

Surface Mount Voltage Controlled Oscillator

JCOS-175LN

Low Noise 125 to 175 MHz

Features

- very low phase noise, -118 dBc/Hz at 10 kHz offset, typ.
- excellent tuning sensitivity, 3-5 MHz/V typ.
- aqueous washable

Applications

- aircraft radios
- VHF/UHF transmitters



Generic photo used for illustration purposes only

CASE STYLE: BG419

Electrical Specifications

FREQUENCY (MHz)	POWER OUTPUT (dBm)	TUNING VOLTAGE (V)	PHASE NOISE (dBc/Hz)					PULLING pk-pk @ 12 dB (MHz)	PUSHING (MHz/V)	TUNING SENSITIVITY (MHz/V)	HARMONICS (dBc)		3 dB MODULATION BANDWIDTH (MHz)	DC OPERATING POWER	
			SSB at offset frequencies: Typ.								Typ.	Typ.		Typ.	Max.
Min.	Max.	Typ.	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz	Typ.	Typ.	Typ.	Typ.	Max.	Typ.	Vcc	Max.
125	175	+3.7	—	-95	-118	-138	-158	0.08	0.05	3-5	-25	-20	2.9	12	20

Pin Connections

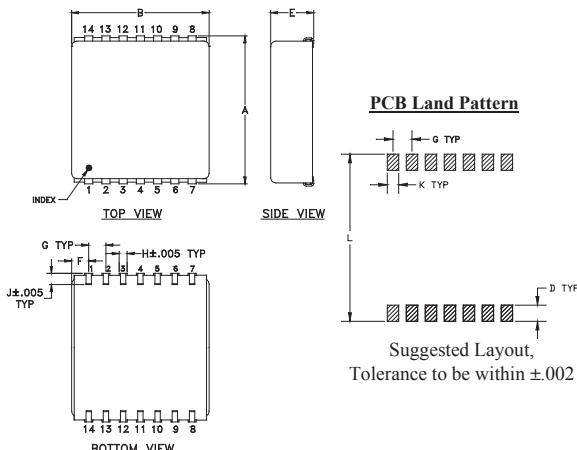
RF OUT	7
VCC	8
V-TUNE	1
GROUND	2,3,4,5,6,9,10,11,12,13,14

Maximum Ratings

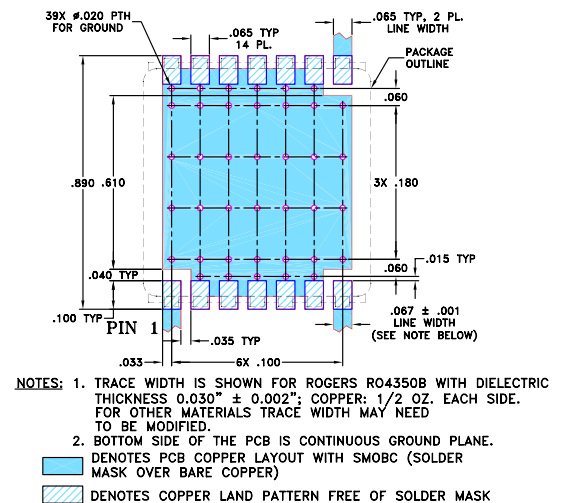
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Supply Voltage (Vcc)	+15V
Absolute Max. Tuning Voltage (Vtune)	+18V

all specifications: 50 ohm system
Permanent damage may occur if any of these limits are exceeded.

Outline Drawing



Demo Board MCL PIN: TB-62 Suggested PCB Layout (PL-011)



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	wt
.870	.800	--	.100	.400	.100	.100	.047	.065	.065	.890	grams
22.10	20.32	--	2.54	10.16	2.54	2.54	1.19	1.65	1.65	22.61	6.4

