

Main Features

- GaAs HBT Technology
 - VT1=VT2 from 1.5 to 11 V
 - $f_{out} = 3.43$ to 4.19 GHz
 - Phase Noise = -85 dBc/Hz @ 10 kHz
- No external resonator needed
- Chip size: 2.6 x 2.33 mm²

Typical Applications

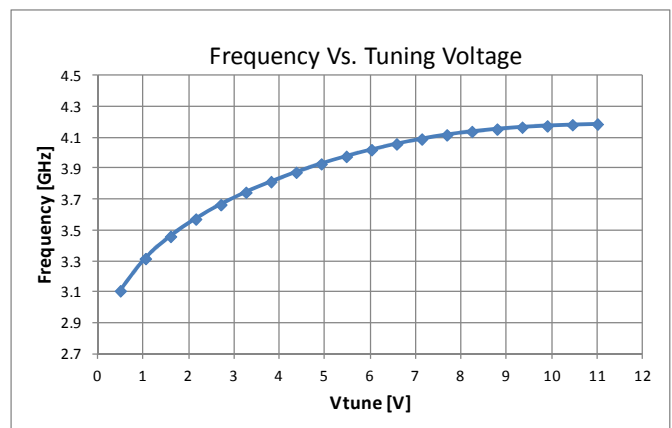
- Wireless Local Loop (WLL)
- Test equipment & industrial controls
- SAR antennas
- Military

Product Description

MECVCO1 is a monolithic microwave integrated circuit (MMIC) voltage controlled oscillator (VCO) designed and tested by MEC for C-Band applications. It integrates a resonator, a negative resistor device, varactor diodes and a buffer amplifier.

In the frequency range from 3.43 GHz to 4.19 GHz MECVCO1 provides more than 10.2 dBm of output power and a phase noise of about -85 dBc/Hz at 10 KHz offset with 5 V supply voltage.

