

Coaxial Frequency Mixer

Level 17 (LO Power +17 dBm) 2 to 600 MHz

ZP-1H+



BNC version shown
CASE STYLE: GG60

Maximum Ratings

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

Coaxial Connections

LO	L
RF	R
IF	X

Features

- low conversion loss, 5.9 dB typ.
- high L-R isolation, 50 dB typ., L-I, 48 dB typ.
- rugged shielded case

Applications

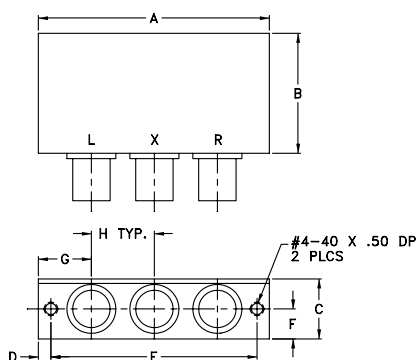
- VHF/UHF
- instrumentation

Connectors	Model	Price	Qty.
BNC	ZP-1H+	\$45.95 ea.	(1-9)
SMA	ZP-1H-S+	\$50.95 ea.	(1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

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
58.7	30.5	15.2	3.2	52.4	7.6	13.5	16.0	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.
2-600	DC-600	5.90	0.18	7.0	8.0	68	50	50	30	43	25	62	45	48	30	33	22

1 dB COMP.: +14 dBm typ.

L = low range [f_L to $10 f_L$]

M = mid range [$10 f_L$ to $f_U/2$]

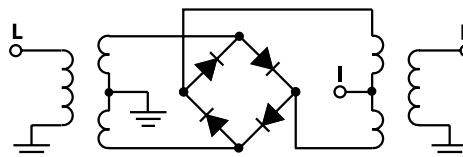
U = upper range [$f_U/2$ to f_U]

m = mid band [$2 f_L$ 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 +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
2.00	32.00	6.30	62.98	52.28	1.22	1.67
5.00	35.00	5.95	62.06	52.79	1.10	1.60
10.00	40.00	5.92	60.47	52.35	1.03	1.63
20.00	50.00	5.91	57.14	51.13	1.02	1.61
34.13	64.13	5.81	53.27	49.30	1.04	1.58
50.00	80.00	5.72	50.24	47.27	1.06	1.57
66.26	96.26	5.66	48.03	45.61	1.07	1.55
82.33	123.33	5.71	46.33	44.27	1.08	1.54
100.00	150.00	5.63	44.99	43.26	1.09	1.57
130.52	190.52	5.61	43.18	41.91	1.10	1.55
162.65	243.65	5.61	41.46	40.45	1.10	1.55
200.00	300.00	5.60	40.12	39.22	1.08	1.60
259.04	388.04	5.42	38.10	37.51	1.07	1.67
307.24	460.24	5.62	37.54	36.13	1.06	1.70
355.43	532.43	5.86	37.41	36.94	1.05	1.76
387.56	581.56	5.92	36.35	35.99	1.04	1.82
435.76	653.76	5.81	35.35	33.91	1.05	1.84
467.89	701.89	5.90	36.34	33.81	1.06	1.85
483.95	730.95	6.08	36.44	33.54	1.08	1.87
500.00	750.00	6.27	36.27	33.21	1.09	1.90
600.00	900.00	6.18	36.36	33.38	1.09	1.89

