Plug-In

Frequency Mixer

RAY-1+

Level 23 (LO Power +23 dBm) 5 to 500 MHz

Generic photo used for illustration purposes only

CASE STYLE: A01

+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	350mW
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
CASE GROUND	2

^pins must be connected together externally

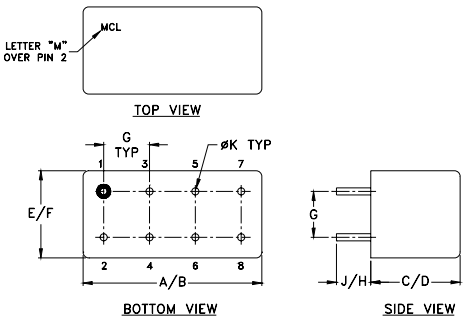
Features

- excellent conversion loss, 6.57 dB typ.
- high isolation 40 dB typ. L-R & L-I
- rugged welded construction
- hermetically sealed

Applications

- VHF/UHF
- defense & federal communications
- aviation

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
.770	.800	.385	.400	.370	.400
19.56	20.32	9.78	10.16	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

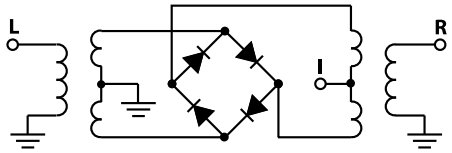
FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
		Mid-Band m			Total Range	L		M		U		L		M		U	
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
5-500	DC-500	6.57	0.09	7.5	8.5	55	45	40	30	30	25	55	45	40	30	30	20

1 dB COMP.: +15 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 +23dBm	LO +23dBm	LO +23dBm	LO +23dBm	LO +23dBm
5.00	35.00	6.52	57.02	82.02	1.29	2.50
10.00	40.00	6.40	56.72	82.32	1.14	2.37
20.00	50.00	6.40	54.48	81.28	1.06	2.33
35.94	65.94	6.43	51.51	75.99	1.05	2.31
50.00	80.00	6.40	48.82	72.57	1.07	2.37
82.35	52.35	6.39	45.62	62.91	1.08	2.20
100.00	70.00	6.36	44.05	58.66	1.10	2.25
144.22	114.22	6.53	41.60	53.71	1.12	2.11
175.16	145.16	6.68	40.04	51.38	1.14	2.25
200.00	170.00	6.69	39.45	50.73	1.16	2.06
221.57	191.57	6.52	36.41	46.45	1.18	2.17
252.50	222.50	6.52	36.33	47.23	1.20	2.04
283.44	253.44	6.64	36.36	47.98	1.22	2.10
314.38	284.38	6.74	36.35	46.73	1.24	1.96
345.32	315.32	6.62	33.85	44.99	1.26	2.04
376.26	346.26	6.50	30.50	41.75	1.29	1.96
407.19	377.19	6.43	32.89	42.28	1.31	1.95
438.13	408.13	6.50	33.81	42.66	1.35	1.90
469.07	439.07	6.81	33.63	41.41	1.38	1.87
500.00	470.00	6.62	34.24	40.42	1.44	1.83

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.
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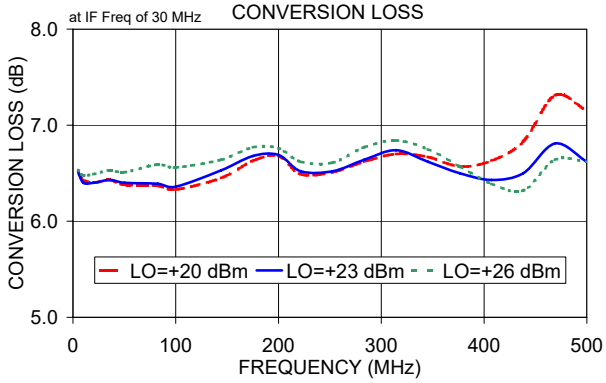
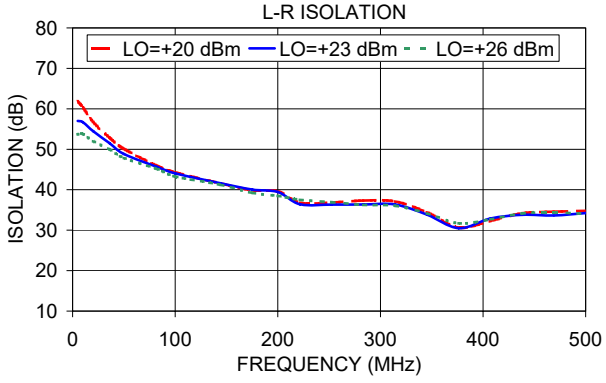
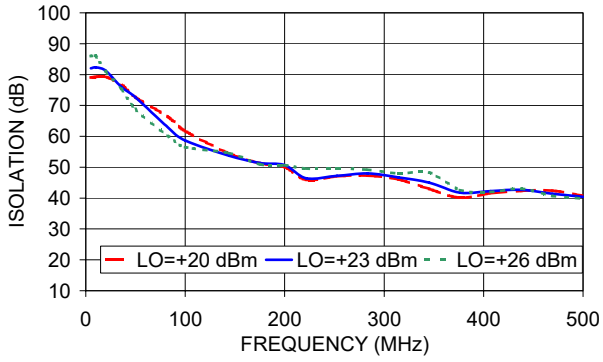
RAY-1+
CONVERSION LOSS
at IF Freq of 30 MHz



