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RFVC1800

WIDEBAND MMIC VCO WITH BUFFER AMPLIFIER, 8GHz to 12GHz

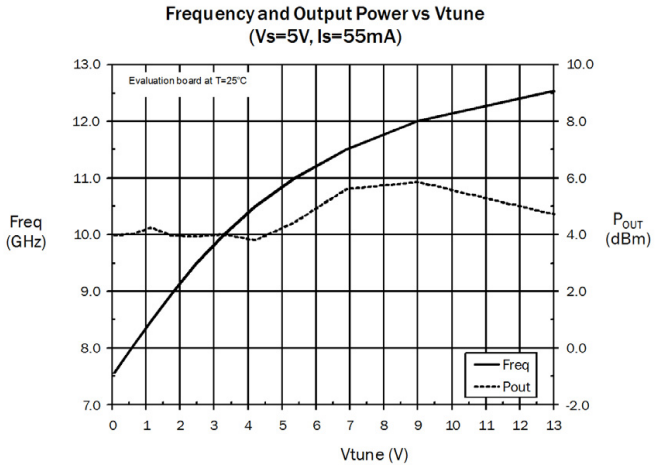
Package: 4mmx4mmx1.1mm

Product Description

RFMD's RFVC1800 wideband Voltage Controlled Oscillator is a GaAs InGaP HBT MMIC with integrated VCO core and RF output buffer. The part operates from a single +5V supply for circuit bias and 0 to +13V Vtune for frequency control. The RFVC1800 is in an RoHS Compliant, compact QFN 4mmx4mm package that offers low phase noise and low power consumption.

Optimum Technology Matching® Applied

- ☐ GaAs HBT
- ☐ GaAs MESFET
- ☑ InGaP HBT
- ☐ SiGe BiCMOS
- ☐ Si BiCMOS
- ☐ SiGe HBT
- ☐ GaAs pHEMT
- ☐ Si CMOS
- ☐ Si BJT
- ☐ GaN HEMT
- ☐ InP HBT
- ☐ RF MEMS
- ☐ LDMOS



Features

- Wideband Performance
- P_{OUT} +4dBm Typ.
- External Resonator Not Required
- Single Bias Supply: +5V at 55mA
- Output Phase Noise: -93dBc/Hz at 100kHz
- Low Profile 4mmx4mm QFN Package
- RoHS Compliant

Applications

- Military - Radar, Communications, ECM/IED
- Satcomm - Communication Modems
- Test Instrumentation
- Industrial/Medical Equipment

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Frequency of Operation	8.0		12.0	GHz	
Supply Voltage (V_S)	4.75	5.00	5.25	V	Recommended operating range.
Supply Current	40	55	70	mA	
Tuning Voltage (Vtune)	0		13	V	
Tuning Sensitivity		565		MHz/V	
Output Power	2	4		dBm	
Output Phase Noise at 10kHz		-66		dBc/Hz	
Output Phase Noise at 100kHz		-93		dBc/Hz	
2nd Harmonic		-20		dBc	
Frequency Pushing		90		MHz/V	
Frequency Pulling (2:1 VSWR)		7		MHz pp	
RF Output Return Loss		8		dB	
Frequency Drift Rate		-0.7		MHz/°C	
Vtune port input capacitance		4		pF	
Thermal Resistance		75		°C/W	junction to paddle

