Surface Mount

Frequency Mixer

ADE-13+

Level 7 (LO Power +7 dBm) 50 to 1600 MHz



CASE STYLE: CD541

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	500,1000

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

Pin Connections

LO	6
RF	3
IF	4
GROUND	1,2,5

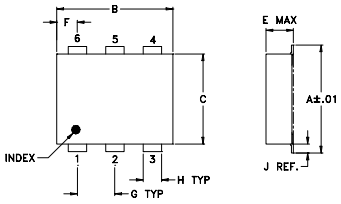
Features

- low conversion loss, 8.1 dB typ.
- excellent L-R isolation, 40 dB typ.
- low profile package
- aqueous washable
- protected by U.S. Patent 6,133,525

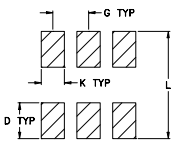
Applications

- satellite distribution
- GPS

Outline Drawing



PCB Land Pattern



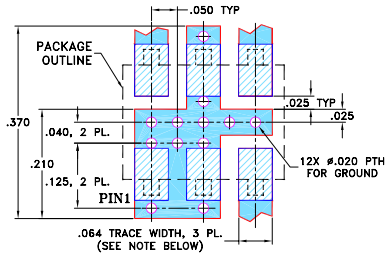
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.272	.310	.220	.100	.082	.055	.100
6.91	7.87	5.59	2.54	2.08	1.40	2.54

H	J	K	L			wt
.030	.026	.065	.300			grams
0.76	0.66	1.65	7.62			0.15

Demo Board MCL P/N: TB-02
Suggested PCB Layout (PL-051)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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 PCB IS CONTINUOUS GROUND PLANE.
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
50-1600	50-1000	8.1	0.10	9.0	9.8	50	25	40	25	33	20	49	30	35	20	32	20	11

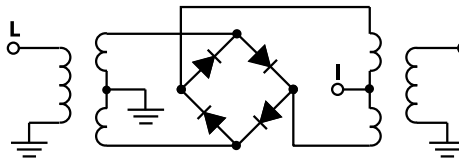
1 dB COMP.: +1 dBm typ.

L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/2] U = upper range [f_U/2 to f_U]
m= mid band [2f_L to f_U/2]

Typical Performance Data

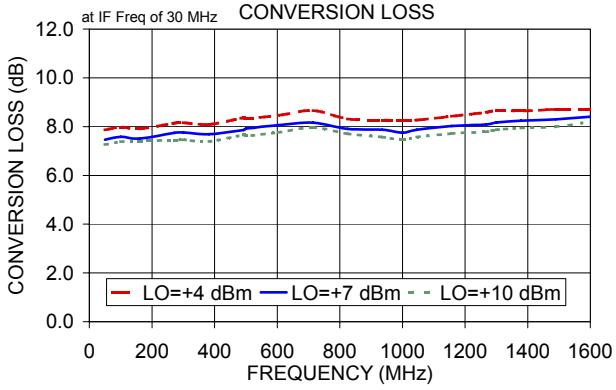
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
50.00	80.00	7.46	55.80	52.20	1.07	2.68
100.00	130.00	7.58	52.00	47.90	1.05	2.72
160.71	190.71	7.51	49.30	44.30	1.01	2.61
271.43	301.43	7.74	45.70	40.50	1.13	2.58
300.00	330.00	7.76	45.00	39.70	1.17	2.72
382.14	412.14	7.69	43.20	38.00	1.31	2.65
492.86	522.86	7.86	40.40	36.20	1.49	2.61
500.00	530.00	7.92	40.40	36.10	1.50	2.61
603.57	633.57	8.06	37.80	35.40	1.71	2.46
714.29	744.29	8.16	36.20	34.40	1.81	2.35
825.00	855.00	7.91	35.30	33.50	1.69	2.52
935.71	965.71	7.87	32.30	33.20	1.64	2.72
1000.00	1030.00	7.75	31.00	33.40	1.63	2.80
1046.43	1076.43	7.87	30.60	33.60	1.61	2.80
1157.14	1187.14	8.02	30.00	33.20	1.48	3.01
1267.86	1297.86	8.09	30.60	32.80	1.30	3.26
1300.00	1330.00	8.17	31.50	32.30	1.27	3.32
1378.57	1408.57	8.24	31.60	31.90	1.27	3.57
1489.29	1519.29	8.30	28.10	31.10	1.42	4.22
1600.00	1630.00	8.40	27.60	30.80	1.56	5.33