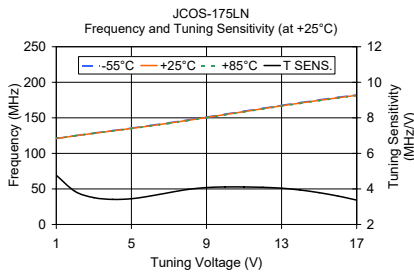
Notes

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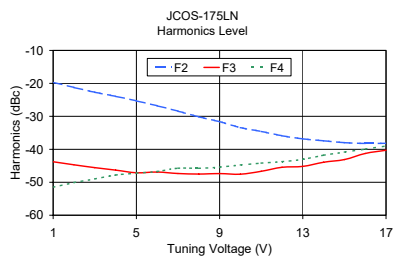
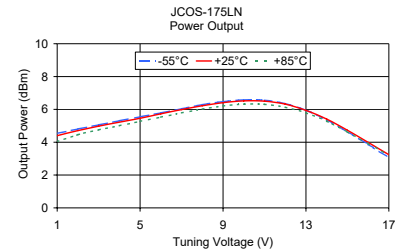


Performance Curves

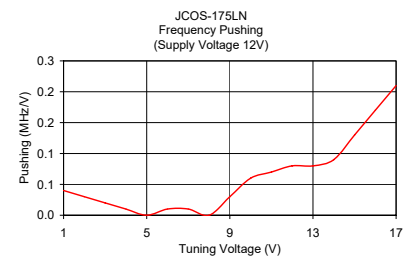
JCOS-175LN



V TUNE	TUNING SENS. (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)		
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C
1.00	4.77	120.86	120.86	121.38	4.54	4.40	4.04
2.00	3.86	124.92	124.72	124.90	4.81	4.71	4.46
3.00	3.51	128.55	128.23	128.24	5.06	4.98	4.76
4.00	3.41	132.06	131.64	131.52	5.31	5.22	5.01
5.00	3.45	135.60	135.09	134.87	5.55	5.46	5.27
6.00	3.60	139.27	138.69	138.39	5.79	5.73	5.53
7.00	3.79	143.11	142.48	142.13	6.04	5.99	5.79
8.00	3.97	147.09	146.45	146.06	6.29	6.22	6.02
9.00	4.08	151.17	150.53	150.13	6.47	6.41	6.21
10.00	4.11	155.29	154.64	154.24	6.58	6.52	6.32
11.00	4.11	159.39	158.74	158.34	6.56	6.50	6.31
12.00	4.09	163.50	162.84	162.42	6.35	6.32	6.13
13.00	4.04	167.57	166.88	166.43	5.95	5.94	5.79
14.00	3.94	171.51	170.81	170.37	5.36	5.41	5.28
15.00	3.79	175.30	174.61	174.17	4.64	4.73	4.63
16.00	3.60	178.90	178.20	177.78	3.87	3.99	3.92
17.00	3.37	182.28	181.58	181.15	3.06	3.24	3.20



V TUNE	HARMONICS (dBc)			FREQ. PUSHING (MHz/V)
	F2	F3	F4	
1.00	-19.69	-43.77	-51.50	0.04
2.00	-21.24	-44.70	-50.08	0.03
3.00	-22.68	-45.56	-48.98	0.02
4.00	-23.91	-46.31	-47.81	0.01
5.00	-25.29	-47.11	-47.24	0.00
6.00	-26.78	-46.91	-46.74	0.01
7.00	-28.43	-47.35	-45.73	0.01
8.00	-30.13	-47.51	-45.74	0.00
9.00	-31.61	-47.36	-45.40	0.03
10.00	-33.40	-47.55	-44.74	0.06
11.00	-34.55	-46.68	-44.18	0.07
12.00	-35.89	-45.46	-43.74	0.08
13.00	-36.83	-45.18	-43.04	0.08
14.00	-37.41	-43.92	-41.80	0.09
15.00	-37.98	-43.11	-40.84	0.13
16.00	-38.20	-41.26	-39.93	0.17
17.00	-38.17	-40.28	-38.99	0.21



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Voltage Controlled Oscillator