Test Conditions: V_S=5V, Freq=8GHz to 12GHz, T=25°C unless noted otherwise

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Absolute Maximum Ratings

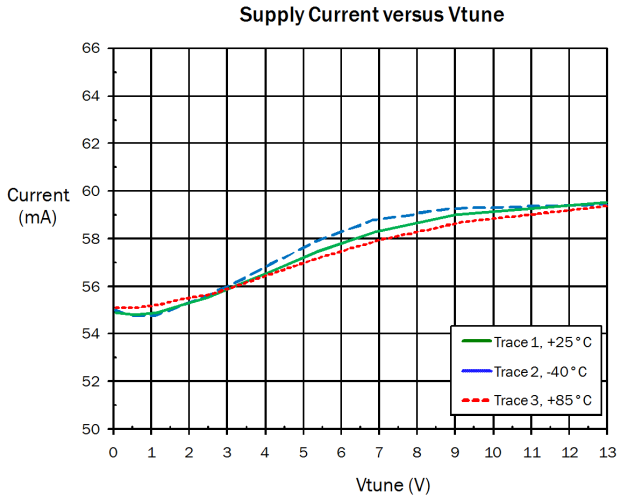
Parameter	Rating	Unit
Device Operating Voltage (V_S)	5.5	V
Vtune (V_t)	0 to +15	V
Power Dissipation at T=85°C (Derate 13.3mW/°C above T=85°C)	730	mW
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-65 to +150	°C
Operating Junction Temperature (T_J)	+140	°C
ESD Rating - Human Body Model (HBM)	Class 1A	

Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

Typical Evaluation Board Performance (V_S=5.0V unless otherwise noted)



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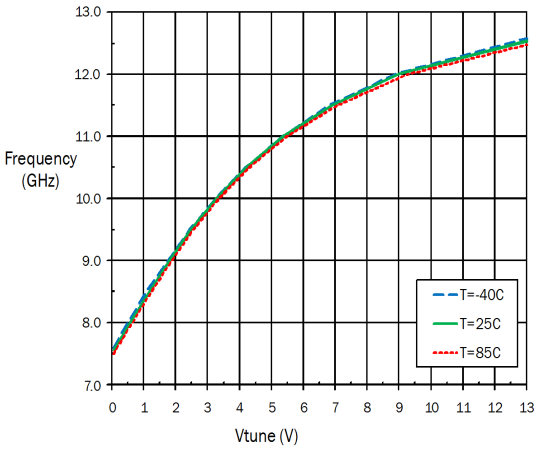
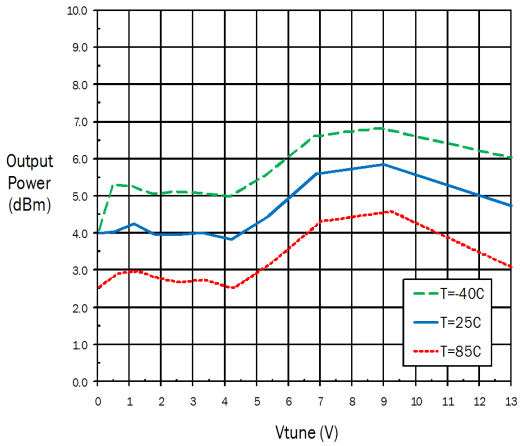
Typical Evaluation Board Performance (V_S=5.0V Unless otherwise noted)