Measured Data



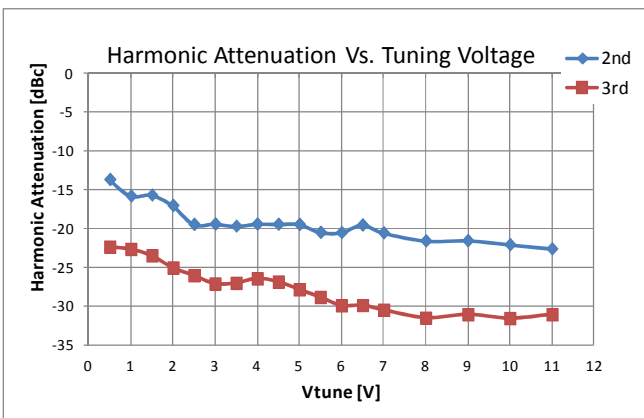
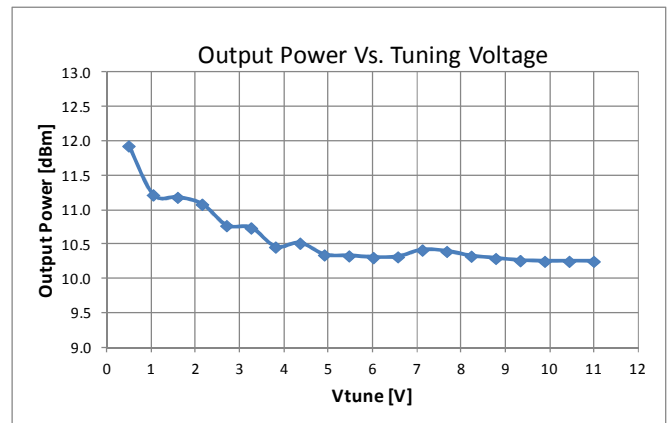
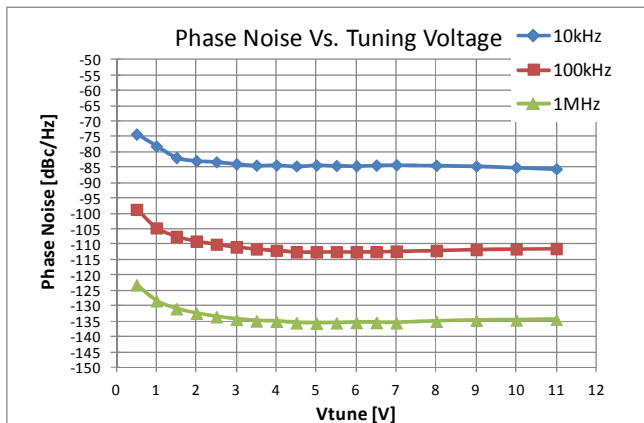
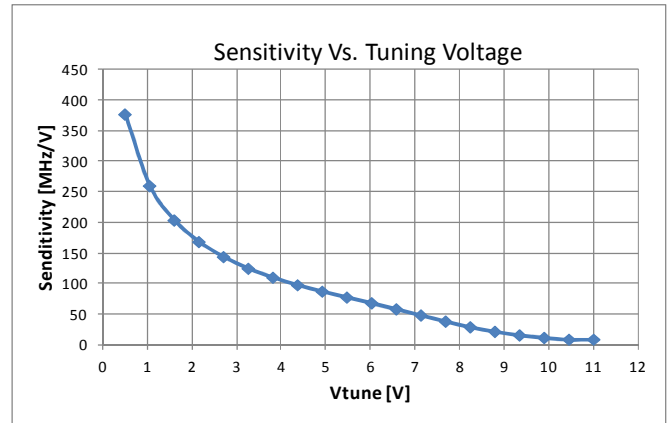
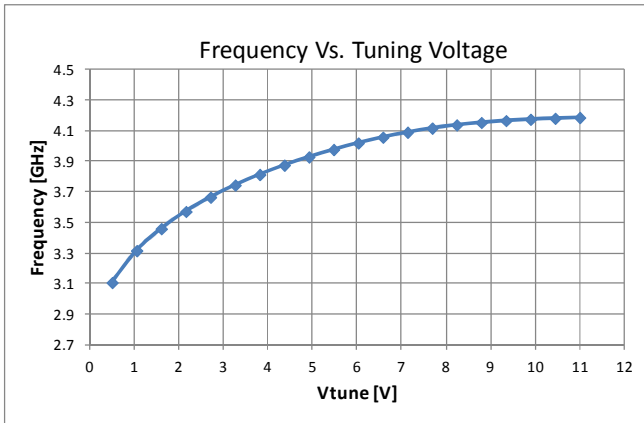
Main Characteristics

Test Conditions: $T_{\text{base_plate}} = 25\text{ }^{\circ}\text{C}$

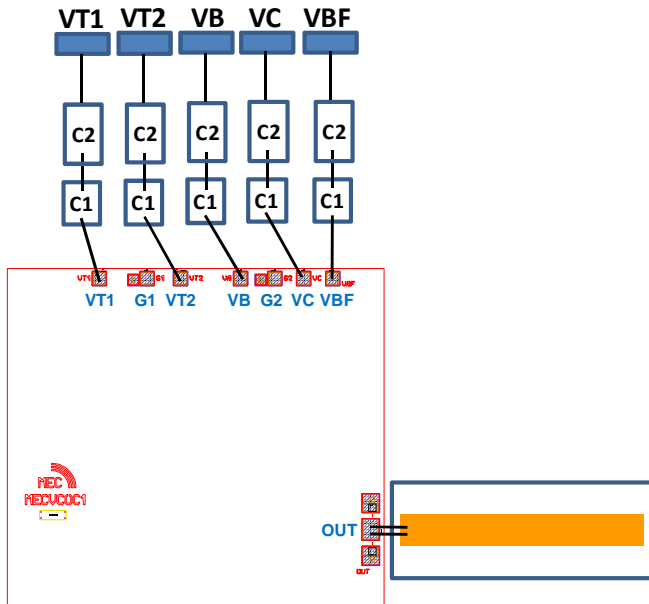
Parameter	Min	Typ	Max	Unit
Frequency Range	3.43		4.19	GHz
Output Power	10.2		11.1	dBm
Phase Noise @ 10 kHz Offset @ 100 kHz Offset @ 1 MHz Offset		-85 -112 -135		dBc/Hz dBc/Hz dBc/Hz
Tuning Voltage ($V_{T1}=V_{T2}$)	1.5		11	V
Supply Voltage (V_{cc})		5		V
Supply Current (I_{cc})		82.5		mA
Harmonic Attenuation 2nd 3rd	-15 -23			dBc dBc
Pulling (into a 2.0:1 VSWR)			1.18	MHz_pp
Pushing @ $V_{\text{tune}}=5\text{V}$			2.6	MHz/V
Sensitivity			230	MHz/V
DC Power Consumption		0.4125		W

