

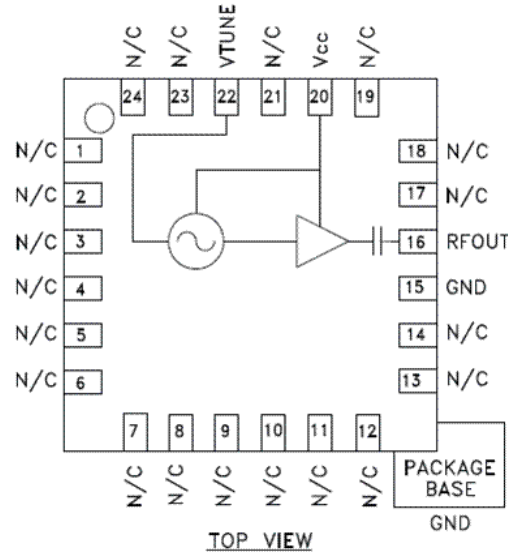


Features

- 6.1GHz to 6.75GHz Operation
- -101 dBc/Hz Phase Noise at 100kHz Offset
- +8.0 dBm P_{OUT}
- No External Resonator or Tuning Elements Needed
- 3V V_{CC} Operation

Applications

- Instrumentation
- Military
- Aerospace
- Point to Point Radio
- Test Equipment
- VSAT
- CATV



Functional Block Diagram

Product Description

RFMD's RFVC1823 is a 3V GaAs InGaP MMIC VCO with an integrated buffer amplifier operating over a frequency range of 6.1GHz to 6.75GHz. Its monolithic structure provides excellent temperature, shock, and vibration performance while its integrated buffer amplifier provides an output power of +8dB from a 3V supply. Phase noise is -101dBc/Hz at 100kHz offset. The RFVC1823 is available in a low cost leadless ceramic 4mmx4mm surface mount QFN outline.

Ordering Information

RFVC1823S2	2 piece sample bag
RFVC1823PCK-410	PCBA with 2 piece sample bag
RFVC1823SB	5 piece bag
RFVC1823SQ	25 piece bag
RFVC1823SR	100 pieces on 7" reel
RFVC1823TR7	750 pieces on 7" reel

Optimum Technology Matching® Applied

- | | | | |
|---|--------------------------------------|-------------------------------------|------------------------------------|
| <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS | <input type="checkbox"/> Si CMOS | <input type="checkbox"/> BiFET HBT |
| <input checked="" type="checkbox"/> InGaP HBT | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si BJT | <input type="checkbox"/> LDMOS |

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Absolute Maximum Ratings

Parameter	Rating	Unit
Bias Voltage (V_{DD})	+3.25	V_{DC}
V_{TUNE}	14	V_{DC}
Operating Junction Temperature (T_J)	97	$^{\circ}C$
Continuous Power Dissipation ($T = +85^{\circ}C$)	200	mW
Thermal Resistance (Pad to Die Bottom)	10	$^{\circ}C/W$
Storage Temperature	-40 to +150	$^{\circ}C$
Operating Temperature	-40 to +85 $^{\circ}C$	$^{\circ}C$
ESD JESD22-A114 Human Body Model (HBM)	Class 0, 150V	



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.

