

Coaxial Frequency Mixer

Level 17 (LO Power +17 dBm) 20 to 1500 MHz

ZP-5H+



Generic photo used for illustration purposes only

Maximum Ratings

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

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

Coaxial Connections

LO	L
RF	R
IF	X

Features

- low conversion loss, 7.5 dB typ.
- excellent L-R isolation, 50 dB typ., L-I, 29 dB typ.
- wideband, 20 to 1500 MHz
- rugged shielded case

Applications

- VHF/UHF
- satellite distribution
- instrumentation
- cellular

CASE STYLE: GG60

Connectors Model

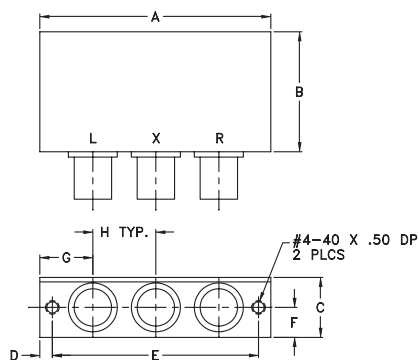
BNC ZP-5H+

SMA ZP-5H-S+

+RoHS Compliant

The +Suffix identifies 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
58.67	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 f_L - f_U	IF	Mid-Band m		Total Range		L		M		U		L		M		U	
		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
20-1500	DC-1000	7.50	0.17	8.5	9.0	62	55	50	40	38	25	40	25	29	18	20	8

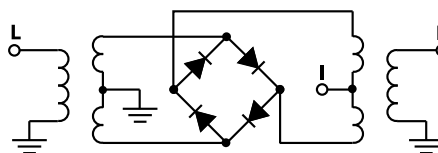
1 dB COMP.: +14 dBm typ.

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)	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
20.00	50.00	6.69	76.70	54.80	1.64	1.69
50.00	80.00	6.37	69.50	48.00	1.53	1.71
110.00	140.00	5.99	65.00	43.50	1.61	1.63
200.00	230.00	5.98	61.10	39.10	1.64	1.63
320.00	350.00	6.13	58.30	36.40	1.80	1.58
500.00	530.00	6.49	56.50	33.60	1.94	1.62
635.00	665.00	6.96	50.80	31.50	2.02	1.62
740.00	770.00	7.59	47.20	30.20	2.32	1.69
845.00	875.00	8.29	46.10	29.80	2.73	1.77
950.00	980.00	8.38	44.20	28.60	3.05	1.89
1000.00	1030.00	8.21	41.40	27.80	3.16	1.86
1055.00	1085.00	7.97	38.90	27.10	3.29	1.84
1100.00	1130.00	7.98	36.60	25.20	3.59	1.93
1200.00	1230.00	7.63	37.20	24.10	3.70	2.03
1250.00	1280.00	7.55	36.30	22.90	3.65	2.08
1300.00	1330.00	7.47	35.00	21.70	3.58	2.08
1350.00	1380.00	7.23	34.50	21.10	3.45	2.14
1400.00	1730.00	7.30	34.00	19.90	3.21	2.24
1470.00	1500.00	7.17	33.80	19.30	3.06	2.24
1500.00	1470.00	7.21	33.30	17.00	2.92	2.37

