

Coaxial Frequency Mixer

Level 13 (LO Power +13 dBm) 50 to 1000 MHz

ZP-2MH+
ZP-2MH



Generic photo used for illustration purposes only

CASE STYLE: GG60

Connectors	Model
BNC	ZP-2MH(+)
SMA	ZP-2MH-S(+)

+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	200mW
IF Current	40mA

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

Coaxial Connections

LO	L
RF	R
IF	X

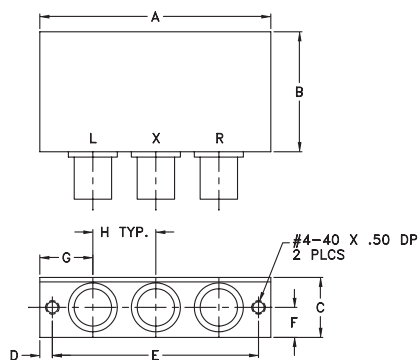
Features

- low conversion loss, 6.0 dB typ.
- wideband, 50 to 1000 MHz
- excellent L-R isolation, 47 dB typ., L-I, 47 dB typ.
- rugged shielded case

Applications

- VHF/UHF
- cellular
- instrumentation

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	wt
2.31	1.20	.60	.125	2.062	.30	.53	.63	grams
58.67	30.48	15.24	3.18	52.37	7.62	13.46	16.00	75.0

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF	IF	Mid-Band		Total		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.
50-1000	DC-1000	6.0	0.25	7.5	9.0	58	40	47	30	37	25	55	35	47	20	32	18

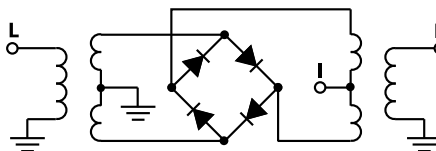
1 dB COMP.: +9 dBm typ.

L = 50-100 MHz M = 100-500 MHz U = upper range [$f_L/2$ 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
50.00	80.00	5.81	57.10	55.26	1.03	2.51
100.00	70.00	5.85	51.37	49.62	1.05	2.39
129.17	99.17	5.79	49.27	47.63	1.07	2.41
200.00	170.00	5.74	46.10	44.54	1.10	2.28
208.33	178.33	5.73	45.84	44.23	1.13	2.36
287.50	257.50	5.70	43.58	42.34	1.17	2.26
340.28	310.28	5.67	42.34	40.78	1.19	2.29
366.67	336.67	5.69	41.82	40.13	1.21	2.28
445.83	415.83	5.72	40.63	37.78	1.26	2.29
498.61	468.61	5.75	39.34	36.04	1.28	2.29
500.00	470.00	5.75	39.33	36.00	1.29	2.28
551.39	521.39	5.86	38.49	34.15	1.33	2.32
630.56	600.56	5.90	38.05	32.59	1.38	2.35
683.33	653.33	6.06	38.00	31.67	1.41	2.33
709.72	679.72	6.12	38.21	31.02	1.43	2.30
788.89	758.89	6.33	38.31	29.48	1.49	2.44
868.06	838.06	6.58	37.78	28.55	1.53	2.37
947.22	917.22	6.88	37.88	27.56	1.60	2.48
973.61	943.61	6.98	37.84	27.05	1.62	2.49
1000.00	970.00	7.05	37.64	26.57	1.64	2.45

