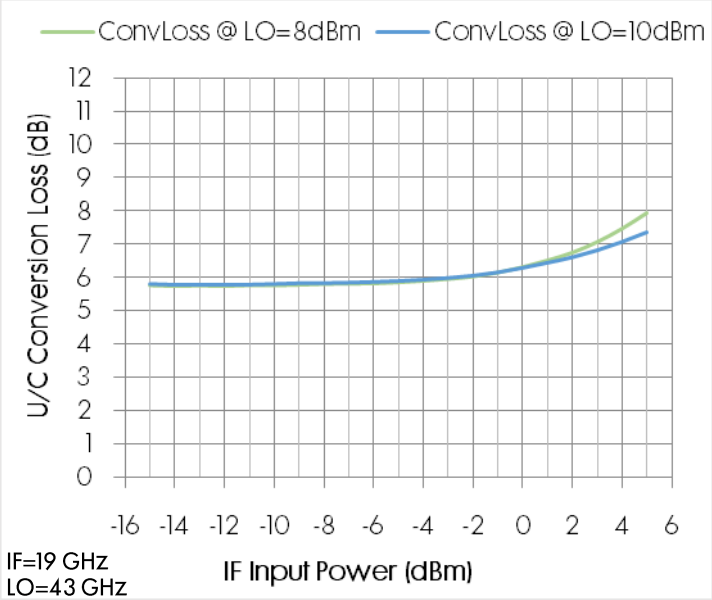


LO Power = 9dBm
LO=42 GHz

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

On-wafer measured Upconverter & Downconverter Performance Characteristics (Typical Performance at 25°C)

Conversion Loss vs. IF Power



IF=19 GHz
LO=43 GHz

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

MDJ187
40 – 76 GHz
InP Schottky Diode Mixer

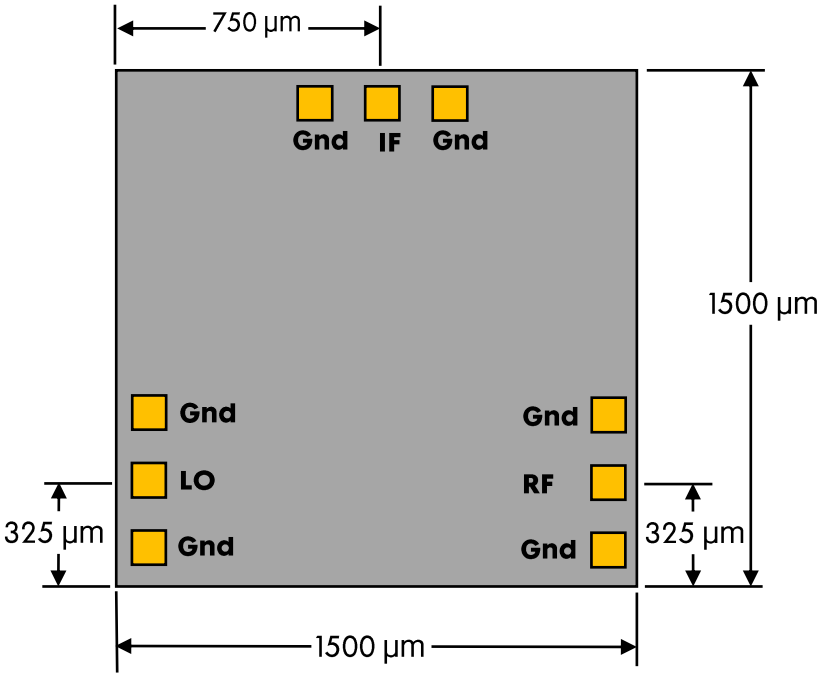
DIE SIZE AND BOND PAD LOCATIONS (NOT TO SCALE)

X = 1500 ± 25 µm

Y = 1500 ± 25 µm

RF Bond Pad = 100 x 100 ± 0.5 µm

Chip Thickness = 76 ± 5 µm



RECOMMENDED ASSEMBLY NOTES

1. Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbon on Ports.

MOUNTING PROCESSES

Most NG InP IC chips have a gold backing and can be mounted successfully using either a conductive epoxy or AuSn attachment. NG recommends the use of conductive epoxy due to the reduced mechanical strain placed on the chip. The two most important factors when mounting these MMICs are to provide a good thermal path and a good RF path to ground. This should be considered when determining the method for attachment.

Note: Many of the NG parts do incorporate airbridges, so caution should be used when determining the pick up tool.

CAUTION: THE IMPROPER USE OF AuSn ATTACHMENT CAN CATASTROPHICALLY DAMAGE InP CHIPS.

PLEASE ALSO REFER TO OUR "GaAs & InP Application Note" BEFORE HANDLING, ASSEMBLING OR BIASING THESE MMICS!

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

NORTHROP GRUMMAN