

# Engineering Development Model

## Voltage Controlled Oscillator

## ROS-ED12615/2

### 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 : DV874**

ELECTRICAL SPECIFICATIONS 50Ω				
Parameter	Min.	Typ.	Max.	Units
Frequency	406		470	MHz
Tuning Voltage	.5		4.7	V
Power Output		+1		dBm
Phase Noise	at 1 kHz offset	-88		dBc/Hz
	at 10 KHz offset	-114		dBc/Hz
	at 100 KHz offset	-134		dBc/Hz
	at 1000 kHz offset	-154		dBc/Hz
Pulling at 12 dB <sub>r</sub> PK-PK all phases		.4		MHz
Pushing at Vcc ± 5%		1		MHz/V
Tuning Sensitivity		17-20		MHz/V
Harmonic Suppression		-29		dBc
3 dB Modulation Bandwidth		10,000		kHz
Supply Voltage		5		V
Supply Current			25	mA

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Supply Voltage (Vcc)	+7V
Absolute Tuning Voltage (Vtune)	+6.7V

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



P.O. Box 350186, Brooklyn, New York 11235-0000 (718) 934-4500 Fax (718) 332-4851 For detailed performance specs & shopping online see Mini-Circuits web site  
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MIN-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)



RF/MICROWAVE COMPONENTS

REV. X2  
ROS-ED12615/2  
12/17/2008  
Page 1 of 1

# Voltage Controlled Oscillator

ROS-ED12615/2

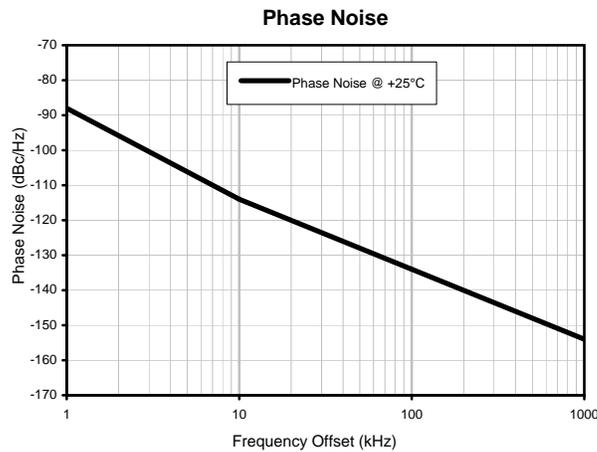
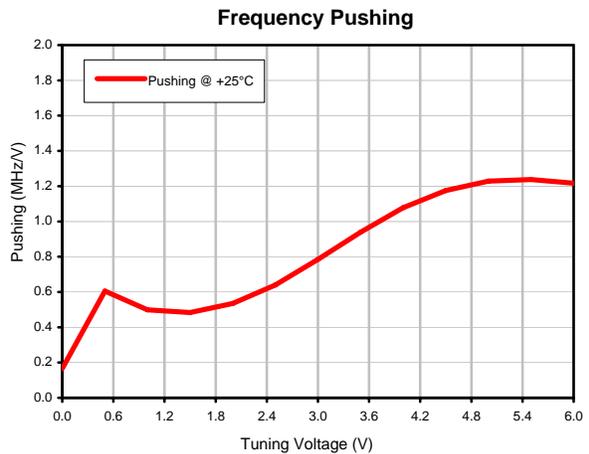
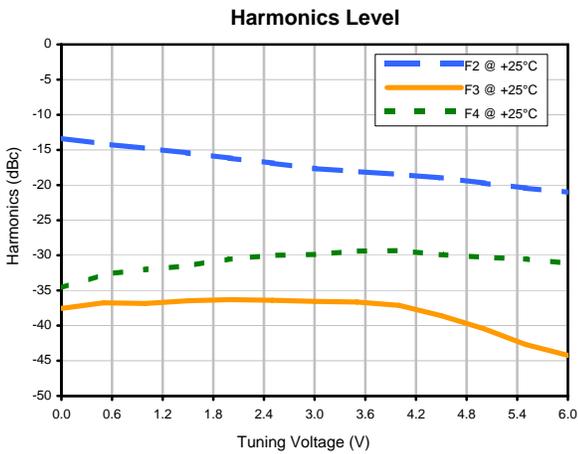
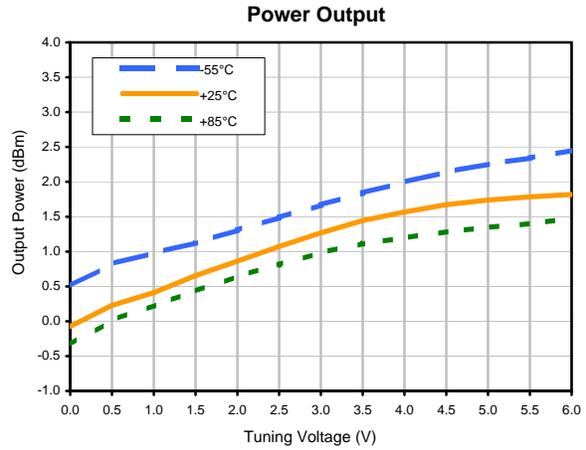
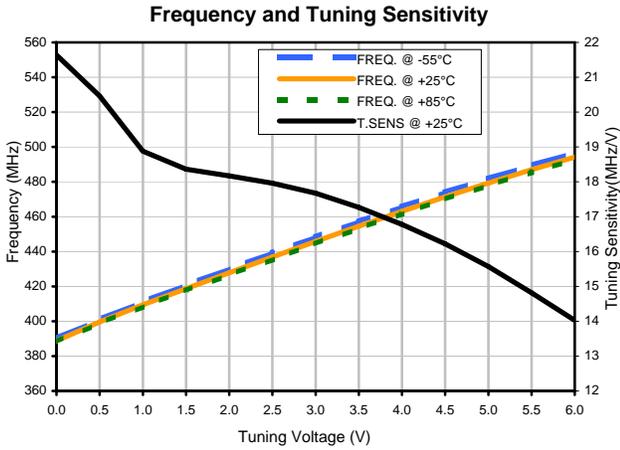
## Typical Performance Data

