RFVC9751

LOW PHASE NOISE VOLTAGE CONTROLLED OSCILLATOR 1920MHz TO 2000MHz

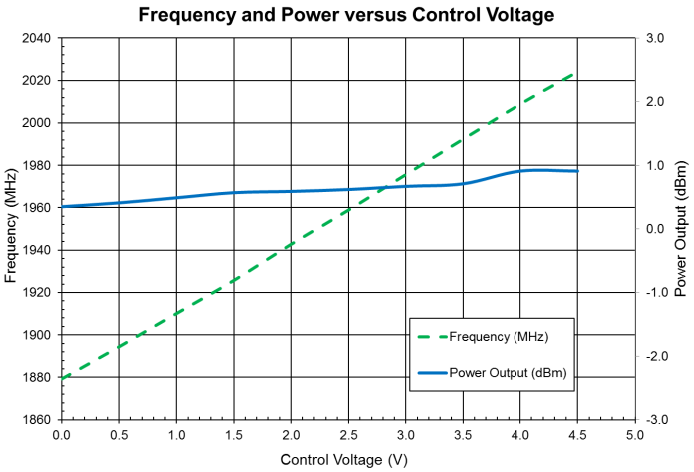
Package: MCM, 20-Pin, 6mmx6mm

Features

- -122dBc/Hz Typical at 100kHz Offset
- P_{OUT} 0dBm Typical
- 5.0V Supply
- 25mA Current Consumption
- Low Profile 6mmx6mm Package

Applications

- 2G, 3G, and 4G (LTE and WIMAX) Cellular Base Stations
- High Performance Transceiver Applications



Product Description

The RFVC9751 is a Voltage Controlled Oscillator (VCO) designed for high performance transceiver applications. It offers phase noise performance that meets or exceeds the requirements of 2G, 3G, and 4G (LTE and WiMAX) cellular base stations. Compared to the current generation of monolithic VCOs, the RFVC9751 provides improved phase noise and lower current consumption thereby lowering energy consumption and improving base station thermal management. The RFVC9751 is also 75% smaller than today's signal source modules, while providing the same low phase noise performance, satisfying the trend toward smaller base station sizes for microcells and remote radio heads.

Ordering Information

RFVC9751SQ	Sample bag with 25 pieces
RFVC9751SR	7" Sample reel with 100 pieces
RFVC9751TR7	7" Reel with 750 pieces
RFVC9751TR13	13" Reel with 2500 pieces
RFVC9751PCK-410	1920MHz to 2000MHz PCBA with 5-piece sample bag

Optimum Technology Matching® Applied

☐ GaAs HBT	☐ SiGe BiCMOS	☐ GaAs pHEMT	☐ GaN HEMT
☐ GaAs MESFET	☐ Si BiCMOS	☐ Si CMOS	☐ BiFET HBT
☐ InGaP HBT	☐ SiGe HBT	☐ Si BJT	☐ LDMOS

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Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage (V_{CC})	6.0	V
Control Voltage	0 to 9	V
DC Voltage on RF Out	20	V
Operating Temperature Range (T_L)	-40 to +85	°C
Storage Temperature	-55 to +125	°C
ESD Rating - Human Body Model (HBM)	Class 3A (4000V)	
Moisture Sensitivity Level	3	

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.

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.		
Frequency	1920		2000	MHz	
Tuning Voltage	0.5		4.5	V	
Tuning Sensitivity	27	34	39	MHz/V	
Output Power	-2.5	0.0	2.5	dBm	
2nd Harmonic			-12	dBc	
SSB Phase Noise at 1kHz Offset		-75	-71	dBc/Hz	
SSB Phase Noise at 10kHz Offset		-102	-98	dBc/Hz	
SSB Phase Noise at 100kHz Offset		-122	-118	dBc/Hz	
SSB Phase Noise at 600kHz Offset		-140	-136	dBc/Hz	
Power Supply	4.9	5.0	5.1	V	
Supply Current		25	30	mA	
Frequency Pushing			1.0	MHz/V	
Frequency Pulling (2:1 VSWR)			0.4	MHz, p-p	

