

Frequency Mixer

Level 23 (LO Power +23 dBm) 0.07 to 200 MHz

RAY-3+



Generic photo used for illustration purposes only

CASE STYLE: A01

Maximum Ratings

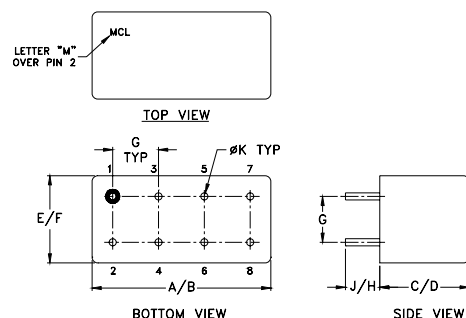
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	350mW
IF Current	40mA
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

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

^pins must be connected together externally

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	

Features

- excellent conversion loss, 5.53 dB typ.
- high isolation 40 dB typ. L-R & L-I
- rugged welded construction
- hermetically sealed

Applications

- VHF
- defense & federal communications
- aviation & maritime communications

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF	IF	Mid-Band m		Total Range Max.		L	M	U				L	M	U			
f_L - f_U		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
0.07-200	DC-200	5.53	0.08	7.5	8.0	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 $f_U/2$]

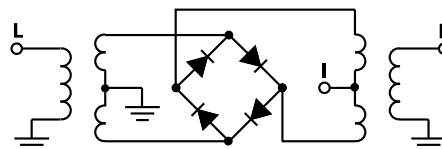
U = upper range [$f_U/2$ to f_U]

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
0.07	30.07	5.77	55.55	56.68	1.17	2.42
0.20	30.20	5.58	53.15	57.09	1.18	2.40
1.00	31.00	5.29	52.74	57.07	1.18	2.23
5.00	35.00	5.23	52.57	56.88	1.17	2.21
20.00	50.00	5.27	52.28	56.59	1.17	2.19
34.54	64.54	5.24	51.27	54.69	1.16	2.20
48.33	78.33	5.26	48.91	51.06	1.15	2.20
62.12	92.12	5.28	46.28	47.85	1.15	2.27
69.01	99.01	5.29	44.38	45.65	1.14	2.27
82.80	52.80	5.28	42.67	43.88	1.13	2.28
96.59	66.59	5.28	41.29	41.90	1.13	2.25
103.48	73.48	5.25	39.95	40.89	1.13	2.14
117.27	87.27	5.28	39.22	39.90	1.12	2.10
131.06	101.06	5.29	39.37	39.78	1.12	2.17
144.85	114.85	5.34	38.04	37.10	1.12	2.25
158.63	128.63	5.43	36.70	33.79	1.12	2.29
165.53	135.53	5.47	36.49	31.41	1.13	2.22
179.32	149.32	5.47	36.22	30.50	1.14	2.16
193.10	163.10	5.54	36.47	29.43	1.16	2.18
200.00	170.00	5.51	36.43	29.00	1.16	2.21