Electrical Schematic



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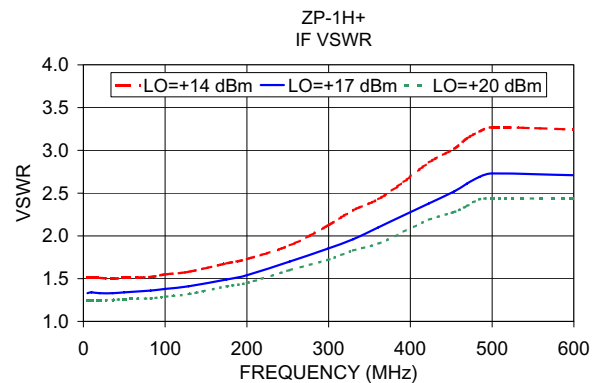
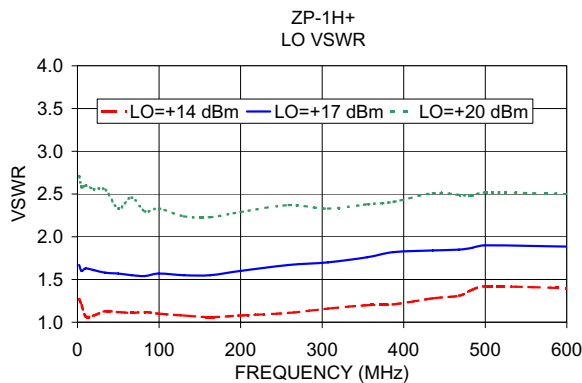
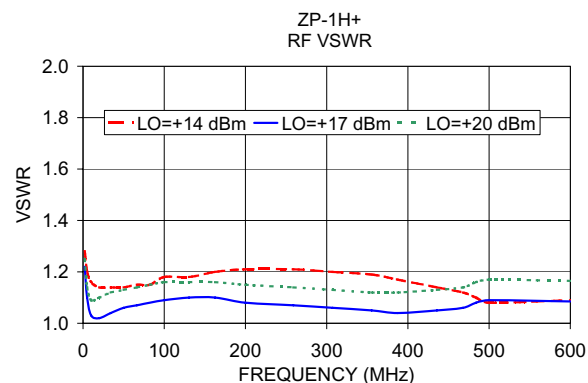
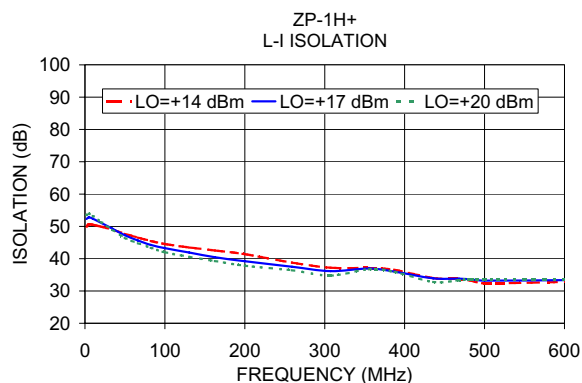
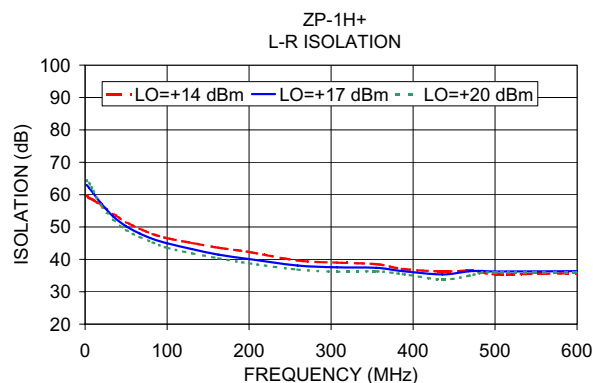
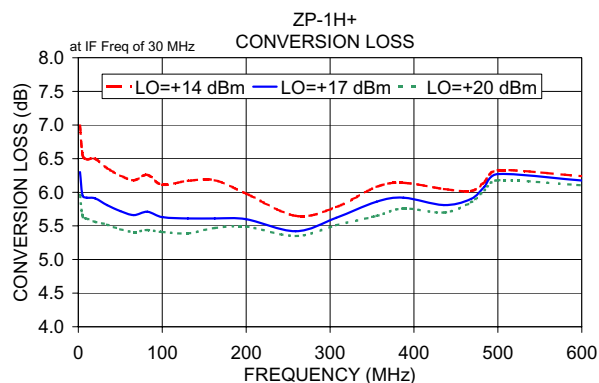
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RF/IF MICROWAVE COMPONENTS

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M108294
ZP-1H+
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070220
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Frequency Mixer

ZP-1H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
2.0	32.0	6.99	6.30	5.96
5.0	35.0	6.55	5.95	5.64
10.0	40.0	6.49	5.92	5.61
50.9	80.9	7.00	6.37	6.04
91.7	121.7	7.02	6.33	6.00
132.6	162.6	6.84	6.19	5.91
173.4	203.4	6.94	6.28	5.96
214.2	244.2	6.83	6.16	5.89
255.0	285.0	6.79	6.16	5.92
295.9	325.9	6.82	6.16	5.93
336.7	366.7	6.72	6.17	5.97
377.5	407.5	6.68	6.15	5.98
418.3	448.3	6.67	6.15	5.96
459.1	489.1	6.73	6.24	6.05
500.0	530.0	6.73	6.26	6.05
540.8	570.8	6.87	6.39	6.12
581.6	611.6	6.88	6.43	6.14
622.4	652.4	6.85	6.47	6.21
663.3	693.3	6.89	6.51	6.29
704.1	734.1	6.85	6.48	6.30
785.7	815.7	7.15	6.67	6.42
826.5	856.5	7.37	6.83	6.54
867.4	897.4	7.76	7.03	6.69
908.2	938.2	8.18	7.33	6.76
949.0	979.0	8.75	7.79	6.94
989.8	1019.8	9.23	8.12	7.08
1030.6	1060.6	9.84	8.54	7.51
1071.5	1101.5	10.39	8.96	7.80
1112.3	1142.3	10.77	9.27	7.95
1153.1	1183.1	11.14	9.64	8.19
1193.9	1223.9	11.26	9.81	8.24
1234.8	1264.8	11.23	9.69	8.13
1255.2	1285.2	11.23	9.57	8.03
1296.0	1326.0	11.21	9.47	8.10
1316.4	1346.4	11.17	9.36	8.07
1357.2	1387.2	10.96	9.35	8.33
1377.6	1407.6	10.85	9.46	8.53
1438.9	1468.9	10.91	9.97	9.26
1479.7	1509.7	10.97	10.38	9.80
1500.1	1530.1	11.00	10.52	10.03

