Plug-In

Frequency Mixer

SBL-1MH+

Level 13 (LO Power +13 dBm) 1 to 500 MHz

Generic photo used for illustration purposes only

CASE STYLE: A06

+RoHS Compliant

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

Maximum Ratings

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

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

Pin Connections

LO	8
RF	1
IF	3,4^
GROUND	2,5,6,7

^ pins must be connected together externally

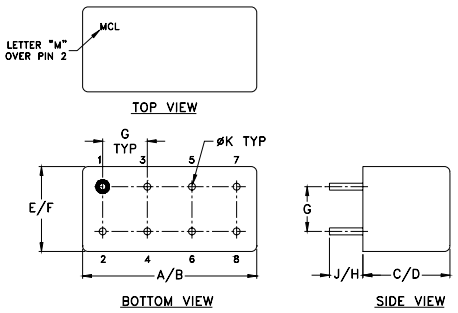
Features

- excellent conversion loss, 5.73 dB typ.
- high L-R isolation, 45 dB typ.; L-I isolation, 40 dB typ.
- rugged welded construction

Applications

- VHF/UHF
- defense & federal communications

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
.770	.800	.285	.310	.370	.400
19.56	20.32	7.24	7.87	9.40	10.16

G	H	J	K		wt
.200	.20	.14	.031		grams
5.08	5.08	3.56	0.79		5.2

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
		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.
1-500	DC-500	5.73	.08	7.5	8.5	50	35	45	30	35	25	45	30	40	25	30	20

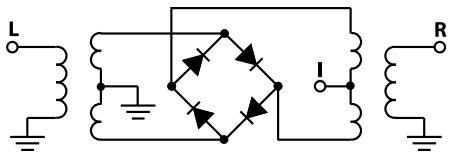
1 dB COMP.: +9 dBm typ.

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 +13dBm	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm
1.00	31.00	7.26	66.63	59.30	1.29	1.95
2.00	32.00	6.48	65.04	58.69	1.07	1.98
20.00	50.00	5.69	63.01	55.53	1.08	1.89
47.78	77.78	5.60	58.78	50.86	1.08	1.82
63.38	93.38	5.57	56.72	48.94	1.08	1.80
141.35	111.35	5.41	48.96	44.44	1.09	1.79
172.53	142.53	5.46	47.22	43.17	1.09	1.83
203.72	173.72	5.61	45.85	42.14	1.09	1.78
219.32	189.32	5.58	44.34	41.70	1.10	1.85
234.91	204.91	5.62	44.18	40.98	1.10	1.83
266.10	236.10	5.48	44.90	40.38	1.11	1.88
281.69	251.69	5.53	43.24	40.07	1.12	1.91
328.47	298.47	5.70	41.21	38.04	1.15	1.96
359.66	329.66	5.95	41.01	37.04	1.18	2.04
390.85	360.85	5.89	39.17	36.14	1.23	2.06
422.04	392.04	6.29	38.02	34.90	1.32	2.08
453.23	423.23	6.32	37.70	34.14	1.37	2.11
468.82	438.82	6.23	37.66	34.16	1.41	2.19
484.41	454.41	6.27	37.86	34.53	1.45	2.34
500.00	470.00	6.32	38.19	35.22	1.49	2.45

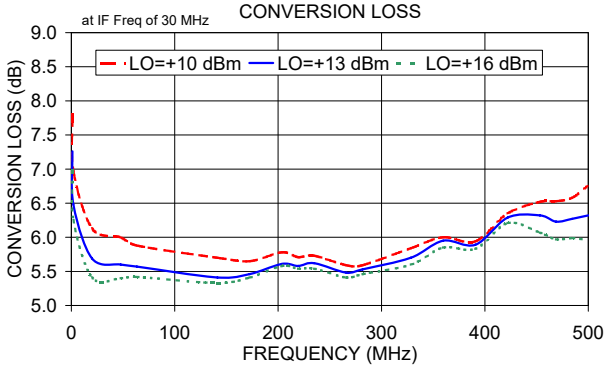
Electrical Schematic



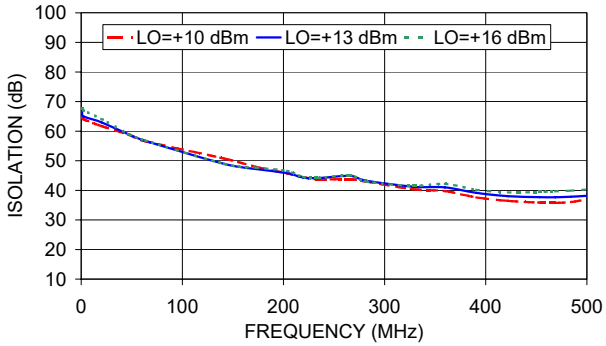
Notes

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

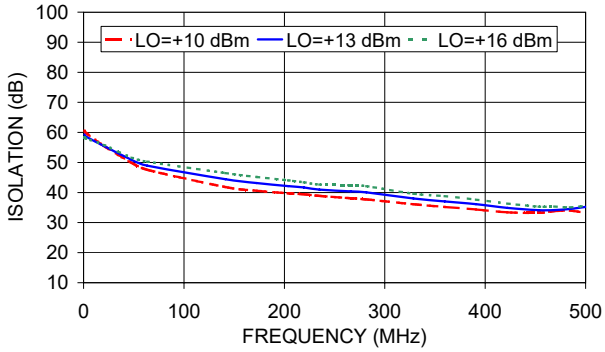
SBL-1MH+
CONVERSION LOSS
at IF Freq of 30 MHz