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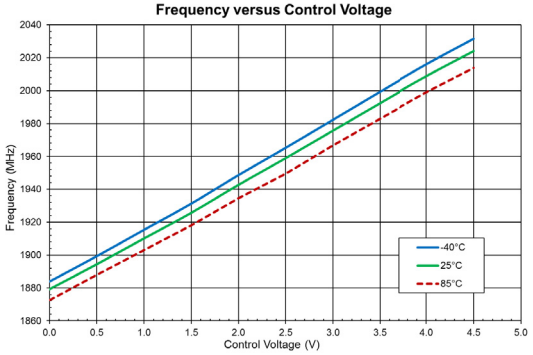
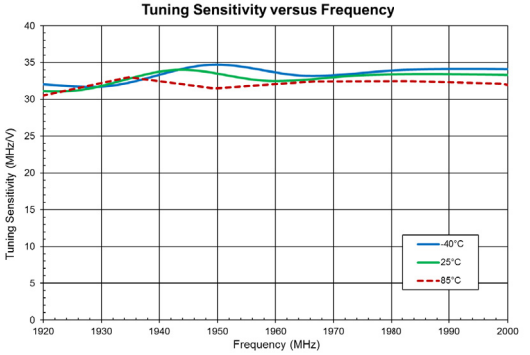
Typical Evaluation Board Performance (V_{CC}=5.0V)

