Engineering Development Model

Voltage Controlled Oscillator ROS-ED9153/1

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 : CK605

ELECTRICAL SPECIFICATIONS 50Ω				
Parameter	**Min.**	**Typ.**	**Max.**	**Units**
Frequency	2404		3137	MHz
Tuning Voltage	1		20	V
Power Output		+5		dBm
Phase Noise				
at 1 kHz offset		-72		dBc/Hz
at 10 KHz offset		-95		dBc/Hz
at 100 KHz offset		-115		dBc/Hz
at 1000 kHz offset		-135		dBc/Hz
Pulling at 12 dBr PK-PK all phases		16		MHz
Pushing at Vcc=5V±0.25V		2		MHz/V
Tuning Sensitivity		40 - 60		MHz/V
Harmonic Suppression		-18		dBc
3 dB Modulation Bandwidth		9000		kHz
Supply Voltage		8		V
Supply Current			30	mA

MAXIMUM RATINGS	
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Supply Voltage (Vcc)	+10V
Absolute Tuning Voltage (Vtune)	+22V

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

Voltage Controlled Oscillator ROS-ED9153/1

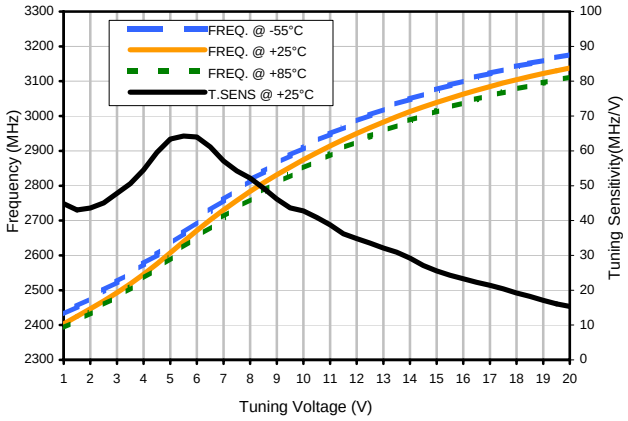
Typical Performance Data

V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			HARMONICS (dBc)			FREQ. PUSH (MHz/V)
		-55ºC	+25ºC	+85ºC	-55ºC	+25ºC	+85ºC	F2	F3	F4	
1.0	44.84	2430.6	2403.4	2391.3	7.02	6.05	4.88	-15.2	-39.8	-32.2	0.90
1.5	43.04	2453.3	2424.9	2413.0	7.42	6.56	5.49	-15.8	-40.2	-32.4	0.94
2.0	43.58	2476.6	2446.7	2434.9	7.59	6.95	5.95	-16.1	-39.5	-32.6	1.01
2.5	45.06	2500.0	2469.2	2457.4	7.53	7.23	6.33	-16.7	-39.4	-32.9	1.05
3.0	47.80	2524.3	2493.1	2481.3	7.40	7.15	6.46	-17.2	-41.4	-34.6	1.13
3.5	50.58	2549.5	2518.4	2506.7	7.28	7.00	6.35	-17.9	-42.1	-35.2	1.16
4.0	54.54	2575.6	2545.7	2533.6	7.43	6.73	6.09	-18.9	-44.2	-36.4	1.20
4.5	59.60	2602.7	2575.5	2562.4	7.72	6.68	5.91	-19.9	-44.6	-38.0	1.21
5.0	63.40	2632.1	2607.2	2592.6	7.82	6.78	6.13	-21.4	-43.3	-36.9	1.17
5.5	64.26	2664.1	2639.3	2622.8	7.49	6.88	6.31	-23.0	-39.9	-37.7	1.21
6.0	64.00	2697.1	2671.3	2652.7	6.79	6.55	6.34	-23.8	-39.1	-37.7	1.33
6.5	61.12	2728.9	2701.9	2682.1	6.47	6.08	5.91	-24.6	-37.6	-37.8	1.37
7.0	57.08	2759.2	2730.4	2710.0	6.52	5.94	5.59	-25.2	-37.9	-39.0	1.50
