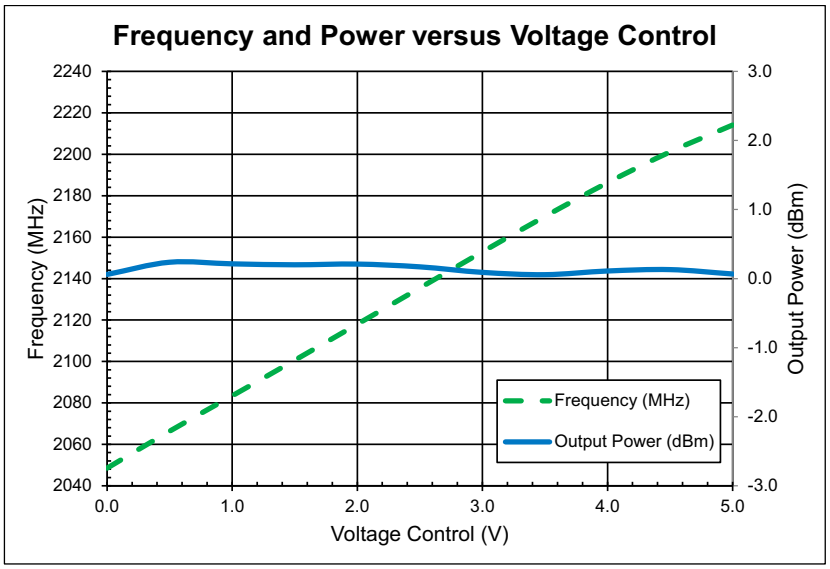
RFVC9800

LOW PHASE NOISE VOLTAGE CONTROLLED OSCILLATOR 2090MHz TO 2180MHz

Package: MCM, 8-Pin, 6.1mm x 8.1mm



Features

- -118dBc/Hz Typical at 100kHz Offset
- P_{OUT} 0dBm Typical
- 3.3V Supply
- 20mA Current Consumption
- Low Profile 6.1mm x 8.1mm Package

Applications

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

Product Description

The RFVC9800 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 improved phase noise and lower current consumption of the RFVC9800 lowers energy consumption, improves base station thermal management, and satisfies the trend toward smaller base station sizes for microcells and remote radio heads.

Ordering Information

RFVC9800SQ	Sample bag with 25 pieces
RFVC9800SR	7” Sample reel with 100 pieces
RFVC9800TR7	7” Reel with 750 pieces
RFVC9800TR13	13” Reel with 2500 pieces
RFVC9800PCK-410	2090MHz to 2180MHz 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	

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Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage (V_{CC})	6.0	V
Control Voltage	0 to 10	V
DC Voltage on RF Out	25	V
Operating Temperature Range (T_L)	-33 to +85	°C
Storage Temperature	-55 to +100	°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	2090		2180	MHz	
Tuning Voltage	0.5	1.0		V	2090MHz
		4.0	4.5	V	2180MHz
Tuning Sensitivity	25	35	45	MHz/V	
Output Power	-3.0	0.0	3.0	dBm	
2nd Harmonic		-25	-15	dBc	
3rd Harmonic		-50	-10	dBc	
Spurious (Non-Harmonic)			-90	dBc	
SSB Phase Noise at 10kHz Offset		-98	-92	dBc/Hz	
SSB Phase Noise at 100kHz Offset		-118	-112	dBc/Hz	
Power Supply	3.15	3.30	3.45	V	
Supply Current		18	20	mA	
Frequency Pushing		1	2	MHz, p-p	3.15V to 3.45MHz
Frequency Pulling		1	8	MHz, p-p	12dB RL
Tuning Port Capacitance		10	50	pF	
Output Impedance		50		Ω	

