

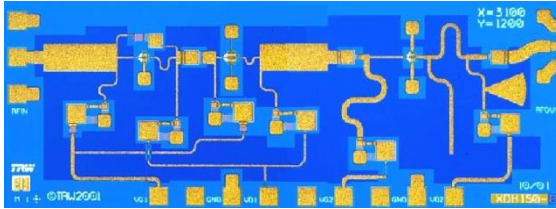
# XDH150

92 – 96 GHz  
X2 Multiplier

**NORTHROP GRUMMAN**

Product Datasheet

Revision: April 2015



X=3100 μm Y=1200 μm

## Applications

- ◆ Short Haul / High Capacity Links
- ◆ Sensors
- ◆ Radar

## Features

- ◆ X2 Active Multiplier
- ◆ Input frequency: 46 to 48 GHz
- ◆ Output frequency: 92 to 96 GHz
- ◆ Conversion Gain: 3 dB (typ.)
- ◆ Conversion Gain @ ~Pinchoff: 5 dB (typ.)
- ◆ RF Input Power: -5 dB (typ.)
- ◆ Die Size: < 3.8 sq. mm

## Product Description

The XDH150 is a monolithic HEMT multiplier designed for use in commercial digital radios and wireless LANs. To ensure rugged and reliable operation, HEMT 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.

## Performance Characteristics (T<sub>OP</sub> = 25°C)

Specification	Min	Typ	Max	Unit
Input Frequency	46		48	GHz
Output Frequency	92		96	GHz
Input Power		-5		dBm
Output Power	-4	-2		dBm
Conversion Gain	1	3		dB
Vd1		4		V
Id1		80		mA
Vd2		4		V
Id2		20		mA
Vg1		0		V
Vg2		-0.1		V
Conversion Gain @ ~Pinchoff		5		dB
Id2 @ ~Pinchoff		0.5		mA

## Absolute Maximum Ratings (T<sub>OP</sub> = 25°C)

Parameter	Min	Max	Unit
Vd1		5.5	V
Id1		90	mA
Vd2		5.5	V
Id2		20	mA
Vg1	-1	+0.3	V
Vg2	-1	+0.3	V
Input Drive Level		0	dBm
Assy. Temperature (60 seconds)		300	°C

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Web: <http://www.as.northropgrumman.com/mps>