7.5	54.26	2788.2	2757.5	2736.2	6.64	6.12	5.59	-25.8	-39.7	-39.5	1.59
8.0	52.20	2815.2	2783.6	2761.3	6.77	6.25	5.77	-26.1	-42.1	-37.7	1.70
8.5	49.28	2840.0	2808.3	2785.4	6.53	6.47	5.92	-26.6	-41.9	-36.1	1.75
9.0	46.16	2863.9	2831.4	2808.4	6.03	6.43	6.15	-27.0	-43.1	-35.3	1.80
9.5	43.62	2886.9	2853.2	2829.9	5.80	6.03	6.13	-27.4	-41.8	-35.2	1.89
10.0	42.76	2908.7	2874.5	2850.4	5.77	5.72	5.82	-27.9	-40.8	-34.7	1.99
10.5	40.88	2929.3	2895.0	2870.4	5.88	5.61	5.48	-28.3	-38.6	-34.6	2.03
11.0	38.78	2948.8	2914.4	2889.8	6.09	5.64	5.31	-28.8	-38.5	-35.3	1.96
11.5	36.20	2967.4	2932.5	2908.5	6.20	5.74	5.27	-28.7	-36.1	-35.1	2.01
12.0	34.80	2985.6	2949.9	2926.0	6.29	5.98	5.30	-29.5	-35.7	-36.3	2.05
12.5	33.52	3002.9	2966.6	2942.4	6.25	6.10	5.48	-29.9	-35.2	-37.5	2.11
13.0	32.10	3019.2	2982.7	2958.0	6.14	6.21	5.65	-30.4	-34.6	-37.4	2.10
13.5	30.92	3034.3	2998.1	2973.0	5.94	6.13	5.87	-31.2	-34.4	-38.3	2.14
14.0	29.22	3048.7	3012.8	2987.4	5.75	6.12	5.86	-31.4	-34.2	-39.5	2.14
14.5	27.12	3062.5	3026.3	3001.2	5.60	6.02	5.76	-31.9	-33.3	-39.8	2.11
15.0	25.52	3075.8	3039.1	3014.1	5.56	5.83	5.76	-32.8	-33.4	-39.6	2.14
15.5	24.28	3088.6	3051.2	3026.3	5.58	5.70	5.67	-33.3	-32.9	-40.0	2.11
16.0	23.30	3100.7	3062.9	3037.7	5.61	5.57	5.48	-33.5	-32.6	-39.9	2.19
16.5	22.30	3112.1	3074.0	3048.4	5.65	5.53	5.36	-34.4	-32.5	-39.5	2.26
17.0	21.42	3122.8	3084.7	3058.7	5.78	5.53	5.28	-34.6	-31.9	-39.7	2.21
17.5	20.38	3132.9	3094.9	3068.6	5.88	5.57	5.22	-35.0	-31.5	-39.8	2.26
18.0	19.18	3142.4	3104.5	3078.1	5.91	5.61	5.21	-35.6	-31.5	-39.2	2.21
18.5	18.22	3151.4	3113.6	3087.1	5.96	5.67	5.22	-36.2	-31.0	-40.5	2.21
19.0	17.10	3160.0	3122.2	3095.7	5.98	5.70	5.25	-36.5	-31.0	-41.1	2.19
19.5	16.08	3168.4	3130.2	3103.9	5.96	5.83	5.30	-36.4	-30.7	-40.4	2.21
20.0	15.32	3176.4	3137.9	3111.6	5.89	5.91	5.31	-37.2	-31.2	-40.4	2.19

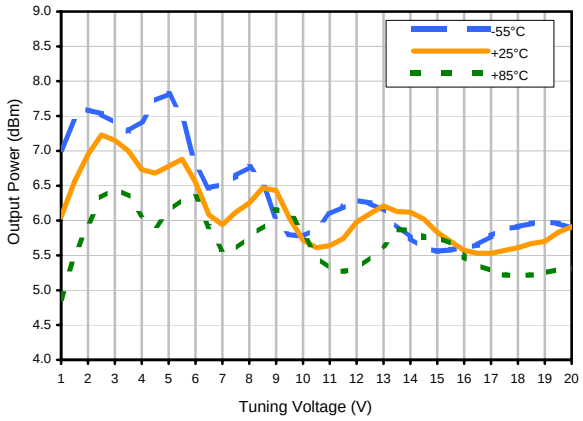
FREQ OFFSET (KHz)	PHASE NOISE (dBc/Hz)
1	-72
10	-95
100	-115
1000	-135

