

Coaxial Frequency Mixer

Level 17 (LO Power +17 dBm) 0.15 to 400 MHz

Maximum Ratings

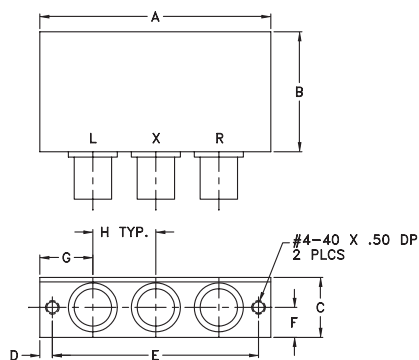
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

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, 50 dB typ., L-I, 45 dB typ.
- rugged shielded case

Applications

- VHF/UHF
- defense & federal communications
- instrumentation



BNC version shown
CASE STYLE: GG60

Connectors	Model
BNC	ZP-3H+
SMA	ZP-3H-S(+)

+RoHS Compliant

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

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	50	35	40	30	60	40	45	25	35	20

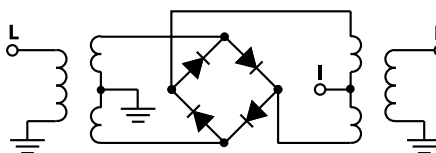
1 dB COMP.: +14 dBm typ.

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 +17dBm	LO +17dBm	LO	LO +17dBm	LO +17dBm	LO +17dBm
0.15	30.15	5.73	1.50	10.00	82.56	73.10	1.50
0.30	30.30	5.50	1.42	20.00	77.94	72.84	1.49
0.50	30.50	5.40	1.41	40.00	73.33	71.28	1.46
0.75	30.75	5.32	1.41	50.00	71.91	69.09	1.49
1.00	31.00	5.29	1.41	68.00	70.74	64.21	1.48
2.80	32.80	5.15	1.42	86.00	70.55	58.19	1.45
10.00	40.00	5.07	1.36	104.00	68.91	54.46	1.47
20.00	50.00	5.01	1.35	122.00	69.27	51.05	1.48
38.00	68.00	4.98	1.35	140.00	65.14	48.62	1.50
56.00	86.00	4.96	1.29	176.00	69.38	45.57	1.52
110.00	140.00	5.08	1.26	212.00	58.50	42.60	1.55
128.00	158.00	5.07	1.25	230.00	54.52	41.38	1.56
164.00	194.00	5.10	1.19	255.00	55.28	41.47	1.61
200.00	230.00	5.24	1.16	280.00	56.41	41.92	1.60
250.00	280.00	5.41	1.11	305.00	51.98	40.69	1.64
300.00	330.00	5.43	1.00	330.00	48.01	38.86	1.66
325.00	355.00	5.40	1.05	355.00	49.07	36.77	1.65
350.00	380.00	5.46	1.08	380.00	53.89	34.86	1.74
375.00	405.00	5.63	1.15	405.00	51.11	33.11	1.90
400.00	430.00	6.10	1.28	430.00	47.28	33.20	1.89