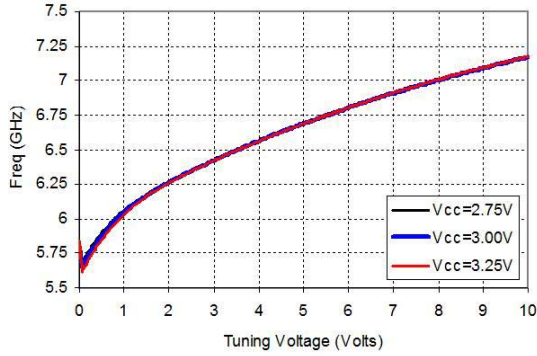
RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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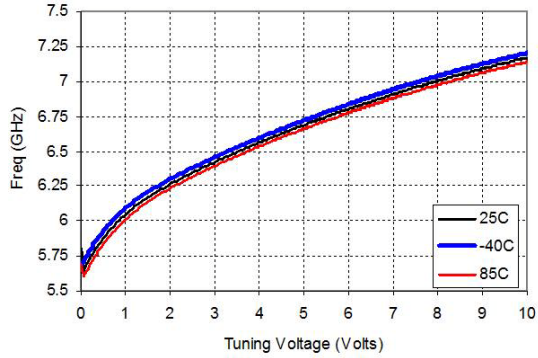
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Electrical Specifications					$T_A = +25^{\circ}C$, $V_{CC} = +3.0V_{DC}$
Operating Frequency	6.1		6.75	GHz	
V_{TUNE}	0		10	V	
V_{TUNE} Leakage Current		0.275	50	μA	At $V_{TUNE} = 10V$
Output Power	5	8.0		dBm	At $V_{TUNE} = 5V$
Phase Noise at 10kHz Offset		-76		dBc/Hz	At $V_{TUNE} = 5V$
Phase Noise at 100kHz Offset		-101		dBc/Hz	At $V_{TUNE} = 5V$
Harmonics					
2nd		-25		dBc	At $V_{TUNE} = 5V$
3rd		-31		dBc	
Output Spurious			-70	dBc	
Output Return Loss		10		dB	
Supply Current		37	45	mA	At $V_{TUNE} = 5V$
Pulling		1.4		MHz	VSWR 2.5:1 all phases
Pushing		10		MHz/V	At $V_{TUNE} = 5V$
Frequency Drift		-0.50		MHz/C	At $V_{TUNE} = 5V$

