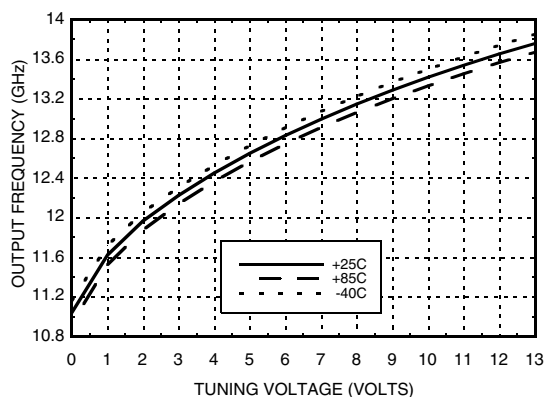
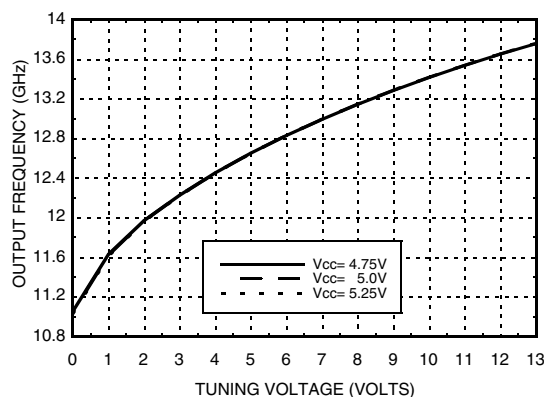
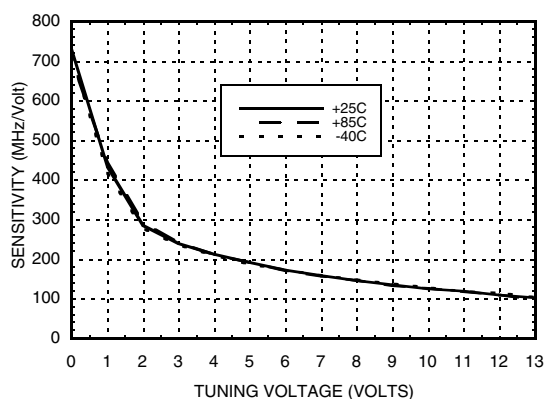
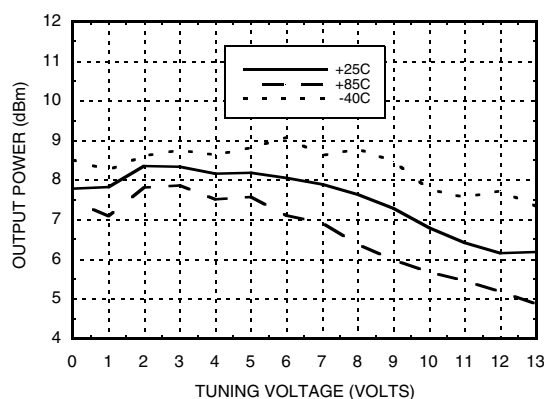
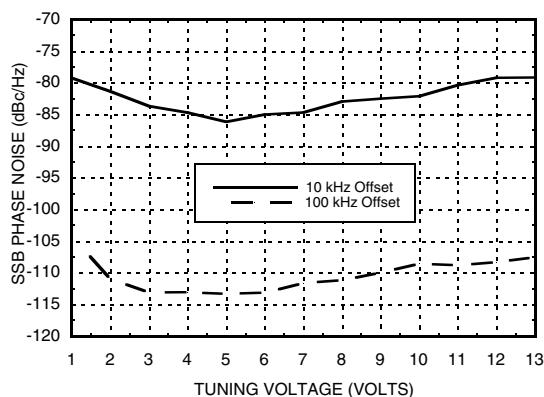
