

Ceramic Surface Mount Frequency Mixer WIDE BAND

SIM-722MH+

Level 13 (LO Power +13 dBm) 2300 to 7200 MHz



Generic photo used for illustration purposes only

CASE STYLE: HV1195

Maximum Ratings

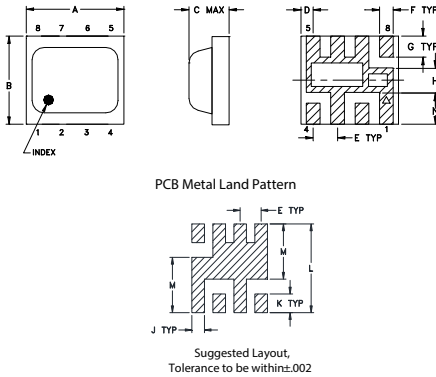
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW

For extended temperature range, consult factory.
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

LO	8
RF	4
IF	2
GROUND	1,3,5,6,7

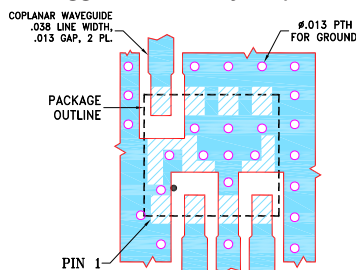
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.200	.180	.087	.025	.050	.028	.043
5.08	4.57	2.2098	0.64	1.27	0.71	1.09
H	J	K	L	M	N	wt
.050	.030	.043	.204	.127	0.065	grams
1.27	0.76	1.09	5.18	3.23	1.65	0.08

Demo Board MCL P/N: TB-382 Suggested PCB Layout (PL-239)



- NOTES:**
- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020"±.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Features

- wide bandwidth, 2300 to 7200 MHz
- low conversion loss, 6.5 dB typ.
- excellent IF BW, DC to 3000 MHz
- LTCC double balanced mixer
- tiny size, low profile, 0.08"
- useable as up and down converter
- aqueous washable
- protected by US patent 7,027,795

Applications

- satellite up and down converters
- defense radar and communications
- line of sight links
- ISM
- WIFI
- blue tooth
- VSAT
- ISM

Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS* (dB)	LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		IP3 at center band (dBm)
		Typ.	Min.	Typ.	Min.	
2300-7200	DC-3000					
LO/RF $f_c - f_u$	IF	Typ.	σ	Max.		
2300-3200		6.2	0.1	7.7	33	26
3200-3700		6.0	0.1	7.6	30	25
3700-4200		6.1	0.2	7.8	28	23
4200-7200		6.7	0.2	9.3	21	14

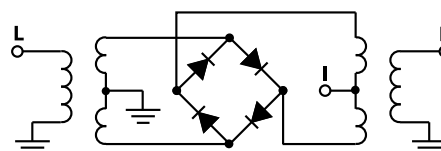
1 dB Compression: +9 dBm typ.

* Conversion loss at 30 MHz IF. σ is a measure of repeatability from unit to unit.

Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)	Isolation (dB)		VSWR RF Port (:1)	VSWR LO Port (:1)
		L-R (dB)	L-I (dB)		
RF	LO	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm
2200.00	2230.00	6.16	39.12	25.57	2.86
2600.00	2630.00	6.03	31.85	27.55	3.05
3000.00	3030.00	6.07	30.38	25.74	2.86
3200.00	3230.00	6.02	30.26	24.45	2.57
3600.00	3630.00	5.81	29.81	24.80	2.50
3800.00	3830.00	5.87	28.44	27.73	2.59
4000.00	4030.00	5.88	28.21	30.73	3.19
4200.00	4230.00	6.29	27.20	22.10	2.83
4400.00	4430.00	6.47	26.31	16.52	3.01
4800.00	4830.00	7.15	24.39	13.52	3.36
5000.00	5030.00	6.95	23.42	13.64	3.42
5200.00	5230.00	6.68	22.81	14.44	3.50
5600.00	5630.00	6.65	21.93	16.64	3.29
5800.00	5830.00	6.64	21.60	18.04	3.19
6000.00	6030.00	6.40	21.25	20.04	3.11
6220.00	6250.00	6.63	21.15	22.65	3.02
6640.00	6670.00	6.47	19.90	22.94	3.25
6840.00	6870.00	6.46	19.00	19.65	3.60
7060.00	7090.00	6.90	19.84	16.96	3.63
7260.00	7290.00	7.19	21.20	14.78	4.23