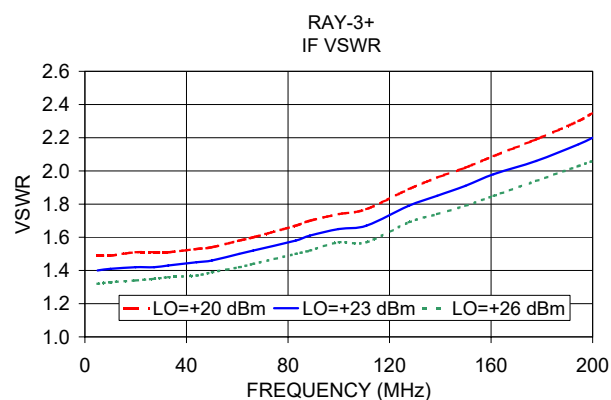
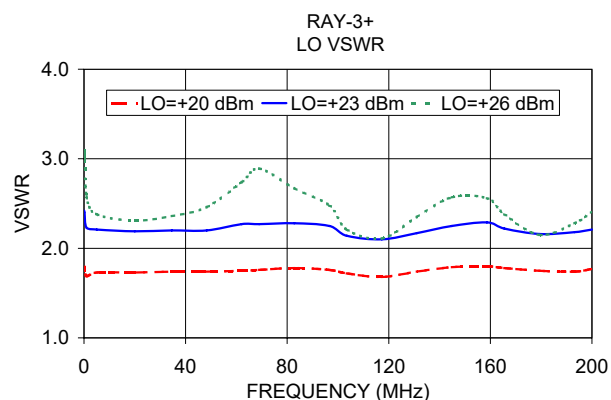
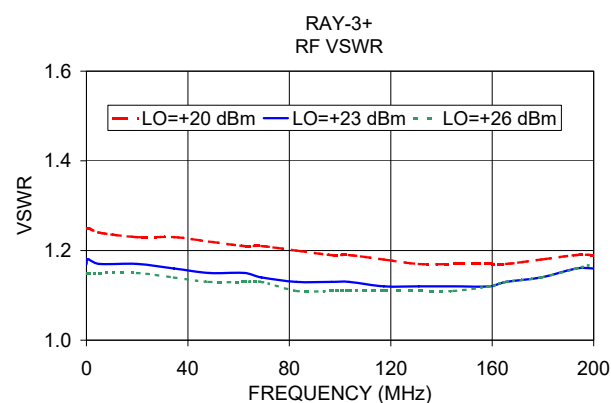
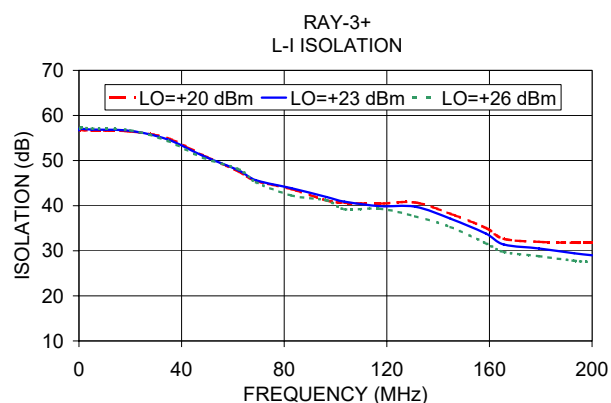
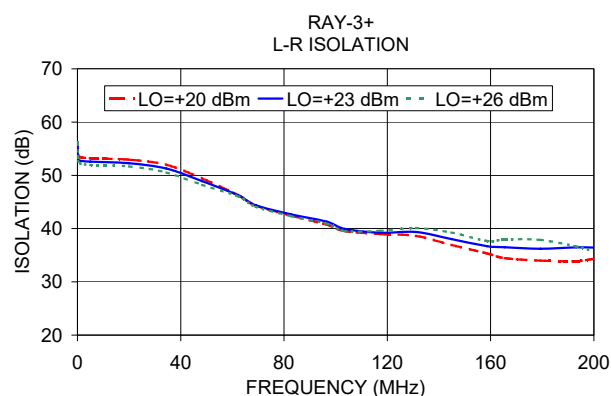
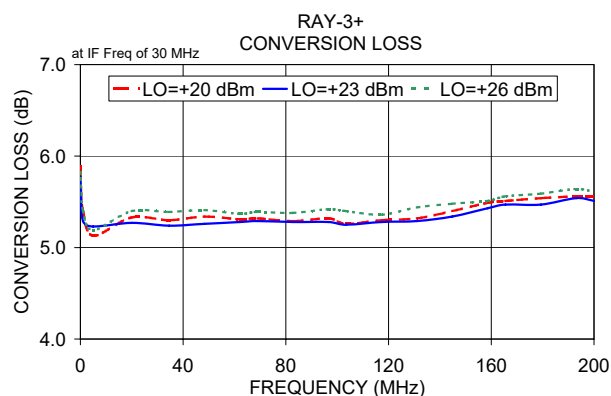
Electrical Schematic



Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Frequency Mixer

RAY-3+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+15dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
+20	+23	+26	+20	+23	+26	+20	+23	+26	+20	+23	+26			
0.1	30.1	5.89	5.77	5.83	10.1	40.1	33.36	32.21	33.61	10.1	40.1	1.07	1.12	0.90
0.2	30.2	5.65	5.58	5.67	22.7	52.7	29.70	31.63	34.32	22.7	52.7	1.14	1.35	1.14
1.0	31.0	5.40	5.29	5.40	35.2	65.2	29.29	36.54	29.99	35.2	65.2	1.16	1.00	0.76
5.0	35.0	5.13	5.23	5.19	47.8	77.8	29.67	32.76	28.74	47.8	77.8	1.18	0.90	0.68
10.1	40.1	4.93	4.83	4.78	60.4	90.4	42.35	28.51	27.12	60.4	90.4	1.16	0.83	0.62
22.7	52.7	4.88	4.82	4.79	72.9	102.9	31.18	26.91	26.63	72.9	102.9	1.09	0.71	0.55
35.2	65.2	4.91	4.84	4.81	85.5	115.5	30.70	27.29	26.54	85.5	115.5	1.12	0.56	0.39
47.8	77.8	4.91	4.85	4.82	98.0	128.0	27.17	25.18	25.05	98.0	128.0	1.06	0.54	0.40
60.4	90.4	4.89	4.84	4.82	110.6	140.6	24.02	23.15	23.48	110.6	140.6	0.94	0.58	0.47
72.9	102.9	4.91	4.85	4.82	123.2	153.2	24.33	23.68	24.23	123.2	153.2	0.91	0.44	0.33
85.5	115.5	4.93	4.89	4.86	135.7	165.7	24.76	23.92	25.09	135.7	165.7	0.91	0.44	0.33
98.0	128.0	4.98	4.92	4.91	148.3	178.3	24.69	24.55	25.70	148.3	178.3	0.91	0.36	0.25
110.6	140.6	4.94	4.89	4.88	160.9	190.9	22.91	22.59	23.58	160.9	190.9	0.95	0.36	0.26
123.2	153.2	4.97	4.93	4.93	173.4	203.4	24.45	23.07	23.41	173.4	203.4	1.07	0.43	0.30
148.3	178.3	5.10	4.99	4.95	186.0	216.0	23.14	21.99	24.33	186.0	216.0	1.22	0.47	0.28
160.9	190.9	5.20	5.10	5.02	198.6	228.6	21.29	22.63	25.47	198.6	228.6	1.41	0.49	0.29
173.4	203.4	5.22	5.16	5.15	211.1	241.1	21.41	23.08	24.93	211.1	241.1	1.54	0.69	0.54
186.0	216.0	5.29	5.25	5.27	223.7	253.7	21.47	22.91	23.57	223.7	253.7	1.70	0.85	0.66
198.6	228.6	5.34	5.36	5.43	236.3	266.3	20.72	22.21	23.43	236.3	266.3	1.77	0.91	0.66
211.1	241.1	5.48	5.47	5.49	248.8	278.8	18.81	22.36	25.06	248.8	278.8	1.81	1.04	0.73
223.7	253.7	5.58	5.53	5.52	261.4	291.4	15.59	20.29	25.49	261.4	291.4	1.81	1.20	0.85
248.8	278.8	5.84	5.62	5.56	273.9	303.9	14.71	17.61	22.45	273.9	303.9	1.82	1.27	0.95
261.4	291.4	6.12	5.72	5.51	286.5	316.5	15.44	17.06	20.64	286.5	316.5	1.78	1.35	1.03
273.9	303.9	6.28	5.88	5.62	299.1	329.1	15.59	16.52	18.41	299.1	329.1	1.68	1.43	1.12
286.5	316.5	6.29	5.99	5.84	311.6	341.6	16.56	17.63	18.73	311.6	341.6	1.56	1.48	1.24
299.1	329.1	6.43	6.22	6.14	324.2	354.2	17.15	18.76	20.00	324.2	354.2	1.47	1.34	1.22
311.6	341.6	6.69	6.41	6.30	336.8	366.8	17.44	19.50	22.64	336.8	366.8	1.47	1.27	1.27
324.2	354.2	6.80	6.56	6.41	349.3	379.3	18.35	21.73	27.23	349.3	379.3	1.63	1.35	1.45
349.3	379.3	6.71	6.55	6.34	361.9	391.9	20.12	26.80	26.68	361.9	391.9	1.73	1.29	1.47
361.9	391.9	6.84	6.67	6.49	374.5	404.5	22.88	28.16	23.90	374.5	404.5	1.81	1.21	1.39
374.5	404.5	7.09	6.99	6.92	387.0	417.0	25.65	25.45	22.42	387.0	417.0	1.82	1.15	1.36
387.0	417.0	7.21	7.20	7.26	399.6	429.6	24.49	23.63	22.80	399.6	429.6	1.74	1.20	1.34
399.6	429.6	7.32	7.36	7.53	412.2	442.2	23.89	24.11	24.48	412.2	442.2	1.68	1.13	1.17
412.2	442.2	7.64	7.71	7.94	424.7	454.7	22.87	23.83	24.26	424.7	454.7	1.71	0.85	0.85
424.7	454.7	8.16	8.27	8.53	437.3	467.3	21.52	22.66	23.96	437.3	467.3	1.73	0.59	0.64
437.3	467.3	8.48	8.66	8.88	449.8	479.8	21.20	22.19	23.96	449.8	479.8	1.71	0.49	0.57
449.8	479.8	8.71	8.90	9.11	462.4	492.4	20.32	21.42	22.68	462.4	492.4	1.65	0.49	0.60
475.0	505.0	9.73	9.84	10.02	475.0	505.0	20.47	21.63	22.79	475.0	505.0	1.58	0.53	0.71
487.5	517.5	10.24	10.31	10.45	487.5	517.5	20.22	21.24	22.40	487.5	517.5	1.50	0.53	0.80
500.1	530.1	10.57	10.57	10.64	500.1	530.1	21.20	21.05	21.79	500.1	530.1	1.37	0.62	1.03

