

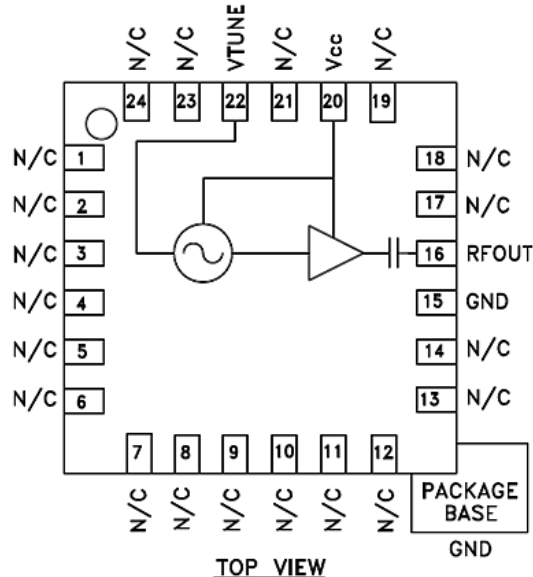


Features

- 7.2GHz to 8.3GHz Operation
- -106dBc/Hz Phase Noise at 100kHz offset
- 12dBm P_{OUT}
- No external resonator or elements needed
- 4mm x 4mm QFN package
- 3V V_{CC} operation

Applications

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



Functional Block Diagram

Product Description

RFMD's RFVC1824 is a 3V InGaP MMIC VCO with an integrated buffer amplifier operating over a frequency range of 7.2GHz to 8.3GHz. Its monolithic tuning structure provides excellent temperature, shock, and vibration performance while its integrated buffer amplifier provides an output power of 12dBm from a 3V supply. Phase noise is -106dBc/Hz at 100kHz offset. The RFVC1824 is available in a low cost leadless ceramic 4mm x 4mm surface mount QFN outline.

Ordering Information

RFVC1824S2	2 piece sample bag
RFVC1824PCK-410	PCBA with 2 piece sample bag
RFVC1824SB	5 piece bag
RFVC1824SQ	25 piece bag
RFVC1824SR	100 pieces on 7" reel
RFVC1824TR7	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}	15	V_{DC}
Operating Junction Temperature (T_J)	120	$^{\circ}C$
Continuous Power Dissipation ($T = +85^{\circ}C$)	250	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.

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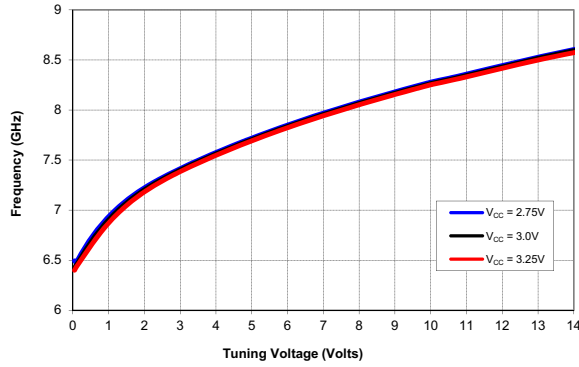


RFMD Green: RoHS compliant per EU Directive 2002/95/EC, halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

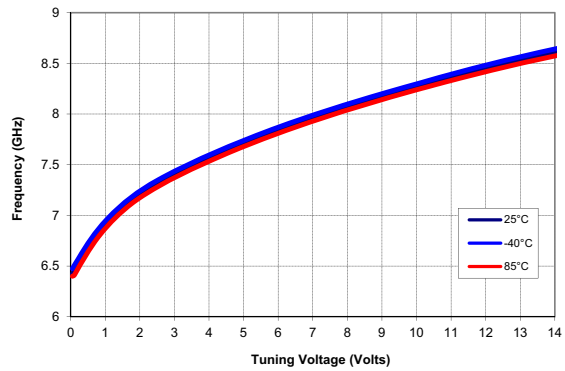
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Electrical Specifications					$T_A = +25^{\circ}C, V_{CC} = +3.0V_{DC}$
Operating Frequency	7.2		8.3	GHz	
V_{TUNE}	1.5		14	V	
V_{TUNE} Leakage Current		0.275	50	μA	At $V_{TUNE} = 10V$
Output Power		12		dBm	At $V_{TUNE} = 5V$
Phase Noise at 10kHz Offset		-80		dBc/Hz	At $V_{TUNE} = 5V$
Phase Noise at 100kHz Offset		-106		dBc/Hz	At $V_{TUNE} = 5V$
Harmonics					
2nd		-12		dBc	At $V_{TUNE} = 5V$
3rd		-32		dBc	
Output Spurious			-70	dBc	
Output Return Loss		10		dB	
Supply Current		65	75	mA	At $V_{TUNE} = 5V$
Pulling		3		MHz	VSWR 2.5:1 all phases
Pushing		-50		MHz/V	At $V_{TUNE} = 5V$
Frequency Drift		-0.5		MHz/C	At $V_{TUNE} = 5V$