JCOS-175LN

Typical Performance Data

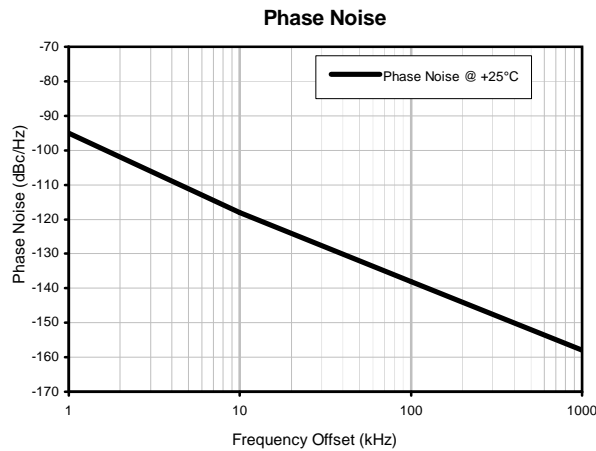
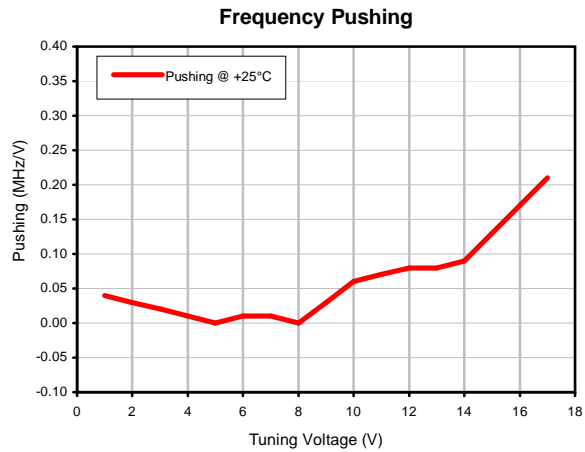
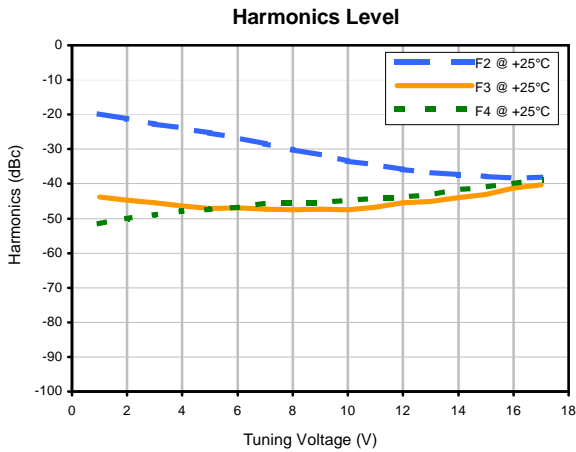
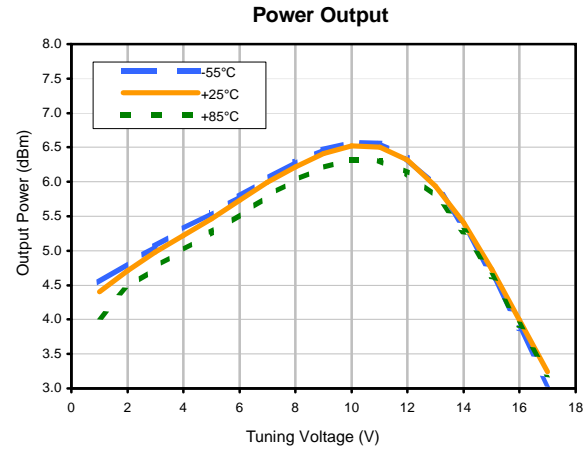
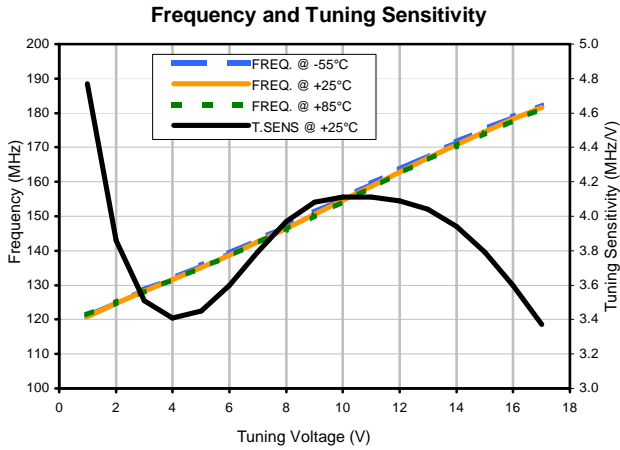
V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ OFFSET (KHz)	PHASE NOISE (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C	F2	F3	F4			
1.0	4.77	120.9	120.9	121.4	4.54	4.40	4.04	-19.7	-43.8	-51.5	0.04	1	-95
2.0	3.86	124.9	124.7	124.9	4.81	4.71	4.46	-21.2	-44.7	-50.1	0.03	10	-118
3.0	3.51	128.6	128.2	128.2	5.06	4.98	4.76	-22.7	-45.6	-49.0	0.02	100	-138
4.0	3.41	132.1	131.6	131.5	5.31	5.22	5.01	-23.9	-46.3	-47.8	0.01	1000	-158
5.0	3.45	135.6	135.1	134.9	5.55	5.46	5.27	-25.3	-47.1	-47.2	0.00		
6.0	3.60	139.3	138.7	138.4	5.79	5.73	5.53	-26.8	-46.9	-46.7	0.01		
7.0	3.79	143.1	142.5	142.1	6.04	5.99	5.79	-28.4	-47.4	-45.7	0.01		
8.0	3.97	147.1	146.5	146.1	6.29	6.22	6.02	-30.1	-47.5	-45.7	0.00		
9.0	4.08	151.2	150.5	150.1	6.47	6.41	6.21	-31.6	-47.4	-45.4	0.03		
10.0	4.11	155.3	154.6	154.2	6.58	6.52	6.32	-33.4	-47.6	-44.7	0.06		
11.0	4.11	159.4	158.7	158.3	6.56	6.50	6.31	-34.6	-46.7	-44.2	0.07		
12.0	4.09	163.5	162.8	162.4	6.35	6.32	6.13	-35.9	-45.5	-43.7	0.08		
13.0	4.04	167.6	166.9	166.4	5.95	5.94	5.79	-36.8	-45.2	-43.0	0.08		
14.0	3.94	171.5	170.8	170.4	5.36	5.41	5.28	-37.4	-43.9	-41.8	0.09		
15.0	3.79	175.3	174.6	174.2	4.64	4.73	4.63	-38.0	-43.1	-40.8	0.13		
16.0	3.60	178.9	178.2	177.8	3.87	3.99	3.92	-38.2	-41.3	-39.9	0.17		
17.0	3.37	182.3	181.6	181.2	3.06	3.24	3.20	-38.2	-40.3	-39.0	0.21		