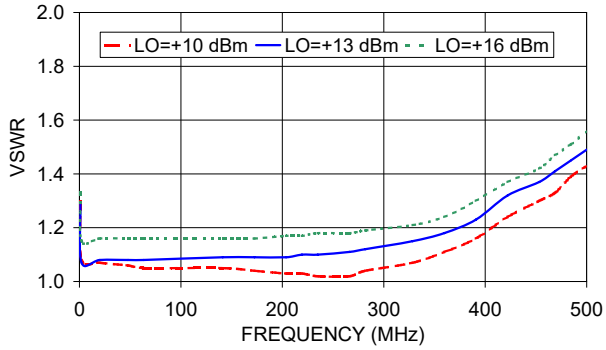
SBL-1MH+
L-R ISOLATION



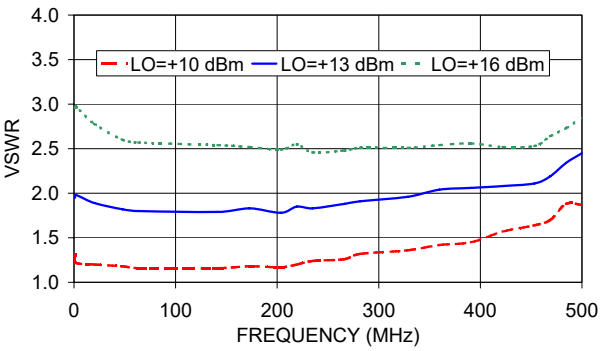
SBL-1MH+
L-I ISOLATION



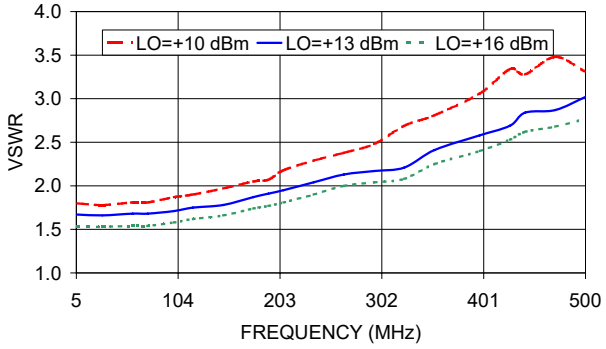
SBL-1MH+
RF VSWR



SBL-1MH+
LO VSWR



SBL-1MH+
IF VSWR



Frequency Mixer SBL-1MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+10	+13	+16
1.0	31.0	7.80	7.26	6.98
2.0	32.0	6.97	6.48	6.25
10.1	40.1	5.38	5.09	4.96
29.9	59.9	5.63	5.30	5.17
49.7	79.7	5.59	5.32	5.20
69.4	99.4	5.52	5.32	5.21
89.2	119.2	5.55	5.33	5.24
109.0	139.0	5.56	5.34	5.26
148.5	178.5	5.55	5.40	5.32
168.3	198.3	5.57	5.39	5.31
188.1	218.1	5.57	5.38	5.30
207.9	237.9	5.58	5.44	5.36
227.7	257.7	5.76	5.58	5.51
247.4	277.4	5.87	5.61	5.48
267.2	297.2	5.92	5.67	5.50
287.0	317.0	5.90	5.73	5.61
306.8	336.8	5.91	5.78	5.72
326.5	356.5	5.97	5.82	5.77
346.3	376.3	6.00	5.85	5.80
366.1	396.1	6.09	5.91	5.84
385.9	415.9	6.21	6.00	5.95
405.7	435.7	6.53	6.12	6.02
445.2	475.2	7.31	6.84	6.25
465.0	495.0	7.68	7.21	6.46
484.8	514.8	8.18	7.62	6.87
504.5	534.5	8.77	8.17	7.48
524.3	554.3	9.12	8.53	7.92
544.1	574.1	9.21	8.60	8.04
583.7	613.7	9.01	8.38	7.82
603.4	633.4	8.89	8.17	7.60
643.0	673.0	8.66	7.84	7.42
662.8	692.8	8.43	7.74	7.45
702.3	732.3	8.15	7.77	7.63
722.1	752.1	8.18	7.86	7.73
761.7	791.7	8.39	8.11	8.04
781.4	811.4	8.63	8.33	8.26
821.0	851.0	9.32	8.95	8.89
840.8	870.8	9.68	9.29	9.24
880.3	910.3	10.39	9.98	9.89
900.1	930.1	10.93	10.46	10.31