Typical Performance Data

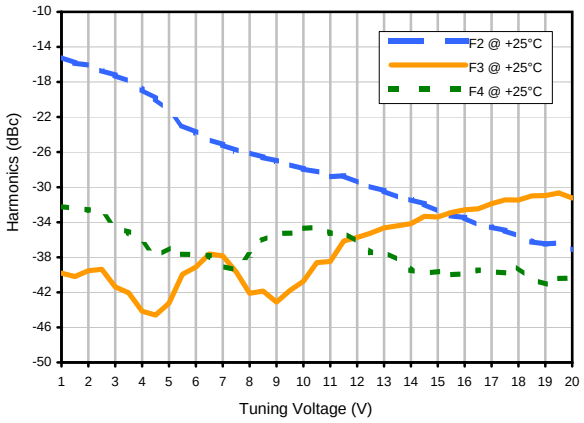
Frequency and Tuning Sensitivity



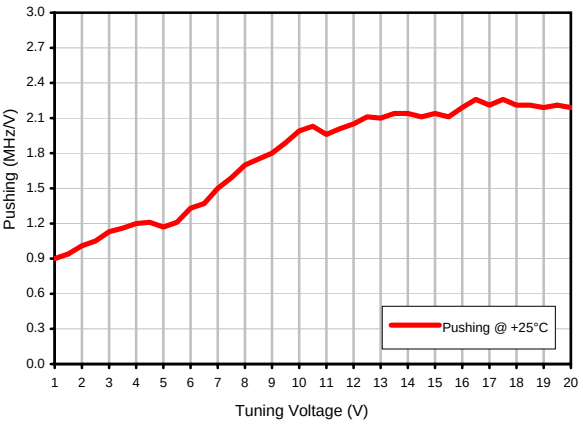
Power Output



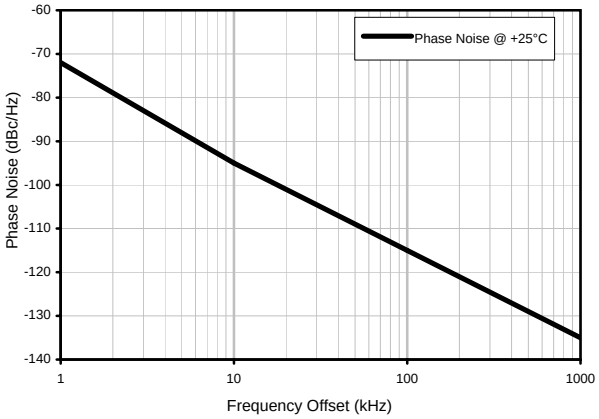
Harmonics Level



Frequency Pushing



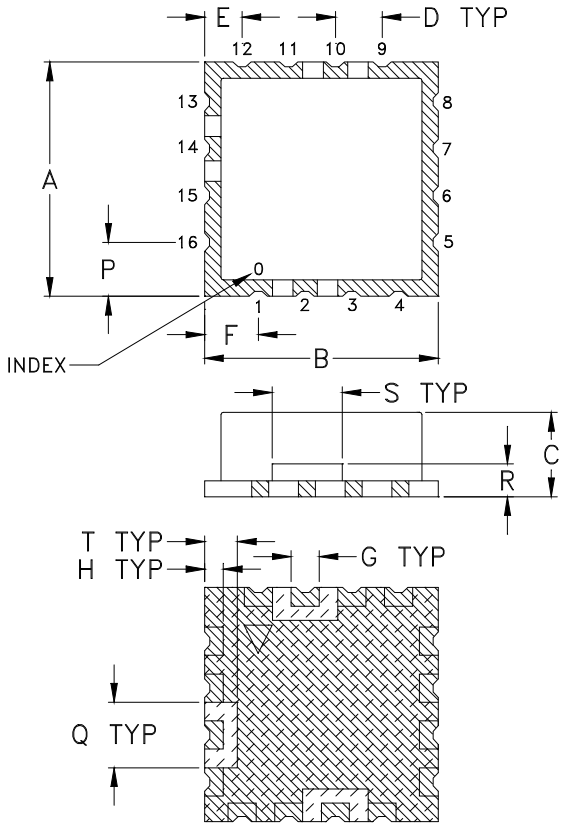
Phase Noise



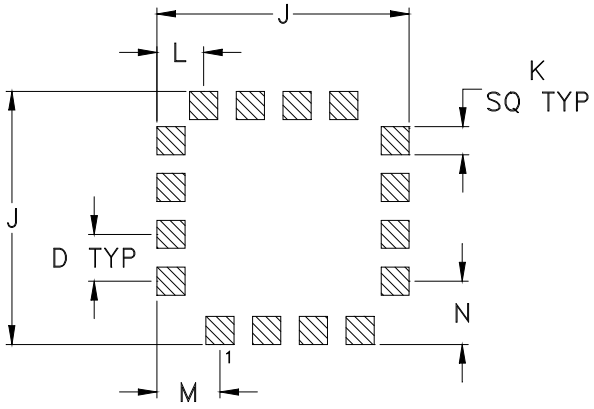
Case Style CK

CK605

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K
CK605	.500 (12.70)	.500 (12.70)	.180 (4.57)	.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	
CK605	.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	+0.5 -0.0