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	21.64	390.1	388.7	388.2	0.50	-0.07	-0.34	-13.36	-37.56	-34.65	0.17	1	-88
0.5	20.46	401.0	399.6	398.8	0.82	0.23	0.01	-14.15	-36.77	-32.70	0.61	10	-114
1.0	18.88	411.2	409.4	408.4	0.98	0.41	0.23	-14.79	-36.84	-32.01	0.50	100	-134
1.5	18.36	420.8	418.7	417.6	1.13	0.65	0.43	-15.43	-36.46	-31.48	0.48	1000	-154
2.0	18.17	430.1	427.9	426.6	1.31	0.86	0.65	-16.18	-36.30	-30.48	0.54		
2.5	17.96	439.4	436.9	435.5	1.49	1.07	0.81	-16.88	-36.39	-30.01	0.64		
3.0	17.67	448.4	445.8	444.4	1.67	1.27	0.98	-17.66	-36.56	-29.87	0.78		
3.5	17.27	457.2	454.6	453.2	1.84	1.44	1.12	-18.06	-36.64	-29.40	0.94		
4.0	16.78	465.7	463.1	461.7	2.00	1.57	1.20	-18.50	-37.13	-29.33	1.08		
4.5	16.22	474.0	471.4	470.0	2.14	1.67	1.28	-18.99	-38.60	-29.90	1.18		
5.0	15.57	481.9	479.3	478.0	2.25	1.74	1.35	-19.71	-40.42	-30.28	1.23		
5.5	14.82	489.4	487.0	485.5	2.34	1.78	1.40	-20.44	-42.70	-30.52	1.24		
6.0	14.03	496.6	494.2	492.7	2.45	1.82	1.47	-21.03	-44.24	-31.15	1.22		