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+10	+13	+16
10.1	40.1	23.53	24.49	26.12
29.9	59.9	24.82	25.72	27.77
49.7	79.7	24.31	26.17	28.74
69.4	99.4	23.93	24.17	30.22
89.2	119.2	21.64	24.50	28.22
109.0	139.0	27.90	30.16	24.78
128.8	158.8	23.49	24.77	20.98
148.5	178.5	24.46	24.69	23.54
168.3	198.3	24.25	26.54	21.38
188.1	218.1	19.32	19.47	20.50
207.9	237.9	18.46	16.44	15.98
227.7	257.7	24.47	20.56	20.01
247.4	277.4	21.08	25.03	27.05
267.2	297.2	20.24	25.80	28.13
287.0	317.0	18.12	17.11	18.93
306.8	336.8	17.56	16.30	15.94
326.5	356.5	16.71	15.50	15.48
346.3	376.3	18.86	16.58	16.62
366.1	396.1	20.03	16.84	18.39
385.9	415.9	16.68	18.72	20.27
405.7	435.7	12.78	19.32	21.91
425.4	455.4	8.48	13.47	19.76
445.2	475.2	7.14	9.43	15.45
465.0	495.0	6.46	7.71	11.79
484.8	514.8	6.57	7.29	9.88
504.5	534.5	6.54	7.18	8.68
524.3	554.3	7.50	7.93	8.79
544.1	574.1	9.18	9.80	10.74
583.7	613.7	12.86	14.36	17.17
603.4	633.4	13.89	17.24	21.60
643.0	673.0	20.34	19.01	23.26
662.8	692.8	18.69	19.51	22.21
702.3	732.3	16.89	20.48	23.12
722.1	752.1	17.46	21.27	23.29
761.7	791.7	16.94	20.41	21.68
781.4	811.4	16.29	19.10	20.24
821.0	851.0	15.01	18.58	19.34
840.8	870.8	15.57	19.19	19.78
880.3	910.3	16.35	19.63	20.26
900.1	930.1	16.50	19.70	19.51

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB) @LO (dBm)		
		+10	+13	+16
10.1	40.1	1.47	1.15	0.91
29.9	59.9	1.34	1.03	0.79
49.7	79.7	1.41	1.03	0.79
69.4	99.4	1.18	0.91	0.69
89.2	119.2	1.12	0.85	0.63
109.0	139.0	1.11	0.80	0.59
128.8	158.8	1.19	0.78	0.60
148.5	178.5	1.14	0.73	0.57
168.3	198.3	1.05	0.70	0.54
188.1	218.1	0.96	0.71	0.57
207.9	237.9	0.89	0.63	0.52
227.7	257.7	0.86	0.55	0.43
247.4	277.4	0.86	0.64	0.47
267.2	297.2	0.90	0.71	0.56
287.0	317.0	1.06	0.81	0.65
306.8	336.8	1.29	0.94	0.76
326.5	356.5	1.54	1.12	0.90
346.3	376.3	1.74	1.27	1.02
366.1	396.1	2.00	1.44	1.10
385.9	415.9	2.27	1.62	1.24
405.7	435.7	2.41	1.95	1.48
425.4	455.4	2.48	2.20	1.76
445.2	475.2	2.40	2.13	1.96
465.0	495.0	2.39	2.13	2.08
484.8	514.8	2.04	1.86	1.87
504.5	534.5	1.74	1.55	1.58
524.3	554.3	1.37	1.17	1.21
544.1	574.1	1.26	1.09	1.10
583.7	613.7	1.33	1.13	1.18
603.4	633.4	1.46	1.31	1.31
643.0	673.0	1.68	1.51	1.18
662.8	692.8	1.80	1.48	1.10
702.3	732.3	1.91	1.31	1.00
722.1	752.1	1.90	1.23	0.95
761.7	791.7	1.79	1.06	0.87
781.4	811.4	1.83	0.99	0.82
821.0	851.0	1.94	0.89	0.67
840.8	870.8	1.89	0.86	0.58
880.3	910.3	1.98	0.85	0.56
900.1	930.1	2.11	0.85	0.50

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB) @LO (dBm) +13
240.0	10.1	5.73
234.1	16.0	5.66
228.2	21.9	5.54
222.3	27.8	5.52
216.4	33.7	5.47
210.5	39.6	5.43
204.6	45.5	5.44
198.7	51.4	5.34
192.8	57.3	5.30
186.9	63.2	5.24
181.0	69.1	5.28
175.1	75.0	5.30
169.2	80.9	5.27
163.3	86.8	5.25
157.4	92.7	5.24
151.5	98.6	5.26
145.6	104.5	5.27
139.7	110.4	5.29
133.8	116.3	5.28
127.9	122.2	5.23
122.1	128.0	5.27
116.2	133.9	5.32
110.3	139.8	5.36
104.4	145.7	5.35
98.5	151.6	5.34
92.6	157.5	5.34
86.7	163.4	5.34
80.8	169.3	5.35
74.9	175.2	5.36
69.0	181.1	5.34
63.1	187.0	5.35
57.2	192.9	5.36
51.3	198.8	5.39
45.4	204.7	5.45
39.5	210.6	5.48
33.6	216.5	5.51
27.7	222.4	5.51
21.8	228.3	5.56
15.9	234.2	5.60
10.0	240.1	5.70