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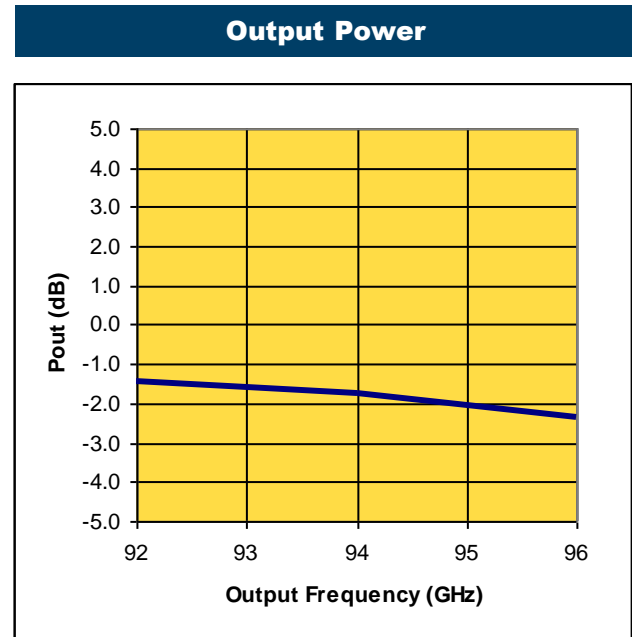
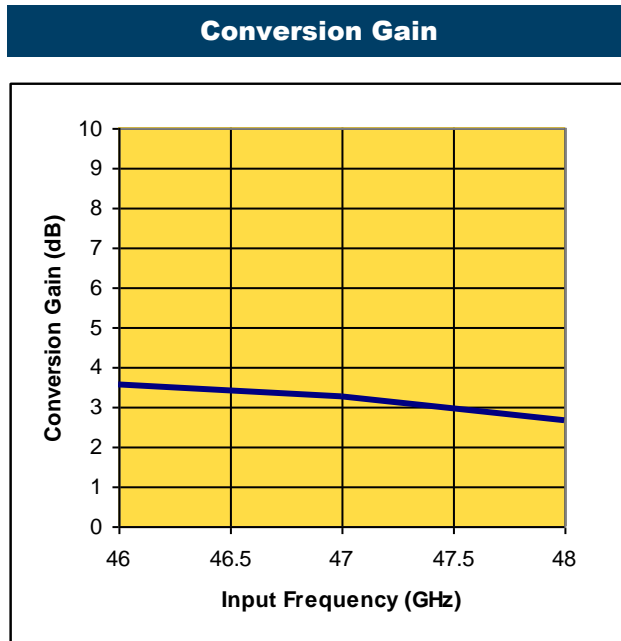
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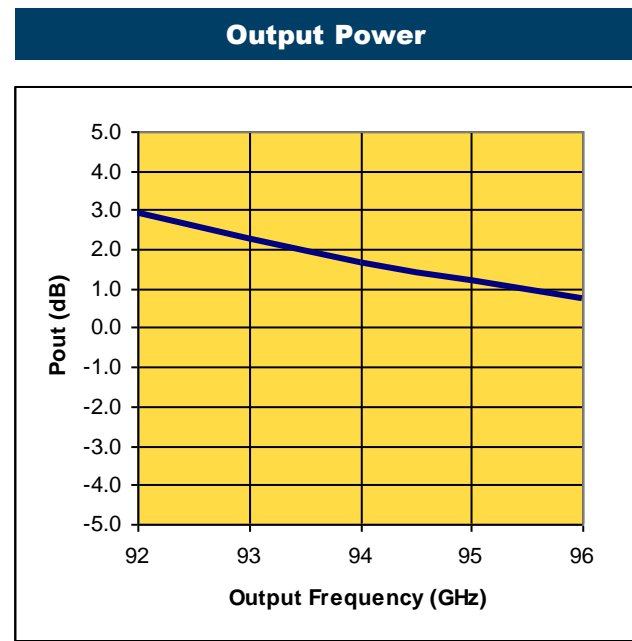
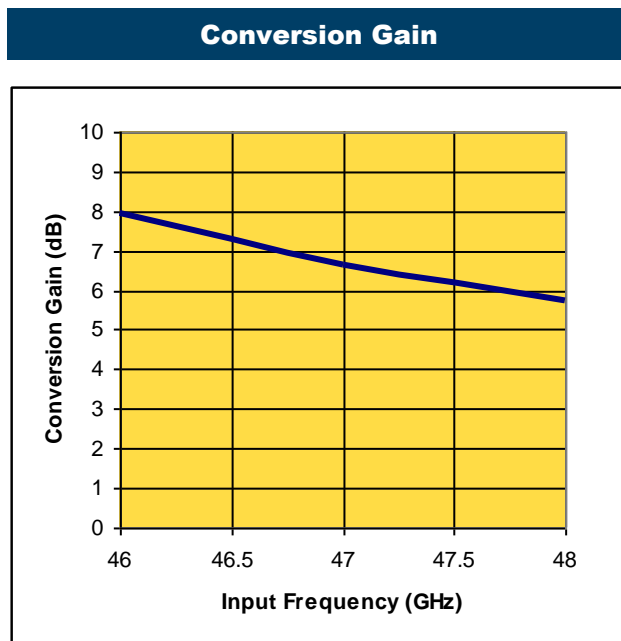
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**On-Wafer Measured Performance Characteristics ( $T_{OP} = 25^{\circ}C$ )**  
 **$P_{in} = -5$  dBm,  $V_d = 4V$ ,  $I_{d1} = 80$  mA,  $I_{d2} = 20$  mA (Screen Specification Conditions)**



**On-Wafer Measured Performance Characteristics ( $T_{OP} = 25^{\circ}C$ )**  
 **$P_{in} = -5$  dBm,  $V_d = 4V$ ,  $I_{d1} = 80$  mA,  $I_{d2} = 0.5$  mA**



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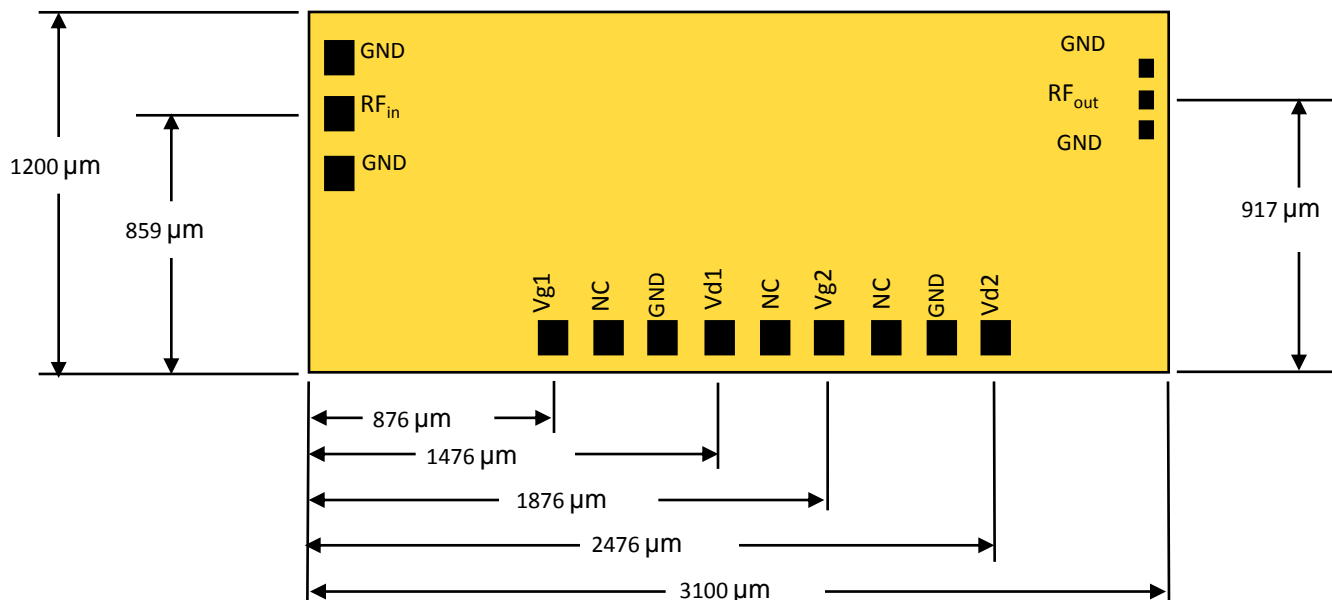
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**Die Size and Bond Pad Locations (Not to Scale)**

