Coaxial

Frequency Mixer

ZP-3LH+

Level 10 (LO Power +10 dBm) 0.15 to 400 MHz

Generic photo used for illustration purposes only

CASE STYLE: GG60

Connectors	Model
BNC	ZP-3LH+
SMA	ZP-3LH-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	50mW
IF Current	40mA

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

Coaxial Connections

LO	L
RF	R
IF	X

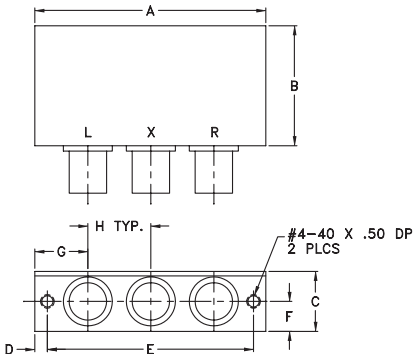
Features

- low conversion loss, 4.8 dB typ.
- high L-R isolation, 51 dB typ., L-I, 45 dB typ.
- IF response to DC
- rugged shielded case

Applications

- VHF/UHF
- instrumentation

Outline Drawing



Outline Dimensions (inch / mm)

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 m			Total Range	L		M		U		L		M		U	
f_L-f_U		$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
0.15-400	DC-400	4.8	0.37	7.0	8.0	67	50	51	30	40	25	67	40	45	25	34	20

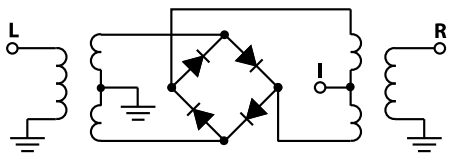
1 dB COMP.: +5 dBm typ.

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 +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm
0.15	30.15	4.98	69.38	85.98	1.21	2.67
0.30	30.30	4.90	69.38	85.28	1.15	2.64
0.50	30.50	4.83	69.26	86.26	1.10	2.57
1.00	31.00	4.74	69.26	83.06	1.06	2.52
1.50	31.50	4.69	69.08	80.98	1.03	2.36
2.00	32.00	4.66	68.95	78.75	1.02	2.40
5.00	35.00	4.62	68.20	71.20	1.01	2.33
10.00	40.00	4.59	66.47	65.07	1.02	2.31
20.00	50.00	4.68	63.23	59.53	1.02	2.25
50.00	80.00	4.66	56.07	50.61	1.02	2.25
57.27	87.27	4.67	54.97	49.44	1.01	2.29
100.00	70.00	4.67	50.23	45.42	1.01	2.25
114.39	84.39	4.68	48.98	45.06	1.01	2.28
171.51	14.15	4.80	45.17	42.49	1.01	2.33
200.00	170.00	4.81	42.29	40.27	1.01	2.44
228.64	198.64	4.90	41.00	37.35	1.04	2.39
285.76	255.76	5.11	48.00	34.00	1.09	2.41
342.88	312.88	5.17	39.79	33.43	1.20	2.58
385.72	356.72	5.29	34.24	31.62	1.23	2.76
400.00	370.00	5.48	34.34	30.09	1.27	2.78

Electrical Schematic



Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
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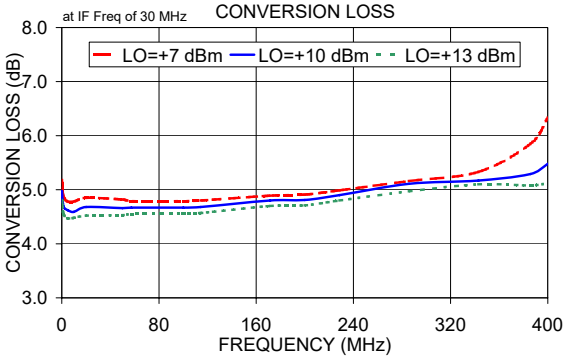
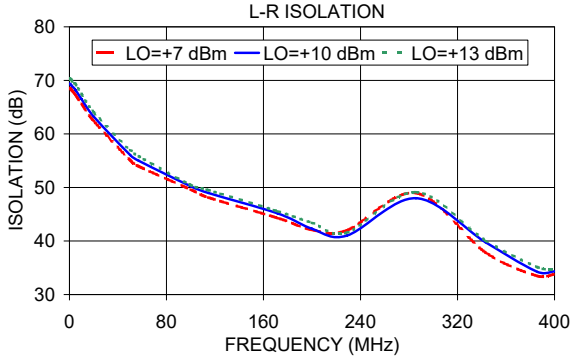
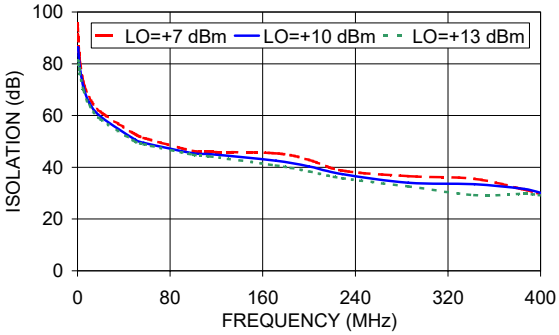
ZP-3LH+
CONVERSION LOSS
at IF Freq of 30 MHz