Electrical Schematic



Notes

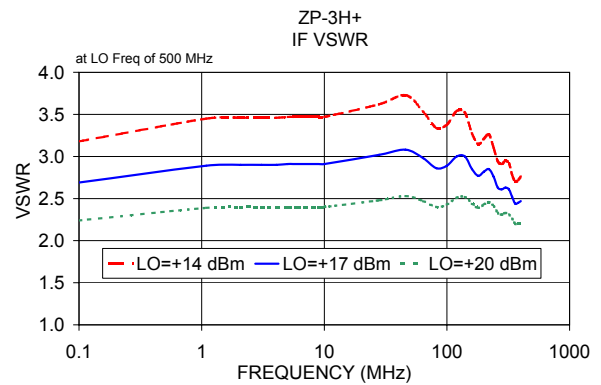
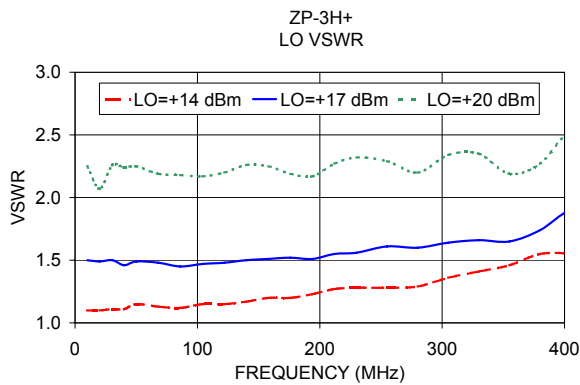
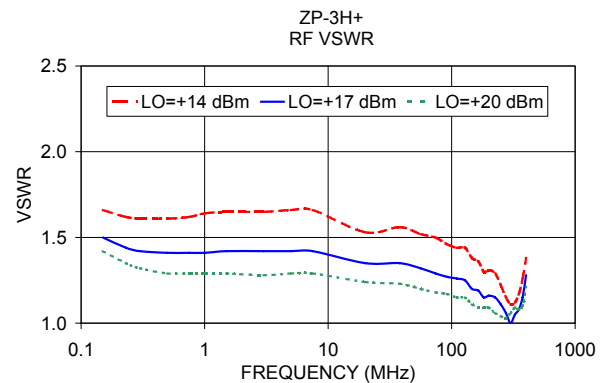
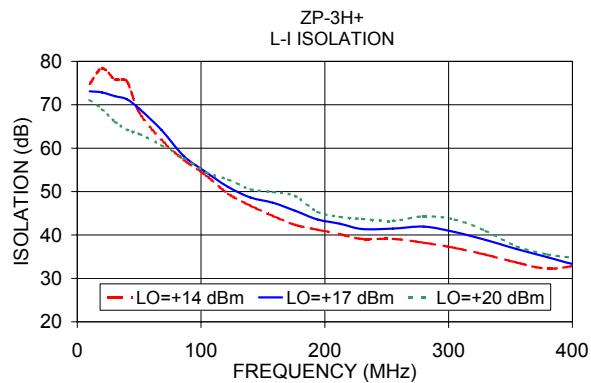
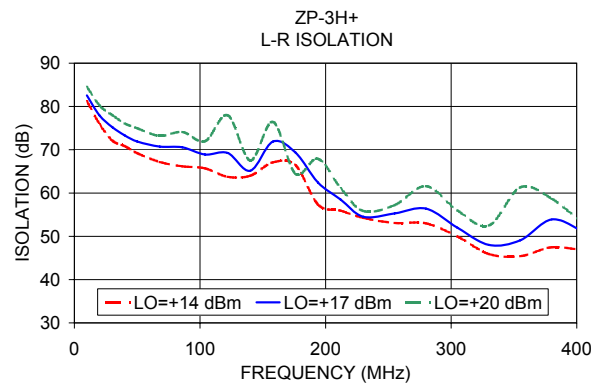
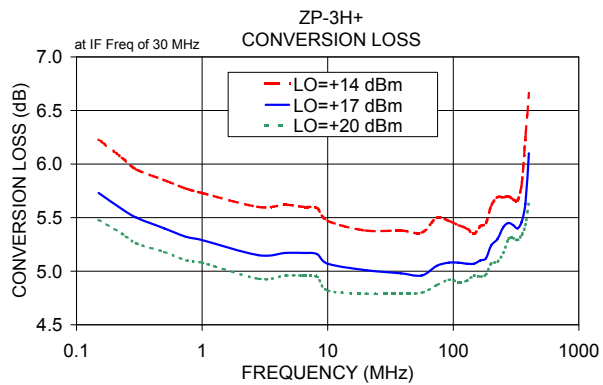
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Performance Charts



Notes

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Frequency Mixer

ZP-3H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
0.1	30.1	5.71	5.43	5.26
5.0	35.0	5.24	4.99	4.92
10.0	40.0	5.17	4.91	4.78
30.6	60.6	5.65	5.18	4.95
51.1	81.1	5.56	5.17	4.99
71.6	101.6	5.51	5.15	4.98
92.1	122.1	5.61	5.19	5.01
112.5	142.5	5.52	5.17	5.01
133.0	163.0	5.53	5.20	5.06
153.5	183.5	5.61	5.28	5.11
174.0	204.0	5.55	5.26	5.12
194.5	224.5	5.57	5.21	5.08
215.0	245.0	5.70	5.33	5.13
256.0	286.0	5.89	5.62	5.42
276.4	306.4	5.83	5.59	5.43
296.9	326.9	5.78	5.53	5.38
317.4	347.4	5.83	5.54	5.38
337.9	367.9	5.91	5.52	5.37
358.4	388.4	6.15	5.63	5.44
378.9	408.9	6.38	5.89	5.59
399.4	429.4	6.43	6.09	5.80
419.9	449.9	6.63	6.33	6.10
440.3	470.3	6.92	6.60	6.36
460.8	490.8	7.31	6.95	6.67
481.3	511.3	7.85	7.42	6.99
501.8	531.8	8.52	7.94	7.27
522.3	552.3	9.14	8.28	7.22
542.8	572.8	9.47	8.20	6.83
563.3	593.3	9.52	7.90	6.48
583.8	613.8	9.27	7.43	6.48
604.2	634.2	8.98	7.20	6.54
624.7	654.7	8.67	7.28	6.75
645.2	675.2	8.64	7.46	7.00
665.7	695.7	8.59	7.66	7.27
686.2	716.2	8.69	7.89	7.52
706.7	736.7	8.82	8.19	7.82
727.2	757.2	9.07	8.45	8.09
768.1	798.1	9.37	8.80	8.51
829.6	859.6	10.42	9.55	9.37
850.1	880.1	10.72	10.00	9.84