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +13
10.0	20.1	5.25
22.3	32.4	5.08
34.6	44.7	5.09
46.9	57.0	5.08
59.2	69.3	5.06
71.5	81.6	5.13
83.8	93.9	5.15
96.2	106.3	5.15
108.5	118.6	5.18
120.8	130.9	5.16
133.1	143.2	5.17
145.4	155.5	5.24
157.7	167.8	5.29
170.0	180.1	5.33
182.3	192.4	5.33
194.6	204.7	5.31
206.9	217.0	5.30
219.2	229.3	5.38
231.5	241.6	5.38
243.8	253.9	5.41
256.2	266.3	5.46
268.5	278.6	5.42
280.8	290.9	5.57
293.1	303.2	5.73
305.4	315.5	5.85
317.7	327.8	5.99
330.0	340.1	5.95
342.3	352.4	5.92
354.6	364.7	5.86
366.9	377.0	5.76
379.2	389.3	5.67
391.5	401.6	5.53
403.8	413.9	5.43
416.2	426.3	5.47
428.5	438.6	5.48
440.8	450.9	5.57
453.1	463.2	5.63
465.4	475.5	5.65
477.7	487.8	5.67
490.0	500.1	5.65

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB) @LO (dBm) +13
490.0	10.1	7.08
477.7	22.4	6.95
465.4	34.7	6.89
453.1	47.0	6.85
440.8	59.3	6.89
428.5	71.6	6.78
416.2	83.9	6.71
403.8	96.3	6.68
391.5	108.6	6.62
379.2	120.9	6.66
366.9	133.2	6.72
354.6	145.5	6.68
342.3	157.8	6.70
330.0	170.1	6.70
317.7	182.4	6.71
305.4	194.7	6.74
293.1	207.0	6.67
280.8	219.3	6.66
268.5	231.6	6.69
256.2	243.9	6.66
243.8	256.3	6.76
231.5	268.6	6.75
219.2	280.9	6.64
206.9	293.2	6.64
194.6	305.5	6.60
182.3	317.8	6.63
170.0	330.1	6.71
157.7	342.4	6.73
145.4	354.7	6.79
133.1	367.0	6.84
120.8	379.3	6.74
108.5	391.6	6.68
96.2	403.9	6.54
83.8	416.3	6.41
71.5	428.6	6.38
59.2	440.9	6.48
46.9	453.2	6.66
34.6	465.5	7.01
22.3	477.8	7.27
10.0	490.1	7.41

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+10	+13	+16	+10	+13	+16
1.0	65.00	66.63	67.65	60.52	59.30	58.20
2.0	64.11	65.04	67.03	59.98	58.69	58.03
10.1	71.24	72.78	73.53	63.05	61.25	59.38
29.9	63.00	64.76	66.19	61.52	60.51	59.79
49.7	58.48	60.25	62.15	60.16	59.29	58.29
69.4	55.45	57.38	59.27	58.32	57.49	57.13
89.2	53.23	55.51	57.52	56.23	55.81	56.60
109.0	51.93	54.30	56.07	53.50	54.60	56.00
148.5	49.79	52.07	53.84	50.51	53.33	54.87
168.3	48.71	51.00	52.76	49.69	52.85	54.25
188.1	47.70	49.74	51.43	49.99	53.61	55.08
207.9	47.09	49.07	50.63	48.84	52.29	53.20
227.7	47.16	49.46	51.49	47.60	50.72	51.73
247.4	46.61	48.63	50.21	48.95	52.08	52.57
267.2	46.44	48.38	50.21	49.43	51.25	50.88
287.0	45.98	48.42	50.29	48.27	50.06	49.70
306.8	44.30	46.96	49.69	48.55	47.71	45.83
326.5	43.41	45.73	47.94	49.11	47.80	45.71
346.3	42.86	45.41	47.99	49.56	47.45	45.19
366.1	42.04	44.71	47.35	51.63	46.61	43.38
385.9	41.65	44.72	48.94	52.87	47.01	41.22
405.7	43.13	47.66	51.95	54.19	43.14	38.94
445.2	44.09	48.84	53.52	60.09	44.92	38.66
465.0	43.29	46.75	49.76	45.45	43.79	38.76
484.8	43.73	49.37	56.13	41.36	40.09	37.65
504.5	44.55	48.74	52.00	39.43	37.99	36.79
524.3	44.86	51.54	57.33	36.93	35.90	35.25
544.1	44.10	47.31	49.07	35.04	34.37	33.82
583.7	43.38	44.40	43.84	32.19	32.09	32.11
603.4	44.03	46.31	47.04	30.57	30.73	30.79
643.0	45.28	45.47	42.57	27.72	28.78	27.89
662.8	47.88	45.17	39.68	26.23	27.87	25.64
702.3	53.86	44.53	38.82	23.81	24.70	22.55
722.1	57.09	43.55	38.23	22.36	23.49	21.80
761.7	41.48	42.12	36.76	19.48	21.39	20.55
781.4	37.89	40.33	36.15	18.11	20.26	19.71
821.0	32.52	35.76	33.66	16.08	18.56	18.45
840.8	30.33	33.12	32.04	15.28	17.76	18.10
880.3	28.27	30.68	30.20	14.72	16.85	17.11
900.1	27.49	29.83	29.61	14.31	16.41	16.69