Electrical Schematic



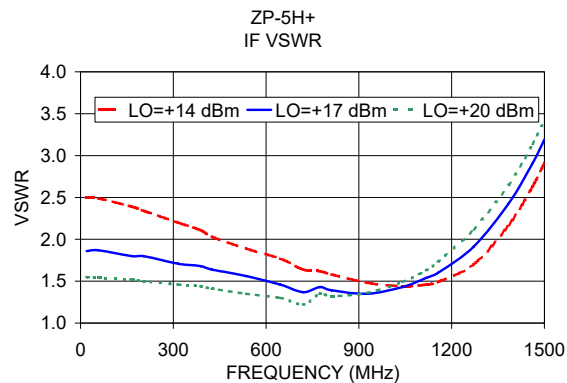
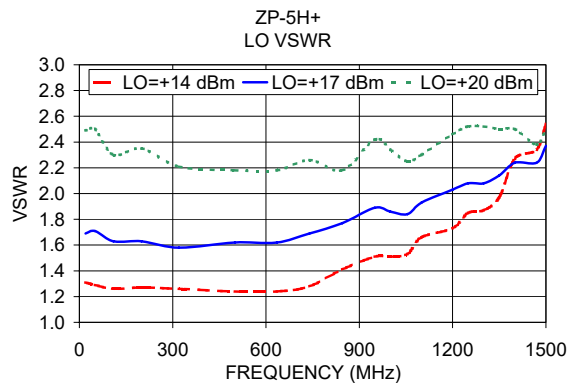
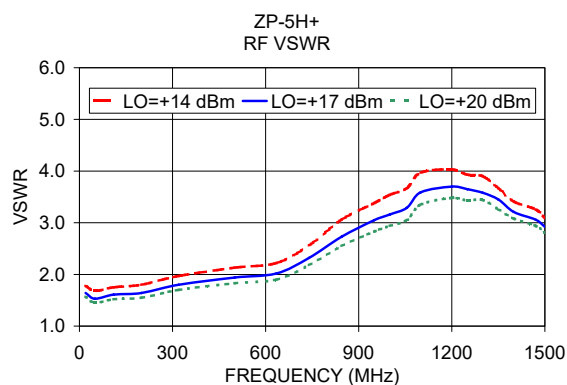
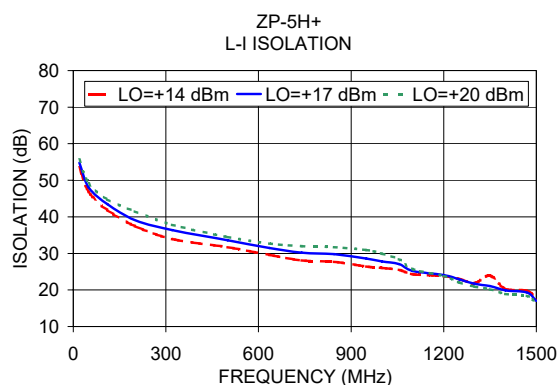
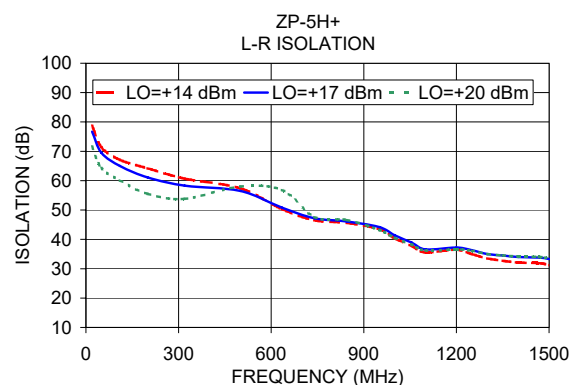
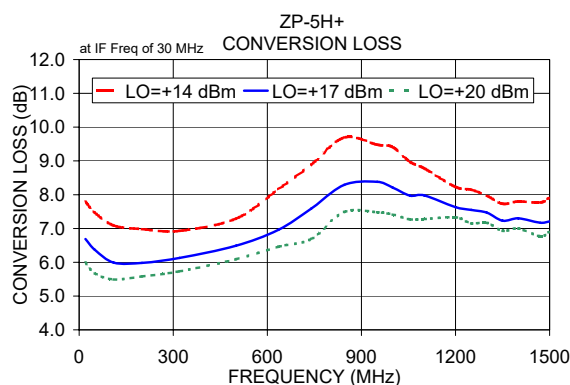
Notes

- 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.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Frequency Mixer

ZP-5H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	7.63	6.39	6.06
70.7	100.7	7.06	6.20	5.72
131.3	161.3	6.97	6.03	5.63
191.9	221.9	6.94	6.03	5.71
252.5	282.5	6.88	6.12	5.80
313.1	343.1	6.91	6.20	5.91
373.7	403.7	7.01	6.32	6.06
434.3	464.3	7.09	6.41	6.11
474.7	504.7	7.14	6.48	6.22
535.2	565.2	7.43	6.66	6.37
575.6	605.6	7.73	6.83	6.40
636.2	666.2	8.16	7.28	6.73
676.6	706.6	8.49	7.58	7.06
737.2	767.2	9.19	7.99	7.42
777.6	807.6	9.68	8.18	7.47
838.2	868.2	10.47	8.30	7.26
878.6	908.6	10.76	8.33	7.25
939.2	969.2	10.41	8.66	7.41
979.6	1009.6	9.86	8.64	7.47
1040.2	1070.2	9.28	8.48	7.70
1080.6	1110.6	9.01	8.37	7.73
1141.2	1171.2	8.67	8.19	7.72
1181.6	1211.6	8.50	8.10	7.75
1242.2	1272.2	8.34	7.94	7.66
1282.6	1312.6	8.18	7.79	7.53
1343.2	1373.2	8.07	7.55	7.28
1383.6	1413.6	8.16	7.52	7.20
1444.2	1474.2	8.28	7.45	6.95
1484.6	1514.6	8.32	7.31	6.79
1545.1	1575.1	8.26	6.97	6.67
1585.5	1615.5	8.40	6.95	6.71
1646.1	1676.1	8.02	6.97	6.80
1686.5	1716.5	8.32	7.10	6.90
1747.1	1777.1	8.96	7.38	7.14
1787.5	1817.5	9.58	7.69	7.34
1848.1	1878.1	11.30	8.11	7.57
1888.5	1918.5	13.05	8.56	7.66
1949.1	1979.1	14.44	9.21	7.83
1989.5	2019.5	15.99	9.75	8.05
2050.1	2080.1	16.87	10.23	8.20

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	21.78	24.66	26.34
70.7	100.7	23.24	26.78	28.24
131.3	161.3	24.23	28.03	23.23
191.9	221.9	23.72	22.65	22.26
252.5	282.5	24.59	20.37	21.87
313.1	343.1	20.45	20.27	22.39
373.7	403.7	18.81	20.35	22.23
434.3	464.3	18.05	19.62	23.85
474.7	504.7	18.37	19.53	21.65
535.2	565.2	17.16	20.71	22.65
575.6	605.6	16.11	20.28	24.66
636.2	666.2	16.26	17.90	21.84
676.6	706.6	17.09	18.24	20.45
737.2	767.2	18.20	19.74	21.21
777.6	807.6	17.60	19.99	21.98
838.2	868.2	15.89	20.36	25.36
878.6	908.6	15.30	21.28	25.65
939.2	969.2	16.50	20.39	23.38
979.6	1009.6	18.58	20.11	22.21
1040.2	1070.2	20.15	20.64	20.52
1080.6	1110.6	20.56	20.57	19.48
1141.2	1171.2	21.80	20.53	19.16
1181.6	1211.6	23.51	21.28	19.45
1242.2	1272.2	25.15	21.79	21.00
1282.6	1312.6	24.50	21.81	23.69
1343.2	1373.2	23.18	25.22	23.89
1383.6	1413.6	21.98	25.33	22.62
1444.2	1474.2	20.06	22.75	22.07
1484.6	1514.6	19.39	20.26	21.85
1545.1	1575.1	20.08	19.19	24.15
1585.5	1615.5	19.85	20.27	25.41
1646.1	1676.1	17.47	22.63	29.70
1686.5	1716.5	17.34	23.10	29.33
1747.1	1777.1	17.46	23.83	29.73
1787.5	1817.5	18.25	25.00	29.08
1848.1	1878.1	22.78	24.82	32.04
1888.5	1918.5	17.49	24.54	30.89
1949.1	1979.1	14.29	22.79	30.60
1989.5	2019.5	12.17	22.27	26.65
2050.1	2080.1	11.23	23.47	24.46

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	0.50	0.30	0.25
70.7	100.7	0.89	0.42	0.25
131.3	161.3	1.08	0.47	0.27
191.9	221.9	1.13	0.50	0.25
252.5	282.5	1.20	0.52	0.24
313.1	343.1	1.13	0.41	0.22
373.7	403.7	1.21	0.44	0.23
434.3	464.3	1.27	0.52	0.34
474.7	504.7	1.29	0.62	0.39
535.2	565.2	1.27	0.83	0.50
575.6	605.6	1.29	0.91	0.66
636.2	666.2	1.27	0.77	0.68
676.6	706.6	1.10	0.64	0.54
737.2	767.2	0.74	0.54	0.41
777.6	807.6	0.29	0.43	0.43
838.2	868.2	-0.39	0.44	0.66
878.6	908.6	-0.70	0.56	0.76
939.2	969.2	-0.56	0.27	0.67
979.6	1009.6	-0.23	0.11	0.56
1040.2	1070.2	0.08	0.09	0.34
1080.6	1110.6	0.33	0.16	0.28
1141.2	1171.2	0.52	0.19	0.24
1181.6	1211.6	0.67	0.24	0.23
1242.2	1272.2	0.90	0.36	0.29
1282.6	1312.6	1.00	0.49	0.41
1343.2	1373.2	1.30	0.68	0.54
1383.6	1413.6	1.38	0.73	0.58
1444.2	1474.2	1.37	0.78	0.65
1484.6	1514.6	1.59	0.92	0.67
1545.1	1575.1	1.65	1.13	0.52
1585.5	1615.5	1.84	1.26	0.46
1646.1	1676.1	2.06	1.16	0.40
1686.5	1716.5	2.04	1.18	0.42
1747.1	1777.1	1.81	1.10	0.42
1787.5	1817.5	1.58	1.17	0.42
1848.1	1878.1	0.51	1.15	0.42
1888.5	1918.5	-0.67	1.11	0.48
1949.1	1979.1	-1.47	0.95	0.56
1989.5	2019.5	-2.52	0.75	0.49
2050.1	2080.1	-3.19	0.58	0.58