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	29.35	31.52	31.15
30.6	60.6	27.76	29.93	28.56
51.1	81.1	30.49	27.55	27.71
71.6	101.6	28.00	26.25	29.63
92.1	122.1	24.25	25.69	32.79
112.5	142.5	28.00	32.52	28.86
133.0	163.0	23.07	28.48	26.16
153.5	183.5	25.72	29.72	28.98
174.0	204.0	29.80	25.81	24.59
194.5	224.5	31.04	24.15	23.06
215.0	245.0	24.52	23.15	23.02
235.5	265.5	23.66	21.59	21.99
256.0	286.0	25.94	23.53	22.48
276.4	306.4	29.14	27.61	26.68
296.9	326.9	30.11	28.87	26.78
317.4	347.4	30.10	24.59	23.34
337.9	367.9	21.84	21.96	22.31
358.4	388.4	18.94	22.12	22.18
378.9	408.9	15.23	16.74	20.48
399.4	429.4	14.46	14.09	17.09
419.9	449.9	13.96	12.94	13.44
440.3	470.3	13.54	12.79	12.66
460.8	490.8	13.13	12.74	12.82
481.3	511.3	12.71	12.82	13.54
501.8	531.8	12.38	13.04	14.59
522.3	552.3	12.77	14.10	16.62
542.8	572.8	13.27	14.88	19.27
563.3	593.3	13.66	16.12	23.77
583.8	613.8	14.51	19.45	26.26
604.2	634.2	15.87	23.91	29.02
624.7	654.7	19.00	26.81	28.99
645.2	675.2	22.73	27.01	27.54
665.7	695.7	24.76	26.90	25.50
686.2	716.2	23.51	25.56	25.23
706.7	736.7	24.92	24.89	26.02
727.2	757.2	24.47	24.56	25.60
768.1	798.1	23.49	24.88	26.82
788.6	818.6	24.15	26.97	28.98
829.6	859.6	21.98	27.73	32.45
850.1	880.1	21.40	24.66	30.00

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	1.41	0.94	0.68
30.6	60.6	1.14	0.80	0.59
51.1	81.1	1.16	0.79	0.57
71.6	101.6	1.23	0.79	0.55
92.1	122.1	1.18	0.74	0.51
112.5	142.5	1.14	0.68	0.47
133.0	163.0	1.08	0.66	0.47
153.5	183.5	1.09	0.64	0.46
174.0	204.0	1.05	0.60	0.43
194.5	224.5	1.10	0.70	0.52
215.0	245.0	0.98	0.68	0.52
235.5	265.5	0.92	0.55	0.45
256.0	286.0	1.05	0.56	0.45
276.4	306.4	1.24	0.71	0.55
296.9	326.9	1.44	0.85	0.63
317.4	347.4	1.62	1.03	0.71
337.9	367.9	1.78	1.29	0.82
358.4	388.4	1.76	1.44	0.94
378.9	408.9	1.89	1.53	1.11
399.4	429.4	2.13	1.67	1.28
419.9	449.9	2.34	1.91	1.45
440.3	470.3	2.32	1.94	1.55
460.8	490.8	2.14	1.73	1.39
481.3	511.3	1.69	1.32	1.04
501.8	531.8	1.19	0.90	0.75
522.3	552.3	0.63	0.54	0.70
542.8	572.8	0.32	0.51	0.96
563.3	593.3	0.32	0.77	1.20
583.8	613.8	0.59	1.16	1.21
604.2	634.2	1.03	1.43	1.23
624.7	654.7	1.34	1.40	1.11
645.2	675.2	1.56	1.31	1.00
665.7	695.7	1.60	1.21	0.93
686.2	716.2	1.65	1.13	0.91
706.7	736.7	1.44	1.03	0.88
727.2	757.2	1.43	0.95	0.82
768.1	798.1	1.20	0.74	0.63
788.6	818.6	1.20	0.66	0.52
829.6	859.6	1.09	0.56	0.38
850.1	880.1	0.98	0.51	0.31

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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)=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)
		+17			+17			+17
190.0	10.1	5.46	10.0	20.1	5.01	390.0	10.1	6.13
185.4	14.7	5.48	19.7	29.8	4.96	380.3	19.8	6.06
180.8	19.3	5.42	29.5	39.6	4.86	370.5	29.6	5.99
176.2	23.9	5.34	39.2	49.3	4.92	360.8	39.3	5.92
171.5	28.6	5.36	49.0	59.1	4.97	351.0	49.1	5.87
166.9	33.2	5.30	58.7	68.8	4.90	341.3	58.8	5.80
162.3	37.8	5.29	68.5	78.6	4.99	331.5	68.6	5.74
157.7	42.4	5.30	78.2	88.3	5.04	321.8	78.3	5.79
153.1	47.0	5.34	87.9	98.0	5.02	312.1	88.0	5.72
148.5	51.6	5.27	97.7	107.8	5.03	302.3	97.8	5.62
143.8	56.3	5.21	107.4	117.5	5.08	292.6	107.5	5.65
139.2	60.9	5.24	117.2	127.3	5.08	282.8	117.3	5.64
134.6	65.5	5.19	126.9	137.0	5.11	273.1	127.0	5.62
130.0	70.1	5.18	136.7	146.8	5.10	263.3	136.8	5.60
125.4	74.7	5.25	146.4	156.5	5.17	253.6	146.5	5.64
120.8	79.3	5.20	156.2	166.3	5.22	243.8	156.3	5.63
116.2	83.9	5.18	165.9	176.0	5.19	234.1	166.0	5.62
111.5	88.6	5.18	175.6	185.7	5.23	224.4	175.7	5.69
106.9	93.2	5.15	185.4	195.5	5.29	214.6	185.5	5.72
102.3	97.8	5.08	195.1	205.2	5.20	204.9	195.2	5.72
97.7	102.4	5.10	204.9	215.0	5.23	195.1	205.0	5.77
93.1	107.0	5.15	214.6	224.7	5.22	185.4	214.7	5.84
88.5	111.6	5.14	224.4	234.5	5.19	175.6	224.5	5.84
83.8	116.3	5.14	234.1	244.2	5.27	165.9	234.2	5.84
79.2	120.9	5.14	243.8	253.9	5.33	156.2	243.9	5.91
74.6	125.5	5.10	253.6	263.7	5.45	146.4	253.7	5.89
70.0	130.1	5.09	263.3	273.4	5.48	136.7	263.4	5.82
65.4	134.7	5.10	273.1	283.2	5.46	126.9	273.2	5.81
60.8	139.3	5.13	282.8	292.9	5.51	117.2	282.9	5.79
56.2	143.9	5.15	292.6	302.7	5.51	107.4	292.7	5.72
51.5	148.6	5.17	302.3	312.4	5.50	97.7	302.4	5.72
46.9	153.2	5.18	312.1	322.2	5.60	87.9	312.2	5.74
42.3	157.8	5.16	321.8	331.9	5.60	78.2	321.9	5.74
37.7	162.4	5.15	331.5	341.6	5.54	68.5	331.6	5.74
33.1	167.0	5.16	341.3	351.4	5.51	58.7	341.4	5.76
28.5	171.6	5.17	351.0	361.1	5.50	49.0	351.1	5.81
23.8	176.3	5.20	360.8	370.9	5.48	39.2	360.9	5.82
19.2	180.9	5.21	370.5	380.6	5.45	29.5	370.6	5.83
14.6	185.5	5.27	380.3	390.4	5.48	19.7	380.4	5.89
10.0	190.1	5.30	390.0	400.1	5.49	10.0	390.1	5.97

