

Coaxial Frequency Mixer

Level 13 (LO Power +13 dBm) 0.15 to 400 MHz

ZP-3MH+



Generic photo used for illustration purposes only

CASE STYLE: GG60

Connectors	Model
BNC	ZP-3MH+
SMA	ZP-3MH-S+

+RoHS Compliant

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

Maximum Ratings

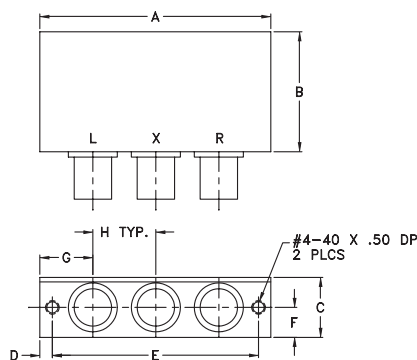
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

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

Coaxial Connections

LO	L
RF	R
IF	X

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

Features

- low conversion loss, 5.0 dB typ.
- high L-R isolation, 46 dB typ., L-I, 42 dB typ.
- rugged shielded case

Applications

- VHF/UHF
- instrumentation

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF	IF	Mid-Band m		Total Range		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.
0.15-400	DC-400	5.0	0.33	7.0	8.0	60	50	46	30	35	25	60	40	42	25	35	20

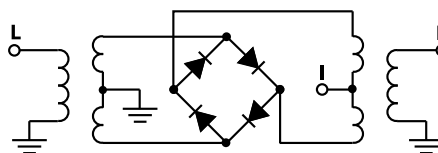
1 dB COMP: +9 dBm typ.

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)	VSWR RF Port (:1)	Frequency (MHz)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR LO Port (:1)
RF	LO			LO			
		LO +13dBm	LO +13dBm		LO +13dBm	LO +13dBm	LO +13dBm
0.15	30.15	5.48	1.53	10.50	59.22	67.83	1.72
0.20	30.20	5.31	1.45	14.50	57.31	65.51	1.71
0.30	30.30	5.27	1.39	18.50	55.80	63.82	1.71
0.40	30.40	5.21	1.37	22.50	54.49	62.93	1.69
0.50	30.50	5.16	1.36	26.50	53.38	61.95	1.70
1.00	31.00	5.09	1.35	30.50	52.42	61.07	1.69
5.00	35.00	4.99	1.34	31.00	52.30	61.12	1.68
10.00	40.00	4.96	1.34	35.10	51.52	60.51	1.68
20.00	50.00	4.88	1.33	40.10	50.70	60.05	1.68
50.10	80.10	4.93	1.32	50.10	49.38	59.05	1.68
75.10	105.10	4.98	1.30	55.10	48.79	58.41	1.68
100.10	130.10	4.99	1.27	105.10	44.38	48.52	1.69
150.10	180.10	5.05	1.21	130.10	42.61	44.85	1.71
200.10	230.10	5.17	1.13	180.10	40.40	39.44	1.75
250.10	280.10	5.36	1.06	205.10	38.48	37.29	1.80
300.10	330.10	5.43	1.10	255.10	37.59	35.97	1.86
325.10	355.10	5.57	1.14	305.10	37.44	32.99	1.94
350.10	380.10	5.68	1.12	330.10	36.46	31.87	1.97
375.10	405.10	6.04	1.09	380.10	35.06	30.61	2.12
400.10	430.10	6.39	1.18	405.10	35.05	29.79	2.17