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

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. 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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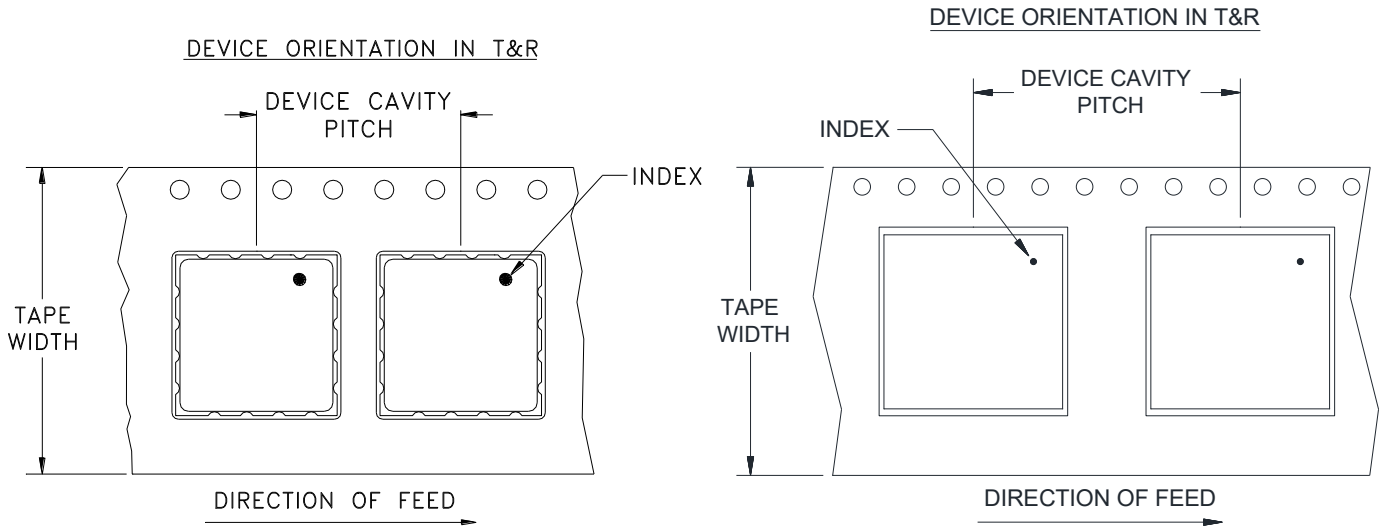
Tape & Reel Packaging TR-F37



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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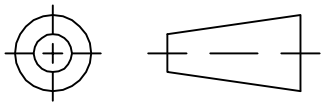
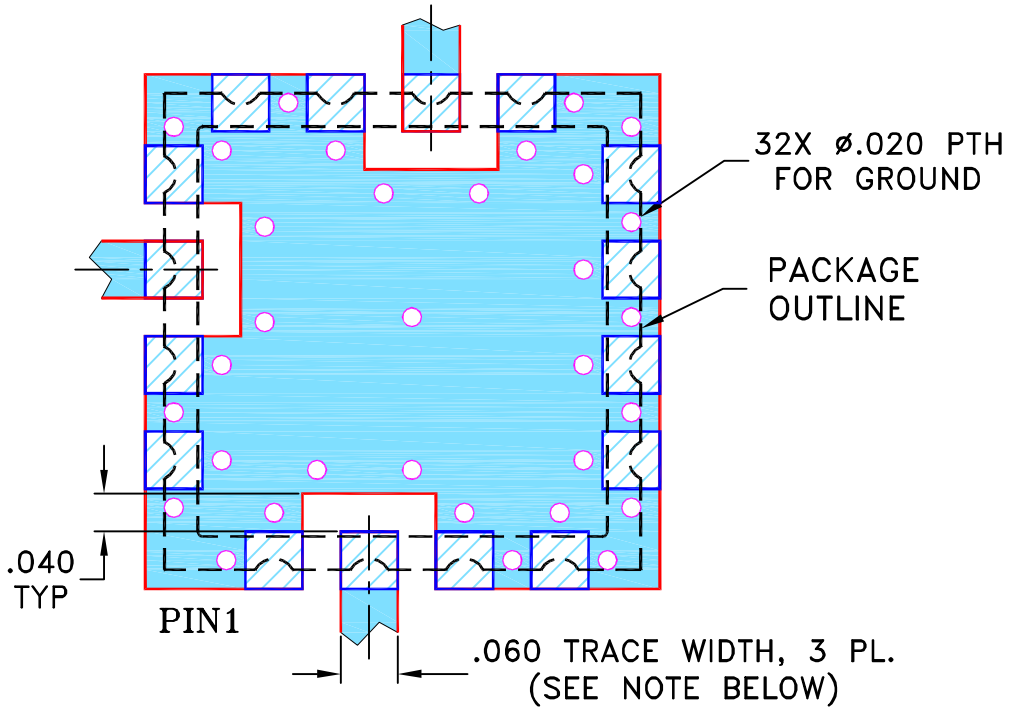
THIRD ANGLE PROJECTION