Voltage Controlled Oscillator

JCOS-175LN

Typical Performance Data



REV. X1
 JCOS-175LN
 060606
 Page 1 of 1



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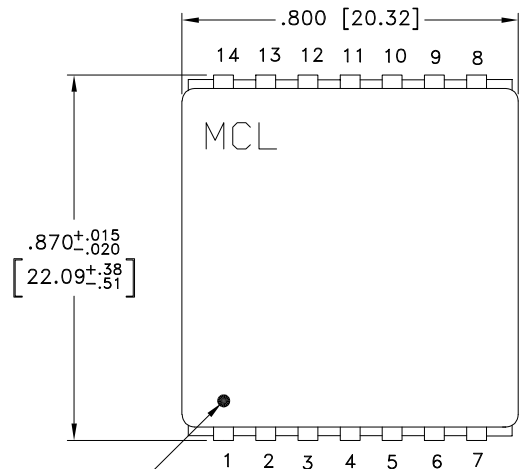


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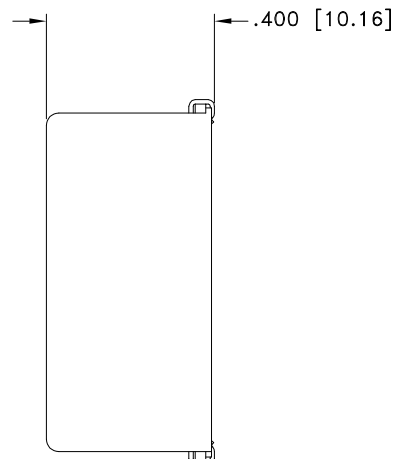