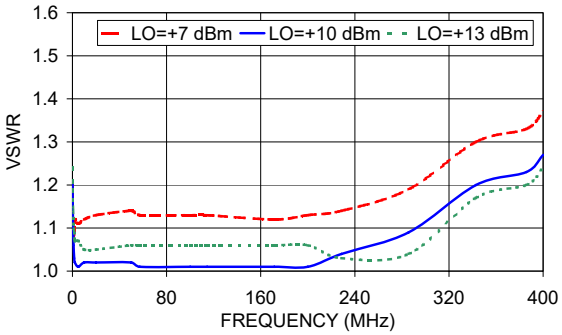
ZP-3LH+
L-R ISOLATION



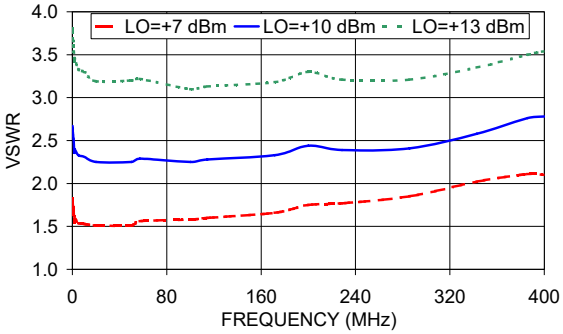
ZP-3LH+
L-I ISOLATION



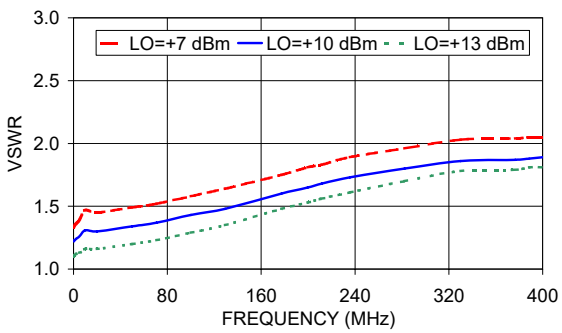
ZP-3LH+
RF VSWR



ZP-3LH+
LO VSWR



ZP-3LH+
IF VSWR



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Frequency Mixer ZP-3LH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+7	+10	+13
0.2	30.2	5.18	4.98	4.81
0.3	30.3	5.09	4.90	4.75
0.5	30.5	5.02	4.83	4.68
1.0	31.0	4.92	4.74	4.59
1.5	31.5	4.86	4.69	4.55
2.0	32.0	4.84	4.66	4.52
5.0	35.0	4.78	4.62	4.47
10.0	40.0	4.78	4.59	4.48
29.1	59.1	4.99	4.78	4.68
48.0	78.0	5.03	4.82	4.74
67.0	97.0	4.96	4.82	4.72
86.0	116.0	5.00	4.85	4.76
105.0	135.0	5.04	4.86	4.78
142.9	172.9	5.07	4.90	4.81
161.9	191.9	5.09	4.97	4.86
199.8	229.8	5.13	4.98	4.88
218.8	248.8	5.26	5.03	4.88
237.8	267.8	5.43	5.23	5.02
256.8	286.8	5.46	5.31	5.16
275.7	305.7	5.40	5.25	5.16
294.7	324.7	5.41	5.25	5.19
313.7	343.7	5.50	5.32	5.26
351.6	381.6	5.75	5.43	5.30
370.6	400.6	6.07	5.57	5.31
389.6	419.6	6.33	5.74	5.36
408.6	438.6	6.47	6.02	5.50
446.5	476.5	6.83	6.33	5.88
465.5	495.5	7.06	6.55	6.11
484.5	514.5	7.23	6.73	6.32
503.4	533.4	7.38	6.87	6.45
541.4	571.4	7.25	6.88	6.56
560.4	590.4	7.28	7.01	6.77
579.3	609.3	7.49	7.27	7.12
598.3	628.3	7.71	7.58	7.43
617.3	647.3	7.94	7.85	7.79
655.2	685.2	8.43	8.40	8.42
674.2	704.2	8.84	8.81	8.90
693.2	723.2	9.34	9.36	9.43
712.2	742.2	9.89	9.85	9.91
750.1	780.1	10.89	10.78	10.78

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+7	+10	+13
10.1	40.1	19.69	22.65	24.11
29.1	59.1	22.54	31.79	22.32
48.0	78.0	23.63	25.01	24.22
67.0	97.0	22.77	26.02	26.85
86.0	116.0	17.53	26.25	23.98
105.0	135.0	20.59	22.42	18.00
123.9	153.9	22.46	19.34	18.23
142.9	172.9	18.24	19.99	18.90
161.9	191.9	20.56	19.17	18.85
180.9	210.9	14.98	13.99	13.21
199.8	229.8	17.44	13.99	16.28
218.8	248.8	19.64	15.90	17.73
237.8	267.8	19.14	17.27	19.04
256.8	286.8	15.65	14.41	14.63
275.7	305.7	16.81	13.63	15.68
294.7	324.7	16.44	13.55	14.52
313.7	343.7	16.79	13.15	17.29
332.7	362.7	14.78	13.47	20.94
351.6	381.6	14.96	15.19	23.35
370.6	400.6	10.02	15.82	22.19
389.6	419.6	6.60	11.55	16.80
408.6	438.6	5.46	8.06	11.70
427.5	457.5	5.24	6.25	9.14
446.5	476.5	5.86	5.84	9.05
465.5	495.5	6.39	5.96	9.35
484.5	514.5	7.68	6.46	11.56
503.4	533.4	8.68	7.42	15.09
522.4	552.4	9.87	8.89	24.54
541.4	571.4	10.65	10.35	21.51
560.4	590.4	11.44	12.04	17.04
579.3	609.3	12.65	14.02	16.12
598.3	628.3	12.83	14.56	15.96
617.3	647.3	13.25	14.52	16.32
636.3	666.3	12.95	15.08	16.82
655.2	685.2	13.23	15.57	17.24
674.2	704.2	13.90	16.74	17.32
693.2	723.2	14.24	16.80	18.11
712.2	742.2	14.66	15.19	18.09
731.1	761.1	14.58	14.45	17.89
750.1	780.1	14.33	14.11	17.70