REV. X2

RAY-3+

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=100.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=200.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+23			+23			+23
0.5	99.6	4.89	0.5	10.6	4.80	0.5	199.6	5.28
0.6	99.5	4.88	0.6	10.7	4.78	0.6	199.5	5.26
0.7	99.4	4.86	0.7	10.8	4.76	0.7	199.4	5.25
0.7	99.4	4.85	0.8	10.9	4.74	0.8	199.3	5.23
0.9	99.2	4.83	0.9	11.0	4.74	0.9	199.2	5.22
1.0	99.1	4.83	1.1	11.2	4.72	1.1	199.0	5.21
1.1	99.0	4.82	1.2	11.3	4.72	1.2	198.9	5.21
1.3	98.8	4.82	1.5	11.6	4.72	1.5	198.6	5.21
1.5	98.6	4.82	1.7	11.8	4.72	1.7	198.4	5.21
1.7	98.4	4.82	2.0	12.1	4.71	2.0	198.1	5.20
1.9	98.2	4.81	2.3	12.4	4.71	2.3	197.8	5.20
2.2	97.9	4.81	2.7	12.8	4.70	2.7	197.4	5.19
2.5	97.6	4.80	3.1	13.2	4.72	3.1	197.0	5.20
2.8	97.3	4.80	3.6	13.7	4.72	3.6	196.5	5.20
3.2	96.9	4.80	4.2	14.3	4.73	4.2	195.9	5.20
3.7	96.4	4.79	4.9	15.0	4.72	4.9	195.2	5.20
4.2	95.9	4.79	5.7	15.8	4.72	5.7	194.4	5.20
4.8	95.3	4.80	6.7	16.8	4.72	6.7	193.4	5.21
5.5	94.6	4.80	7.8	17.9	4.73	7.8	192.3	5.21
6.3	93.8	4.81	9.0	19.1	4.73	9.0	191.1	5.21
7.2	92.9	4.82	10.5	20.6	4.74	10.5	189.6	5.23
8.2	91.9	4.80	12.2	22.3	4.74	12.2	187.9	5.24
9.4	90.7	4.81	14.3	24.4	4.74	14.3	185.8	5.28
10.7	89.4	4.80	16.6	26.7	4.76	16.6	183.5	5.26
12.2	87.9	4.80	19.3	29.4	4.76	19.3	180.8	5.26
14.0	86.1	4.80	22.5	32.6	4.77	22.5	177.6	5.24
15.9	84.2	4.80	26.2	36.3	4.78	26.2	173.9	5.24
18.2	81.9	4.82	30.5	40.6	4.80	30.5	169.6	5.26
20.8	79.3	4.82	35.6	45.7	4.80	35.6	164.5	5.28
23.8	76.3	4.83	41.4	51.5	4.80	41.4	158.7	5.30
27.2	72.9	4.84	48.2	58.3	4.84	48.2	151.9	5.30
31.0	69.1	4.86	56.2	66.3	4.86	56.2	143.9	5.25
35.4	64.7	4.86	65.4	75.5	4.87	65.4	134.7	5.26
40.5	59.6	4.88	76.2	86.3	4.90	76.2	123.9	5.25
46.2	53.9	4.87	88.7	98.8	4.93	88.7	111.4	5.30
52.8	47.3	4.87	103.3	113.4	5.01	103.3	96.8	5.34
60.4	39.7	4.91	120.3	130.4	5.13	120.3	79.8	5.40
69.0	31.1	4.93	140.1	150.2	5.08	140.1	60.0	5.43
78.8	21.3	4.97	163.2	173.3	5.20	163.2	36.9	5.54
90.0	10.1	5.05	190.0	200.1	5.55	190.0	10.1	5.78

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+20	+23	+26	+20	+23	+26
0.1	55.50	55.55	56.16	56.70	56.68	56.98
0.2	53.87	53.15	52.66	56.88	57.09	57.21
1.0	53.43	52.74	52.25	56.80	57.07	57.32
5.0	53.20	52.57	51.95	56.66	56.88	57.11
10.1	75.42	75.64	81.10	67.26	65.43	64.69
22.7	69.15	69.18	75.05	62.79	61.36	61.68
35.2	65.33	65.21	71.10	57.84	58.40	59.83
47.8	62.72	62.82	70.06	55.63	57.58	58.92
60.4	61.26	61.49	66.50	52.68	54.62	55.97
72.9	59.11	59.22	66.18	51.78	53.19	53.87
85.5	59.46	59.62	65.69	50.52	51.66	51.81
98.0	58.97	59.08	66.90	47.56	48.48	49.05
110.6	54.81	54.83	58.90	48.64	49.24	48.69
123.2	55.36	55.36	57.68	46.35	47.42	46.99
148.3	53.82	53.91	50.53	45.12	45.75	45.42
160.9	51.89	51.85	48.72	44.37	44.83	42.59
173.4	46.67	46.68	52.43	43.92	43.59	41.61
186.0	46.43	46.49	55.18	41.42	40.47	38.73
198.6	46.24	46.25	50.99	39.29	38.35	36.89
211.1	44.71	44.77	45.37	39.41	37.09	34.69
223.7	45.23	45.30	40.51	38.85	35.37	33.60
248.8	47.98	48.04	37.10	36.67	33.22	32.29
261.4	55.75	55.72	49.35	36.90	32.86	31.29
273.9	53.31	53.33	41.90	36.32	31.63	29.49
286.5	50.56	50.66	40.45	35.77	30.65	27.85
299.1	44.67	44.80	39.40	32.37	29.02	26.31
311.6	42.11	42.15	37.71	31.57	28.11	24.70
324.2	42.11	42.11	37.71	31.62	28.22	25.13
349.3	46.49	46.52	37.65	31.10	26.00	23.12
361.9	40.60	40.63	31.88	29.00	23.62	20.67
374.5	35.40	35.43	28.06	25.08	20.59	17.95
387.0	31.56	31.58	25.69	21.61	17.93	15.87
399.6	28.93	28.96	24.05	19.25	16.25	14.45
412.2	27.67	27.70	23.35	18.28	15.55	13.83
424.7	27.70	27.74	24.47	18.65	15.97	14.50
437.3	27.52	27.55	24.76	19.10	16.43	14.96
449.8	26.52	26.53	23.48	18.93	16.33	14.75
475.0	22.83	22.85	19.69	16.27	14.24	12.77
487.5	20.69	20.71	18.13	14.61	12.85	11.61
500.1	19.29	19.31	17.16	13.53	11.98	10.84

