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HMC358MS8G

MMIC VCO w/ BUFFER AMPLIFIER, 5.8 - 6.8 GHz

Typical Applications

Low noise MMIC VCO w/Buffer Amplifier for C-Band applications such as:

- UNII & Pt. to Pt. Radios
- 802.11a & HiperLAN WLAN
- VSAT Radios

Features

Pout: +11 dBm

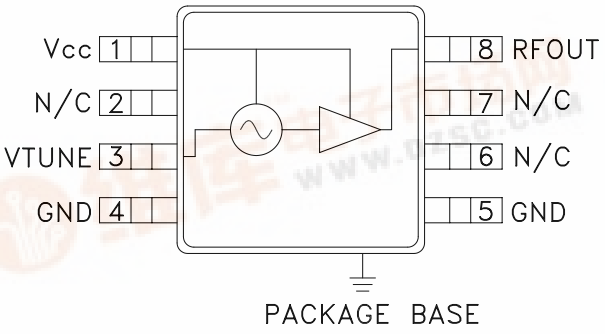
Phase Noise: -110 dBc/Hz @100 KHz

No External Resonator Needed

Single Supply: 3V @ 100 mA

15mm² MSOP8G SMT Package

Functional Diagram



General Description

The HMC358MS8G is a GaAs InGaP Hetero-junction Bipolar Transistor (HBT) MMIC VCO. The HMC358MS8G integrates a resonator, negative resistance device, varactor diode, and buffer amplifier. The VCO's phase noise performance is excellent over temperature, shock, and process due to the oscillator's monolithic structure. Power output is 11 dBm typical from a 3.0V supply voltage. The voltage controlled oscillator is packaged in a low cost, surface mount 8 lead MSOP package with an exposed base for improved RF and thermal performance.

Electrical Specifications, T_A = +25° C, Vcc = +3V

Parameter	Min.	Typ.	Max.	Units
Frequency Range		5.8 - 6.8		GHz
Power Output	8	11		dBm
SSB Phase Noise @ 100 kHz Offset, Vtune= +5V @ RF Output		-110		dBc/Hz
Tune Voltage (Vtune)	0		10	V
Supply Current (Icc)		100		mA
Tune Port Leakage Current (Vtune= 10V)			10	µA
Output Return Loss		9		dB
Harmonics 2nd 3rd		 -10 -20		 dB dB
Pulling (into a 2.0:1 VSWR)		10		MHz pp
Pushing @ Vtune= +3V		150		MHz/V
Frequency Drift Rate		0.8		MHz/°C

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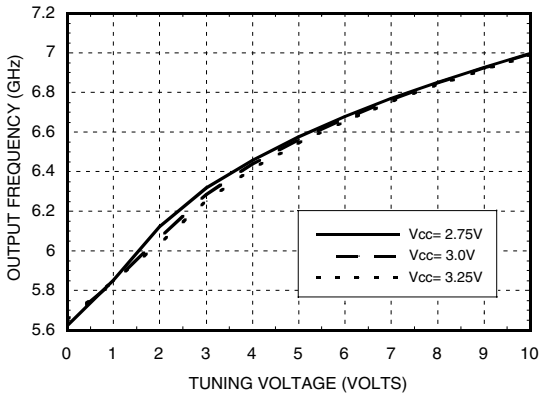
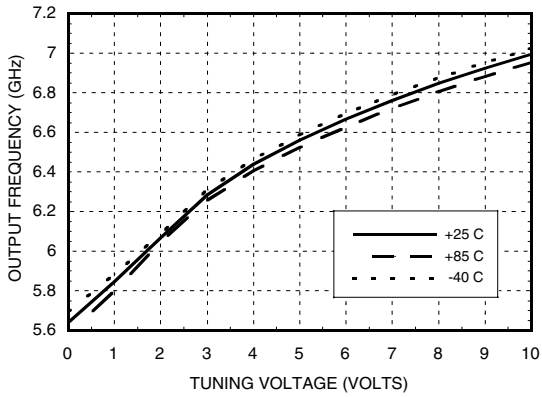
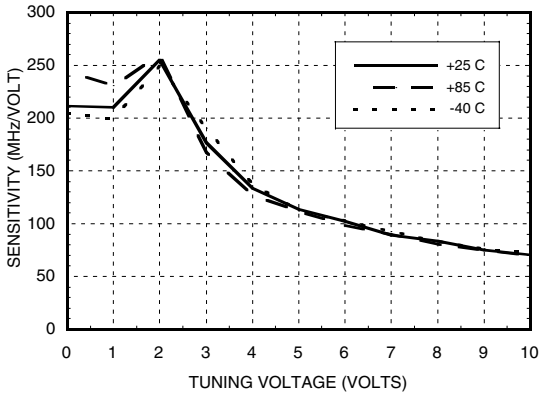
Frequency vs. Tuning Voltage, T= 25°C