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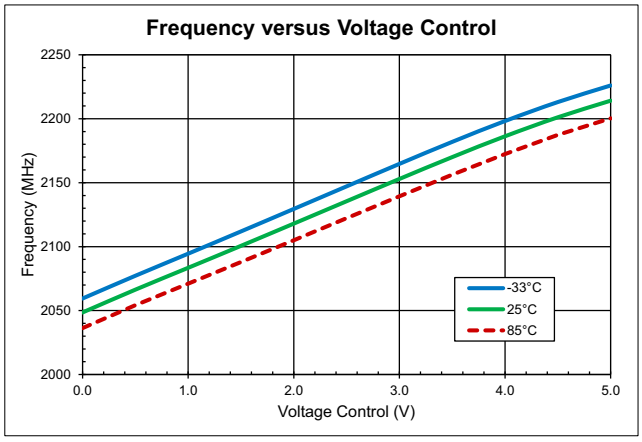
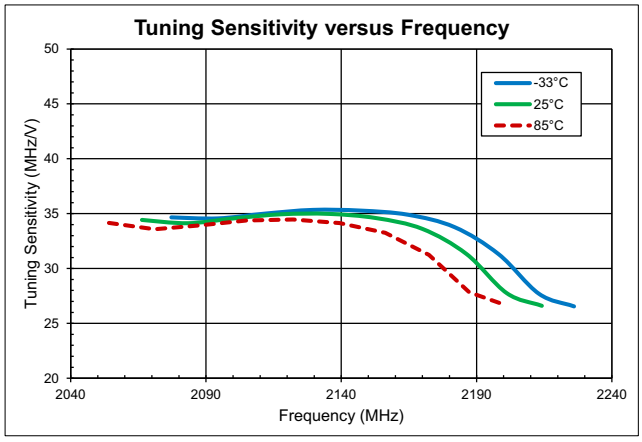
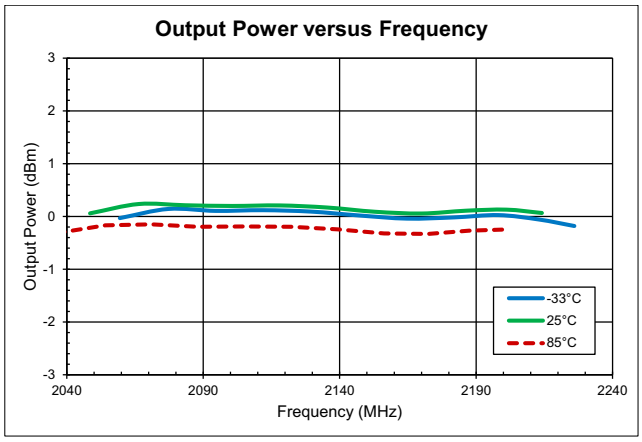
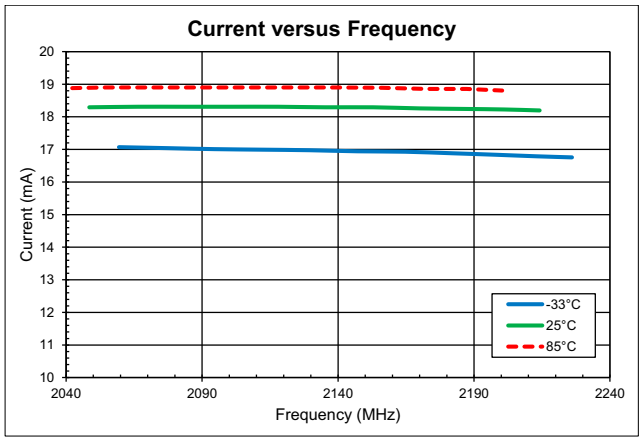
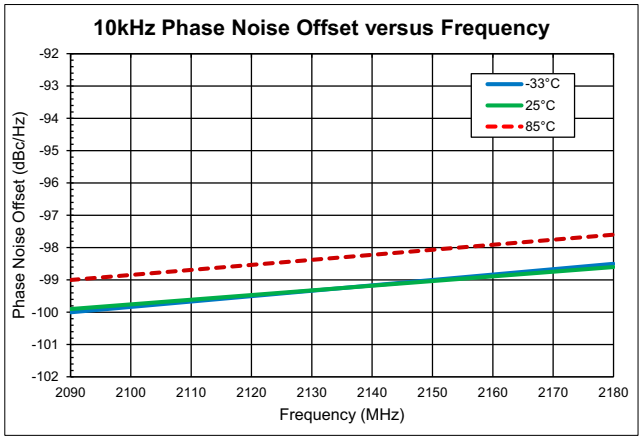
Typical Evaluation Board Performance (V_{CC} = 3.3V)

