

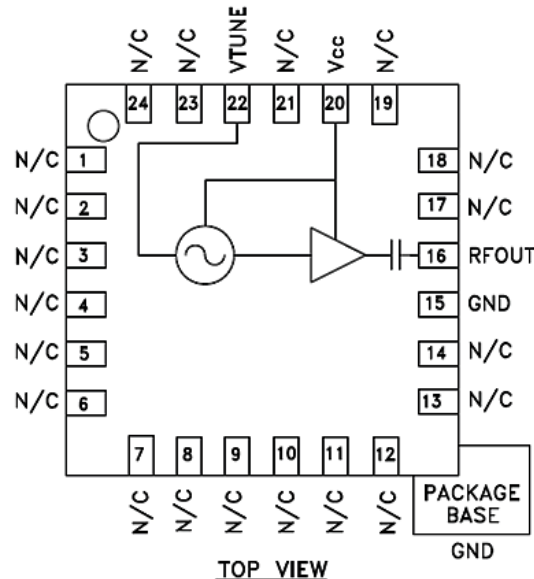


### Features

- 7.8GHz to 8.7GHz Operation
- -107 dBc/Hz Phase Noise at 100KHz offset
- +11.0 dBm P<sub>OUT</sub>
- No external resonator or elements needed
- 4mmx4mm QFN package
- 3V V<sub>CC</sub> operation

### Applications

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



Functional Block Diagram

### Product Description

RFMD's RFVC1825 is a 3V InGaP MMIC VCO with an integrated buffer amplifier operating over a frequency range of 7.8GHz to 8.7GHz. Its monolithic tuning structure provides excellent temperature, shock, and vibration performance while its integrated buffer amplifier provides an output power of 11dBm from a 3V supply. Phase noise is -107dBc/Hz at 100kHz offset. The RFVC1825 is available in a low cost leadless ceramic 4mmx4mm surface mount QFN outline.

### Ordering Information

RFVC1825S2	2 piece sample bag
RFVC1825PCK-410	PCBA with 2 piece sample bag
RFVC1825SB	5 piece bag
RFVC1825SQ	25 piece bag
RFVC1825SR	100 pieces on 7" reel
RFVC1825TR7	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 ( $T_J$ )	99	$^{\circ}C$
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.

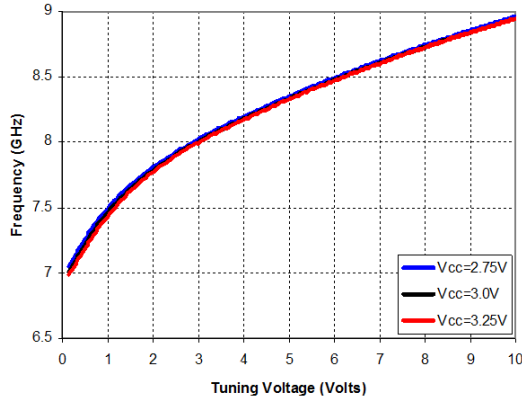
RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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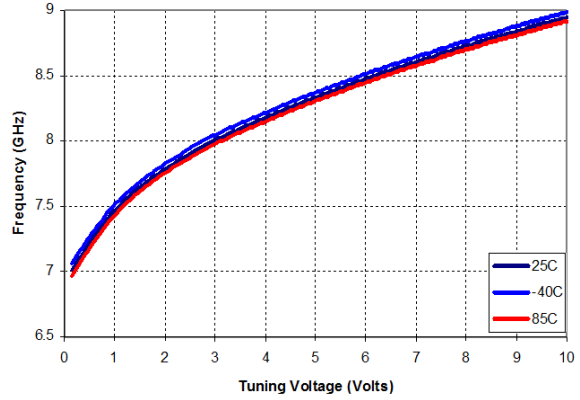
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Electrical Specifications</b>					$T_A = +25^{\circ}C$ , $V_{CC} = +3.0V_{DC}$
Operating Frequency	7.8		8.7	GHz	
$V_{TUNE}$	0		12	V	
$V_{TUNE}$ Leakage Current		0.36	1.0	$\mu A$	At $V_{TUNE} = 10V$
Output Power	5	11		dBm	At $V_{TUNE} = 5V$
Phase Noise at 10kHz Offset		-80		dBc/Hz	At $V_{TUNE} = 5V$
Phase Noise at 100kHz Offset		-107		dBc/Hz	At $V_{TUNE} = 5V$
Harmonics					
2nd		-10		dBc	At $V_{TUNE} = 5V$
3rd		-25		dBc	
Output Spurious			-70	dBc	
Output Return Loss		10		dB	
Supply Current		67	80	mA	At $V_{TUNE} = 5V$
Pulling		1.6		MHz	VSWR 2.5:1 all phases
Pushing		-47		MHz/V	At $V_{TUNE} = 5V$
Frequency Drift		-0.53		MHz/C	At $V_{TUNE} = 5V$

**Typical Electrical Performance**

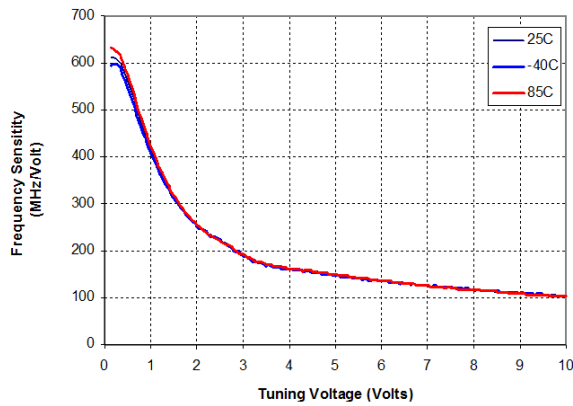
**Frequency vs. Tuning Voltage**  
T=25C



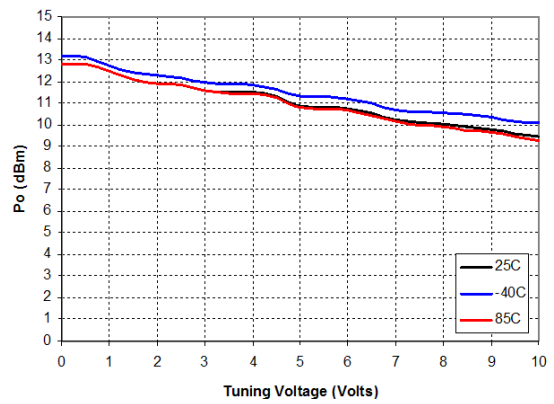
**Frequency vs. Tuning Voltage**  
Vcc=+3V



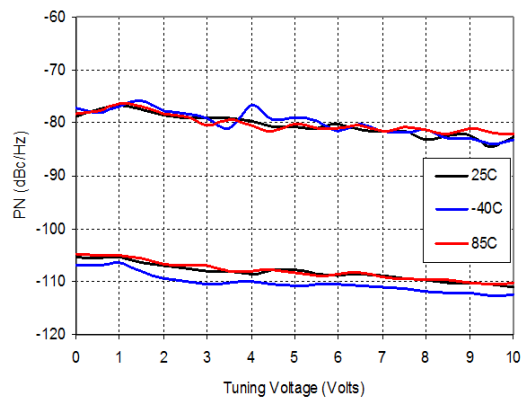
**Sensitivity vs. Tuning Voltage**  
Vcc=+3V



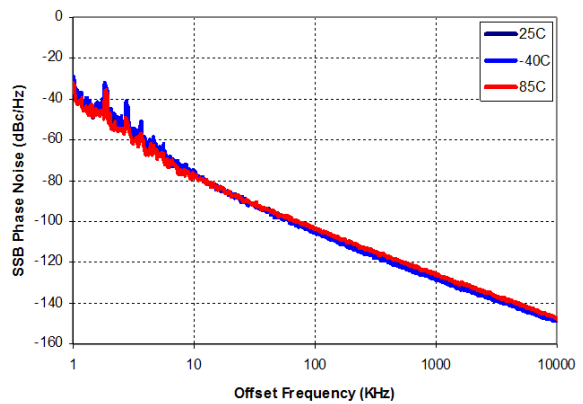
**Output Power vs. Tuning Voltage**  
Vcc=+3V



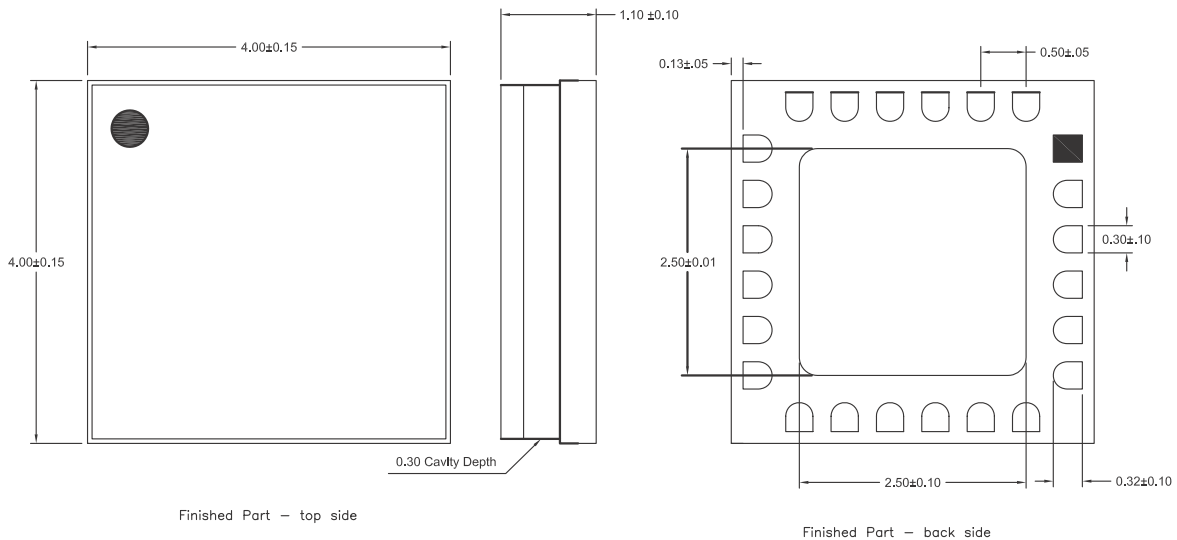
**Phase Noise 10KHz and 100KHz Offset vs. Tuning Voltage**