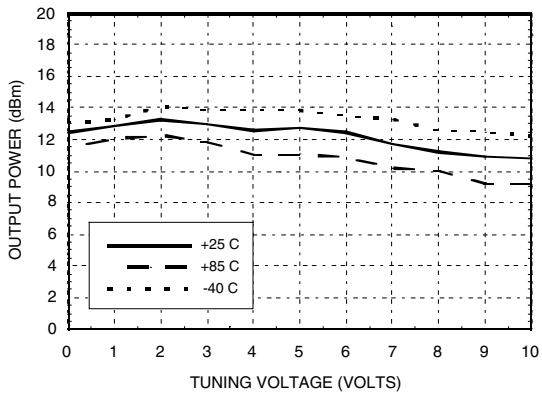
Frequency vs. Tuning Voltage, Vcc= +3V



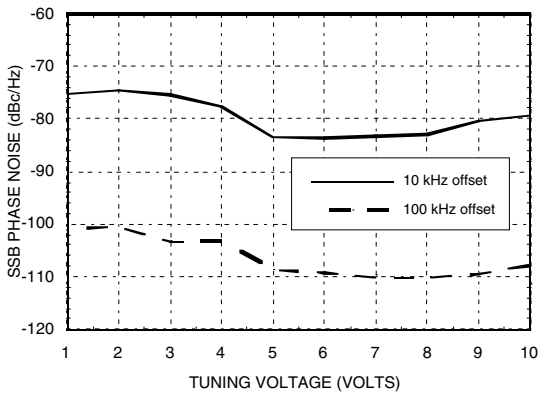
Sensitivity vs. Tuning Voltage, Vcc= +3V



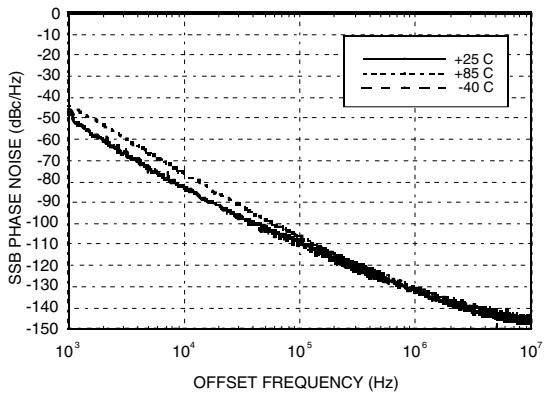
Output Power vs. Tuning Voltage, Vcc= +3V



Phase Noise vs. Tuning Voltage



Typical SSB Phase Noise @ Vtune= +5V



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Absolute Maximum Ratings

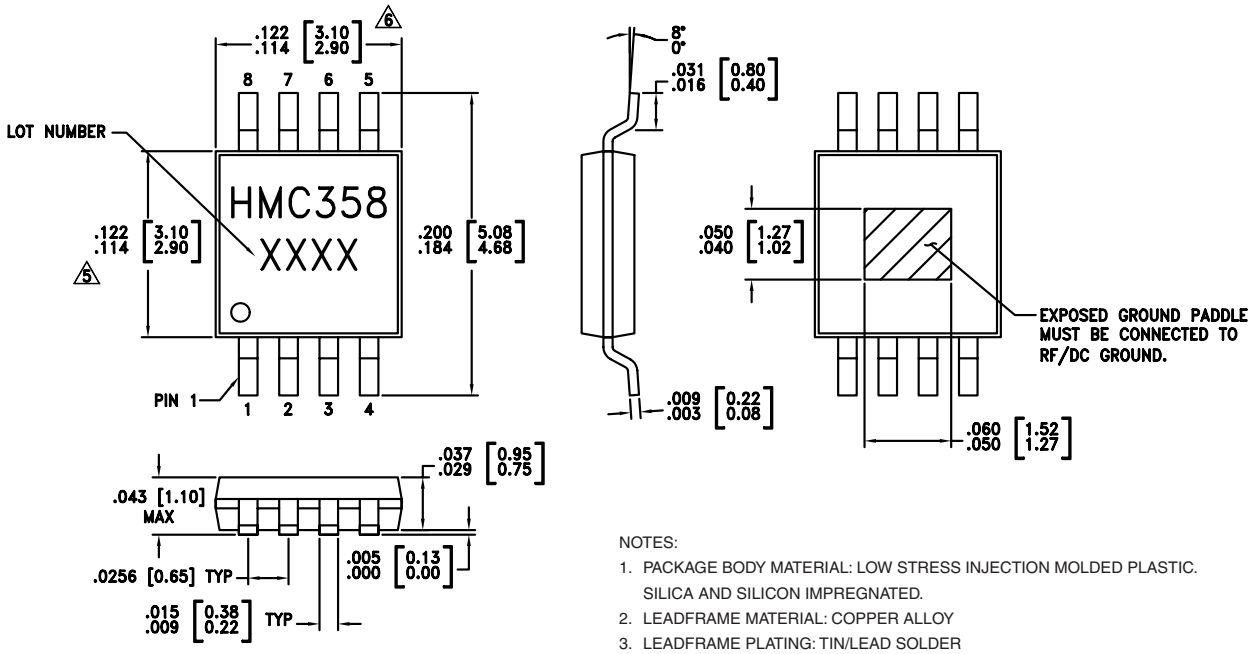
Vcc	3.5 Vdc
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Vtune	0 to 11V

