High IP3

Frequency Mixer

ADE-201FMH+

Level 13 (LO Power +13 dBm) 90 to 200 MHz



CASE STYLE: CD636

The Big Deal

- High IP3: +30 dBm
- Low conversion loss, 6.4 dB
- Excellent P1dB compression, +16 dBm at input
- High L-R isolation, 42 dB typ.
- High L-I isolation, 35 dB typ.

Product Overview

Mini-Circuits' ADE-201FMH+ is a surface mount frequency mixer providing high IP3 performance, ideal for minimizing 3rd order intermodulation distortion in multiple carrier environments and other systems where unwanted signals may be present. It also provides high isolation, high P1dB compression point, and low conversion loss. The mixer comes in a compact, six-lead plastic case measuring 0.27 x 0.31 x 0.22", saving space in dense board layouts.

Feature	Advantages
High IP3, +30 dBm	Minimizes third order intermodulation distortion and enables high-dynamic range.
Low conversion loss, 6.4 dB	Enables lower NF front ends, improving system sensitivity.
Excellent P1dB compression, +16 dBm at input	Provides linear performance for a wide range of RF input power levels.
High L-R isolation, • L-R, 42 dB • L-I, 35 dB	Preserves signal integrity from input to output and reduces undesired signal responses that can interfere with system performance.
Small size (0.27 x 0.31 x 0.22")	Saves board space and accommodates tight layouts

Notes
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Generic photo used for illustration purposes only

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+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
13"	500,1000

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	20 dBm
LO Power	17 dBm

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

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

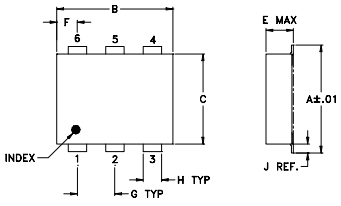
Features

- excellent IP3, 30 dBm typ.
- excellent P1dB compression,+16 dBm at input
- good L-R isolation, 42 dB typ.
- good L-I isolation, 35 dB typ.
- aqueous washable
- protected by U.S. patent 6,133,525

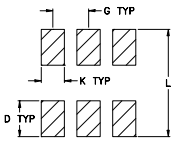
Applications

- amateur radio
- mobil radio
- radar
- vehicle recovery system
- locator transmitters

Outline Drawing



PCB Land Pattern



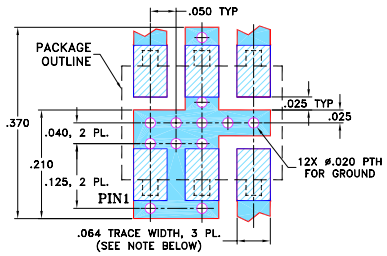
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.272	.310	.220	.100	.162	.055	.100
6.91	7.87	5.59	2.54	4.11	1.40	2.54

H	J	K	L	wt
.030	.026	.065	.300	grams
0.76	0.66	1.65	7.62	0.25

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

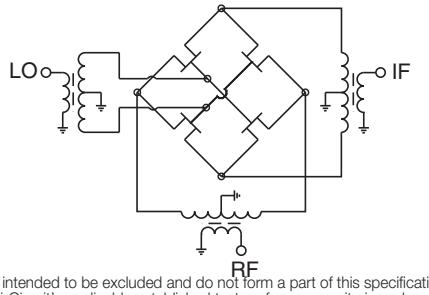
Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Frequency Range, RF	90	—	200	MHz
Frequency Range, LO	154	—	264	MHz
Frequency Range, IF	10	—	150	MHz
Conversion Loss	—	6.4	8.2	dB
LO to RF Isolation	34	42	—	dB
LO to IF Isolation	26	35	—	dB
IP3	—	30	—	dBm
RF Input Power at 1 dB Compression	—	+16	—	dBm

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)	IP3 (dBm)
RF	LO	LO +13 dBm	LO +13 dBm	LO +13 dBm	LO +13 dBm	LO +13 dBm	LO +13 dBm
90.10	154.10	6.87	52.67	42.88	1.88	5.24	28.50
100.10	164.10	6.79	50.96	40.90	1.92	5.03	29.99
106.10	170.10	6.67	49.81	39.71	1.96	4.86	30.79
110.10	174.10	6.57	48.93	38.94	1.98	4.70	31.12
112.10	176.10	6.46	48.50	38.56	1.96	4.63	31.01
114.10	178.10	6.41	48.14	38.20	1.96	4.55	31.67
116.10	180.10	6.41	47.76	37.83	1.95	4.46	32.52
118.10	182.10	6.39	47.29	37.44	1.94	4.35	32.32
120.10	184.10	6.36	46.83	37.08	1.94	4.23	32.40
130.10	194.10	6.23	45.00	35.42	1.97	3.55	33.15
136.10	200.10	6.29	44.04	34.47	1.95	3.06	33.70
138.10	202.10	6.26	43.81	34.16	1.94	2.89	32.69
140.10	204.10	6.24	43.55	33.85	1.93	2.72	33.30
142.10	206.10	6.26	43.25	33.58	1.92	2.56	32.81
150.10	214.10	6.20	42.42	32.67	1.98	1.98	33.46
160.10	224.10	6.28	41.79	32.22	1.94	1.61	34.49
170.10	234.10	6.33	42.09	32.64	1.81	1.77	34.58
180.10	244.10	6.43	43.19	33.44	1.82	2.17	34.26
190.10	254.10	6.52	44.37	34.27	1.82	2.58	29.36
200.10	264.10	6.55	45.33	35.02	1.69	2.94	27.92