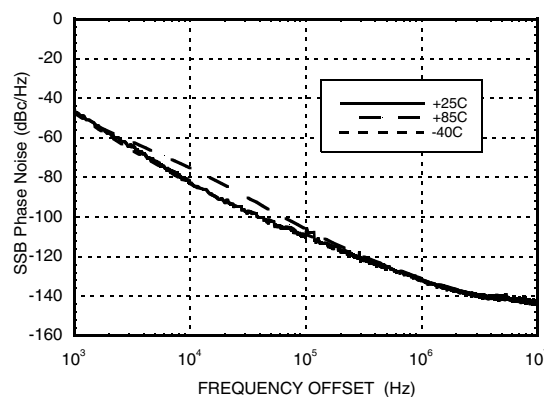
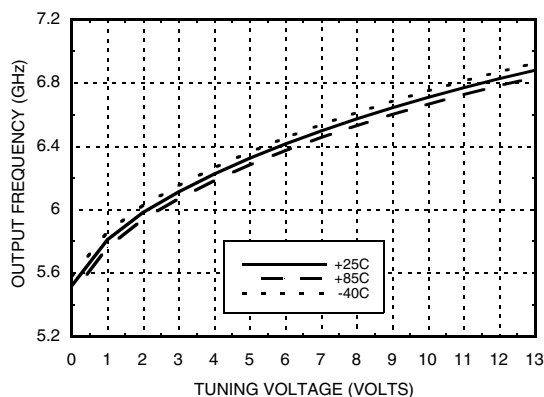
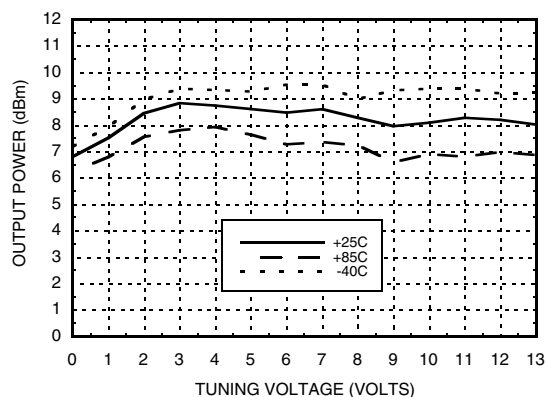
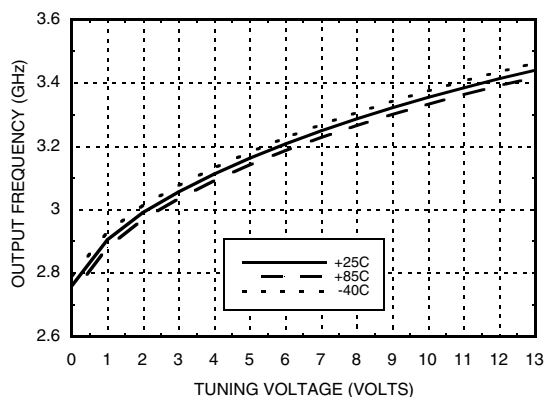
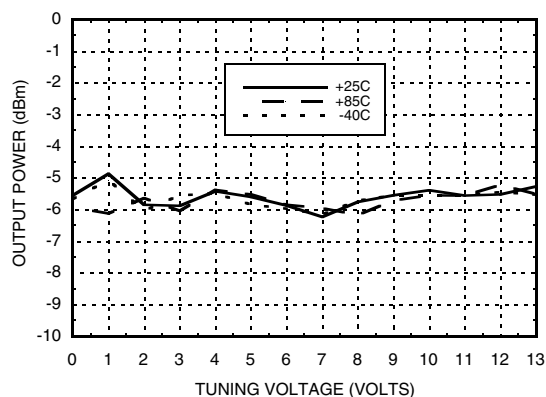


