

Coaxial Frequency Mixer

Level 7 (LO Power +7 dBm) 20 to 1500 MHz

ZP-5+



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	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, 5.7 dB typ.
- excellent L-R isolation, 42 dB typ.
- wideband, 20 to 1500 MHz
- rugged shielded case

Applications

- VHF/UHF
- satellite distribution
- instrumentation

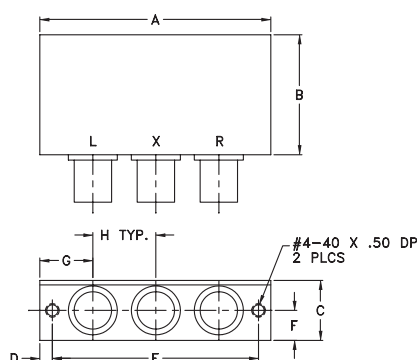
CASE STYLE: GG60

Connectors	Model
BNC	ZP-5+
SMA	ZP-5-S+

+RoHS Compliant

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

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

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	5.7	0.10	9.0	9.0	54	40	42	30	39	25	40	25	32	18	23	8

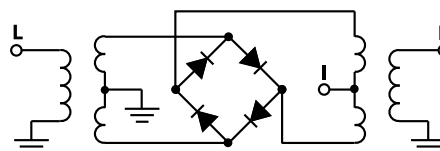
1 dB COMP.: +1 dBm typ.

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 +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
20.00	50.00	5.76	69.06	50.01	1.56	2.37
40.00	70.00	5.54	63.75	45.70	1.44	2.31
50.00	80.00	5.44	61.73	43.88	1.56	2.17
100.00	70.00	5.38	56.05	38.99	1.62	2.16
158.75	128.75	5.40	52.30	36.23	1.89	2.18
200.00	170.00	5.41	49.90	34.38	2.12	2.20
297.50	267.50	5.58	46.54	31.36	2.25	2.23
436.25	406.25	5.81	46.39	28.70	2.65	2.27
500.00	470.00	5.94	46.35	27.70	3.02	2.33
575.00	545.00	6.28	45.43	26.65	3.26	2.35
713.75	683.75	6.65	43.76	25.47	3.36	2.38
750.00	720.00	6.73	43.43	25.18	3.43	2.42
852.50	822.50	6.83	42.21	24.77	3.60	2.54
991.25	961.25	7.20	40.31	22.85	3.65	2.71
1000.00	970.00	7.15	40.23	22.65	3.65	2.84
1130.00	1100.00	7.28	38.87	19.85	3.62	2.90
1268.75	1238.00	7.27	38.46	17.22	3.58	3.10
1407.50	1377.50	7.29	37.61	14.48	3.50	3.39
1453.75	1423.75	7.22	37.14	13.58	3.42	3.62
1500.00	1470.00	7.38	36.87	12.98	3.39	3.76

Electrical Schematic



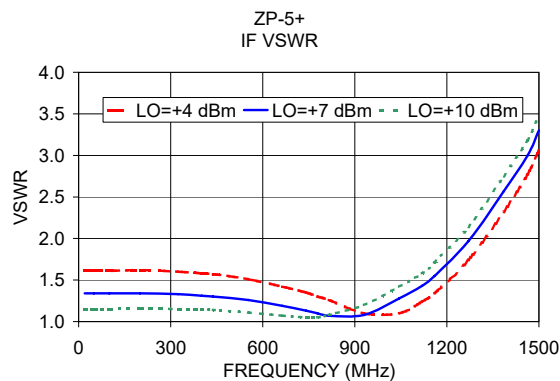
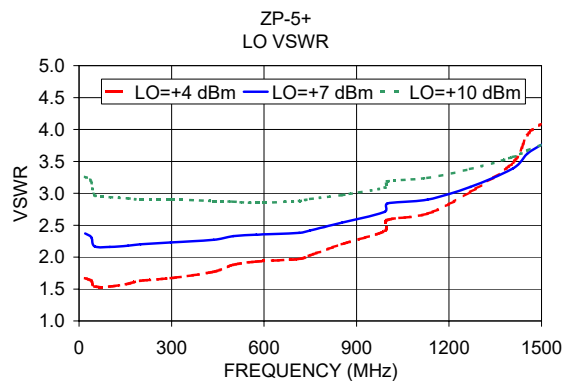
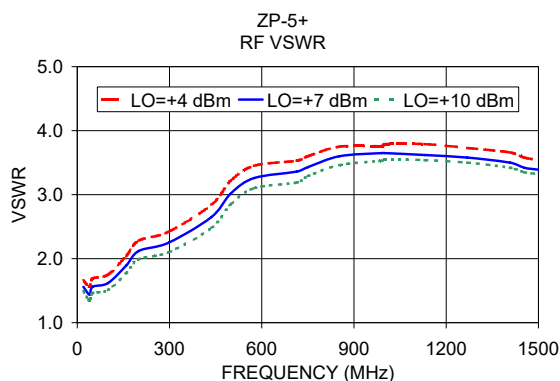
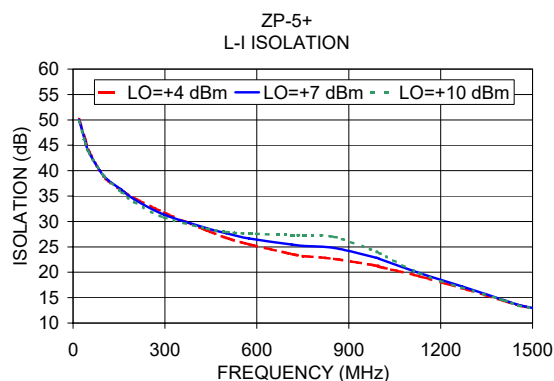
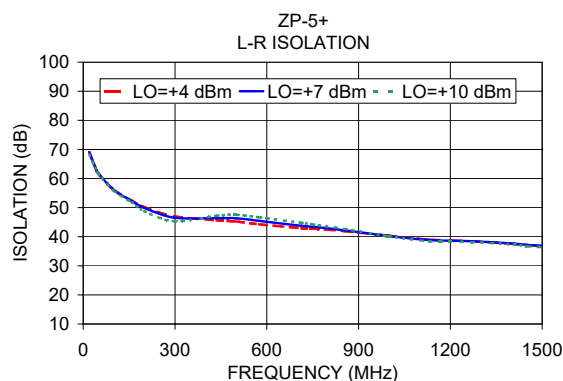
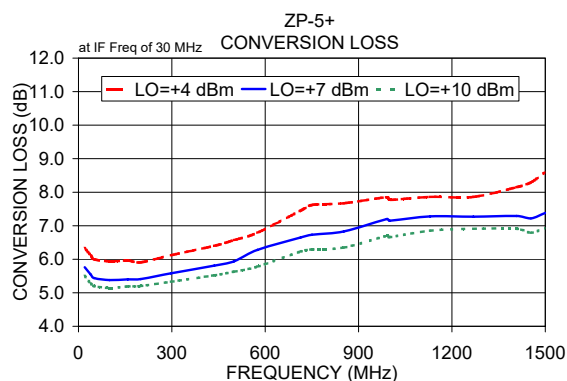
Notes