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+10	+13	+16
10.1	40.1	45.73	48.81	42.27
29.9	59.9	38.95	38.39	38.59
49.7	79.7	34.25	34.76	34.88
69.4	99.4	31.83	32.19	32.23
89.2	119.2	30.25	30.54	30.84
109.0	139.0	28.99	29.40	29.78
128.8	158.8	28.14	28.26	28.58
148.5	178.5	27.69	28.08	28.34
168.3	198.3	27.38	27.94	28.30
188.1	218.1	26.86	27.67	28.49
207.9	237.9	26.49	27.04	27.67
227.7	257.7	26.55	27.09	27.44
247.4	277.4	26.80	27.25	27.49
267.2	297.2	27.15	27.76	28.14
287.0	317.0	27.79	28.47	29.30
306.8	336.8	27.63	28.20	29.07
326.5	356.5	27.17	27.77	28.45
346.3	376.3	26.40	26.94	27.80
366.1	396.1	25.34	25.79	26.33
385.9	415.9	24.49	24.46	24.51
405.7	435.7	23.34	22.90	22.75
425.4	455.4	22.88	22.47	22.20
445.2	475.2	22.10	21.89	21.73
465.0	495.0	21.74	21.65	21.67
484.8	514.8	21.44	21.47	21.56
504.5	534.5	21.35	21.36	21.37
524.3	554.3	21.77	21.84	21.83
544.1	574.1	22.03	22.07	21.84
583.7	613.7	22.31	22.18	21.58
603.4	633.4	21.81	21.56	20.75
643.0	673.0	20.41	19.80	19.39
662.8	692.8	19.69	18.97	18.44
702.3	732.3	17.98	17.29	16.92
722.1	752.1	17.38	16.65	16.21
761.7	791.7	15.91	15.08	14.57
781.4	811.4	15.18	14.36	13.76
821.0	851.0	13.75	12.99	12.37
840.8	870.8	13.14	12.42	11.83
880.3	910.3	11.90	11.27	10.82
900.1	930.1	11.36	10.76	10.40

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm) +10	+13	+16
5.0	35.0	1.30	1.29	1.33
10.1	40.1	1.26	1.16	1.12
29.9	59.9	1.26	1.12	1.05
49.7	79.7	1.23	1.10	1.02
69.4	99.4	1.18	1.07	1.00
89.2	119.2	1.17	1.04	1.02
109.0	139.0	1.13	1.01	1.06
128.8	158.8	1.09	1.01	1.06
148.5	178.5	1.08	1.02	1.09
168.3	198.3	1.05	1.06	1.12
188.1	218.1	1.04	1.08	1.16
207.9	237.9	1.01	1.07	1.13
227.7	257.7	1.00	1.08	1.13
247.4	277.4	1.04	1.14	1.22
267.2	297.2	1.05	1.18	1.29
287.0	317.0	1.09	1.19	1.30
306.8	336.8	1.14	1.23	1.32
326.5	356.5	1.18	1.27	1.34
346.3	376.3	1.24	1.34	1.41
366.1	396.1	1.28	1.40	1.46
385.9	415.9	1.29	1.40	1.43
405.7	435.7	1.22	1.33	1.35
425.4	455.4	1.13	1.21	1.23
445.2	475.2	1.12	1.14	1.14
465.0	495.0	1.19	1.15	1.06
484.8	514.8	1.29	1.24	1.15
504.5	534.5	1.45	1.41	1.32
524.3	554.3	1.61	1.58	1.50
544.1	574.1	1.75	1.72	1.65
583.7	613.7	1.97	1.96	1.89
603.4	633.4	2.11	2.09	2.04
643.0	673.0	2.38	2.40	2.39
662.8	692.8	2.51	2.56	2.55
702.3	732.3	2.74	2.82	2.79
722.1	752.1	2.84	2.93	2.89
761.7	791.7	3.12	3.20	3.16
781.4	811.4	3.29	3.34	3.30
821.0	851.0	3.63	3.69	3.67
840.8	870.8	3.78	3.84	3.86
880.3	910.3	3.98	4.00	4.05
900.1	930.1	4.09	4.08	4.12

LO (MHz)	LO VSWR (:1) @LO (dBm) +10	+13	+16
5.0	1.31	1.95	2.96
10.1	1.28	1.94	2.77
29.9	1.37	2.11	3.10
49.7	1.35	2.10	3.04
69.4	1.30	1.97	2.81
89.2	1.29	1.94	2.79
109.0	1.31	1.99	2.84
128.8	1.35	2.08	2.96
148.5	1.37	2.07	2.91
168.3	1.36	2.02	2.81
188.1	1.38	2.03	2.82
207.9	1.43	2.11	2.92
227.7	1.48	2.18	3.01
247.4	1.50	2.17	2.97
267.2	1.53	2.16	2.94
287.0	1.57	2.21	2.96
306.8	1.62	2.30	3.09
326.5	1.67	2.35	3.16
346.3	1.70	2.35	3.12
366.1	1.73	2.37	3.16
385.9	1.77	2.36	3.11
405.7	1.85	2.44	3.20
425.4	1.96	2.54	3.27
445.2	2.03	2.62	3.31
465.0	2.06	2.69	3.38
484.8	2.11	2.77	3.49
504.5	2.18	2.84	3.59
524.3	2.22	2.88	3.63
544.1	2.25	2.89	3.67
583.7	2.34	2.96	3.70
603.4	2.39	3.00	3.73
643.0	2.44	2.98	3.71
662.8	2.42	2.95	3.62
702.3	2.47	2.98	3.69
722.1	2.53	3.02	3.71
761.7	2.82	3.20	3.83
781.4	3.02	3.34	3.94
821.0	3.38	3.62	4.12
840.8	3.47	3.70	4.15
880.3	3.51	3.86	4.30
900.1	3.48	3.90	4.35