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	25.21	28.66	31.80
50.9	80.9	24.57	27.53	30.56
91.7	121.7	23.70	26.84	28.51
132.6	162.6	26.82	27.64	26.87
173.4	203.4	24.60	25.19	26.14
214.2	244.2	24.45	24.15	32.74
255.0	285.0	23.78	26.63	28.03
295.9	325.9	21.59	26.22	26.21
336.7	366.7	23.97	27.99	25.33
377.5	407.5	24.18	26.21	26.54
418.3	448.3	23.81	23.10	22.85
459.1	489.1	27.30	22.95	22.62
500.0	530.0	24.50	23.68	24.84
540.8	570.8	21.98	21.70	24.62
581.6	611.6	22.23	21.66	23.87
622.4	652.4	22.40	21.78	22.60
663.3	693.3	21.85	22.08	22.33
704.1	734.1	20.92	22.13	23.06
744.9	774.9	19.25	21.14	23.46
785.7	815.7	17.61	20.05	23.17
826.5	856.5	15.96	19.36	23.41
867.4	897.4	14.52	18.37	22.27
908.2	938.2	13.66	16.29	21.08
949.0	979.0	13.25	14.81	20.16
989.8	1019.8	13.21	14.31	19.28
1030.6	1060.6	13.26	14.70	17.01
1071.5	1101.5	13.13	15.35	17.47
1112.3	1142.3	13.50	15.90	19.28
1153.1	1183.1	13.91	15.95	20.05
1193.9	1223.9	14.51	15.70	19.57
1234.8	1264.8	15.07	16.00	20.53
1255.2	1285.2	14.94	15.94	20.72
1296.0	1326.0	15.56	17.15	22.30
1316.4	1346.4	15.71	17.86	22.67
1357.2	1387.2	16.70	19.66	23.42
1377.6	1407.6	17.45	20.42	23.91
1418.5	1448.5	18.75	21.23	24.14
1438.9	1468.9	19.63	21.59	24.23
1479.7	1509.7	21.39	22.27	23.95
1500.1	1530.1	22.01	22.49	24.10

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	0.69	0.35	0.19
50.9	80.9	0.58	0.29	0.16
91.7	121.7	0.54	0.27	0.16
132.6	162.6	0.70	0.31	0.17
173.4	203.4	0.51	0.25	0.15
214.2	244.2	0.57	0.32	0.18
255.0	285.0	0.67	0.33	0.18
295.9	325.9	0.64	0.31	0.19
336.7	366.7	0.71	0.30	0.17
377.5	407.5	0.75	0.33	0.18
418.3	448.3	0.76	0.36	0.23
459.1	489.1	0.79	0.31	0.20
500.0	530.0	0.82	0.33	0.21
540.8	570.8	0.78	0.36	0.25
581.6	611.6	0.88	0.40	0.30
622.4	652.4	1.07	0.47	0.32
663.3	693.3	1.15	0.52	0.34
704.1	734.1	1.32	0.62	0.39
744.9	774.9	1.29	0.67	0.39
785.7	815.7	1.35	0.79	0.48
826.5	856.5	1.33	0.88	0.48
867.4	897.4	1.19	0.83	0.46
908.2	938.2	1.08	0.79	0.51
949.0	979.0	0.73	0.55	0.49
989.8	1019.8	0.51	0.37	0.44
1030.6	1060.6	0.13	0.19	0.28
1071.5	1101.5	-0.40	-0.07	0.12
1112.3	1142.3	-0.73	-0.33	0.08
1153.1	1183.1	-1.05	-0.59	0.01
1193.9	1223.9	-1.08	-0.62	0.10
1234.8	1264.8	-0.97	-0.40	0.35
1255.2	1285.2	-0.84	-0.24	0.46
1296.0	1326.0	-0.67	0.05	0.63
1316.4	1346.4	-0.50	0.23	0.71
1357.2	1387.2	-0.16	0.40	0.73
1377.6	1407.6	-0.07	0.41	0.72
1418.5	1448.5	0.08	0.31	0.56
1438.9	1468.9	0.18	0.23	0.44
1479.7	1509.7	0.20	0.05	0.21
1500.1	1530.1	0.26	0.03	0.15

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Frequency Mixer

ZP-1H+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=300.1MHz (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)=600.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
290.0	10.1	6.35	10.0	20.1	6.29	590.0	10.1	6.61
282.8	17.3	6.42	24.9	35.0	6.14	575.1	25.0	6.49
275.6	24.5	6.33	39.7	49.8	6.19	560.3	39.8	6.48
268.5	31.6	6.37	54.6	64.7	6.24	545.4	54.7	6.45
261.3	38.8	6.26	69.5	79.6	6.26	530.5	69.6	6.46
254.1	46.0	6.36	84.4	94.5	6.32	515.6	84.5	6.44
246.9	53.2	6.27	99.2	109.3	6.25	500.8	99.3	6.38
239.7	60.4	6.33	114.1	124.2	6.31	485.9	114.2	6.34
232.6	67.5	6.27	129.0	139.1	6.26	471.0	129.1	6.26
225.4	74.7	6.28	143.8	153.9	6.27	456.2	143.9	6.30
218.2	81.9	6.24	158.7	168.8	6.37	441.3	158.8	6.29
211.0	89.1	6.29	173.6	183.7	6.37	426.4	173.7	6.27
203.8	96.3	6.29	188.5	198.6	6.37	411.5	188.6	6.20
196.7	103.4	6.27	203.3	213.4	6.35	396.7	203.4	6.17
189.5	110.6	6.26	218.2	228.3	6.33	381.8	218.3	6.16
182.3	117.8	6.19	233.1	243.2	6.35	366.9	233.2	6.10
175.1	125.0	6.24	247.9	258.0	6.39	352.1	248.0	6.12
167.9	132.2	6.16	262.8	272.9	6.41	337.2	262.9	6.04
160.8	139.3	6.23	277.7	287.8	6.40	322.3	277.8	6.14
153.6	146.5	6.11	292.6	302.7	6.39	307.4	292.7	6.08
146.4	153.7	6.18	307.4	317.5	6.36	292.6	307.5	6.05
139.2	160.9	6.14	322.3	332.4	6.43	277.7	322.4	6.06
132.1	168.0	6.23	337.2	347.3	6.37	262.8	337.3	6.05
124.9	175.2	6.17	352.1	362.2	6.39	247.9	352.2	6.11
117.7	182.4	6.16	366.9	377.0	6.46	233.1	367.0	6.06
110.5	189.6	6.14	381.8	391.9	6.42	218.2	381.9	6.11
103.3	196.8	6.14	396.7	406.8	6.48	203.3	396.8	6.12
96.2	203.9	6.20	411.5	421.6	6.36	188.5	411.6	6.16
89.0	211.1	6.10	426.4	436.5	6.46	173.6	426.5	6.20
81.8	218.3	6.12	441.3	451.4	6.49	158.7	441.4	6.22
74.6	225.5	6.05	456.2	466.3	6.52	143.8	456.3	6.26
67.4	232.7	6.15	471.0	481.1	6.52	129.0	471.1	6.30
60.3	239.8	6.08	485.9	496.0	6.46	114.1	486.0	6.33
53.1	247.0	6.12	500.8	510.9	6.50	99.2	500.9	6.30
45.9	254.2	6.03	515.6	525.7	6.44	84.4	515.7	6.32
38.7	261.4	6.10	530.5	540.6	6.48	69.5	530.6	6.33
31.5	268.6	6.13	545.4	555.5	6.46	54.6	545.5	6.33
24.4	275.7	6.17	560.3	570.4	6.53	39.7	560.4	6.38
17.2	282.9	6.13	575.1	585.2	6.53	24.9	575.2	6.38
10.0	290.1	6.18	590.0	600.1	6.50	10.0	590.1	6.48

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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
2.0	59.73	62.98	64.42	49.91	52.28	53.48
5.0	58.95	62.06	63.57	50.65	52.79	53.94
10.0	58.36	60.47	61.17	50.51	52.35	53.27
50.9	65.34	67.61	69.89	69.42	70.04	61.48
91.7	60.76	62.94	65.51	63.23	66.32	57.55
132.6	57.85	60.75	63.76	58.23	61.09	53.89
173.4	56.03	58.83	61.61	55.53	59.18	52.40
214.2	54.64	57.75	60.81	51.91	56.05	51.15
255.0	53.73	56.82	60.19	50.29	53.53	49.70
295.9	53.05	55.87	60.03	48.14	50.83	48.52
336.7	52.10	55.47	59.46	45.29	46.60	45.69
377.5	51.43	56.27	61.47	43.13	44.32	44.40
418.3	50.21	56.45	65.91	41.57	42.66	43.27
459.1	49.06	54.19	60.60	38.95	40.32	41.08
500.0	48.19	51.79	55.16	37.45	38.88	39.78
540.8	47.64	50.03	52.94	35.93	37.09	38.30
581.6	47.07	49.30	52.07	34.57	35.74	36.97
622.4	47.38	51.05	56.59	33.63	35.34	36.65
663.3	49.01	53.41	61.67	32.67	34.69	36.22
704.1	50.46	55.90	60.48	31.66	34.08	35.84
785.7	60.58	61.12	55.99	30.05	32.34	34.58
826.5	56.86	57.47	53.89	29.22	31.19	33.18
867.4	50.66	52.58	51.10	28.51	30.08	31.92
908.2	46.49	48.86	48.70	28.14	29.16	30.81
949.0	44.27	45.55	45.96	27.89	28.38	29.69
989.8	42.62	42.80	43.13	27.69	27.88	28.74
1030.6	41.77	41.82	41.98	27.18	27.64	28.14
1071.5	40.72	40.72	40.93	26.88	27.52	28.18
1112.3	39.55	39.80	39.80	26.54	27.48	28.09
1153.1	38.58	39.30	39.30	26.11	27.47	28.44
1193.9	37.59	38.67	39.10	25.67	27.25	28.57
1234.8	36.40	37.61	38.40	25.13	26.78	28.27
1255.2	36.30	37.50	38.55	25.22	26.75	28.26
1296.0	35.14	36.54	38.16	24.53	25.92	27.47
1316.4	34.75	36.02	37.44	24.48	25.64	27.09
1357.2	33.84	35.51	37.21	23.77	24.94	26.60
1377.6	33.15	35.04	36.91	23.55	24.69	26.46
1438.9	32.00	34.26	36.03	22.69	24.17	25.99
1479.7	31.62	33.98	35.60	22.47	24.16	26.00
1500.1	31.67	33.80	35.25	22.57	24.22	25.98

