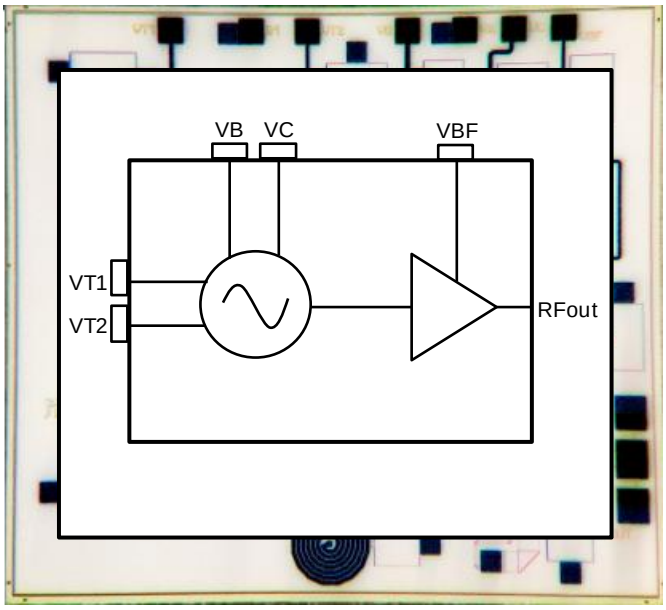
MECVCOC2

C-Band GaAs HBT VCO



Main Features

- GaAs HBT Technology
  VT1=VT2 from 1.5 to 11 V
  f_{out} = 3.82 to 4.67 GHz
  Phase Noise = -82 dBc/Hz @10 kHz
- No external resonator needed
- Chip size: 2.6 x 2.33 mm^2

Typical Applications

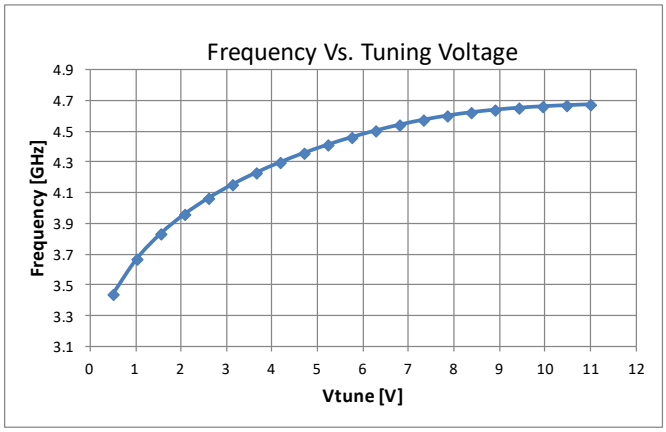
- Wireless Local Loop (WLL)
- Test equipment & industrial controls
- SAR antennas
- Military

Product Description

MECVCOC2 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 3.82 GHz to 4.67 GHz MECVCOC2 provides more than 9.6 dBm of output power and a phase noise of about -82 dBc/Hz at 10 KHz offset with 5 V supply voltage.