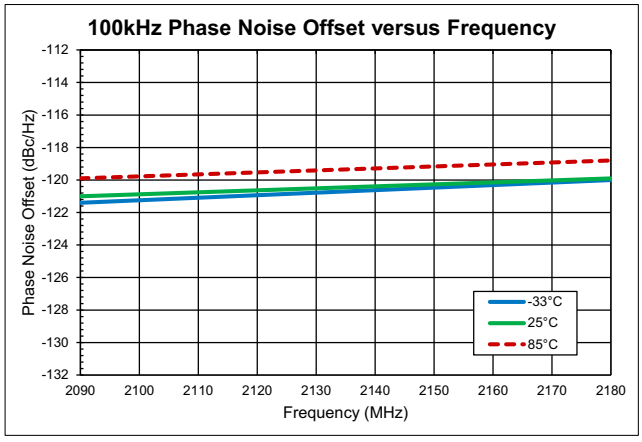






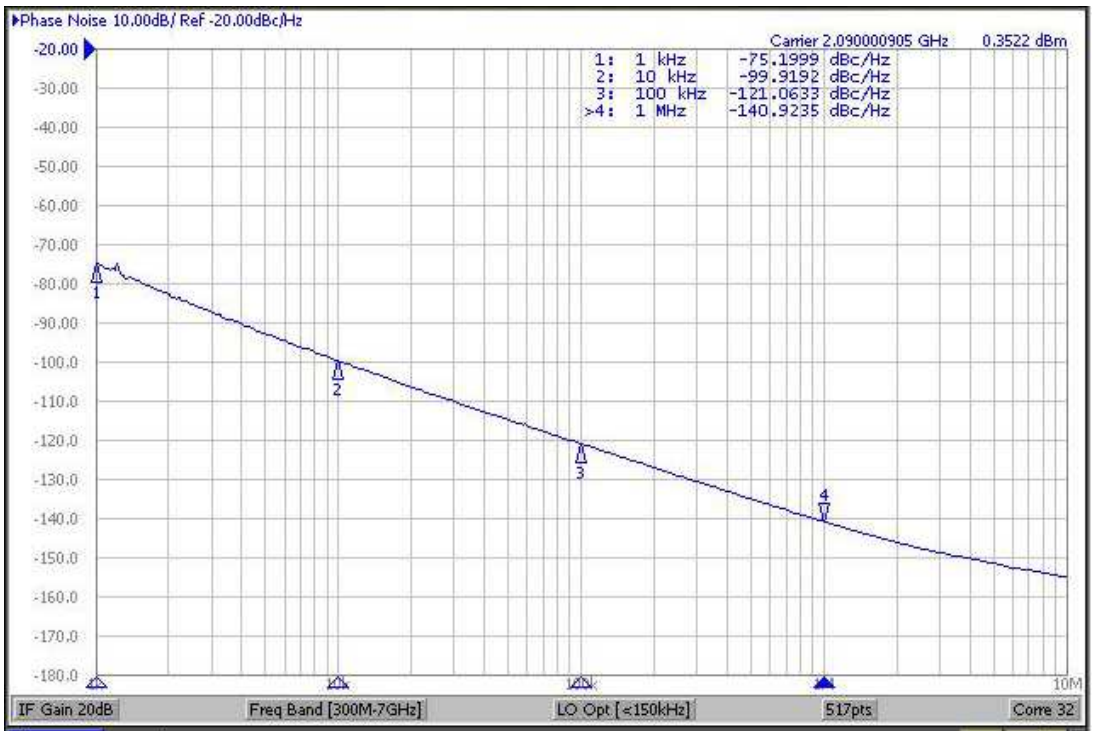




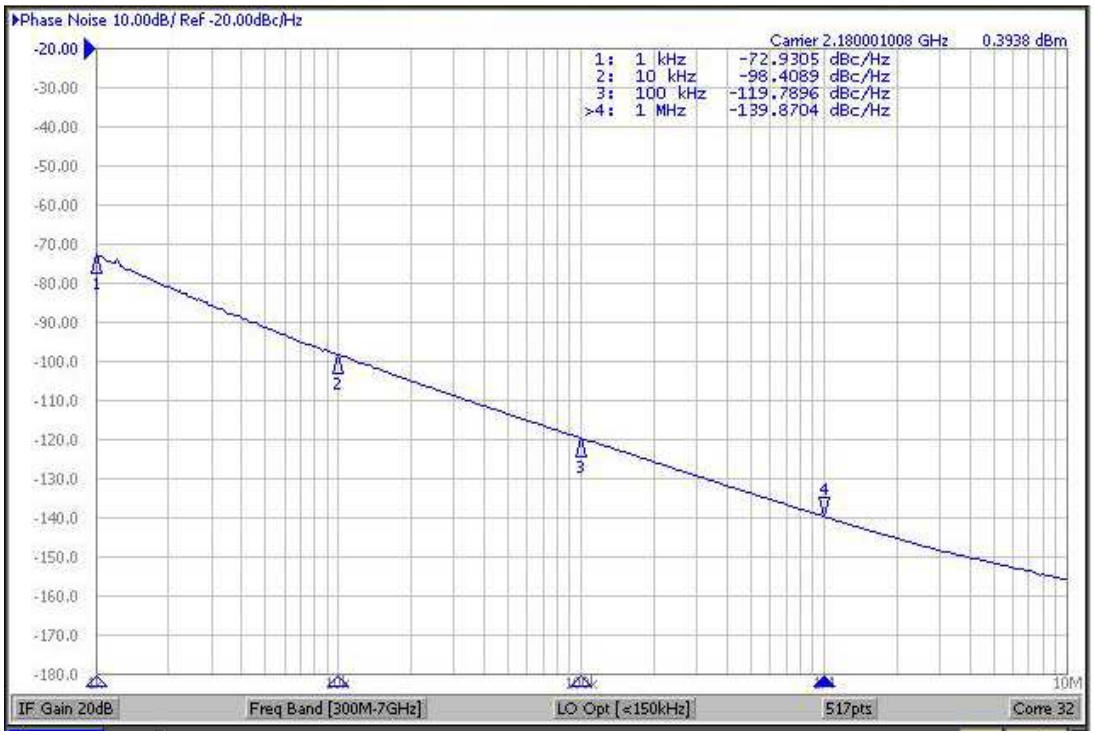


Typical Evaluation Board Performance (V_{CC} = 3.3V)