Outline Dimensions

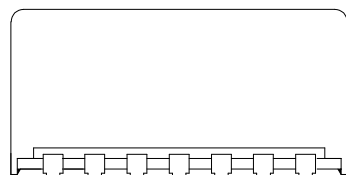
BG419



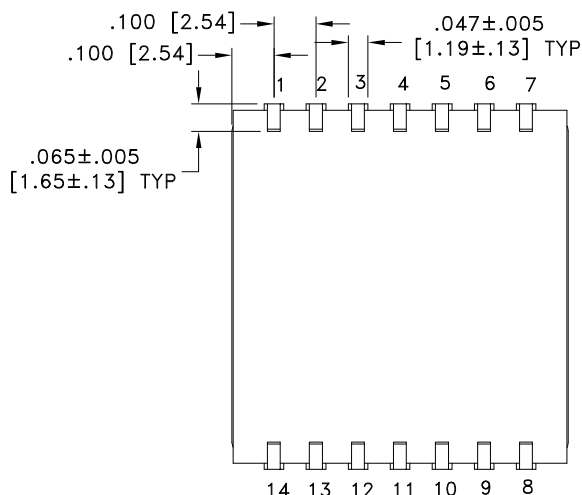
TOP VIEW



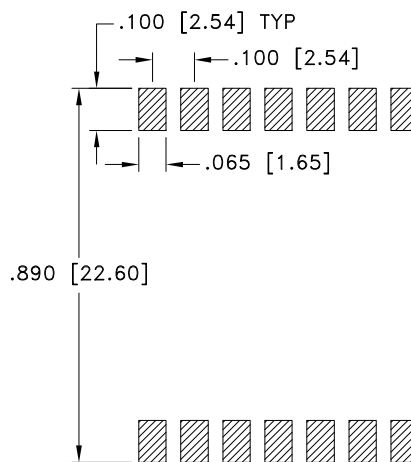
SIDE VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED LAYOUT FOR PCB LAND PATTERN (TOL ±.002)

 DENOTES METALLIZATION

Weight: 4 gram

Dimensions are in inches[mm]. Tolerances: 2PL±0.03[0.76]; 3 PL±0.015 [0.381] inches[mm], unless otherwise specified

Notes:

1. Case material: Copper-Nickel alloy.
2. Base material: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
 For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



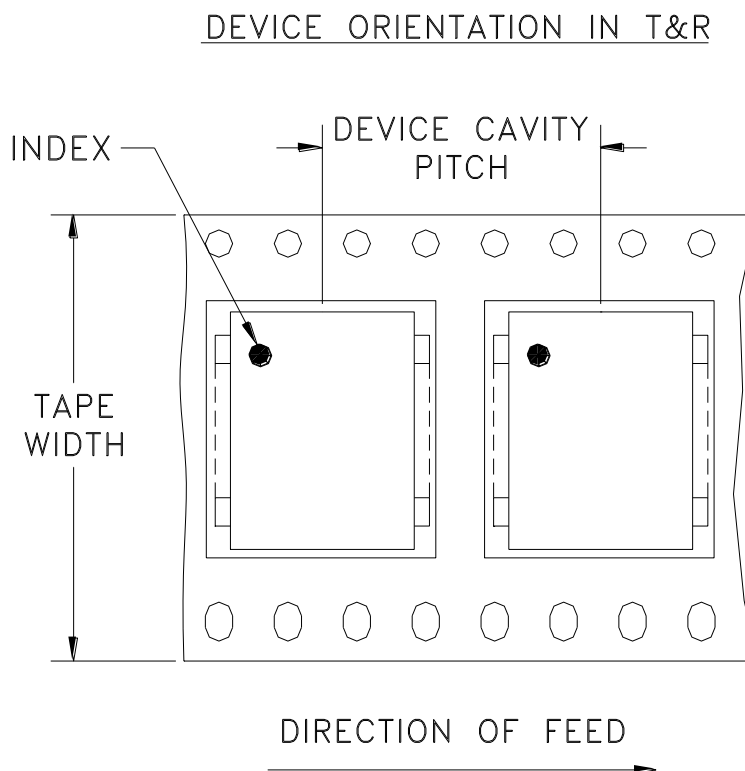
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F25



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
44	32	13	Small quantity standards (see note)	20
				50
				100
			Standard	125

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.