- 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-5+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
10.1	40.1	6.19	5.79	5.60	10.1	40.1	15.10	16.20	19.63	10.1	40.1	0.93	0.68	0.51
70.8	100.8	6.14	5.75	5.54	70.8	100.8	16.93	15.01	13.84	70.8	100.8	0.97	0.88	0.61
131.5	161.5	6.02	5.69	5.49	131.5	161.5	12.48	12.83	15.05	131.5	161.5	1.15	0.86	0.65
192.1	222.1	6.05	5.70	5.52	192.1	222.1	10.82	13.17	16.76	192.1	222.1	1.16	0.84	0.64
252.8	282.8	6.09	5.74	5.56	252.8	282.8	10.05	13.49	15.69	252.8	282.8	1.18	0.89	0.68
313.5	343.5	6.13	5.80	5.59	313.5	343.5	11.04	13.89	16.38	313.5	343.5	1.17	0.87	0.69
374.2	404.2	6.26	5.89	5.66	374.2	404.2	11.35	15.11	17.97	374.2	404.2	1.22	0.96	0.74
434.8	464.8	6.33	5.92	5.68	434.8	464.8	10.57	14.22	19.10	434.8	464.8	1.31	1.03	0.82
515.7	545.7	6.48	6.04	5.76	515.7	545.7	10.96	14.00	18.51	515.7	545.7	1.47	1.19	0.95
576.4	606.4	6.65	6.15	5.86	576.4	606.4	10.19	13.07	16.55	576.4	606.4	1.51	1.24	1.05
657.3	687.3	6.99	6.39	5.99	657.3	687.3	10.55	14.00	14.92	657.3	687.3	1.51	1.35	1.17
718.0	748.0	7.29	6.63	6.17	718.0	748.0	9.90	12.93	14.83	718.0	748.0	1.45	1.30	1.21
798.9	828.9	7.67	6.98	6.51	798.9	828.9	8.73	11.21	12.20	798.9	828.9	1.27	1.17	1.11
859.6	889.6	7.84	7.10	6.61	859.6	889.6	7.35	8.82	9.70	859.6	889.6	1.19	1.12	1.04
940.5	970.5	7.76	7.02	6.51	940.5	970.5	6.14	7.62	9.42	940.5	970.5	1.25	1.20	1.11
1001.2	1031.2	7.57	6.86	6.38	1001.2	1031.2	6.29	7.62	9.28	1001.2	1031.2	1.32	1.26	1.15
1082.1	1112.1	7.45	6.84	6.39	1082.1	1112.1	7.11	7.28	8.21	1082.1	1112.1	1.28	1.15	1.10
1142.7	1172.7	7.31	6.75	6.36	1142.7	1172.7	7.41	7.13	7.48	1142.7	1172.7	1.30	1.13	1.05
1223.6	1253.6	7.21	6.71	6.35	1223.6	1253.6	8.10	7.21	6.88	1223.6	1253.6	1.35	1.10	1.01
1284.3	1314.3	7.16	6.69	6.39	1284.3	1314.3	8.21	7.39	6.67	1284.3	1314.3	1.43	1.10	0.99
1365.2	1395.2	7.13	6.65	6.41	1365.2	1395.2	8.26	7.69	7.33	1365.2	1395.2	1.44	1.07	0.90
1425.9	1455.9	7.15	6.61	6.37	1425.9	1455.9	8.45	9.31	9.23	1425.9	1455.9	1.48	1.08	0.89
1506.8	1536.8	7.25	6.59	6.27	1506.8	1536.8	8.62	11.03	12.42	1506.8	1536.8	1.48	1.07	0.86
1567.5	1597.5	7.37	6.61	6.22	1567.5	1597.5	8.83	12.52	12.39	1567.5	1597.5	1.51	1.08	0.87
1648.4	1678.4	7.48	6.56	6.11	1648.4	1678.4	8.94	12.04	12.82	1648.4	1678.4	1.58	1.10	0.80
1709.0	1739.0	7.70	6.58	6.10	1709.0	1739.0	8.85	11.55	13.70	1709.0	1739.0	1.56	1.16	0.76
1789.9	1819.9	8.02	6.66	6.17	1789.9	1819.9	8.16	13.09	15.82	1789.9	1819.9	1.65	1.27	0.80
1850.6	1880.6	8.23	6.75	6.24	1850.6	1880.6	7.86	13.23	17.28	1850.6	1880.6	1.66	1.29	0.83
1931.5	1961.5	8.67	6.93	6.33	1931.5	1961.5	6.91	11.61	15.50	1931.5	1961.5	1.58	1.34	0.89
1992.2	2022.2	9.30	7.13	6.43	1992.2	2022.2	5.07	9.93	13.12	1992.2	2022.2	1.50	1.49	1.04
2073.1	2103.1	10.20	7.56	6.60	2073.1	2103.1	3.82	7.91	10.81	2073.1	2103.1	1.22	1.54	1.09
2133.8	2163.8	10.22	7.59	6.62	2133.8	2163.8	3.96	8.31	10.71	2133.8	2163.8	1.19	1.52	1.16
2214.7	2244.7	10.67	8.00	6.75	2214.7	2244.7	3.90	7.83	11.04	2214.7	2244.7	1.04	1.37	1.12
2275.4	2305.4	11.55	8.53	7.05	2275.4	2305.4	2.76	7.10	9.49	2275.4	2305.4	0.91	1.35	1.15
2356.3	2386.3	11.82	8.78	7.23	2356.3	2386.3	3.06	8.17	9.24	2356.3	2386.3	0.95	1.38	1.15
2416.9	2446.9	11.64	8.76	7.35	2416.9	2446.9	4.34	9.78	10.06	2416.9	2446.9	1.10	1.37	1.11
2497.8	2527.8	12.26	9.32	7.77	2497.8	2527.8	4.36	11.51	10.17	2497.8	2527.8	1.14	1.55	1.21
2558.5	2588.5	12.65	9.72	8.10	2558.5	2588.5	4.48	13.88	10.92	2558.5	2588.5	1.03	1.53	1.23
2639.4	2669.4	12.70	9.88	8.45	2639.4	2669.4	6.32	24.06	11.55	2639.4	2669.4	1.33	1.63	1.28
2700.1	2730.1	12.83	10.15	8.76	2700.1	2730.1	6.95	12.96	11.32	2700.1	2730.1	1.42	1.65	1.37