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
0.1	64.78	66.42	66.35	68.59	66.28	63.03
5.0	60.18	61.64	63.09	64.99	64.07	62.71
10.0	59.08	60.33	61.40	61.56	61.62	60.74
30.6	71.60	74.47	77.21	60.61	56.39	54.07
51.1	69.13	73.22	78.25	57.25	52.88	50.58
71.6	67.99	72.62	77.65	53.85	50.40	47.96
92.1	68.20	76.87	77.22	51.78	48.75	46.56
112.5	69.20	76.84	76.17	49.54	46.71	44.72
133.0	67.22	74.79	65.19	45.80	44.19	42.83
153.5	71.99	77.06	68.10	44.93	43.62	41.91
174.0	74.28	69.16	65.89	42.23	42.31	41.41
194.5	90.00	60.27	56.07	39.48	39.83	39.83
215.0	68.35	62.08	56.68	38.49	38.79	38.51
256.0	59.64	63.30	63.48	35.60	35.36	35.47
276.4	57.49	64.15	66.74	35.35	36.09	35.75
296.9	55.73	59.70	57.44	33.98	35.20	35.49
317.4	51.74	54.74	54.42	32.89	34.51	35.30
337.9	46.20	46.88	47.18	32.09	34.56	36.04
358.4	45.67	46.29	48.30	30.55	32.64	34.19
378.9	44.00	43.91	46.02	29.03	31.36	33.26
399.4	46.22	43.90	47.26	27.97	29.46	31.37
419.9	51.68	47.25	48.32	28.85	28.48	29.71
440.3	51.96	48.19	47.66	28.47	28.22	28.50
460.8	56.15	51.92	49.84	28.56	28.47	28.32
481.3	58.49	51.66	47.42	28.32	28.70	28.87
501.8	51.33	49.16	46.75	27.84	28.25	28.40
522.3	48.59	46.52	43.75	28.00	28.68	28.69
542.8	44.79	43.81	42.12	27.62	28.45	28.58
563.3	43.06	42.32	40.82	27.64	28.42	28.45
583.8	40.59	40.05	40.28	27.89	28.45	28.58
604.2	40.24	40.37	40.98	28.07	28.19	28.45
624.7	38.47	37.92	37.82	28.40	27.53	28.00
645.2	37.89	37.53	37.88	28.45	26.98	27.44
665.7	36.50	35.38	34.97	27.78	26.11	26.50
686.2	35.71	35.01	35.43	26.88	25.51	25.95
706.7	34.73	33.70	33.09	26.04	25.06	25.09
727.2	34.31	33.55	33.27	26.52	25.24	24.88
768.1	34.23	32.56	31.66	28.93	25.94	24.56
829.6	32.20	30.66	28.99	25.41	24.26	22.38
850.1	29.75	29.36	27.68	23.02	23.64	21.98