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-Circuits' applicable established test performance criteria and measurement instructions.
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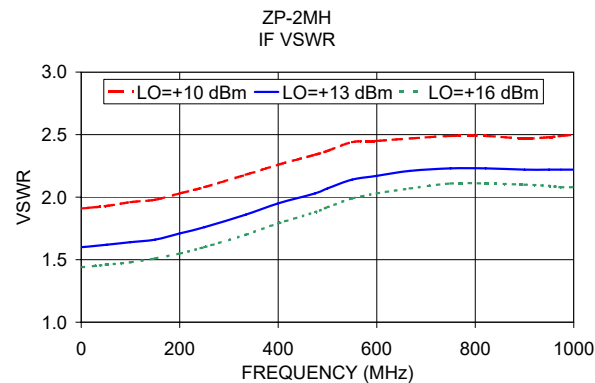
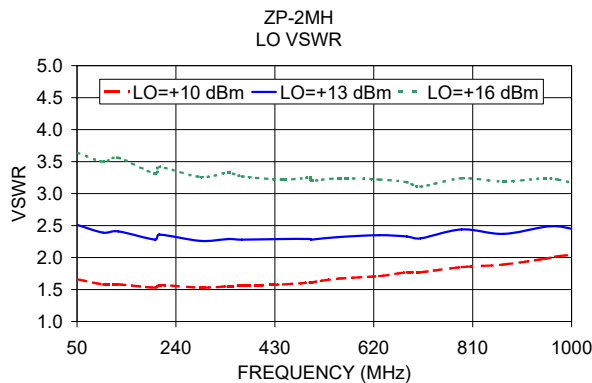
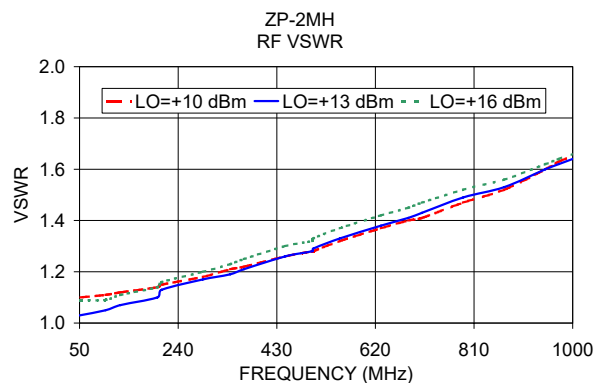
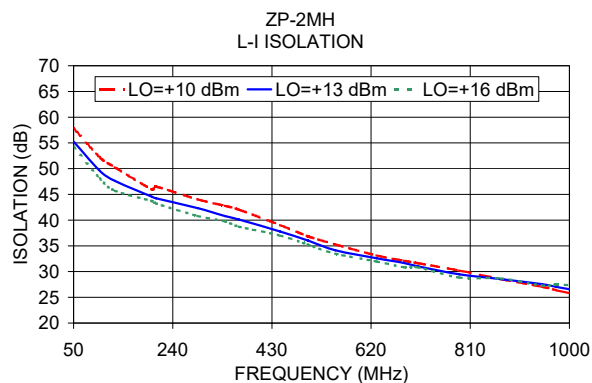
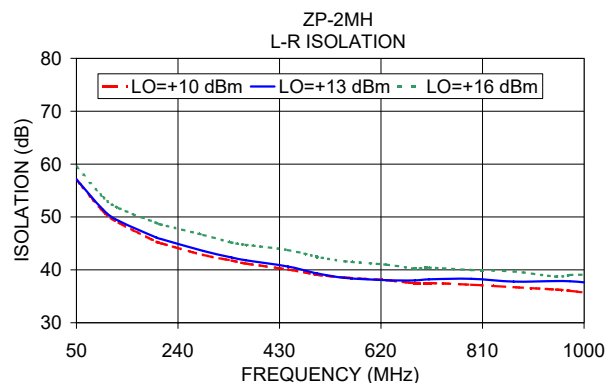
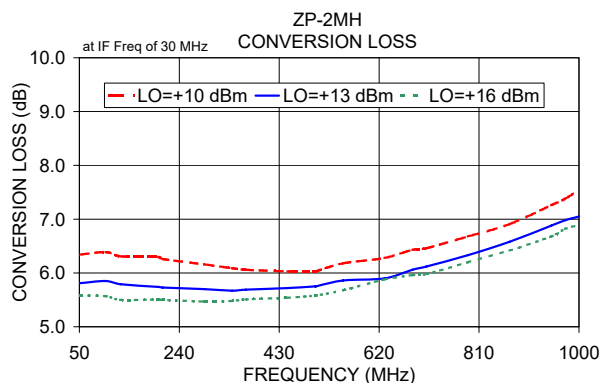


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Performance Charts

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Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	6.12	5.68	5.39
50.4	80.4	6.18	5.77	5.50
90.7	120.7	6.16	5.70	5.44
131.0	161.0	6.06	5.62	5.41
171.3	201.3	6.13	5.65	5.42
211.5	241.5	5.94	5.54	5.36
251.8	281.8	6.06	5.62	5.40
292.1	322.1	5.96	5.55	5.39
332.4	362.4	5.93	5.61	5.43
372.7	402.7	5.96	5.62	5.44
413.0	443.0	5.85	5.55	5.40
453.3	483.3	5.98	5.61	5.45
493.6	523.6	5.99	5.67	5.45
533.9	563.9	6.00	5.74	5.54
574.2	604.2	6.02	5.77	5.61
614.4	644.4	6.10	5.76	5.59
654.7	684.7	6.14	5.83	5.65
695.0	725.0	6.14	5.91	5.74
735.3	765.3	6.25	6.03	5.86
775.6	805.6	6.25	6.07	5.92
815.9	845.9	6.31	6.14	6.01
856.2	886.2	6.38	6.15	6.00
896.5	926.5	6.61	6.27	6.06
916.6	946.6	6.65	6.29	6.09
956.9	986.9	6.79	6.35	6.12
977.1	1007.1	6.92	6.36	6.13
1017.3	1047.3	7.27	6.53	6.23
1037.5	1067.5	7.38	6.54	6.23
1077.8	1107.8	7.78	6.83	6.36
1097.9	1127.9	7.74	6.80	6.39
1138.2	1168.2	8.25	7.14	6.59
1158.4	1188.4	8.43	7.31	6.69
1198.7	1228.7	8.90	7.74	6.96
1218.8	1248.8	9.16	7.94	7.10
1259.1	1289.1	9.52	8.36	7.38
1279.2	1309.2	9.69	8.62	7.62
1319.5	1349.5	10.23	9.11	8.16
1339.7	1369.7	10.51	9.47	8.57
1380.0	1410.0	10.99	10.08	9.17
1400.1	1430.1	11.30	10.48	9.58