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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)
		+7			+7			+7
710.0	40.1	6.22	10.0	30.1	6.06	1000.0	500.1	7.47
692.1	58.0	6.21	30.2	50.3	5.98	979.8	520.3	7.40
674.1	76.0	6.32	50.4	70.5	6.02	959.6	540.5	7.33
656.2	93.9	6.34	70.6	90.7	6.05	939.4	560.7	7.30
638.2	111.9	6.35	90.8	110.9	6.00	919.2	580.9	7.25
620.3	129.8	6.34	111.0	131.1	5.95	899.0	601.1	7.20
602.3	147.8	6.39	131.2	151.3	5.99	878.8	621.3	7.17
584.4	165.7	6.38	151.4	171.5	6.01	858.6	641.5	7.15
566.4	183.7	6.49	171.6	191.7	6.00	838.4	661.7	7.15
548.5	201.6	6.47	191.8	211.9	5.98	818.2	681.9	7.10
530.5	219.6	6.43	212.0	232.1	5.96	798.0	702.1	7.09
512.6	237.5	6.41	232.2	252.3	5.96	777.8	722.3	7.07
494.6	255.5	6.45	252.4	272.5	6.02	757.6	742.5	7.12
476.7	273.4	6.45	272.7	292.8	5.99	737.3	762.8	6.93
458.7	291.4	6.47	292.9	313.0	5.99	717.1	783.0	6.97
440.8	309.3	6.50	313.1	333.2	5.98	696.9	803.2	6.94
422.8	327.3	6.46	333.3	353.4	5.99	676.7	823.4	6.89
404.9	345.2	6.41	353.5	373.6	6.05	656.5	843.6	6.90
386.9	363.2	6.42	373.7	393.8	6.02	636.3	863.8	6.86
369.0	381.1	6.39	393.9	414.0	6.02	616.1	884.0	6.81
351.0	399.1	6.46	434.3	454.4	6.07	575.7	924.4	6.71
333.1	417.0	6.46	454.5	474.6	6.05	555.5	944.6	6.68
315.1	435.0	6.49	494.9	515.0	6.05	515.1	985.0	6.54
297.2	452.9	6.48	515.1	535.2	6.04	494.9	1005.2	6.46
279.2	470.9	6.51	555.5	575.6	6.12	454.5	1045.6	6.40
261.3	488.8	6.54	575.7	595.8	6.12	434.3	1065.8	6.37
243.3	506.8	6.53	616.1	636.2	6.16	393.9	1106.2	6.38
225.4	524.7	6.55	636.3	656.4	6.24	373.7	1126.4	6.41
207.4	542.7	6.56	676.7	696.8	6.29	333.3	1166.8	6.42
189.5	560.6	6.59	696.9	717.0	6.31	313.1	1187.0	6.46
171.5	578.6	6.59	737.3	757.4	6.49	272.7	1227.4	6.52
153.6	596.5	6.61	757.6	777.7	6.49	252.4	1247.7	6.51
135.6	614.5	6.59	798.0	818.1	6.57	212.0	1288.1	6.55
117.7	632.4	6.59	818.2	838.3	6.65	191.8	1308.3	6.54
99.7	650.4	6.59	858.6	878.7	6.74	151.4	1348.7	6.55
81.8	668.3	6.62	878.8	898.9	6.80	131.2	1368.9	6.55
63.8	686.3	6.62	919.2	939.3	6.94	90.8	1409.3	6.58
45.9	704.2	6.64	939.4	959.5	7.00	70.6	1429.5	6.58
27.9	722.2	6.66	979.8	999.9	7.15	30.2	1469.9	6.59
10.0	740.1	6.91	1000.0	1020.1	7.19	10.0	1490.1	6.74