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+20	+23	+26
10.1	40.1	35.61	33.91	30.85
22.7	52.7	30.62	29.88	27.84
35.2	65.2	28.69	28.46	28.17
47.8	77.8	26.96	27.05	27.20
60.4	90.4	25.61	25.75	26.23
72.9	102.9	25.02	25.19	25.59
85.5	115.5	25.43	25.58	25.78
98.0	128.0	25.17	25.70	26.09
110.6	140.6	24.61	25.08	25.08
123.2	153.2	24.89	25.58	26.15
135.7	165.7	25.22	25.93	26.80
148.3	178.3	25.45	26.11	26.80
160.9	190.9	25.67	26.23	26.81
173.4	203.4	24.59	25.37	26.38
186.0	216.0	22.52	23.05	23.55
198.6	228.6	20.21	20.49	21.22
211.1	241.1	18.63	18.82	19.79
223.7	253.7	17.25	17.36	17.52
236.3	266.3	16.50	16.63	16.58
248.8	278.8	15.93	16.10	16.17
261.4	291.4	15.61	15.90	16.18
273.9	303.9	15.79	16.24	16.58
286.5	316.5	15.49	16.15	17.05
299.1	329.1	14.92	15.33	16.06
311.6	341.6	15.05	15.26	15.40
324.2	354.2	15.23	15.37	15.27
336.8	366.8	14.76	14.84	14.57
349.3	379.3	14.31	14.14	13.85
361.9	391.9	13.64	13.23	12.94
374.5	404.5	12.55	12.09	11.73
387.0	417.0	11.43	11.00	10.58
399.6	429.6	10.61	10.13	9.36
412.2	442.2	9.93	9.39	8.72
424.7	454.7	9.08	8.62	8.19
437.3	467.3	8.39	7.98	7.66
449.8	479.8	7.74	7.45	7.18
462.4	492.4	7.15	6.98	6.80
475.0	505.0	6.67	6.59	6.51
487.5	517.5	6.33	6.28	6.26
500.1	530.1	6.28	6.19	6.17