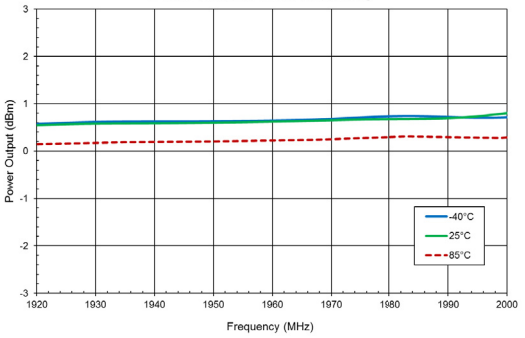
Frequency versus Control Voltage



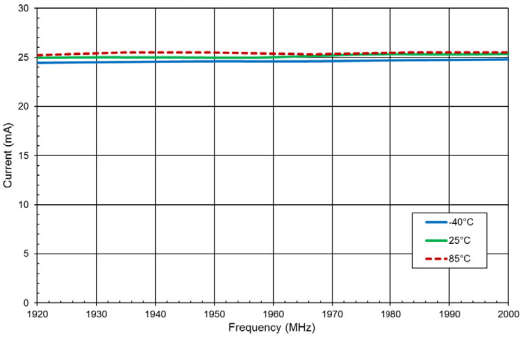
Tuning Sensitivity versus Frequency



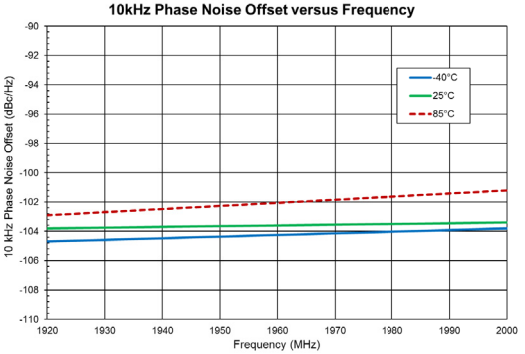
Power Output versus Frequency



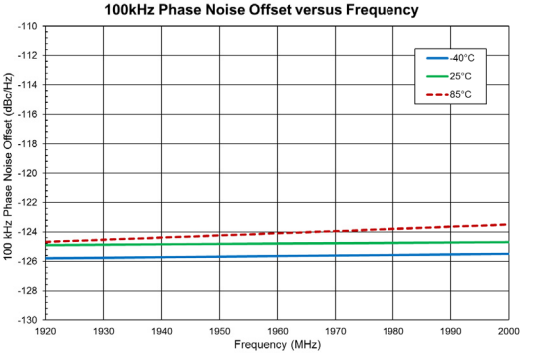
Current versus Frequency



10kHz Phase Noise Offset versus Frequency



100kHz Phase Noise Offset versus Frequency



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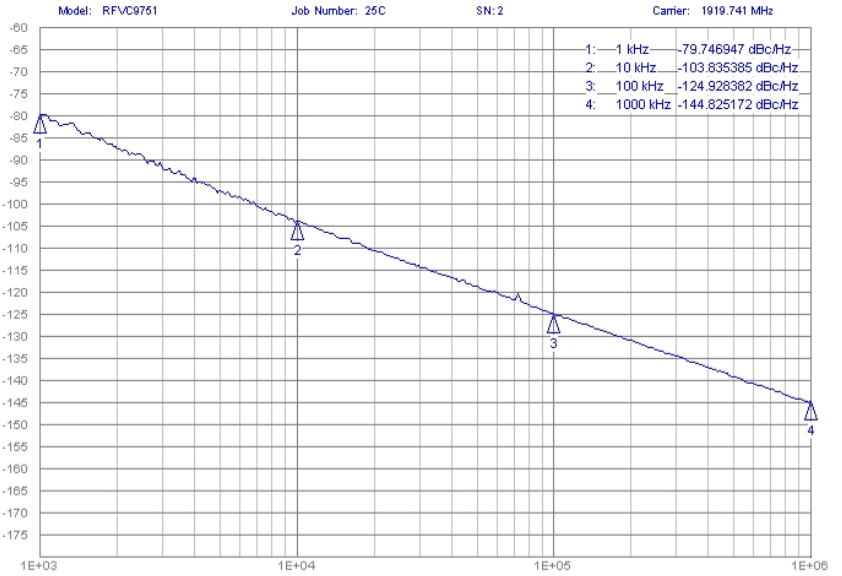
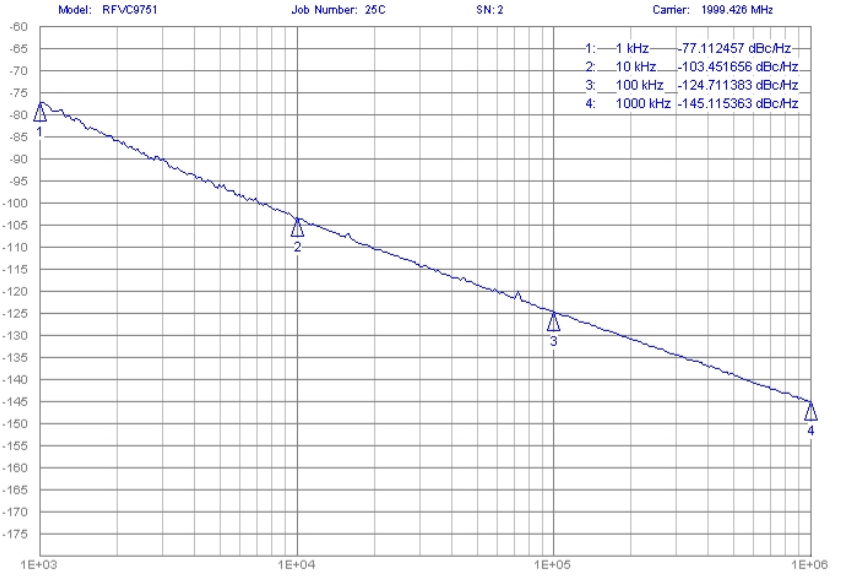
Typical Evaluation Board Performance (V_{CC}=5.0V, Temp=25°C)