Electrical Schematic

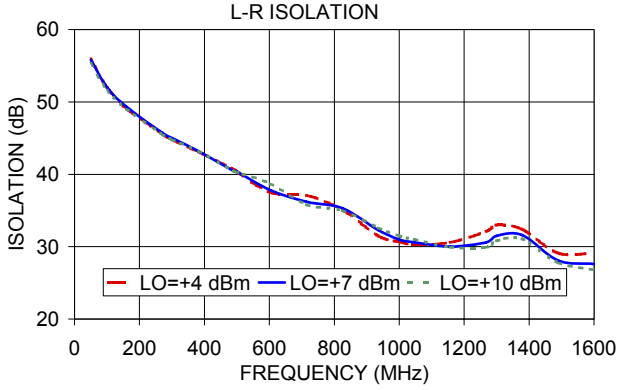


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

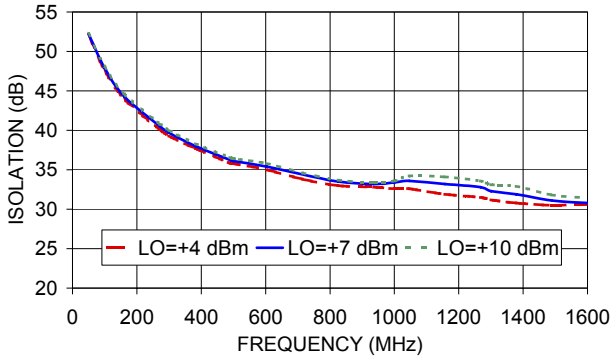
ADE-13+
CONVERSION LOSS
at IF Freq of 30 MHz



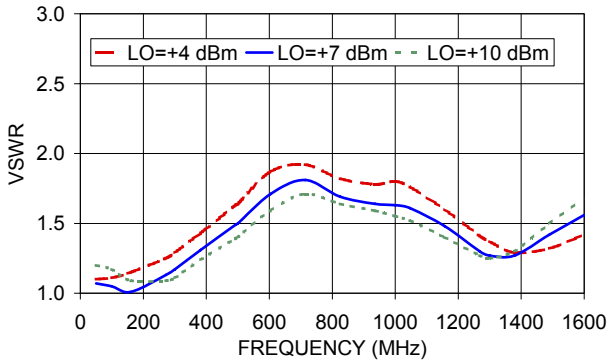
ADE-13+
L-R ISOLATION



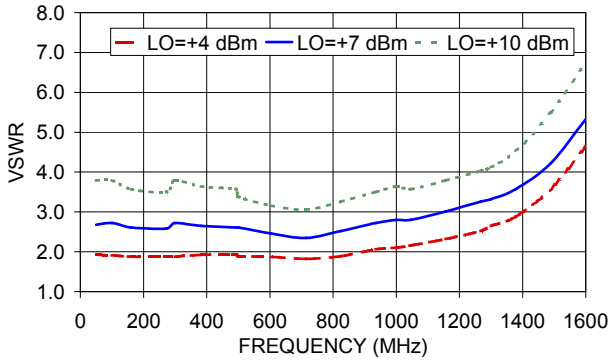
ADE-13+
L-I ISOLATION



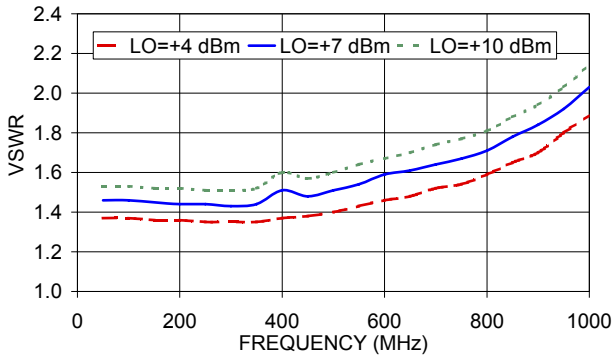
ADE-13+
RF VSWR



ADE-13+
LO VSWR



ADE-13+
IF VSWR



Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp