

Frequency Mixer

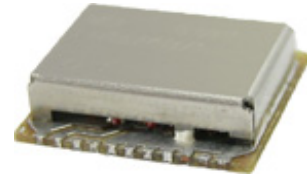
MWJ-ED13697/1

Level 17 (LO Power + 17 dBm)

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

Please click "Back", and then click "Contact Us" for Applications support.

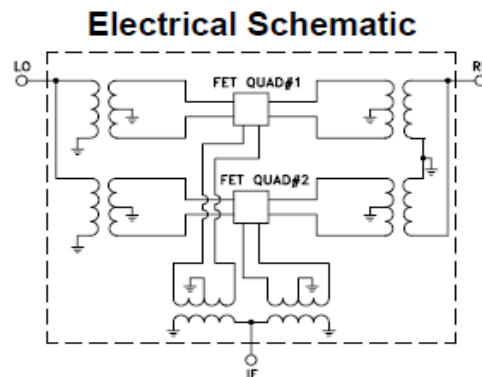


CASE STYLE : 99-01-1410

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (f _L to f _U)	109		645	MHz
	RF (f _L to f _U)	109		645	MHz
	IF	10		202	MHz
Conversion Loss	Total Range		7.15		dB
LO-RF Isolation			52		dB
LO-IF Isolation			52		dB
Input IP3			+30		dBm
1 dB Compression			+20		dBm

MAXIMUM RATINGS	
Operating Temperature	-45°C to +85°C
Storage Temperature	-55°C to +100°C

PIN CONNECTIONS	
LO	13
RF	21
IF	2
OPEN	10
GROUND	1,3,4,5,6,7,8,9,11,12,14,15,16,17,18,19,20,22



Frequency Mixer

MWJ-ED13697/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+20dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
10.1	40.1	8.86	8.17	7.42	10.1	40.1	12.08	14.68	18.08	10.1	40.1	10.80	8.90	7.36
25.1	55.1	8.45	7.75	7.36	25.1	55.1	13.62	16.76	20.16	25.1	55.1	9.43	7.64	5.74
43.1	73.1	8.02	7.51	7.15	43.1	73.1	15.45	18.73	21.92	43.1	73.1	8.20	6.34	4.44
58.1	88.1	7.72	7.31	7.03	58.1	88.1	17.56	20.74	23.38	58.1	88.1	6.16	4.28	2.59
76.1	106.1	7.49	7.23	7.03	76.1	106.1	20.50	23.13	25.41	76.1	106.1	5.50	3.61	2.09
91.1	121.1	7.36	7.15	6.98	91.1	121.1	22.31	24.75	27.23	91.1	121.1	4.28	2.52	1.32
109.1	139.1	7.34	7.11	6.95	109.1	139.1	23.34	25.93	28.51	109.1	139.1	2.78	1.52	0.80
124.1	154.1	7.26	7.05	6.90	124.1	154.1	23.98	26.79	29.45	124.1	154.1	2.73	1.49	0.81
139.1	169.1	7.11	6.90	6.77	139.1	169.1	24.94	27.78	29.98	139.1	169.1	2.07	1.10	0.61
157.1	187.1	7.11	6.97	6.85	157.1	187.1	26.39	28.86	30.92	157.1	187.1	1.66	0.89	0.51
172.1	202.1	7.17	7.07	6.95	172.1	202.1	27.82	29.98	32.32	172.1	202.1	1.51	0.79	0.48
190.1	220.1	7.20	7.07	6.95	190.1	220.1	28.55	30.95	33.17	190.1	220.1	1.09	0.61	0.37
205.1	235.1	7.22	7.09	7.01	205.1	235.1	28.78	31.23	32.89	205.1	235.1	1.07	0.60	0.37
223.1	253.1	7.11	6.98	6.90	223.1	253.1	29.22	31.32	33.84	223.1	253.1	0.93	0.53	0.33
238.1	268.1	7.08	6.95	6.86	238.1	268.1	29.78	31.92	35.00	238.1	268.1	0.89	0.52	0.32
256.1	286.1	7.17	7.06	6.99	256.1	286.1	30.11	32.55	34.65	256.1	286.1	0.86	0.49	0.30
271.1	301.1	7.25	7.13	7.05	271.1	301.1	30.13	32.13	34.30	271.1	301.1	0.80	0.45	0.29
286.1	316.1	7.28	7.16	7.07	286.1	316.1	30.17	32.39	34.08	286.1	316.1	0.90	0.52	0.31
304.1	334.1	7.25	7.14	7.06	304.1	334.1	30.10	32.90	34.63	304.1	334.1	0.87	0.50	0.30
319.1	349.1	7.20	7.07	6.99	319.1	349.1	29.82	33.43	35.27	319.1	349.1	0.97	0.55	0.33
337.1	367.1	7.18	7.04	6.96	337.1	367.1	30.01	32.81	35.71	337.1	367.1	1.03	0.57	0.34
352.1	382.1	7.29	7.17	7.07	352.1	382.1	29.55	32.39	35.83	352.1	382.1	0.87	0.49	0.31
370.1	400.1	7.38	7.24	7.14	370.1	400.1	29.56	32.69	35.74	370.1	400.1	1.23	0.65	0.38
385.1	415.1	7.42	7.29	7.18	385.1	415.1	29.53	32.27	34.37	385.1	415.1	1.27	0.67	0.36
405.1	435.1	7.41	7.26	7.16	405.1	435.1	29.64	32.57	34.11	405.1	435.1	1.10	0.60	0.34
480.1	510.1	7.53	7.37	7.20	480.1	510.1	27.41	30.94	34.49	480.1	510.1	1.49	0.73	0.38
555.1	585.1	7.67	7.45	7.27	555.1	585.1	25.31	29.61	33.64	555.1	585.1	2.52	1.18	0.56
645.1	675.1	8.08	7.81	7.60	645.1	675.1	25.33	27.30	28.28	645.1	675.1	3.23	1.55	0.71
720.1	750.1	8.41	8.12	7.87	720.1	750.1	21.50	23.26	25.06	720.1	750.1	3.59	1.90	1.00
810.1	840.1	8.84	8.59	8.38	810.1	840.1	22.88	25.60	28.24	810.1	840.1	4.05	2.34	1.18
885.1	915.1	8.95	8.68	8.50	885.1	915.1	22.55	25.72	28.94	885.1	915.1	4.06	2.35	1.12
975.1	1005.1	9.09	8.81	8.64	975.1	1005.1	21.97	25.35	28.88	975.1	1005.1	4.29	2.60	1.31
1050.1	1080.1	9.23	8.94	8.76	1050.1	1080.1	21.81	25.32	28.95	1050.1	1080.1	4.72	2.93	1.53
1125.1	1155.1	9.28	8.93	8.69	1125.1	1155.1	21.12	24.86	28.69	1125.1	1155.1	5.02	3.18	1.65
1215.1	1245.1	9.52	9.10	8.80	1215.1	1245.1	20.37	24.12	28.11	1215.1	1245.1	5.48	3.54	1.92
1290.1	1320.1	9.89	9.43	9.10	1290.1	1320.1	20.54	24.27	27.80	1290.1	1320.1	5.75	3.80	2.05
1380.1	1410.1	10.24	9.74	9.36	1380.1	1410.1	20.61	23.54	25.97	1380.1	1410.1	6.13	4.10	2.30
1455.1	1485.1	10.27	9.76	9.37	1455.1	1485.1	19.65	22.33	24.71	1455.1	1485.1	6.57	4.45	2.61
1545.1	1575.1	10.37	9.85	9.46	1545.1	1575.1	19.13	21.81	24.36	1545.1	1575.1	6.49	4.46	2.71
1605.1	1635.1	10.51	9.99	9.61	1605.1	1635.1	19.19	22.18	25.13	1605.1	1635.1	6.16	4.29	2.70

Frequency Mixer

MWJ-ED13697/1

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=807MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1605MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
786.9	20.1	11.60	10.1	20.1	9.79	850.9	754.1	10.43
746.9	60.1	9.62	50.1	60.1	7.56	830.9	774.1	10.27
706.9	100.1	8.65	90.1	100.1	7.18	810.9	794.1	10.13
666.9	140.1	8.41	130.1	140.1	7.04	780.9	824.1	10.13
626.9	180.1	8.04	170.1	180.1	7.10	760.9	844.1	10.23
586.9	220.1	8.00	210.1	220.1	6.99	740.9	864.1	10.10
546.9	260.1	7.96	250.1	260.1	7.36	720.9	884.1	9.88
506.9	300.1	7.92	290.1	300.1	7.18	700.9	904.1	9.93
466.9	340.1	7.90	330.1	340.1	7.32	680.9	924.1	10.06
426.9	380.1	7.93	370.1	380.1	7.25	650.9	954.1	9.97
386.9	420.1	7.61	390.1	400.1	7.18	630.9	974.1	9.84
346.9	460.1	7.90	430.1	440.1	7.64	610.9	994.1	9.86
306.9	500.1	7.96	470.1	480.1	7.70	590.9	1014.1	9.87
266.9	540.1	8.21	510.1	520.1	7.70	570.9	1034.1	9.86
226.9	580.1	8.21	550.1	560.1	7.74	540.9	1064.1	9.81
186.9	620.1	8.21	590.1	600.1	7.96	520.9	1084.1	9.71
146.9	660.1	8.27	630.1	640.1	7.77	500.9	1104.1	9.72
106.9	700.1	8.21	670.1	680.1	8.07	480.9	1124.1	9.70
66.9	740.1	8.26	710.1	720.1	7.87	460.9	1144.1	9.71
26.9	780.1	8.23	750.1	760.1	8.27	440.9	1164.1	9.73
13.1	820.1	8.35	790.1	800.1	8.44	410.9	1194.1	9.60
63.1	870.1	8.56	830.1	840.1	8.62	390.9	1214.1	9.51
103.1	910.1	8.64	870.1	880.1	8.93	370.9	1234.1	9.71
153.1	960.1	8.74	910.1	920.1	8.70	350.9	1254.1	9.74
193.1	1000.1	8.82	950.1	960.1	8.92	330.9	1274.1	9.79
243.1	1050.1	9.01	990.1	1000.1	8.87	310.9	1294.1	9.78
283.1	1090.1	9.07	1030.1	1040.1	8.84	280.9	1324.1	9.84
333.1	1140.1	9.05	1070.1	1080.1	8.88	260.9	1344.1	9.91
383.1	1190.1	8.89	1110.1	1120.1	8.73	240.9	1364.1	9.88
423.1	1230.1	9.09	1150.1	1160.1	8.77	220.9	1384.1	9.80
473.1	1280.1	9.16	1170.1	1180.1	8.85	200.9	1404.1	9.73
513.1	1320.1	9.22	1210.1	1220.1	9.01	170.9	1434.1	9.74
563.1	1370.1	9.37	1250.1	1260.1	9.30	150.9	1454.1	9.74
603.1	1410.1	9.42	1290.1	1300.1	9.47	130.9	1474.1	9.68
653.1	1460.1	9.54	1330.1	1340.1	9.60	110.9	1494.1	9.69
693.1	1500.1	9.62	1370.1	1380.1	10.05	90.9	1514.1	9.65
743.1	1550.1	9.75	1410.1	1420.1	10.34	70.9	1534.1	9.62
793.1	1600.1	9.91	1450.1	1460.1	10.68	40.9	1564.1	9.70
833.1	1640.1	10.17	1490.1	1500.1	11.01	20.9	1584.1	9.67
883.1	1690.1	10.40	1510.1	1520.1	11.50	10.9	1594.1	9.88

Frequency Mixer

MWJ-ED13697/1

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
40.1	71.80	71.38	72.53	69.35	70.15	67.11
55.1	69.69	70.18	71.80	67.50	67.39	66.41
73.1	70.44	70.02	68.75	65.18	64.66	64.38
88.1	68.55	67.23	66.61	63.64	63.23	62.69
106.1	64.52	64.62	64.67	61.04	60.43	60.51
121.1	61.72	60.72	60.25	58.12	57.68	57.14
139.1	60.71	60.36	59.97	57.79	57.34	57.14
154.1	60.01	59.52	59.20	56.80	56.36	56.03
169.1	58.46	58.02	57.53	55.58	55.40	54.91
187.1	57.16	56.68	56.40	54.63	54.21	53.99
202.1	55.37	55.11	54.72	52.69	52.32	51.97
220.1	54.00	53.66	53.31	52.13	51.89	51.63
235.1	53.15	52.99	52.81	52.09	51.81	51.53
253.1	52.34	52.10	51.91	51.32	50.99	50.81
268.1	51.89	51.63	51.51	51.01	50.75	50.48
286.1	51.05	50.93	50.76	50.19	49.91	49.68
301.1	50.98	50.82	50.70	50.11	49.77	49.53
316.1	51.06	50.84	50.73	50.26	49.92	49.73
334.1	50.61	50.39	50.26	49.95	49.66	49.43
349.1	50.48	50.28	50.17	49.94	49.57	49.37
367.1	50.26	50.08	49.97	50.08	49.65	49.42
382.1	50.80	50.60	50.41	50.65	50.22	49.92
400.1	52.07	52.07	52.06	52.32	51.98	51.70
415.1	52.38	52.32	52.27	52.64	52.23	51.97
435.1	52.30	52.31	52.27	52.60	52.23	51.92
510.1	51.75	51.63	51.48	55.73	55.37	55.09
585.1	49.99	49.75	49.63	54.86	54.09	53.62
675.1	48.08	47.73	47.49	53.30	52.17	51.41
750.1	45.32	44.83	44.48	50.00	48.75	48.27
840.1	49.10	48.43	47.97	45.07	44.31	43.77
915.1	53.75	53.05	52.46	47.55	47.04	46.68
1005.1	52.23	52.63	53.03	50.77	50.36	50.19
1080.1	51.69	52.21	52.74	51.38	51.00	50.66
1155.1	48.10	48.44	48.74	50.80	50.59	50.44
1245.1	46.62	46.92	47.20	48.52	48.38	48.18
1320.1	44.81	45.01	45.11	47.69	47.73	47.77
1410.1	42.83	42.81	42.74	47.38	47.53	47.68
1485.1	45.35	45.29	45.20	52.09	52.72	53.36
1575.1	43.00	42.65	42.31	51.31	51.07	50.91
1635.1	40.74	40.71	40.61	45.36	45.20	45.08

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	34.82	37.54	38.56
25.1	55.1	44.86	47.45	43.30
43.1	73.1	38.46	39.05	36.94
58.1	88.1	43.75	45.81	47.09
76.1	106.1	46.74	50.32	47.46
91.1	121.1	39.47	38.09	36.53
109.1	139.1	49.21	46.33	43.54
124.1	154.1	46.33	46.23	45.94
139.1	169.1	46.46	47.26	46.73
157.1	187.1	48.94	47.65	46.63
172.1	202.1	46.42	45.67	43.59
190.1	220.1	48.89	48.71	48.25
205.1	235.1	48.91	48.19	48.15
223.1	253.1	48.69	48.73	48.58
238.1	268.1	48.28	47.78	48.06
256.1	286.1	48.08	48.14	47.47
271.1	301.1	48.36	48.29	48.28
286.1	316.1	47.55	47.11	46.97
304.1	334.1	47.31	46.79	46.97
319.1	349.1	46.41	45.19	44.98
337.1	367.1	46.56	46.21	46.67
352.1	382.1	46.60	46.25	46.06
370.1	400.1	46.31	46.31	45.86
385.1	415.1	44.64	44.66	43.74
405.1	435.1	44.89	45.14	44.98
480.1	510.1	45.73	45.55	45.72
555.1	585.1	44.05	43.01	42.65
645.1	675.1	42.32	41.06	40.17
720.1	750.1	40.72	39.34	38.39
810.1	840.1	34.74	34.02	33.24
885.1	915.1	37.98	37.29	36.32
975.1	1005.1	42.61	42.22	41.12
1050.1	1080.1	42.99	43.00	42.62
1125.1	1155.1	41.27	41.06	40.75
1215.1	1245.1	39.16	38.97	38.94
1290.1	1320.1	38.45	38.56	38.51
1380.1	1410.1	39.89	40.47	40.76
1455.1	1485.1	45.26	47.25	48.56
1545.1	1575.1	40.67	39.82	38.88
1605.1	1635.1	38.27	37.57	36.96