**MMIC VCO w/ HALF FREQUENCY OUTPUT  
& DIVIDE-BY-4, 12.4 - 13.4 GHz**
**Frequency vs. Tuning Voltage,  $V_{CC} = +5V$** 

**Frequency vs. Tuning Voltage,  $T = 25^{\circ}C$** 

**Sensitivity vs. Tuning Voltage,  $V_{CC} = +5V$** 

**Output Power  
vs. Tuning Voltage,  $V_{CC} = +5V$** 

**SSB Phase Noise vs. Tuning Voltage**

**SSB Phase Noise @  $V_{tune} = +5V$** 



**MMIC VCO w/ HALF FREQUENCY OUTPUT  
& DIVIDE-BY-4, 12.4 - 13.4 GHz**
**RFOUT/2 Frequency  
vs. Tuning Voltage, Vcc= +5V**

**RFOUT/2 Output Power  
vs. Tuning Voltage, Vcc= +5V**

**Divide-by-4 Frequency  
vs. Tuning Voltage, Vcc= +5V**

**Divide-by-4 Output Power  
vs. Tuning Voltage, Vcc= +5V**

**Absolute Maximum Ratings**

Vcc1, Vcc2	+5.5 Vdc
Vtune	0 to +15V
Junction Temperature	135 °C
Continuous P <sub>diss</sub> (T=85 °C) (derate 37 mW/°C above 85 °C)	1.85 W
Thermal Resistance (junction to ground paddle)	27 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

**Typical Supply Current vs. Vcc**

Vcc (V)	I <sub>cc</sub> (mA)
4.75	235
5.00	260
5.25	275

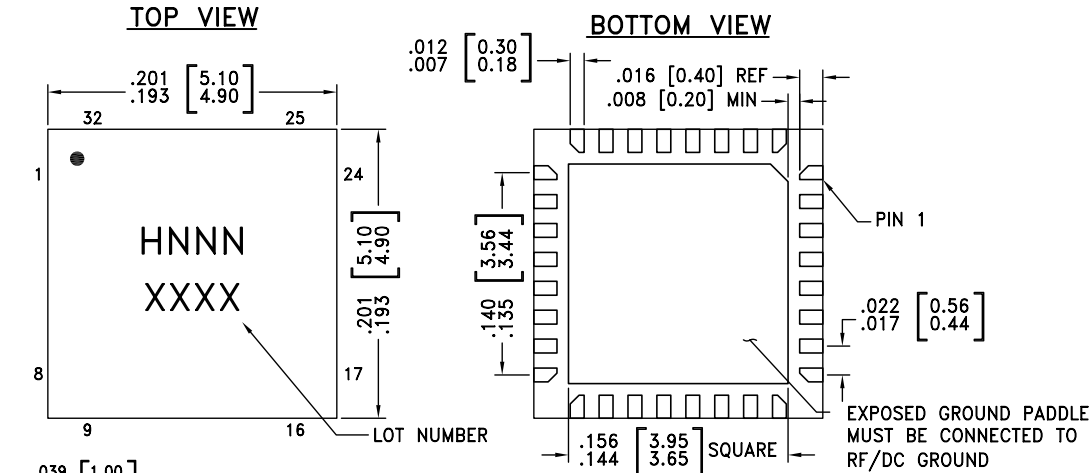
Note: VCO will operate over full voltage range shown above.



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

## MMIC VCO w/ HALF FREQUENCY OUTPUT & DIVIDE-BY-4, 12.4 - 13.4 GHz

### Outline Drawing



#### NOTES:

1. LEADFRAME MATERIAL: COPPER ALLOY
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

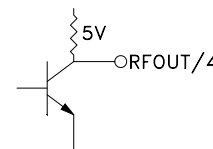
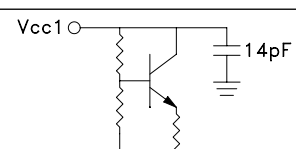
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[3]</sup>
HMC529LP5	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL3 <sup>[1]</sup>	H529 XXXX
HMC529LP5E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 <sup>[2]</sup>	H529 XXXX