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

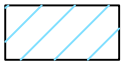
SUGGESTED MOUNTING CONFIGURATION FOR CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION



NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" ± .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	DRAWN	AV	08/07/00
TOLERANCES ON:	CHECKED	SK	08/08/00
2 PL DECIMALS ±	APPROVED	DB	08/08/00
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

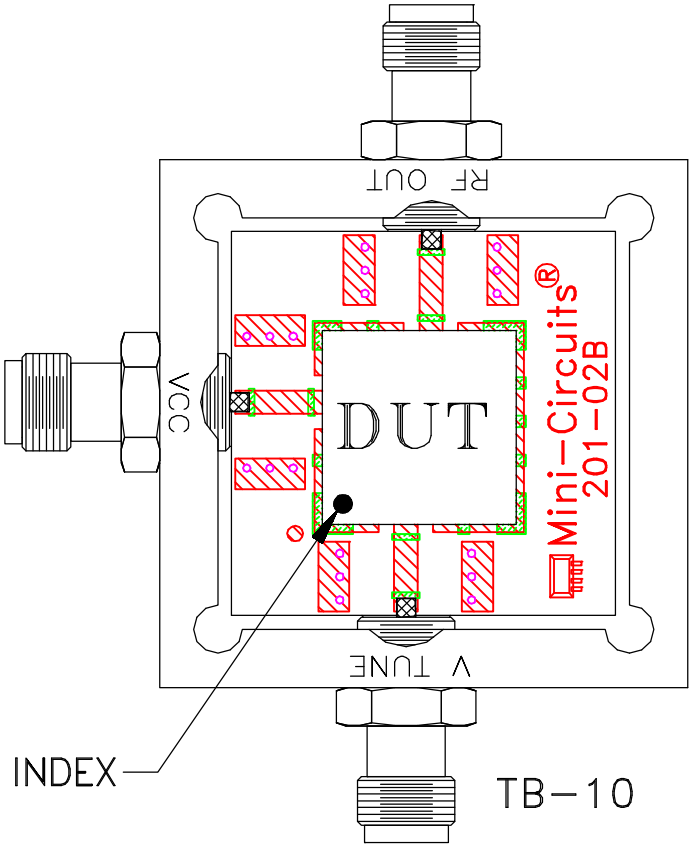
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

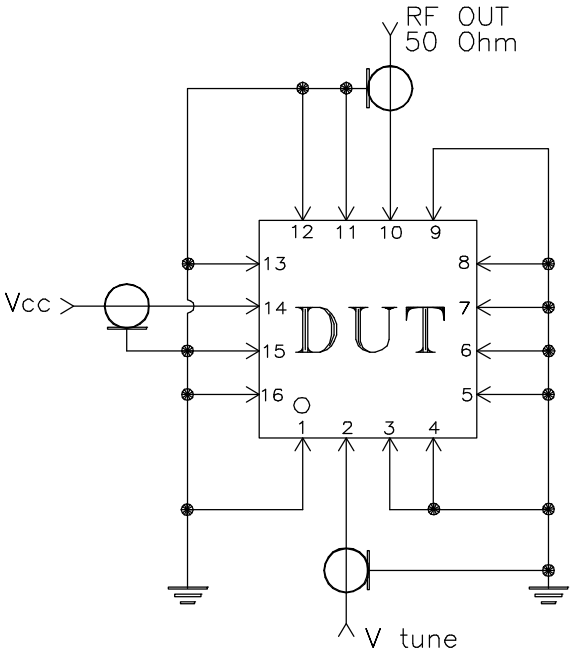
PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-012	G

FILE:	SCALE:	SHEET:
98PL012	5:1	1 OF 1

Evaluation Board and Circuit





Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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Environmental Specifications ENV03

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

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