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	20.04	23.58	25.85
50.4	80.4	19.05	22.18	23.87
90.7	120.7	19.24	20.85	21.08
131.0	161.0	19.77	19.86	23.49
171.3	201.3	19.31	19.34	25.23
211.5	241.5	18.78	23.03	23.94
251.8	281.8	17.65	27.09	21.89
292.1	322.1	19.12	23.75	21.73
332.4	362.4	23.15	21.74	25.20
372.7	402.7	24.55	22.12	23.57
413.0	443.0	19.81	18.72	22.60
453.3	483.3	18.81	17.36	18.99
493.6	523.6	18.86	22.00	32.90
533.9	563.9	18.91	21.62	28.09
574.2	604.2	18.32	20.62	25.50
614.4	644.4	21.10	21.44	24.00
654.7	684.7	21.20	25.88	28.53
695.0	725.0	16.55	21.92	29.67
735.3	765.3	15.48	18.22	21.99
775.6	805.6	14.42	16.35	18.77
815.9	845.9	12.81	14.38	16.92
856.2	886.2	11.55	13.54	15.85
896.5	926.5	13.24	15.74	17.90
916.6	946.6	14.94	17.87	19.96
956.9	986.9	16.22	21.81	24.10
977.1	1007.1	15.86	24.18	27.52
1017.3	1047.3	13.19	22.75	26.10
1037.5	1067.5	12.36	22.69	23.82
1077.8	1107.8	11.33	18.02	23.05
1097.9	1127.9	12.04	18.86	28.04
1138.2	1168.2	11.56	18.12	26.78
1158.4	1188.4	12.44	18.18	28.80
1198.7	1228.7	12.59	16.88	23.70
1218.8	1248.8	12.90	16.59	23.49
1259.1	1289.1	13.48	15.66	21.19
1279.2	1309.2	14.08	15.68	20.63
1319.5	1349.5	14.08	15.99	18.12
1339.7	1369.7	14.01	15.56	17.13
1380.0	1410.0	14.56	15.22	16.40
1400.1	1430.1	14.46	14.46	15.47

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.54	1.29	1.09
50.4	80.4	1.30	1.14	0.96
90.7	120.7	1.40	1.10	0.94
131.0	161.0	1.41	1.14	0.96
171.3	201.3	1.29	1.07	0.90
211.5	241.5	1.30	1.04	0.87
251.8	281.8	1.31	1.06	0.85
292.1	322.1	1.39	1.06	0.85
332.4	362.4	1.35	0.98	0.81
372.7	402.7	1.34	0.98	0.78
413.0	443.0	1.32	0.92	0.73
453.3	483.3	1.31	0.96	0.78
493.6	523.6	1.21	0.85	0.72
533.9	563.9	1.16	0.80	0.67
574.2	604.2	1.32	0.89	0.69
614.4	644.4	1.28	0.95	0.78
654.7	684.7	1.39	1.00	0.79
695.0	725.0	1.47	1.08	0.83
735.3	765.3	1.65	1.22	0.96
775.6	805.6	1.92	1.43	1.12
815.9	845.9	1.93	1.47	1.19
856.2	886.2	2.10	1.62	1.31
896.5	926.5	2.10	1.64	1.32
916.6	946.6	2.08	1.63	1.35
956.9	986.9	2.18	1.71	1.38
977.1	1007.1	2.20	1.77	1.46
1017.3	1047.3	2.19	1.91	1.54
1037.5	1067.5	2.14	1.91	1.56
1077.8	1107.8	1.98	1.87	1.55
1097.9	1127.9	1.91	1.81	1.50
1138.2	1168.2	1.62	1.67	1.44
1158.4	1188.4	1.56	1.62	1.40
1198.7	1228.7	1.26	1.43	1.34
1218.8	1248.8	1.15	1.34	1.33
1259.1	1289.1	1.03	1.22	1.38
1279.2	1309.2	0.89	1.10	1.32
1319.5	1349.5	0.71	1.01	1.21
1339.7	1369.7	0.57	0.93	1.14
1380.0	1410.0	0.32	0.70	1.07
1400.1	1430.1	0.18	0.52	0.94