Electrical Schematic



Notes

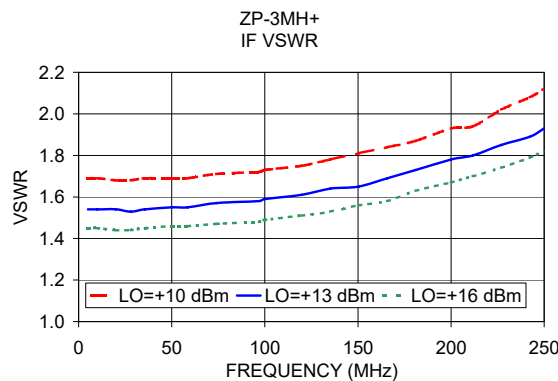
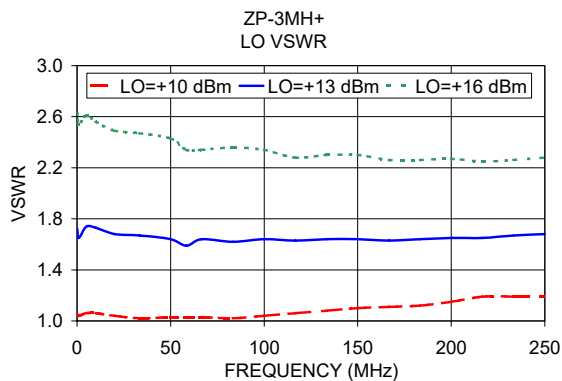
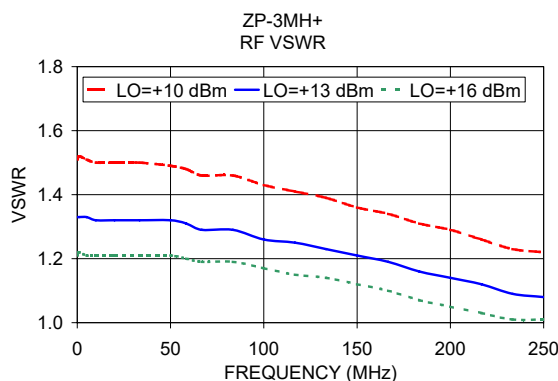
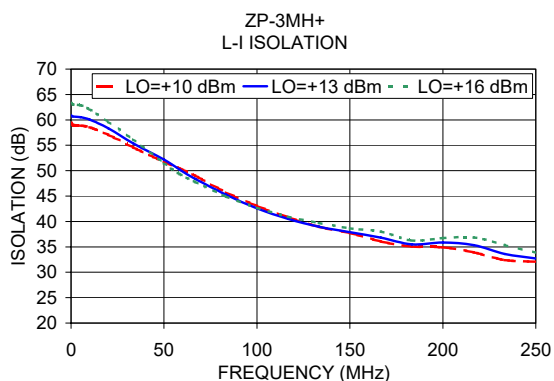
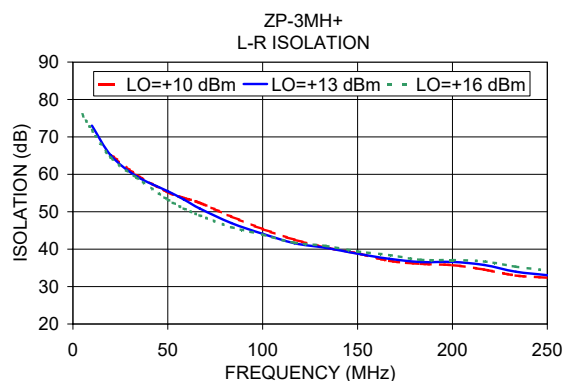
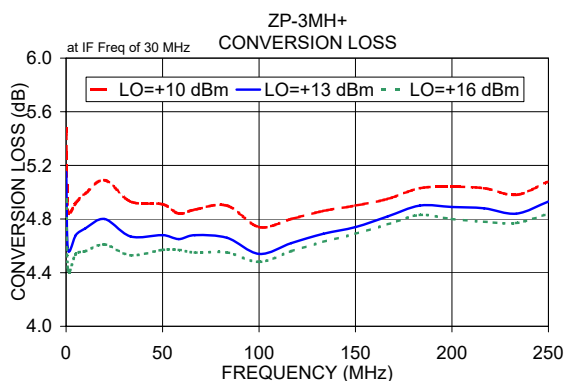
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Notes

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Frequency Mixer

ZP-3MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
0.1	30.1	5.47	5.15	4.95
1.0	31.0	4.85	4.57	4.42
5.0	35.0	4.92	4.68	4.54
10.0	40.0	4.99	4.73	4.56
27.8	57.8	4.92	4.69	4.55
45.5	75.5	5.00	4.74	4.61
63.2	93.2	4.92	4.71	4.57
80.9	110.9	4.90	4.73	4.63
98.6	128.6	4.93	4.75	4.64
133.9	163.9	4.98	4.81	4.71
151.6	181.6	5.04	4.83	4.71
169.3	199.3	5.11	4.95	4.83
187.0	217.0	5.14	4.95	4.83
204.7	234.7	5.11	4.90	4.81
222.4	252.4	5.27	5.00	4.84
240.1	270.1	5.31	5.10	4.91
257.8	287.8	5.27	5.15	5.04
275.5	305.5	5.26	5.12	5.02
293.2	323.2	5.30	5.14	5.03
310.9	340.9	5.43	5.19	5.05
328.6	358.6	6.12	5.33	5.01
346.3	376.3	6.82	5.69	5.05
363.9	393.9	7.08	5.92	5.16
381.6	411.6	7.19	6.13	5.32
399.3	429.3	7.59	6.54	5.65
417.0	447.0	7.76	6.89	6.15
434.7	464.7	7.91	7.08	6.42
452.4	482.4	7.57	6.87	6.49
470.1	500.1	7.36	6.93	6.75
487.8	517.8	7.55	7.18	6.97
505.5	535.5	7.57	7.23	7.05
523.2	553.2	7.48	7.21	7.09
540.9	570.9	7.42	7.29	7.27
558.6	588.6	7.62	7.58	7.64
576.3	606.3	7.89	7.87	7.90
593.9	623.9	8.15	8.19	8.25
611.6	641.6	8.39	8.46	8.54
629.3	659.3	9.32	9.40	9.53
647.0	677.0	9.65	9.78	9.89
664.7	694.7	10.04	10.17	10.30
682.4	712.4			
700.1	730.1			