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	1.87	1.50	1.22
29.1	59.1	1.69	1.38	1.11
48.0	78.0	1.60	1.37	1.11
67.0	97.0	1.68	1.31	1.05
86.0	116.0	1.61	1.23	0.98
105.0	135.0	1.48	1.14	0.90
123.9	153.9	1.47	1.13	0.90
142.9	172.9	1.46	1.14	0.91
161.9	191.9	1.40	1.08	0.87
180.9	210.9	1.30	1.05	0.86
199.8	229.8	1.27	1.02	0.83
218.8	248.8	1.26	1.01	0.81
237.8	267.8	1.25	1.00	0.82
256.8	286.8	1.34	1.07	0.89
275.7	305.7	1.54	1.23	1.03
294.7	324.7	1.70	1.34	1.09
313.7	343.7	1.85	1.39	1.11
332.7	362.7	2.14	1.53	1.21
351.6	381.6	2.26	1.69	1.36
370.6	400.6	2.31	1.93	1.52
389.6	419.6	2.31	2.03	1.67
408.6	438.6	2.44	2.12	1.85
427.5	457.5	2.41	2.17	1.96
446.5	476.5	2.29	2.09	1.94
465.5	495.5	2.23	2.07	1.90
484.5	514.5	2.07	1.89	1.74
503.4	533.4	2.00	1.82	1.70
522.4	552.4	1.95	1.75	1.63
541.4	571.4	1.94	1.69	1.55
560.4	590.4	1.88	1.55	1.42
579.3	609.3	1.77	1.39	1.23
598.3	628.3	1.74	1.30	1.14
617.3	647.3	1.69	1.25	1.03
636.3	666.3	1.65	1.22	1.01
655.2	685.2	1.57	1.13	0.90
674.2	704.2	1.41	0.99	0.79
693.2	723.2	1.29	0.88	0.69
712.2	742.2	1.22	0.85	0.69
731.1	761.1	1.19	0.86	0.69
750.1	780.1	1.20	0.89	0.74

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=200.1MHz (dB) @LO (dBm) +10
190.0	10.1	5.21
185.4	14.7	5.19
180.8	19.3	5.15
176.2	23.9	5.10
171.5	28.6	5.08
166.9	33.2	5.03
162.3	37.8	5.01
157.7	42.4	5.01
153.1	47.0	5.02
148.5	51.6	5.00
143.8	56.3	4.99
139.2	60.9	4.98
134.6	65.5	4.95
130.0	70.1	4.96
125.4	74.7	4.97
120.8	79.3	4.96
116.2	83.9	4.96
111.5	88.6	4.96
106.9	93.2	4.95
102.3	97.8	4.92
97.7	102.4	4.92
93.1	107.0	4.95
88.5	111.6	4.95
83.8	116.3	4.93
79.2	120.9	4.94
74.6	125.5	4.93
70.0	130.1	4.93
65.4	134.7	4.93
60.8	139.3	4.95
56.2	143.9	4.95
51.5	148.6	4.96
46.9	153.2	4.94
42.3	157.8	4.93
37.7	162.4	4.92
33.1	167.0	4.93
28.5	171.6	4.94
23.8	176.3	4.96
19.2	180.9	4.93
14.6	185.5	5.02
10.0	190.1	5.19

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +10
10.0	20.1	4.61
19.7	29.8	4.51
29.5	39.6	4.44
39.2	49.3	4.49
49.0	59.1	4.52
58.7	68.8	4.49
68.5	78.6	4.55
78.2	88.3	4.59
87.9	98.0	4.59
97.7	107.8	4.60
107.4	117.5	4.61
117.2	127.3	4.63
126.9	137.0	4.62
136.7	146.8	4.65
146.4	156.5	4.70
156.2	166.3	4.74
165.9	176.0	4.74
175.6	185.7	4.77
185.4	195.5	4.80
195.1	205.2	4.75
204.9	215.0	4.74
214.6	224.7	4.75
224.4	234.5	4.74
234.1	244.2	4.76
243.8	253.9	4.88
253.6	263.7	5.03
263.3	273.4	5.12
273.1	283.2	5.23
282.8	292.9	5.26
292.6	302.7	5.23
302.3	312.4	5.27
312.1	322.2	5.21
321.8	331.9	5.15
331.5	341.6	5.13
341.3	351.4	5.01
351.0	361.1	5.01
360.8	370.9	5.05
370.5	380.6	4.96
380.3	390.4	4.95
390.0	400.1	4.97