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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)=750.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=20.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
710.0	40.1	6.63	10.0	30.1	6.71	1000.0	500.1	8.56
692.1	58.0	6.68	30.2	50.3	6.59	979.8	520.3	8.46
674.1	76.0	6.89	50.4	70.5	6.57	959.6	540.5	8.40
656.2	93.9	6.76	70.6	90.7	6.73	939.4	560.7	8.43
638.2	111.9	6.71	90.8	110.9	6.57	919.2	580.9	8.36
620.3	129.8	6.59	111.0	131.1	6.49	899.0	601.1	8.41
602.3	147.8	6.67	131.2	151.3	6.54	878.8	621.3	8.39
584.4	165.7	6.66	151.4	171.5	6.60	858.6	641.5	8.48
566.4	183.7	6.82	171.6	191.7	6.47	838.4	661.7	8.54
548.5	201.6	6.81	191.8	211.9	6.46	818.2	681.9	8.47
530.5	219.6	6.89	212.0	232.1	6.47	798.0	702.1	8.49
512.6	237.5	6.88	232.2	252.3	6.36	777.8	722.3	8.35
494.6	255.5	6.98	252.4	272.5	6.41	757.6	742.5	8.31
476.7	273.4	6.99	272.7	292.8	6.36	737.3	762.8	8.03
458.7	291.4	7.09	292.9	313.0	6.33	717.1	783.0	8.01
440.8	309.3	7.16	313.1	333.2	6.32	696.9	803.2	8.00
422.8	327.3	7.11	333.3	353.4	6.30	676.7	823.4	7.85
404.9	345.2	7.03	353.5	373.6	6.36	656.5	843.6	7.83
386.9	363.2	7.04	373.7	393.8	6.29	636.3	863.8	7.75
369.0	381.1	7.11	393.9	414.0	6.28	616.1	884.0	7.65
351.0	399.1	7.22	434.3	454.4	6.29	575.7	924.4	7.47
333.1	417.0	7.23	454.5	474.6	6.34	555.5	944.6	7.50
315.1	435.0	7.26	494.9	515.0	6.30	515.1	985.0	7.47
297.2	452.9	7.26	515.1	535.2	6.24	494.9	1005.2	7.50
279.2	470.9	7.35	555.5	575.6	6.34	454.5	1045.6	7.69
261.3	488.8	7.44	575.7	595.8	6.31	434.3	1065.8	7.71
243.3	506.8	7.41	616.1	636.2	6.40	393.9	1106.2	7.78
225.4	524.7	7.45	636.3	656.4	6.52	373.7	1126.4	7.84
207.4	542.7	7.45	676.7	696.8	6.54	333.3	1166.8	7.78
189.5	560.6	7.52	696.9	717.0	6.54	313.1	1187.0	7.84
171.5	578.6	7.48	737.3	757.4	6.73	272.7	1227.4	7.85
153.6	596.5	7.59	757.6	777.7	6.67	252.4	1247.7	7.84
135.6	614.5	7.61	798.0	818.1	6.73	212.0	1288.1	7.77
117.7	632.4	7.74	818.2	838.3	6.76	191.8	1308.3	7.69
99.7	650.4	7.77	858.6	878.7	6.84	151.4	1348.7	7.64
81.8	668.3	7.90	878.8	898.9	6.91	131.2	1368.9	7.57
63.8	686.3	7.90	919.2	939.3	7.15	90.8	1409.3	7.49
45.9	704.2	7.96	939.4	959.5	7.31	70.6	1429.5	7.52
27.9	722.2	7.95	979.8	999.9	7.58	30.2	1469.9	7.44
10.0	740.1	8.13	1000.0	1020.1	7.61	10.0	1490.1	7.50

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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
10.1	86.73	84.43	83.51	56.04	57.24	60.21
70.7	71.74	71.49	71.46	38.92	41.03	43.06
131.3	66.20	65.95	66.48	33.81	36.23	38.84
191.9	63.03	63.29	63.71	30.94	33.55	36.23
252.5	60.51	61.81	62.96	29.08	32.14	34.51
313.1	58.86	59.95	60.47	27.96	30.80	32.98
373.7	57.53	58.67	59.19	26.95	29.46	31.62
434.3	56.11	57.94	59.08	25.72	28.36	30.50
474.7	54.46	55.83	56.79	25.13	27.55	29.84
535.2	52.02	52.60	52.59	24.01	26.58	28.66
575.6	51.41	51.79	52.03	23.33	26.03	28.22
636.2	50.12	51.02	50.66	22.64	24.99	27.52
676.6	49.71	51.20	51.54	22.50	24.42	26.69
737.2	48.96	50.89	52.05	22.42	24.09	25.84
777.6	48.42	49.84	50.54	22.37	24.02	25.46
838.2	48.30	49.04	49.61	22.09	23.65	24.47
878.6	48.98	48.80	49.22	21.85	23.24	23.72
939.2	50.28	48.76	48.46	21.15	22.38	22.61
979.6	50.85	49.54	48.49	20.80	21.76	21.87
1040.2	51.22	50.91	49.71	20.46	21.04	21.05
1080.6	51.73	51.78	50.68	20.46	20.81	20.65
1141.2	51.72	51.56	49.34	20.10	20.31	20.03
1181.6	51.47	50.52	47.46	20.03	20.04	19.66
1242.2	50.40	49.82	48.10	19.88	19.57	18.94
1282.6	49.53	49.12	47.50	19.55	19.07	18.02
1343.2	48.77	49.18	48.55	18.74	17.91	16.71
1383.6	48.32	48.95	47.66	17.92	16.99	15.59
1444.2	48.94	49.07	46.92	16.76	15.58	14.25
1484.6	48.67	47.96	45.14	16.07	14.82	13.56
1545.1	49.05	46.41	43.48	14.82	13.67	12.89
1585.5	48.19	45.39	43.06	14.11	13.16	12.42
1646.1	46.38	44.11	42.01	13.29	12.54	11.95
1686.5	45.17	43.65	41.69	12.64	12.21	11.64
1747.1	45.01	44.47	42.92	11.82	11.66	11.22
1787.5	44.74	44.33	43.44	11.26	11.20	11.02
1848.1	45.91	45.31	44.83	10.67	10.74	10.69
1888.5	46.80	45.34	45.08	10.29	10.42	10.51
1949.1	46.83	45.15	44.28	9.93	10.09	10.14
1989.5	46.79	44.99	43.67	9.73	9.90	10.04
2050.1	45.92	43.60	41.88	9.38	9.64	9.75

