

Engineering Development Model

Voltage Controlled Oscillator

ROS-ED16050/1

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability.

At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

Please click "Back", and then click "Contact Us" for Applications support.



CASE STYLE : CK1113

ELECTRICAL SPECIFICATIONS 50Ω				
Parameter	Min.	Typ.	Max.	Units
Frequency	2248		2252	MHz
Tuning Voltage	0		5	V
Power Output		4.5		dBm
Phase Noise				
at 1 kHz offset		-96		dBc/Hz
at 10 KHz offset		-118		dBc/Hz
at 100 KHz offset		-138		dBc/Hz
at 1000 kHz offset		-158		dBc/Hz
Pulling at 12 dBm PK-PK all phases		1.5		MHz
Pushing at $V_{cc} \pm 0.25V$		0.2		MHz/V
Tuning Sensitivity		4.5-6		MHz/V
Harmonic Suppression		-30		dBc
3 dB Modulation Bandwidth		110,000		kHz
Supply Voltage		5		V
Supply Current			30	mA

MAXIMUM RATINGS	
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Supply Voltage (V_{cc})	+6V
Absolute Tuning Voltage (V_{tune})	+6V

PIN CONNECTIONS	
RF OUT	10
VCC	14
V-TUNE	2
GROUND	1,3,4,5,6,7,8,9,11,12,13,15,16



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IF/RF MICROWAVE COMPONENTS



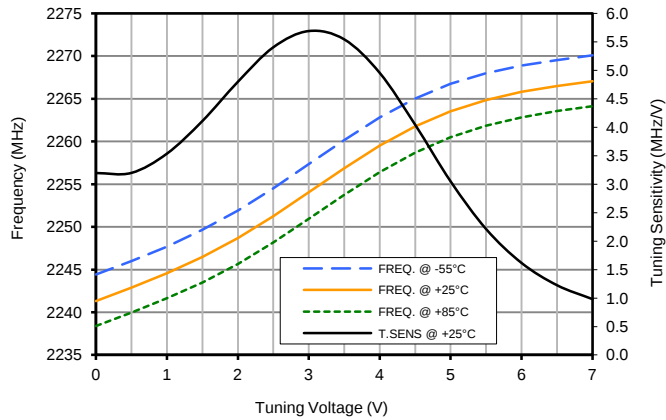
REV. X1
ROS-ED16050/1
5/21/2013
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Typical Performance Data

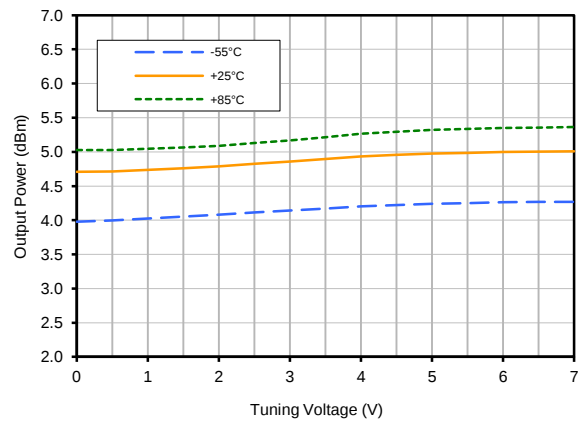
V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ OFFSET (kHz)	PHASE NOISE (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C	F2	F3	F4			
0.0	3.20	2244.42	2241.31	2238.38	3.98	4.71	5.03	-38.91	-27.89	-35.52	0.21	1	-96
0.5	3.20	2245.99	2242.89	2239.98	4.00	4.71	5.03	-39.19	-27.84	-35.38	0.21	10	-118
1.0	3.54	2247.66	2244.56	2241.63	4.02	4.74	5.04	-39.39	-27.78	-35.30	0.20	100	-138
1.5	4.11	2249.65	2246.47	2243.50	4.05	4.76	5.06	-39.70	-27.75	-35.19	0.20	1000	-158
2.0	4.80	2251.92	2248.69	2245.67	4.08	4.79	5.09	-40.04	-27.75	-35.08	0.19		
2.5	5.40	2254.51	2251.25	2248.18	4.11	4.83	5.13	-40.59	-27.72	-34.94	0.19		
3.0	5.69	2257.35	2254.04	2250.93	4.14	4.86	5.17	-40.85	-27.66	-34.86	0.18		
3.5	5.54	2260.16	2256.87	2253.74	4.17	4.90	5.22	-41.46	-27.57	-34.70	0.16		
4.0	4.95	2262.82	2259.51	2256.39	4.20	4.93	5.27	-41.86	-27.56	-34.69	0.15		
4.5	4.04	2265.01	2261.77	2258.68	4.22	4.96	5.29	-42.17	-27.59	-34.61	0.14		
5.0	3.05	2266.73	2263.54	2260.49	4.24	4.98	5.32	-42.30	-27.69	-34.39	0.14		
5.5	2.21	2267.99	2264.84	2261.83	4.25	4.99	5.34	-42.36	-27.75	-34.21	0.15		
6.0	1.62	2268.86	2265.79	2262.81	4.26	5.00	5.35	-42.58	-27.80	-34.18	0.16		
6.5	1.22	2269.52	2266.49	2263.54	4.27	5.00	5.36	-42.63	-27.79	-34.12	0.16		
7.0	0.98	2270.08	2267.04	2264.11	4.27	5.01	5.36	-42.68	-27.80	-33.99	0.17		