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1) @LO (dBm) +10	+13	+16
5.0	1.80	1.67	1.53
10.0	3.36	2.77	2.16
22.6	3.44	2.78	2.19
35.1	3.19	2.59	2.06
47.7	3.11	2.52	2.01
60.3	3.11	2.54	2.03
72.8	3.19	2.62	2.09
85.4	3.24	2.66	2.12
97.9	3.29	2.71	2.16
110.5	3.32	2.75	2.19
123.1	3.38	2.80	2.23
135.6	3.37	2.82	2.26
148.2	3.35	2.80	2.26
160.8	3.30	2.78	2.25
173.3	3.31	2.81	2.27
185.9	3.39	2.89	2.34
198.5	3.49	3.00	2.42
211.0	3.53	3.03	2.46
223.6	3.45	2.96	2.42
236.2	3.35	2.90	2.39
248.7	3.36	2.91	2.40
261.3	3.46	3.00	2.48
273.8	3.49	3.06	2.52
286.4	3.45	3.04	2.51
299.0	3.41	3.00	2.47
311.5	3.40	2.98	2.45
324.1	3.40	3.00	2.48
336.7	3.42	3.02	2.52
349.2	3.42	3.02	2.52
361.8	3.36	2.97	2.50
374.4	3.27	2.91	2.44
386.9	3.30	2.93	2.44
399.5	3.38	2.99	2.48
412.1	3.35	2.98	2.47
424.6	3.29	2.93	2.43
437.2	3.28	2.90	2.40
449.7	3.26	2.89	2.40
462.3	3.27	2.91	2.42
474.9	3.32	2.95	2.44
487.4	3.32	2.94	2.44
500.0	2.73	2.52	2.31

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	35	54	25	44	31	53	40	56	63	74
1	-	23	+0	32	12	37	28	49	40	55	41	61
2	86	56	58	60	64	60	49	59	48	63	50	74
3	>100	49	42	49	51	51	38	62	52	58	50	61
4	>100	75	68	67	74	67	72	68	66	77	61	75
5	>100	76	64	61	48	66	46	61	46	65	59	71
6	>100	89	82	82	78	79	78	79	74	73	87	90
7	>100	85	80	83	68	72	65	73	62	68	58	82
8	>100	96	90	93	>98	86	78	82	81	83	78	85
9	>100	84	85	95	84	88	81	74	72	78	69	75
10	>100	96	98	>98	>98	>98	>98	97	92	92	83	88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; 4.00 dBm.**
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -1.53 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	24	40	15	32	19	39	25	46	45	64
1	-	22	+0	30	11	37	27	44	40	46	31	48
2	>100	72	70	65	68	69	55	68	53	67	55	83
3	>100	70	63	75	56	74	57	87	64	79	62	79
4	>100	>88	>88	>88	87	>88	86	>88	83	>88	85	>88
5	>100	>88	82	>88	81	>88	78	>88	77	>88	87	>88
6	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
7	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
8	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
9	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
10	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

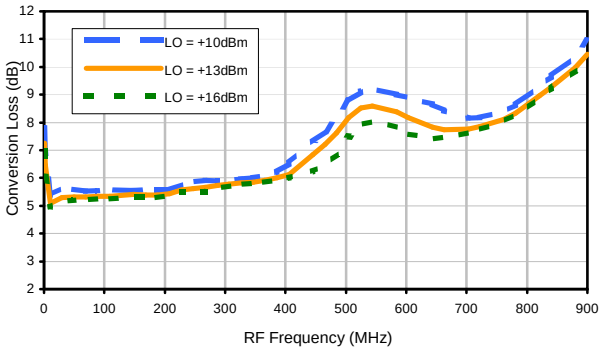
LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; -6.00 dBm.**
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -11.55 dBm

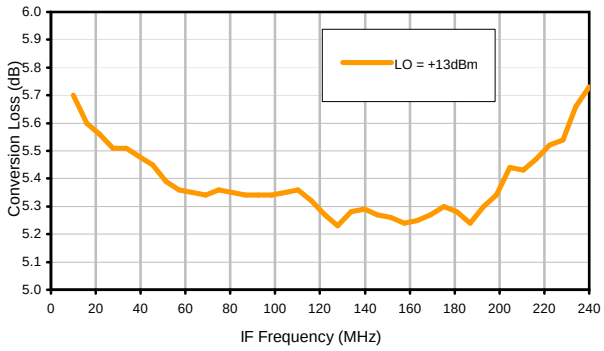
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