[1] Max peak reflow temperature of 235 °C

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

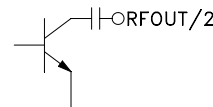
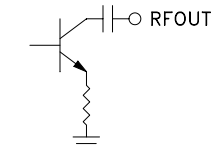
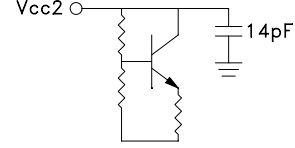
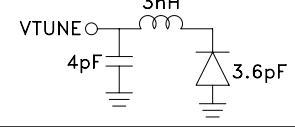

### Pin Descriptions

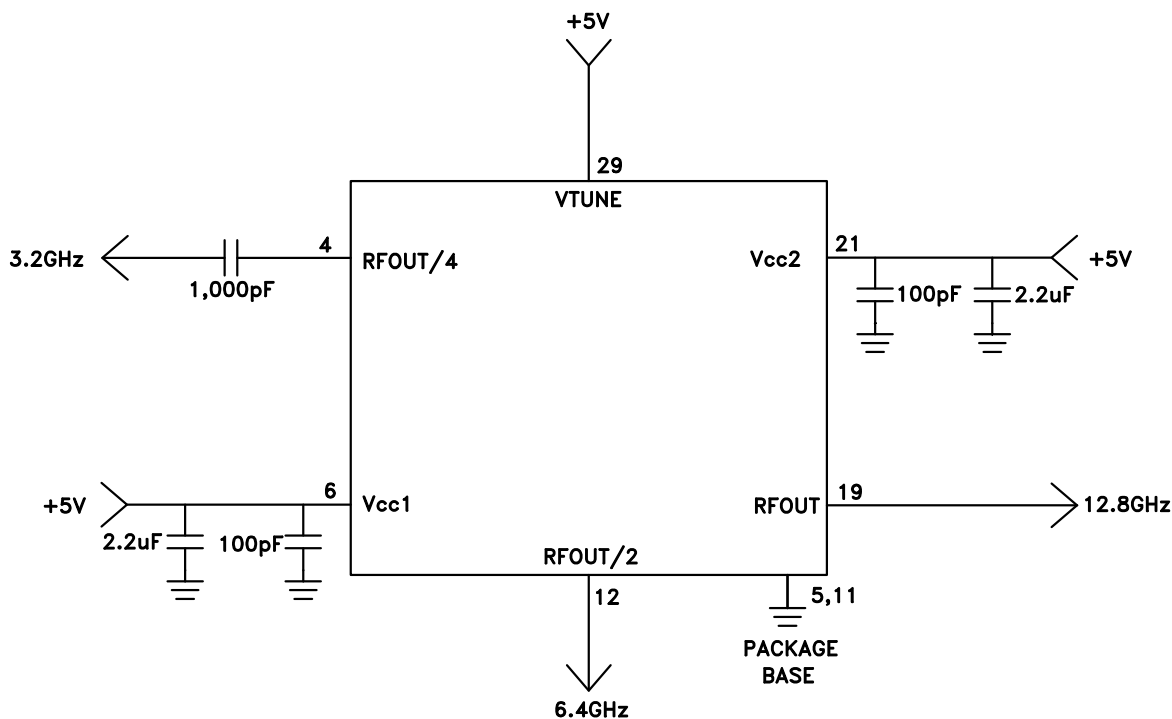
Pin Number	Function	Description	Interface Schematic
1 - 3, 7 - 10, 13 - 18, 20, 22 - 28, 30 - 32	N/C	No Connection. These pins may be connected to RF/DC ground. Performance will not be affected.	
4	RFOUT/4	Divide-by-4 Output.	
6	Vcc1	Supply Voltage for prescaler. If prescaler is not required, this pin may be left open to conserve 65 mA of current.	