Typical Performance Curves

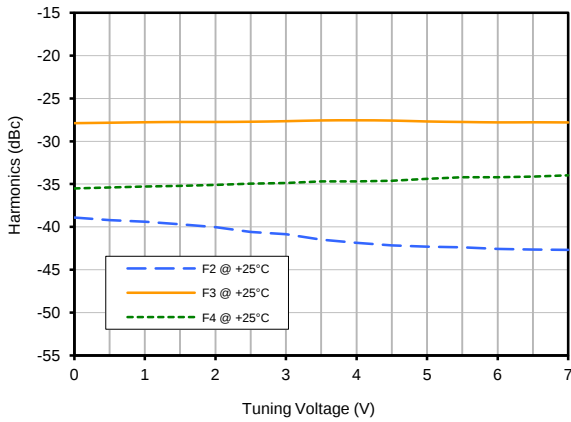
Frequency and Tuning Sensitivity



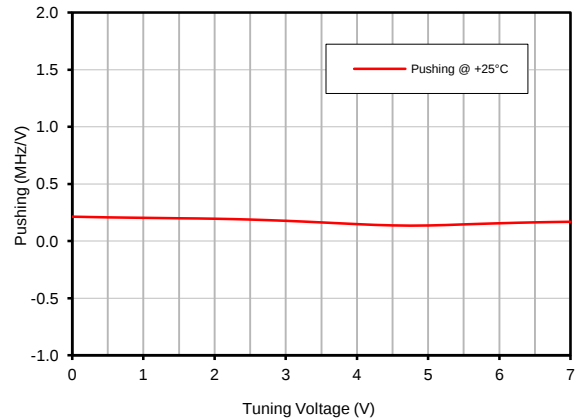
Output Power



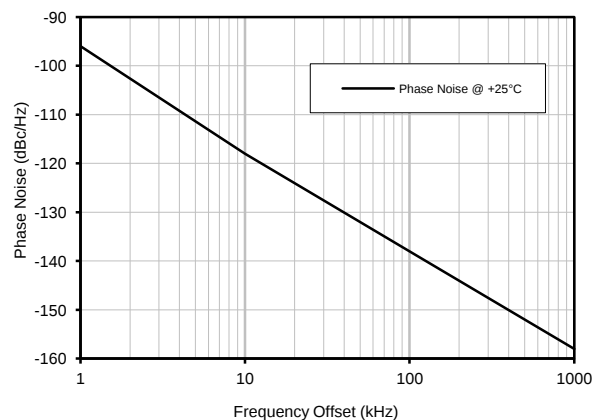
Harmonics Level



Frequency Pushing

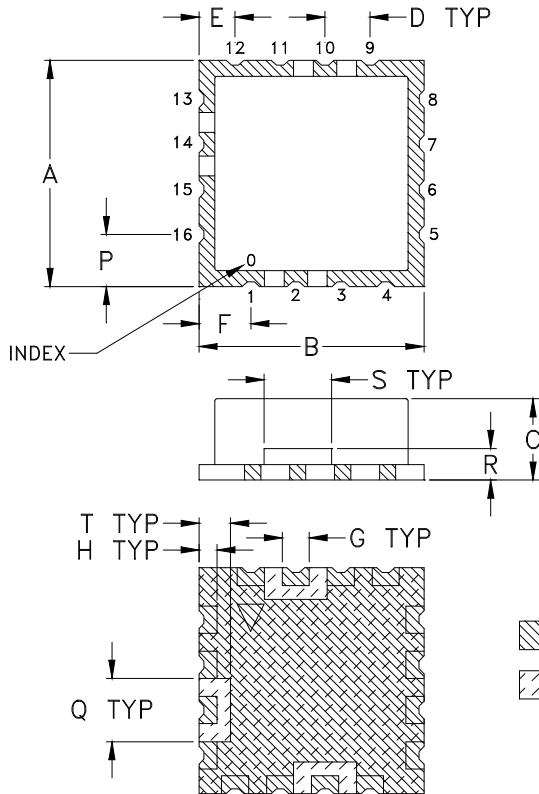


Phase Noise

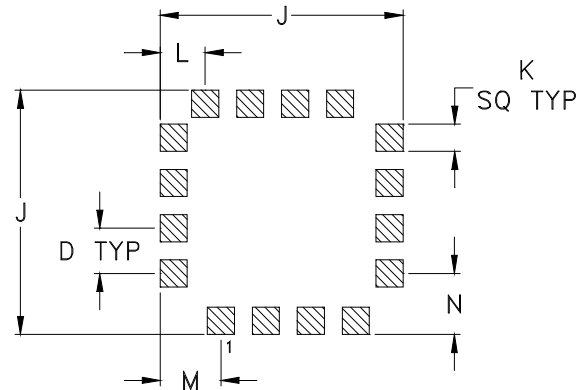


CK1113

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K
CK1113	.500 (12.70)	.500 (12.70)	.220 (5.59)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CK1113	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	.070 (1.78)	1.2

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3Pl. $\pm .015$

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:

For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.

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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
				500

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



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THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
E	M105563	ADDED "rl" PIN CONNECTION	06/02/06	MMG	DJ
F	M105640	CORRECTED NOTE 2	06/08/06	MMG	MM
G	M124395	ADDED "RAMP"	09/09	EM	HH
G	R77589	ADDED "RAMP"	09/09	EM	HH

SUGGESTED MOUNTING CONFIGURATION FOR
CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION

NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE BOTTOM IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

AV

08/07/00

CHECKED

SK

08/08/00

APPROVED

DB

08/08/00

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ASHEETA1.DWG REV:A DATE:01/12/95



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PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-012

REV:
G

FILE: 98PL012

SCALE: 5:1

SHEET: 1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

 **Mini-Circuits®**



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215