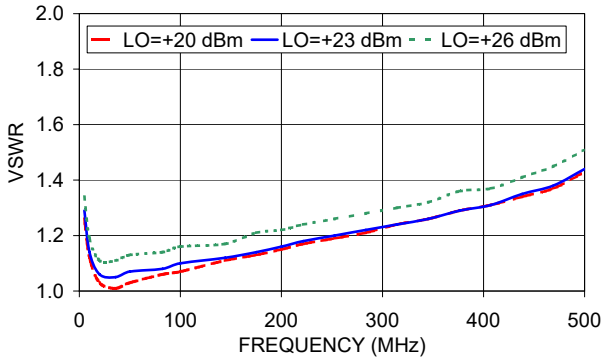
RAY-1+
L-R ISOLATION



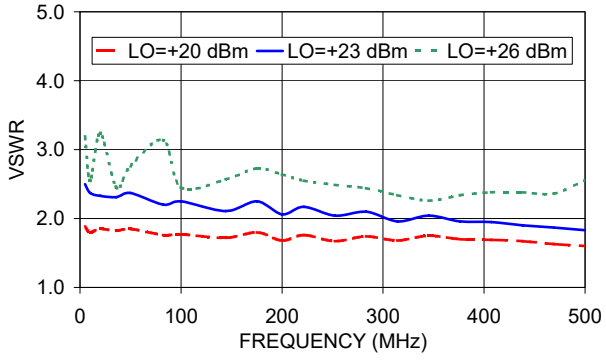
RAY-1+
L-I ISOLATION



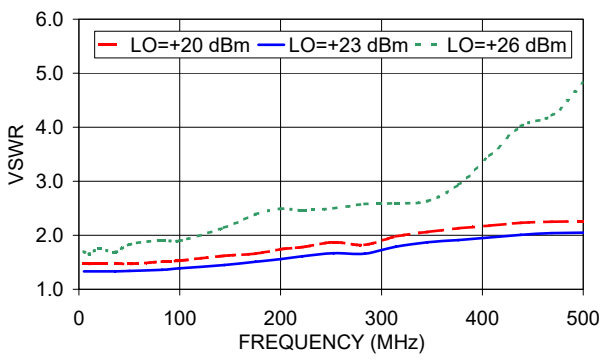
RAY-1+
RF VSWR



RAY-1+
LO VSWR



RAY-1+
IF VSWR



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Frequency Mixer RAY-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+20	+23	+26
5.0	35.0	6.50	6.52	6.53
10.0	40.0	6.60	6.40	6.48
20.1	50.1	5.64	5.52	5.46
30.1	60.1	5.67	5.54	5.48
40.1	70.1	5.69	5.54	5.49
50.1	80.1	5.65	5.53	5.50
60.1	90.1	5.63	5.54	5.51
80.1	110.1	5.66	5.57	5.55
100.1	130.1	5.67	5.60	5.57
120.1	150.1	5.68	5.61	5.58
140.1	170.1	5.70	5.65	5.62
160.1	190.1	5.70	5.64	5.61
180.1	210.1	5.72	5.67	5.64
200.1	230.1	5.76	5.69	5.66
220.1	250.1	5.79	5.72	5.69
240.1	270.1	5.82	5.75	5.71
260.1	290.1	5.89	5.80	5.75
280.1	310.1	5.91	5.84	5.79
300.1	330.1	5.89	5.83	5.80
320.1	350.1	5.92	5.86	5.85
350.1	380.1	6.08	5.96	5.91
380.1	410.1	6.20	6.06	5.94
410.1	440.1	6.37	6.19	6.03
440.1	470.1	6.47	6.22	6.04
470.1	500.1	6.35	6.11	5.96
500.1	530.1	6.39	6.09	5.92
530.1	560.1	6.57	6.24	6.05
560.1	590.1	7.08	6.57	6.34
590.1	620.1	7.39	6.63	6.33
620.1	650.1	7.67	6.94	6.57
650.1	680.1	8.62	7.90	7.30
690.1	720.1	8.44	7.92	7.40
730.1	760.1	8.09	7.77	7.54
810.1	840.1	8.30	8.10	7.90
850.1	880.1	8.40	8.15	7.98
890.1	920.1	8.60	8.30	8.12
930.1	960.1	8.80	8.55	8.40
970.1	1000.1	9.46	9.11	8.86
1010.1	1040.1	10.51	10.05	9.69
1050.1	1080.1	11.85	11.28	10.69

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+20	+23	+26
10.1	40.1	26.95	26.61	34.09
20.1	50.1	25.12	32.82	27.31
30.1	60.1	25.12	32.54	28.50
40.1	70.1	26.50	26.40	29.08
50.1	80.1	27.57	27.39	29.22
60.1	90.1	25.37	27.97	28.90
80.1	110.1	24.28	27.36	28.18
100.1	130.1	25.74	27.06	27.64
120.1	150.1	25.45	26.70	27.38
140.1	170.1	25.78	26.17	26.89
160.1	190.1	24.74	25.40	26.89
180.1	210.1	24.76	25.73	27.23
200.1	230.1	23.31	24.44	26.59
220.1	250.1	24.65	25.20	26.35
240.1	270.1	25.58	26.50	28.60
260.1	290.1	22.63	24.21	26.98
280.1	310.1	22.70	23.36	25.18
300.1	330.1	23.61	24.49	26.84
320.1	350.1	24.32	25.67	28.50
350.1	380.1	21.75	24.36	27.00
380.1	410.1	17.95	20.48	24.38
410.1	440.1	18.27	19.45	22.03
440.1	470.1	20.01	21.93	24.19
470.1	500.1	23.13	26.20	30.13
500.1	530.1	25.56	29.49	39.10
530.1	560.1	26.74	30.04	32.88
560.1	590.1	26.59	35.14	42.27
590.1	620.1	21.16	31.00	32.66
620.1	650.1	20.19	26.34	29.75
650.1	680.1	19.71	21.44	24.54
690.1	720.1	20.04	21.60	29.25
730.1	760.1	24.02	26.76	27.62
770.1	800.1	24.62	29.29	32.32
810.1	840.1	26.39	34.47	33.29
850.1	880.1	25.50	27.81	31.80
890.1	920.1	25.77	26.75	27.85
930.1	960.1	27.51	28.82	30.01
970.1	1000.1	24.81	26.81	29.82
1010.1	1040.1	20.78	23.04	22.24
1050.1	1080.1	17.98	22.47	19.95

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+15dBm (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	0.45	0.30	0.16
20.1	50.1	0.51	0.34	0.19
30.1	60.1	0.55	0.38	0.21
40.1	70.1	0.53	0.35	0.17
50.1	80.1	0.49	0.29	0.12
60.1	90.1	0.42	0.22	0.08
80.1	110.1	0.39	0.19	0.06
100.1	130.1	0.41	0.21	0.08
120.1	150.1	0.41	0.24	0.13
140.1	170.1	0.38	0.24	0.13
160.1	190.1	0.34	0.22	0.12
180.1	210.1	0.28	0.16	0.07
200.1	230.1	0.29	0.19	0.10
220.1	250.1	0.32	0.22	0.15
240.1	270.1	0.35	0.24	0.15
260.1	290.1	0.36	0.26	0.16
280.1	310.1	0.37	0.26	0.14
300.1	330.1	0.51	0.34	0.18
320.1	350.1	0.72	0.48	0.31
350.1	380.1	0.96	0.69	0.44
380.1	410.1	1.08	0.81	0.51
410.1	440.1	1.18	0.93	0.63
440.1	470.1	1.33	1.17	0.91
470.1	500.1	1.22	1.05	0.81
500.1	530.1	1.27	1.08	0.88
530.1	560.1	1.44	1.22	1.01
560.1	590.1	1.29	1.14	0.93
590.1	620.1	0.98	1.11	0.90
620.1	650.1	0.74	0.93	0.77
650.1	680.1	0.43	0.67	0.75
690.1	720.1	0.39	0.56	0.61
730.1	760.1	0.71	0.73	0.54
770.1	800.1	0.68	0.62	0.35
810.1	840.1	0.61	0.51	0.38
850.1	880.1	0.68	0.61	0.51
890.1	920.1	0.59	0.44	0.40
930.1	960.1	0.58	0.33	0.49
970.1	1000.1	0.71	0.33	0.52
1010.1	1040.1	0.96	0.48	0.58
1050.1	1080.1	0.94	0.60	0.51

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB)
		@LO (dBm)
		+23
0.5	249.6	5.80
1.0	249.1	5.72
1.5	248.6	5.71
2.0	248.1	5.70
2.5	247.6	5.70
3.0	247.1	5.69
4.0	246.1	5.69
5.0	245.1	5.70
6.0	244.1	5.70
8.0	242.1	5.69
10.0	240.1	5.69
15.0	235.1	5.71
20.0	230.1	5.70
25.0	225.1	5.70
30.0	220.1	5.71
35.0	215.1	5.72
40.0	210.1	5.70
45.0	205.1	5.72
50.0	200.1	5.74
55.0	195.1	5.75
60.0	190.1	5.74
65.0	185.1	5.74
70.0	180.1	5.75
80.0	170.1	5.75
90.0	160.1	5.76
100.0	150.1	5.77
110.0	140.1	5.78
120.0	130.1	5.77
130.0	120.1	5.75
140.0	110.1	5.76
150.0	100.1	5.77
160.0	90.1	5.77
170.0	80.1	5.76
180.0	70.1	5.75
190.0	60.1	5.76
200.0	50.1	5.77
210.0	40.1	5.82
220.0	30.1	5.86
230.0	20.1	5.89
240.0	10.1	5.93

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+23
0.5	10.6	5.58
0.8	10.9	5.53
1.0	11.1	5.51
2.0	12.1	5.49
3.0	13.1	5.49
4.0	14.1	5.50
5.0	15.1	5.50
6.0	16.1	5.50
8.0	18.1	5.50
10.0	20.1	5.51
15.0	25.1	5.52
20.0	30.1	5.53
25.0	35.1	5.55
30.0	40.1	5.55
35.0	45.1	5.55
40.0	50.1	5.52
45.0	55.1	5.50
50.0	60.1	5.54
70.0	80.1	5.52
90.0	100.1	5.53
110.0	120.1	5.55
130.0	140.1	5.58
150.0	160.1	5.57
170.0	180.1	5.60
190.0	200.1	5.61
210.0	220.1	5.60
230.0	240.1	5.66
250.0	260.1	5.66
270.0	280.1	5.70
290.0	300.1	5.72
310.0	320.1	5.72
330.0	340.1	5.74
350.0	360.1	5.72
370.0	380.1	5.75
390.0	400.1	5.76
410.0	420.1	5.71
430.0	440.1	5.77
450.0	460.1	5.74
470.0	480.1	5.73
490.0	500.1	5.70

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)
		@LO (dBm)
		+23
0.5	499.6	6.18
0.8	499.4	6.11
1.0	499.1	6.09
2.0	498.1	6.10
3.0	497.1	6.10
4.0	496.1	6.11
5.0	495.1	6.12
6.0	494.1	6.13
8.0	492.1	6.14
10.0	490.1	6.17
15.0	485.1	6.24
20.0	480.1	6.30
25.0	475.1	6.34
30.0	470.1	6.38
35.0	465.1	6.45
40.0	460.1	6.50
45.0	455.1	6.54
50.0	450.1	6.55
70.0	430.1	6.52
90.0	410.1	6.43
110.0	390.1	6.35
130.0	370.1	6.27
150.0	350.1	6.32
170.0	330.1	6.38
190.0	310.1	6.50
210.0	290.1	6.44
230.0	270.1	6.46
250.0	250.1	6.28
270.0	230.1	6.48
290.0	210.1	6.50
310.0	190.1	6.50
330.0	170.1	6.54
350.0	150.1	6.53
370.0	130.1	6.52
390.0	110.1	6.49
410.0	90.1	6.47
430.0	70.1	6.46
450.0	50.1	6.44
470.0	30.1	6.52
490.0	10.1	6.54

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+20	+23	+26	+20	+23	+26
5.0	61.85	57.02	53.70	79.05	82.02	86.00
10.0	60.36	56.72	53.82	79.25	82.32	86.00
20.1	77.12	77.40	83.55	66.09	65.11	58.40
30.1	74.00	74.22	80.80	64.92	64.16	58.60
40.1	72.01	72.07	77.47	62.98	63.52	57.90
50.1	70.45	70.64	73.52	61.98	59.85	57.43
60.1	68.79	68.97	71.28	59.17	57.44	56.61
80.1	68.19	68.21	66.55	53.20	55.19	54.72
100.1	67.07	67.10	64.58	51.25	53.50	52.90
120.1	67.22	66.90	63.35	49.41	51.65	51.59
140.1	64.03	63.79	65.62	48.02	50.41	50.91
160.1	63.29	62.98	62.21	47.35	49.27	49.80
180.1	63.35	63.07	60.17	45.58	47.31	47.55
200.1	61.19	61.02	59.61	44.67	45.95	45.44
220.1	65.32	64.97	58.86	43.99	44.71	43.79
240.1	63.07	62.94	59.87	41.67	43.06	43.29
260.1	64.10	63.71	56.72	41.90	42.66	42.35
280.1	78.04	73.63	54.92	39.60	40.51	40.54
300.1	60.08	59.64	56.39	39.81	40.04	38.83
320.1	57.09	56.78	63.96	37.74	37.70	36.68
350.1	54.22	54.18	47.00	35.85	35.62	35.21
380.1	58.13	58.41	51.64	35.15	34.52	34.13
410.1	53.94	54.28	61.42	34.03	33.27	31.50
440.1	50.54	52.13	44.08	32.65	31.90	30.41
470.1	52.89	54.13	43.32	30.71	29.70	29.32
500.1	45.57	47.79	47.95	27.77	26.97	26.65
530.1	44.93	45.56	41.03	25.36	24.34	23.90
560.1	47.31	42.72	40.94	25.18	24.01	24.09
590.1	44.69	42.71	43.58	25.51	23.80	23.26
620.1	41.70	37.43	37.50	24.24	21.79	20.91
650.1	44.77	37.30	37.51	23.07	20.26	19.24
690.1	43.92	37.72	38.76	24.11	21.93	20.87
730.1	39.42	33.93	31.55	20.43	18.30	17.81
810.1	35.55	31.20	29.24	17.16	15.58	16.02
850.1	32.71	28.09	26.93	13.34	12.22	13.04
890.1	32.87	28.57	28.24	13.87	12.89	14.14
930.1	31.94	27.43	25.86	13.58	12.66	13.92
970.1	29.40	25.38	24.12	11.23	10.24	11.65
1010.1	30.04	26.98	24.97	13.33	12.27	13.68
1050.1	27.79	25.26	23.14	11.85	10.84	12.30

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	34.65	32.88	30.61
20.1	50.1	33.51	31.73	29.00
30.1	60.1	33.26	31.59	29.32
40.1	70.1	32.87	31.67	31.04
50.1	80.1	32.32	31.70	31.73
60.1	90.1	31.77	31.29	31.62
80.1	110.1	30.87	30.44	30.58
100.1	130.1	29.93	29.53	29.16
120.1	150.1	28.92	28.47	27.01
140.1	170.1	28.61	28.61	28.05
160.1	190.1	28.51	28.61	28.82
180.1	210.1	28.35	28.53	28.82
200.1	230.1	28.20	28.32	28.36
220.1	250.1	28.11	28.14	27.64
240.1	270.1	28.62	28.72	28.57
260.1	290.1	28.50	28.78	29.14
280.1	310.1	29.11	29.45	29.88
300.1	330.1	29.37	30.08	30.72
320.1	350.1	29.72	30.60	31.20
350.1	380.1	28.71	29.85	30.78
380.1	410.1	27.71	28.78	29.07
410.1	440.1	25.98	26.86	28.32
440.1	470.1	24.83	25.12	25.88
470.1	500.1	24.61	24.79	24.76
500.1	530.1	23.76	24.05	24.45
530.1	560.1	23.44	23.86	24.85
560.1	590.1	24.00	24.00	23.97
590.1	620.1	24.46	24.33	24.08
620.1	650.1	24.65	25.22	25.24
650.1	680.1	24.15	23.87	23.28
690.1	720.1	23.45	23.39	23.05
730.1	760.1	23.08	22.33	21.62
770.1	800.1	22.75	22.16	21.51
810.1	840.1	22.21	21.94	21.70
850.1	880.1	21.40	21.00	20.55
890.1	920.1	20.84	20.49	20.17
930.1	960.1	19.94	19.47	19.01
970.1	1000.1	19.53	19.31	19.08
1010.1	1040.1	17.84	17.61	17.13
1050.1	1080.1	17.43	17.54	17.49

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+20	+23	+26
5.0	35.0	1.26	1.29	1.34
10.0	40.0	1.12	1.14	1.19
20.1	50.1	1.16	1.07	1.02
30.1	60.1	1.16	1.07	1.01
40.1	70.1	1.16	1.05	1.01
50.1	80.1	1.11	1.04	1.02
60.1	90.1	1.09	1.04	1.04
80.1	110.1	1.10	1.05	1.05
100.1	130.1	1.09	1.06	1.06
120.1	150.1	1.10	1.07	1.07
140.1	170.1	1.10	1.08	1.08
160.1	190.1	1.09	1.08	1.09
180.1	210.1	1.09	1.08	1.09
200.1	230.1	1.09	1.08	1.09
220.1	250.1	1.09	1.08	1.09
240.1	270.1	1.09	1.08	1.10
260.1	290.1	1.08	1.08	1.09
280.1	310.1	1.06	1.06	1.08
300.1	330.1	1.05	1.07	1.09
320.1	350.1	1.04	1.06	1.08
350.1	380.1	1.03	1.00	1.02
380.1	410.1	1.09	1.06	1.04
410.1	440.1	1.18	1.15	1.12
440.1	470.1	1.26	1.23	1.21
470.1	500.1	1.33	1.30	1.28
500.1	530.1	1.48	1.44	1.40
530.1	560.1	1.51	1.47	1.44
560.1	590.1	1.76	1.70	1.66
590.1	620.1	1.80	1.72	1.69
620.1	650.1	2.01	1.93	1.89
650.1	680.1	2.24	2.15	2.10
690.1	720.1	2.31	2.28	2.22
730.1	760.1	2.62	2.61	2.57
810.1	840.1	3.67	3.59	3.51
850.1	880.1	4.07	3.95	3.89
890.1	920.1	4.87	4.69	4.54
930.1	960.1	5.95	5.70	5.56
970.1	1000.1	7.60	7.34	7.14
1010.1	1040.1	8.27	8.05	7.87
1050.1	1080.1	10.02	9.79	9.90

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+20	+23	+26
5.0	1.88	2.50	3.19
10.0	1.80	2.37	2.55
20.1	1.49	2.09	2.67
30.1	1.43	1.91	2.21
40.1	1.41	1.84	2.08
50.1	1.41	1.87	2.16
60.1	1.48	2.01	2.40
80.1	1.59	2.38	3.34
100.1	1.54	2.27	3.13
120.1	1.43	1.90	2.16
140.1	1.42	1.85	2.15
160.1	1.54	2.15	2.77
180.1	1.62	2.39	3.38
200.1	1.52	2.10	2.52
220.1	1.46	1.89	2.13
240.1	1.53	2.01	2.36
260.1	1.70	2.42	3.37
280.1	1.70	2.40	3.06
300.1	1.60	2.08	2.32
320.1	1.57	2.00	2.31
350.1	1.80	2.51	3.42
380.1	1.78	2.35	2.71
410.1	1.70	2.13	2.46
440.1	1.94	2.61	3.42
470.1	1.92	2.48	2.88
500.1	1.82	2.27	2.63
530.1	2.02	2.63	3.34
560.1	2.10	2.67	3.09
590.1	2.02	2.49	2.84
620.1	2.21	2.75	3.29
650.1	2.36	2.94	3.37
690.1	2.28	2.75	3.08
730.1	2.48	3.04	3.53
810.1	2.42	2.86	3.25
850.1	2.82	3.47	4.01
890.1	2.33	2.69	2.97
930.1	2.95	3.56	4.01
970.1	2.47	2.81	3.01
1010.1	2.92	3.33	3.55
1050.1	2.89	3.31	3.67

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1) @LO (dBm)		
	+20	+23	+26
0.5	1.32	1.31	1.33
0.8	1.22	1.13	1.11
1.0	1.29	1.16	1.09
2.0	1.39	1.25	1.16
3.0	1.38	1.24	1.15
4.0	1.36	1.22	1.13
5.0	1.34	1.20	1.12
6.0	1.32	1.19	1.11
8.0	1.31	1.17	1.09
10.0	1.30	1.17	1.09
15.0	1.30	1.17	1.09
20.0	1.31	1.17	1.09
25.0	1.31	1.18	1.09
30.0	1.32	1.18	1.10
35.0	1.33	1.19	1.10
40.0	1.33	1.19	1.11
45.0	1.34	1.20	1.12
50.0	1.35	1.20	1.12
70.0	1.37	1.23	1.15
90.0	1.38	1.24	1.17
110.0	1.40	1.27	1.19
130.0	1.43	1.29	1.22
150.0	1.45	1.31	1.24
170.0	1.48	1.34	1.27
190.0	1.50	1.36	1.29
210.0	1.52	1.38	1.30
230.0	1.55	1.40	1.32
250.0	1.57	1.42	1.33
270.0	1.60	1.44	1.35
290.0	1.61	1.45	1.36
310.0	1.62	1.46	1.36
330.0	1.64	1.47	1.36
350.0	1.66	1.48	1.37
370.0	1.66	1.48	1.37
390.0	1.66	1.48	1.36
410.0	1.66	1.48	1.36
430.0	1.66	1.47	1.35
450.0	1.67	1.48	1.35
470.0	1.67	1.48	1.35
490.0	1.65	1.46	1.33

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	12	27	14	30	17	38	25	32	25	38
1	-	27	+0	32	11	36	23	41	29	47	41	47
2	98	70	49	66	49	66	51	66	62	74	62	74
3	109	76	60	79	60	82	60	78	68	86	69	85
4	>123	95	87	98	85	95	85	94	86	100	94	103
5	>122	112	99	103	95	102	94	103	94	103	103	111
6	>124	>123	115	>118	105	116	105	114	104	113	108	120
7	>123	>124	>122	>124	>121	118	>122	>121	>122	>120	>123	>123
8	>123	>122	>122	>125	>122	>123	117	>122	119	>122	118	>124
9	>123	>121	>123	>123	>124	>122	>123	>123	>120	>123	>121	>122
10	>123	>122	>121	>123	>124	>123	>123	>123	>122	>122	>122	>121
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; .02.00 dBm.**
LO IN: 280.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -5.65 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	21	36	26	41	28	50	37	43	37	50
1	-	27	+0	32	11	37	24	43	30	48	40	51
2	85	68	43	66	43	64	44	59	56	65	53	60
3	98	59	48	66	46	67	45	60	54	63	62	72
4	118	81	63	85	62	77	61	73	63	80	74	82
5	>122	75	66	72	61	73	59	72	57	70	62	73
6	>123	88	84	82	86	80	77	82	74	90	76	91
7	>124	91	83	88	74	99	74	100	77	103	86	98
8	123	115	93	106	91	94	84	89	87	89	90	91
9	>124	108	101	106	95	114	84	97	81	95	81	98
10	123	108	109	111	109	110	104	105	95	112	94	106
RF CAL		0	1	2	3	4	5	6	7	8	9	10

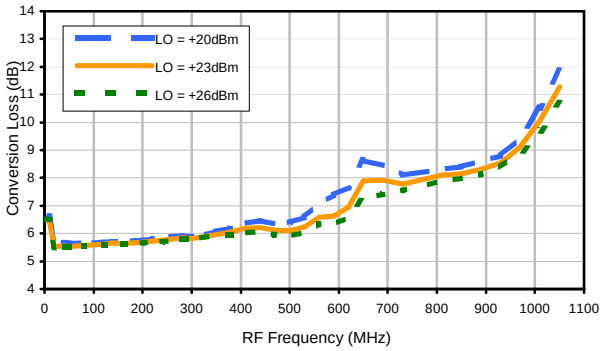
LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; 10.00 dBm.**
LO IN: 280.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 4.37 dBm

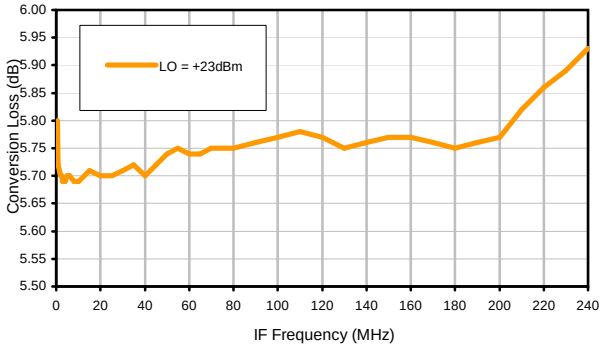
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

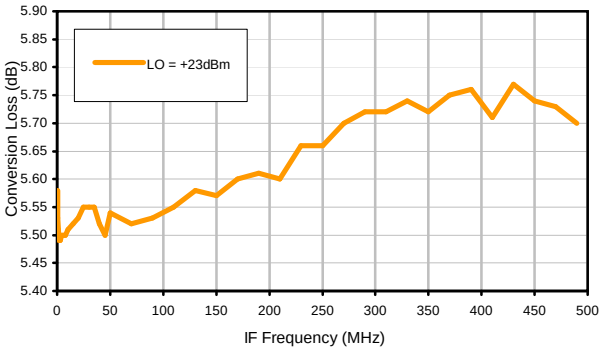
Conversion Loss @ IF=30MHz



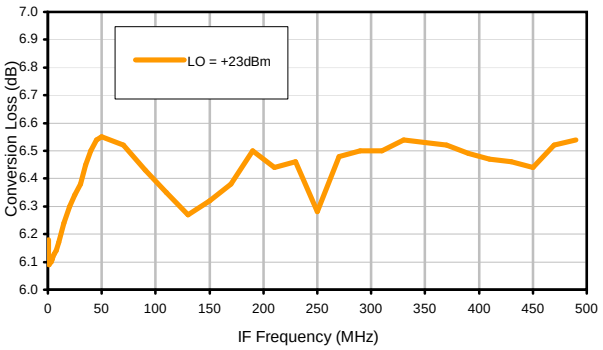
Conversion Loss vs. IF @ RF=250.1MHz



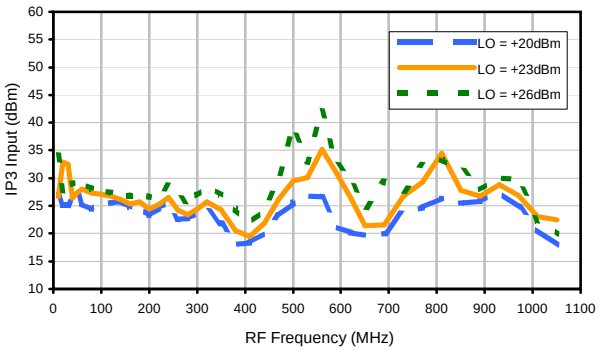
Conversion Loss vs. IF @ RF=10.1MHz



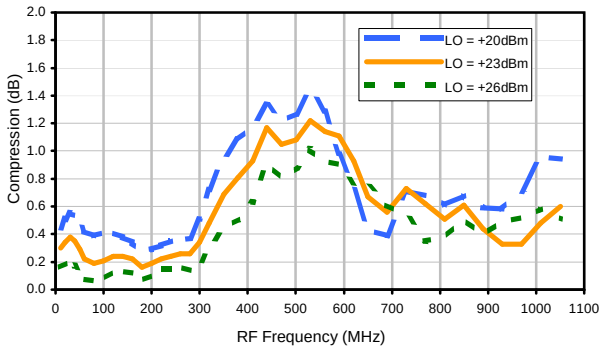
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input