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	48.39	49.59	50.09
50.9	80.9	34.61	34.95	35.22
91.7	121.7	29.88	30.27	30.62
132.6	162.6	27.21	27.58	27.93
173.4	203.4	25.30	25.71	26.09
214.2	244.2	24.03	24.63	24.97
255.0	285.0	23.36	23.83	24.26
295.9	325.9	22.91	23.59	23.91
336.7	366.7	22.59	23.64	24.03
377.5	407.5	22.46	23.39	24.12
418.3	448.3	22.65	23.28	24.03
459.1	489.1	23.39	24.13	24.47
500.0	530.0	24.50	25.15	25.32
540.8	570.8	25.17	25.37	25.64
581.6	611.6	24.53	24.78	25.55
622.4	652.4	22.80	23.11	23.93
663.3	693.3	21.03	21.14	21.62
704.1	734.1	19.62	19.53	19.58
744.9	774.9	18.49	18.09	17.79
785.7	815.7	17.56	16.83	16.33
826.5	856.5	16.80	15.88	15.32
867.4	897.4	16.26	15.24	14.59
908.2	938.2	15.98	14.90	14.18
949.0	979.0	15.67	14.71	13.84
989.8	1019.8	15.22	14.46	13.54
1030.6	1060.6	14.91	14.34	13.67
1071.5	1101.5	14.65	14.25	13.81
1112.3	1142.3	14.41	14.08	13.76
1153.1	1183.1	14.18	13.93	13.66
1193.9	1223.9	13.85	13.69	13.50
1234.8	1264.8	13.46	13.41	13.30
1255.2	1285.2	13.29	13.25	13.14
1296.0	1326.0	12.88	12.89	12.80
1316.4	1346.4	12.64	12.70	12.62
1357.2	1387.2	12.19	12.18	12.06
1377.6	1407.6	11.98	11.89	11.76
1418.5	1448.5	11.47	11.21	11.06
1438.9	1468.9	11.22	10.88	10.71
1479.7	1509.7	10.68	10.28	10.07
1500.1	1530.1	10.37	9.93	9.70

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Frequency Mixer

ZP-1H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)				IF (OUT) (MHz)	IF VSWR @LO=600.1MHz (:1)		
		@LO (dBm)				@LO (dBm)					@LO (dBm)		
		+14	+17	+20		+14	+17	+20	+14		+17	+20	
2.0	32.0	1.28	1.22	1.25	2.0	1.27	1.67	2.71	5.0	1.51	1.33	1.25	
5.0	35.0	1.20	1.10	1.14	5.0	1.20	1.60	2.58	10.0	1.51	1.34	1.25	
10.0	40.0	1.16	1.03	1.09	10.0	1.07	1.63	2.60	25.1	2.01	1.70	1.46	
50.9	80.9	1.19	1.06	1.03	50.9	1.04	1.58	2.38	40.3	1.88	1.59	1.37	
91.7	121.7	1.23	1.08	1.05	91.7	1.06	1.50	2.24	55.4	1.85	1.57	1.35	
132.6	162.6	1.20	1.08	1.09	132.6	1.10	1.54	2.30	70.5	1.87	1.59	1.37	
173.4	203.4	1.24	1.12	1.11	173.4	1.11	1.50	2.19	85.6	1.90	1.62	1.40	
214.2	244.2	1.25	1.15	1.14	214.2	1.17	1.52	2.21	100.8	1.95	1.66	1.43	
255.0	285.0	1.27	1.17	1.17	255.0	1.18	1.52	2.22	115.9	1.99	1.68	1.45	
295.9	325.9	1.31	1.20	1.19	295.9	1.21	1.50	2.15	131.0	2.01	1.70	1.46	
336.7	366.7	1.31	1.21	1.20	336.7	1.27	1.56	2.23	146.2	1.98	1.68	1.45	
377.5	407.5	1.32	1.22	1.22	377.5	1.28	1.53	2.21	161.3	1.93	1.64	1.42	
418.3	448.3	1.33	1.22	1.22	418.3	1.31	1.55	2.19	176.4	1.94	1.64	1.42	
459.1	489.1	1.34	1.23	1.22	459.1	1.38	1.58	2.21	191.5	2.00	1.70	1.46	
500.0	530.0	1.35	1.24	1.24	500.0	1.40	1.56	2.15	206.7	2.06	1.75	1.51	
540.8	570.8	1.38	1.27	1.26	540.8	1.44	1.61	2.18	221.8	2.04	1.74	1.50	
581.6	611.6	1.38	1.29	1.28	581.6	1.50	1.62	2.14	236.9	2.00	1.70	1.47	
622.4	652.4	1.38	1.31	1.29	622.4	1.52	1.62	2.17	252.1	1.99	1.70	1.46	
663.3	693.3	1.37	1.30	1.29	663.3	1.55	1.63	2.14	267.2	2.05	1.74	1.50	
704.1	734.1	1.35	1.27	1.27	704.1	1.63	1.65	2.13	282.3	2.08	1.78	1.54	
744.9	774.9	1.33	1.24	1.23	744.9	1.66	1.66	2.12	297.4	2.09	1.78	1.55	
785.7	815.7	1.33	1.21	1.21	785.7	1.72	1.65	2.06	312.6	2.09	1.78	1.54	
826.5	856.5	1.36	1.24	1.23	826.5	1.77	1.70	2.09	327.7	2.12	1.81	1.56	
867.4	897.4	1.43	1.31	1.29	867.4	1.81	1.74	2.09	342.8	2.15	1.83	1.58	
908.2	938.2	1.55	1.42	1.40	908.2	1.80	1.77	2.12	357.9	2.15	1.84	1.59	
949.0	979.0	1.71	1.58	1.53	949.0	1.78	1.80	2.14	373.1	2.14	1.84	1.59	
989.8	1019.8	1.88	1.74	1.67	989.8	1.78	1.79	2.14	388.2	2.17	1.86	1.60	
1030.6	1060.6	2.08	1.93	1.83	1030.6	1.77	1.79	2.16	403.3	2.21	1.89	1.63	
1071.5	1101.5	2.28	2.11	1.99	1071.5	1.78	1.76	2.12	418.5	2.23	1.91	1.66	
1112.3	1142.3	2.45	2.26	2.11	1112.3	1.78	1.71	2.06	433.6	2.23	1.92	1.66	
1153.1	1183.1	2.62	2.42	2.24	1153.1	1.77	1.68	2.02	448.7	2.22	1.91	1.65	
1193.9	1223.9	2.75	2.55	2.34	1193.9	1.76	1.63	1.96	463.8	2.26	1.94	1.67	
1234.8	1264.8	2.83	2.62	2.40	1234.8	1.77	1.59	1.90	479.0	2.32	1.99	1.71	
1255.2	1285.2	2.86	2.65	2.42	1255.2	1.71	1.59	1.94	494.1	2.34	2.00	1.73	
1296.0	1326.0	2.92	2.69	2.48	1296.0	1.76	1.52	1.83	509.2	2.31	1.98	1.72	
1316.4	1346.4	2.94	2.71	2.51	1316.4	1.69	1.51	1.82	524.4	2.30	1.97	1.71	
1357.2	1387.2	2.93	2.72	2.55	1357.2	1.69	1.52	1.84	539.5	2.33	2.00	1.73	
1377.6	1407.6	2.92	2.73	2.57	1377.6	1.78	1.51	1.82	554.6	2.38	2.05	1.78	
1438.9	1468.9	2.88	2.75	2.62	1438.9	1.84	1.55	1.83	569.7	2.41	2.08	1.81	
1479.7	1509.7	2.85	2.75	2.65	1479.7	1.87	1.60	1.85	584.9	2.40	2.08	1.81	
1500.1	1530.1	2.82	2.74	2.65	1500.1	1.85	1.62	1.85	600.0	2.07	1.86	1.71	