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	24.64	25.70	35.07
27.8	57.8	27.92	35.29	34.28
45.5	75.5	24.74	28.25	28.25
63.2	93.2	23.59	24.40	23.70
80.9	110.9	29.22	27.17	22.72
98.6	128.6	27.44	21.79	20.83
116.3	146.3	24.15	22.81	21.99
133.9	163.9	26.28	20.15	19.03
151.6	181.6	19.95	20.29	20.34
169.3	199.3	17.39	16.44	17.04
187.0	217.0	19.79	18.07	18.11
204.7	234.7	24.48	25.22	22.87
222.4	252.4	21.21	28.07	21.39
240.1	270.1	15.52	15.82	18.67
257.8	287.8	15.78	15.76	16.73
275.5	305.5	16.02	16.05	17.15
293.2	323.2	15.05	15.35	15.76
310.9	340.9	14.73	15.03	17.23
328.6	358.6	14.30	16.70	21.58
346.3	376.3	12.69	18.59	25.79
363.9	393.9	9.18	15.81	21.90
381.6	411.6	8.58	13.02	17.97
399.3	429.3	9.82	13.86	15.98
417.0	447.0	10.99	16.29	16.31
434.7	464.7	12.31	17.16	19.50
452.4	482.4	12.64	17.85	20.86
470.1	500.1	15.52	29.32	27.37
487.8	517.8	19.63	22.55	23.08
505.5	535.5	21.19	21.60	21.32
523.2	553.2	20.04	18.78	20.18
540.9	570.9	19.07	16.71	19.18
558.6	588.6	16.16	16.02	18.68
576.3	606.3	14.77	15.90	18.86
593.9	623.9	14.22	15.44	18.31
611.6	641.6	13.50	14.76	17.50
629.3	659.3	12.89	13.51	15.64
647.0	677.0	13.62	14.03	15.77
664.7	694.7	14.14	14.15	15.11
682.4	712.4	15.39	14.68	15.07
700.1	730.1	16.02	15.22	15.35

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.76	1.42	1.20
27.8	57.8	1.61	1.27	1.09
45.5	75.5	1.62	1.33	1.08
63.2	93.2	1.55	1.21	0.99
80.9	110.9	1.50	1.18	0.97
98.6	128.6	1.43	1.07	0.90
116.3	146.3	1.33	1.02	0.86
133.9	163.9	1.37	1.09	0.93
151.6	181.6	1.35	1.06	0.88
169.3	199.3	1.20	0.92	0.79
187.0	217.0	1.25	0.95	0.82
204.7	234.7	1.31	0.99	0.81
222.4	252.4	1.30	1.12	0.92
240.1	270.1	1.45	1.21	1.08
257.8	287.8	1.72	1.39	1.22
275.5	305.5	1.99	1.63	1.45
293.2	323.2	2.35	1.82	1.62
310.9	340.9	2.49	1.88	1.67
328.6	358.6	2.69	2.06	1.78
346.3	376.3	2.56	2.30	1.98
363.9	393.9	2.37	2.43	2.19
381.6	411.6	2.17	2.31	2.17
399.3	429.3	2.00	2.18	2.14
417.0	447.0	1.69	1.93	2.02
434.7	464.7	1.49	1.68	1.82
452.4	482.4	1.50	1.69	1.80
470.1	500.1	1.71	1.80	1.73
487.8	517.8	1.67	1.60	1.48
505.5	535.5	1.65	1.42	1.35
523.2	553.2	1.62	1.32	1.31
540.9	570.9	1.77	1.35	1.25
558.6	588.6	1.76	1.22	1.15
576.3	606.3	1.57	1.04	0.94
593.9	623.9	1.55	0.96	0.84
611.6	641.6	1.40	0.84	0.77
629.3	659.3	1.46	0.81	0.69
647.0	677.0	1.34	0.78	0.75
664.7	694.7	1.22	0.83	0.88
682.4	712.4	1.41	1.00	1.04
700.1	730.1	1.46	1.14	1.23