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Application Support: Phone: 1-800-ANALOG-D

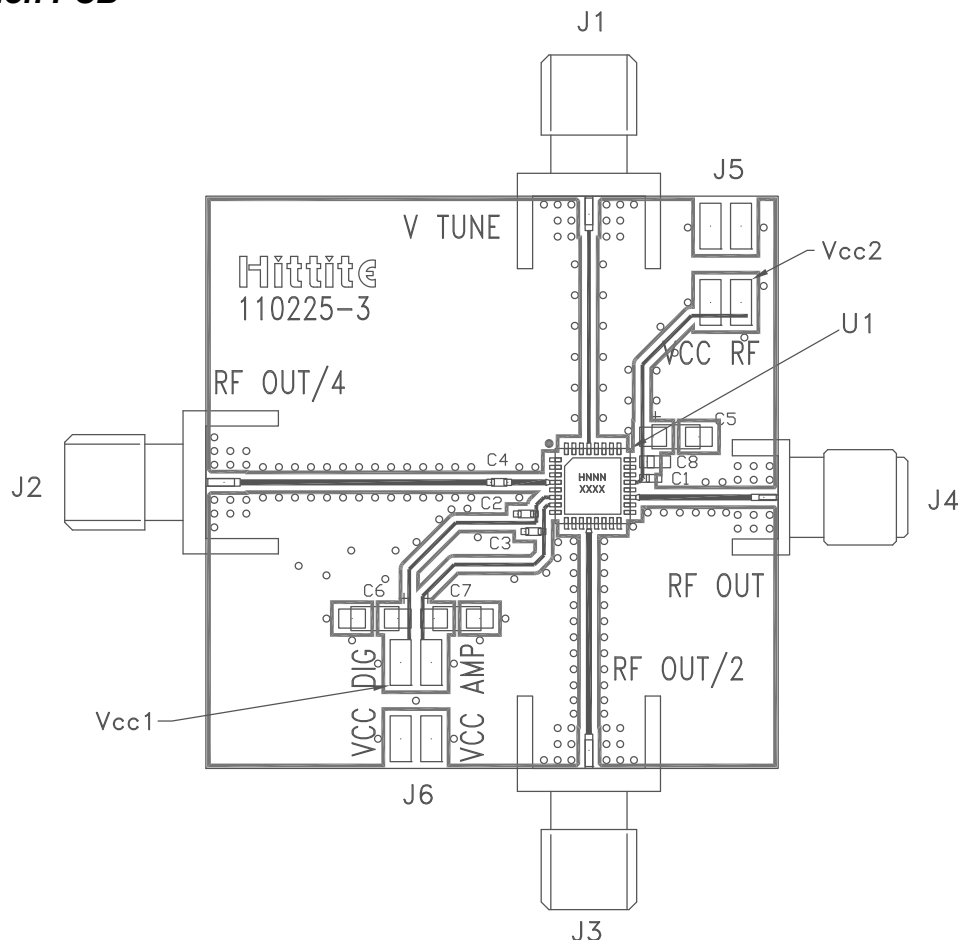

**MMIC VCO w/ HALF FREQUENCY OUTPUT  
& DIVIDE-BY-4, 12.4 - 13.4 GHz**
**Pin Descriptions**

Pin Number	Function	Description	Interface Schematic
12	RFOUT/2	Half frequency output (AC coupled).	
19	RF OUT	RF output (AC coupled).	
21	Vcc2	Supply Voltage, +5V	
29	VTUNE	Control Voltage and Modulation Input. Modulation bandwidth dependent on drive source impedance. See "Determining the FM Bandwidth of a Wideband Varactor Tuned VCO" application note.	
5, 11, Paddle	GND	Package bottom has an exposed metal paddle that must be connected to RF/DC ground.	

**Typical Application Circuit**


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**Evaluation PCB**

**List of Materials for Evaluation PCB 110227 [1]**

Item	Description
J1 - J4	PCB Mount SMA RF Connector
J5 - J6	2 mm DC Header
C1 - C3	100 pF Capacitor, 0402 Pkg.
C4	1,000 pF Capacitor, 0402 Pkg.
C5 - C7	2.2 $\mu$ F Tantalum Capacitor
U1	HMC529LP5(E) VCO
PCB [2]	110225 Eval Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Arlon 25FR

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and backside ground paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.