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	59.27	62.65	60.61
70.7	100.7	47.23	46.82	46.63
131.3	161.3	42.09	41.71	41.28
191.9	221.9	38.95	38.49	38.06
252.5	282.5	37.09	36.46	35.93
313.1	343.1	35.54	34.71	34.21
373.7	403.7	33.61	32.81	32.29
434.3	464.3	32.24	31.44	31.14
474.7	504.7	31.55	30.64	30.13
535.2	565.2	30.82	29.88	29.37
575.6	605.6	30.34	29.46	28.98
636.2	666.2	29.68	28.91	28.35
676.6	706.6	28.96	28.30	27.75
737.2	767.2	28.01	27.41	26.91
777.6	807.6	27.80	27.30	27.05
838.2	868.2	28.73	28.07	27.94
878.6	908.6	29.88	28.63	28.32
939.2	969.2	32.83	30.88	29.81
979.6	1009.6	34.80	32.83	31.22
1040.2	1070.2	37.14	36.23	34.37
1080.6	1110.6	37.10	36.99	36.43
1141.2	1171.2	35.47	36.08	37.93
1181.6	1211.6	34.21	34.83	37.11
1242.2	1272.2	33.39	33.92	35.22
1282.6	1312.6	32.99	33.22	33.40
1343.2	1373.2	33.54	33.44	32.54
1383.6	1413.6	33.39	33.08	31.97
1444.2	1474.2	33.10	32.28	31.11
1484.6	1514.6	32.62	31.74	30.71
1545.1	1575.1	32.07	31.49	30.84
1585.5	1615.5	31.98	31.54	30.88
1646.1	1676.1	32.35	32.15	31.89
1686.5	1716.5	32.53	32.48	32.29
1747.1	1777.1	32.49	33.19	33.06
1787.5	1817.5	32.34	33.31	33.37
1848.1	1878.1	31.47	33.17	33.47
1888.5	1918.5	30.85	32.81	33.34
1949.1	1979.1	30.34	32.29	33.02
1989.5	2019.5	30.15	32.26	32.99
2050.1	2080.1	30.03	32.29	33.05

Frequency Mixer

ZP-5H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	2.03	1.85	1.77	10.1	1.05	1.45	2.04	10.0	2.35	1.80	1.49
70.7	100.7	1.48	1.27	1.14	70.7	1.02	1.50	2.19	30.2	2.03	1.52	1.22
131.3	161.3	1.49	1.24	1.09	131.3	1.03	1.51	2.23	50.4	1.82	1.38	1.13
191.9	221.9	1.53	1.26	1.14	191.9	1.03	1.46	2.10	70.6	1.80	1.35	1.09
252.5	282.5	1.56	1.31	1.21	252.5	1.03	1.48	2.16	90.8	1.86	1.40	1.13
313.1	343.1	1.60	1.36	1.28	313.1	1.05	1.48	2.14	111.0	1.98	1.48	1.18
373.7	403.7	1.64	1.43	1.36	373.7	1.09	1.49	2.17	131.2	2.02	1.52	1.22
434.3	464.3	1.70	1.51	1.43	434.3	1.13	1.55	2.19	151.4	1.93	1.45	1.16
474.7	504.7	1.74	1.57	1.49	474.7	1.18	1.55	2.16	171.6	1.87	1.40	1.11
535.2	565.2	1.90	1.71	1.62	535.2	1.23	1.61	2.21	191.8	1.96	1.47	1.17
575.6	605.6	2.08	1.86	1.75	575.6	1.26	1.61	2.17	212.0	2.03	1.52	1.21
636.2	666.2	2.40	2.20	2.06	636.2	1.29	1.67	2.23	232.2	1.98	1.48	1.17
676.6	706.6	2.66	2.45	2.31	676.6	1.33	1.68	2.22	252.4	1.96	1.46	1.17
737.2	767.2	3.12	2.84	2.68	737.2	1.39	1.73	2.25	272.7	2.00	1.49	1.19
777.6	807.6	3.43	3.07	2.86	777.6	1.43	1.73	2.22	292.9	2.02	1.51	1.20
838.2	868.2	3.90	3.34	3.03	838.2	1.50	1.79	2.24	313.1	2.03	1.52	1.20
878.6	908.6	4.16	3.50	3.17	878.6	1.53	1.79	2.21	333.3	2.09	1.56	1.25
939.2	969.2	4.32	3.80	3.41	939.2	1.59	1.90	2.31	353.5	2.07	1.54	1.23
979.6	1009.6	4.28	3.91	3.54	979.6	1.59	1.92	2.34	373.7	2.04	1.51	1.20
1040.2	1070.2	4.17	3.92	3.64	1040.2	1.64	1.98	2.41	393.9	2.10	1.56	1.25
1080.6	1110.6	4.09	3.88	3.63	1080.6	1.67	1.97	2.39	434.3	2.15	1.60	1.26
1141.2	1171.2	3.88	3.72	3.50	1141.2	1.72	2.01	2.42	454.5	2.16	1.60	1.27
1181.6	1211.6	3.74	3.58	3.40	1181.6	1.75	2.02	2.41	494.9	2.26	1.68	1.33
1242.2	1272.2	3.60	3.43	3.24	1242.2	1.80	2.04	2.42	515.1	2.24	1.65	1.32
1282.6	1312.6	3.54	3.34	3.13	1282.6	1.83	2.04	2.39	555.5	2.33	1.72	1.37
1343.2	1373.2	3.48	3.19	2.95	1343.2	1.88	2.06	2.39	575.7	2.34	1.73	1.37
1383.6	1413.6	3.46	3.09	2.82	1383.6	1.91	2.03	2.33	616.1	2.39	1.77	1.42
1444.2	1474.2	3.37	2.86	2.55	1444.2	1.95	2.03	2.30	636.3	2.35	1.73	1.38
1484.6	1514.6	3.27	2.67	2.37	1484.6	1.96	2.00	2.26	676.7	2.49	1.85	1.47
1545.1	1575.1	3.05	2.39	2.20	1545.1	2.02	2.01	2.32	696.9	2.53	1.87	1.49
1585.5	1615.5	2.97	2.32	2.14	1585.5	2.07	2.08	2.35	737.3	2.42	1.80	1.45
1646.1	1676.1	2.75	2.28	2.12	1646.1	2.29	2.23	2.47	757.6	2.50	1.86	1.48
1686.5	1716.5	2.85	2.36	2.18	1686.5	2.43	2.34	2.51	798.0	2.60	1.93	1.56
1747.1	1777.1	3.06	2.52	2.34	1747.1	2.82	2.53	2.65	818.2	2.56	1.93	1.57
1787.5	1817.5	3.22	2.63	2.44	1787.5	3.05	2.65	2.69	858.6	2.52	1.89	1.53
1848.1	1878.1	3.55	2.74	2.51	1848.1	3.43	2.87	2.86	878.8	2.63	1.97	1.61
1888.5	1918.5	3.84	2.78	2.52	1888.5	3.64	3.01	2.90	919.2	2.60	1.98	1.66
1949.1	1979.1	3.94	2.81	2.50	1949.1	3.83	3.26	3.08	939.4	2.50	1.92	1.63
1989.5	2019.5	4.09	2.88	2.51	1989.5	3.92	3.38	3.12	979.8	2.59	1.99	1.67
2050.1	2080.1	4.19	2.96	2.52	2050.1	4.13	3.67	3.34	1000.0	2.66	2.06	1.76