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=400.1MHz (dB) @LO (dBm) +10
390.0	10.1	6.28
380.3	19.8	6.21
370.5	29.6	6.13
360.8	39.3	6.07
351.0	49.1	6.01
341.3	58.8	5.96
331.5	68.6	5.95
321.8	78.3	5.96
312.1	88.0	5.93
302.3	97.8	5.90
292.6	107.5	5.89
282.8	117.3	5.86
273.1	127.0	5.85
263.3	136.8	5.85
253.6	146.5	5.88
243.8	156.3	5.88
234.1	166.0	5.89
224.4	175.7	5.90
214.6	185.5	5.92
204.9	195.2	5.92
195.1	205.0	5.93
185.4	214.7	5.96
175.6	224.5	5.95
165.9	234.2	5.91
156.2	243.9	5.92
146.4	253.7	5.89
136.7	263.4	5.84
126.9	273.2	5.84
117.2	282.9	5.84
107.4	292.7	5.76
97.7	302.4	5.74
87.9	312.2	5.75
78.2	321.9	5.70
68.5	331.6	5.65
58.7	341.4	5.58
49.0	351.1	5.56
39.2	360.9	5.52
29.5	370.6	5.48
19.7	380.4	5.55
10.0	390.1	5.56

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+7	+10	+13	+7	+10	+13
0.2	68.61	69.38	70.23	95.61	85.98	81.23
0.3	68.54	69.38	70.31	95.14	85.28	81.11
0.5	68.43	69.26	70.29	91.53	86.26	81.09
1.0	68.40	69.26	70.08	86.70	83.06	79.78
1.5	68.24	69.08	70.11	84.04	80.98	78.01
2.0	68.12	68.95	69.89	81.22	78.75	76.49
5.0	67.27	68.20	69.26	73.17	71.20	69.86
10.0	65.60	66.47	67.46	67.00	65.07	63.96
29.1	64.45	64.90	64.96	53.45	51.61	50.46
48.0	59.61	60.40	61.14	49.55	47.83	46.81
67.0	56.15	57.51	57.66	46.76	45.58	44.35
86.0	53.79	54.71	55.23	45.53	43.90	43.07
105.0	52.08	52.66	52.87	43.26	42.39	41.46
142.9	48.61	48.88	49.06	41.96	40.64	39.38
161.9	47.76	47.89	47.82	41.24	39.17	38.00
199.8	43.49	43.84	43.94	40.12	38.29	36.91
218.8	43.01	43.06	43.44	40.08	37.73	36.10
237.8	42.55	42.14	42.24	38.23	36.59	34.95
256.8	42.97	42.31	41.91	35.83	34.60	33.71
275.7	43.56	42.94	42.30	34.66	33.16	32.14
294.7	42.69	41.76	40.96	34.13	32.55	31.46
313.7	42.85	42.15	41.68	33.90	31.70	30.44
351.6	42.55	42.22	41.18	32.59	29.42	27.43
370.6	41.29	41.25	40.27	32.89	28.97	26.60
389.6	40.86	41.63	41.09	31.68	28.96	26.25
408.6	40.60	41.16	40.53	30.03	27.57	25.29
446.5	39.90	40.97	40.06	28.35	26.76	24.19
465.5	38.79	39.51	38.54	27.53	26.16	24.14
484.5	39.05	40.35	39.42	26.41	25.03	22.88
503.4	39.00	39.23	36.74	26.22	24.56	21.81
541.4	37.22	36.56	33.63	25.48	23.04	19.77
560.4	35.73	34.72	31.67	24.52	21.81	18.58
579.3	34.05	32.29	29.53	24.01	20.69	17.57
598.3	32.34	30.18	27.49	23.06	19.61	16.74
617.3	30.83	28.76	26.41	21.76	18.56	16.03
655.2	27.15	25.66	23.81	19.55	17.37	15.17
674.2	25.31	24.04	22.48	18.59	16.78	14.78
693.2	23.73	22.67	21.24	17.72	16.13	14.35
712.2	22.46	21.66	20.41	16.91	15.54	13.92
750.1	20.74	20.16	19.05	16.28	15.34	13.85

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	39.34	39.93	38.57
29.1	59.1	32.34	32.99	32.47
48.0	78.0	29.05	29.17	29.14
67.0	97.0	26.55	26.94	26.82
86.0	116.0	25.17	25.50	25.56
105.0	135.0	23.86	24.06	24.29
123.9	153.9	23.35	23.60	23.78
142.9	172.9	22.92	23.29	23.48
161.9	191.9	22.65	23.26	23.83
180.9	210.9	22.03	22.56	22.93
199.8	229.8	22.34	22.80	23.14
218.8	248.8	22.74	23.33	23.92
237.8	267.8	23.50	24.09	24.93
256.8	286.8	24.99	25.75	26.64
275.7	305.7	25.07	25.99	26.86
294.7	324.7	23.82	24.67	25.56
313.7	343.7	22.01	22.88	23.51
332.7	362.7	20.38	20.87	21.35
351.6	381.6	19.22	19.82	20.30
370.6	400.6	18.16	18.74	19.38
389.6	419.6	17.73	18.44	19.31
408.6	438.6	17.29	18.07	19.19
427.5	457.5	17.27	17.88	19.08
446.5	476.5	17.59	18.18	19.20
465.5	495.5	18.16	18.62	19.11
484.5	514.5	18.60	18.84	18.96
503.4	533.4	18.61	18.51	18.26
522.4	552.4	17.99	17.46	16.93
541.4	571.4	16.77	16.17	15.53
560.4	590.4	15.49	14.77	14.19
579.3	609.3	14.09	13.46	12.98
598.3	628.3	13.16	12.56	12.06
617.3	647.3	12.14	11.55	10.99
636.3	666.3	11.26	10.74	10.25
655.2	685.2	10.34	9.82	9.38
674.2	704.2	9.45	9.01	8.58
693.2	723.2	8.75	8.37	8.05
712.2	742.2	8.00	7.66	7.40
731.1	761.1	7.51	7.28	6.99
750.1	780.1	6.98	6.72	6.47