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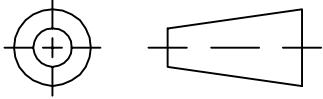
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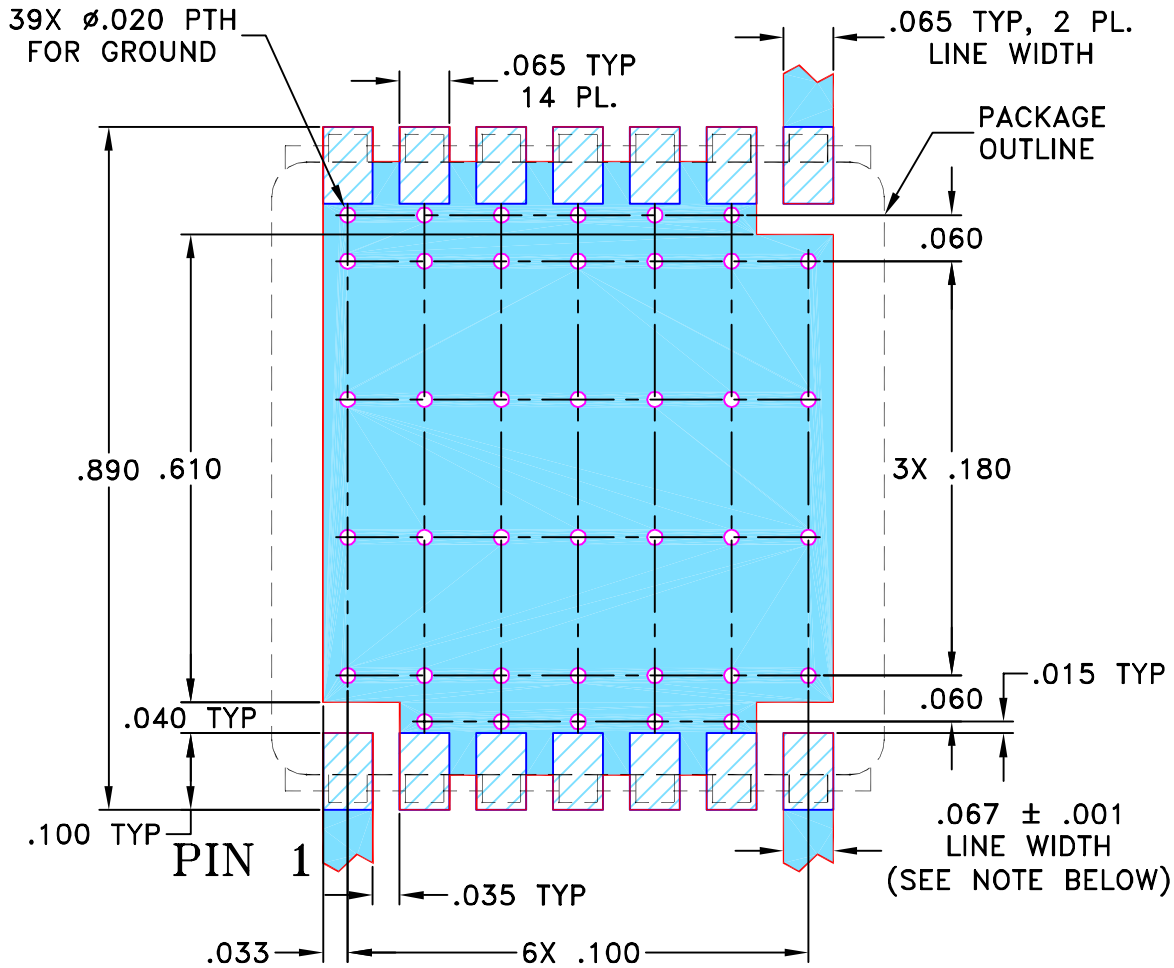
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M75893	REDRAWN	03/01	GF	DB
B	M76077	UPDATED DRAWING	04/01	GF	MM
C	M82575	UPDATED DRAWING	08/08/02	AV	MM
D	M102713	UPDATED NOTES	01/12/06	GF	IL