Typical Supply Current vs. Vcc

Vcc (V)	Icc (mA)
2.75	80
3.0	100
3.25	115

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

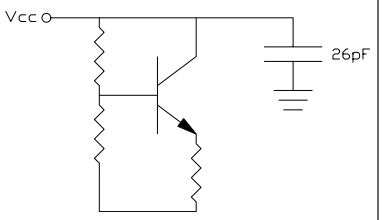
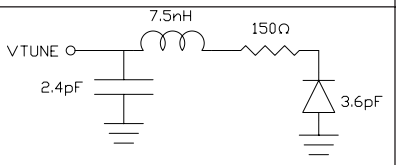
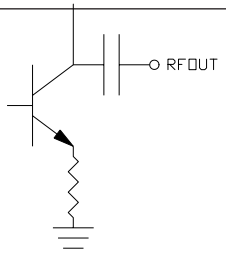
Outline Drawing



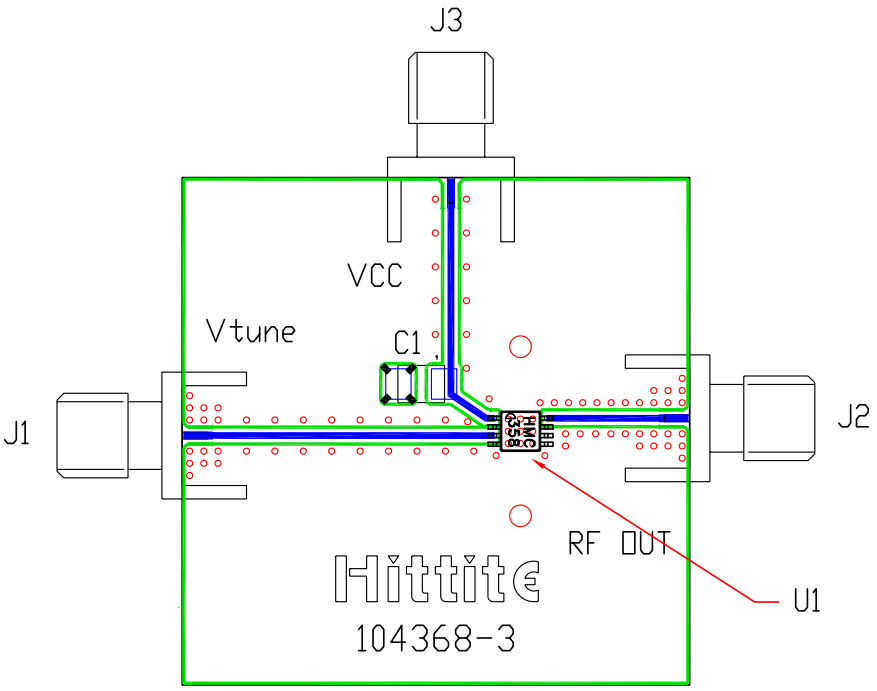
NOTES:

1. PACKAGE BODY MATERIAL: LOW STRESS INJECTION MOLDED PLASTIC. SILICA AND SILICON IMPREGNATED.
2. LEADFRAME MATERIAL: COPPER ALLOY
3. LEADFRAME PLATING: TIN/LEAD SOLDER
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15 mm PER SIDE.
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25 mm PER SIDE.

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	Vcc	Supply Voltage Vcc= 3V	
2, 6, 7	N/C	No Connection	
3	VTUNE	Control Voltage Input. Modulation port bandwidth dependent on drive source impedance.	
4, 5	GND	Package bottom has an exposed metal paddle that must be RF & DC grounded.	
8	RFOUT	RF output (AC coupled).	

Evaluation PCB



List of Materials

Item	Description
J1 - J3	PC Mount SMA RF Connector
C1	10 µF Tantalum Capacitor
U1	HMC358MS8G VCO
PCB*	104368 Eval Board
* Circuit Board Material: Rogers 4350	

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.

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Notes: