

Coaxial Frequency Mixer

Level 7 (LO Power +7 dBm) 50 to 1000 MHz

ZP-2+



Generic photo used for illustration purposes only

CASE STYLE: GG60

Connectors	Model
BNC	ZP-2+
SMA	ZP-2-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

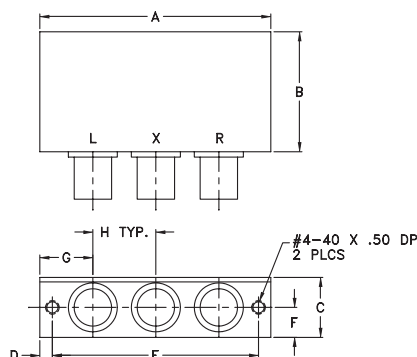
Features

- low conversion loss, 5.85 dB typ.
- wideband, 50 to 1000 MHz
- excellent L-R isolation, 47 dB typ., L-I, 44 dB typ.
- rugged shielded case

Applications

- VHF/UHF
- cellular
- instrumentation

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	IF	Mid-Band		Total		L		M		U		L		M		U	
		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
50-1000	DC-1000	5.85	0.10	7.5	9.0	58	40	47	30	42	25	50	35	44	20	29	18

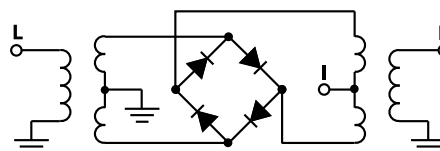
1 dB COMP.: +1 dBm typ.

L = 50-100 MHz M = 100-500 MHz U = upper range [$f_c/2$ to f_u]
m = mid band [$2f_c$ 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
50.00	80.00	6.03	61.24	62.94	1.08	2.52
100.00	70.00	6.12	55.20	58.22	1.10	2.47
129.17	99.17	6.03	53.19	56.36	1.12	2.42
200.00	170.00	5.94	49.63	53.04	1.17	2.35
208.33	178.33	5.97	49.40	52.95	1.22	2.31
287.50	257.50	5.98	46.76	49.61	1.27	2.32
340.28	310.28	5.94	45.51	47.70	1.33	2.34
366.67	336.67	5.91	45.07	46.56	1.36	2.32
445.83	415.83	5.88	43.51	43.99	1.43	2.32
498.61	468.61	5.96	42.80	42.71	1.47	2.34
500.00	470.00	5.98	42.81	42.75	1.50	2.33
551.39	521.39	6.04	42.43	42.00	1.58	2.37
630.56	600.56	6.27	41.96	39.82	1.68	2.38
683.33	653.33	6.36	41.15	38.97	1.76	2.35
709.72	679.72	6.45	40.66	38.42	1.79	2.33
788.89	758.89	6.59	39.89	37.39	1.94	2.34
868.06	838.06	6.81	39.69	36.49	2.11	2.38
947.22	917.22	7.04	39.66	34.99	2.31	2.42
973.61	943.61	7.23	39.91	34.80	2.37	2.42
1000.00	970.00	7.37	39.73	34.55	2.44	2.41

Electrical Schematic



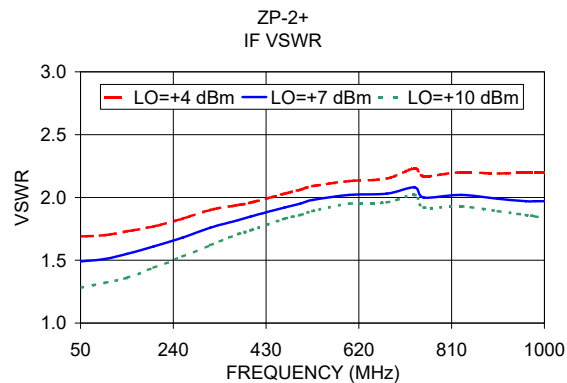
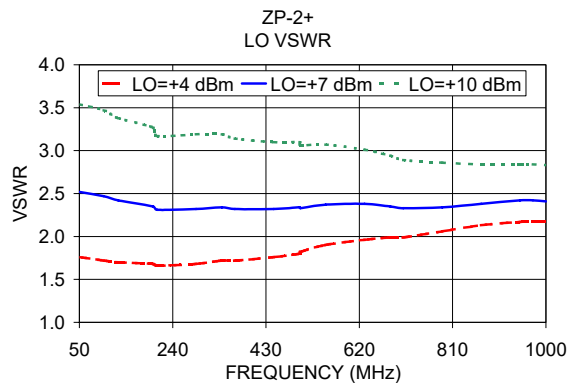
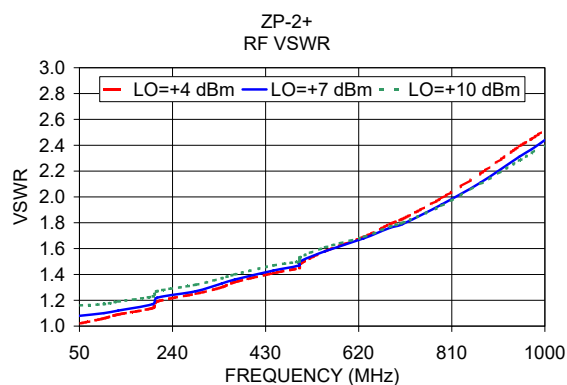
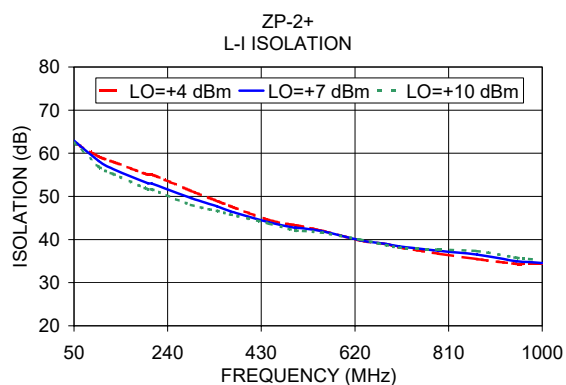
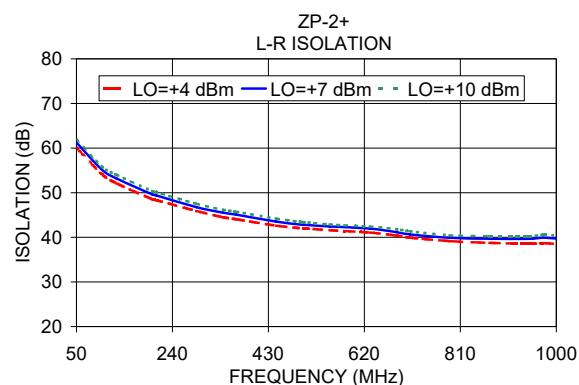
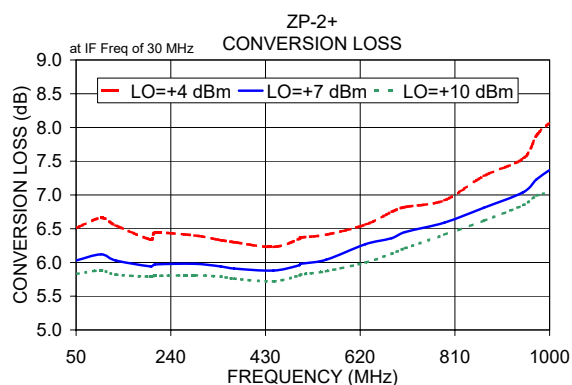
Notes

- 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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Frequency Mixer

ZP-2+

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	6.09	5.73	5.58	10.1	40.1	16.52	16.87	20.71	10.1	40.1	0.97	0.68	0.48
50.7	80.7	6.39	5.93	5.69	50.7	80.7	15.63	17.06	16.64	50.7	80.7	0.81	0.63	0.49
91.2	121.2	6.33	5.88	5.66	91.2	121.2	13.26	14.58	15.83	91.2	121.2	0.88	0.63	0.45
131.8	161.8	6.26	5.87	5.64	131.8	161.8	13.49	15.36	23.55	131.8	161.8	0.95	0.66	0.49
172.4	202.4	6.39	5.91	5.68	172.4	202.4	12.38	14.77	26.16	172.4	202.4	0.79	0.62	0.46
212.9	242.9	6.17	5.80	5.63	212.9	242.9	13.93	23.73	20.22	212.9	242.9	0.81	0.59	0.43
253.5	283.5	6.30	5.83	5.66	253.5	283.5	15.24	20.65	18.09	253.5	283.5	0.82	0.61	0.43
294.0	324.0	6.18	5.83	5.67	294.0	324.0	15.36	19.38	23.24	294.0	324.0	0.86	0.58	0.43
334.6	364.6	6.21	5.84	5.69	334.6	364.6	22.49	18.68	23.95	334.6	364.6	0.85	0.56	0.41
375.2	405.2	6.19	5.85	5.69	375.2	405.2	19.42	17.67	24.46	375.2	405.2	0.83	0.57	0.41
415.7	445.7	6.11	5.82	5.67	415.7	445.7	14.23	16.80	26.16	415.7	445.7	0.84	0.53	0.41
456.3	486.3	6.21	5.87	5.70	456.3	486.3	12.79	13.81	18.27	456.3	486.3	0.84	0.54	0.40
496.9	526.9	6.22	5.89	5.71	496.9	526.9	17.13	20.88	18.37	496.9	526.9	0.75	0.51	0.39
537.4	567.4	6.24	5.95	5.77	537.4	567.4	15.51	21.70	18.48	537.4	567.4	0.78	0.50	0.39
578.0	608.0	6.30	5.98	5.84	578.0	608.0	14.52	22.27	16.88	578.0	608.0	0.83	0.54	0.39
618.6	648.6	6.34	6.04	5.87	618.6	648.6	13.54	14.28	26.06	618.6	648.6	0.86	0.59	0.44
659.1	689.1	6.41	6.11	5.96	659.1	689.1	14.73	16.79	16.34	659.1	689.1	0.91	0.60	0.44
699.7	729.7	6.42	6.17	6.06	699.7	729.7	14.54	16.36	18.58	699.7	729.7	0.99	0.65	0.45
740.2	770.2	6.56	6.29	6.18	740.2	770.2	11.16	16.81	19.14	740.2	770.2	1.05	0.68	0.49
780.8	810.8	6.64	6.36	6.25	780.8	810.8	9.22	13.03	19.83	780.8	810.8	1.15	0.79	0.55
821.4	851.4	6.77	6.50	6.34	821.4	851.4	7.50	10.50	15.35	821.4	851.4	1.25	0.85	0.65
861.9	891.9	6.88	6.56	6.39	861.9	891.9	6.13	8.10	11.62	861.9	891.9	1.33	0.96	0.73
902.5	932.5	7.00	6.64	6.45	902.5	932.5	6.09	7.68	9.69	902.5	932.5	1.40	1.02	0.79
943.1	973.1	7.18	6.81	6.60	943.1	973.1	7.06	9.05	10.90	943.1	973.1	1.41	1.07	0.82
983.6	1013.6	7.29	6.81	6.55	983.6	1013.6	8.83	12.25	14.45	983.6	1013.6	1.46	1.10	0.87
1024.2	1054.2	7.36	6.84	6.59	1024.2	1054.2	11.50	17.31	20.61	1024.2	1054.2	1.47	1.11	0.88
1064.7	1094.7	7.52	6.89	6.63	1064.7	1094.7	15.08	17.76	15.83	1064.7	1094.7	1.47	1.13	0.88
1085.0	1115.0	7.65	6.98	6.69	1085.0	1115.0	13.98	15.98	15.82	1085.0	1115.0	1.46	1.12	0.86
1125.6	1155.6	7.86	7.13	6.80	1125.6	1155.6	13.40	16.93	15.98	1125.6	1155.6	1.37	1.11	0.84
1145.9	1175.9	8.04	7.26	6.91	1145.9	1175.9	13.86	15.26	15.57	1145.9	1175.9	1.26	1.03	0.78
1186.4	1216.4	8.35	7.50	7.09	1186.4	1216.4	11.25	15.98	13.63	1186.4	1216.4	1.19	1.01	0.78
1206.7	1236.7	8.47	7.66	7.22	1206.7	1236.7	11.57	14.32	14.52	1206.7	1236.7	1.08	0.96	0.75
1247.3	1277.3	8.85	7.93	7.40	1247.3	1277.3	10.81	12.75	14.50	1247.3	1277.3	0.96	0.93	0.75
1267.6	1297.6	9.04	8.10	7.55	1267.6	1297.6	10.50	12.37	13.58	1267.6	1297.6	0.92	0.89	0.75
1308.1	1338.1	9.52	8.54	7.91	1308.1	1338.1	9.56	11.65	13.10	1308.1	1338.1	0.83	0.87	0.80
1328.4	1358.4	9.72	8.74	8.09	1328.4	1358.4	9.50	11.53	12.53	1328.4	1358.4	0.77	0.83	0.81
1369.0	1399.0	10.25	9.32	8.60	1369.0	1399.0	9.27	11.29	13.72	1369.0	1399.0	0.63	0.76	0.81
1389.3	1419.3	10.49	9.60	8.90	1389.3	1419.3	9.20	11.72	12.56	1389.3	1419.3	0.58	0.74	0.83
1429.8	1459.8	11.15	10.41	9.67	1429.8	1459.8	9.65	10.67	13.40	1429.8	1459.8	0.35	0.55	0.72
1450.1	1480.1	11.39	10.70	10.08	1450.1	1480.1	9.24	10.59	13.41	1450.1	1480.1	0.26	0.43	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)=500.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=50.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
400.0	100.1	6.00	10.0	60.1	5.85	950.0	50.1	7.66
390.3	109.9	5.94	30.0	80.1	5.94	930.0	70.1	7.63
380.5	119.6	5.93	50.0	100.1	5.87	910.0	90.1	7.66
370.8	129.4	5.92	70.0	120.1	5.89	890.0	110.1	7.54
361.0	139.1	5.88	90.0	140.1	5.89	870.0	130.1	7.46
351.3	148.9	5.86	110.0	160.1	5.89	850.0	150.1	7.44
341.5	158.6	5.88	130.0	180.1	5.97	830.0	170.1	7.48
331.8	168.4	5.89	150.0	200.1	5.93	810.0	190.1	7.40
322.0	178.1	5.85	170.0	220.1	5.97	790.0	210.1	7.36
312.3	187.9	5.89	190.0	240.1	5.93	770.0	230.1	7.31
302.5	197.6	5.87	210.0	260.1	5.98	750.0	250.1	7.27
292.8	207.4	5.84	230.0	280.1	6.05	730.0	270.1	7.34
283.0	217.1	5.82	250.0	300.1	5.98	710.0	290.1	7.30
273.3	226.9	5.82	270.0	320.1	5.98	690.0	310.1	7.27
263.5	236.6	5.84	290.0	340.1	6.00	670.0	330.1	7.25
253.8	246.4	5.81	310.0	360.1	6.08	650.0	350.1	7.27
244.0	256.1	5.84	330.0	380.1	6.04	630.0	370.1	7.32
234.3	265.9	5.86	350.0	400.1	6.06	610.0	390.1	7.29
224.5	275.6	5.85	370.0	420.1	6.09	590.0	410.1	7.26
214.8	285.4	5.84	390.0	440.1	6.02	570.0	430.1	7.24
205.0	295.1	5.87	410.0	460.1	6.05	550.0	450.1	7.29
195.3	304.9	5.87	430.0	480.1	6.09	530.0	470.1	7.26
185.5	314.6	5.84	450.0	500.1	6.07	510.0	490.1	7.25
175.8	324.4	5.84	470.0	520.1	6.01	490.0	510.1	7.26
166.0	334.1	5.84	510.0	560.1	6.15	450.0	550.1	7.24
156.3	343.9	5.85	530.0	580.1	6.13	430.0	570.1	7.20
146.5	353.6	5.83	570.0	620.1	6.22	390.0	610.1	7.15
136.8	363.4	5.85	590.0	640.1	6.25	370.0	630.1	7.17
127.0	373.1	5.88	630.0	680.1	6.38	330.0	670.1	7.12
117.3	382.9	5.85	650.0	700.1	6.38	310.0	690.1	7.13
107.5	392.6	5.84	690.0	740.1	6.38	270.0	730.1	7.02
97.8	402.4	5.86	710.0	760.1	6.43	250.0	750.1	7.03
88.0	412.1	5.85	750.0	800.1	6.38	210.0	790.1	6.99
78.3	421.9	5.83	770.0	820.1	6.32	190.0	810.1	6.96
68.5	431.6	5.85	810.0	860.1	6.30	150.0	850.1	6.98
58.8	441.4	5.87	830.0	880.1	6.28	130.0	870.1	7.00
49.0	451.1	5.87	870.0	920.1	6.18	90.0	910.1	7.06
39.3	460.9	5.87	890.0	940.1	6.20	70.0	930.1	7.05
19.8	480.4	5.92	930.0	980.1	6.15	30.0	970.1	6.99
10.0	490.1	5.89	950.0	1000.1	6.11	10.0	990.1	6.87

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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	75.28	78.13	78.53	62.68	67.53	67.95
50.7	63.44	64.01	64.22	61.07	61.17	58.48
91.2	58.26	58.78	59.24	59.56	55.98	54.62
131.8	55.60	56.01	56.73	54.74	52.82	51.80
172.4	53.12	53.86	54.25	53.03	51.22	50.06
212.9	51.63	52.28	52.69	51.13	49.54	48.54
253.5	50.40	50.99	51.31	49.67	48.30	47.31
294.0	49.24	49.94	50.26	48.75	47.39	46.24
334.6	48.38	48.95	49.14	47.20	45.81	44.66
375.2	47.53	48.02	48.22	45.83	44.45	43.47
415.7	47.00	47.50	47.77	44.27	43.22	42.46
456.3	46.10	46.61	46.88	42.70	41.79	40.98
496.9	45.42	45.84	46.08	41.38	40.69	40.15
537.4	44.43	44.91	45.34	39.67	39.03	38.89
578.0	43.66	44.05	44.51	38.60	37.87	37.41
618.6	43.38	43.60	43.96	37.82	37.11	36.49
659.1	43.36	43.69	43.86	36.98	36.54	35.97
699.7	43.37	43.75	43.88	36.35	35.91	35.67
740.2	43.34	43.83	43.83	35.13	34.81	34.68
780.8	43.20	43.53	43.65	34.53	33.87	33.58
821.4	42.63	42.90	43.06	33.68	33.16	32.61
861.9	42.03	42.16	42.36	32.86	32.46	31.96
902.5	41.89	42.15	42.43	32.16	31.91	31.45
943.1	41.43	41.83	42.00	31.43	31.43	31.20
983.6	40.97	41.51	41.78	30.60	30.83	30.81
1024.2	40.41	41.10	41.46	29.81	30.06	30.22
1064.7	39.63	40.43	40.93	29.07	29.39	29.63
1085.0	39.37	40.21	40.82	28.68	28.99	29.30
1125.6	38.94	39.96	40.70	27.74	28.05	28.43
1145.9	38.66	39.76	40.61	27.39	27.58	27.99
1186.4	38.48	39.68	40.64	26.89	26.89	27.25
1206.7	38.25	39.55	40.62	26.59	26.57	26.89
1247.3	38.02	39.46	40.75	26.13	26.10	26.35
1267.6	37.81	39.34	40.71	25.92	25.83	26.08
1308.1	37.66	39.32	41.01	25.58	25.59	25.78
1328.4	37.51	39.33	41.22	25.34	25.36	25.58
1369.0	37.31	39.32	41.53	25.06	25.19	25.47
1389.3	37.30	39.36	41.79	24.91	25.06	25.37
1429.8	36.83	39.07	41.65	24.57	24.86	25.17
1450.1	36.73	39.09	41.81	24.44	24.76	25.16

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	45.17	45.18	53.39
50.7	80.7	36.62	35.93	36.34
91.2	121.2	31.86	31.71	31.88
131.8	161.8	29.05	29.17	29.29
172.4	202.4	27.36	27.53	27.69
212.9	242.9	26.29	26.46	26.50
253.5	283.5	25.53	25.82	26.08
294.0	324.0	25.43	25.58	25.79
334.6	364.6	25.58	25.90	26.03
375.2	405.2	25.70	26.31	26.75
415.7	445.7	25.87	26.57	27.13
456.3	486.3	26.36	26.73	27.02
496.9	526.9	27.22	27.27	27.33
537.4	567.4	27.66	28.03	28.35
578.0	608.0	26.62	27.46	28.27
618.6	648.6	24.41	25.12	25.93
659.1	689.1	22.07	22.44	22.90
699.7	729.7	20.36	20.35	20.46
740.2	770.2	19.09	18.89	18.83
780.8	810.8	17.94	17.70	17.56
821.4	851.4	17.15	16.85	16.66
861.9	891.9	16.58	16.30	16.06
902.5	932.5	15.97	15.67	15.45
943.1	973.1	15.52	15.24	15.04
983.6	1013.6	15.24	14.99	14.83
1024.2	1054.2	15.20	15.02	14.90
1064.7	1094.7	15.06	14.96	14.95
1085.0	1115.0	15.04	15.00	15.00
1125.6	1155.6	14.77	14.75	14.76
1145.9	1175.9	14.74	14.74	14.66
1186.4	1216.4	14.59	14.64	14.68
1206.7	1236.7	14.56	14.61	14.68
1247.3	1277.3	14.42	14.57	14.63
1267.6	1297.6	14.36	14.53	14.62
1308.1	1338.1	14.08	14.32	14.42
1328.4	1358.4	14.00	14.19	14.31
1369.0	1399.0	13.75	13.93	13.99
1389.3	1419.3	13.56	13.73	13.77
1429.8	1459.8	13.22	13.28	13.32
1450.1	1480.1	13.01	13.03	12.99

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.10	1.09	1.13	10.1	1.79	2.75	3.91	10.0	1.62	1.40	1.25
50.7	80.7	1.09	1.03	1.08	50.7	1.92	2.79	4.01	30.2	1.64	1.43	1.31
91.2	121.2	1.10	1.06	1.11	91.2	1.79	2.52	3.53	50.4	1.75	1.55	1.41
131.8	161.8	1.10	1.09	1.14	131.8	1.87	2.72	3.84	70.6	1.83	1.61	1.48
172.4	202.4	1.12	1.11	1.17	172.4	1.80	2.54	3.55	90.8	1.75	1.54	1.42
212.9	242.9	1.12	1.15	1.20	212.9	1.82	2.59	3.62	111.0	1.71	1.51	1.40
253.5	283.5	1.15	1.17	1.23	253.5	1.82	2.59	3.61	131.2	1.80	1.59	1.48
294.0	324.0	1.17	1.20	1.25	294.0	1.79	2.52	3.48	151.4	1.84	1.64	1.53
334.6	364.6	1.19	1.24	1.29	334.6	1.84	2.60	3.61	171.6	1.80	1.60	1.49
375.2	405.2	1.21	1.26	1.31	375.2	1.79	2.50	3.44	191.8	1.80	1.60	1.49
415.7	445.7	1.23	1.28	1.33	415.7	1.83	2.56	3.52	212.0	1.82	1.63	1.54
456.3	486.3	1.25	1.28	1.32	456.3	1.81	2.52	3.45	232.2	1.80	1.63	1.54
496.9	526.9	1.27	1.30	1.33	496.9	1.81	2.50	3.40	252.4	1.83	1.65	1.56
537.4	567.4	1.29	1.32	1.36	537.4	1.84	2.54	3.45	272.7	1.89	1.71	1.62
578.0	608.0	1.30	1.35	1.40	578.0	1.81	2.48	3.34	292.9	1.89	1.71	1.64
618.6	648.6	1.32	1.37	1.42	618.6	1.85	2.52	3.40	313.1	1.86	1.69	1.63
659.1	689.1	1.34	1.40	1.44	659.1	1.85	2.49	3.33	333.3	1.92	1.75	1.69
699.7	729.7	1.34	1.40	1.45	699.7	1.85	2.48	3.31	353.5	2.00	1.84	1.77
740.2	770.2	1.32	1.38	1.43	740.2	1.88	2.49	3.29	373.7	1.99	1.83	1.77
780.8	810.8	1.28	1.32	1.36	780.8	1.88	2.48	3.25	393.9	1.98	1.82	1.76
821.4	851.4	1.24	1.26	1.29	821.4	1.89	2.50	3.27	434.3	2.03	1.89	1.85
861.9	891.9	1.23	1.24	1.26	861.9	1.90	2.48	3.22	454.5	2.00	1.87	1.83
902.5	932.5	1.25	1.25	1.25	902.5	1.92	2.49	3.23	494.9	2.12	1.99	1.95
943.1	973.1	1.31	1.29	1.29	943.1	1.91	2.46	3.17	515.1	2.07	1.95	1.93
983.6	1013.6	1.39	1.37	1.37	983.6	1.92	2.44	3.13	555.5	2.11	1.99	1.97
1024.2	1054.2	1.48	1.46	1.46	1024.2	1.92	2.41	3.07	575.7	2.12	2.02	2.00
1064.7	1094.7	1.60	1.58	1.58	1064.7	1.93	2.39	3.03	616.1	2.19	2.07	2.04
1085.0	1115.0	1.67	1.64	1.63	1085.0	1.94	2.41	3.04	636.3	2.18	2.07	2.05
1125.6	1155.6	1.80	1.77	1.75	1125.6	1.97	2.42	3.03	676.7	2.13	2.02	2.00
1145.9	1175.9	1.86	1.82	1.80	1145.9	1.98	2.42	3.02	696.9	2.22	2.10	2.08
1186.4	1216.4	1.99	1.93	1.90	1186.4	2.01	2.45	3.04	737.3	2.15	2.02	1.99
1206.7	1236.7	2.05	1.98	1.94	1206.7	2.02	2.46	3.04	757.6	2.14	2.01	1.97
1247.3	1277.3	2.15	2.08	2.03	1247.3	2.01	2.45	3.00	798.0	2.12	2.00	1.97
1267.6	1297.6	2.20	2.12	2.07	1267.6	2.02	2.45	3.01	818.2	2.17	2.03	1.98
1308.1	1338.1	2.31	2.23	2.16	1308.1	2.03	2.46	3.00	858.6	2.08	1.93	1.88
1328.4	1358.4	2.36	2.29	2.21	1328.4	2.02	2.44	2.98	878.8	2.04	1.89	1.83
1369.0	1399.0	2.48	2.42	2.33	1369.0	2.02	2.44	2.98	919.2	2.12	1.96	1.89
1389.3	1419.3	2.53	2.47	2.39	1389.3	2.03	2.44	2.98	939.4	2.08	1.91	1.82
1429.8	1459.8	2.65	2.60	2.52	1429.8	2.02	2.42	2.93	979.8	2.04	1.85	1.76
1450.1	1480.1	2.70	2.65	2.58	1450.1	2.01	2.41	2.93	1000.0	2.11	2.21	2.37

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	25	20	40	36	45	39	38	34	52
1	-	21	+0	27	12	29	20	39	41	38	57	44
2	>100	74	58	74	59	76	57	74	70	>80	>80	68
3	>100	>80	70	>80	76	77	65	>80	>80	78	>80	71
4	>100	>80	>80	>80	>80	78	>80	>80	>80	>80	>80	>80
5	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
6	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
7	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
8	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
9	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
10	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -19.97 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	22	35	32	52	47	56	51	54	51	69
1	-	21	+0	27	12	30	21	43	42	44	63	51
2	99	68	50	65	50	77	52	69	65	73	73	60
3	>100	59	46	58	48	55	41	57	47	56	63	53
4	>100	>90	79	84	70	89	67	81	63	78	76	>90
5	>100	80	69	76	60	72	58	68	58	71	65	81
6	>100	>90	>90	>90	89	>90	84	>90	84	>90	>90	>90
7	>100	88	>90	>90	80	>90	89	>90	82	86	75	>90
8	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90
9	>100	>90	>90	>90	>90	>90	>90	>90	89	>90	86	>90
10	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -4.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -10.06 dBm

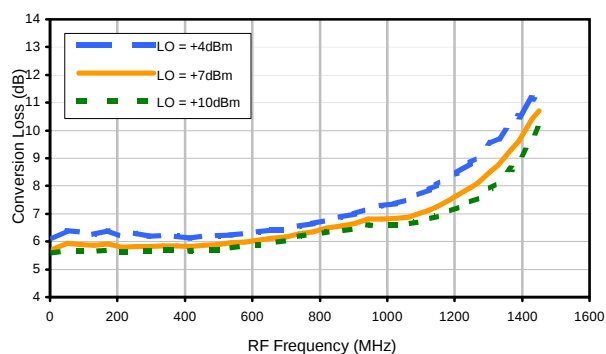
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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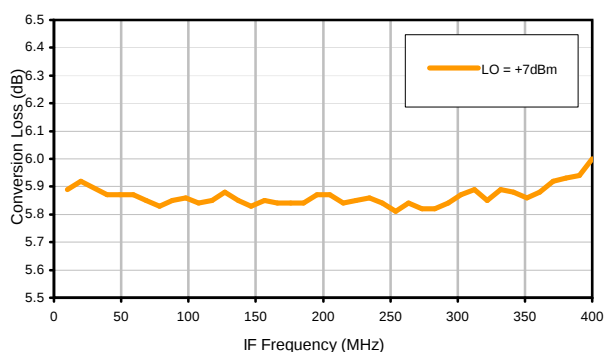


Typical Performance Curves

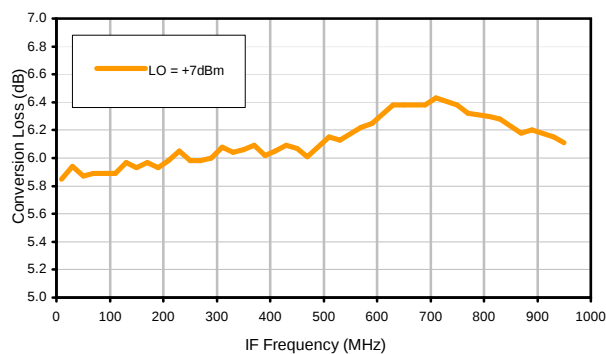
Conversion Loss @ IF=30MHz



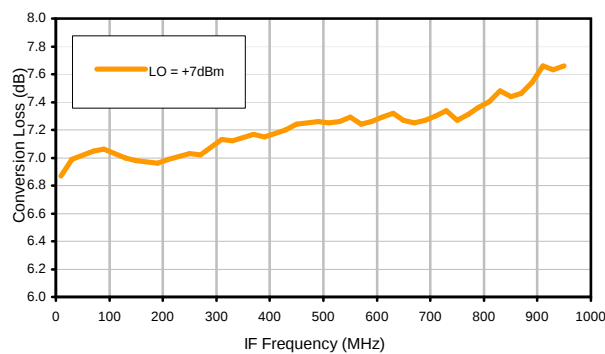
Conversion Loss vs. IF @ RF=500.1MHz



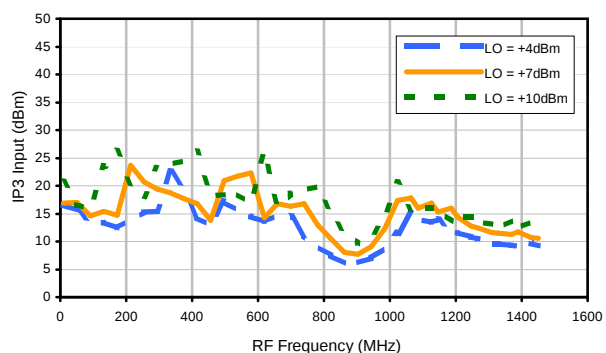
Conversion Loss vs. IF @ RF=50.1MHz



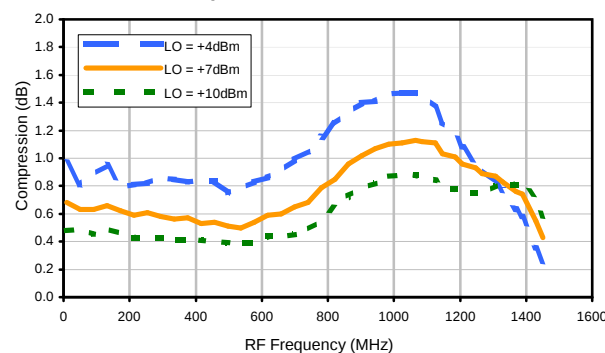
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

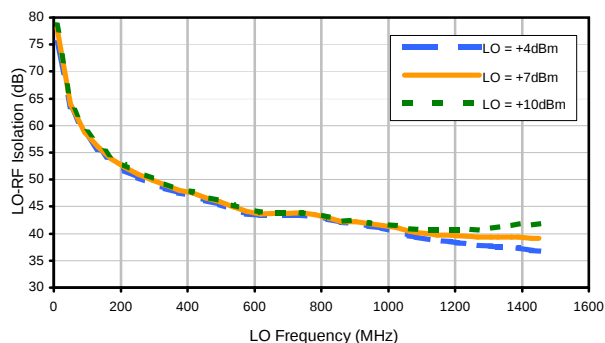


Compression @ RF IN=+1dBm

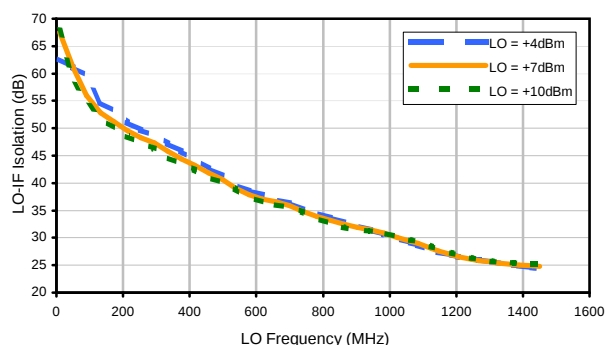


Typical Performance Curves

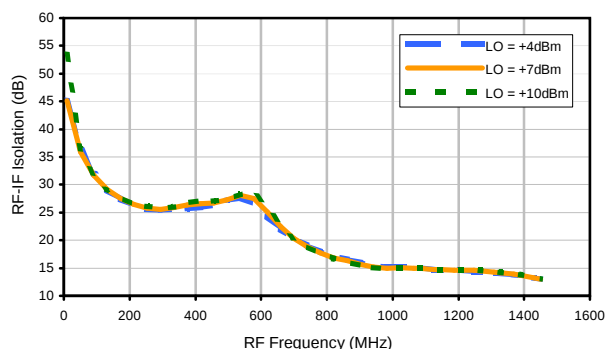
LO-RF Isolation



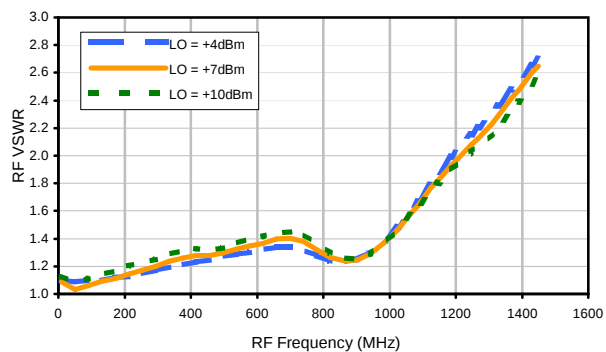
LO-IF Isolation



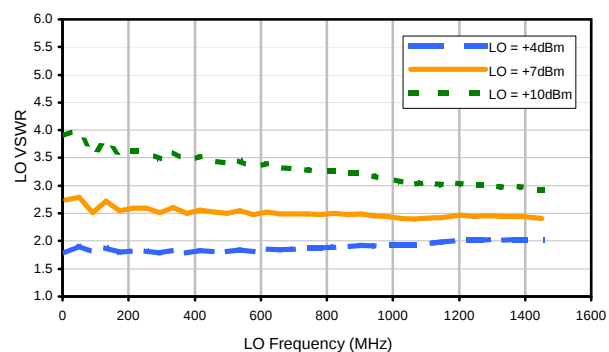
RF-IF Isolation



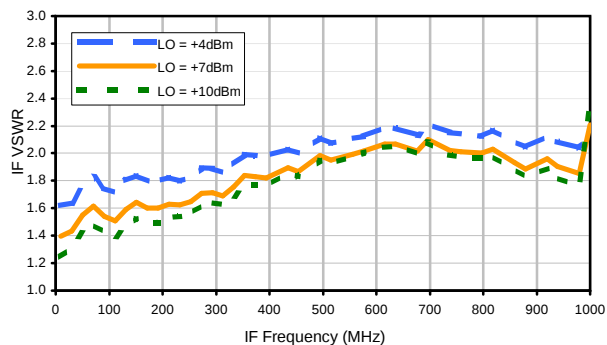
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	25	20	40	36	45	39	38	34	52
1	-	21	+0	27	12	29	20	39	41	38	57	44
2	>100	74	58	74	59	76	57	74	70	>80	>80	68
3	>100	>80	70	>80	76	77	65	>80	>80	78	>80	71
4	>100	>80	>80	>80	>80	78	>80	>80	>80	>80	>80	>80
5	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
6	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
7	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
8	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
9	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
10	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions:

RF IN: 500.1 MHz; -14.00 dBm.

LO IN: 530.01 MHz; +7.00 dBm

IF OUT: 29.91 MHz; -19.97 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	22	35	32	52	47	56	51	54	51	69
1	-	21	+0	27	12	30	21	43	42	44	63	51
2	99	68	50	65	50	77	52	69	65	73	73	60
3	>100	59	46	58	48	55	41	57	47	56	63	53
4	>100	>90	79	84	70	89	67	81	63	78	76	>90
5	>100	80	69	76	60	72	58	68	58	71	65	81
6	>100	>90	>90	>90	89	>90	84	>90	84	>90	>90	>90
7	>100	88	>90	>90	80	>90	89	>90	82	86	75	>90
8	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90
9	>100	>90	>90	>90	>90	>90	>90	>90	89	>90	86	>90
10	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90	>90
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions:

RF IN: 500.1 MHz; -4.00 dBm.

LO IN: 530.01 MHz; +7.00 dBm

IF OUT: 29.91 MHz; -10.06 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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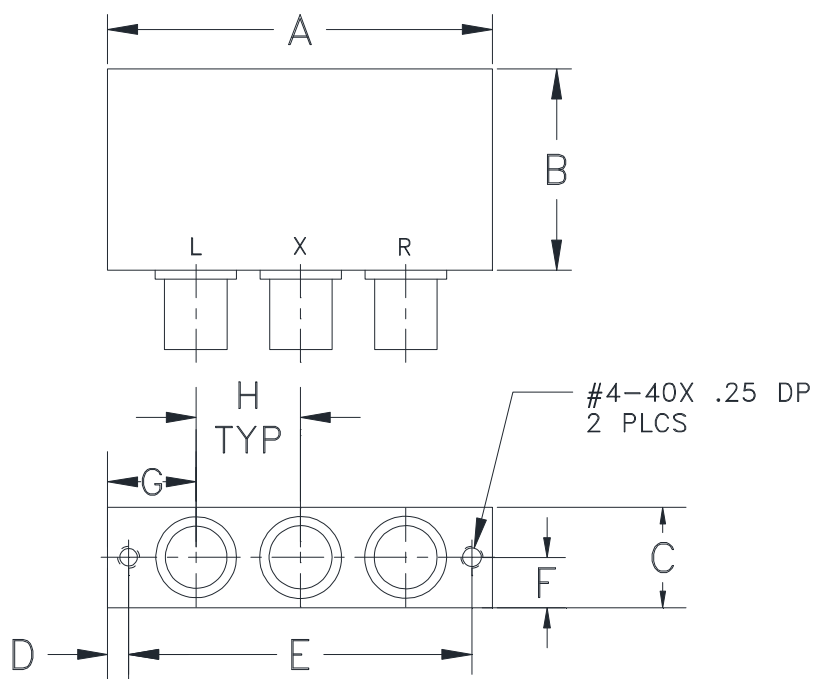


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Outline Dimensions

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