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV. X2

MJW-ED13697/1

10/4/2010

Page 3 of 5

Frequency Mixer

MWJ-ED13697/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1635.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	1.06	1.22	1.26	55.1	9.54	9.32	9.85	10.1	1.60	1.76	1.99
25.1	55.1	1.07	1.15	1.21	73.1	2.45	2.43	2.44	14.1	1.43	1.65	1.76
43.1	73.1	1.20	1.26	1.32	88.1	1.97	1.97	1.97	17.1	1.41	1.55	1.71
58.1	88.1	1.23	1.28	1.35	103.1	3.77	3.76	3.80	21.1	1.45	1.64	1.80
76.1	106.1	1.32	1.38	1.45	118.1	20.53	20.15	21.54	25.1	1.47	1.64	1.82
91.1	121.1	1.39	1.45	1.50	136.1	9.57	9.57	9.51	28.1	1.48	1.65	1.82
109.1	139.1	1.45	1.51	1.56	151.1	10.41	10.42	10.54	32.1	1.45	1.62	1.76
124.1	154.1	1.54	1.60	1.65	166.1	5.66	5.66	5.66	35.1	1.41	1.58	1.73
139.1	169.1	1.56	1.61	1.66	184.1	3.90	3.90	3.90	39.1	1.39	1.55	1.69
157.1	187.1	1.59	1.63	1.67	199.1	3.25	3.25	3.25	45.1	1.40	1.55	1.70
172.1	202.1	1.61	1.66	1.71	214.1	2.95	2.95	2.95	46.1	1.41	1.56	1.70
190.1	220.1	1.63	1.67	1.71	232.1	2.44	2.44	2.44	50.1	1.41	1.56	1.70
205.1	235.1	1.68	1.73	1.77	247.1	1.99	1.99	1.99	54.1	1.41	1.55	1.69
223.1	253.1	1.69	1.73	1.77	268.1	1.65	1.65	1.65	57.1	1.41	1.56	1.70
238.1	268.1	1.72	1.76	1.79	280.1	1.63	1.63	1.63	61.1	1.42	1.56	1.70
256.1	286.1	1.69	1.72	1.75	295.1	1.74	1.74	1.74	65.1	1.41	1.55	1.69
271.1	301.1	1.67	1.70	1.73	310.1	1.97	1.97	1.97	68.1	1.40	1.55	1.69
286.1	316.1	1.66	1.68	1.71	325.1	2.21	2.21	2.21	72.1	1.40	1.56	1.70
304.1	334.1	1.68	1.70	1.72	343.1	2.50	2.50	2.50	76.1	1.43	1.57	1.71
319.1	349.1	1.69	1.71	1.72	358.1	2.79	2.79	2.79	79.1	1.44	1.58	1.72
337.1	367.1	1.68	1.68	1.69	373.1	3.17	3.17	3.17	83.1	1.43	1.57	1.70
352.1	382.1	1.68	1.68	1.68	391.1	3.80	3.80	3.80	86.1	1.42	1.55	1.68
370.1	400.1	1.64	1.63	1.63	406.1	4.40	4.40	4.40	90.1	1.42	1.55	1.68
385.1	415.1	1.66	1.65	1.65	421.1	4.99	4.99	4.99	94.1	1.43	1.56	1.69
405.1	435.1	1.70	1.68	1.67	450.1	5.81	5.81	5.81	97.1	1.45	1.58	1.71
480.1	510.1	1.90	1.85	1.81	540.1	9.78	9.78	9.78	102.1	1.46	1.58	1.71
555.1	585.1	2.39	2.31	2.24	615.1	21.54	21.54	21.54	110.1	1.44	1.56	1.69
645.1	675.1	3.10	3.01	2.92	690.1	37.45	37.45	37.45	116.1	1.43	1.55	1.67
720.1	750.1	3.35	3.27	3.18	780.1	43.33	43.33	43.33	124.1	1.41	1.52	1.63
810.1	840.1	2.58	2.49	2.41	855.1	18.15	18.15	18.15	132.1	1.41	1.50	1.61
885.1	915.1	2.31	2.21	2.13	930.1	9.82	9.82	9.82	138.1	1.41	1.51	1.61
975.1	1005.1	2.07	1.93	1.82	1020.1	10.29	10.29	10.29	146.1	1.42	1.51	1.62
1050.1	1080.1	2.08	1.92	1.79	1095.1	9.51	9.51	9.51	154.1	1.43	1.52	1.62
1125.1	1155.1	2.35	2.21	2.10	1170.1	13.39	13.39	13.39	160.1	1.44	1.51	1.61
1215.1	1245.1	2.76	2.65	2.55	1260.1	12.16	12.16	12.16	168.1	1.43	1.51	1.59
1290.1	1320.1	2.92	2.81	2.72	1335.1	15.10	15.10	15.10	174.1	1.43	1.49	1.57
1380.1	1410.1	2.78	2.69	2.60	1410.1	13.94	13.94	13.94	182.1	1.43	1.49	1.56
1455.1	1485.1	2.50	2.40	2.32	1485.1	10.54	10.54	10.54	190.1	1.45	1.49	1.56
1545.1	1575.1	2.11	2.03	1.96	1575.1	8.46	8.46	8.46	196.1	1.45	1.50	1.57
1605.1	1635.1	1.89	1.81	1.74	1635.1	7.39	7.39	7.39	202.1	1.46	1.50	1.56

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	19.97	22.32	45.44	51.28	49.43	116.98	118.43	110.20	115.01	114.77
1	---	25.25	---	25.02	17.38	47.47	54.21	49.21	105.02	111.23	109.38	107.10
2	91.92	52.78	60.23	58.06	60.91	55.32	77.79	70.14	73.46	118.79	117.00	117.48
3	113.79	87.09	62.57	68.47	58.54	65.81	65.96	83.62	87.66	81.64	118.60	116.48
4	115.52	119.77	112.83	95.67	96.31	85.39	90.63	89.45	111.57	104.77	101.23	118.62
5	114.14	119.48	117.74	117.78	96.98	110.54	101.25	105.62	106.73	117.33	120.61	118.32
6	115.80	119.79	118.38	118.29	119.24	116.51	106.07	113.74	102.23	118.22	117.36	118.17
7	113.56	118.21	119.11	116.89	119.15	118.53	107.81	101.57	111.30	106.84	114.30	118.77
8	113.93	118.32	116.50	118.63	118.94	120.56	117.99	114.68	102.24	112.21	102.94	118.91
9	115.68	119.34	118.82	118.15	118.64	117.05	118.21	116.35	116.11	108.10	111.01	108.90
10	115.12	119.13	117.98	119.08	118.02	118.89	118.78	118.07	119.71	114.86	107.33	110.35
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 807.0 MHz; 0 dBm.
LO IN: 837.0 MHz; +17.00 dBm
IF OUT: 30.0 MHz; -8.58 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	32.36	33.90	49.81	63.37	57.54	113.20	121.55	119.23	117.67	122.38
1	---	25.88	---	25.81	18.03	49.76	67.79	52.55	102.66	118.11	110.57	113.67
2	81.63	41.56	53.01	46.63	51.47	47.21	70.22	60.56	66.51	115.93	121.60	122.45
3	103.50	68.68	42.42	51.09	40.12	49.00	49.21	67.28	71.34	67.05	120.00	121.40
4	105.23	83.02	77.26	62.58	65.99	55.09	61.79	60.25	80.15	79.90	76.07	122.40
5	103.85	101.71	89.67	82.19	64.79	66.41	62.35	63.72	69.72	83.88	89.86	79.42
6	105.51	100.32	111.29	102.66	90.75	84.29	75.83	75.16	72.21	77.29	94.14	93.24
7	103.27	121.70	97.10	108.60	107.84	92.56	82.48	78.31	81.60	77.59	91.27	100.79
8	103.64	123.25	123.16	109.10	119.84	122.01	100.66	90.13	85.80	86.98	82.42	91.91
9	105.39	122.63	122.28	122.44	108.88	117.12	119.41	103.56	98.43	91.05	100.86	92.63
10	104.83	123.05	121.54	122.36	121.86	122.35	123.32	123.83	107.54	102.01	95.75	100.48
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 807.0 MHz; +10 dBm.
LO IN: 837.0 MHz; +17.00 dBm
IF OUT: 30.0 MHz; 1.71 dBm

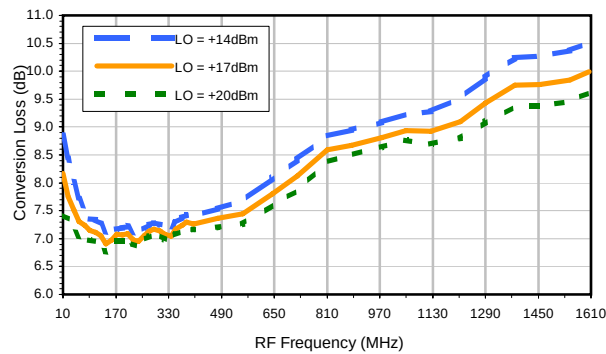
- Notes:
1. All Harmonics are in (dBc) relative to IF OUTPUT
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT
 3. RF Cal represents the Harmonics level of the RF Input Signal to the mixer

Frequency Mixer

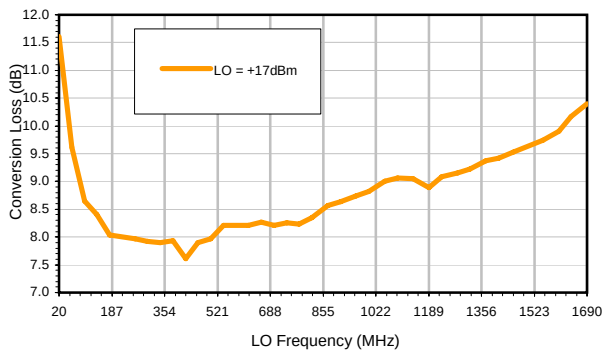
Typical Performance Curves

MWJ-ED13697/1

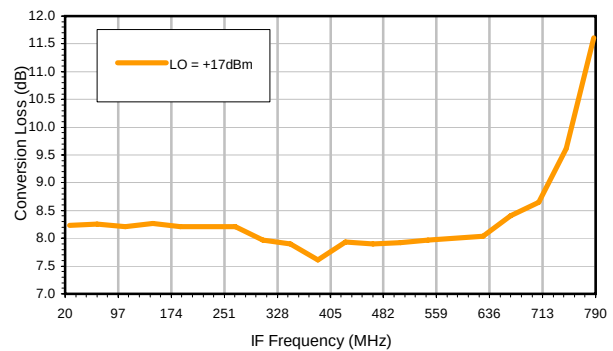
Conversion Loss @IF=30 MHz



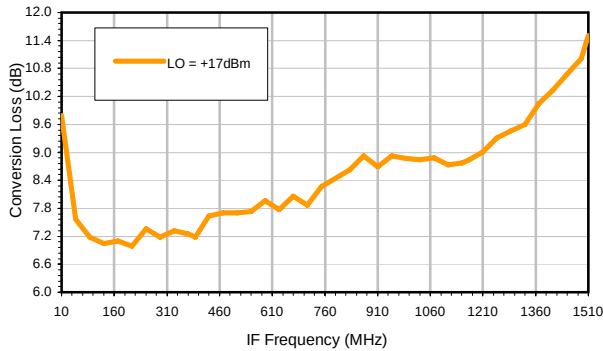
Conversion Loss vs. LO @ RF=807 MHz



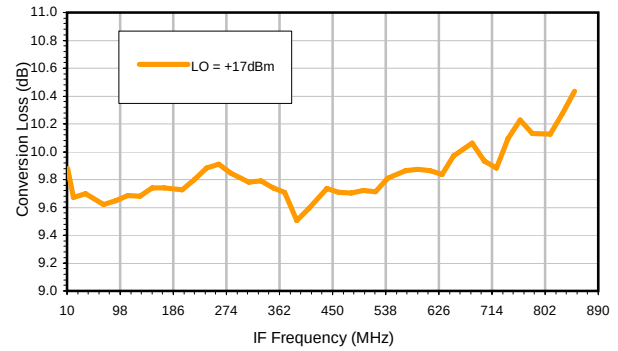
Conversion Loss vs. IF @ RF=807 MHz



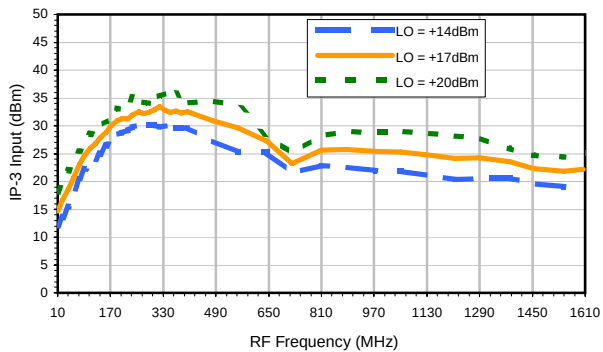
Conversion Loss vs. IF @ RF=10 MHz



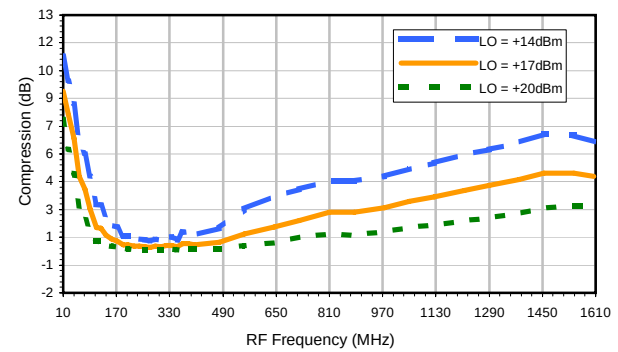
Conversion Loss vs. IF @ RF=1605 MHz



IP-3 Input



Compression @RF IN=+20 dBm



Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV. X2

MJW-ED13697/1

10/4/2010

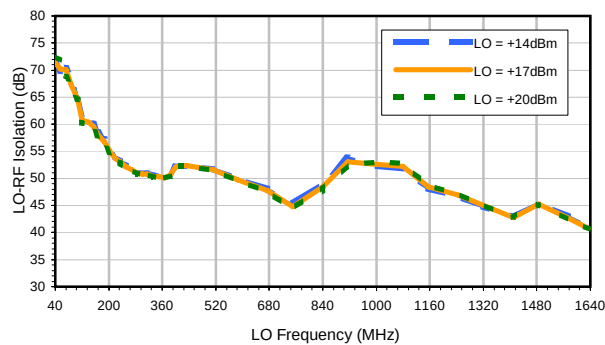
Page 1 of 3

Frequency Mixer

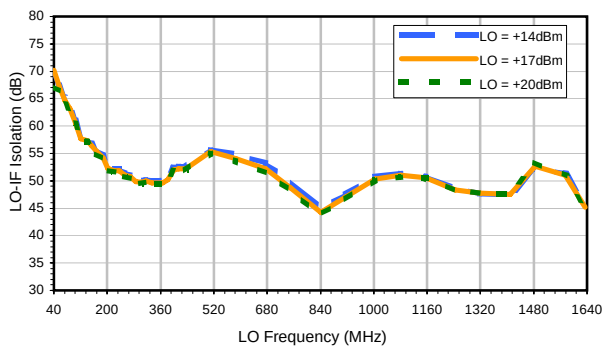
Typical Performance Curves

MWJ-ED13697/1

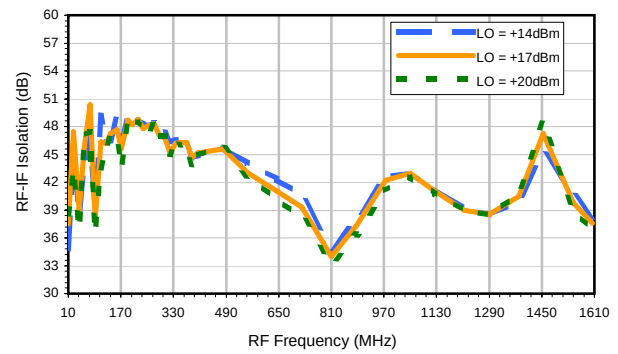
LO-RF Isolation



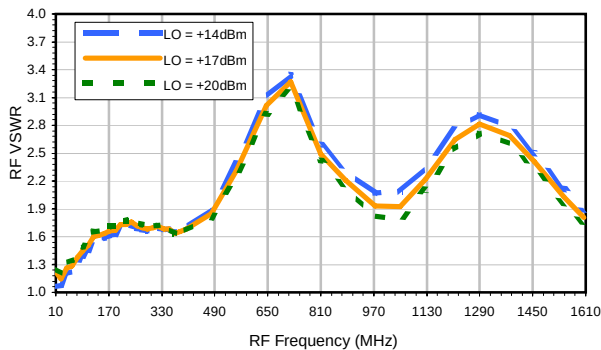
LO-IF Isolation



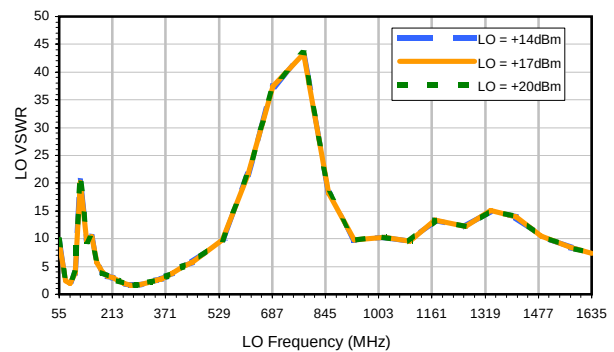
RF-IF Isolation



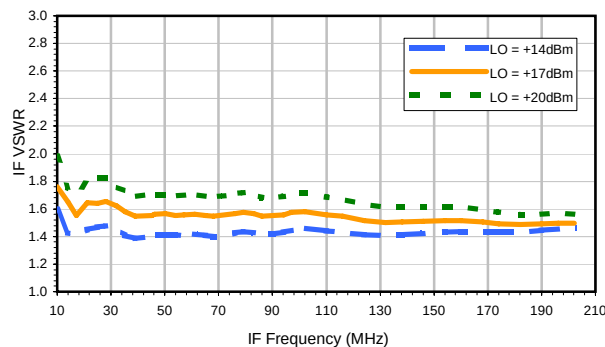
RF VSWR



LO VSWR



IF VSWR



Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV. X2

MJW-ED13697/1

10/4/2010

Page 2 of 3

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	19.97	22.32	45.44	51.28	49.43	116.98	118.43	110.20	115.01	114.77
1	---	25.25	---	25.02	17.38	47.47	54.21	49.21	105.02	111.23	109.38	107.10
2	91.92	52.78	60.23	58.06	60.91	55.32	77.79	70.14	73.46	118.79	117.00	117.48
3	113.79	87.09	62.57	68.47	58.54	65.81	65.96	83.62	87.66	81.64	118.60	116.48
4	115.52	119.77	112.83	95.67	96.31	85.39	90.63	89.45	111.57	104.77	101.23	118.62
5	114.14	119.48	117.74	117.78	96.98	110.54	101.25	105.62	106.73	117.33	120.61	118.32
6	115.80	119.79	118.38	118.29	119.24	116.51	106.07	113.74	102.23	118.22	117.36	118.17
7	113.56	118.21	119.11	116.89	119.15	118.53	107.81	101.57	111.30	106.84	114.30	118.77
8	113.93	118.32	116.50	118.63	118.94	120.56	117.99	114.68	102.24	112.21	102.94	118.91
9	115.68	119.34	118.82	118.15	118.64	117.05	118.21	116.35	116.11	108.10	111.01	108.90
10	115.12	119.13	117.98	119.08	118.02	118.89	118.78	118.07	119.71	114.86	107.33	110.35
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 807.0 MHz; 0 dBm.
LO IN: 837.0 MHz; +17.00 dBm
IF OUT: 30.0 MHz; -8.58 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	---	---	32.36	33.90	49.81	63.37	57.54	113.20	121.55	119.23	117.67	122.38
1	---	25.88	---	25.81	18.03	49.76	67.79	52.55	102.66	118.11	110.57	113.67
2	81.63	41.56	53.01	46.63	51.47	47.21	70.22	60.56	66.51	115.93	121.60	122.45
3	103.50	68.68	42.42	51.09	40.12	49.00	49.21	67.28	71.34	67.05	120.00	121.40
4	105.23	83.02	77.26	62.58	65.99	55.09	61.79	60.25	80.15	79.90	76.07	122.40
5	103.85	101.71	89.67	82.19	64.79	66.41	62.35	63.72	69.72	83.88	89.86	79.42
6	105.51	100.32	111.29	102.66	90.75	84.29	75.83	75.16	72.21	77.29	94.14	93.24
7	103.27	121.70	97.10	108.60	107.84	92.56	82.48	78.31	81.60	77.59	91.27	100.79
8	103.64	123.25	123.16	109.10	119.84	122.01	100.66	90.13	85.80	86.98	82.42	91.91
9	105.39	122.63	122.28	122.44	108.88	117.12	119.41	103.56	98.43	91.05	100.86	92.63
10	104.83	123.05	121.54	122.36	121.86	122.35	123.32	123.83	107.54	102.01	95.75	100.48
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