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	40.80	41.23	41.18
30.6	60.6	32.31	32.48	32.83
51.1	81.1	28.31	28.70	28.90
71.6	101.6	25.80	26.19	26.57
92.1	122.1	24.33	24.83	25.15
112.5	142.5	23.04	23.55	24.02
133.0	163.0	22.40	22.73	22.93
153.5	183.5	21.97	22.75	23.21
174.0	204.0	21.35	22.15	22.72
194.5	224.5	21.12	21.95	22.61
215.0	245.0	21.14	21.69	22.33
235.5	265.5	21.96	22.24	22.55
256.0	286.0	23.12	23.48	23.59
276.4	306.4	23.35	23.99	24.28
296.9	326.9	23.18	24.18	25.32
317.4	347.4	21.98	23.11	24.46
337.9	367.9	20.17	20.95	21.72
358.4	388.4	18.70	19.17	19.42
378.9	408.9	17.62	17.66	17.50
399.4	429.4	16.83	16.62	16.25
419.9	449.9	16.34	16.08	15.61
440.3	470.3	15.58	15.31	14.95
460.8	490.8	15.37	15.01	14.71
481.3	511.3	15.20	14.96	14.80
501.8	531.8	15.33	15.11	14.90
522.3	552.3	16.10	15.85	15.53
542.8	572.8	16.53	16.17	15.64
563.3	593.3	16.83	16.21	15.52
583.8	613.8	16.52	15.77	15.12
604.2	634.2	15.82	14.94	14.39
624.7	654.7	14.88	14.17	13.81
645.2	675.2	14.02	13.43	13.14
665.7	695.7	13.10	12.75	12.50
686.2	716.2	12.48	12.13	11.89
706.7	736.7	11.76	11.46	11.22
727.2	757.2	11.15	10.78	10.59
768.1	798.1	10.08	9.56	9.22
788.6	818.6	9.48	8.90	8.60
829.6	859.6	8.58	7.89	7.44
850.1	880.1	8.04	7.40	6.93

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Frequency Mixer

ZP-3H+

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)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
5.0	35.0	1.66	1.40	1.24	5.0	1.32	1.51	2.55	5.0	1.78	1.56	1.47
10.1	40.1	1.48	1.29	1.19	10.1	1.09	1.44	2.11	10.0	2.72	2.14	1.75
30.6	60.6	1.53	1.32	1.21	30.6	1.10	1.53	2.32	20.0	2.62	2.05	1.67
51.1	81.1	1.49	1.31	1.20	51.1	1.09	1.52	2.28	30.0	2.60	2.06	1.67
71.6	101.6	1.48	1.30	1.19	71.6	1.12	1.48	2.16	40.0	2.41	1.90	1.55
92.1	122.1	1.49	1.29	1.17	92.1	1.11	1.45	2.15	50.0	2.31	1.84	1.50
112.5	142.5	1.42	1.24	1.13	112.5	1.15	1.48	2.17	60.0	2.26	1.80	1.47
133.0	163.0	1.42	1.25	1.14	133.0	1.19	1.53	2.25	70.0	2.27	1.81	1.49
153.5	183.5	1.42	1.25	1.13	153.5	1.15	1.52	2.21	80.0	2.43	1.92	1.58
174.0	204.0	1.35	1.19	1.09	174.0	1.20	1.51	2.15	90.0	2.49	1.98	1.62
194.5	224.5	1.36	1.16	1.07	194.5	1.25	1.53	2.17	100.0	2.58	2.05	1.69
215.0	245.0	1.37	1.18	1.07	215.0	1.24	1.56	2.23	110.0	2.63	2.10	1.73
235.5	265.5	1.34	1.20	1.09	235.5	1.29	1.61	2.26	120.0	2.58	2.05	1.70
256.0	286.0	1.29	1.17	1.09	256.0	1.30	1.63	2.25	130.0	2.51	1.99	1.64
276.4	306.4	1.25	1.12	1.06	276.4	1.29	1.62	2.25	140.0	2.48	1.97	1.63
296.9	326.9	1.18	1.06	1.05	296.9	1.35	1.63	2.26	150.0	2.51	1.99	1.65
317.4	347.4	1.16	1.01	1.10	317.4	1.40	1.68	2.31	160.0	2.56	2.04	1.70
337.9	367.9	1.16	1.04	1.14	337.9	1.44	1.70	2.30	170.0	2.59	2.07	1.74
358.4	388.4	1.21	1.07	1.15	358.4	1.54	1.73	2.28	180.0	2.59	2.09	1.76
378.9	408.9	1.26	1.09	1.13	378.9	1.58	1.80	2.32	190.0	2.61	2.10	1.78
399.4	429.4	1.29	1.17	1.15	399.4	1.56	1.87	2.42	200.0	2.63	2.10	1.78
419.9	449.9	1.35	1.26	1.21	419.9	1.54	1.94	2.53	210.0	2.64	2.10	1.78
440.3	470.3	1.42	1.36	1.30	440.3	1.53	1.94	2.56	220.0	2.67	2.12	1.80
460.8	490.8	1.55	1.48	1.42	460.8	1.55	1.97	2.59	230.0	2.70	2.15	1.83
481.3	511.3	1.69	1.61	1.54	481.3	1.55	1.92	2.53	240.0	2.71	2.18	1.85
501.8	531.8	1.87	1.78	1.66	501.8	1.57	1.93	2.56	250.0	2.70	2.17	1.86
522.3	552.3	2.04	1.90	1.73	522.3	1.58	1.94	2.56	260.0	2.66	2.15	1.85
542.8	572.8	2.17	1.96	1.75	542.8	1.61	1.92	2.52	270.0	2.66	2.14	1.84
563.3	593.3	2.25	2.00	1.80	563.3	1.63	1.89	2.48	280.0	2.73	2.17	1.87
583.8	613.8	2.27	2.00	1.87	583.8	1.65	1.89	2.49	290.0	2.81	2.24	1.91
604.2	634.2	2.31	2.06	1.97	604.2	1.66	1.88	2.52	300.0	2.87	2.29	1.96
624.7	654.7	2.34	2.17	2.09	624.7	1.69	1.89	2.54	310.0	2.88	2.30	1.98
645.2	675.2	2.39	2.27	2.20	645.2	1.73	1.94	2.58	320.0	2.86	2.27	1.96
665.7	695.7	2.45	2.36	2.31	665.7	1.84	1.99	2.60	330.0	2.82	2.24	1.93
686.2	716.2	2.51	2.43	2.38	686.2	1.97	2.10	2.70	340.0	2.82	2.23	1.91
706.7	736.7	2.55	2.49	2.43	706.7	2.14	2.22	2.79	350.0	2.84	2.24	1.91
727.2	757.2	2.60	2.53	2.48	727.2	2.36	2.34	2.86	360.0	2.89	2.27	1.94
768.1	798.1	2.66	2.55	2.48	768.1	2.92	2.62	3.01	370.0	2.96	2.33	1.98
788.6	818.6	2.70	2.57	2.49	788.6	3.15	2.78	3.13	380.0	2.99	2.36	2.01
829.6	859.6	2.84	2.62	2.53	829.6	3.73	3.18	3.42	390.0	2.97	2.35	2.01
850.1	880.1	2.86	2.67	2.57	850.1	4.62	3.46	3.48	400.0	2.91	2.35	2.05