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Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=50.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
400.0	100.1	5.72	10.0	60.1	5.84	950.0	50.1	7.15
390.3	109.9	5.67	30.0	80.1	5.77	930.0	70.1	7.20
380.5	119.6	5.68	50.0	100.1	5.67	910.0	90.1	7.20
370.8	129.4	5.66	70.0	120.1	5.72	890.0	110.1	7.08
361.0	139.1	5.63	90.0	140.1	5.75	870.0	130.1	6.99
351.3	148.9	5.58	110.0	160.1	5.70	850.0	150.1	6.99
341.5	158.6	5.59	130.0	180.1	5.78	830.0	170.1	7.02
331.8	168.4	5.61	150.0	200.1	5.77	810.0	190.1	6.92
322.0	178.1	5.55	170.0	220.1	5.78	790.0	210.1	6.90
312.3	187.9	5.57	190.0	240.1	5.74	770.0	230.1	6.85
302.5	197.6	5.57	210.0	260.1	5.81	750.0	250.1	6.80
292.8	207.4	5.52	230.0	280.1	5.86	730.0	270.1	6.89
283.0	217.1	5.51	250.0	300.1	5.79	710.0	290.1	6.84
273.3	226.9	5.50	270.0	320.1	5.78	690.0	310.1	6.88
263.5	236.6	5.53	290.0	340.1	5.81	670.0	330.1	6.88
253.8	246.4	5.50	310.0	360.1	5.87	650.0	350.1	6.93
244.0	256.1	5.53	330.0	380.1	5.80	630.0	370.1	6.94
234.3	265.9	5.57	350.0	400.1	5.83	610.0	390.1	6.93
224.5	275.6	5.54	370.0	420.1	5.87	590.0	410.1	6.92
214.8	285.4	5.51	390.0	440.1	5.76	570.0	430.1	6.93
205.0	295.1	5.58	410.0	460.1	5.77	550.0	450.1	6.95
195.3	304.9	5.58	430.0	480.1	5.84	530.0	470.1	6.90
185.5	314.6	5.55	450.0	500.1	5.81	510.0	490.1	6.91
175.8	324.4	5.56	470.0	520.1	5.76	490.0	510.1	6.90
166.0	334.1	5.57	510.0	560.1	5.88	450.0	550.1	6.87
156.3	343.9	5.57	530.0	580.1	5.85	430.0	570.1	6.87
146.5	353.6	5.55	570.0	620.1	5.91	390.0	610.1	6.82
136.8	363.4	5.56	590.0	640.1	5.94	370.0	630.1	6.82
127.0	373.1	5.59	630.0	680.1	6.04	330.0	670.1	6.74
117.3	382.9	5.57	650.0	700.1	6.04	310.0	690.1	6.73
107.5	392.6	5.58	690.0	740.1	6.11	270.0	730.1	6.70
97.8	402.4	5.59	710.0	760.1	6.13	250.0	750.1	6.72
88.0	412.1	5.57	750.0	800.1	6.00	210.0	790.1	6.75
78.3	421.9	5.53	770.0	820.1	5.93	190.0	810.1	6.72
68.5	431.6	5.58	810.0	860.1	5.88	150.0	850.1	6.69
58.8	441.4	5.59	830.0	880.1	5.87	130.0	870.1	6.78
49.0	451.1	5.60	870.0	920.1	5.75	90.0	910.1	6.79
39.3	460.9	5.57	890.0	940.1	5.73	70.0	930.1	6.67
19.8	480.4	5.65	930.0	980.1	5.64	30.0	970.1	6.53
10.0	490.1	5.73	950.0	1000.1	5.61	10.0	990.1	6.61

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
10.1	76.41	76.00	76.25	76.82	79.76	70.78
50.4	61.76	62.79	63.60	70.14	71.40	70.84
90.7	56.53	57.54	58.42	68.38	69.40	68.69
131.0	53.57	54.63	55.47	65.45	67.24	66.51
171.3	51.05	52.11	53.11	62.77	64.77	64.04
211.5	49.50	50.73	51.70	60.58	61.48	61.50
251.8	48.00	49.33	50.27	58.58	58.85	59.40
292.1	46.86	48.13	49.15	55.43	55.85	57.18
332.4	45.98	47.25	48.05	52.80	53.88	55.56
372.7	45.12	46.60	47.12	50.78	52.45	54.46
413.0	44.43	45.67	46.68	48.98	50.79	52.62
453.3	43.60	44.70	45.09	47.50	49.70	51.29
493.6	42.87	43.95	44.70	46.45	48.07	49.84
533.9	42.44	43.22	44.02	45.74	47.06	48.24
574.2	42.13	42.77	43.18	44.81	47.08	48.56
614.4	42.15	42.39	42.45	44.21	46.63	48.12
654.7	42.23	43.36	43.77	43.83	46.15	47.53
695.0	41.87	42.84	43.07	42.92	44.87	45.82
735.3	41.30	42.10	42.44	42.14	43.47	44.36
775.6	40.70	41.18	41.47	41.46	43.23	44.11
815.9	39.89	40.11	40.30	40.57	42.40	43.47
856.2	39.18	39.36	39.56	39.86	41.49	42.45
896.5	39.51	40.26	41.07	39.37	40.98	42.08
916.6	39.47	40.70	41.41	38.67	40.24	41.11
956.9	38.59	39.95	40.54	37.81	38.87	39.42
977.1	38.59	39.91	40.57	37.45	38.22	38.86
1017.3	37.57	38.95	39.73	36.38	37.02	37.52
1037.5	37.79	38.97	39.55	35.98	36.54	37.10
1077.8	37.18	38.51	39.18	35.34	35.97	36.64
1097.9	37.01	38.38	39.08	35.49	35.81	36.73
1138.2	36.70	37.99	38.86	35.81	36.21	37.17
1158.4	36.79	38.33	39.09	36.32	37.02	37.60
1198.7	36.70	38.19	38.94	36.06	37.12	37.61
1218.8	36.74	38.17	38.68	36.15	37.19	37.47
1259.1	36.82	38.06	38.85	35.82	36.71	37.05
1279.2	36.50	37.52	38.56	35.58	36.35	36.79
1319.5	36.53	37.47	38.25	35.43	36.06	36.19
1339.7	36.24	37.22	38.14	35.06	35.69	35.76
1380.0	36.06	36.86	37.53	35.01	35.50	35.15
1400.1	35.78	36.55	37.09	34.84	35.23	34.66