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	37	18	40	27	48	36	61	39	49
1	-	17	+0	28	16	40	46	40	23	42	30	45
2	95	75	49	68	49	70	51	70	62	72	59	74
3	>100	59	54	63	48	59	44	62	43	56	44	63
4	>100	83	79	86	81	84	85	82	75	83	70	80
5	>100	72	70	76	68	75	65	75	67	82	67	83
6	>100	>93	92	>93	91	>93	90	89	90	>93	89	>93
7	>100	90	86	88	88	91	85	90	88	90	88	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	90	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	82	>93
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; -1.00 dBm.
LO IN: 330.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.38 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	34	51	32	57	47	60	49	64	50	57
1	-	17	+0	29	15	40	28	41	35	49	43	54
2	80	69	47	60	46	59	45	69	49	64	63	79
3	>100	45	45	49	57	59	41	54	40	50	38	57
4	>100	68	60	73	60	73	61	71	62	75	68	77
5	>100	64	66	65	56	61	49	55	46	57	45	60
6	>100	72	70	75	69	80	72	81	76	77	70	90
7	>100	68	79	71	73	68	64	65	59	64	59	68
8	>100	100	81	81	78	88	79	100	81	84	80	80
9	>100	83	76	74	73	70	69	72	66	71	67	74
10	>100	101	>103	>103	95	99	97	101	93	90	88	84
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; 9.00 dBm.
LO IN: 330.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.68 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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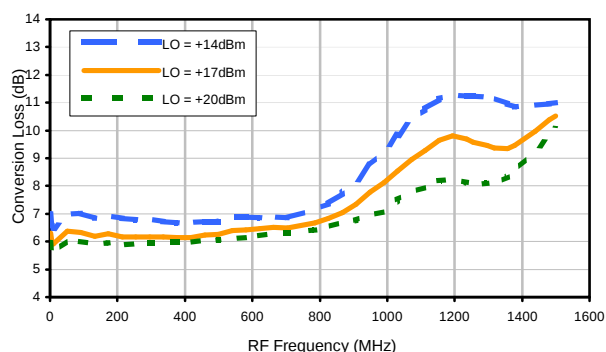


Frequency Mixer

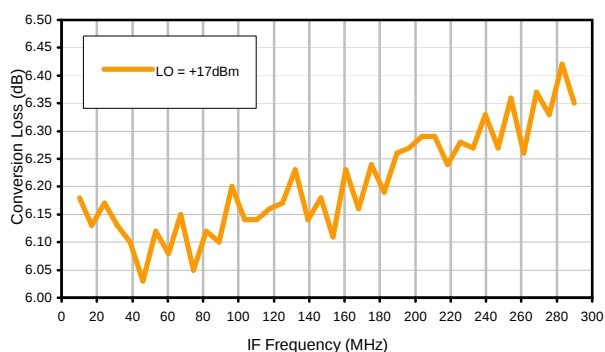
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Typical Performance Curves