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+2	31	16	37	11	45	34	50	41	56
1	-	20	+0	35	32	34	23	63	42	57	45	51
2	83	71	60	67	53	63	50	76	48	60	52	66
3	>100	84	56	72	50	74	62	77	66	76	65	84
4	>100	>91	89	>91	81	85	81	>91	83	88	81	87
5	>100	>91	>91	>91	>91	>91	78	>91	>91	>91	89	>91
6	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
7	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
8	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
9	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -1.00 dBm.

LO IN: 780.01 MHz; +17.00 dBm

IF OUT: 29.91 MHz; -8.91 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	41	26	51	26	53	41	66	56	76
1	-	20	+0	36	27	38	33	59	45	69	53	59
2	72	61	39	63	36	62	50	61	48	61	52	74
3	>100	60	38	51	31	53	43	59	41	67	57	74
4	>100	77	65	71	46	65	44	66	59	74	51	87
5	>100	72	63	66	67	67	54	65	64	63	54	75
6	>100	82	74	80	91	78	60	72	63	78	69	72
7	>100	95	81	85	67	77	64	79	58	75	74	82
8	>100	>102	92	88	77	89	85	85	65	82	63	80
9	>100	98	>102	>102	87	94	84	95	73	78	67	78
10	>100	>102	>102	>102	100	>102	85	97	95	83	68	78
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; 9.00 dBm.

LO IN: 780.01 MHz; +17.00 dBm

IF OUT: 29.91 MHz; 1.59 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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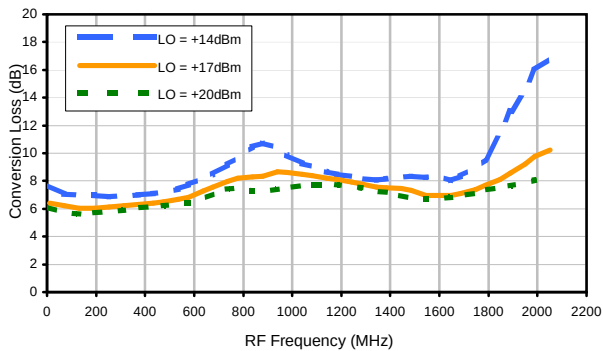


Frequency Mixer

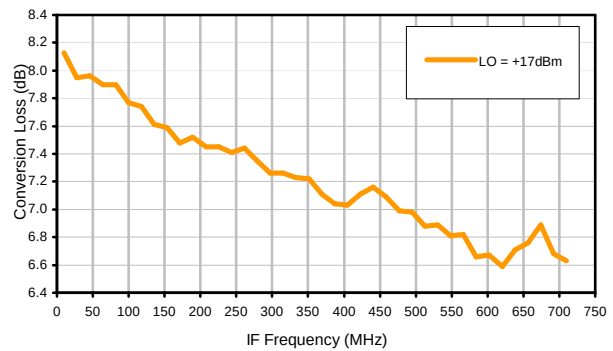
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Typical Performance Curves