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	46.43	47.69	51.81
50.4	80.4	37.27	37.47	37.88
90.7	120.7	32.71	33.02	33.12
131.0	161.0	29.87	30.16	30.39
171.3	201.3	28.20	28.48	28.73
211.5	241.5	27.13	27.43	27.65
251.8	281.8	26.19	26.69	27.05
292.1	322.1	26.15	26.52	26.71
332.4	362.4	26.18	26.75	27.07
372.7	402.7	25.97	27.01	27.43
413.0	443.0	26.39	27.28	27.94
453.3	483.3	26.89	27.33	27.69
493.6	523.6	28.21	28.28	28.28
533.9	563.9	29.24	29.34	29.36
574.2	604.2	28.56	28.81	29.43
614.4	644.4	26.08	26.77	27.59
654.7	684.7	23.45	23.83	24.53
695.0	725.0	21.68	21.53	21.62
735.3	765.3	20.45	20.14	19.97
775.6	805.6	19.40	19.04	18.81
815.9	845.9	18.75	18.37	18.09
856.2	886.2	18.25	17.84	17.54
896.5	926.5	17.65	17.21	16.88
916.6	946.6	17.39	16.91	16.63
956.9	986.9	16.96	16.49	16.20
977.1	1007.1	16.92	16.45	16.18
1017.3	1047.3	16.79	16.41	16.23
1037.5	1067.5	16.76	16.44	16.31
1077.8	1107.8	16.63	16.34	16.27
1097.9	1127.9	16.46	16.25	16.25
1138.2	1168.2	16.44	16.19	16.13
1158.4	1188.4	16.38	16.24	16.09
1198.7	1228.7	16.20	16.24	16.14
1218.8	1248.8	16.12	16.20	16.25
1259.1	1289.1	15.91	16.04	16.11
1279.2	1309.2	15.76	15.97	16.02
1319.5	1349.5	15.44	15.73	15.74
1339.7	1369.7	15.26	15.56	15.61
1380.0	1410.0	14.89	15.15	15.17
1400.1	1430.1	14.68	14.91	14.94

Frequency Mixer

ZP-2MH

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
10.1	40.1	1.17	1.09	1.10	10.1	1.55	2.19	3.19	10.0	2.26	1.81	1.58
50.4	80.4	1.18	1.06	1.03	50.4	1.66	2.52	3.67	30.2	1.93	1.54	1.38
90.7	120.7	1.16	1.07	1.06	90.7	1.56	2.35	3.45	50.4	1.74	1.39	1.26
131.0	161.0	1.16	1.08	1.10	131.0	1.61	2.44	3.54	70.6	1.75	1.41	1.30
171.3	201.3	1.20	1.12	1.14	171.3	1.59	2.35	3.36	90.8	1.82	1.48	1.37
211.5	241.5	1.20	1.15	1.18	211.5	1.60	2.38	3.40	111.0	1.89	1.52	1.39
251.8	281.8	1.24	1.19	1.21	251.8	1.64	2.45	3.52	131.2	1.92	1.55	1.42
292.1	322.1	1.26	1.21	1.24	292.1	1.64	2.40	3.40	151.4	1.84	1.51	1.40
332.4	362.4	1.26	1.23	1.26	332.4	1.69	2.51	3.60	171.6	1.80	1.48	1.38
372.7	402.7	1.28	1.26	1.29	372.7	1.75	2.63	3.79	191.8	1.90	1.56	1.45
413.0	443.0	1.28	1.28	1.32	413.0	1.75	2.54	3.62	212.0	1.98	1.62	1.52
453.3	483.3	1.31	1.29	1.32	453.3	1.77	2.57	3.65	232.2	1.91	1.58	1.49
493.6	523.6	1.35	1.34	1.37	493.6	1.81	2.58	3.62	252.4	1.87	1.56	1.47
533.9	563.9	1.38	1.39	1.42	533.9	1.88	2.67	3.75	272.7	1.95	1.64	1.55
574.2	604.2	1.41	1.42	1.45	574.2	1.90	2.62	3.65	292.9	2.01	1.70	1.61
614.4	644.4	1.44	1.45	1.48	614.4	2.00	2.76	3.79	313.1	1.98	1.67	1.60
654.7	684.7	1.46	1.49	1.53	654.7	2.09	2.86	3.94	333.3	2.02	1.70	1.63
695.0	725.0	1.44	1.48	1.53	695.0	2.09	2.77	3.70	353.5	2.05	1.77	1.71
735.3	765.3	1.43	1.46	1.51	735.3	2.18	2.84	3.77	373.7	2.03	1.77	1.71
775.6	805.6	1.41	1.44	1.48	775.6	2.20	2.80	3.68	393.9	2.05	1.77	1.72
815.9	845.9	1.39	1.41	1.43	815.9	2.24	2.80	3.65	434.3	2.12	1.86	1.83
856.2	886.2	1.41	1.41	1.43	856.2	2.31	2.79	3.50	454.5	2.09	1.85	1.83
896.5	926.5	1.47	1.46	1.47	896.5	2.31	2.70	3.38	494.9	2.18	1.95	1.93
916.6	946.6	1.50	1.48	1.49	916.6	2.30	2.65	3.30	515.1	2.11	1.89	1.89
956.9	986.9	1.58	1.57	1.57	956.9	2.32	2.58	3.18	555.5	2.24	2.03	2.04
977.1	1007.1	1.65	1.63	1.63	977.1	2.36	2.63	3.21	575.7	2.25	2.05	2.07
1017.3	1047.3	1.80	1.75	1.74	1017.3	2.36	2.57	3.08	616.1	2.20	2.00	2.02
1037.5	1067.5	1.90	1.84	1.83	1037.5	2.41	2.64	3.12	636.3	2.24	2.06	2.10
1077.8	1107.8	2.08	2.00	1.97	1077.8	2.39	2.61	3.05	676.7	2.30	2.08	2.11
1097.9	1127.9	2.16	2.08	2.05	1097.9	2.38	2.53	2.92	696.9	2.30	2.08	2.11
1138.2	1168.2	2.40	2.28	2.22	1138.2	2.32	2.46	2.82	737.3	2.18	1.99	2.03
1158.4	1188.4	2.51	2.38	2.31	1158.4	2.30	2.44	2.77	757.6	2.30	2.08	2.11
1198.7	1228.7	2.76	2.61	2.51	1198.7	2.22	2.33	2.64	798.0	2.24	1.99	2.01
1218.8	1248.8	2.89	2.72	2.60	1218.8	2.17	2.30	2.59	818.2	2.18	1.93	1.94
1259.1	1289.1	3.12	2.96	2.79	1259.1	2.10	2.23	2.53	858.6	2.24	2.00	2.01
1279.2	1309.2	3.24	3.08	2.89	1279.2	2.05	2.13	2.42	878.8	2.28	1.99	1.97
1319.5	1349.5	3.45	3.29	3.13	1319.5	1.94	2.02	2.31	919.2	2.16	1.87	1.84
1339.7	1369.7	3.55	3.40	3.26	1339.7	1.90	1.96	2.25	939.4	2.08	1.81	1.79
1380.0	1410.0	3.65	3.54	3.40	1380.0	1.81	1.86	2.15	979.8	2.30	1.95	1.89
1400.1	1430.1	3.73	3.62	3.49	1400.1	1.73	1.83	2.13	1000.0	2.28	2.37	2.65