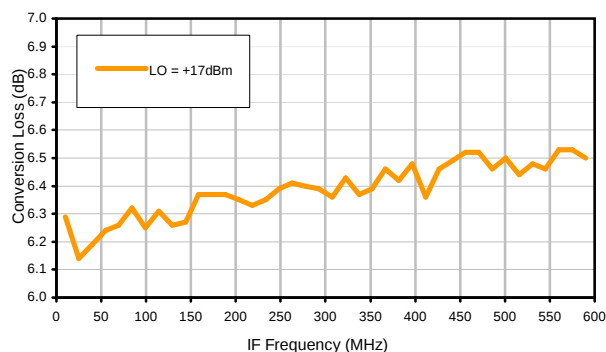
Conversion Loss @ IF=30MHz



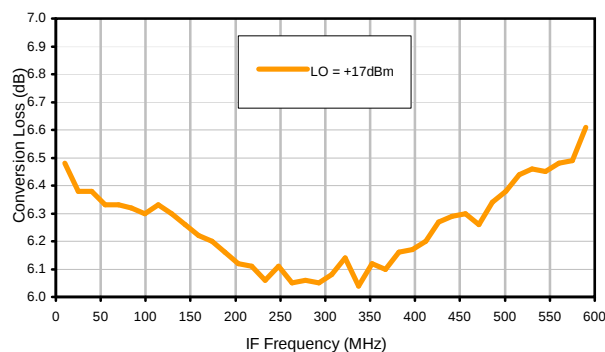
Conversion Loss vs. IF @ RF=300.1MHz



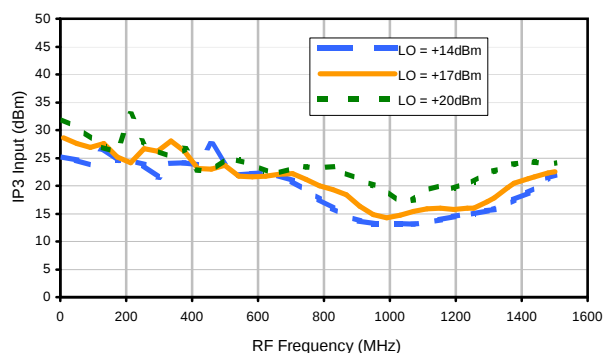
Conversion Loss vs. IF @ RF=10.1MHz



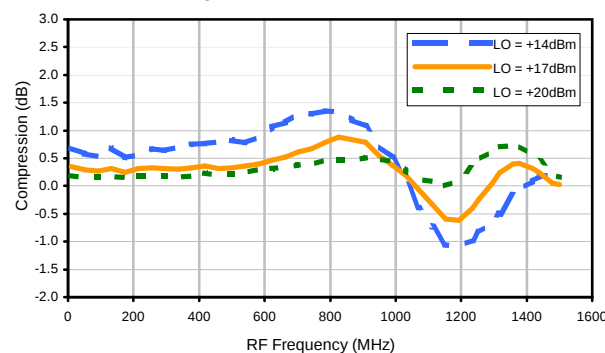
Conversion Loss vs. IF @ RF=600.1MHz



IP3 Input



Compression @ RF IN=+14dBm



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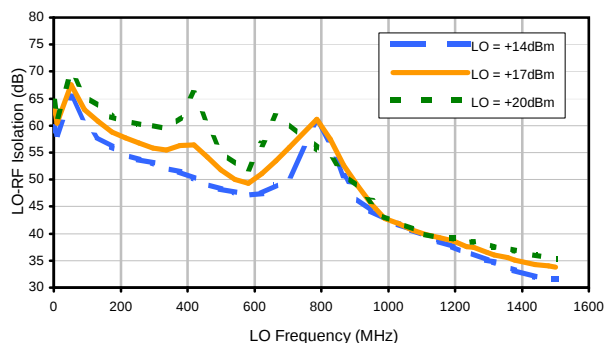


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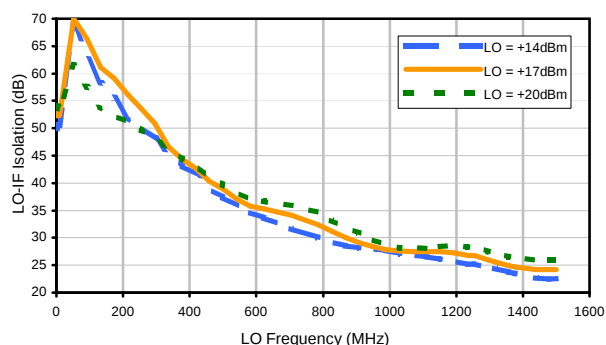


