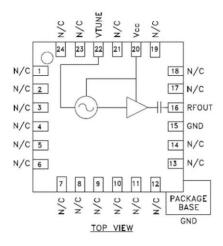


# **RFVC1824**

## Low Noise MMIC VCO with Buffer Amplifier

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.



Functional Block Diagram

#### **Ordering Information**

RFVC1824S2	Sample bag with 2 pieces			
RFVC1824SB	Sample bag with 5 pieces			
RFVC1824SQ	Bag with 25 pieces			
RFVC1824SR	7" Reel with 100 pieces			
RFVC1824TR7	7" Reel with 750 pieces			
RFVC1824PCK-410	PCBA with 2-piece sample bag			



Package: QFN, 24-pir 4mm x 4mm

#### **Features**

- 7.2GHz to 8.3GHz Operation
- -106dBc/Hz Phase Noise at 100KHz Offset
- 12dBm P<sub>OUT</sub>
- No External Resonator or Elements Needed
- 4mm x 4mm QFN Package
- 3V V<sub>CC</sub> Operation

#### **Applications**

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



#### **Absolute Maximum Ratings**

Parameter	Rating	Unit
Bias Voltage (V <sub>DD</sub> )	+3.25	$V_{DC}$
V <sub>TUNE</sub> (V <sub>T</sub> )	15	$V_{DC}$
Operating Junction Temperature (T <sub>J</sub> )	120	°C
Continuous Power Dissipation (T = +85°C)	250	mW
Thermal Resistance (Pad to Die Bottom)	10	°C/W
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-55 to +150	°C
ESD JESD22-A114 Human Body Model (HBM)	Class 0, 150V	



Caution! ESD sensitive device.



RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), 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.

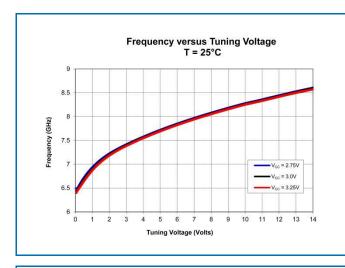
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute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

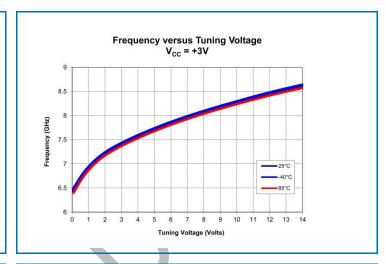
#### **Nominal Operating Parameters**

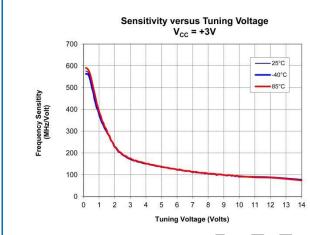
Dovemeter	Specification		Unit	Condition		
Parameter	Min	Тур	Max	Unit	Condition	
Electrical Specifications					$V_{CC} = +3.0V_{DC}, T_A = +25^{\circ}C$	
Operating Frequency	7.2		8.3	GHz		
Tuning Voltage (V <sub>TUNE</sub> )	1.5		14	V		
V <sub>TUNE</sub> Leakage Current		0.275	50	μA	At V <sub>TUNE</sub> = 10V	
Output Power		12		dBm	At V <sub>TUNE</sub> = 5V	
Phase Noise at 10kHz Offset		-80		dBc/Hz		
Phase Noise at 100kHz Offset		-106		dBc/Hz		
Harmonics						
2nd		-12		dBc	At V <sub>TUNE</sub> = 5V	
3rd		-32		dBc		
Output Spurious			-70	dBc		
Output Return Loss		10		dB		
Supply Current		66	75	mA		
Pulling		3		MHz	VSWR 2.5:1 all phases	
Pushing		-50		MHz/V	At V <sub>TUNE</sub> = 5V	
Frequency Drift Rate		-0.5		MHz/°C		