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	35	18	36	20	54	25	41	41	52
1	-	16	+0	25	13	38	24	36	38	48	30	51
2	98	63	54	62	51	76	54	65	48	68	55	62
3	>100	52	53	56	58	61	50	56	49	79	55	71
4	>100	83	79	81	77	80	71	76	71	81	77	79
5	>100	78	77	80	75	83	67	78	65	86	69	82
6	>100	>94	92	92	>94	90	>94	92	89	93	84	>94
7	>100	>94	>94	93	91	>94	90	90	87	91	85	90
8	>100	>94	>94	>94	>94	>94	>94	>94	82	>94	>94	>94
9	>100	>94	>94	>94	>94	>94	>94	>94	>94	87	>94	>94
10	>100	>94	>94	>94	>94	>94	>94	>94	>94	>94	92	>94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -1.00 dBm.
LO IN: 230.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -6.18 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	44	30	45	33	61	40	60	52	62
1	-	17	+0	28	13	39	22	43	46	56	43	59
2	82	55	47	55	45	63	47	67	45	70	48	69
3	>100	41	37	43	39	44	38	45	52	53	51	58
4	>100	66	70	72	62	77	57	79	58	77	61	73
5	>100	62	52	53	55	53	50	61	47	53	52	71
6	>100	87	71	95	68	78	69	75	65	69	66	88
7	>100	89	75	65	61	61	64	64	60	65	57	68
8	>100	95	83	96	74	93	73	78	70	76	70	71
9	>100	80	82	85	89	73	69	71	70	75	64	67
10	>100	98	89	98	93	97	81	90	77	83	76	80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; 9.00 dBm.
LO IN: 230.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 3.72 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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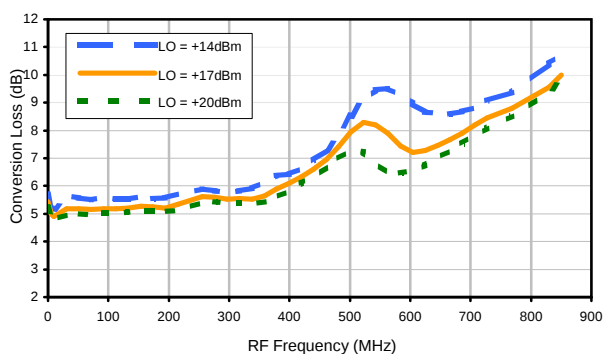


Frequency Mixer

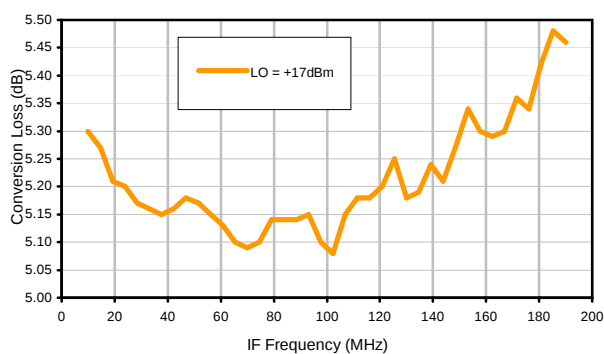
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Typical Performance Curves