Measured Data



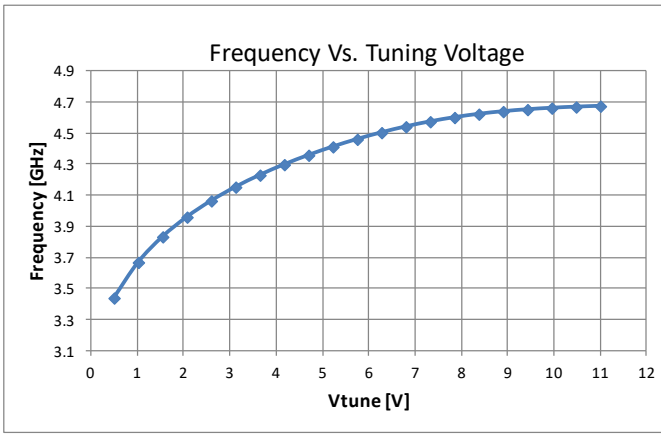
Main Characteristics

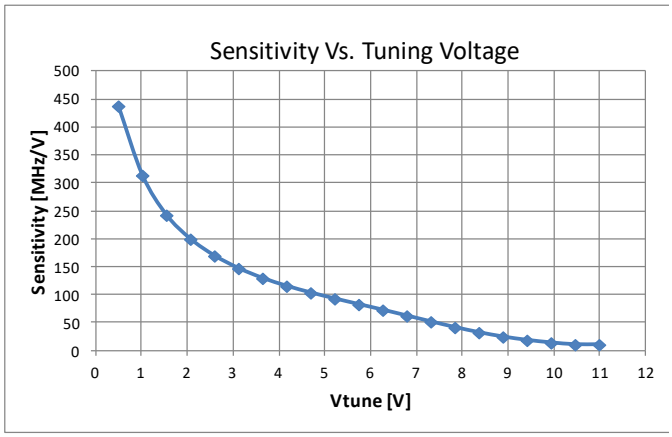
Test Conditions: T_{base_plate} = 25 °C

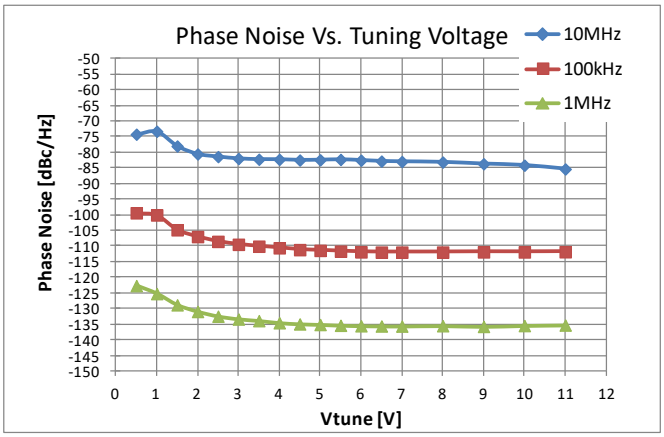
Parameter	Min	Typ	Max	Unit
Frequency Range	3.82		4.67	GHz
Output Power	9.6		10.8	dBm
Phase Noise @ 10 kHz Offset @ 100 kHz Offset @ 1 MHz Offset		 -82 -111 -135		 dBc/Hz dBc/Hz dBc/Hz
Tuning Voltage (VT1=VT2)	1.5		11	V
Supply Voltage (Vcc)		5		V
Supply Current (Icc)		82.5		mA
Harmonic Attenuation 2nd 3rd	 -14 -22			 dBc dBc
Pulling (into a 2.0:1 VSWR)			1.28	MHz_pp
Pushing @ Vtune=5V			4	MHz/V
Sensitivity			250	MHz/V
DC Power Consumption		0.4125		W

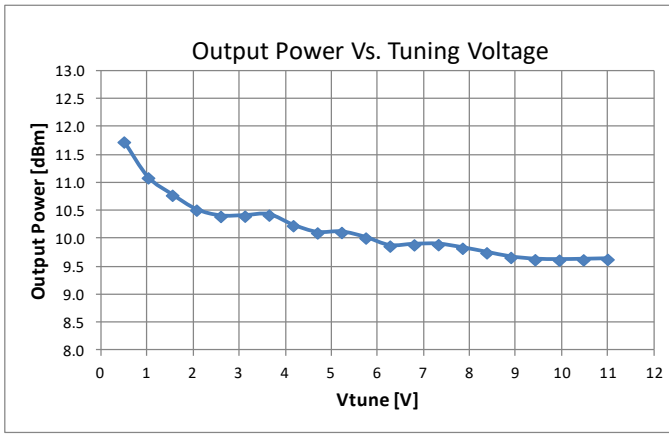
Measurement Performances

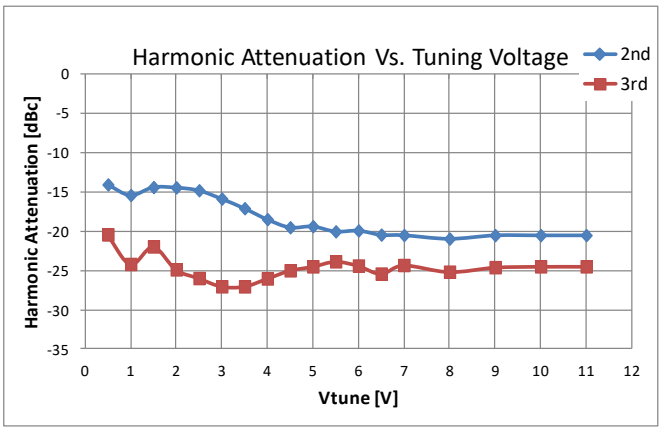
Test Conditions: T_{base_plate} = 25 °C, Vcc = 5 V, Icc = 82.5 mA