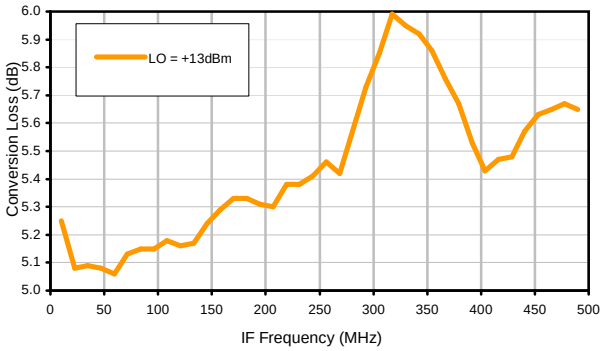
Conversion Loss @ IF=30MHz



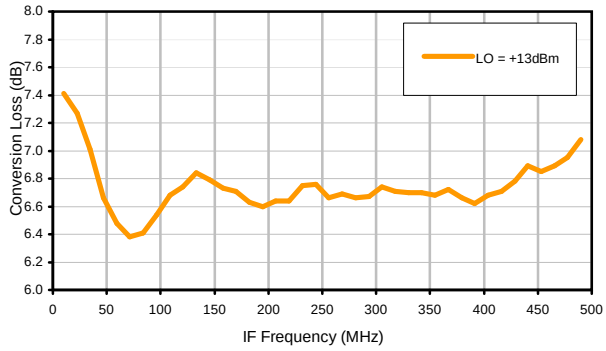
Conversion Loss vs. IF @ RF=250.1MHz



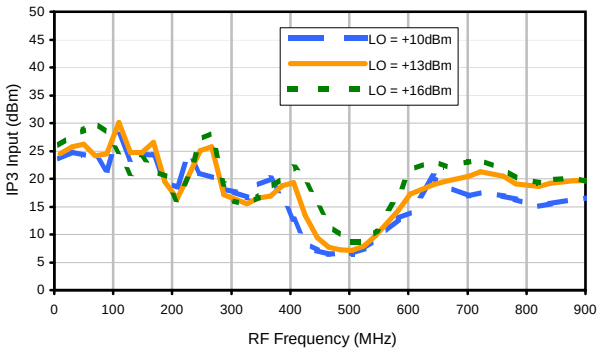
Conversion Loss vs. IF @ RF=10.1MHz



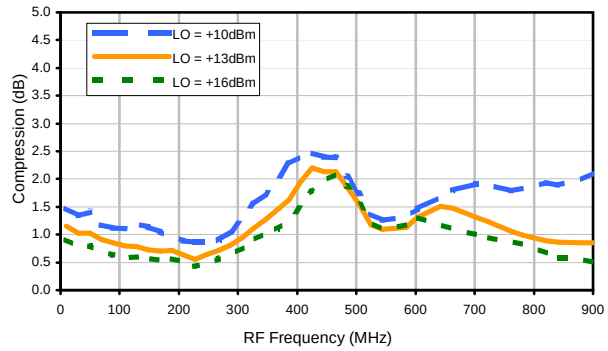
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input

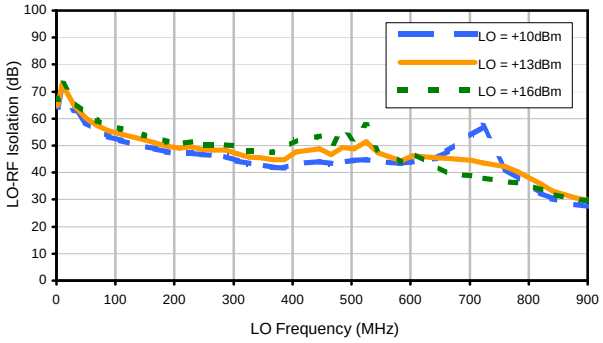


Compression @ RF IN=+9dBm

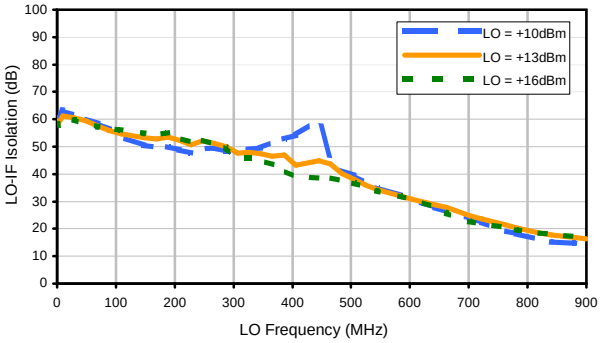


Typical Performance Curves

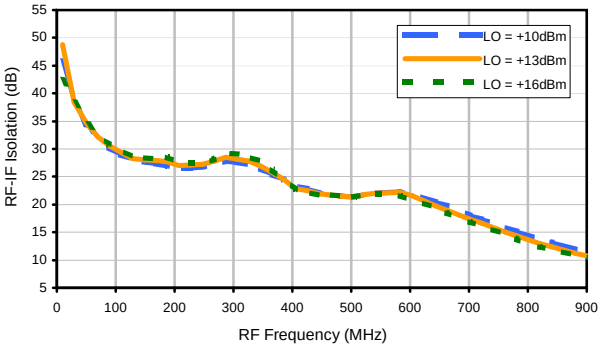
LO-RF Isolation



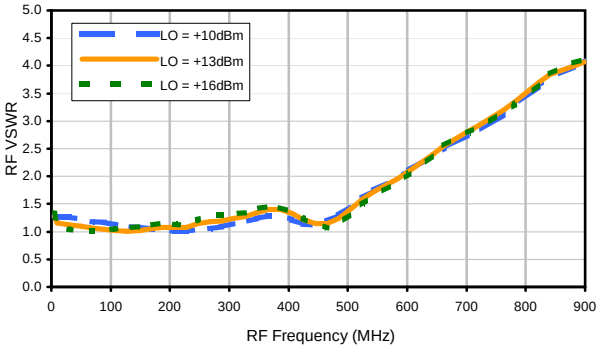
LO-IF Isolation



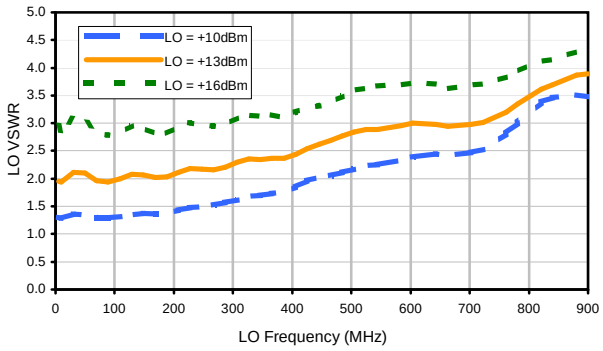
RF-IF Isolation



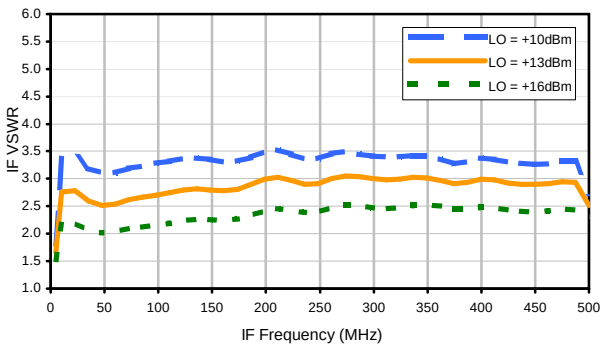
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	35	54	25	44	31	53	40	56	63	74
1	-	23	+0	32	12	37	28	49	40	55	41	61
2	86	56	58	60	64	60	49	59	48	63	50	74
3	>100	49	42	49	51	51	38	62	52	58	50	61
4	>100	75	68	67	74	67	72	68	66	77	61	75
5	>100	76	64	61	48	66	46	61	46	65	59	71
6	>100	89	82	82	78	79	78	79	74	73	87	90
7	>100	85	80	83	68	72	65	73	62	68	58	82
8	>100	96	90	93	>98	86	78	82	81	83	78	85
9	>100	84	85	95	84	88	81	74	72	78	69	75
10	>100	96	98	>98	>98	>98	>98	97	92	92	83	88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; 4.00 dBm.**
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -1.53 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	24	40	15	32	19	39	25	46	45	64
1	-	22	+0	30	11	37	27	44	40	46	31	48
2	>100	72	70	65	68	69	55	68	53	67	55	83
3	>100	70	63	75	56	74	57	87	64	79	62	79
4	>100	>88	>88	>88	87	>88	86	>88	83	>88	85	>88
5	>100	>88	82	>88	81	>88	78	>88	77	>88	87	>88
6	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
7	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
8	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
9	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
10	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

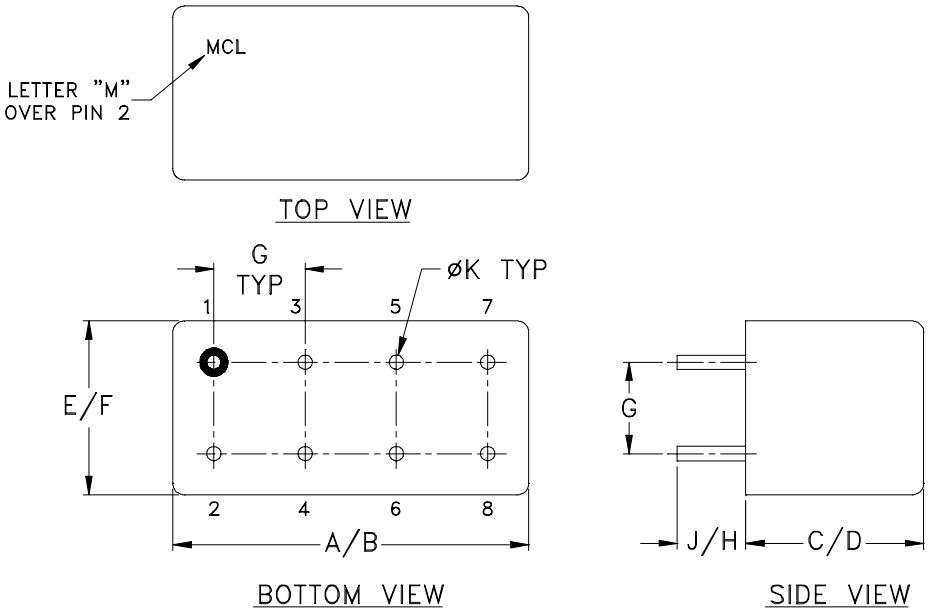
Test conditions: **RF IN: 250.1 MHz; -6.00 dBm.**
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -11.55 dBm

Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Case Style A

A01
A04
A05
A06

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01	.770 (19.56)	.800 (20.32)	.385 (9.78)	.400 (10.16)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	5.2
A04			.200 (5.08)	.210 (5.33)							3.7
A05			.240 (6.10)	.250 (6.35)							3.7
A06			.285 (7.24)	.310 (7.87)							5.2

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

Notes:

1. Header material: C.R.S.
   Pin material: #52 alloy.
   Cover material: Cupro-Nickel.
2. Pin finish: Electro Tin-Silver.
3. Insulated spacer available. Request P/N B14-045-01.
4. Tolerance on pin diameter +/-.005 inch.
5. Glass meniscus 0.015 inch max.
6. Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.

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Environmental Specifications ENV30

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 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
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
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A

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
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D