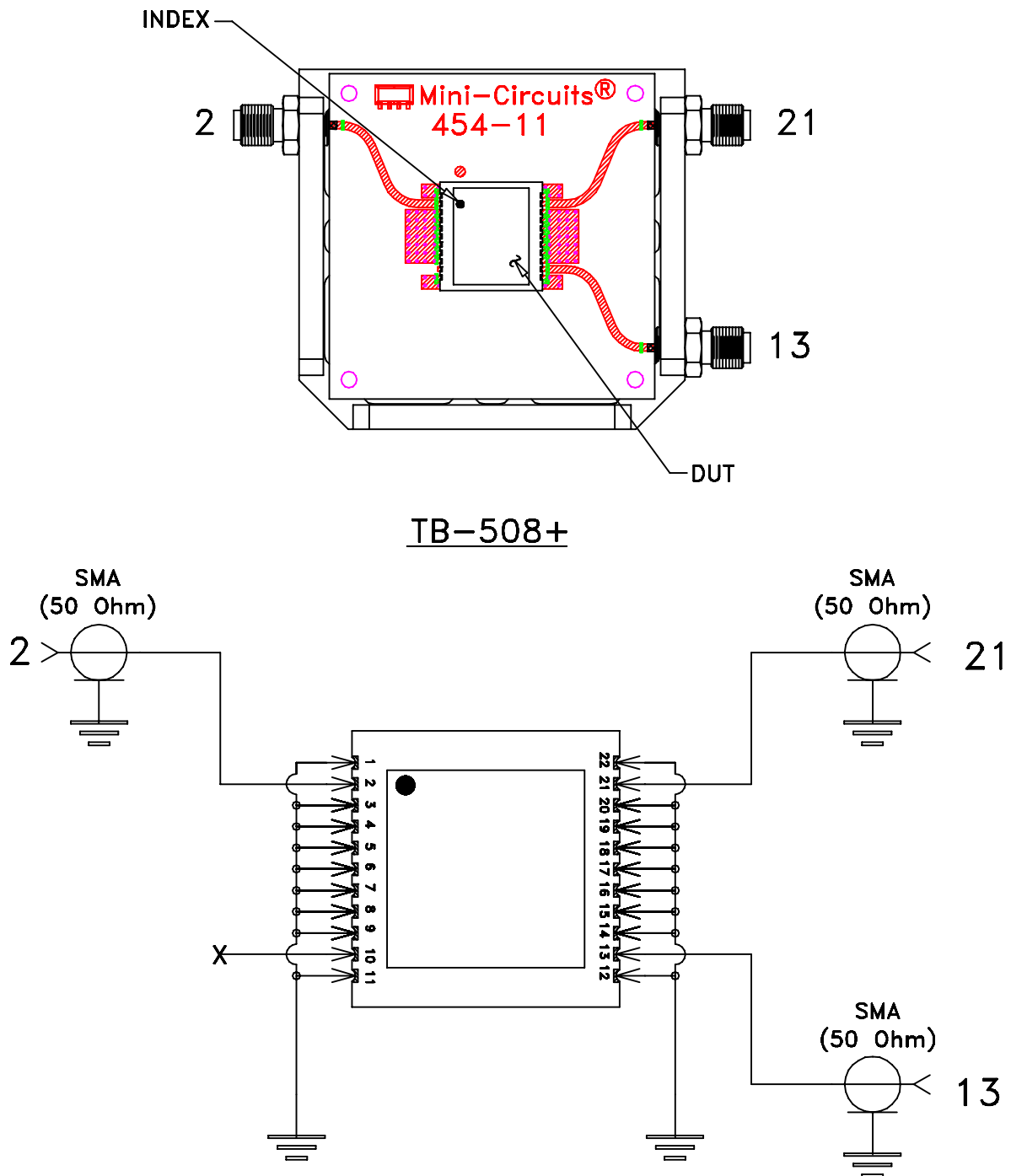
LO HARMONICS ORDER

Test conditions: RF IN: 807.0 MHz; +10 dBm.
LO IN: 837.0 MHz; +17.00 dBm
IF OUT: 30.0 MHz; 1.71 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 represents the Harmonics level of the RF Input Signal to the mixer

Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

 Mini-Circuits®



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	-45° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215