Typical Electrical Performance

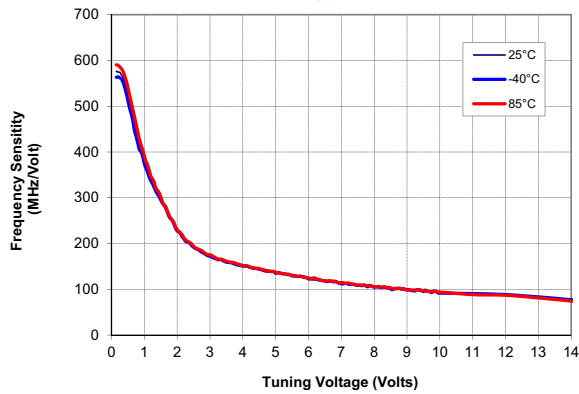
Frequency versus Tuning Voltage
T = 25°C



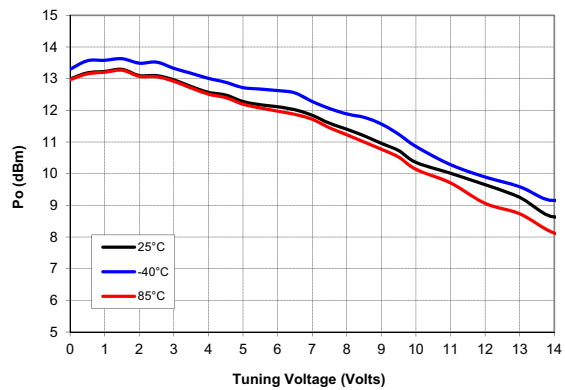
Frequency versus Tuning Voltage
V_{CC} = +3V



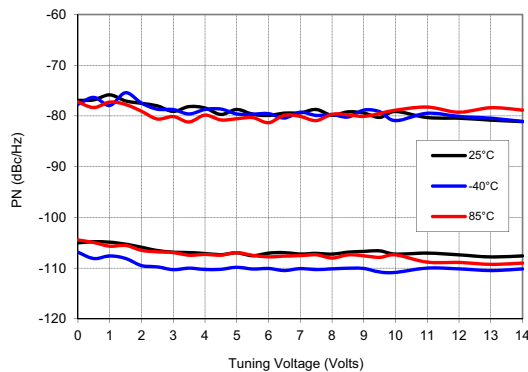
Sensitivity versus Tuning Voltage
V_{CC} = +3V



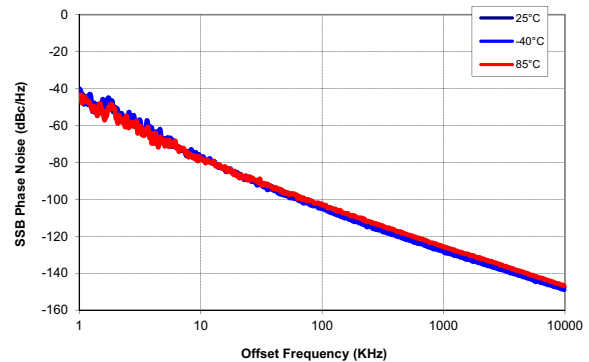
Output Power versus Tuning Voltage
V_{CC} = +3V



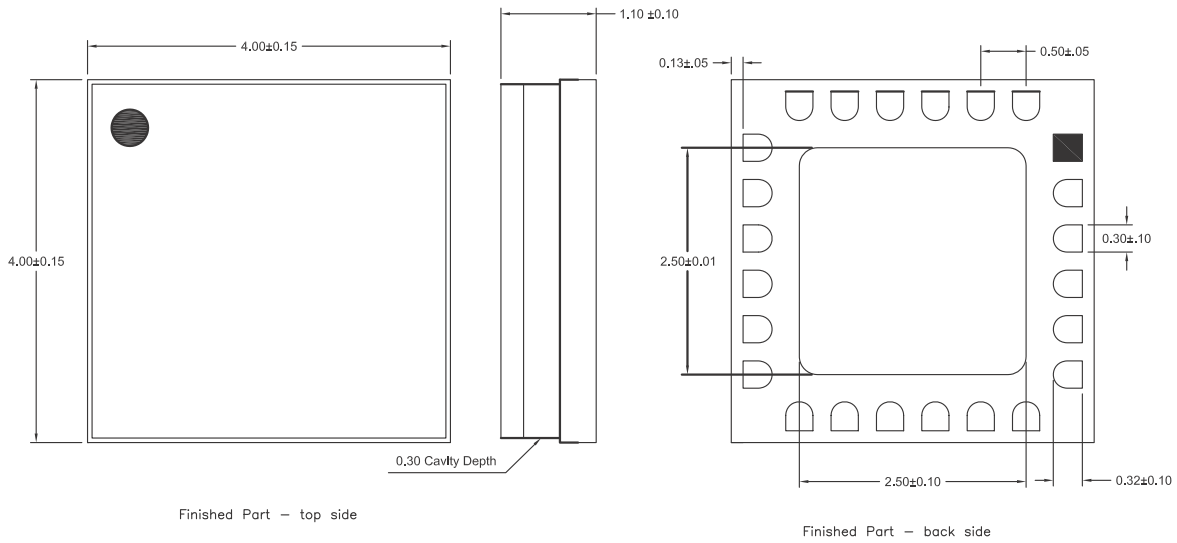
Phase Noise
10KHz and 100KHz Offset versus Tuning Voltage