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	32	38	37	45	41	63	55	60	58	74
1	-	23	+0	29	12	33	21	41	45	45	56	61
2	81	66	68	60	62	66	59	57	58	82	59	65
3	>100	64	41	56	43	52	38	57	46	53	56	50
4	>100	81	77	68	76	69	72	73	76	83	77	83
5	>100	71	64	73	53	66	50	60	47	64	52	74
6	>100	97	88	94	79	84	77	85	75	89	79	84
7	>100	84	78	84	75	84	74	96	69	81	65	80
8	>100	>98	>98	>98	95	>98	92	89	95	85	86	83
9	>100	89	90	89	90	87	92	86	77	83	74	79
10	>100	>98	>98	>98	>98	>98	>98	95	93	95	88	95
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 500.1 MHz; 4.00 dBm.

LO IN: 530.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -1.88 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	22	28	26	31	29	54	37	42	41	74
1	-	22	+0	28	11	32	20	37	44	37	46	51
2	>100	66	80	65	76	69	67	66	65	85	66	70
3	>100	>88	72	87	64	75	59	79	62	79	68	74
4	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
5	>100	>88	86	>88	>88	>88	88	>88	86	>88	85	>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: 500.1 MHz; -6.00 dBm.

LO IN: 530.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -11.88 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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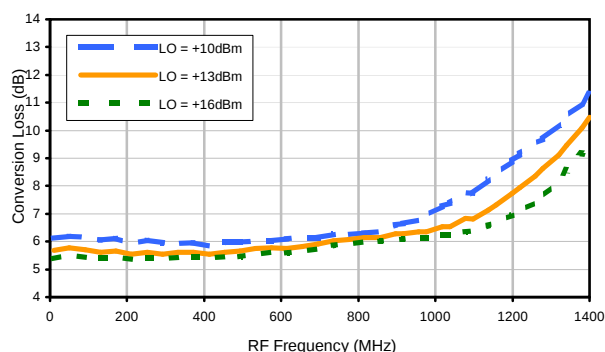


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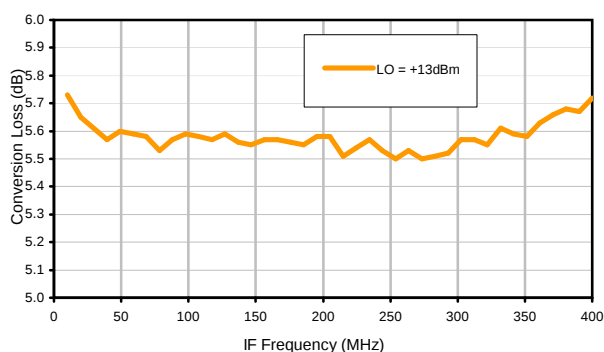