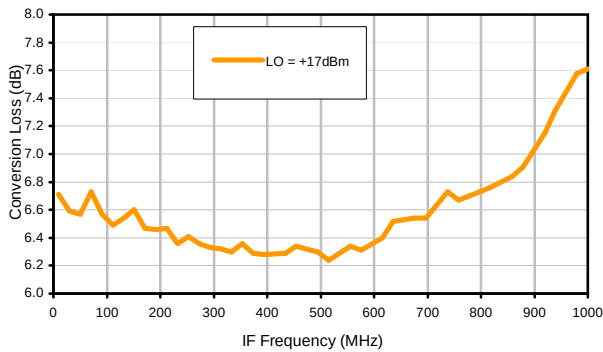
Conversion Loss @ IF=30MHz



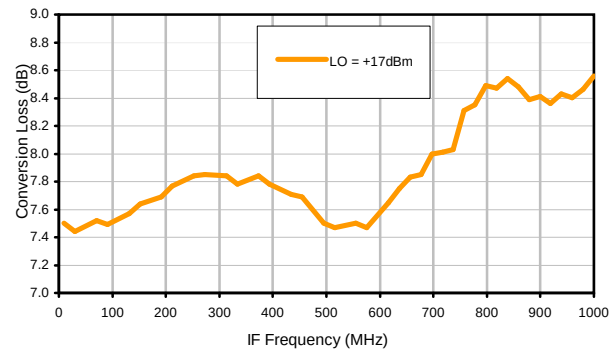
Conversion Loss vs. IF @ RF=750.1MHz



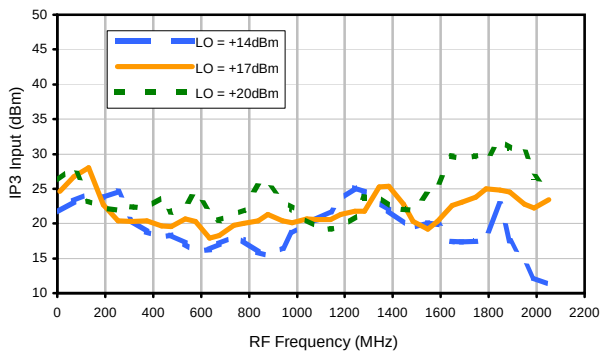
Conversion Loss vs. IF @ RF=20.1MHz



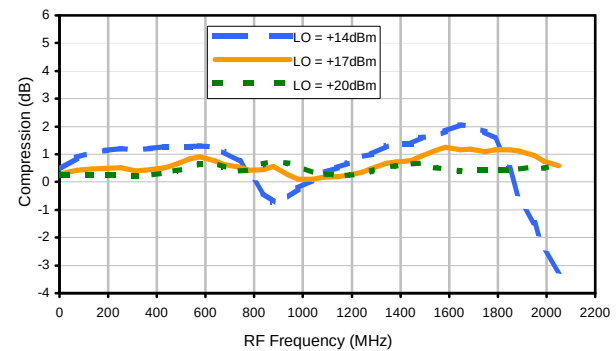
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



Compression @ RF IN=+14dBm



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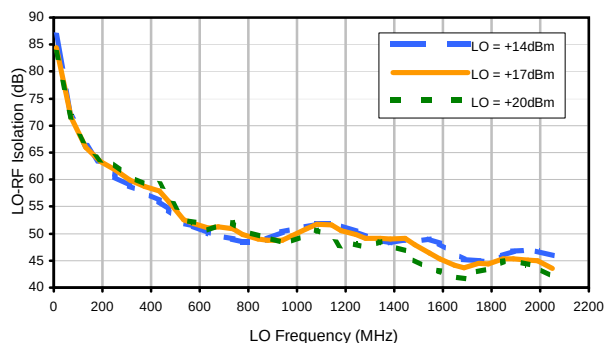


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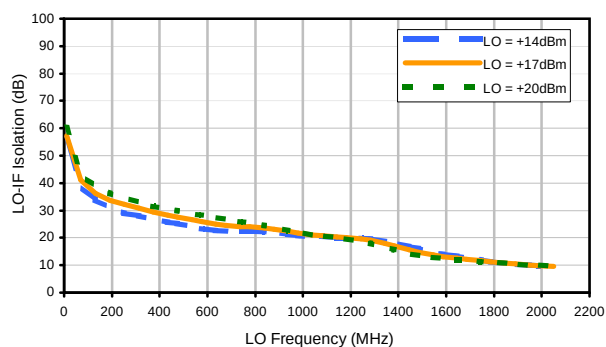