REV. X2

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=200.1MHz (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)=400.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
190.0	10.1	5.10	10.0	20.1	4.61	390.0	10.1	5.96
185.4	14.7	5.11	19.7	29.8	4.46	380.3	19.8	5.89
180.8	19.3	5.06	29.5	39.6	4.39	370.5	29.6	5.82
176.2	23.9	4.99	39.2	49.3	4.44	360.8	39.3	5.79
171.5	28.6	4.99	49.0	59.1	4.48	351.0	49.1	5.76
166.9	33.2	4.93	58.7	68.8	4.45	341.3	58.8	5.73
162.3	37.8	4.91	68.5	78.6	4.50	331.5	68.6	5.72
157.7	42.4	4.90	78.2	88.3	4.54	321.8	78.3	5.79
153.1	47.0	4.92	87.9	98.0	4.53	312.1	88.0	5.78
148.5	51.6	4.88	97.7	107.8	4.55	302.3	97.8	5.74
143.8	56.3	4.82	107.4	117.5	4.57	292.6	107.5	5.77
139.2	60.9	4.86	117.2	127.3	4.57	282.8	117.3	5.76
134.6	65.5	4.84	126.9	137.0	4.56	273.1	127.0	5.75
130.0	70.1	4.85	136.7	146.8	4.60	263.3	136.8	5.80
125.4	74.7	4.86	146.4	156.5	4.68	253.6	146.5	5.87
120.8	79.3	4.87	156.2	166.3	4.70	243.8	156.3	5.85
116.2	83.9	4.86	165.9	176.0	4.65	234.1	166.0	5.83
111.5	88.6	4.86	175.6	185.7	4.66	224.4	175.7	5.87
106.9	93.2	4.85	185.4	195.5	4.73	214.6	185.5	5.88
102.3	97.8	4.81	195.1	205.2	4.68	204.9	195.2	5.87
97.7	102.4	4.83	204.9	215.0	4.64	195.1	205.0	5.90
93.1	107.0	4.85	214.6	224.7	4.70	185.4	214.7	5.89
88.5	111.6	4.87	224.4	234.5	4.68	175.6	224.5	5.88
83.8	116.3	4.86	234.1	244.2	4.69	165.9	234.2	5.83
79.2	120.9	4.86	243.8	253.9	4.85	156.2	243.9	5.86
74.6	125.5	4.83	253.6	263.7	5.00	146.4	253.7	5.87
70.0	130.1	4.84	263.3	273.4	4.95	136.7	263.4	5.89
65.4	134.7	4.82	273.1	283.2	5.02	126.9	273.2	5.99
60.8	139.3	4.84	282.8	292.9	5.03	117.2	282.9	6.04
56.2	143.9	4.85	292.6	302.7	4.90	107.4	292.7	5.95
51.5	148.6	4.85	302.3	312.4	4.94	97.7	302.4	6.01
46.9	153.2	4.86	312.1	322.2	4.95	87.9	312.2	6.09
42.3	157.8	4.85	321.8	331.9	4.82	78.2	321.9	6.00
37.7	162.4	4.85	331.5	341.6	4.84	68.5	331.6	5.90
33.1	167.0	4.85	341.3	351.4	4.78	58.7	341.4	5.73
28.5	171.6	4.89	351.0	361.1	4.71	49.0	351.1	5.65
23.8	176.3	4.88	360.8	370.9	4.84	39.2	360.9	5.55
19.2	180.9	4.85	370.5	380.6	4.85	29.5	370.6	5.48
14.6	185.5	4.95	380.3	390.4	4.78	19.7	380.4	5.63
10.0	190.1	5.07	390.0	400.1	4.88	10.0	390.1	5.70

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
0.1	70.00	73.00	76.00	59.41	60.91	63.34
1.0	70.00	73.00	76.00	59.03	60.66	63.06
5.0	70.00	73.00	76.00	58.89	60.53	62.89
10.0	70.00	73.00	71.81	58.55	60.07	62.11
27.8	59.55	60.37	61.04	56.36	54.09	53.18
45.5	55.47	56.19	56.92	51.16	49.68	48.12
63.2	52.61	53.48	54.35	48.26	46.39	45.78
80.9	50.41	51.48	52.27	45.04	44.31	44.15
98.6	48.77	49.63	50.02	43.07	42.64	42.47
133.9	45.76	46.16	46.42	40.12	40.26	39.90
151.6	44.86	45.75	46.13	39.99	39.94	39.27
169.3	42.34	43.16	43.64	40.08	39.54	38.66
187.0	41.14	41.18	41.43	41.05	39.70	38.29
204.7	40.29	40.81	41.25	39.39	38.34	37.07
222.4	40.15	39.92	39.95	38.86	37.68	36.30
240.1	42.00	40.71	40.47	37.16	35.44	34.49
257.8	46.62	43.74	41.23	38.41	33.92	31.87
275.5	49.17	45.26	41.86	40.33	35.17	31.87
293.2	47.31	45.08	42.73	41.94	35.84	32.56
310.9	42.95	41.85	39.92	44.89	36.15	32.23
346.3	38.07	38.29	37.67	37.26	31.84	27.66
363.9	36.65	37.51	37.76	33.32	28.80	25.97
381.6	36.50	37.27	38.23	32.19	28.16	25.57
399.3	36.66	36.44	36.58	31.14	26.73	24.44
417.0	37.96	38.40	38.32	29.63	25.13	22.70
434.7	37.75	37.39	35.87	29.16	24.91	21.54
452.4	38.83	38.60	36.46	27.81	23.88	20.71
470.1	39.10	38.73	36.24	27.39	24.03	20.53
487.8	38.51	37.68	34.22	26.86	23.40	19.74
505.5	36.94	35.26	32.10	25.79	22.16	18.24
523.2	34.72	32.56	29.40	24.54	21.54	17.36
540.9	33.62	31.16	28.10	22.96	19.56	15.84
558.6	31.82	29.62	26.89	21.51	18.44	15.08
576.3	30.08	27.80	25.16	20.18	17.19	14.04
593.9	27.97	25.68	23.51	18.56	15.52	12.88
611.6	25.43	23.83	22.03	16.92	14.74	12.35
629.3	23.69	22.44	21.08	15.48	13.76	11.82
647.0	20.82	20.07	19.04	13.67	12.43	10.76
664.7	19.82	19.14	18.40	13.19	11.83	10.48
682.4	19.11	18.44	17.62	12.86	11.55	10.03