Frequency=1920MHz



Frequency=2000MHz



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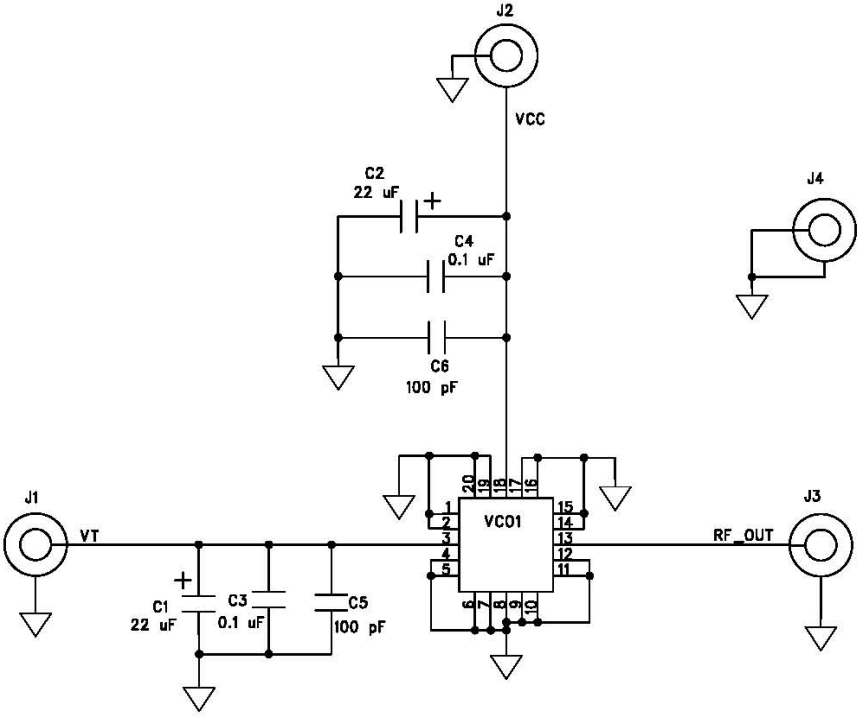
Evaluation Board Schematic



C1, C2 CASE D TANTALUM
C3 – C6 0402

Evaluation Board Bill of Materials (BOM)

Description	Reference Designator	Manufacturer	Manufacturer's P/N
Evaluation Board		RFMD	225242(A)
CONN, SMA, END LNCH, MINI, FLT, 0.042"	J1-J4	Emerson Network Power	142-0741-831
CAP, 0.1uF, 10%, 16V, X7R, 0402	C3-C6	Murata Electronics	GRM155R71C104KA88D
CAP, 22uF, 20%, 35V, TANT-D	C1-C2	AVX Corporation	TAJD226M035RNJ
RFVC9751	U1	RFMD	RFVC9751

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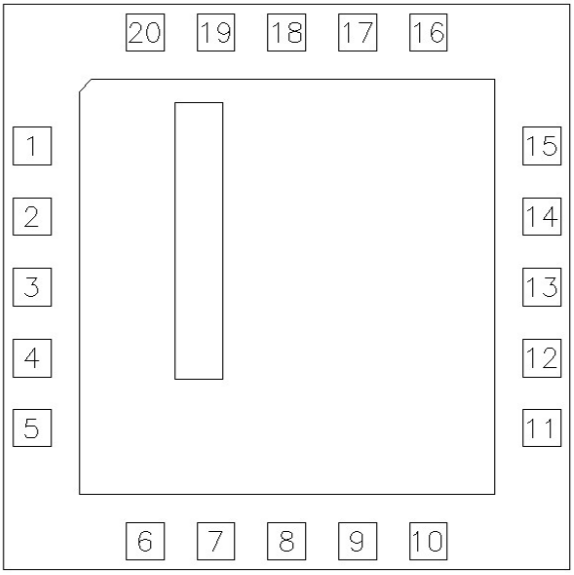
Pin Out