# Voltage Controlled Oscillator

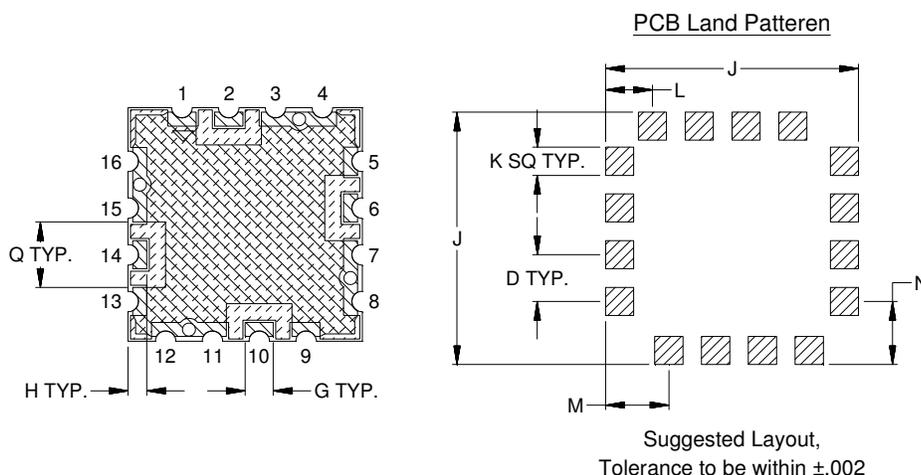
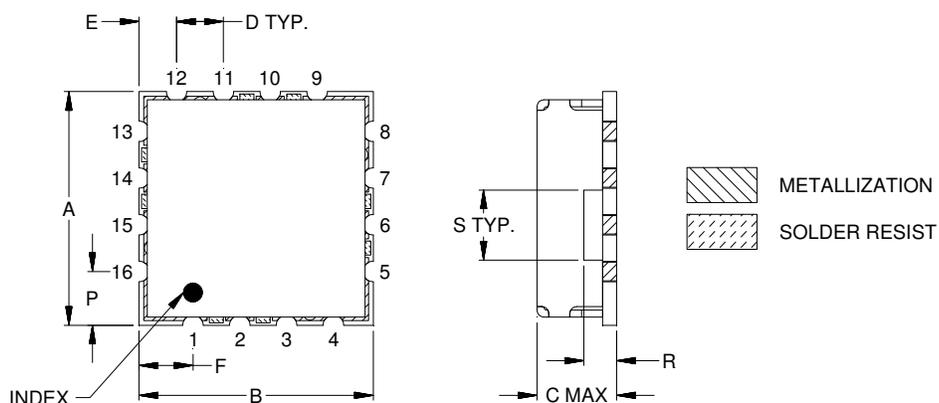
ROS-ED12615/2

## Typical Performance Data



## Outline Dimensions

## DV874



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
DV874	.500 (12.70)	.500 (12.70)	.195 (4.95)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)	.100 (2.54)	.135 (3.43)

CASE#	N	P	Q	R	S	WT.GRAM
DV874	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	1.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .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.
  - For RoHS-5 Case Styles: Tin-Lead plate.



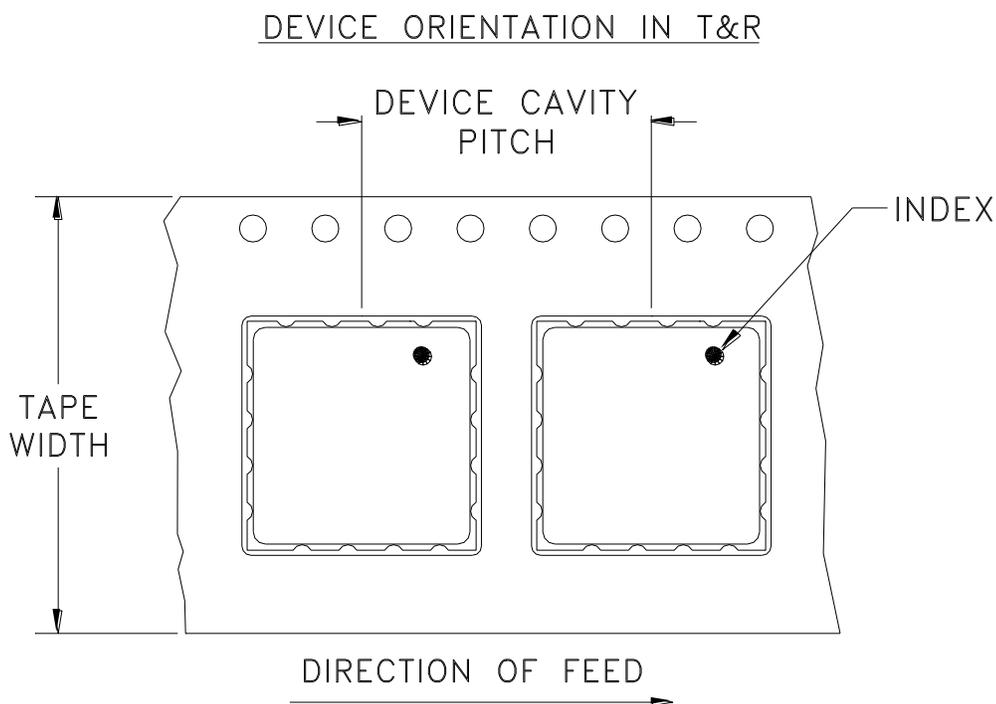
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



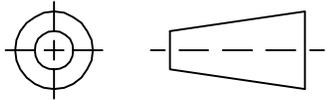
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