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	38.46	37.04	36.30
27.8	57.8	30.78	31.01	31.12
45.5	75.5	26.97	27.09	27.30
63.2	93.2	24.78	24.94	25.21
80.9	110.9	23.19	23.52	23.76
98.6	128.6	22.18	22.38	22.48
116.3	146.3	21.62	22.00	22.08
133.9	163.9	20.89	21.26	21.53
151.6	181.6	20.49	21.04	21.60
169.3	199.3	20.42	20.84	21.25
187.0	217.0	21.20	21.42	21.66
204.7	234.7	21.82	22.20	22.49
222.4	252.4	22.71	23.54	24.22
240.1	270.1	23.18	24.33	25.62
257.8	287.8	23.45	24.46	25.78
275.5	305.5	21.98	22.69	23.59
293.2	323.2	20.09	20.52	20.85
310.9	340.9	18.61	18.73	18.62
328.6	358.6	17.37	17.29	17.27
346.3	376.3	16.51	16.51	16.53
363.9	393.9	15.88	15.69	15.77
381.6	411.6	15.87	15.76	15.87
399.3	429.3	15.97	15.83	15.62
417.0	447.0	16.40	16.30	15.97
434.7	464.7	16.13	16.05	15.70
452.4	482.4	15.72	15.62	15.10
470.1	500.1	14.95	14.73	14.23
487.8	517.8	14.20	13.78	13.38
505.5	535.5	13.60	13.03	12.82
523.2	553.2	12.84	12.36	12.25
540.9	570.9	12.07	11.65	11.43
558.6	588.6	11.37	10.98	10.70
576.3	606.3	10.46	10.01	9.58
593.9	623.9	9.64	9.22	8.87
611.6	641.6	8.64	8.26	7.98
629.3	659.3	7.80	7.47	7.26
647.0	677.0	7.13	6.82	6.66
664.7	694.7	6.48	6.21	6.05
682.4	712.4	6.14	5.94	5.82
700.1	730.1	5.81	5.62	5.47

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Frequency Mixer

ZP-3MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=400.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
5.0	35.0	1.51	1.33	1.21	5.0	1.05	1.72	2.63	5.0	1.69	1.54	1.45
10.0	40.0	1.52	1.33	1.22	10.0	1.04	1.65	2.54	10.0	1.69	1.54	1.45
27.8	57.8	1.39	1.25	1.16	27.8	1.33	2.10	3.10	20.0	2.46	1.74	1.38
45.5	75.5	1.42	1.27	1.17	45.5	1.35	2.14	3.15	30.0	2.42	1.74	1.38
63.2	93.2	1.37	1.22	1.14	63.2	1.31	2.02	2.94	40.0	2.23	1.60	1.27
80.9	110.9	1.34	1.22	1.14	80.9	1.29	1.96	2.84	50.0	2.13	1.56	1.23
98.6	128.6	1.30	1.19	1.13	98.6	1.30	1.99	2.84	60.0	2.07	1.52	1.21
116.3	146.3	1.30	1.19	1.11	116.3	1.33	2.03	2.92	70.0	2.08	1.53	1.23
133.9	163.9	1.30	1.19	1.13	133.9	1.38	2.09	3.01	80.0	2.22	1.64	1.30
151.6	181.6	1.31	1.17	1.10	151.6	1.38	2.07	2.94	90.0	2.32	1.70	1.37
169.3	199.3	1.29	1.19	1.12	169.3	1.38	2.01	2.84	100.0	2.40	1.78	1.43
187.0	217.0	1.25	1.17	1.12	187.0	1.40	2.08	2.90	110.0	2.46	1.81	1.47
204.7	234.7	1.21	1.11	1.07	204.7	1.41	2.06	2.90	120.0	2.40	1.78	1.45
222.4	252.4	1.25	1.11	1.07	222.4	1.48	2.13	2.98	130.0	2.34	1.73	1.41
240.1	270.1	1.25	1.13	1.06	240.1	1.54	2.15	2.96	140.0	2.31	1.72	1.40
257.8	287.8	1.20	1.12	1.06	257.8	1.55	2.16	2.94	150.0	2.32	1.74	1.42
275.5	305.5	1.18	1.10	1.05	275.5	1.55	2.25	3.06	160.0	2.36	1.81	1.48
293.2	323.2	1.18	1.11	1.06	293.2	1.54	2.14	2.95	170.0	2.41	1.86	1.54
310.9	340.9	1.23	1.15	1.10	310.9	1.59	2.21	3.02	180.0	2.46	1.88	1.58
328.6	358.6	1.34	1.22	1.18	328.6	1.64	2.23	3.02	190.0	2.48	1.90	1.59
346.3	376.3	1.51	1.35	1.28	346.3	1.70	2.22	2.97	200.0	2.46	1.90	1.59
363.9	393.9	1.72	1.50	1.37	363.9	1.80	2.34	3.13	210.0	2.42	1.89	1.60
381.6	411.6	1.83	1.59	1.41	381.6	1.83	2.32	3.02	220.0	2.44	1.90	1.61
399.3	429.3	1.87	1.67	1.46	399.3	1.86	2.44	3.14	230.0	2.45	1.92	1.63
417.0	447.0	2.06	1.85	1.64	417.0	1.91	2.56	3.27	240.0	2.46	1.95	1.66
434.7	464.7	2.14	1.95	1.74	434.7	1.88	2.50	3.22	250.0	2.43	1.95	1.68
452.4	482.4	2.17	1.96	1.76	452.4	1.92	2.60	3.31	260.0	2.37	1.92	1.68
470.1	500.1	2.06	1.87	1.73	470.1	1.88	2.48	3.15	270.0	2.37	1.91	1.67
487.8	517.8	1.99	1.84	1.76	487.8	1.87	2.48	3.17	280.0	2.40	1.93	1.68
505.5	535.5	2.09	1.97	1.91	505.5	1.92	2.56	3.22	290.0	2.43	1.97	1.72
523.2	553.2	2.11	2.02	1.97	523.2	1.89	2.48	3.11	300.0	2.42	1.99	1.77
540.9	570.9	2.07	2.00	1.97	540.9	1.90	2.49	3.06	310.0	2.41	1.98	1.76
558.6	588.6	2.04	2.01	1.99	558.6	1.88	2.41	2.93	320.0	2.39	1.96	1.74
576.3	606.3	2.08	2.08	2.06	576.3	1.88	2.37	2.88	330.0	2.34	1.93	1.72
593.9	623.9	2.16	2.14	2.13	593.9	1.91	2.40	2.86	340.0	2.28	1.91	1.71
611.6	641.6	2.18	2.17	2.15	611.6	1.90	2.34	2.79	350.0	2.26	1.88	1.70
629.3	659.3	2.14	2.15	2.15	629.3	1.93	2.35	2.77	360.0	2.31	1.89	1.70
647.0	677.0	2.14	2.15	2.14	647.0	1.99	2.39	2.78	370.0	2.36	1.94	1.73
664.7	694.7	2.14	2.15	2.14	664.7	1.98	2.35	2.74	380.0	2.35	1.95	1.76
682.4	712.4	2.15	2.13	2.12	682.4	2.01	2.39	2.77	390.0	2.28	1.91	1.74
700.1	730.1	2.12	2.09	2.07	700.1	1.99	2.36	2.74	400.0	2.34	1.97	1.82