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+7	+10	+13
0.3	30.3	1.20	1.21	1.24
0.5	30.5	1.14	1.15	1.19
1.0	31.0	1.09	1.10	1.14
2.0	32.0	1.08	1.06	1.11
5.0	35.0	1.09	1.03	1.09
10.0	40.0	1.12	1.02	1.07
29.1	59.1	1.31	1.21	1.13
48.0	78.0	1.31	1.20	1.13
67.0	97.0	1.27	1.17	1.10
86.0	116.0	1.25	1.15	1.09
105.0	135.0	1.22	1.13	1.07
123.9	153.9	1.21	1.12	1.06
142.9	172.9	1.17	1.09	1.05
161.9	191.9	1.18	1.08	1.04
180.9	210.9	1.16	1.08	1.03
199.8	229.8	1.14	1.06	1.03
218.8	248.8	1.13	1.04	1.06
237.8	267.8	1.13	1.06	1.09
256.8	286.8	1.09	1.05	1.08
275.7	305.7	1.04	1.05	1.11
294.7	324.7	1.03	1.11	1.17
313.7	343.7	1.06	1.15	1.20
332.7	362.7	1.05	1.14	1.18
351.6	381.6	1.05	1.10	1.15
370.6	400.6	1.11	1.06	1.09
389.6	419.6	1.18	1.07	1.05
408.6	438.6	1.24	1.14	1.03
427.5	457.5	1.31	1.21	1.10
446.5	476.5	1.37	1.27	1.17
465.5	495.5	1.50	1.39	1.28
484.5	514.5	1.60	1.49	1.41
503.4	533.4	1.70	1.59	1.53
522.4	552.4	1.76	1.67	1.63
541.4	571.4	1.81	1.75	1.71
560.4	590.4	1.89	1.85	1.82
579.3	609.3	2.02	1.99	1.95
598.3	628.3	2.13	2.10	2.05
617.3	647.3	2.24	2.18	2.13
636.3	666.3	2.26	2.21	2.17
655.2	685.2	2.29	2.24	2.20
674.2	704.2	2.33	2.26	2.23
693.2	723.2	2.39	2.33	2.28
712.2	742.2	2.44	2.37	2.31
731.1	761.1	2.50	2.42	2.37
750.1	780.1	2.50	2.41	2.35

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+7	+10	+13
0.3	1.82	2.67	3.81
0.5	1.78	2.64	3.77
1.0	1.73	2.57	3.67
2.0	1.69	2.52	3.61
5.0	1.55	2.36	3.42
10.0	1.59	2.40	3.46
29.1	1.62	2.43	3.42
48.0	1.62	2.42	3.40
67.0	1.55	2.26	3.16
86.0	1.52	2.20	3.08
105.0	1.55	2.24	3.10
123.9	1.58	2.33	3.23
142.9	1.60	2.34	3.24
161.9	1.59	2.28	3.12
180.9	1.58	2.27	3.10
199.8	1.60	2.29	3.12
218.8	1.65	2.36	3.21
237.8	1.70	2.39	3.21
256.8	1.70	2.37	3.16
275.7	1.69	2.40	3.22
294.7	1.71	2.39	3.19
313.7	1.75	2.44	3.26
332.7	1.79	2.44	3.25
351.6	1.81	2.42	3.20
370.6	1.87	2.48	3.24
389.6	1.93	2.54	3.29
408.6	2.01	2.65	3.40
427.5	2.04	2.71	3.46
446.5	2.03	2.71	3.46
465.5	2.03	2.71	3.46
484.5	2.06	2.73	3.50
503.4	2.09	2.77	3.53
522.4	2.10	2.78	3.52
541.4	2.09	2.75	3.46
560.4	2.10	2.72	3.40
579.3	2.12	2.73	3.40
598.3	2.14	2.75	3.40
617.3	2.14	2.73	3.37
636.3	2.15	2.74	3.35
655.2	2.18	2.73	3.34
674.2	2.25	2.78	3.38
693.2	2.33	2.84	3.42
712.2	2.39	2.88	3.42
731.1	2.48	2.94	3.48
750.1	2.51	2.94	3.45