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
10.1	75.89	77.59	76.90	58.08	58.16	57.38
70.8	58.68	59.31	60.44	41.79	42.83	43.48
131.5	53.33	54.15	55.01	37.12	38.39	38.74
192.1	50.11	51.00	51.83	34.71	35.71	36.25
252.8	48.11	49.26	50.17	33.10	33.81	34.17
313.5	46.58	47.76	48.69	31.70	32.38	32.78
374.2	45.57	46.59	47.58	30.19	30.95	31.55
434.8	45.04	46.36	47.49	29.01	30.04	30.92
515.7	43.95	45.32	46.37	27.62	29.11	30.41
576.4	43.27	44.89	46.31	26.62	28.32	29.94
657.3	41.98	43.61	45.01	25.59	27.53	29.55
718.0	41.80	43.54	44.92	24.94	26.93	29.19
798.9	41.43	43.38	44.79	24.40	26.24	28.25
859.6	41.01	42.57	43.57	23.83	25.46	27.09
940.5	40.12	41.05	41.62	23.02	24.27	25.31
1001.2	39.37	39.84	40.12	22.19	23.14	23.80
1082.1	38.66	38.81	38.85	21.28	21.76	21.91
1142.7	38.16	38.11	37.96	20.59	20.82	20.64
1223.6	37.66	37.53	37.35	19.79	19.77	19.31
1284.3	37.18	37.05	36.85	19.11	18.91	18.37
1365.2	36.39	36.37	36.36	17.91	17.54	16.92
1425.9	35.81	35.78	35.72	16.88	16.52	15.90
1506.8	35.13	35.21	35.44	15.46	15.05	14.53
1567.5	34.70	34.90	35.45	14.42	14.02	13.55
1648.4	34.30	35.05	36.01	13.27	12.91	12.57
1709.0	34.14	35.17	36.44	12.51	12.28	11.98
1789.9	33.83	35.06	36.17	11.72	11.62	11.34
1850.6	33.63	34.80	35.96	11.23	11.23	11.03
1931.5	32.92	34.06	35.23	10.73	10.72	10.73
1992.2	32.27	33.46	34.63	10.42	10.49	10.38
2073.1	31.87	33.12	34.53	10.02	10.12	10.27
2133.8	31.47	32.74	34.07	9.85	10.01	10.10
2214.7	31.26	32.62	33.98	9.61	9.82	10.05
2275.4	31.31	32.85	34.49	9.55	9.79	9.97
2356.3	31.12	32.70	34.42	9.44	9.73	10.06
2416.9	30.85	32.44	33.98	9.43	9.73	10.04
2497.8	31.07	32.62	34.15	9.50	9.76	10.18
2558.5	31.29	32.92	34.24	9.46	9.89	10.40
2639.4	31.53	33.02	34.19	9.59	10.04	10.63
2700.1	31.59	32.92	33.94	9.61	10.10	10.70