X Dimension:  $3100 \pm 25 \mu\text{m}$   
 Y Dimension:  $1200 \pm 25 \mu\text{m}$   
 DC & Input RF Bond Pad Dimension:  $101 \times 101 \mu\text{m} \pm 0.5 \mu\text{m}$   
 Output RF Bond Pad Dimension:  $51 \times 51 \mu\text{m} \pm 0.5 \mu\text{m}$   
 Chip Thickness =  $101 \pm 5 \mu\text{m}$



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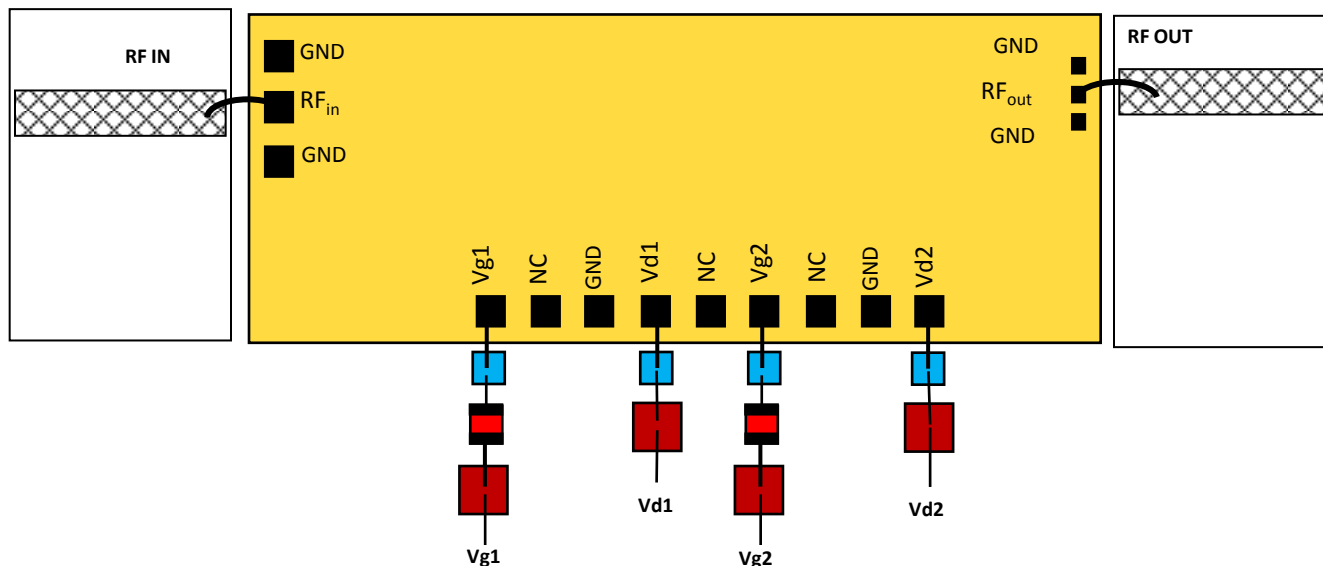
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## Suggested Bonding Arrangement

-  = 0.1uF, 15V (Shunt)
-  = 10 Ohms, 30V (Series)
-  = 100 pF, 15V (Shunt)



### Recommended Assembly Notes

1. Bypass caps should be 100 pF (approximately) ceramic (single-layer) placed no farther than 30 mils from the amplifier.
2. Input bond pad & dc bias pads dimensions are 0.1mm x 0.1mm (4mil x 4mil).
3. Output bond pad dimension is 0.05mm x 0.05mm (2mil x 2mil).
4. Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbon on input bond pads and <6 mil (long) by 1.5 by 0.5 mil ribbon on output bond pads

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