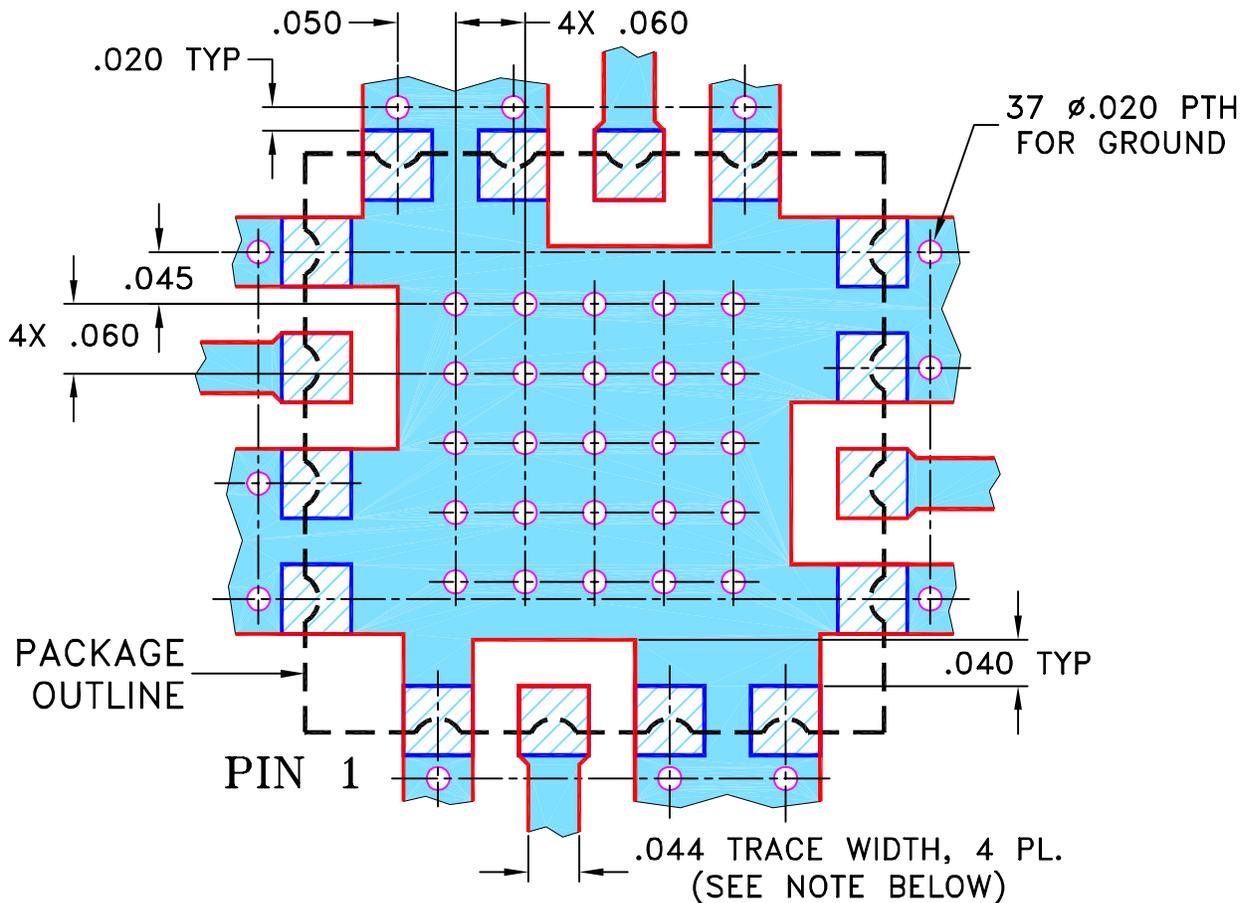
THIRD ANGLE PROJECTION



REVISIONS

REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M108586	NEW RELEASE	11/22/06	MMG	DJ

SUGGESTED MOUNTING CONFIGURATION FOR DV874 CASE STYLE, "rt" PIN CONNECTION



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
 2. BOTTOM SIDE OF THE PCB 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 MMG	11/21/06
TOLERANCES ON:	CHECKED AV	11/22/06
2 PL DECIMALS ±	APPROVED DJ	11/22/06
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