Measurement Performances

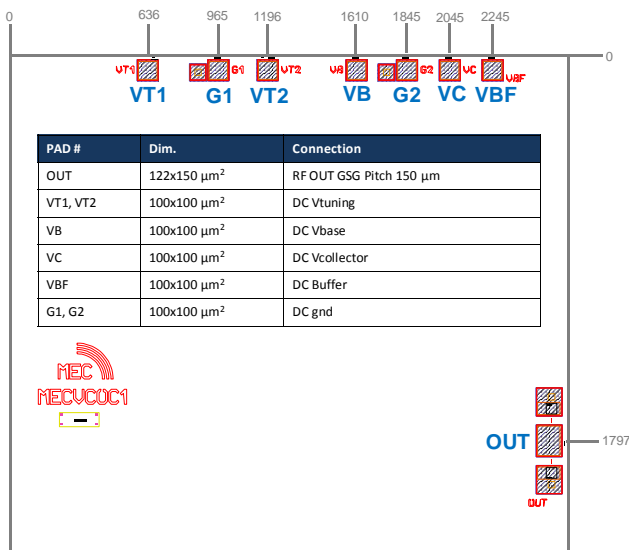
Test Conditions: $T_{\text{base_plate}} = 25\text{ }^{\circ}\text{C}$, $V_{\text{cc}} = 5\text{ V}$, $I_{\text{cc}} = 82.5\text{ mA}$



Bond Pad Configuration & Assembly Recommendations



Bond Pad #	Connection	External Components
OUT	2 Bonding Wires $L_{bond} = 0.3 \text{ nH}$	
VT1 Vtuning	$L_{bond} \leq 1 \text{ nH}$	$C1 = 10\text{nF}/10\text{V}$ $C2 = 1\mu\text{F}/10\text{V}$
VT2 Vtuning	$L_{bond} \leq 1 \text{ nH}$	$C1 = 10\text{nF}/10\text{V}$ $C2 = 1\mu\text{F}/10\text{V}$
VB Vbase	$L_{bond} \leq 1 \text{ nH}$	$C1 = 10\text{nF}/10\text{V}$ $C2 = 1\mu\text{F}/10\text{V}$
VC Vcollector	$L_{bond} \leq 1 \text{ nH}$	$C1 = 10\text{nF}/10\text{V}$ $C2 = 1\mu\text{F}/10\text{V}$
VBF Vbuffer	$L_{bond} \leq 1 \text{ nH}$	$C1 = 10\text{nF}/10\text{V}$ $C2 = 1\mu\text{F}/10\text{V}$



Eutectic Die bond using AuSn (80/20) solder is recommended.

The backside of the die is the Source (ground) contact.

Thermosonic ball or wedge bonding are the preferred connection methods.

Gold wire must be used for connections.

Bias Procedure

Bias-Up

1. Set VT1 and VT2 to 5 V and turn on.
2. Set VBF to 0 V and turn on.
3. Increase VBF to 5 V ($IBF \approx 20.5$ mA).
4. Set VB to 0 V and turn on.
5. Set VC to 0 V and turn on.
6. Increase VC to 5 V.
7. Increase VB to 5 V ($IB \approx 12.5$ mA, $IC = 49.5$ mA).
8. Sweep VT1 and VT2 from 0.5 V to 11 V.

Bias-Down

1. Set VB to 0 V and turn off.
2. Set VC to 0 V and turn off.
3. Set VBF to 0 V and turn off.
4. Turn off VT1 and VT2.

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Notice

The furnished information is believed to be reliable. However, performances and specifications contained herein are based on preliminary characterizations and then susceptible to possible variations. On the basis of customer requirements the product can be tested and characterized in specific operating conditions and, if needed, tuned to meet custom specifications.

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