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	47.48	60.01	50.07
70.8	100.8	52.71	52.70	54.66
131.5	161.5	48.30	48.94	48.95
192.1	222.1	45.24	44.91	44.58
252.8	282.8	42.29	41.99	41.94
313.5	343.5	39.86	39.65	39.63
374.2	404.2	37.55	37.38	37.23
434.8	464.8	35.62	35.44	35.40
515.7	545.7	34.04	33.78	33.56
576.4	606.4	33.55	33.25	33.08
657.3	687.3	32.16	31.97	31.68
718.0	748.0	30.86	30.62	30.66
798.9	828.9	29.83	29.78	29.81
859.6	889.6	30.17	30.20	30.28
940.5	970.5	31.70	31.71	32.14
1001.2	1031.2	33.33	33.41	33.95
1082.1	1112.1	35.14	34.90	35.31
1142.7	1172.7	34.70	34.17	33.92
1223.6	1253.6	32.34	31.73	31.12
1284.3	1314.3	30.60	29.68	29.04
1365.2	1395.2	28.43	27.83	27.45
1425.9	1455.9	27.12	26.65	26.47
1506.8	1536.8	25.73	25.70	25.55
1567.5	1597.5	25.01	25.10	25.14
1648.4	1678.4	24.28	24.52	24.56
1709.0	1739.0	23.96	24.41	24.48
1789.9	1819.9	23.51	24.21	24.46
1850.6	1880.6	23.22	23.92	24.23
1931.5	1961.5	22.62	23.39	23.82
1992.2	2022.2	22.29	23.14	23.59
2073.1	2103.1	21.87	22.89	23.29
2133.8	2163.8	21.94	22.93	23.41
2214.7	2244.7	22.18	23.10	23.74
2275.4	2305.4	22.13	23.21	24.03
2356.3	2386.3	22.66	23.75	24.61
2416.9	2446.9	23.25	24.38	25.22
2497.8	2527.8	23.90	25.04	25.93
2558.5	2588.5	24.35	25.59	26.52
2639.4	2669.4	25.32	26.54	27.48
2700.1	2730.1	25.72	26.87	27.92

Frequency Mixer

ZP-5+

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)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.57	1.54	1.54	10.1	1.87	2.53	3.44	10.0	1.53	1.36	1.17
70.8	100.8	1.11	1.06	1.07	70.8	1.83	2.59	3.54	30.2	1.50	1.24	1.05
131.5	161.5	1.13	1.05	1.05	131.5	1.87	2.66	3.69	50.4	1.42	1.19	1.06
192.1	222.1	1.19	1.13	1.11	192.1	1.78	2.48	3.38	70.6	1.44	1.19	1.02
252.8	282.8	1.26	1.20	1.18	252.8	1.83	2.57	3.48	90.8	1.46	1.21	1.01
313.5	343.5	1.34	1.27	1.24	313.5	1.83	2.55	3.42	111.0	1.51	1.24	1.05
374.2	404.2	1.43	1.37	1.33	374.2	1.84	2.51	3.33	131.2	1.52	1.26	1.08
434.8	464.8	1.54	1.46	1.42	434.8	1.91	2.59	3.40	151.4	1.49	1.23	1.06
515.7	545.7	1.71	1.62	1.56	515.7	1.94	2.58	3.33	171.6	1.47	1.21	1.06
576.4	606.4	1.91	1.81	1.73	576.4	1.95	2.55	3.25	191.8	1.50	1.24	1.07
657.3	687.3	2.26	2.11	2.01	657.3	2.02	2.58	3.23	212.0	1.52	1.26	1.08
718.0	748.0	2.60	2.43	2.29	718.0	2.07	2.62	3.24	232.2	1.50	1.25	1.09
798.9	828.9	3.04	2.86	2.71	798.9	2.10	2.61	3.18	252.4	1.50	1.25	1.11
859.6	889.6	3.29	3.09	2.92	859.6	2.14	2.60	3.14	272.7	1.52	1.27	1.11
940.5	970.5	3.42	3.19	3.03	940.5	2.19	2.61	3.09	292.9	1.52	1.27	1.11
1001.2	1031.2	3.40	3.18	3.01	1001.2	2.22	2.61	3.06	313.1	1.52	1.27	1.13
1082.1	1112.1	3.33	3.14	2.99	1082.1	2.27	2.65	3.06	333.3	1.53	1.29	1.15
1142.7	1172.7	3.25	3.05	2.89	1142.7	2.31	2.67	3.07	353.5	1.51	1.27	1.13
1223.6	1253.6	3.09	2.91	2.75	1223.6	2.34	2.66	3.03	373.7	1.51	1.27	1.13
1284.3	1314.3	2.98	2.77	2.61	1284.3	2.37	2.67	3.02	393.9	1.53	1.30	1.16
1365.2	1395.2	2.83	2.60	2.42	1365.2	2.41	2.67	2.99	434.3	1.53	1.30	1.16
1425.9	1455.9	2.73	2.47	2.26	1425.9	2.42	2.64	2.94	454.5	1.54	1.30	1.16
1506.8	1536.8	2.62	2.32	2.10	1506.8	2.44	2.62	2.89	494.9	1.60	1.35	1.18
1567.5	1597.5	2.55	2.21	1.97	1567.5	2.48	2.63	2.88	515.1	1.60	1.35	1.19
1648.4	1678.4	2.42	2.01	1.78	1648.4	2.52	2.62	2.85	555.5	1.61	1.36	1.19
1709.0	1739.0	2.35	1.92	1.70	1709.0	2.57	2.62	2.84	575.7	1.62	1.37	1.19
1789.9	1819.9	2.29	1.87	1.67	1789.9	2.68	2.70	2.89	616.1	1.68	1.43	1.25
1850.6	1880.6	2.25	1.84	1.66	1850.6	2.82	2.82	3.00	636.3	1.65	1.40	1.23
1931.5	1961.5	2.24	1.83	1.66	1931.5	3.04	2.96	3.09	676.7	1.69	1.43	1.24
1992.2	2022.2	2.27	1.83	1.66	1992.2	3.18	3.08	3.13	696.9	1.72	1.46	1.26
2073.1	2103.1	2.30	1.82	1.62	2073.1	3.42	3.27	3.30	737.3	1.70	1.45	1.28
2133.8	2163.8	2.20	1.76	1.58	2133.8	3.55	3.39	3.41	757.6	1.71	1.46	1.28
2214.7	2244.7	2.14	1.74	1.56	2214.7	3.72	3.58	3.54	798.0	1.73	1.47	1.30
2275.4	2305.4	2.18	1.77	1.58	2275.4	3.85	3.73	3.67	818.2	1.73	1.48	1.31
2356.3	2386.3	2.14	1.78	1.62	2356.3	4.07	3.90	3.91	858.6	1.71	1.46	1.31
2416.9	2446.9	2.08	1.77	1.67	2416.9	4.13	4.01	3.97	878.8	1.73	1.49	1.34
2497.8	2527.8	2.13	1.83	1.75	2497.8	4.38	4.27	4.22	919.2	1.72	1.49	1.36
2558.5	2588.5	2.18	1.88	1.82	2558.5	4.66	4.54	4.44	939.4	1.69	1.48	1.37
2639.4	2669.4	2.23	1.93	1.91	2639.4	4.88	4.78	4.74	979.8	1.70	1.49	1.38
2700.1	2730.1	2.29	1.99	1.96	2700.1	5.02	4.92	4.88	1000.0	1.71	1.51	1.41