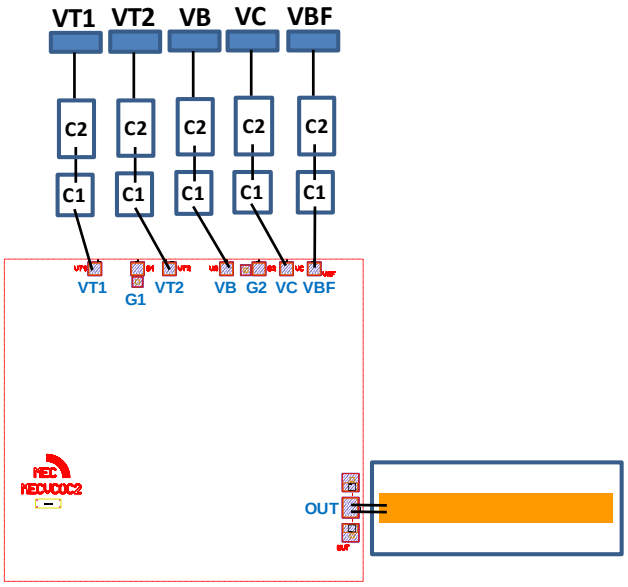




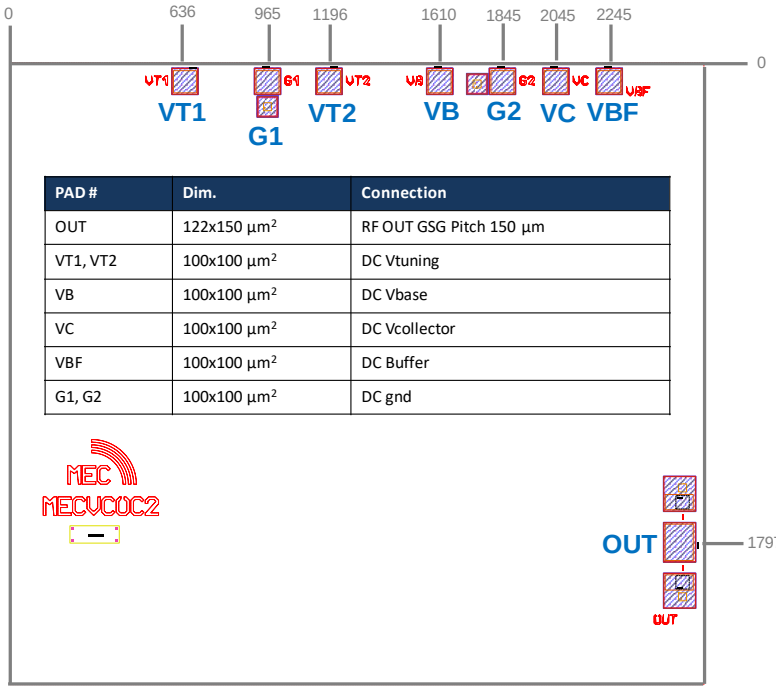




Bond Pad Configuration & Assembly Recommendations



Bond Pad #	Connection	External Components
OUT	**2** Bonding Wires L_bond = 0.3 nH	
VT1 Vtuning	L_bond ≤ 1 nH	C1 = 10nF/10V C2 = 1µF/10V
VT2 Vtuning	L_bond ≤ 1 nH	C1 = 10nF/10V C2 = 1µF/10V
VB Vbase	L_bond ≤ 1 nH	C1 = 10nF/10V C2 = 1µF/10V
VC Vcollector	L_bond ≤ 1 nH	C1 = 10nF/10V C2 = 1µF/10V
VBF Vbuffer	L_bond ≤ 1 nH	C1 = 10nF/10V C2 = 1µF/10V



PAD #	Dim.	Connection
OUT	122x150 µm²	RF OUT GSG Pitch 150 µm
VT1, VT2	100x100 µm²	DC Vtuning
VB	100x100 µm²	DC Vbase
VC	100x100 µm²	DC Vcollector
VBF	100x100 µm²	DC Buffer
G1, G2	100x100 µm²	DC gnd

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 ≈ 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 ≈ 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.

Contact Information

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Notice

The furbished 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.