Frequency = 2090MHz



Frequency = 2090MHz



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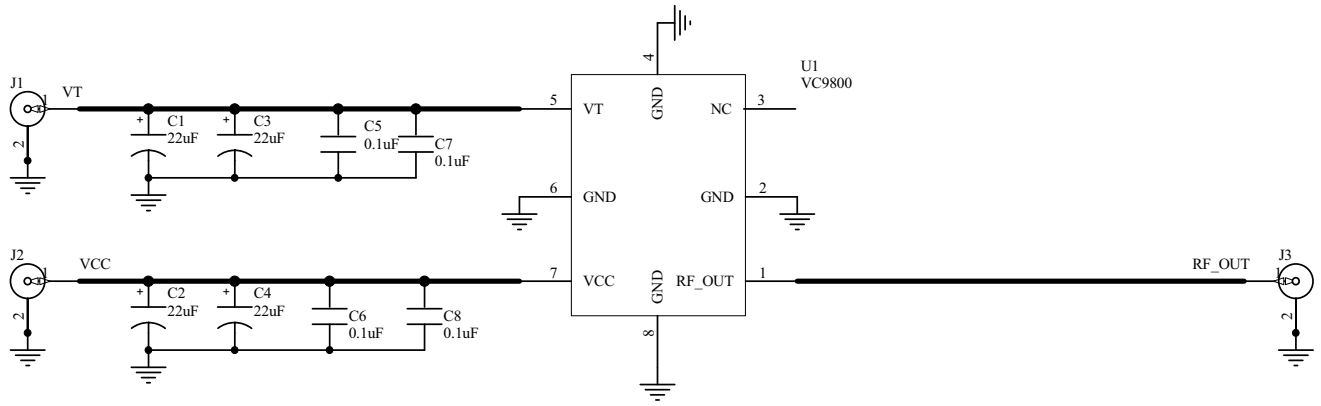
Evaluation Board Schematic