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Frequency Mixer

RAY-3+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=200.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+20	+23	+26		+20	+23	+26		+20	+23	+26
5.0	35.0	1.25	1.17	1.15	35.0	1.79	2.42	3.01	0.5	1.49	1.41	1.33
10.0	40.0	1.25	1.18	1.15	40.0	1.79	2.40	3.09	0.6	1.47	1.37	1.27
22.7	52.7	1.22	1.15	1.10	22.7	1.59	2.14	2.55	0.7	1.48	1.38	1.25
35.2	65.2	1.22	1.15	1.09	35.2	1.47	1.85	2.09	0.8	1.51	1.40	1.26
47.8	77.8	1.18	1.11	1.07	47.8	1.45	1.84	2.10	0.9	1.59	1.46	1.30
60.4	90.4	1.15	1.08	1.04	60.4	1.59	2.11	2.50	1.1	1.65	1.50	1.34
72.9	102.9	1.14	1.07	1.02	72.9	1.80	2.63	3.36	1.3	1.70	1.55	1.38
85.5	115.5	1.09	1.04	1.03	85.5	1.94	2.99	4.09	1.5	1.73	1.58	1.40
98.0	128.0	1.08	1.03	1.05	98.0	1.88	2.78	3.68	1.7	1.76	1.60	1.42
110.6	140.6	1.09	1.06	1.08	110.6	1.72	2.33	2.81	2.0	1.77	1.62	1.43
123.2	153.2	1.09	1.07	1.09	123.2	1.60	2.04	2.30	2.3	1.77	1.61	1.43
135.7	165.7	1.09	1.11	1.14	135.7	1.58	1.98	2.25	2.7	1.76	1.60	1.43
148.3	178.3	1.07	1.12	1.18	148.3	1.70	2.18	2.52	3.2	1.74	1.59	1.41
160.9	190.9	1.08	1.14	1.21	160.9	1.96	2.70	3.28	3.7	1.72	1.57	1.40
173.4	203.4	1.14	1.20	1.26	173.4	2.20	3.19	4.28	4.3	1.70	1.56	1.38
186.0	216.0	1.21	1.29	1.33	186.0	2.19	3.11	4.04	5.0	1.69	1.55	1.37
198.6	228.6	1.29	1.36	1.39	198.6	2.04	2.73	3.26	5.8	1.68	1.52	1.36
211.1	241.1	1.37	1.41	1.43	211.1	1.90	2.43	2.77	6.8	1.66	1.51	1.35
223.7	253.7	1.38	1.40	1.39	223.7	1.84	2.32	2.65	7.9	1.65	1.51	1.35
236.3	266.3	1.34	1.35	1.33	236.3	1.91	2.42	2.78	9.3	1.65	1.51	1.34
248.8	278.8	1.34	1.36	1.33	248.8	2.17	2.87	3.37	10.8	1.65	1.50	1.33
261.4	291.4	1.34	1.33	1.28	261.4	2.49	3.43	4.43	12.6	1.65	1.51	1.34
273.9	303.9	1.31	1.26	1.18	273.9	2.61	3.51	4.38	14.7	1.65	1.51	1.34
286.5	316.5	1.25	1.20	1.17	286.5	2.54	3.30	3.90	17.1	1.66	1.52	1.35
299.1	329.1	1.26	1.21	1.17	299.1	2.43	3.08	3.52	20.0	1.66	1.51	1.35
311.6	341.6	1.28	1.18	1.08	311.6	2.37	2.95	3.34	23.3	1.67	1.53	1.36
324.2	354.2	1.21	1.12	1.09	324.2	2.39	2.96	3.34	27.1	1.68	1.53	1.36
336.8	366.8	1.13	1.09	1.13	336.8	2.52	3.13	3.48	31.7	1.70	1.55	1.37
349.3	379.3	1.12	1.11	1.16	349.3	2.69	3.38	3.91	36.9	1.71	1.56	1.38
361.9	391.9	1.22	1.21	1.25	361.9	2.79	3.52	4.11	43.0	1.73	1.58	1.40
374.5	404.5	1.35	1.34	1.39	374.5	2.85	3.58	4.16	50.2	1.76	1.60	1.42
387.0	417.0	1.40	1.42	1.51	387.0	2.91	3.63	4.15	58.5	1.80	1.63	1.44
399.6	429.6	1.46	1.47	1.61	399.6	2.92	3.58	4.00	68.2	1.83	1.68	1.49
412.2	442.2	1.57	1.60	1.72	412.2	2.76	3.34	3.70	79.6	1.88	1.72	1.54
424.7	454.7	1.71	1.73	1.85	424.7	2.48	2.91	3.15	92.8	1.94	1.78	1.59
437.3	467.3	1.76	1.77	1.88	437.3	2.40	2.75	2.93	108.2	2.04	1.87	1.67
449.8	479.8	1.77	1.78	1.86	449.8	2.52	2.93	3.25	126.1	2.15	1.96	1.77
475.0	505.0	1.87	1.85	1.90	475.0	3.02	3.58	4.01	147.1	2.31	2.12	1.89
487.5	517.5	1.91	1.90	1.93	487.5	3.16	3.70	4.01	171.5	2.49	2.31	2.09
500.1	530.1	1.92	1.89	1.91	500.1	2.85	3.26	3.48	200.0	2.78	2.61	2.38

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	34	18	29	20	38	26	55	35	55
1	-	20	+0	28	12	39	17	36	31	42	60	48
2	98	60	50	59	50	61	51	61	59	76	76	76
3	111	61	52	62	53	66	54	63	65	66	63	76
4	>125	81	81	81	77	82	77	82	75	105	85	87
5	>125	86	79	82	79	82	80	85	81	83	88	86
6	>126	103	97	106	96	103	94	99	95	96	94	100
7	>126	109	103	107	113	102	109	102	100	106	99	104
8	>125	117	111	108	103	109	102	105	102	106	104	105
9	>125	119	123	117	112	118	110	114	109	>115	111	118
10	>126	>129	125	>126	121	118	116	116	113	115	113	120
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 100.1 MHz; .02.00 dBm.
LO IN: 130.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -5 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	45	29	40	31	48	37	68	46	72
1	-	21	+0	28	12	37	18	39	30	45	45	50
2	89	58	52	58	53	57	55	59	63	82	64	76
3	100	48	42	53	41	52	41	51	47	51	57	58
4	119	72	62	75	60	73	60	71	59	71	67	77
5	>121	73	54	64	56	62	56	60	57	59	62	66
6	>121	81	70	77	73	75	71	77	74	76	74	90
7	121	79	75	78	67	74	64	78	65	73	65	79
8	>121	88	85	83	82	86	82	84	80	86	79	82
9	>121	88	80	83	87	80	79	78	81	81	79	79
10	>120	107	108	101	105	94	96	95	88	94	87	101
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 100.1 MHz; 10.00 dBm.
LO IN: 130.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 5.01 dBm