Typical Electrical Performance

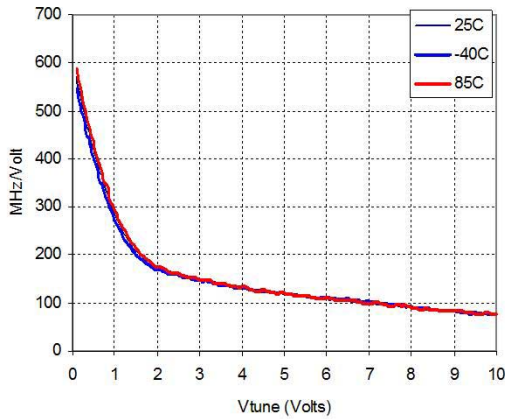
Frequency vs. Tuning Voltage
T=25C



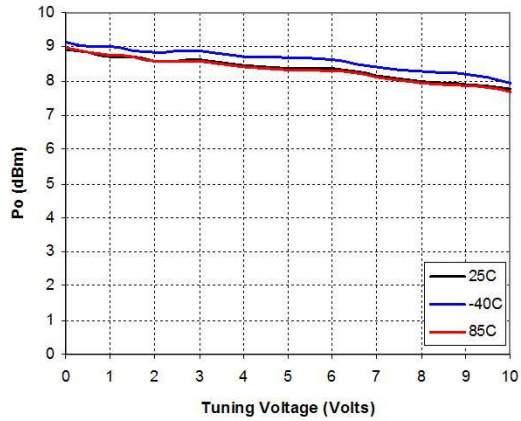
Frequency vs. Tuning Voltage
Vcc=+3V



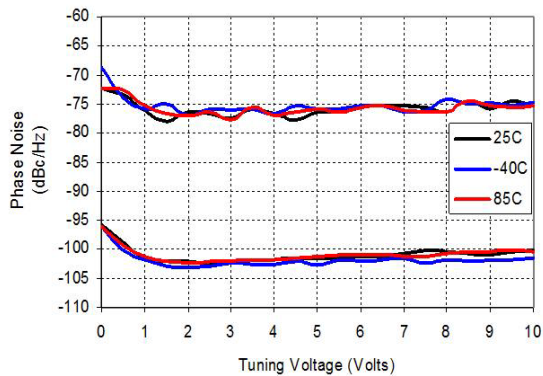
Sensitivity vs. Tuning Voltage, Vcc=+3V



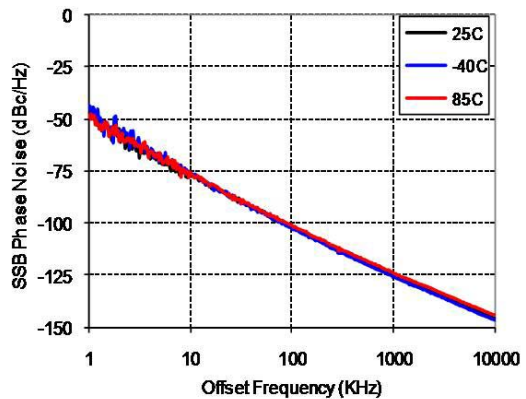
Output Power vs. Tuning Voltage, Vcc=+3V



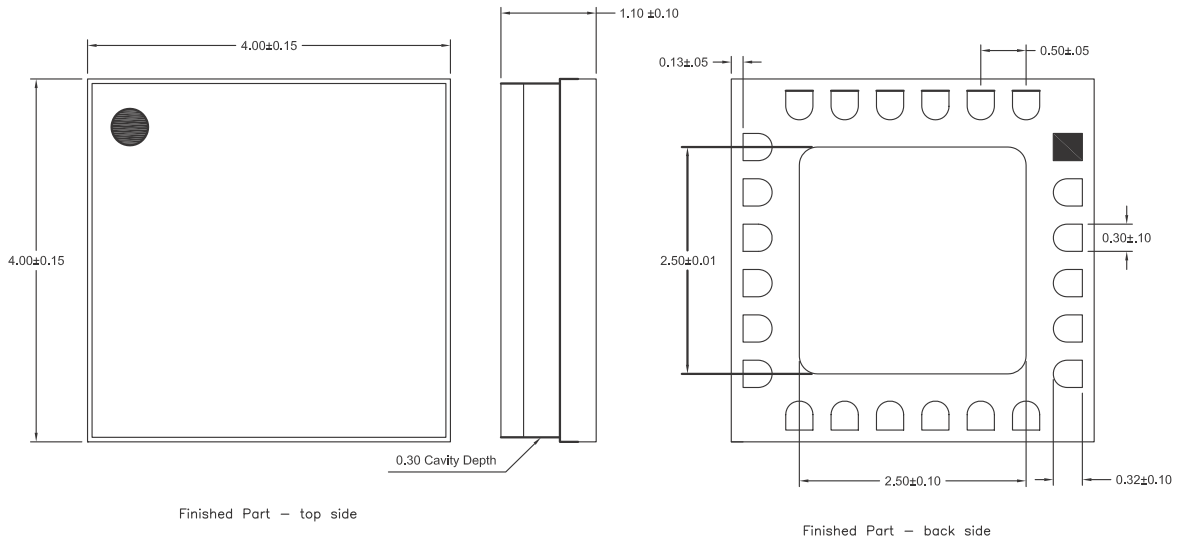
Phase Noise
10KHz and 100KHz Offset vs. Tuning Voltage