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+1	23	13	38	13	40	21	50	36	58
1	-	23	+0	36	21	39	36	51	46	59	58	60
2	>100	79	49	63	49	66	55	75	49	72	55	>79
3	>100	74	60	76	54	75	61	79	61	>79	71	>79
4	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -14.00 dBm.
LO IN: 780.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -20.99 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	34	23	48	26	53	35	64	48	74
1	-	24	+0	38	21	45	33	59	45	70	62	73
2	88	59	40	53	41	58	50	75	45	66	52	74
3	>100	50	41	61	40	65	48	56	49	75	64	81
4	>100	73	78	78	56	71	58	75	68	77	62	89
5	>100	72	67	67	57	68	51	73	62	75	59	88
6	>100	80	73	87	85	89	81	78	75	85	86	89
7	>100	89	87	>89	74	>89	67	80	67	88	78	85
8	>100	>89	>89	>89	85	>89	>89	>89	79	83	84	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	83	85	76	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -4.00 dBm.
LO IN: 780.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -10.79 dBm

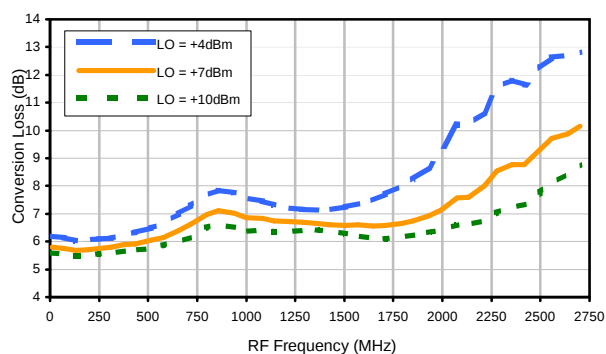
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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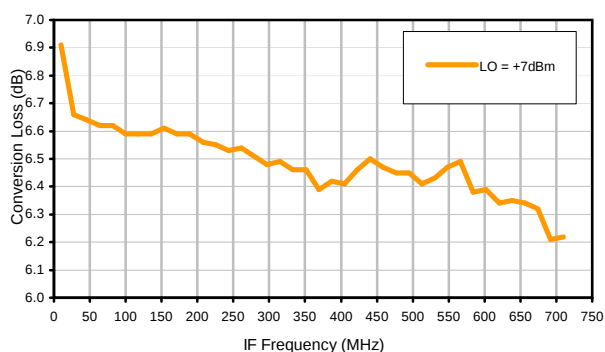