Typical SSB Phase Noise
V_{TUNE} = +5V



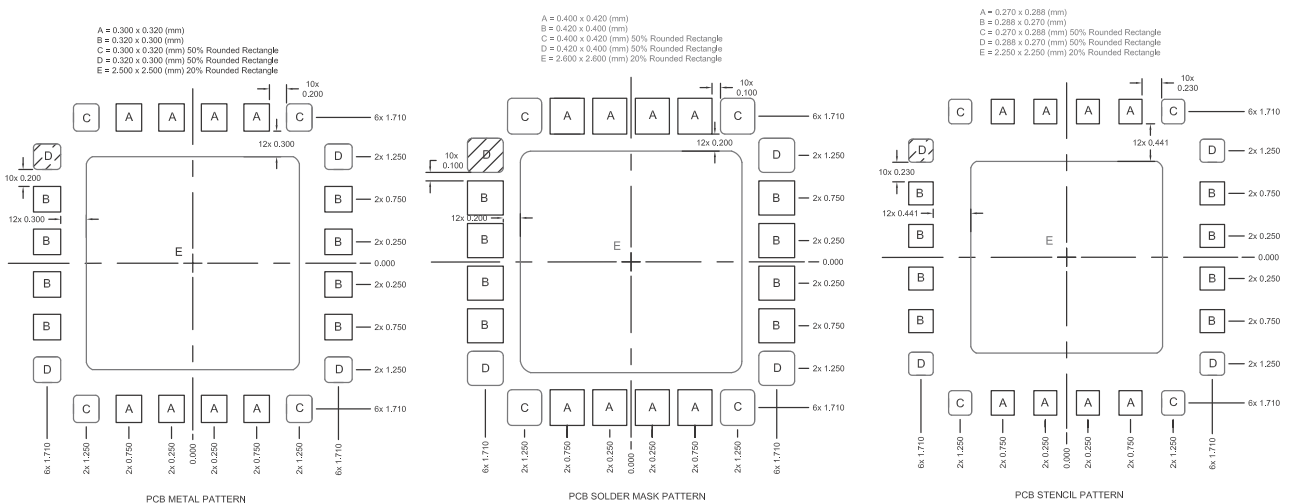
Package Drawing



Notes:

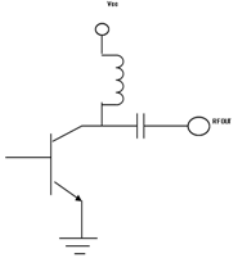
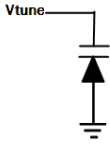
1. Dimensions in mm.
2. Dimensions are for reference only.
3. Package body material: Alumina.
4. Lead and paddle plating: Au, 30u" minimum.

Recommended PCB Layout

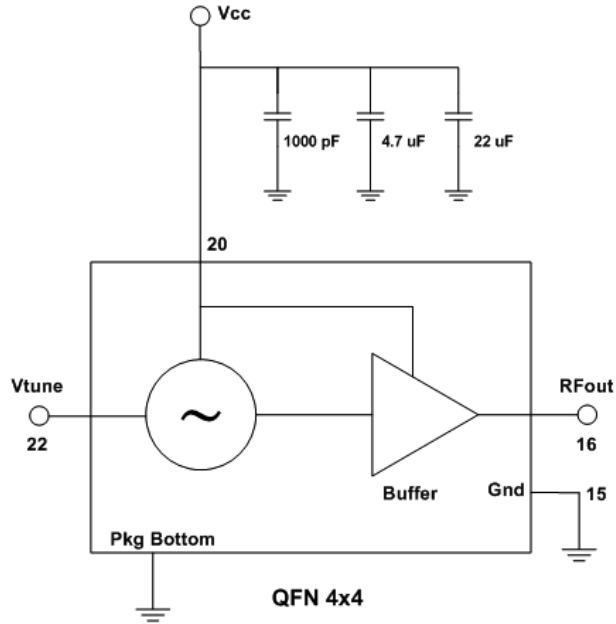


Notes:

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