**Typical SSB Phase Noise**  
Vtune= +5V



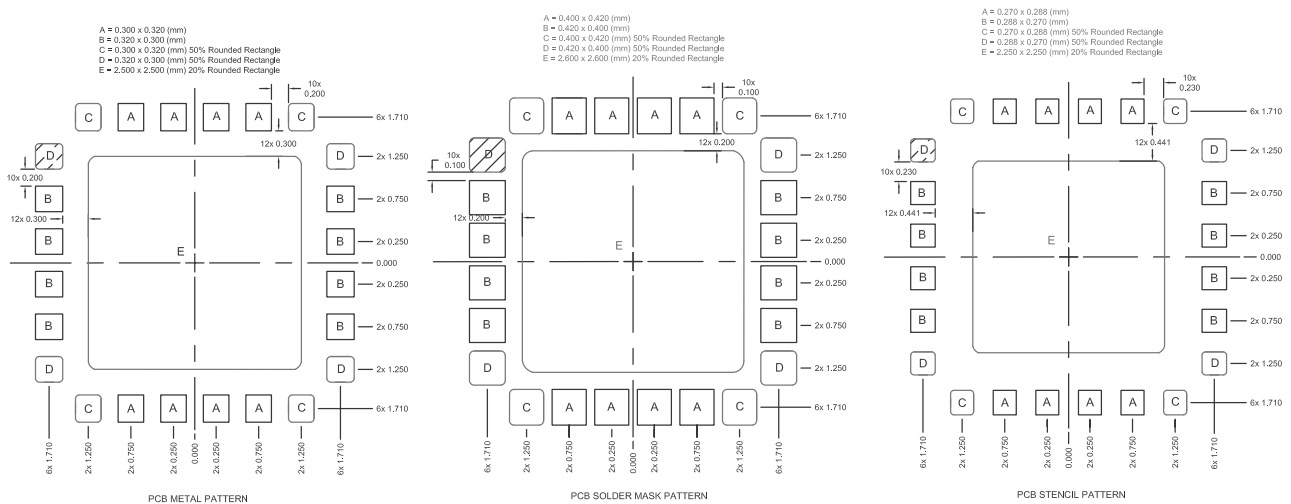
## Package Drawing



### Notes:

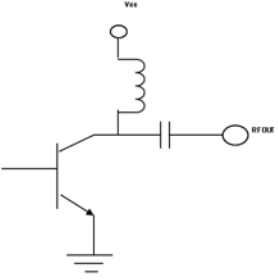
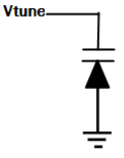
1. Dimensions in mm.
2. Dimensions are for reference only.
3. Package body material: Alumina.
4. Lead and paddle plating: Au, 30u" minimum.

## Recommended PCB Layout

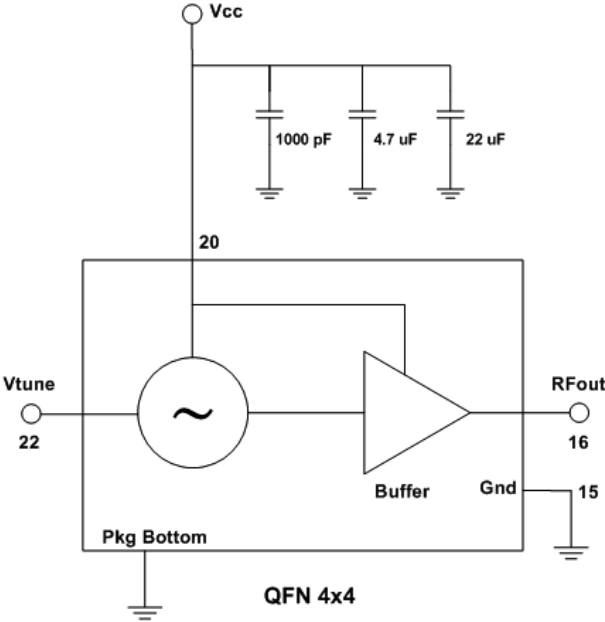


### Notes:

1. Shaded area represents Pin 1 location.

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

## Application Circuit Block Diagram



## Evaluation Board Layout

