

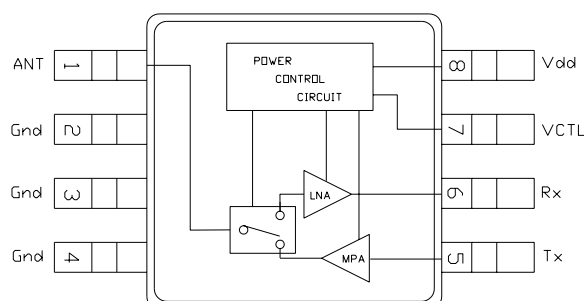
BLUETOOTH & 2.4 GHz WLAN TRANSCEIVER

Typical Applications

Transmit & Receive
Switch for 2.4 GHz Applications:

- Bluetooth
- HomeRF
- WLAN Radios

Functional Diagram



Features

Tx Gain: 15 dB, Rx Gain: 13 dB
Tx 1 dB Compression Point: 5 dBm
Rx Noise Figure: 3 dB @ 2.4 GHz
Single Positive Supply: +3V
No External Matching Required

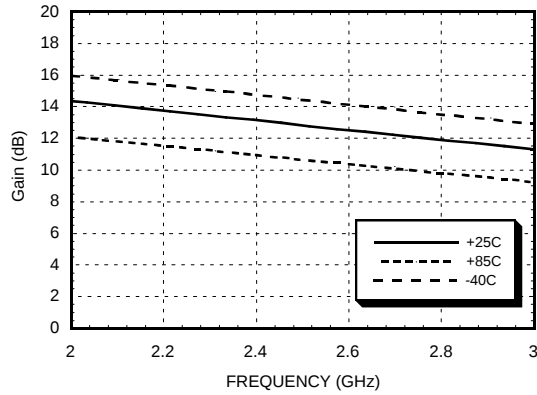
General Description

The HMC310MS8G is a multifunction RFIC that incorporates a power amplifier (PA) and low noise amplifier (LNA) with a transmit/receive switch. The RFIC offers 15 dB gain and +5 dBm P1dB in the transmit mode and 13 dB of gain with an overall noise figure of 3 dB when in receive mode. Transmit and receive performance levels have been selected to meet the BLUETOOTH Class 2 & 3 requirements when used in conjunction with 2.4 GHz ASICs such as National Semiconductor's LMX3162. This low current and low cost transceiver requires no external circuitry to operate the amplifier power down features, and is available in the industry standard MSOP8G package, which is 0.118" x 0.190" (3.0mm x 4.9mm).

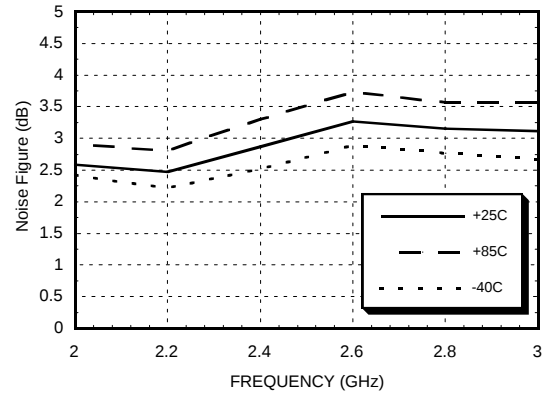
Guaranteed Performance, $V_{dd} = +3V, +25^{\circ}C$

Parameter	Receive Mode			Transmit Mode			Units
	Min.	Rx Typ.	Max.	Min.	Tx Typ.	Max.	
Frequency Range, RF	2.4 - 2.5			2.4 - 2.5			GHz
Gain @ 25° C	8	13	15	12	15	17	dB
Gain Variation Over Temperature		0.03	0.04		0.03	0.04	dB/ °C
Noise Figure @ 25° C		3.0	4.0				dB
Input Return Loss	4	6		4	7		dB
Output Return Loss	9	12		10	13		dB
Output Power for 1 dB Compression (P1dB)	-7	-4		1	5		dBm
Saturated Output Power (Psat)	-5	0		3	7		dBm
Output Third Order Intercept (IP3)	3	6		3	10		dBm
Recommended Supply Voltage (Vdd)		3.0			3.0		Vdc
Supply Current (Idd)		12			24		mA