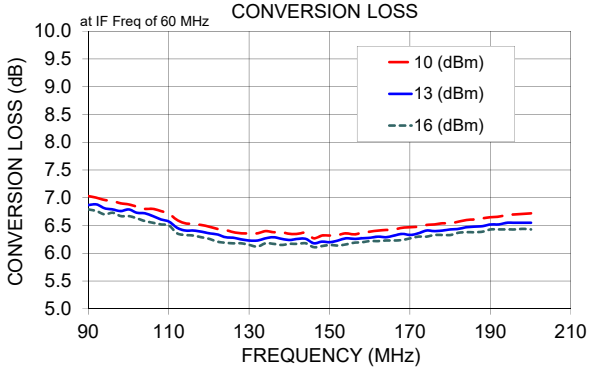
Electrical Schematic



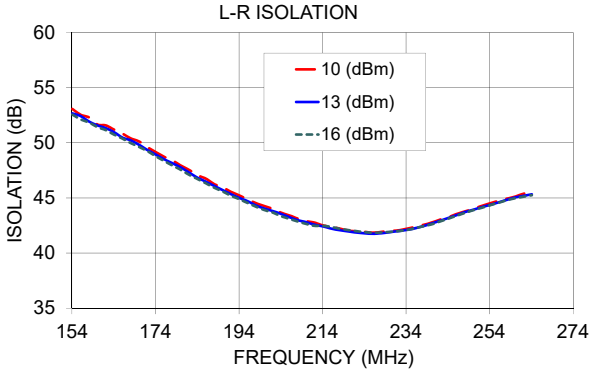
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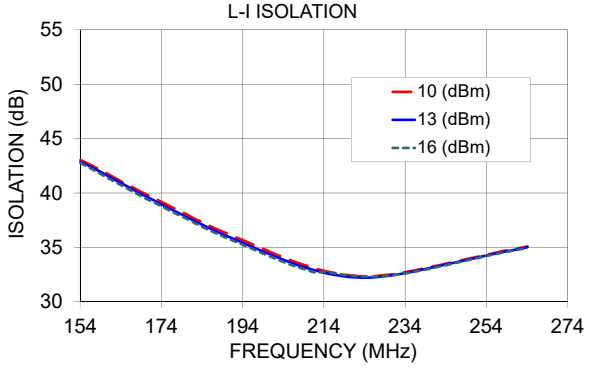
ADE-201FMH+
CONVERSION LOSS
at IF Freq of 60 MHz



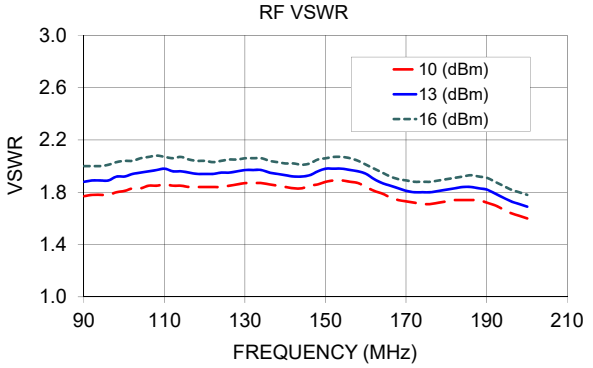
ADE-201FMH+
L-R ISOLATION



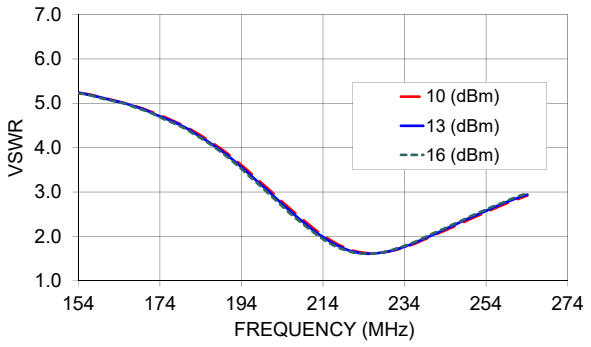
ADE-201FMH+
L-I ISOLATION



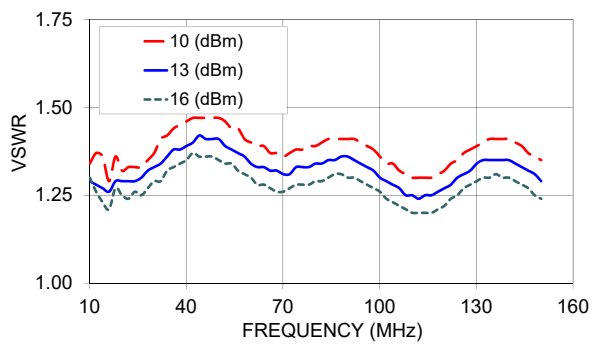
ADE-201FMH+
RF VSWR



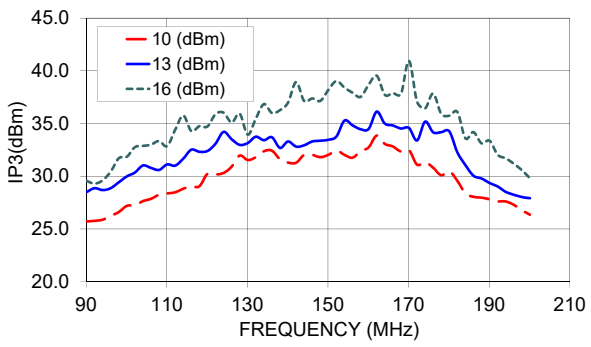
ADE-201FMH+
LO VSWR



ADE-20F1MH+
IF VSWR



ADE-201FMH+
IP3



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