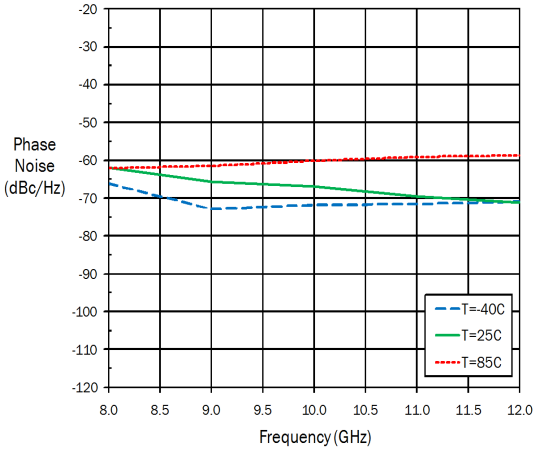
Frequency versus Vtune



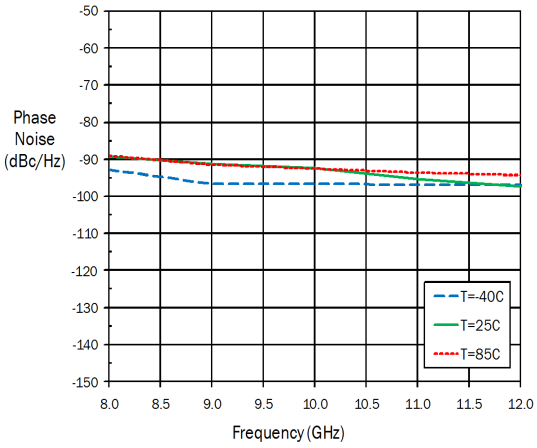
Output Power versus Vtune



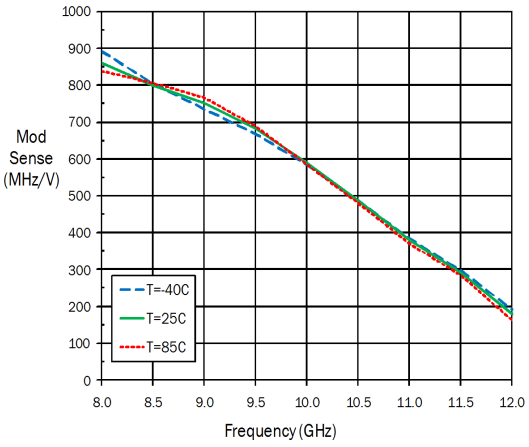
Phase Noise at 10kHz offset versus Frequency



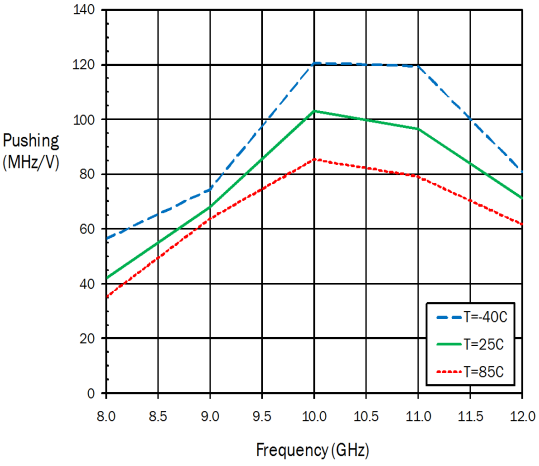
Phase Noise at 100kHz offset versus Frequency



Modulation Sensitivity versus Frequency



Pushing versus Frequency



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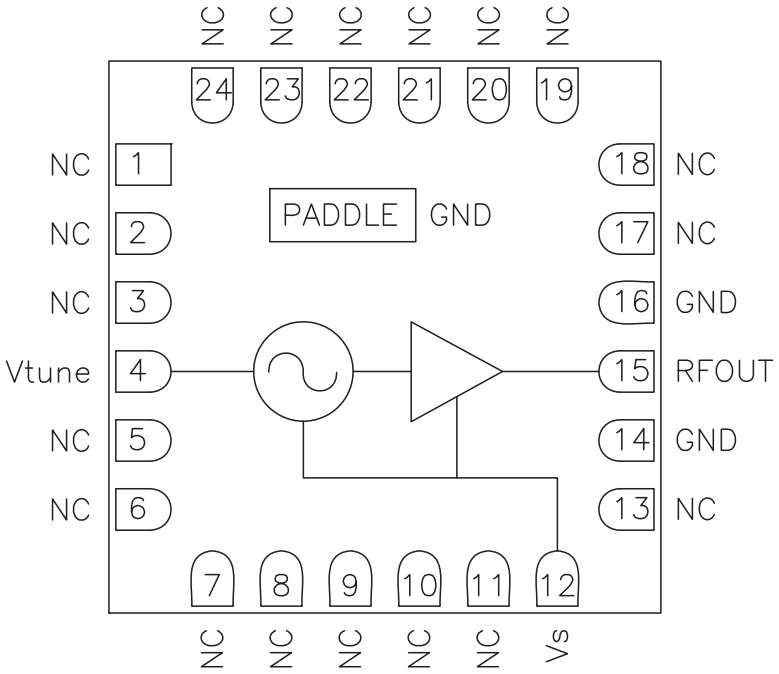
Pin Out



Pin	Function	Description
1-3, 5-11, 13, 17-24	NC	No internal connection. Connect to PCB ground.
4	VTUNE	VCO control voltage input.
12	VS	Supply voltage input for the VCO and Buffer stage.
14, 16	GND	Pin internally bonded to package paddle. Connect to PCB ground.
15	RFOUT	VCO RF output. Pin is internally DC-blocked.
Paddle	GND	Exposed paddle on backside needs to be soldered to PCB ground.

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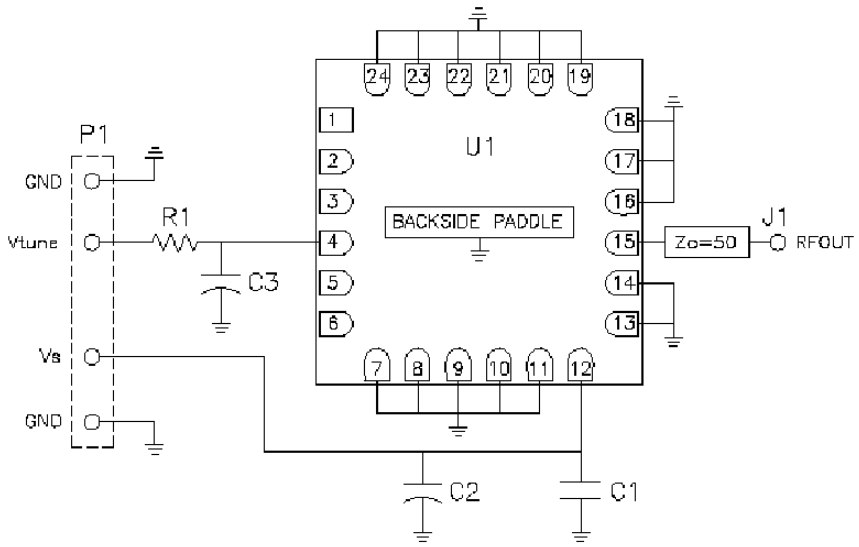
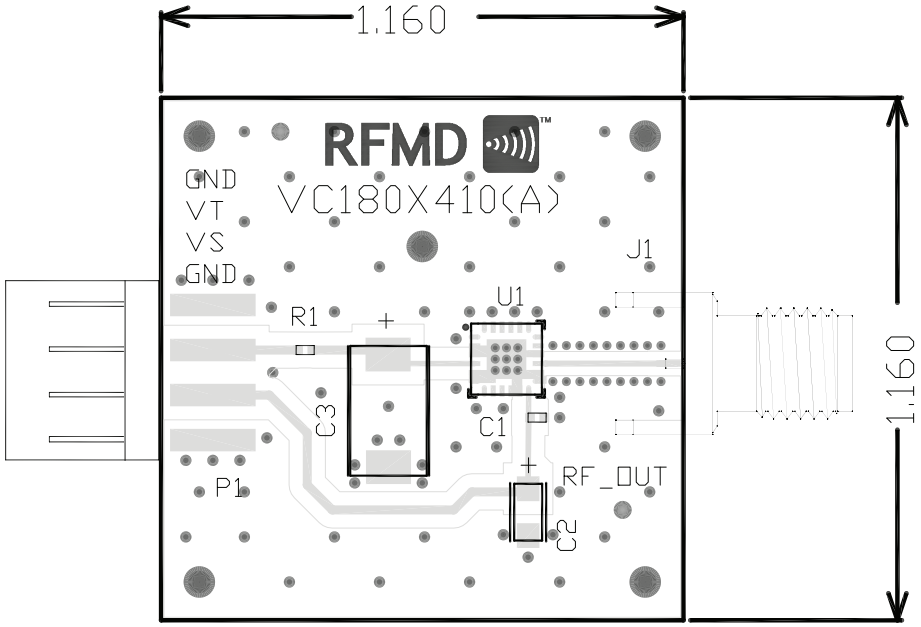
Evaluation Board



Item	Description
U1	RFVC1800
C1	CAP, 1000pF, 0402
C2	CAP, 4.7uF, TANT-A
C3	CAP, 22uF, TANT-D
R1	Jumper, 0 Ω, 0402
P1	CONN, HDR, ST, PLRZD, 4-Pin, 0.100”
J1	CONN, SMA, END LAUNCH

Evaluation Board Layout



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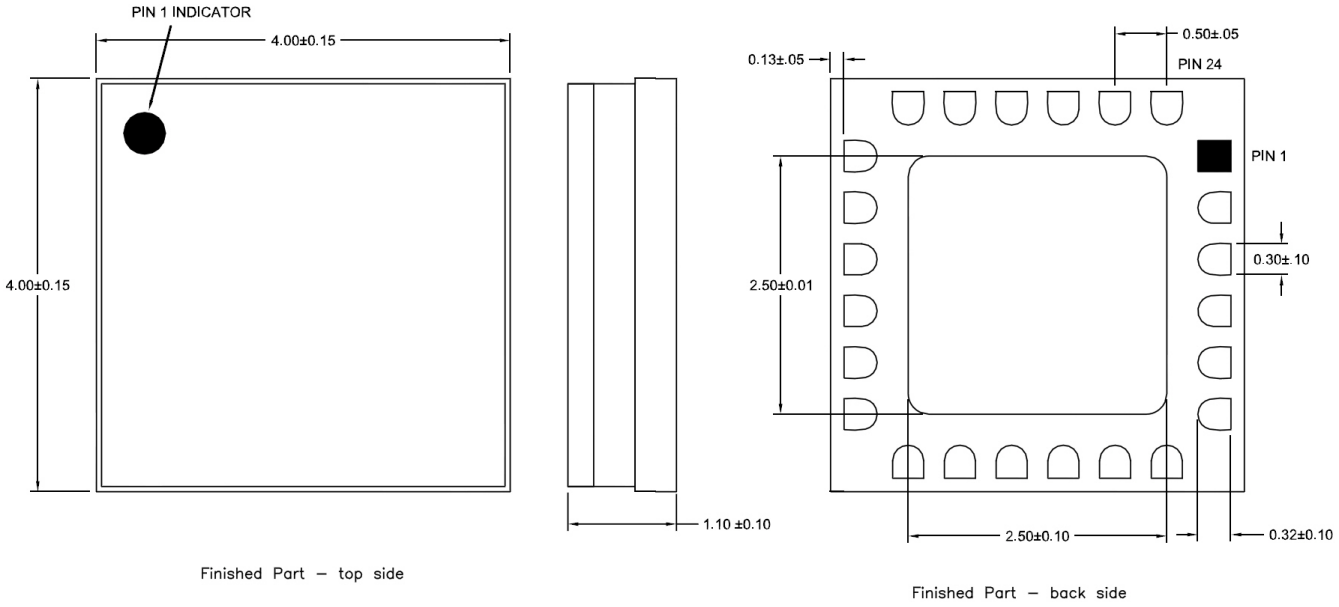
Package Drawing.



Notes:

1. Dimensions in mm.
2. Dimensions are for reference only.
3. Package body material: Alumina.
4. Lead and Paddle plating: Gold.

Ordering Information

Part Number	Description
RFVC1800S2	2pc sample bag
RFVC1800PCK-410	Fully assembled evaluation board
RFVC1800	10pcs or more

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