IF (OUT) (MHz)	IF VSWR @LO=400.1MHz (:1) @LO (dBm)		
	+7	+10	+13
0.3	1.33	1.22	1.10
0.5	1.34	1.23	1.11
1.0	1.35	1.23	1.11
2.0	1.36	1.24	1.12
5.0	1.39	1.26	1.13
10.0	1.47	1.31	1.16
20.0	2.13	1.69	1.47
30.0	2.03	1.62	1.42
40.0	1.93	1.56	1.35
50.0	1.83	1.49	1.30
60.0	1.82	1.46	1.29
70.0	1.83	1.49	1.32
80.0	1.87	1.54	1.38
90.0	2.02	1.65	1.46
100.0	2.08	1.70	1.51
110.0	2.09	1.72	1.53
120.0	2.04	1.70	1.52
130.0	2.01	1.67	1.50
140.0	1.97	1.64	1.49
150.0	2.00	1.66	1.51
160.0	2.06	1.72	1.57
170.0	2.09	1.78	1.63
180.0	2.13	1.82	1.68
190.0	2.12	1.82	1.69
200.0	2.10	1.80	1.67
210.0	2.09	1.80	1.68
220.0	2.09	1.81	1.70
230.0	2.11	1.83	1.72
240.0	2.10	1.83	1.73
250.0	2.09	1.84	1.74
260.0	2.07	1.83	1.75
270.0	2.03	1.81	1.74
280.0	2.04	1.80	1.73
290.0	2.09	1.83	1.75
300.0	2.11	1.87	1.79
310.0	2.08	1.87	1.79
320.0	2.04	1.83	1.77
330.0	2.01	1.80	1.73
340.0	1.99	1.78	1.71
350.0	1.97	1.77	1.70
360.0	1.98	1.77	1.70
370.0	2.01	1.78	1.71
380.0	2.03	1.81	1.73
390.0	2.01	1.80	1.73
400.0	1.97	1.78	1.72

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	20	38	24	49	33	55	39	50	50	54
1	-	18	+0	27	12	38	24	45	41	51	50	57
2	>100	59	42	57	42	52	42	55	68	61	50	65
3	>100	42	36	42	39	43	35	45	46	52	55	58
4	>100	66	54	71	53	64	53	69	50	66	76	70
5	>100	73	59	75	52	64	49	64	50	58	62	68
6	>100	85	69	>95	62	80	65	82	64	69	81	73
7	>100	81	78	74	70	71	64	74	60	65	56	73
8	>100	>95	87	90	89	81	72	85	67	79	68	75
9	>100	88	84	>95	78	85	74	84	79	91	72	77
10	>100	94	>95	>95	>95	>95	81	93	76	95	76	82
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; 0.00 dBm.
LO IN: 230.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -5.23 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	11	27	12	41	22	41	24	37	36	40
1	-	17	+0	24	11	32	23	39	44	45	39	42
2	>100	68	45	56	44	64	44	63	70	74	55	63
3	>100	60	59	62	61	66	58	63	63	73	62	79
4	>100	82	79	82	74	78	71	81	72	>85	77	>85
5	>100	>85	82	>85	81	82	80	>85	77	>85	84	>85
6	>100	>85	>85	>85	>85	>85	82	>85	>85	>85	>85	>85
7	>100	>85	>85	>85	>85	>85	>85	74	>85	>85	>85	>85
8	>100	>85	>85	>85	>85	>85	>85	>85	65	>85	>85	>85
9	>100	>85	>85	>85	>85	>85	>85	>85	>85	71	>85	>85
10	>100	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

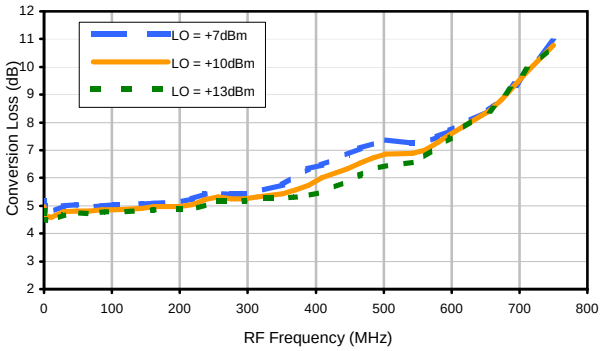
Test conditions:
RF IN: 200.1 MHz; -10.00 dBm.
LO IN: 230.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -15.2 dBm

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.