Pin Name and Description

Pin	Function	Description
1	GND	Ground
2	GND	Ground
3	VT	Control Voltage
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	RFOUT	VCO RF Output
14	GND	Ground
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	VCC	Supply Voltage
19	GND	Ground
20	GND	Ground

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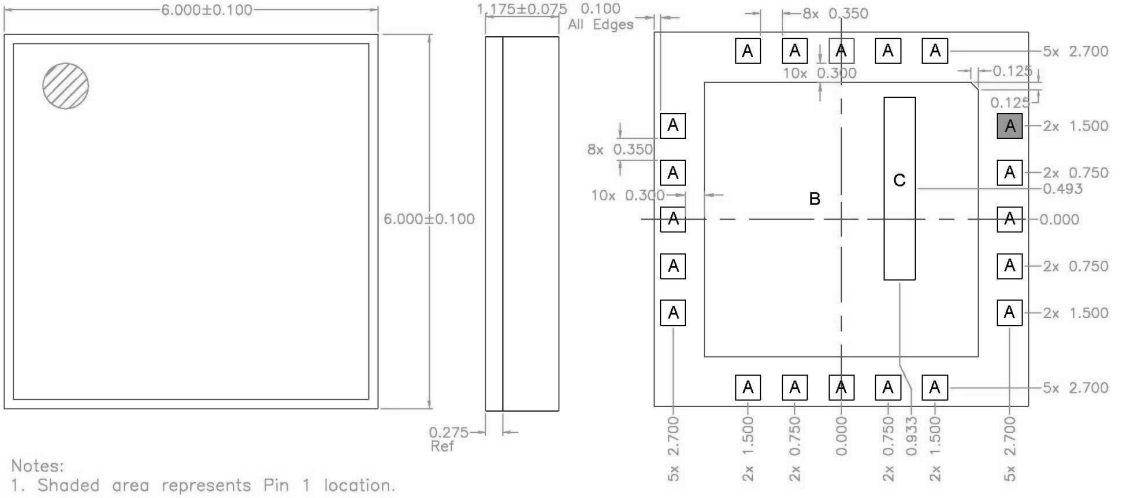
Package Drawing

Dimensions in millimeters



Notes:
1. Shaded area represents Pin 1 location.

A = 0.400 x 0.400 mm
B = 4.400 x 4.400 mm
C= 0.500 x 2.930 mm (opening in metal)

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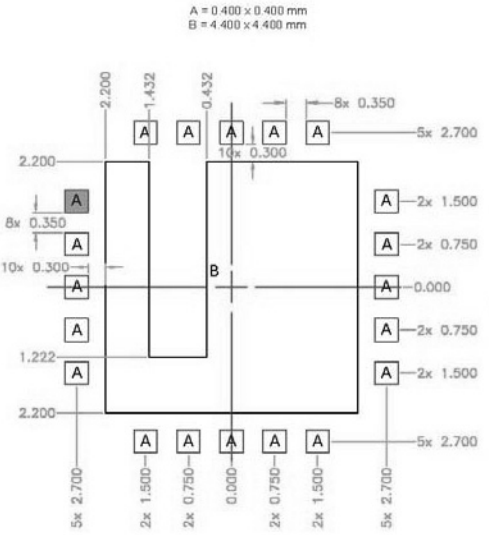
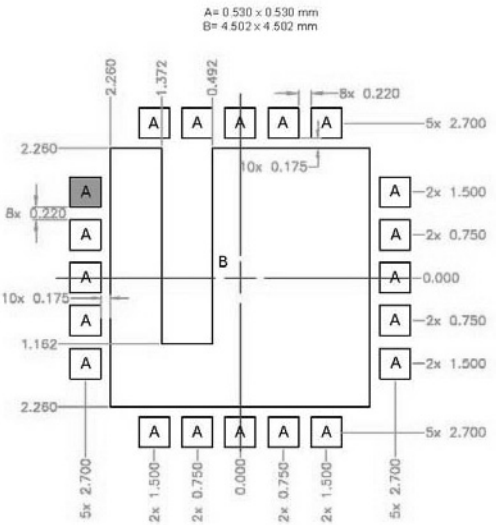
Evaluation Board Pattern

