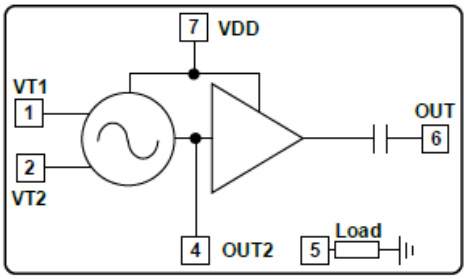
Features

- Output Power: +10dBm
- Phase Noise: -94dBc/Hz @100kHz
- Single Power Supply: +5V @ 60mA
- Buffer Isolation Amplifier integrated on chip, two channel RF output, ESD function at power supply port
- Die Size: 1.5 x 2 x 0.1 mm

Functional Block Diagram



Typical Applications

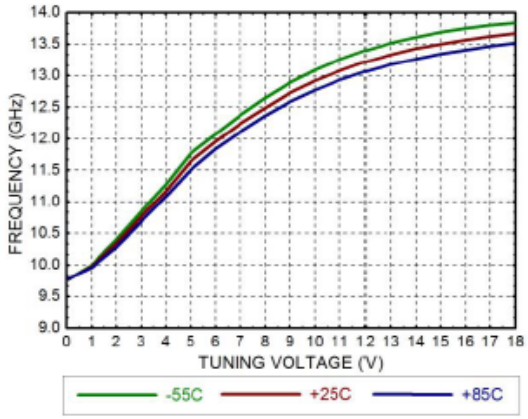
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Electrical Specifications

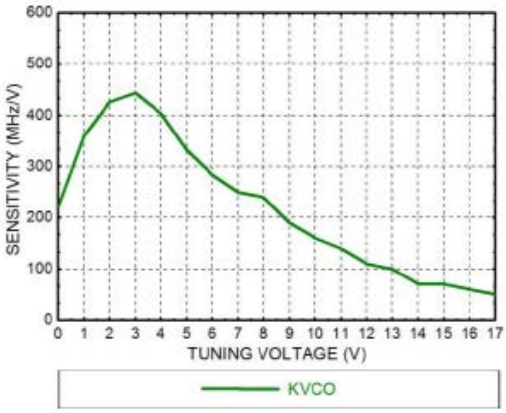
TA = +25ºC, VDD=+5V, IDD=60mA

Parameters	Min.	Typ.	Max.	Units
Frequency		10-13.5		GHz
Output Power (OUT)		10		dBm
Output Power (OUT2)		0		dBm
SSB phase noise @ 100kHz, VT=+3V@RF output		-94		dBc/Hz
Tuning Voltage(VT)	1		18	V
Tuning Sensitivity(KVCO)	50		440	MHz/V
Operating Current(IDD) (VDD=+5V)		60		mA
Isolation between OUT and OUT2		0		dB
Output Return Loss		10		dB
Second Harmonic		-20		dBc
Pull (to 2.0:1 VSWR)		1		MHz pp
Frequency Pushing Factor @VT=+5V		45		MHz/V
Frequency Drift		1.8		MHz/℃

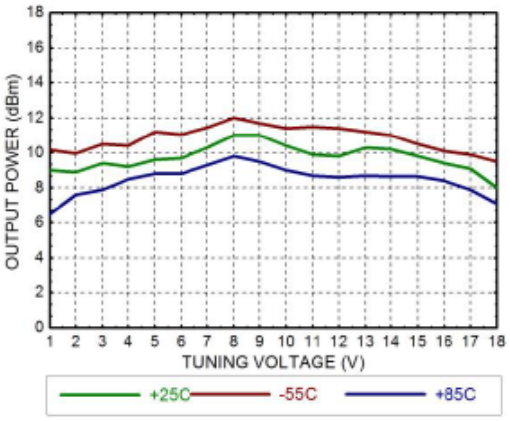
Frequency vs. Tuning Voltage VDD=+5V



Tuning Sensitivity vs. Tuning Voltage, T=25℃

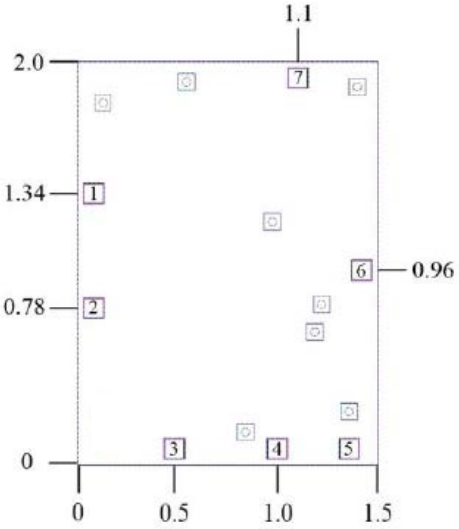


Output Power vs. Tuning Voltage, VDD=+5V



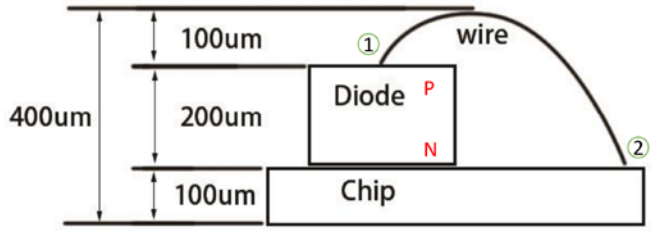
Outline Drawing:

All Dimensions in mm



VCO and Diode Assembly Instructions:

1. Attach the VCO die to the carrier, cavity or PCB.
2. Apply epoxy to the diode attachment pad on top of the VCO MMIC.
3. Attach the diode (N side) on top of the VCO, and make sure the epoxy does not overflow, short out, or allow any air voids underneath.
4. Bond the P side diode making sure to start from point #1 with 200-300um length of wire and end up at point #2.
5. The length of the wire will affect the frequency of oscillation. The longer the wire, the lower the frequency. The shorter the wire, the higher the frequency.
6. In order to increase the frequency, consider doubling the bonding wire to reduce the inductance.
7. In order to decrease the frequency, you can increase the length of the wire. Starting from point #1, then running the bonding wire to the die capacitor, then from the die capacitor bond back to the VCO MMIC Pad.



Pad Description

Pad	Function	Description
1	VT1	Negative Resistance HBT Base Tuning Voltage
2	VT2	Negative Resistance HBT Emitter Tuning Voltage
3	RB	Negative Resistance HBT Emitter to Ground tuning port, change power by tuning Negative Resistance current, e.g. connect 45**Ω resistance, then current increases 5mA, power increases** 1~2dB; . connect 25**Ω resistance, then current increases 10mA, power increases 2~4dB**
4	OUT2	RF output2, AC coupling, if not used, connect it to LOAD on chip
5	LOAD	50**Ω load** on chip, connect it to OUT2 if it is not used
6	OUT	RF output, AC coupling
7	VDD	Power supply, external 100pF/1nF/4.7uF bypass capacitor required

Notes:

1. Die thickness: 100um
2. Typical bond pad is 100*100 μm^2
3. Bond pad metalization: Gold
4. Backside metalization: Gold
5. Backside of the die (GND)
6. No connection required for unlabeled bond pads

Maximum Ratings:

1. Operating temperature: -55℃ to +85℃
2. Storage temperature: -65℃ to +150℃