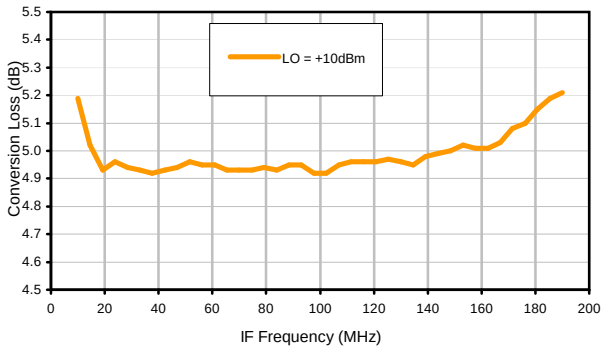
Frequency Mixer ZP-3LH+

Typical Performance Curves

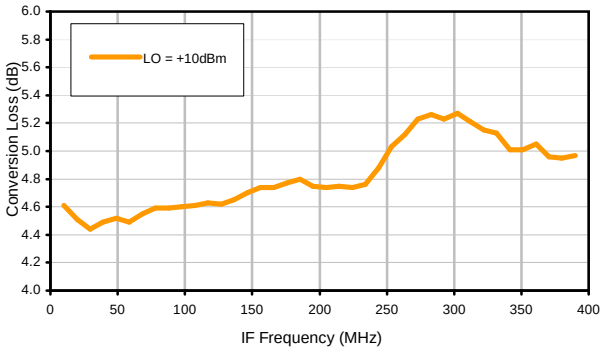
Conversion Loss @ IF=30MHz



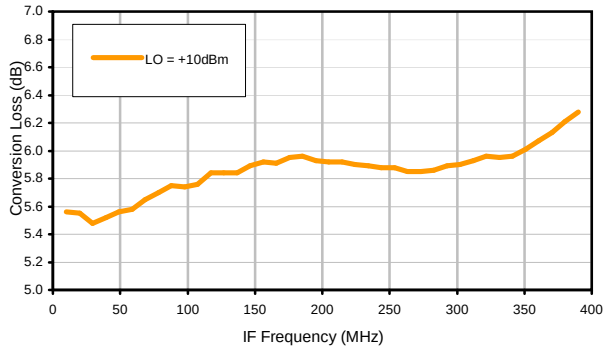
Conversion Loss vs. IF @ RF=200.1MHz



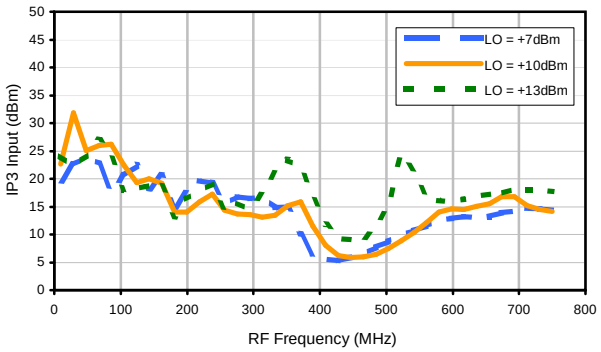
Conversion Loss vs. IF @ RF=10.1MHz



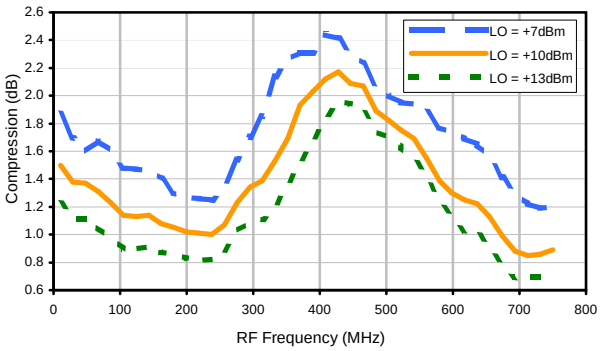
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input