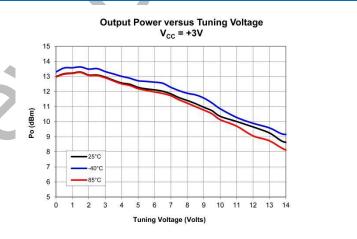


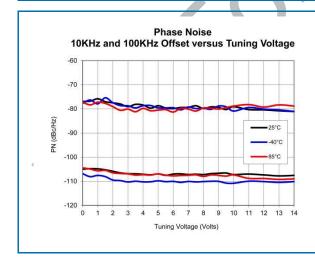
#### **Typical Electrical Performance**

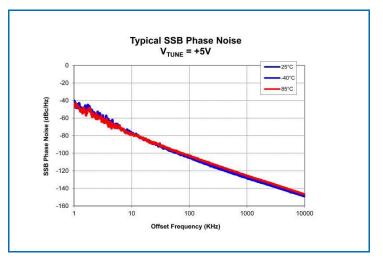












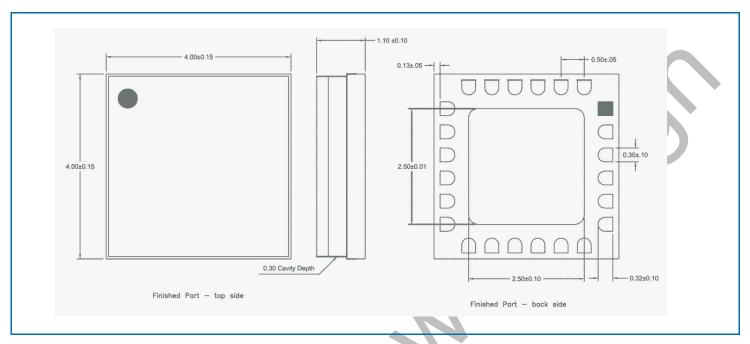


#### **Pin Names and Descriptions**

Pin	Name	Description	Interface Schematic
1-14	N/C	No internal connection. Connect to PCB ground.	
15	GND	Connect directly to PCB ground for best performance.	
16	RFOUT	RF out. This pad is AC coupled and matched for optimum $P_{\text{OUT}}$ . A $50\Omega$ termination is recommended for this pin.	Vcc ORFOUT
17-19	N/C	No internal connection. Connect to PCB ground.	
20	VCC	Connect 3V to power both the oscillator core and the buffer amplifier.	
21	N/C	No internal connection. Connect to PCB ground.	
22	VTUNE	Direct connection to the varactor diodes used to vary the frequency of oscillation.	Vtune————————————————————————————————————
23-24	N/C	No internal connection. Connect to PCB ground.	
PKG BASE	GND	Ground connection. Solder package bottom directly to ground plane for best performance.	



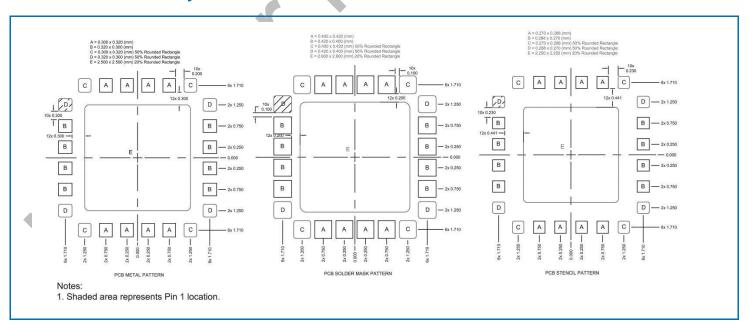
#### Package Drawing (Dimensions in millimeters)



#### Notes:

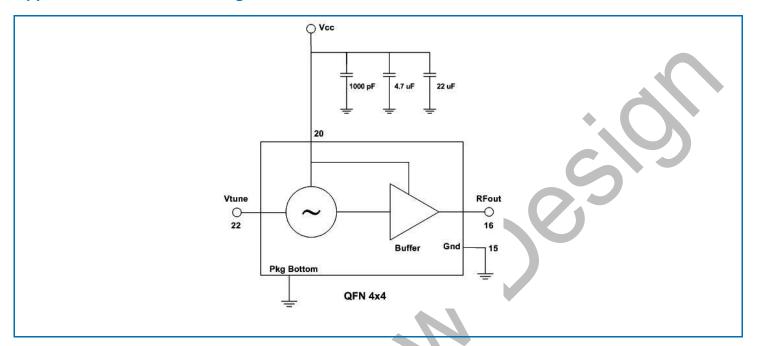
- 1. Dimensions are for reference only.
- 2. Package body material: Alumina.
- 3. Lead and paddle plating: Au, 30u" minimum.

#### **Recommended PCB Layout**





## **Application Circuit Block Diagram**



## **Evaluation Board Layout**