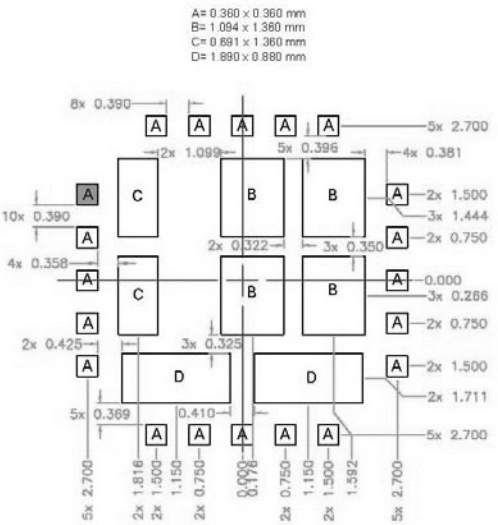
Dimensions in millimeters



PCB Metal Land Pattern



PCB Solder Mask Pattern



PCB Stencil Pattern

Notes:
1. Shaded area represents Pin 1 location.

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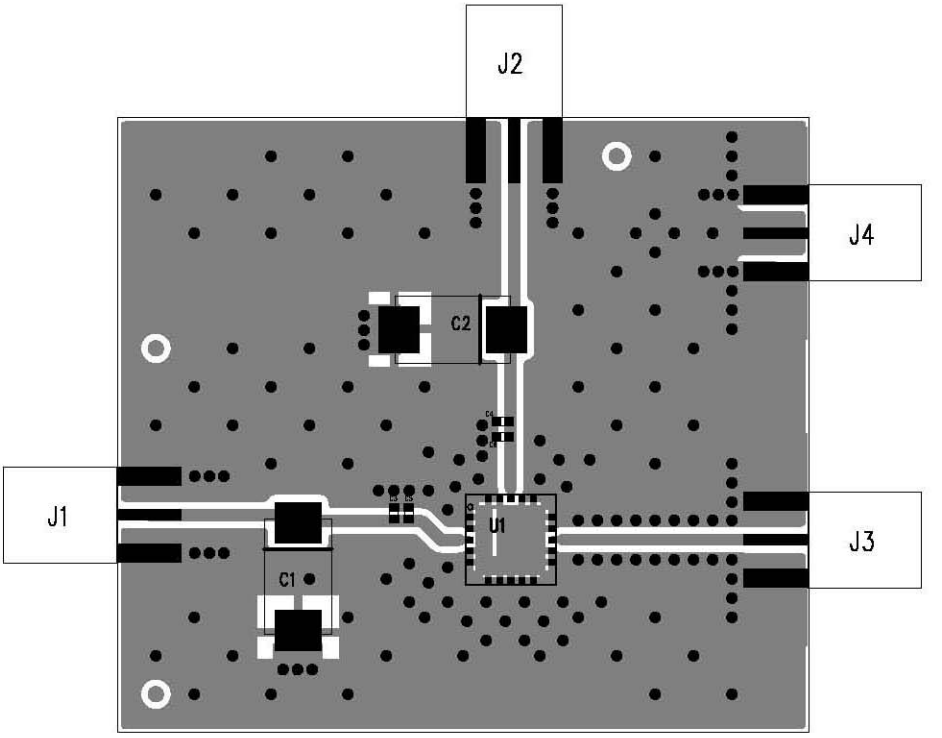
Evaluation Board Assembly Drawing



Connector	Function	Description
J1	VT	Control Voltage
J2	VCC	Supply Voltage
J3	RFOUT	RF Output
J4	GND	Ground