Typical Performance Curves

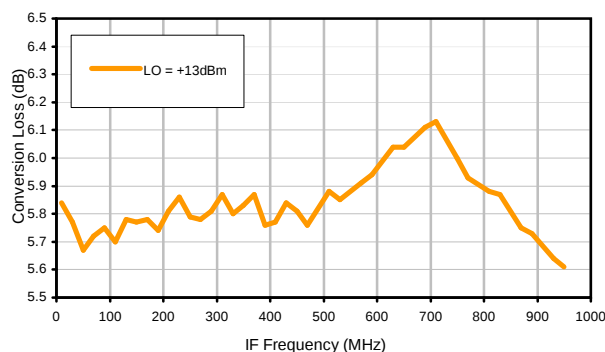
Conversion Loss @ IF=30MHz



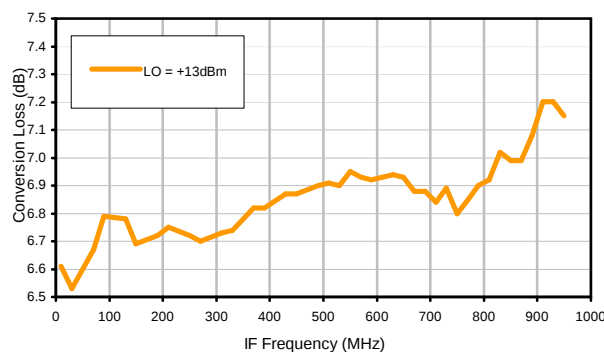
Conversion Loss vs. IF @ RF=500.1MHz



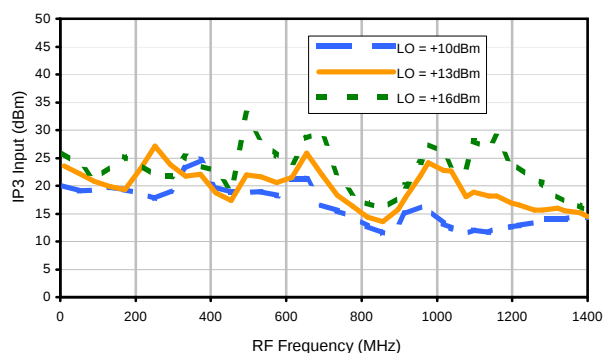
Conversion Loss vs. IF @ RF=50.1MHz



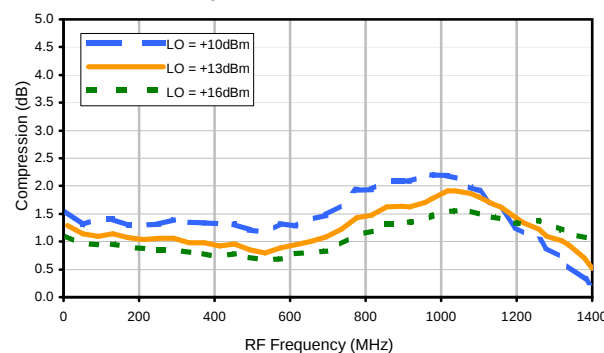
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