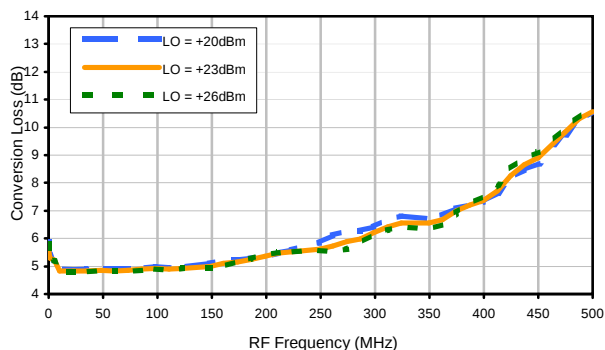
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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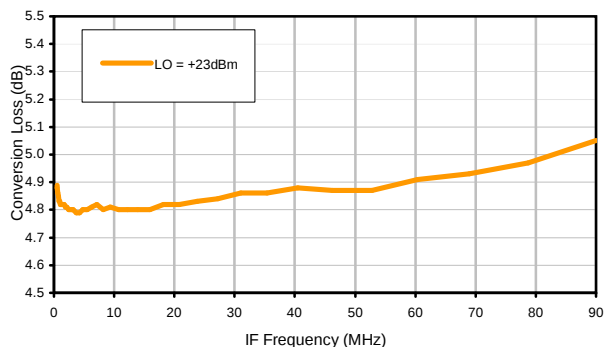


