## **HMC368\* PRODUCT PAGE QUICK LINKS**

Last Content Update: 02/23/2017

## COMPARABLE PARTS -

View a parametric search of comparable parts.

### **EVALUATION KITS**

• HMC368LP4 Evaluation Board.

## **DOCUMENTATION**

#### **Data Sheet**

• HMC368 Data Sheet

## REFERENCE MATERIALS 🖵

#### **Quality Documentation**

- Package/Assembly Qualification Test Report: LP4, LP4B, LP4C, LP4K (QTR: 2013-00487 REV: 04)
- Semiconductor Qualification Test Report: PHEMT-F (QTR: 2013-00269)

## DESIGN RESOURCES 🖵

- HMC368 Material Declaration
- PCN-PDN Information
- · Quality And Reliability
- Symbols and Footprints

### **DISCUSSIONS**

View all HMC368 EngineerZone Discussions.

## SAMPLE AND BUY

Visit the product page to see pricing options.

## TECHNICAL SUPPORT 🖳

Submit a technical question or find your regional support number.

#### DOCUMENT FEEDBACK 🖳

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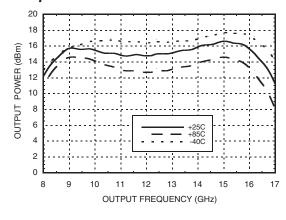


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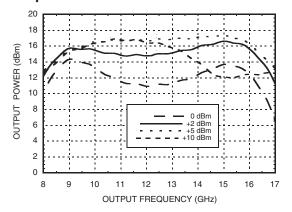


## SMT GaAs PHEMT MMIC AMP-DOUBLER-AMP, 9 - 16 GHz OUTPUT

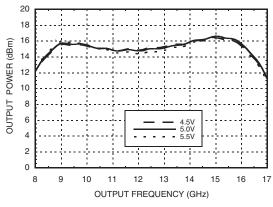
# Output Power vs. Temperature @ +2 dBm Drive Level



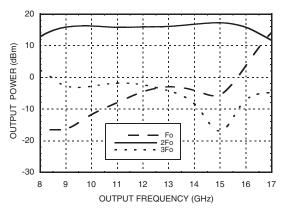
#### **Output Power vs. Drive Level**



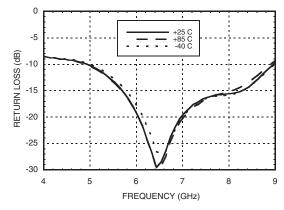
## Output Power vs. Supply Voltage @ +2 dBm Drive Level



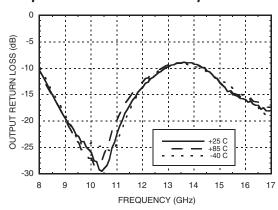
#### Isolation @ +2 dBm Drive Level



## Input Return Loss vs. Temperature



#### **Output Return Loss vs. Temperature**



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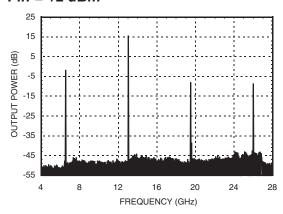


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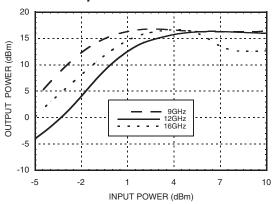


## SMT GaAs PHEMT MMIC AMP-DOUBLER-AMP, 9 - 16 GHz OUTPUT

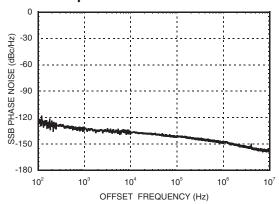
Output Spectrum @ Fin = 6.5 GHz, Pin = +2 dBm



# Output Power vs. Input Power @ Three Frequencies



#### SSB Phase Noise Performance, Fout = 13 GHz, Input Power = +2 dBm





## HMC368LP4 / 368LP4E

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# SMT GaAs PHEMT MMIC AMP-DOUBLER-AMP, 9 - 16 GHz OUTPUT