Typical SSB Phase Noise
Vtune=+5V



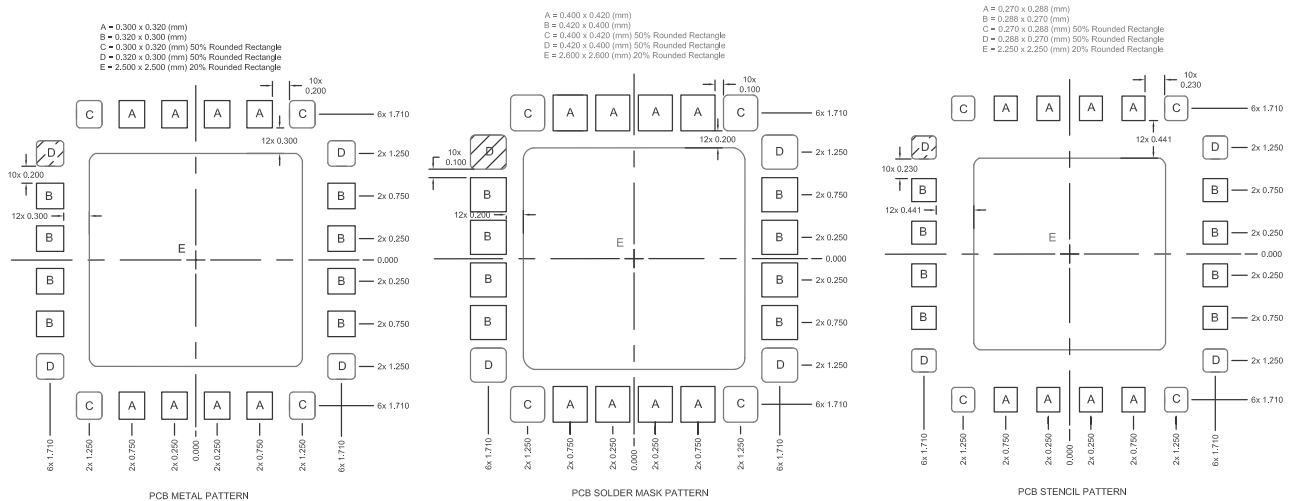
Package Drawing



Notes:

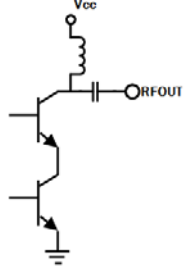
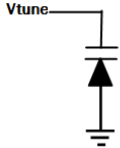
1. Dimensions in mm.
2. Dimensions are for reference only.
3. Package body material: Alumina.
4. Lead and paddle plating: Au, 30u" minimum.

Recommended PCB Layout

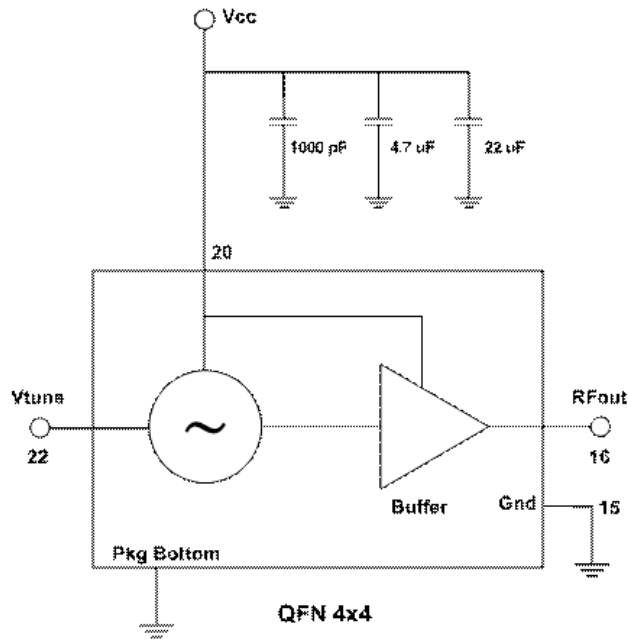


Notes:

1. Shaded area represents Pin 1 location.

Pin	Function	Description	Interface Schematic
15	GND	Connect directly to PCB ground for best performance.	
16	RFOUT	RF out. This pad is AC coupled and matched for optimum P _{OUT} . A 50Ω termination is recommended for this pin.	
20	VCC	Connect 3V to power both the oscillator core and the buffer amplifier.	
22	VTUNE	Direct connection to the varactor diodes used to vary the frequency of oscillation.	
Pkg Base	GND	Ground connection. Solder package bottom directly to ground plane for best performance.	

Application Circuit Block Diagram



Evaluation Board Layout