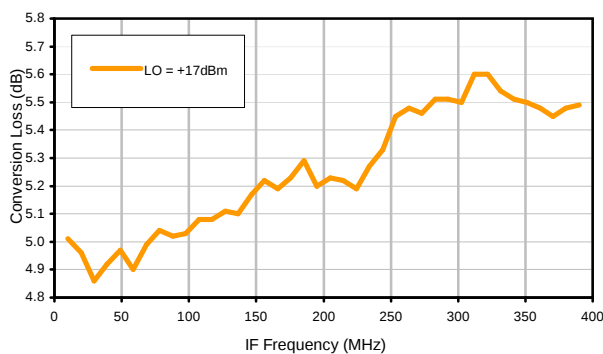
Conversion Loss @ IF=30MHz



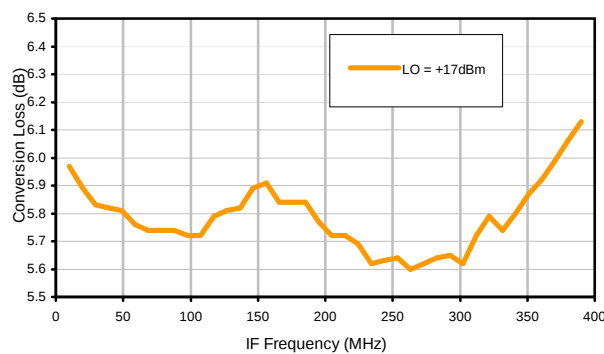
Conversion Loss vs. IF @ RF=200.1MHz



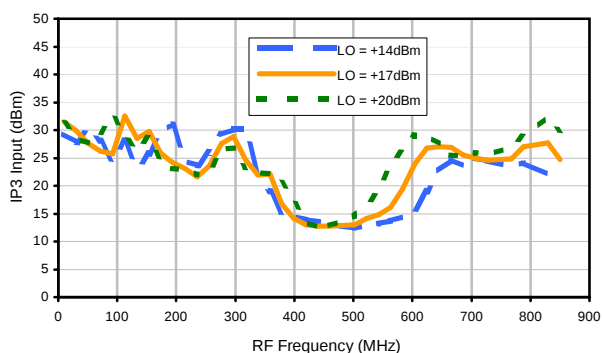
Conversion Loss vs. IF @ RF=10.1MHz



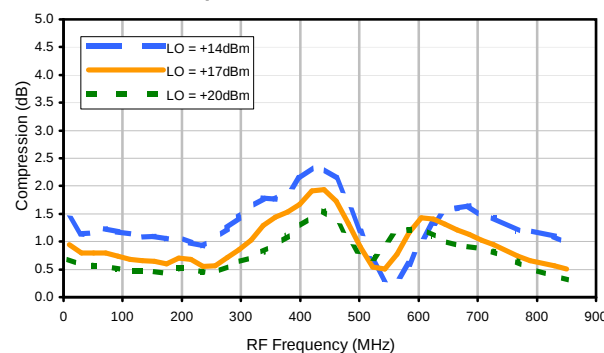
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input



Compression @ RF IN=+14dBm



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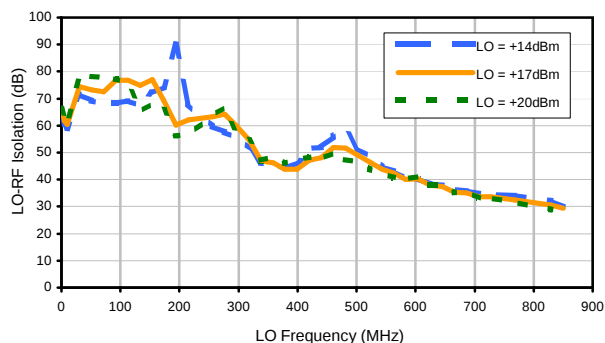


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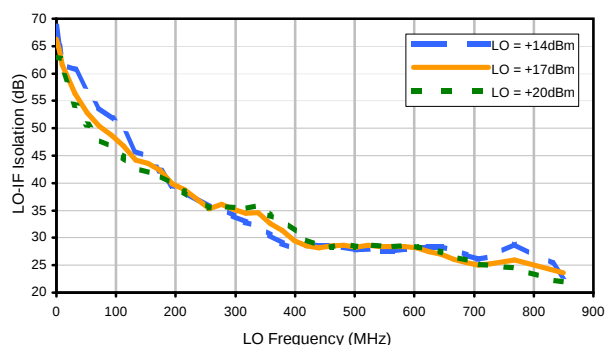