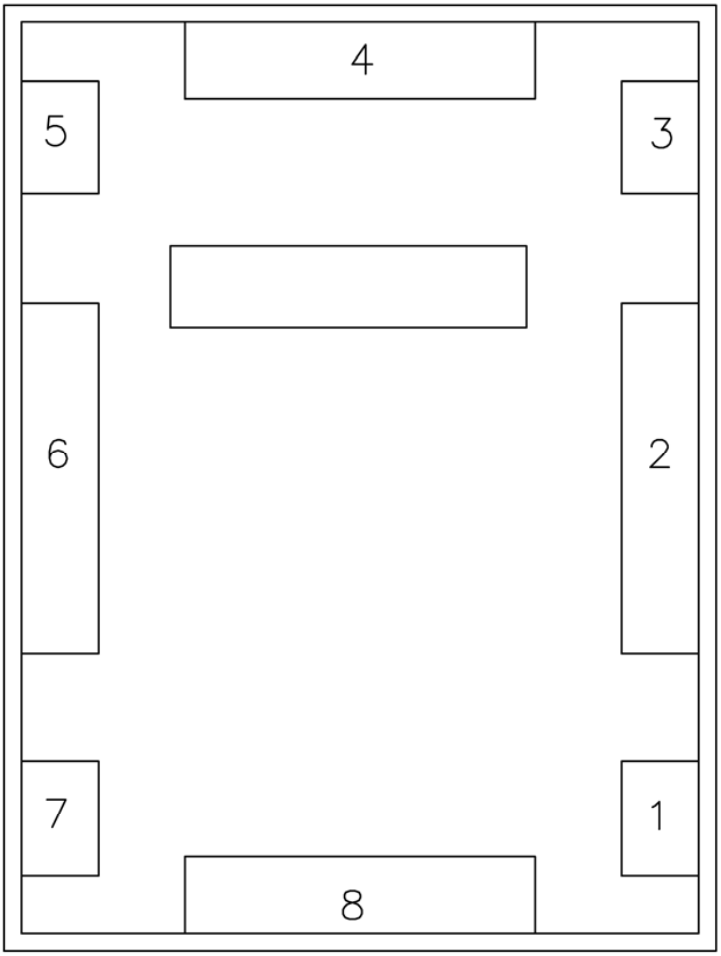
Connector	Function	Description
J1	VT	Control voltage
J2	VCC	Supply voltage
J3	RF_OUT	RF output
J4	GND	Ground

Evaluation Board Bill of Materials (BOM)

Description	Reference Designator	Manufacturer	Manufacturer's P/N
Evaluation Board			VC9800-410(A)
CONN, SMA, END LNCH, MINI, FLT, 0.042"	J1-J3	Emerson Network Power	142-0741-831
CONN, BANANA JACK, BLACK	P1	Emerson Network Power	108-0903-001
CAP, 0.1µF, 10%, 16V, X7R, 0402	C5-C8	Murata Electronics	GRM155R71C104KA88D
CAP, 22µF, 20%, 35V, TANT-D	C1-C4	AVX Corporation	TAJD226M035RNJ
DUT	U1	RFMD	

Pin Out

Top View



Pin Names and Descriptions

Pin	Name	Description
1	RF OUT	VCO RF Output
2	GND	Ground
3	NC	No Connect
4	GND	Ground
5	VT	Control Voltage
6	GND	Ground
7	VCC	Supply Voltage
8	GND	Ground