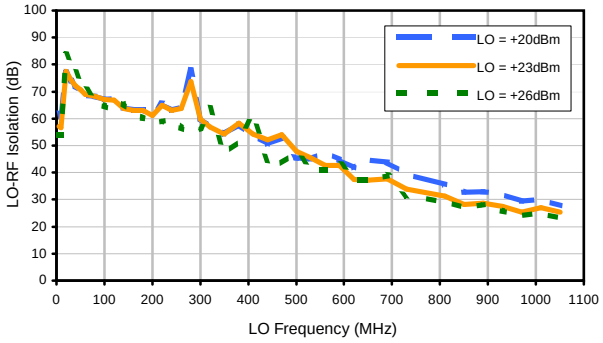


Compression @ RF IN=+15dBm

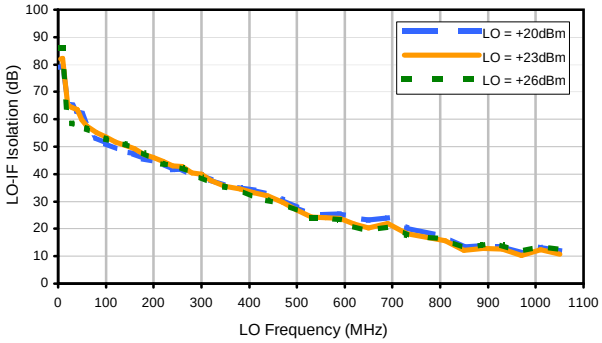


Typical Performance Curves

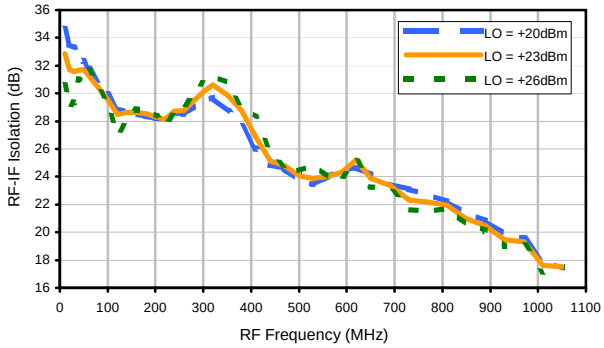
LO-RF Isolation



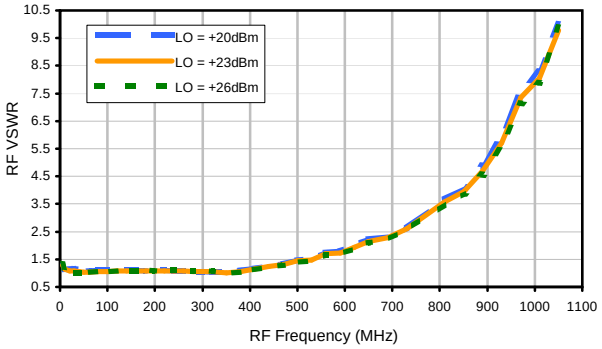
LO-IF Isolation



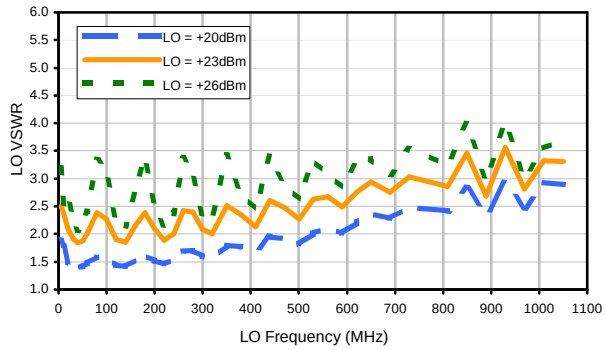
RF-IF Isolation



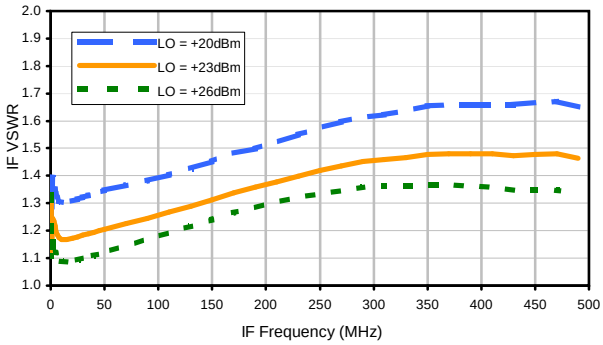
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	12	27	14	30	17	38	25	32	25	38
1	-	27	+0	32	11	36	23	41	29	47	41	47
2	98	70	49	66	49	66	51	66	62	74	62	74
3	109	76	60	79	60	82	60	78	68	86	69	85
4	>123	95	87	98	85	95	85	94	86	100	94	103
5	>122	112	99	103	95	102	94	103	94	103	103	111
6	>124	>123	115	>118	105	116	105	114	104	113	108	120
7	>123	>124	>122	>124	>121	118	>122	>121	>122	>120	>123	>123
8	>123	>122	>122	>125	>122	>123	117	>122	119	>122	118	>124
9	>123	>121	>123	>123	>124	>122	>123	>123	>120	>123	>121	>122
10	>123	>122	>121	>123	>124	>123	>123	>123	>122	>122	>122	>121
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; .02.00 dBm.
LO IN: 280.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -5.65 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	21	36	26	41	28	50	37	43	37	50
1	-	27	+0	32	11	37	24	43	30	48	40	51
2	85	68	43	66	43	64	44	59	56	65	53	60
3	98	59	48	66	46	67	45	60	54	63	62	72
4	118	81	63	85	62	77	61	73	63	80	74	82
5	>122	75	66	72	61	73	59	72	57	70	62	73
6	>123	88	84	82	86	80	77	82	74	90	76	91
7	>124	91	83	88	74	99	74	100	77	103	86	98
8	123	115	93	106	91	94	84	89	87	89	90	91
9	>124	108	101	106	95	114	84	97	81	95	81	98
10	123	108	109	111	109	110	104	105	95	112	94	106
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

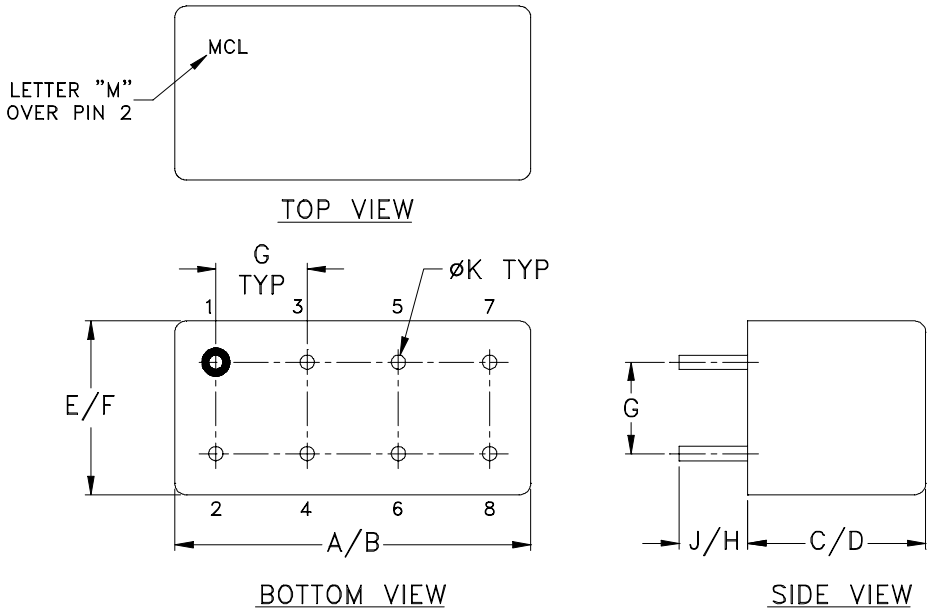
Test conditions: RF IN: 250.1 MHz; 10.00 dBm.
LO IN: 280.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 4.37 dBm

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 ENV01

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
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D