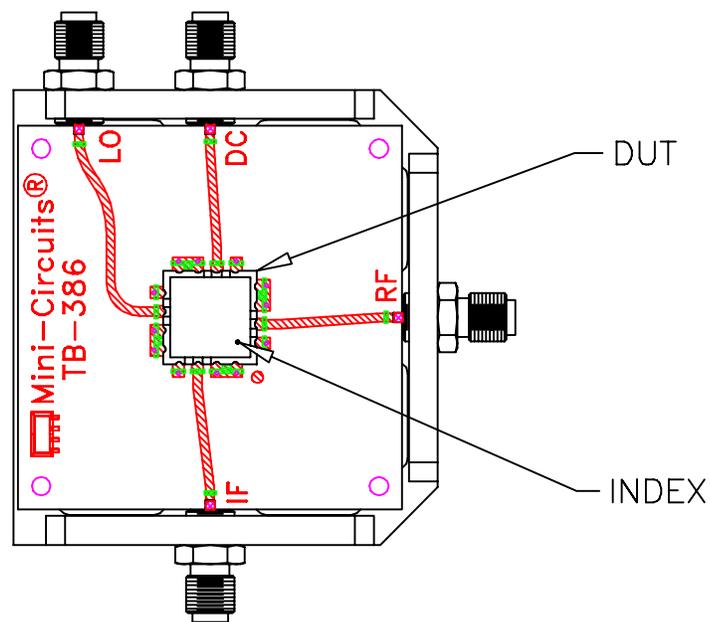
**Mini-Circuits®** 13 Neptune Avenue  
Brooklyn NY 11235

PL, rt, DV874, DACY, TB-386

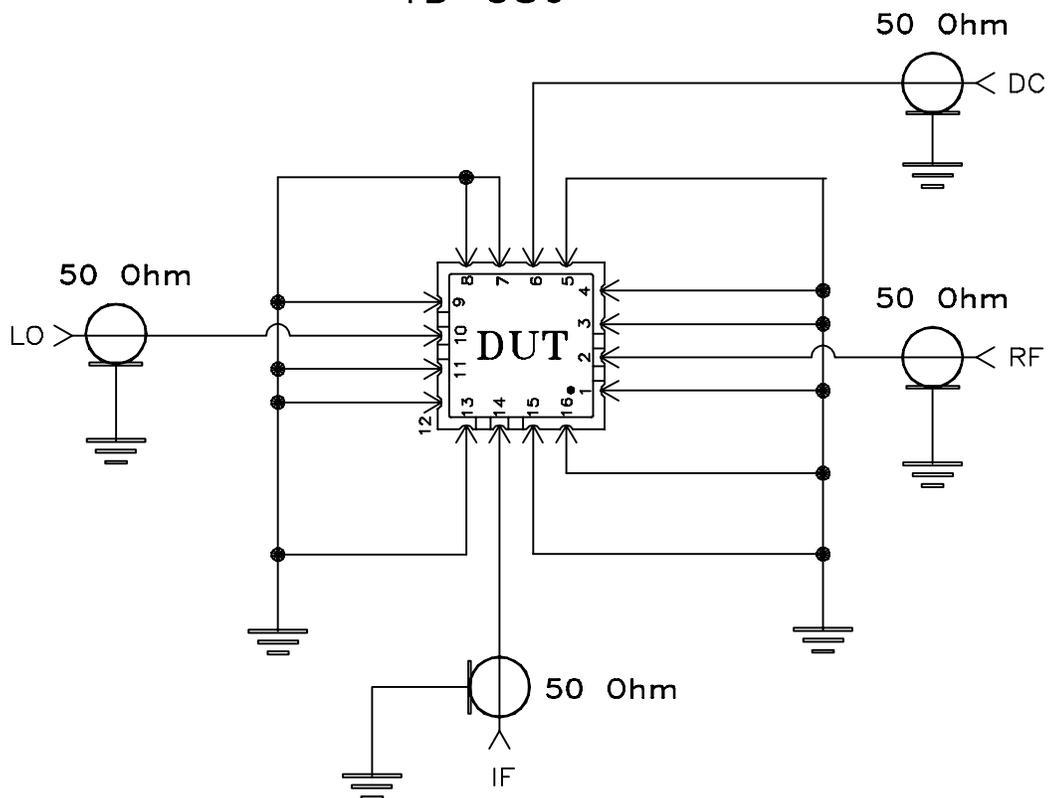
Mini-Circuits®  
 THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-256	OR
FILE:	98PL256	SCALE: 6:1	SHEET: 1 OF 1

# Evaluation Board and Circuit



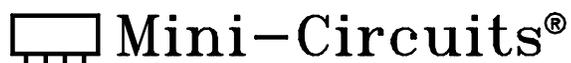
TB-386



Schematic Diagram

## Notes:

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



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	-40° 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