#### Absolute Maximum Ratings

RF Input ( $Vdd = +5V$ )	+20 dBm		
Supply Voltage, Vd1, Vd2	+6.0V		
Gate Bias Voltage (Vg1, Vg2)	-4 to 0 Vdc		
Channel Temperature	150 °C		
Continuous Pdiss (T = 85 °C) (derate 12.5 mW/°C above 85 °C)	812 mW		
Thermal Resistance (junction to ground paddle)	80 °C/W		
Storage Temperature	-65 to +150 °C		
Operating Temperature	-40 to +85 °C		

#### Typical Supply Current vs. Vdd

Vdd (V)	Idd (mA)
4.5	73
5.0	75
5.5	77

Note: Amp-Doubler-Amp will operate over full voltage range shown above.



ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

## **Outline Drawing**

#### **BOTTOM VIEW** -.016 [0.40] REF .012 \[ 0.30 \] .007 \[ 0.18 \] .008 [0.20] MIN 19 PIN 1 HNNN XXXX 13 EXPOSED GROUND PADDLE LOT NUMBER MUST BE CONNECTED TO RF/DC GROUND **SQUARE** 0.05 1. LEADFRAME MATERIAL: COPPER ALLOY

#### 

SEATING PLANE

- 2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
- 3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
- 4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
- 5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
- 6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
- 7. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

#### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [3]
HMC368LP4	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 [1]	H368 XXXX
HMC368LP4E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [2]	<u>H368</u> XXXX

- [1] Max peak reflow temperature of 235  $^{\circ}\text{C}$
- [2] Max peak reflow temperature of 260  $^{\circ}\text{C}$
- [3] 4-Digit lot number XXXX

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#### **Pin Description**

Pin Number	Function	Description	Interface Schematic	
1, 5-14, 18, 19, 24	N/C	No Connection. These pins may be connected to RF ground. Performance will not be affected.		
3	RFIN	Multiplier Input. AC Coupled. No external DC blocks required.	RFIN O——	
2, 4, 15, 17	GND	All ground leads and ground paddle must be soldered to PCB RF/DC ground.	GND	
16	RFOUT	Multiplied Output. AC coupled. No external DC blocks necessary.	—  —○ RFOUT	
20, 22	Vd2, Vd1	Drain supply voltage 5V ± 0.5V.	OVd1,Vd2	
21, 23	Vg2, Vg1	Gate supply voltages. Adjust between -2 Vdc to 0 Vdc to achieve 75 mA drain current.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	



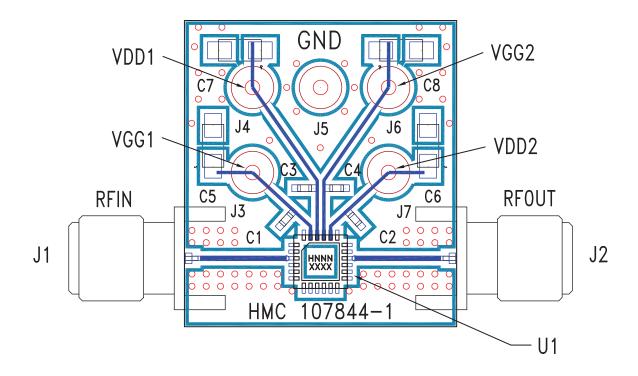
## HMC368LP4 / 368LP4E

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## SMT GaAs PHEMT MMIC AMP-DOUBLER-AMP, 9 - 16 GHz OUTPUT

#### **Evaluation PCB**



#### List of Materials for Evaluation PCB 107846 [1]

Item	Description	
J1 - J2	PCB Mount SMA Connector	
J3 - J7	DC Pin	
C1 - C4 100 pF capacitor, 0402 Pkg.		
C5 - C8	2.2 µF capacitor, case size A	
U1	HMC368LP4 / HMC368LP4E Amp-x2-Amp	
PCB [2]	107844 PCB	

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the final application should be generated with proper RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. The evaluation circuit board shown is available from Hittite upon request.