Typical Performance Curves

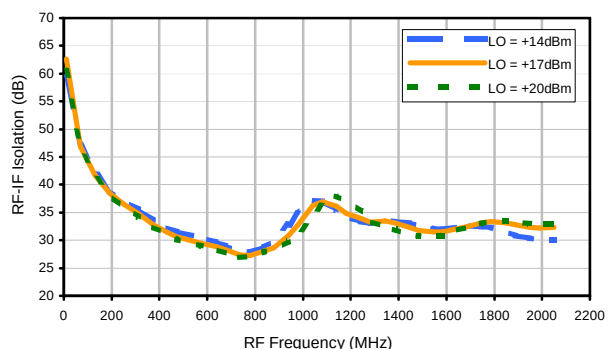
LO-RF Isolation



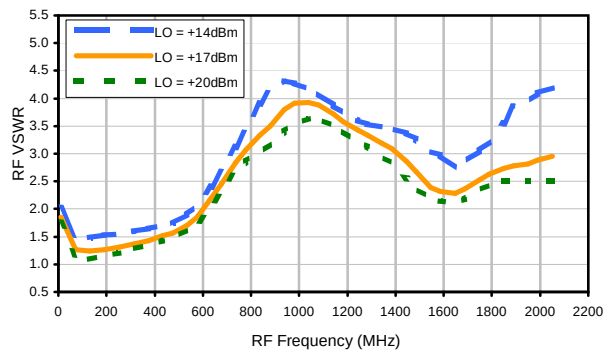
LO-IF Isolation



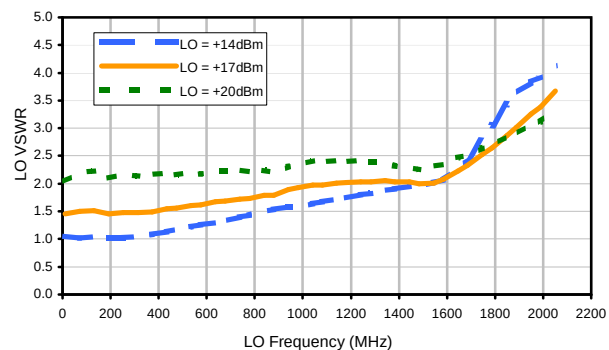
RF-IF Isolation



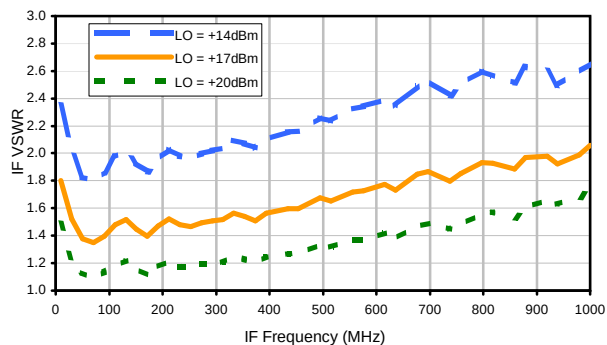
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+2	31	16	37	11	45	34	50	41	56
1	-	20	+0	35	32	34	23	63	42	57	45	51
2	83	71	60	67	53	63	50	76	48	60	52	66
3	>100	84	56	72	50	74	62	77	66	76	65	84
4	>100	>91	89	>91	81	85	81	>91	83	88	81	87
5	>100	>91	>91	>91	>91	>91	78	>91	>91	>91	89	>91
6	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
7	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
8	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
9	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -1.00 dBm.

LO IN: 780.01 MHz; +17.00 dBm

IF OUT: 29.91 MHz; -8.91 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	41	26	51	26	53	41	66	56	76
1	-	20	+0	36	27	38	33	59	45	69	53	59
2	72	61	39	63	36	62	50	61	48	61	52	74
3	>100	60	38	51	31	53	43	59	41	67	57	74
4	>100	77	65	71	46	65	44	66	59	74	51	87
5	>100	72	63	66	67	67	54	65	64	63	54	75
6	>100	82	74	80	91	78	60	72	63	78	69	72
7	>100	95	81	85	67	77	64	79	58	75	74	82
8	>100	>102	92	88	77	89	85	85	65	82	63	80
9	>100	98	>102	>102	87	94	84	95	73	78	67	78
10	>100	>102	>102	>102	100	>102	85	97	95	83	68	78
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; 9.00 dBm.

LO IN: 780.01 MHz; +17.00 dBm

IF OUT: 29.91 MHz; 1.59 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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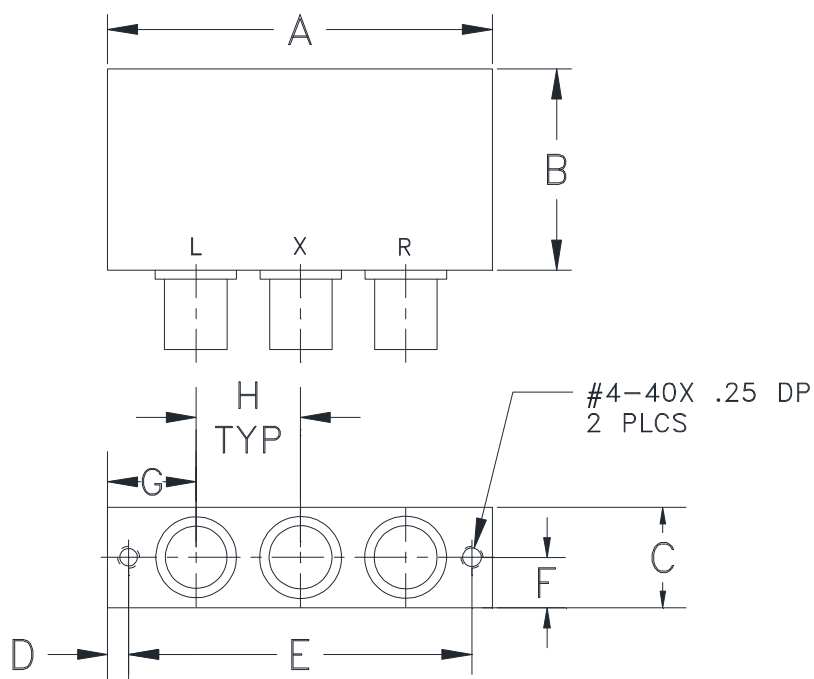


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Outline Dimensions

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