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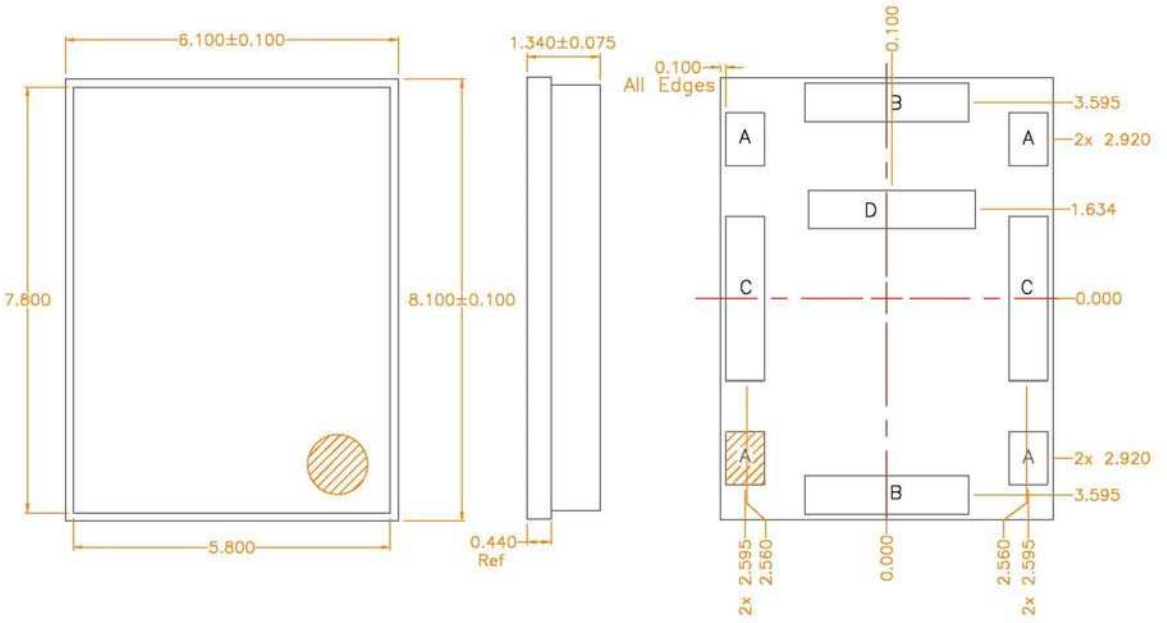
Package Drawing

Dimensions in millimeters

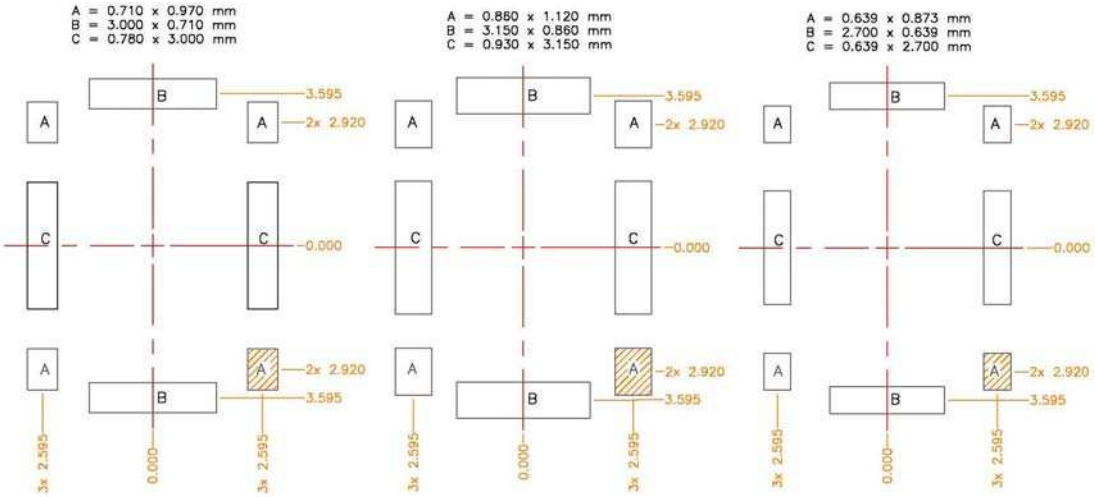


A = 0.710 x 0.970 mm
B = 3.000 x 0.710 mm
C = 0.710 x 3.000 mm
D = 3.050 x 0.700 mm (window in mask)

Notes:
1. Shaded area represents Pin 1 location.