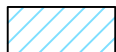
SUGGESTED MOUNTING CONFIGURATION FOR BG419 CASE STYLE, "jd" PIN CONNECTION



- NOTES:**
1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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	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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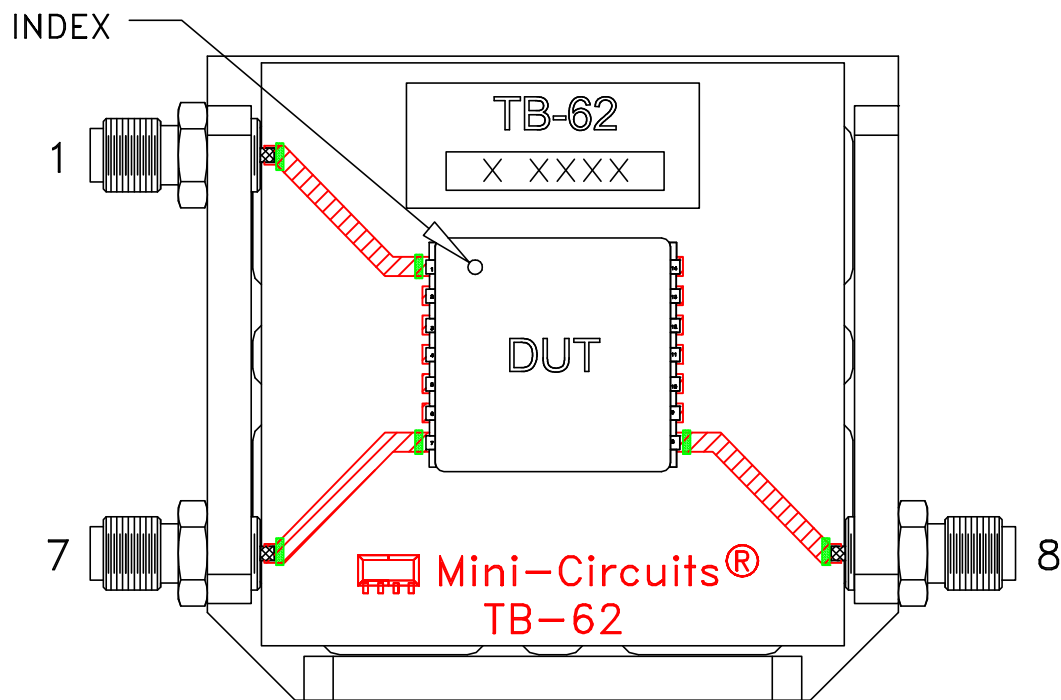
PL, jd, BG419, JCOS, TB-62

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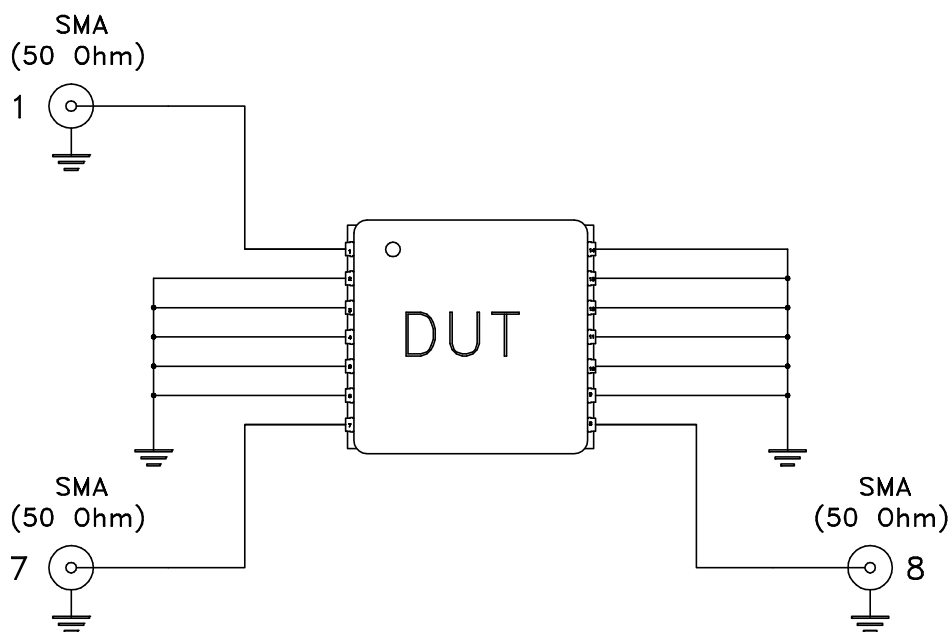
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-011	D
FILE:	98PL011	SCALE:	4:1
		SHEET:	1 OF 1

Evaluation Board and Circuit

For Pin Connection Refer to
Data Sheet of the DUT



TB-62



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