Typical Performance Curves

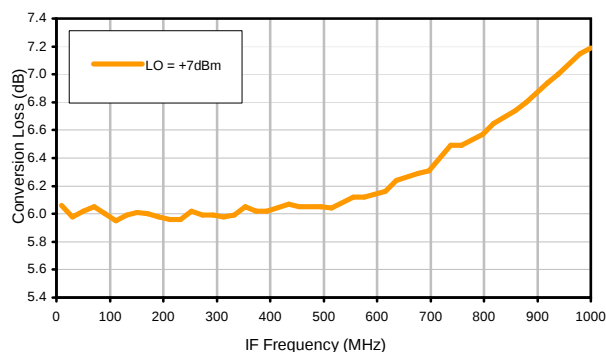
Conversion Loss @ IF=30MHz



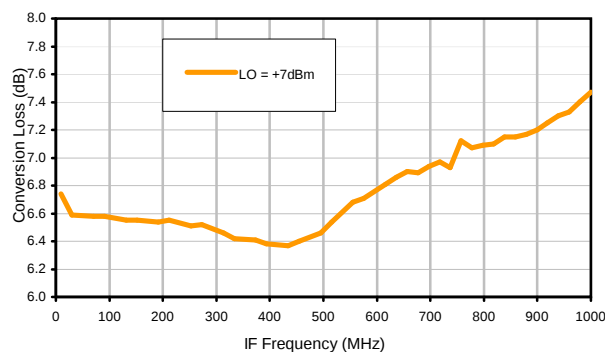
Conversion Loss vs. IF @ RF=750.1MHz



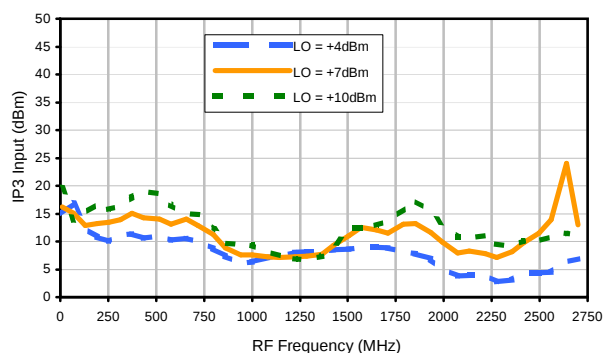
Conversion Loss vs. IF @ RF=20.1MHz



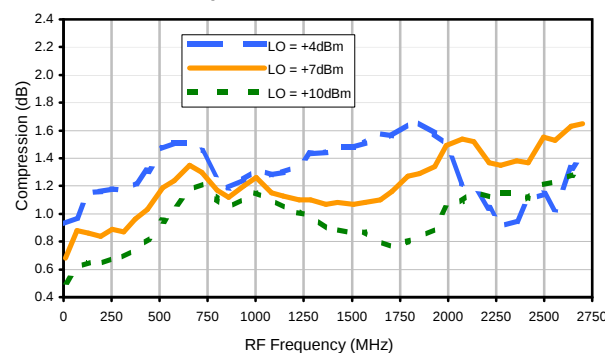
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



Compression @ RF IN=+1dBm



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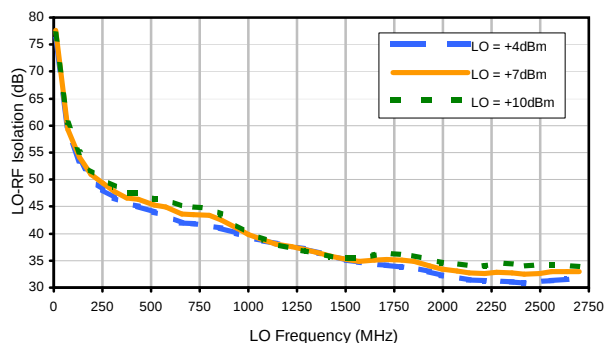


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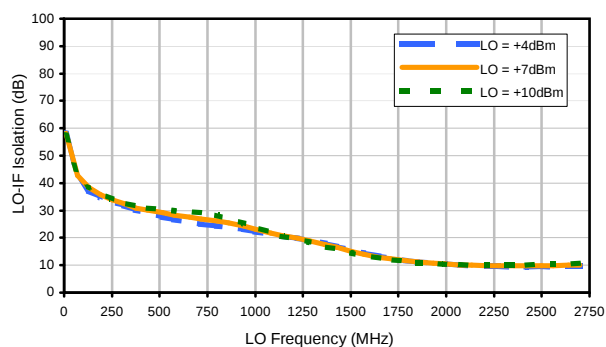