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	21	33	20	43	34	51	38	45	39	50
1	-	17	+0	24	12	36	29	46	37	47	41	53
2	92	49	40	49	42	44	41	60	53	55	46	57
3	>100	43	38	45	43	49	40	58	52	51	46	51
4	>100	62	59	53	53	53	52	60	57	76	65	78
5	>100	65	54	49	46	54	46	56	47	61	58	62
6	>100	75	77	76	80	64	63	62	61	66	70	69
7	>100	76	>99	76	70	59	61	64	61	67	63	89
8	>100	87	83	94	88	75	74	69	90	66	65	72
9	>100	80	78	80	77	78	67	64	67	72	69	72
10	>100	88	89	88	91	89	86	83	77	74	85	75
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; 4.00 dBm.

LO IN: 230.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -1.32 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	12	23	8	30	25	34	22	33	29	37
1	-	17	+0	23	11	34	30	39	36	41	32	43
2	>100	50	48	47	48	49	47	65	54	62	59	62
3	>100	80	72	74	59	64	58	78	60	65	57	67
4	>100	>89	76	76	73	73	70	74	77	85	72	86
5	>100	>89	84	>89	85	>89	80	83	80	87	>89	88
6	>100	>89	>89	>89	>89	>89	79	>89	>89	>89	>89	>89
7	>100	>89	>89	>89	>89	>89	>89	81	>89	>89	>89	>89
8	>100	>89	>89	>89	>89	>89	>89	88	67	88	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	>89	80	>89	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; -6.00 dBm.

LO IN: 230.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -11.3 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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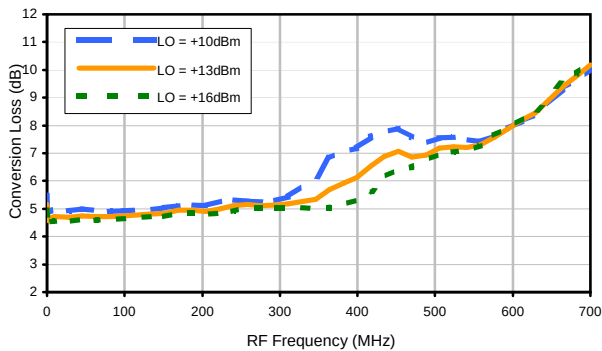


Frequency Mixer

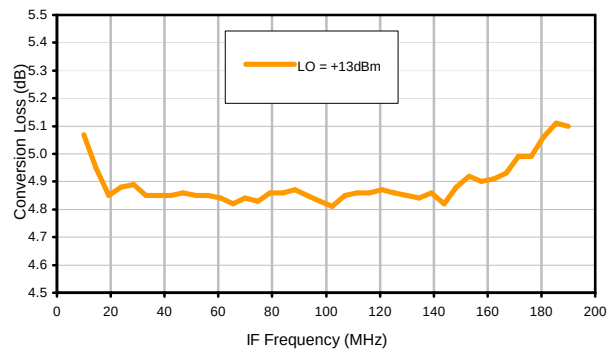
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Typical Performance Curves