Evaluation Board Pattern

Dimensions in millimeters



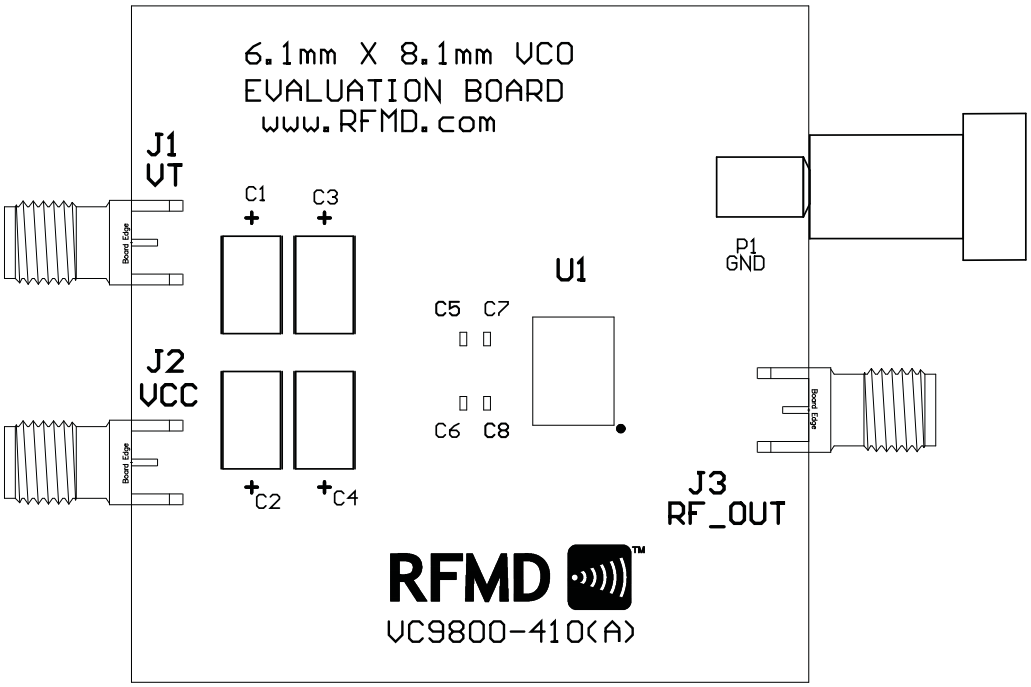
PCB Metal Land Pattern

PCB Solder Mask Pattern

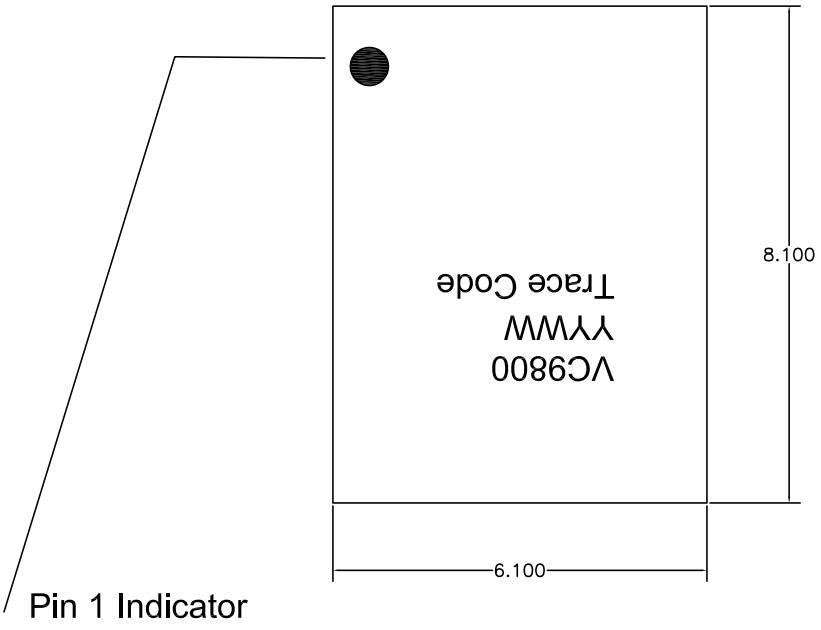
PCB Stencil Pattern

Notes:
1. Shaded area represents Pin 1 location.

Evaluation Board Assembly Drawing



Branding Diagram



Pin 1 Indicator
YY = Year
WW = Week
Note: text must be upside down as shown

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