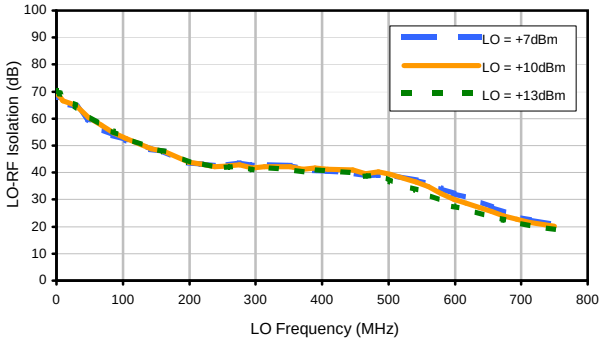


Compression @ RF IN=+5dBm

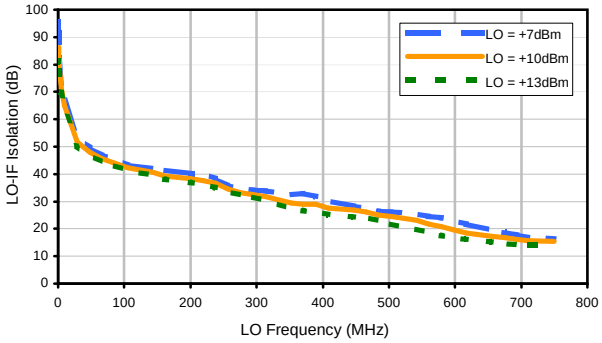


Typical Performance Curves

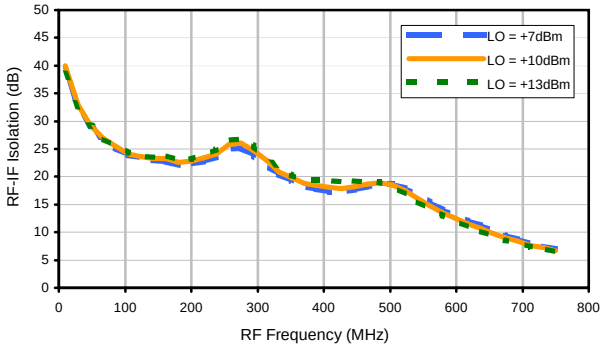
LO-RF Isolation



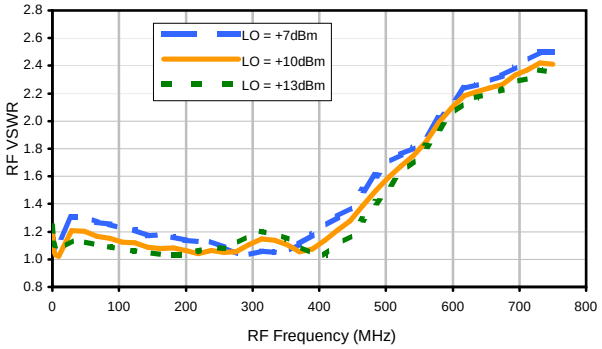
LO-IF Isolation



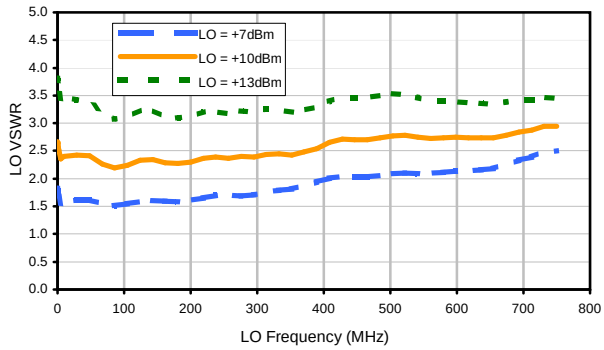
RF-IF Isolation



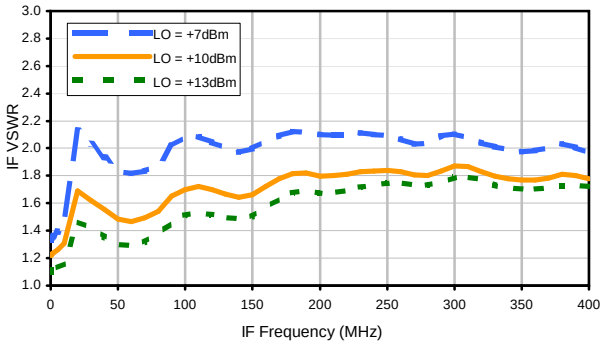
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	20	38	24	49	33	55	39	50	50	54
1	-	18	+0	27	12	38	24	45	41	51	50	57
2	>100	59	42	57	42	52	42	55	68	61	50	65
3	>100	42	36	42	39	43	35	45	46	52	55	58
4	>100	66	54	71	53	64	53	69	50	66	76	70
5	>100	73	59	75	52	64	49	64	50	58	62	68
6	>100	85	69	>95	62	80	65	82	64	69	81	73
7	>100	81	78	74	70	71	64	74	60	65	56	73
8	>100	>95	87	90	89	81	72	85	67	79	68	75
9	>100	88	84	>95	78	85	74	84	79	91	72	77
10	>100	94	>95	>95	>95	>95	81	93	76	95	76	82
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; 0.00 dBm.
LO IN: 230.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -5.23 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	11	27	12	41	22	41	24	37	36	40
1	-	17	+0	24	11	32	23	39	44	45	39	42
2	>100	68	45	56	44	64	44	63	70	74	55	63
3	>100	60	59	62	61	66	58	63	63	73	62	79
4	>100	82	79	82	74	78	71	81	72	>85	77	>85
5	>100	>85	82	>85	81	82	80	>85	77	>85	84	>85
6	>100	>85	>85	>85	>85	>85	82	>85	>85	>85	>85	>85
7	>100	>85	>85	>85	>85	>85	>85	74	>85	>85	>85	>85
8	>100	>85	>85	>85	>85	>85	>85	>85	65	>85	>85	>85
9	>100	>85	>85	>85	>85	>85	>85	>85	>85	71	>85	>85
10	>100	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

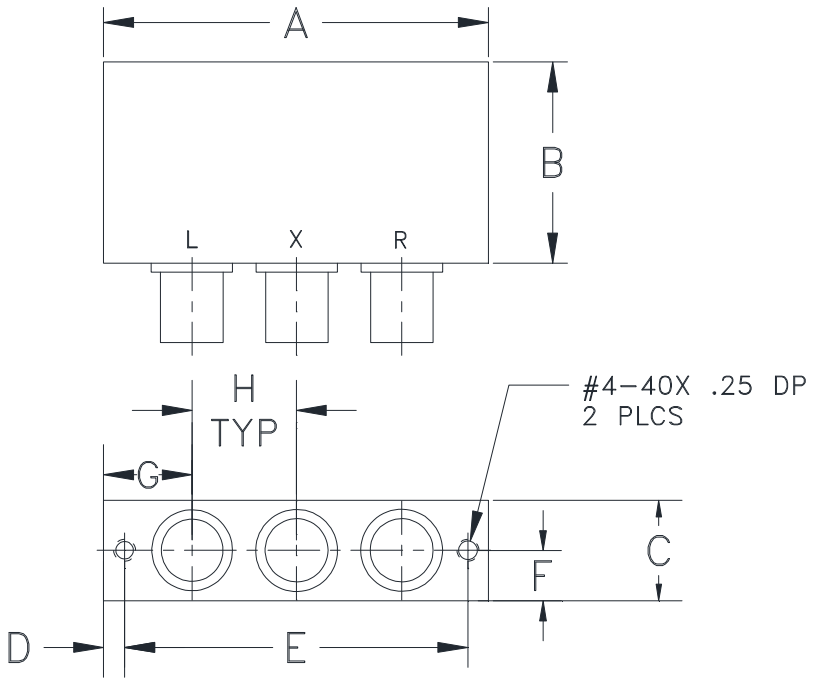
LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; -10.00 dBm.
LO IN: 230.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -15.2 dBm

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

Case Style GG

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. ± .03; 3Pl. ± .015

Notes:

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

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Environmental Specifications ENV28

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