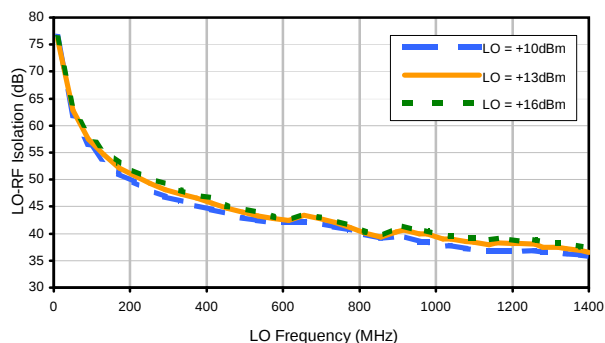


Compression @ RF IN=+9dBm

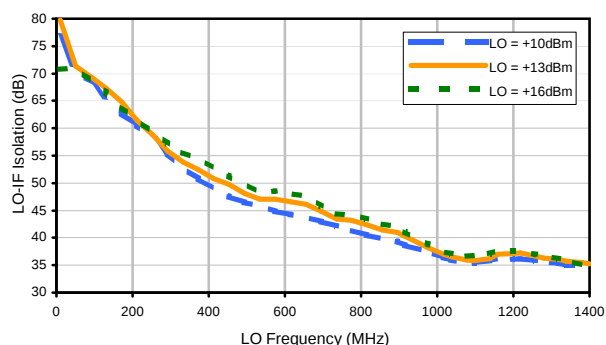


Typical Performance Curves

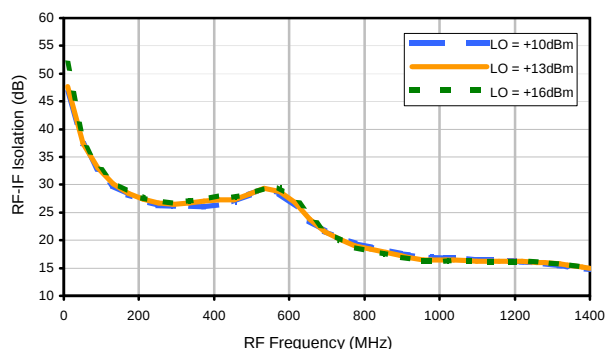
LO-RF Isolation



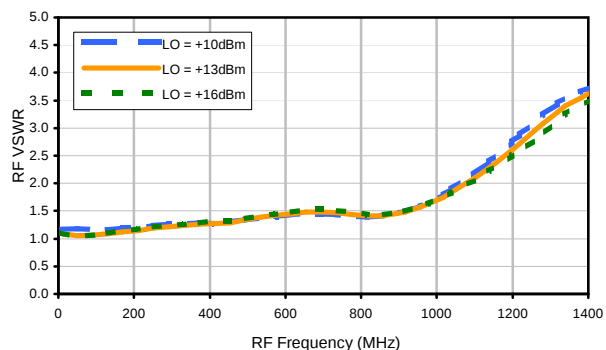
LO-IF Isolation



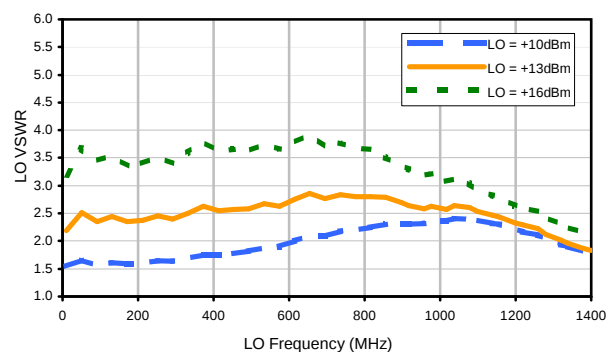
RF-IF Isolation



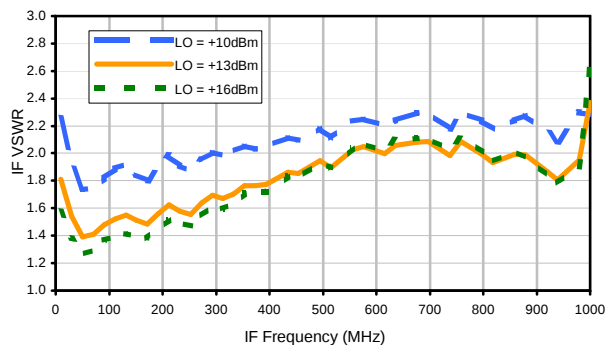
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	32	38	37	45	41	63	55	60	58	74
1	-	23	+0	29	12	33	21	41	45	45	56	61
2	81	66	68	60	62	66	59	57	58	82	59	65
3	>100	64	41	56	43	52	38	57	46	53	56	50
4	>100	81	77	68	76	69	72	73	76	83	77	83
5	>100	71	64	73	53	66	50	60	47	64	52	74
6	>100	97	88	94	79	84	77	85	75	89	79	84
7	>100	84	78	84	75	84	74	96	69	81	65	80
8	>100	>98	>98	>98	95	>98	92	89	95	85	86	83
9	>100	89	90	89	90	87	92	86	77	83	74	79
10	>100	>98	>98	>98	>98	>98	>98	95	93	95	88	95
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; 4.00 dBm.
LO IN: 530.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -1.88 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	22	28	26	31	29	54	37	42	41	74
1	-	22	+0	28	11	32	20	37	44	37	46	51
2	>100	66	80	65	76	69	67	66	65	85	66	70
3	>100	>88	72	87	64	75	59	79	62	79	68	74
4	>100	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88	>88
5	>100	>88	86	>88	>88	>88	88	>88	86	>88	85	>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: 500.1 MHz; -6.00 dBm.
LO IN: 530.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -11.88 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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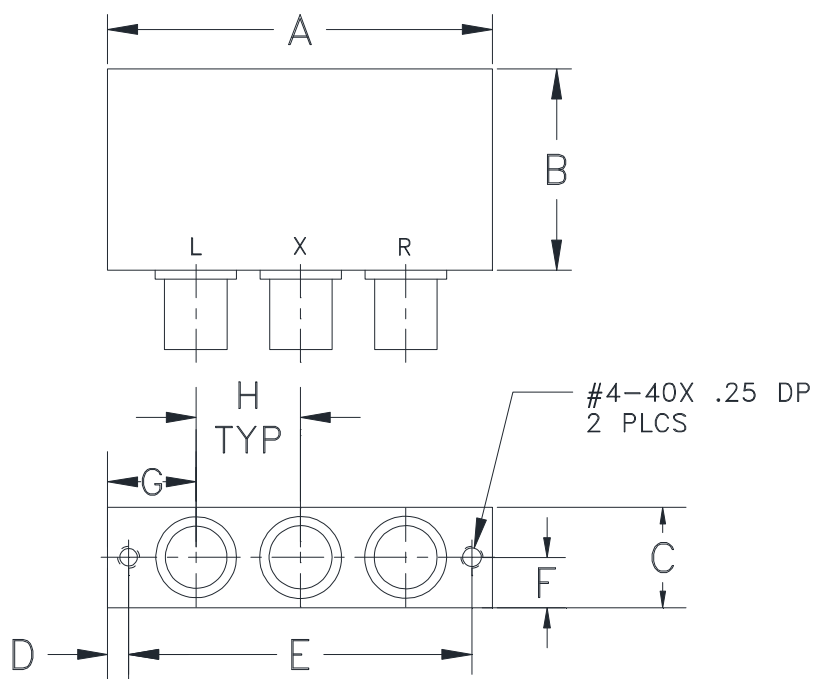
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Outline Dimensions

GG60



CASE #.	A	B	C	D	E	F	G	H	WT. GRAM
GG60	2.31 (58.67)	1.20 (30.48)	.60 (15.24)	.125 (3.18)	2.062 (52.37)	.30 (7.62)	.53 (13.46)	.63 (16.00)	75.0

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

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.



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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
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I