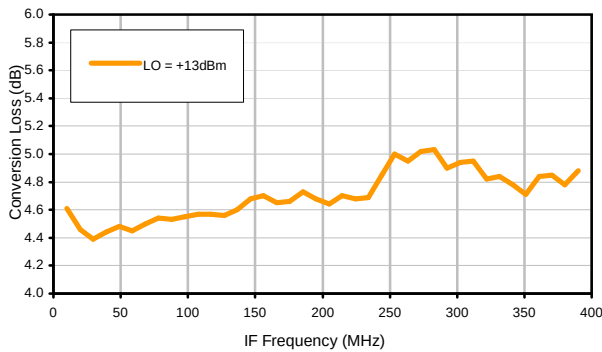
Conversion Loss @ IF=30MHz



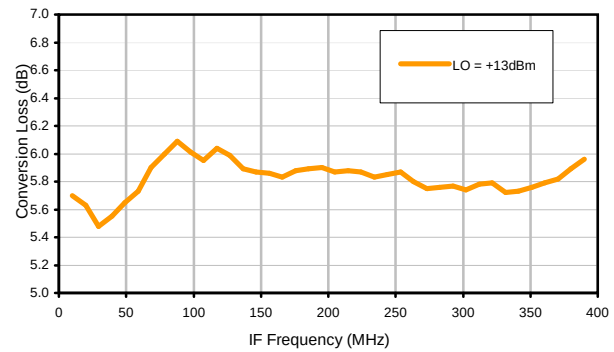
Conversion Loss vs. IF @ RF=200.1MHz



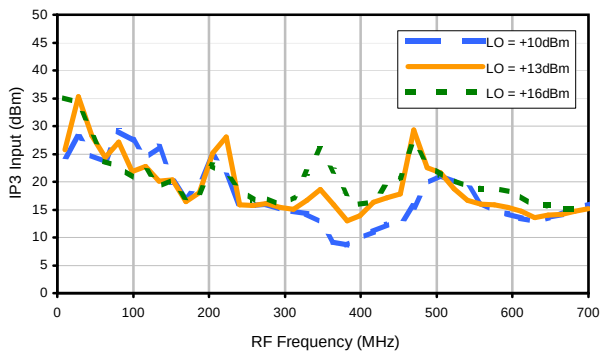
Conversion Loss vs. IF @ RF=10.1MHz



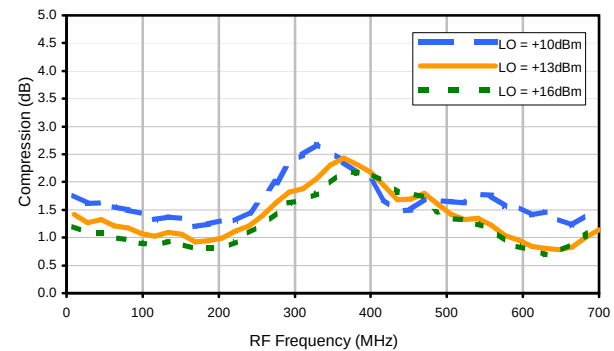
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input



Compression @ RF IN=+9dBm



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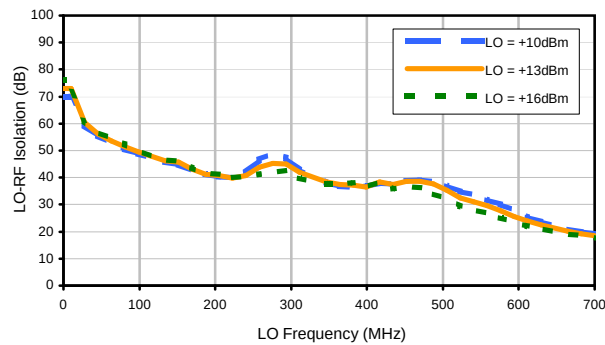
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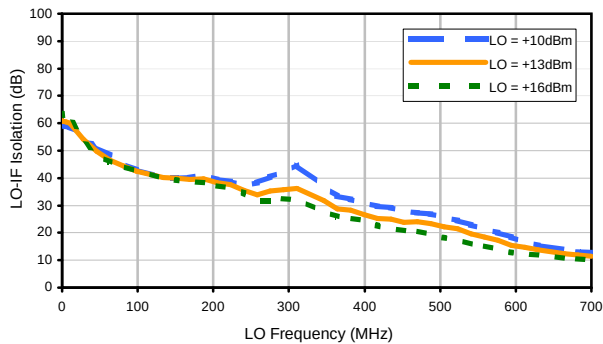
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Typical Performance Curves