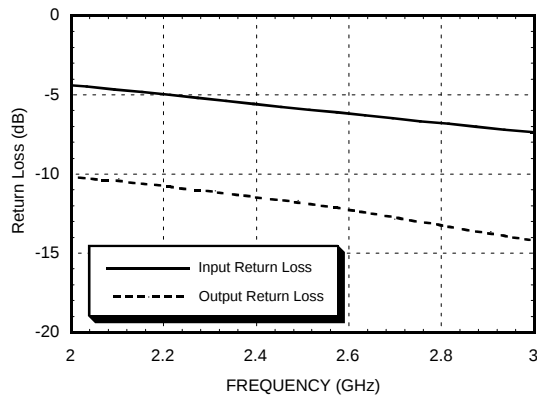
Rx Gain



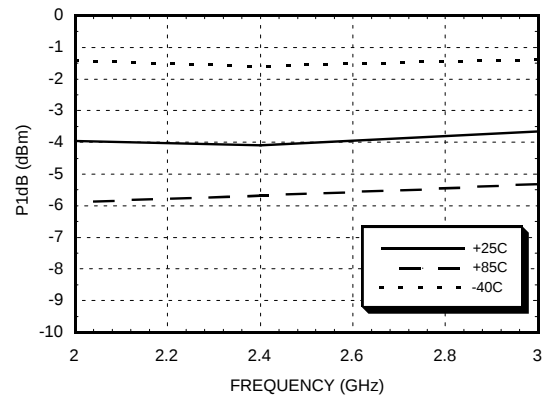
Rx Noise Figure



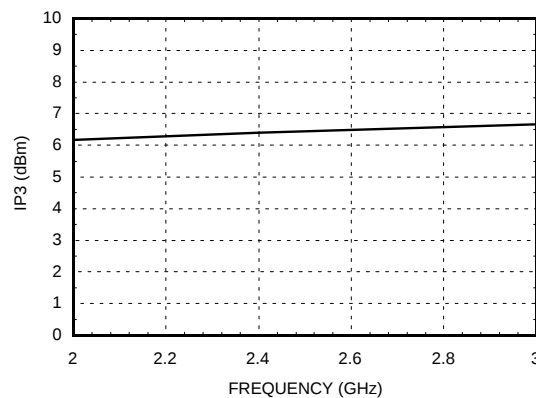
Rx Return Loss



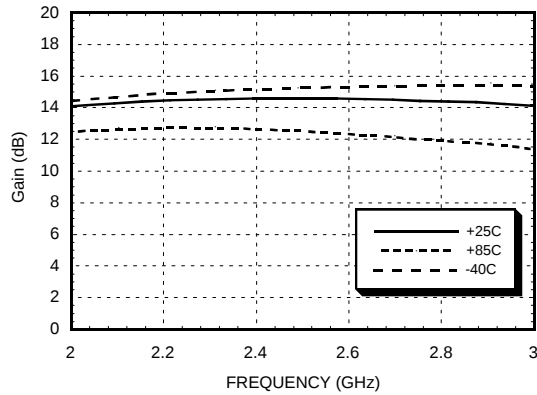
Rx 1dB Compression Point



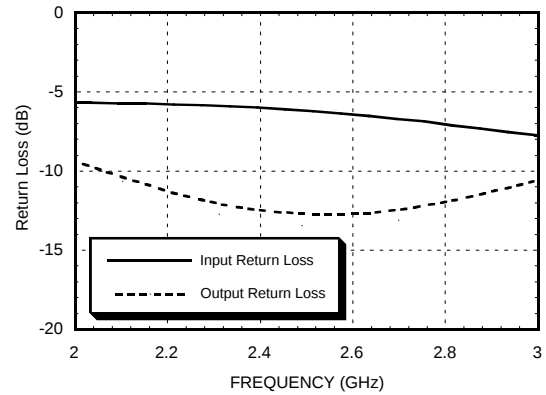
Rx Output Third Order Intercept Point



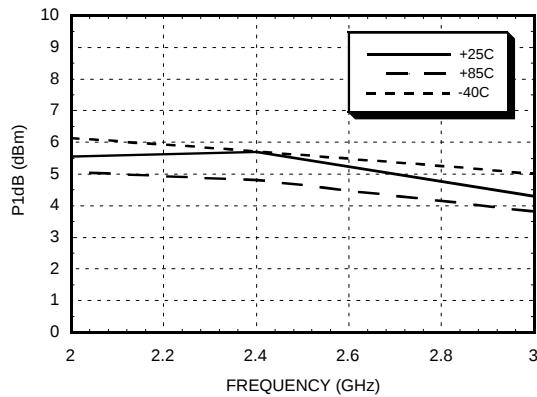
Tx Gain



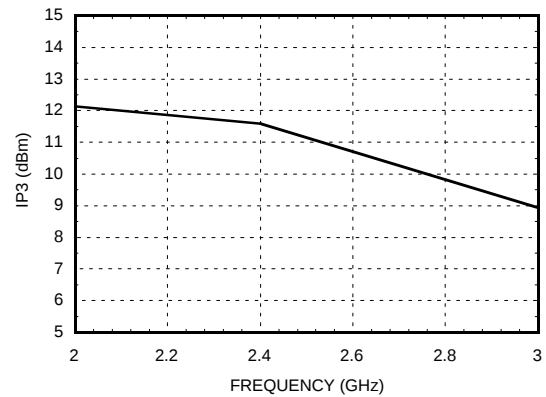
Tx Return Loss



Tx 1dB Compression Point



Tx Output Third Order Intercept Point



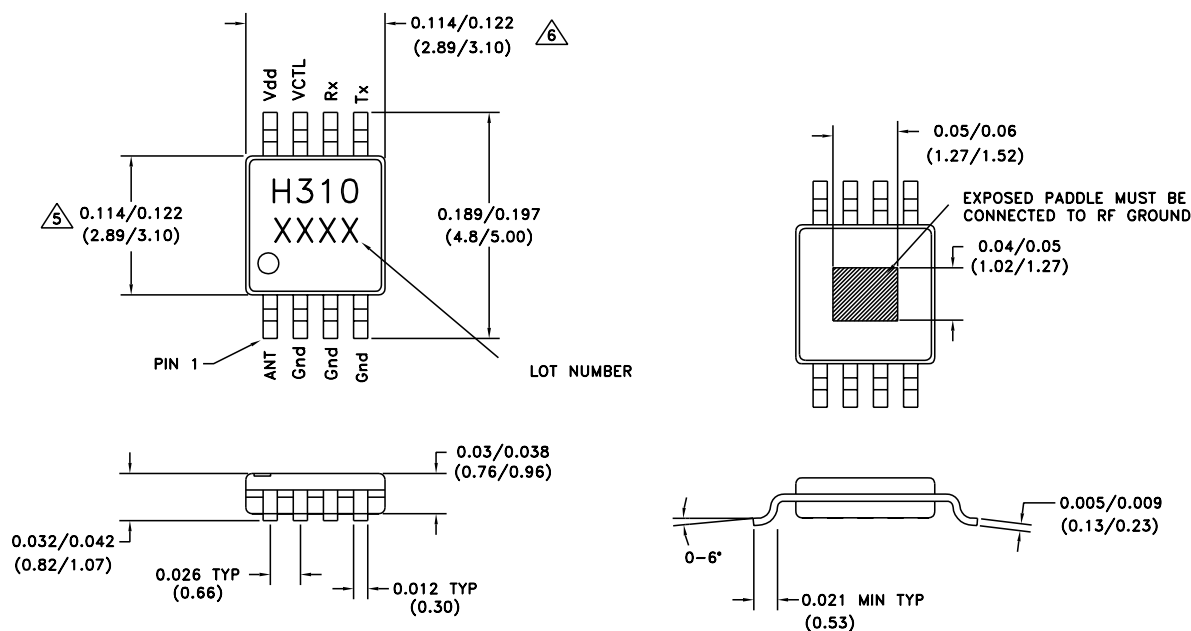
Absolute Maximum Ratings

Input Power (Vdd= +3 Vdc)	0 dBm
Thermal Resistance	200 °C/W
Junction Temperature (Tj)	175 °C
Supply Voltage (Vdd)	+7V
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

Truth Table

Tx Section Active	VCTL= Vdd
Rx Section Active	VCTL= 0V

Pin Locations & Outline Drawing



1. MATERIAL:

- A. PACKAGE BODY - LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
- B. LEADFRAME MATERIAL: COPPER ALLOY

2. PLATING: LEAD-TIN SOLDER PLATE

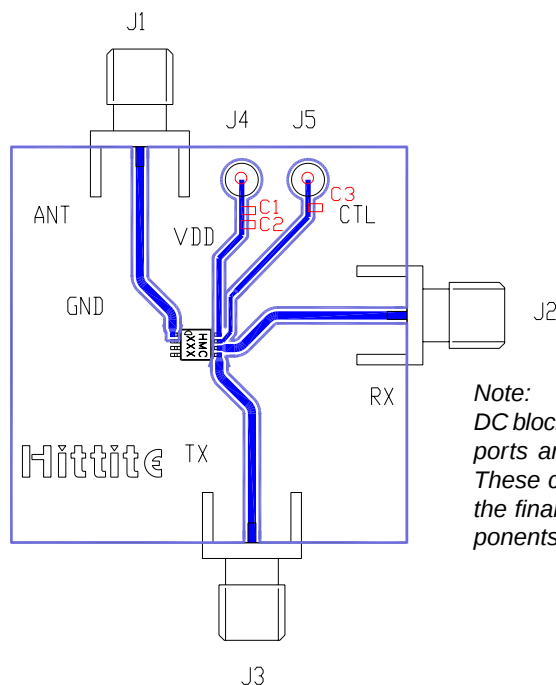
3. DIMENSIONS ARE IN INCHES (MILLIMETERS)

- 4. CHARACTERS TO BE HELVETICA MEDIUM, .030 HIGH USING WHITE INK, LOCATED APPROX AS SHOWN

- 5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.

- 6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.

HMC310MS8G Evaluation PCB



Note:
DC blocking capacitors on the Tx and ANT ports are required to evaluate this part. These capacitors may not be required in the final circuit design if interfacing components are DC blocked.

The circuit board used in the final application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads and backside ground slug 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.

Evaluation Circuit Board Layout Design Details

Item	Description
J1 - J3	PC Mount SMA RF Connector
J4, J5	DC Pin
C1	.01 μ F Capacitor, 0603 Pkg.
C2 - C3	100 pF Capacitor, 0603 Pkg.
U1	HMC310MS8G Transceiver
PCB*	Evaluation PCB 1.5" x 1.5"
* Circuit Board Material: Rogers 4350	

HMC310MS8G

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Notes:

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AMPLIFIERS - SMT