Typical Performance Curves

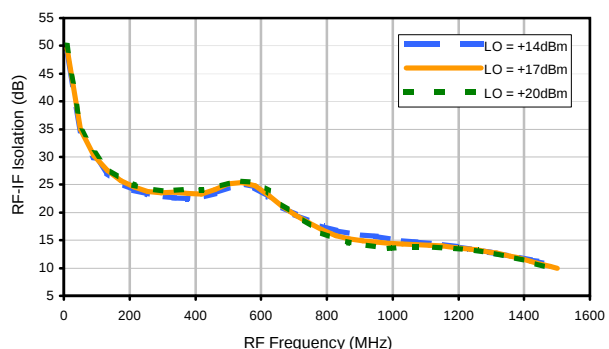
LO-RF Isolation



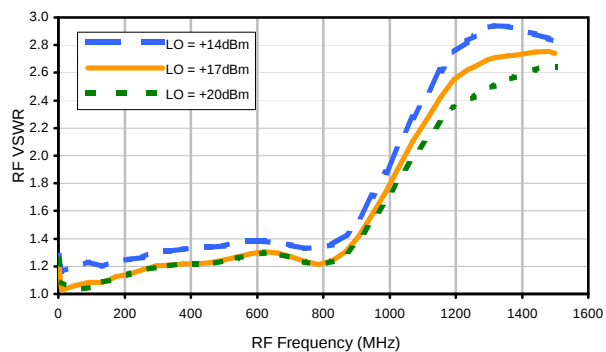
LO-IF Isolation



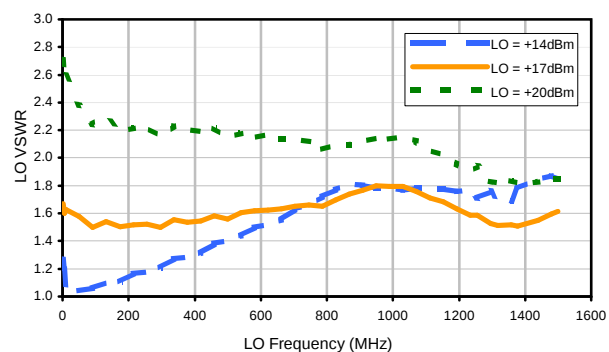
RF-IF Isolation



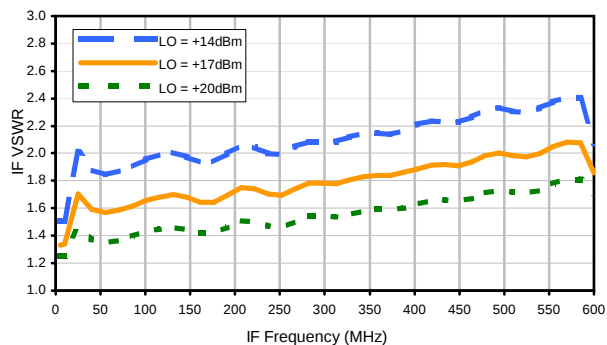
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	37	18	40	27	48	36	61	39	49
1	-	17	+0	28	16	40	46	40	23	42	30	45
2	95	75	49	68	49	70	51	70	62	72	59	74
3	>100	59	54	63	48	59	44	62	43	56	44	63
4	>100	83	79	86	81	84	85	82	75	83	70	80
5	>100	72	70	76	68	75	65	75	67	82	67	83
6	>100	>93	92	>93	91	>93	90	89	90	>93	89	>93
7	>100	90	86	88	88	91	85	90	88	90	88	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	90	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	82	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; -1.00 dBm.
LO IN: 330.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.38 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	34	51	32	57	47	60	49	64	50	57
1	-	17	+0	29	15	40	28	41	35	49	43	54
2	80	69	47	60	46	59	45	69	49	64	63	79
3	>100	45	45	49	57	59	41	54	40	50	38	57
4	>100	68	60	73	60	73	61	71	62	75	68	77
5	>100	64	66	65	56	61	49	55	46	57	45	60
6	>100	72	70	75	69	80	72	81	76	77	70	90
7	>100	68	79	71	73	68	64	65	59	64	59	68
8	>100	100	81	81	78	88	79	100	81	84	80	80
9	>100	83	76	74	73	70	69	72	66	71	67	74
10	>100	101	>103	>103	95	99	97	101	93	90	88	84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; 9.00 dBm.
LO IN: 330.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.68 dBm

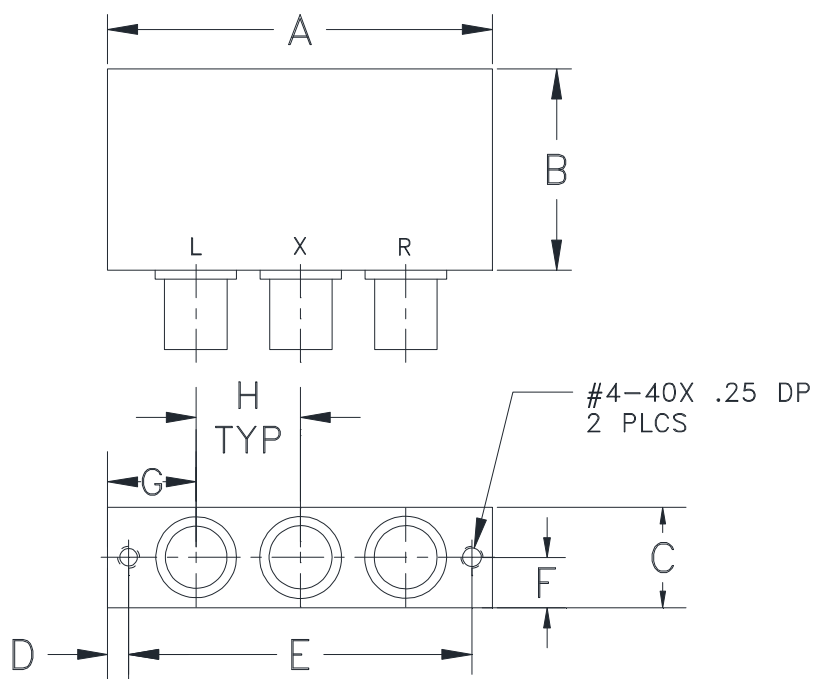
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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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