Typical Performance Curves

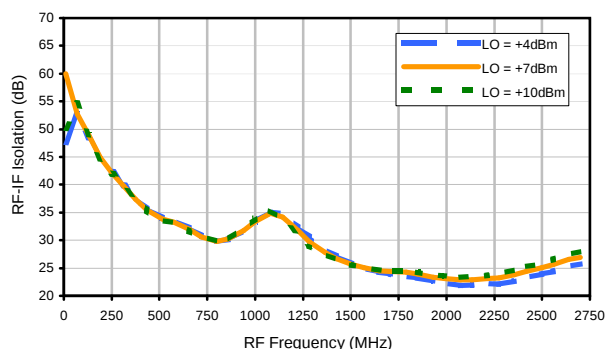
LO-RF Isolation



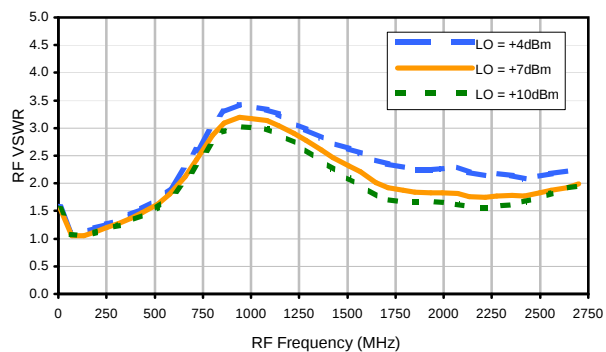
LO-IF Isolation



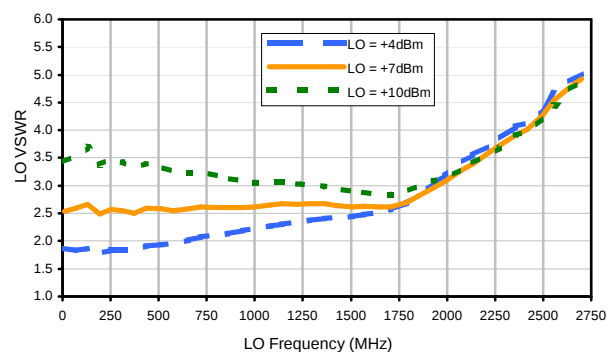
RF-IF Isolation



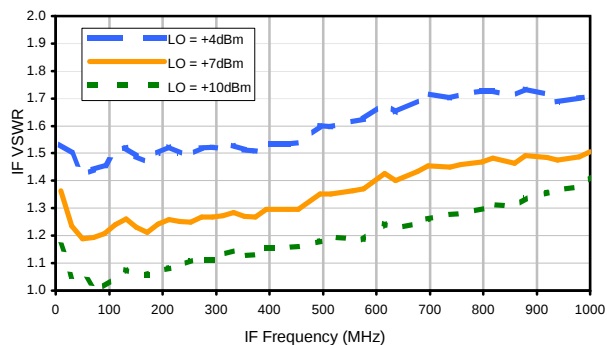
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+1	23	13	38	13	40	21	50	36	58
1	-	23	+0	36	21	39	36	51	46	59	58	60
2	>100	79	49	63	49	66	55	75	49	72	55	>79
3	>100	74	60	76	54	75	61	79	61	>79	71	>79
4	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -14.00 dBm.
LO IN: 780.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -20.99 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	34	23	48	26	53	35	64	48	74
1	-	24	+0	38	21	45	33	59	45	70	62	73
2	88	59	40	53	41	58	50	75	45	66	52	74
3	>100	50	41	61	40	65	48	56	49	75	64	81
4	>100	73	78	78	56	71	58	75	68	77	62	89
5	>100	72	67	67	57	68	51	73	62	75	59	88
6	>100	80	73	87	85	89	81	78	75	85	86	89
7	>100	89	87	>89	74	>89	67	80	67	88	78	85
8	>100	>89	>89	>89	85	>89	>89	>89	79	83	84	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	83	85	76	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -4.00 dBm.
LO IN: 780.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -10.79 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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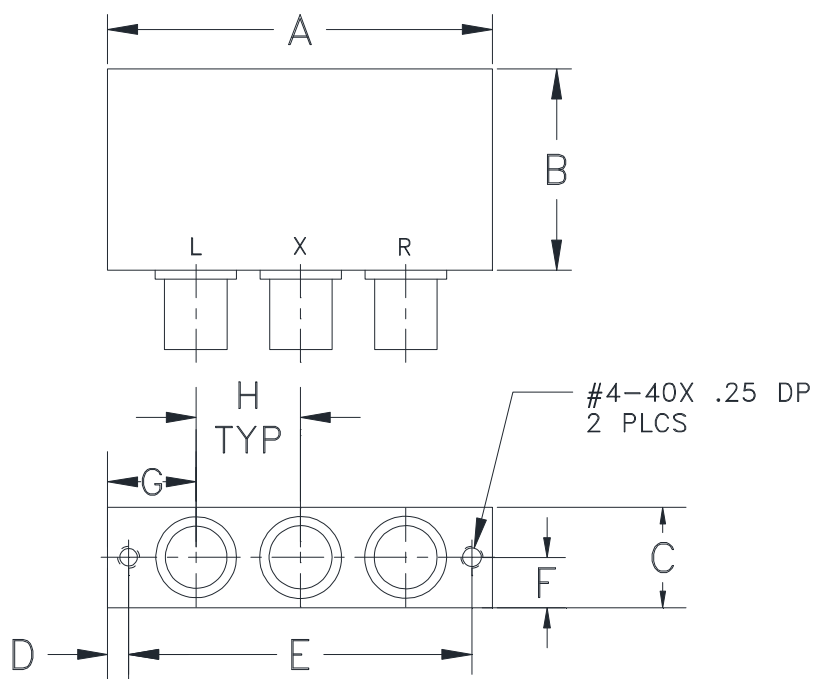


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Outline Dimensions

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