Typical Performance Curves

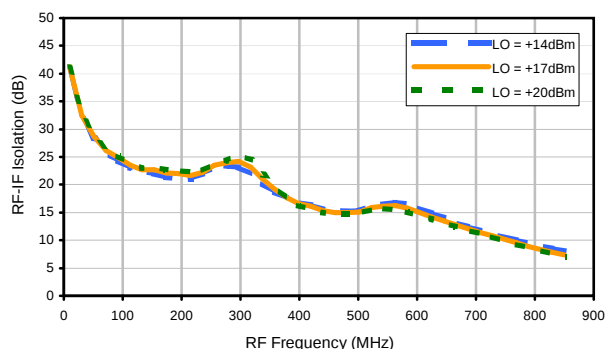
LO-RF Isolation



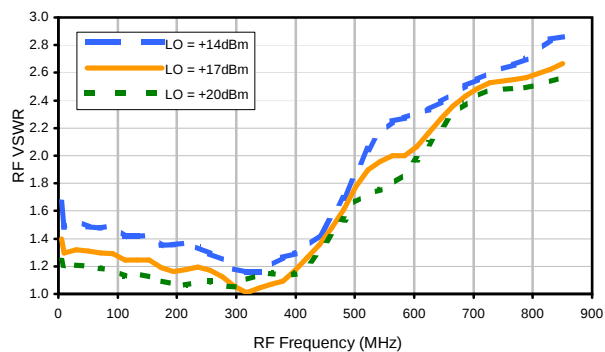
LO-IF Isolation



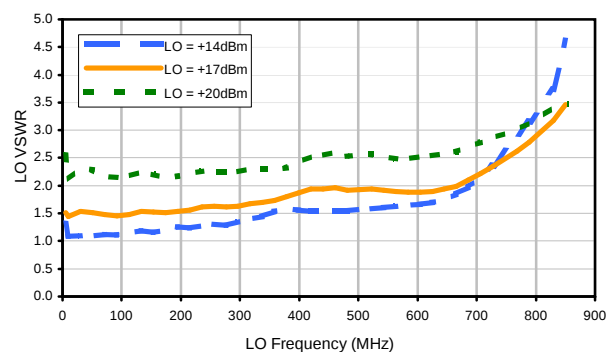
RF-IF Isolation



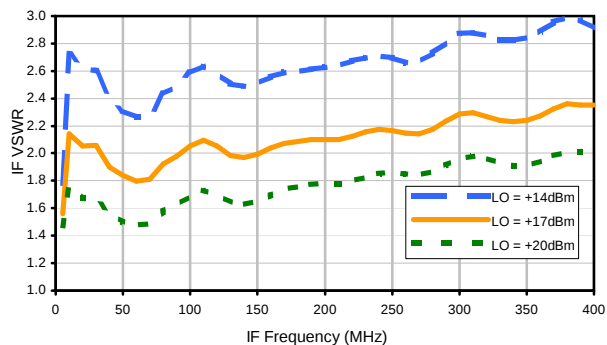
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	35	18	36	20	54	25	41	41	52
1	-	16	+0	25	13	38	24	36	38	48	30	51
2	98	63	54	62	51	76	54	65	48	68	55	62
3	>100	52	53	56	58	61	50	56	49	79	55	71
4	>100	83	79	81	77	80	71	76	71	81	77	79
5	>100	78	77	80	75	83	67	78	65	86	69	82
6	>100	>94	92	92	>94	90	>94	92	89	93	84	>94
7	>100	>94	>94	93	91	>94	90	90	87	91	85	90
8	>100	>94	>94	>94	>94	>94	>94	>94	82	>94	>94	>94
9	>100	>94	>94	>94	>94	>94	>94	>94	>94	87	>94	>94
10	>100	>94	>94	>94	>94	>94	>94	>94	>94	>94	92	>94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; -1.00 dBm.
LO IN: 230.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -6.18 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	44	30	45	33	61	40	60	52	62
1	-	17	+0	28	13	39	22	43	46	56	43	59
2	82	55	47	55	45	63	47	67	45	70	48	69
3	>100	41	37	43	39	44	38	45	52	53	51	58
4	>100	66	70	72	62	77	57	79	58	77	61	73
5	>100	62	52	53	55	53	50	61	47	53	52	71
6	>100	87	71	95	68	78	69	75	65	69	66	88
7	>100	89	75	65	61	61	64	64	60	65	57	68
8	>100	95	83	96	74	93	73	78	70	76	70	71
9	>100	80	82	85	89	73	69	71	70	75	64	67
10	>100	98	89	98	93	97	81	90	77	83	76	80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 200.1 MHz; 9.00 dBm.
LO IN: 230.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 3.72 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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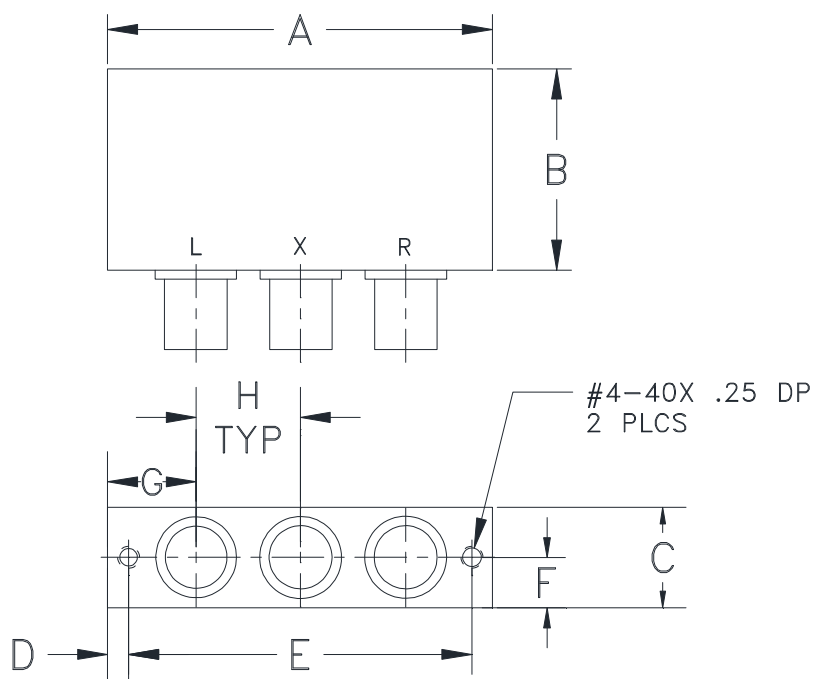


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Outline Dimensions

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