Typical Performance Curves

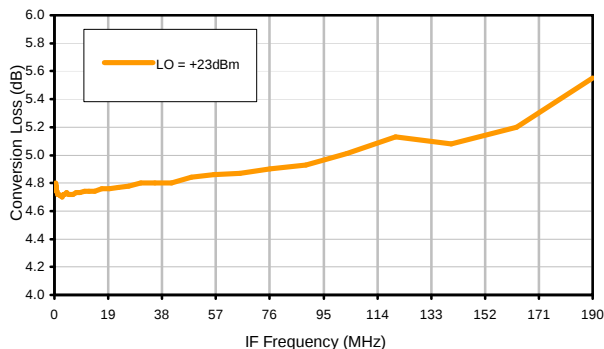
Conversion Loss @ IF=30MHz



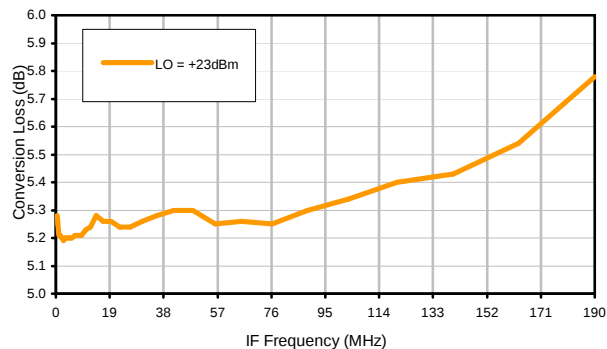
Conversion Loss vs. IF @ RF=100.1MHz



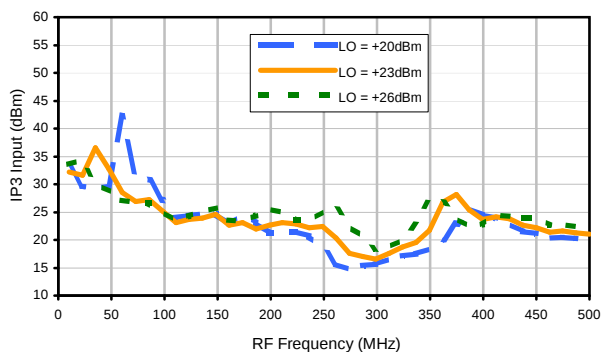
Conversion Loss vs. IF @ RF=10.1MHz



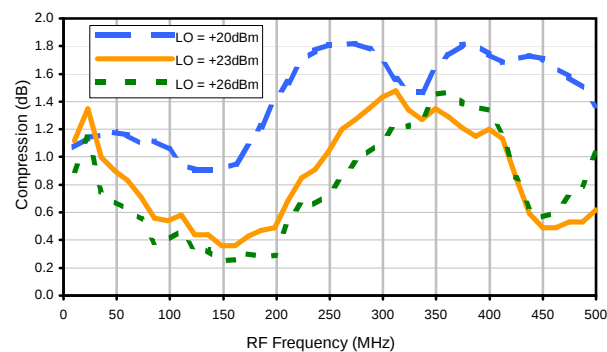
Conversion Loss vs. IF @ RF=200.1MHz



IP3 Input

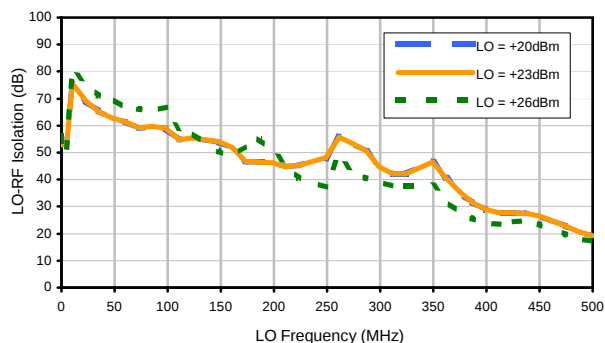


Compression @ RF IN=+15dBm

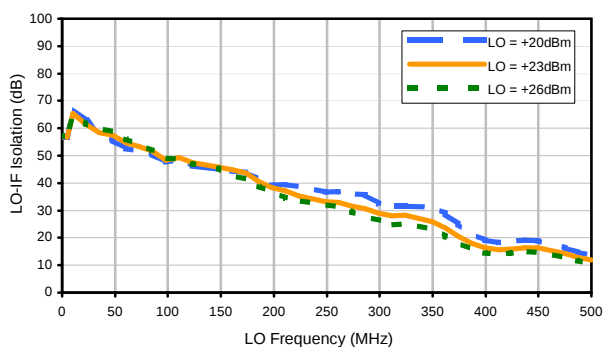


Typical Performance Curves

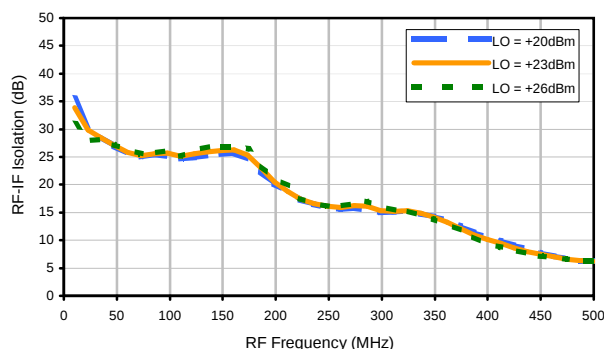
LO-RF Isolation



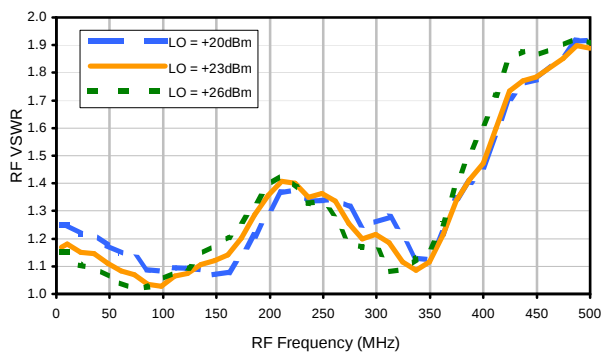
LO-IF Isolation



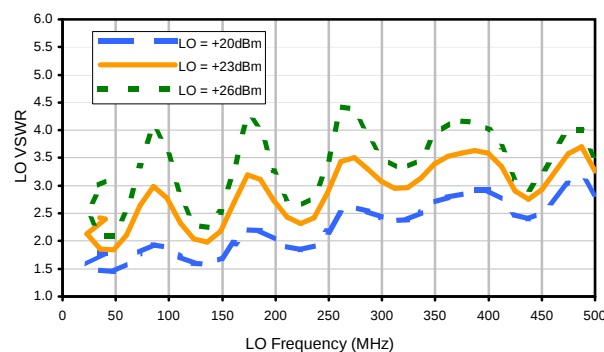
RF-IF Isolation



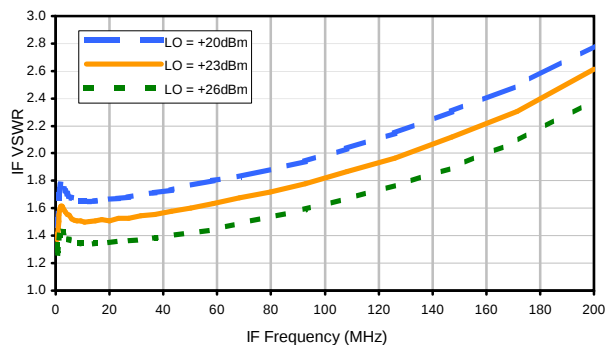
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	34	18	29	20	38	26	55	35	55
1	-	20	+0	28	12	39	17	36	31	42	60	48
2	98	60	50	59	50	61	51	61	59	76	76	76
3	111	61	52	62	53	66	54	63	65	66	63	76
4	>125	81	81	81	77	82	77	82	75	105	85	87
5	>125	86	79	82	79	82	80	85	81	83	88	86
6	>126	103	97	106	96	103	94	99	95	96	94	100
7	>126	109	103	107	113	102	109	102	100	106	99	104
8	>125	117	111	108	103	109	102	105	102	106	104	105
9	>125	119	123	117	112	118	110	114	109	>115	111	118
10	>126	>129	125	>126	121	118	116	116	113	115	113	120
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 100.1 MHz; .02.00 dBm.
LO IN: 130.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -5 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	45	29	40	31	48	37	68	46	72
1	-	21	+0	28	12	37	18	39	30	45	45	50
2	89	58	52	58	53	57	55	59	63	82	64	76
3	100	48	42	53	41	52	41	51	47	51	57	58
4	119	72	62	75	60	73	60	71	59	71	67	77
5	>121	73	54	64	56	62	56	60	57	59	62	66
6	>121	81	70	77	73	75	71	77	74	76	74	90
7	121	79	75	78	67	74	64	78	65	73	65	79
8	>121	88	85	83	82	86	82	84	80	86	79	82
9	>121	88	80	83	87	80	79	78	81	81	79	79
10	>120	107	108	101	105	94	96	95	88	94	87	101
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 100.1 MHz; 10.00 dBm.
LO IN: 130.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 5.01 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.

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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. $\pm .03$; 3 Pl. $\pm .015$

Notes:

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



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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



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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