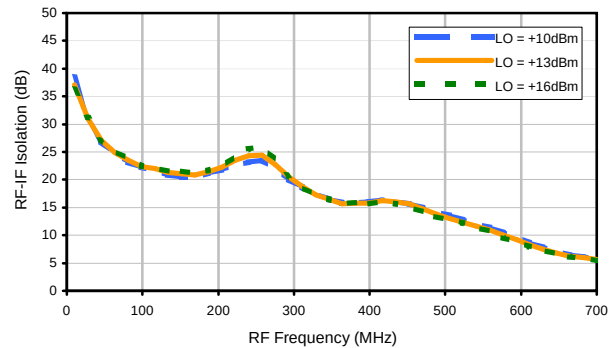
LO-RF Isolation



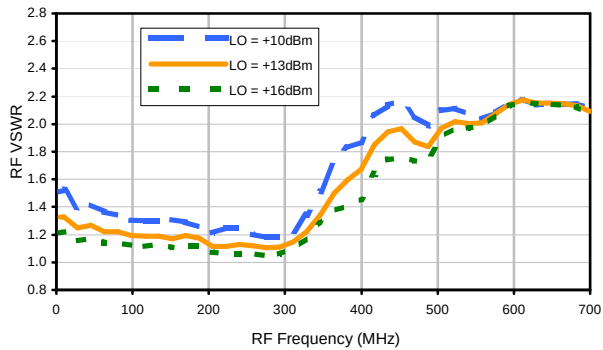
LO-IF Isolation



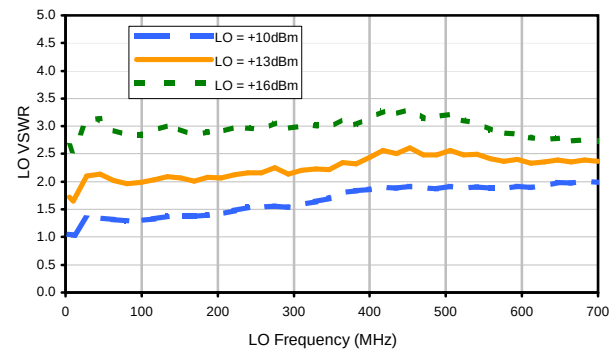
RF-IF Isolation



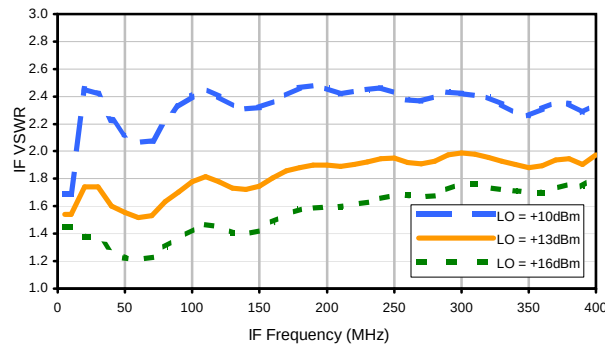
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	21	33	20	43	34	51	38	45	39	50
1	-	17	+0	24	12	36	29	46	37	47	41	53
2	92	49	40	49	42	44	41	60	53	55	46	57
3	>100	43	38	45	43	49	40	58	52	51	46	51
4	>100	62	59	53	53	53	52	60	57	76	65	78
5	>100	65	54	49	46	54	46	56	47	61	58	62
6	>100	75	77	76	80	64	63	62	61	66	70	69
7	>100	76	>99	76	70	59	61	64	61	67	63	89
8	>100	87	83	94	88	75	74	69	90	66	65	72
9	>100	80	78	80	77	78	67	64	67	72	69	72
10	>100	88	89	88	91	89	86	83	77	74	85	75
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; 4.00 dBm.

LO IN: 230.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -1.32 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	12	23	8	30	25	34	22	33	29	37
1	-	17	+0	23	11	34	30	39	36	41	32	43
2	>100	50	48	47	48	49	47	65	54	62	59	62
3	>100	80	72	74	59	64	58	78	60	65	57	67
4	>100	>89	76	76	73	73	70	74	77	85	72	86
5	>100	>89	84	>89	85	>89	80	83	80	87	>89	88
6	>100	>89	>89	>89	>89	>89	79	>89	>89	>89	>89	>89
7	>100	>89	>89	>89	>89	>89	>89	81	>89	>89	>89	>89
8	>100	>89	>89	>89	>89	>89	>89	88	67	88	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	>89	80	>89	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; -6.00 dBm.

LO IN: 230.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -11.3 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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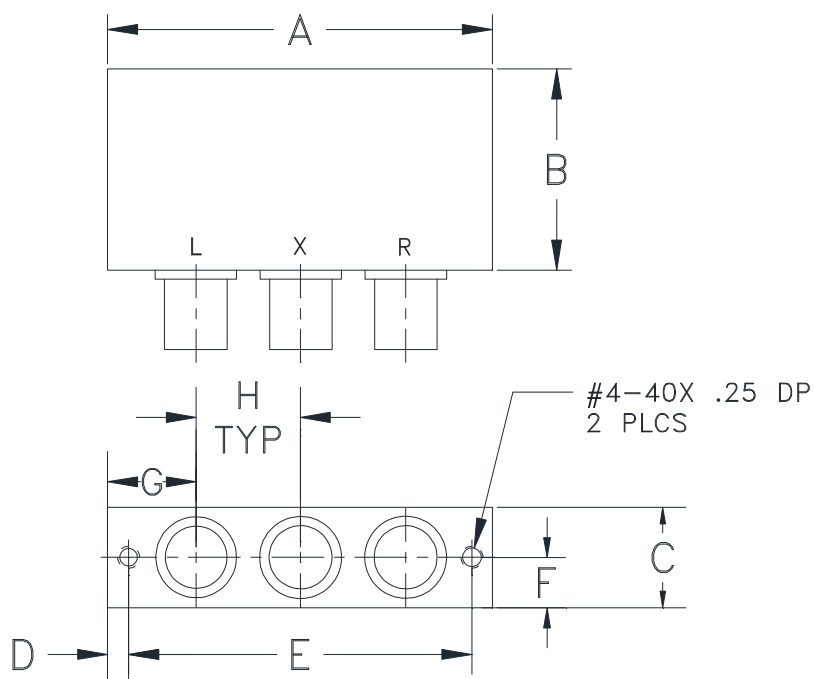


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Outline Dimensions

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