Electrical Schematic



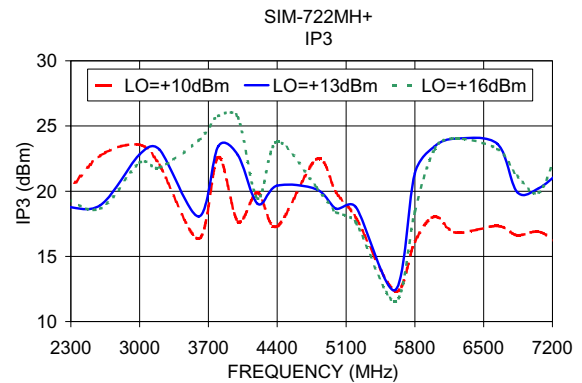
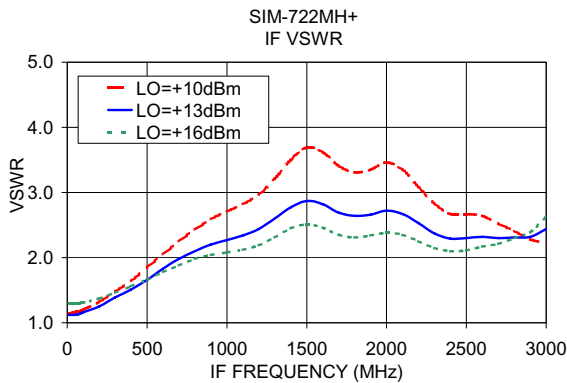
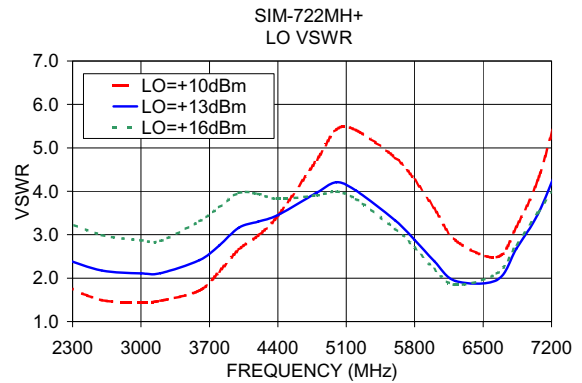
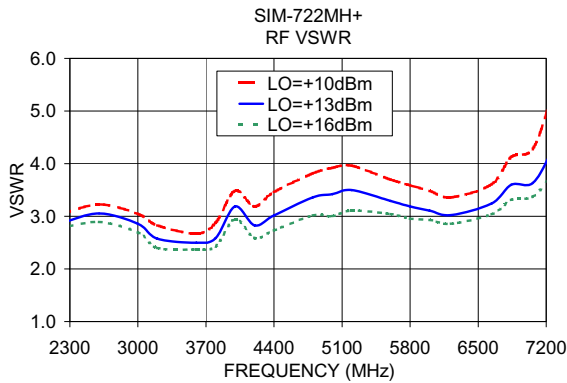
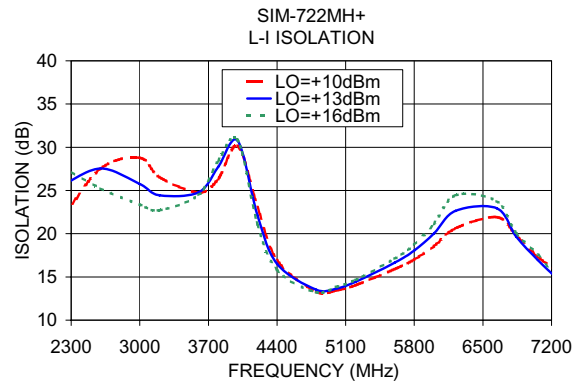
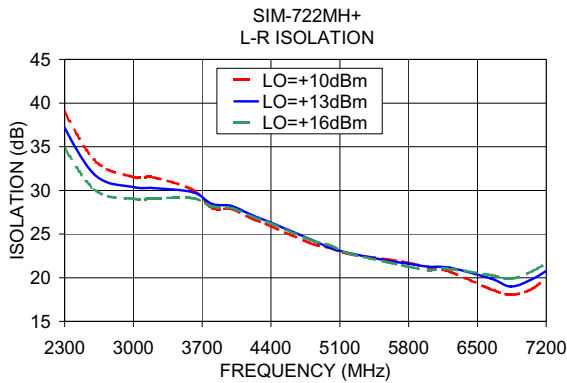
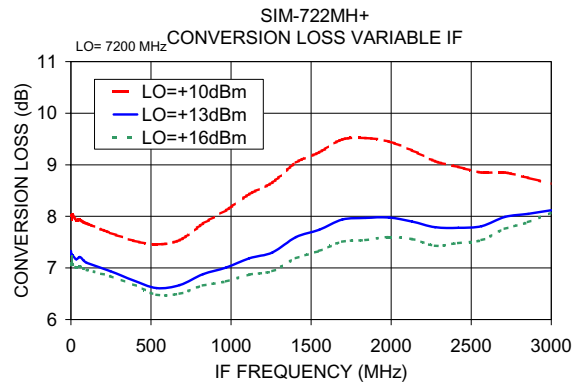
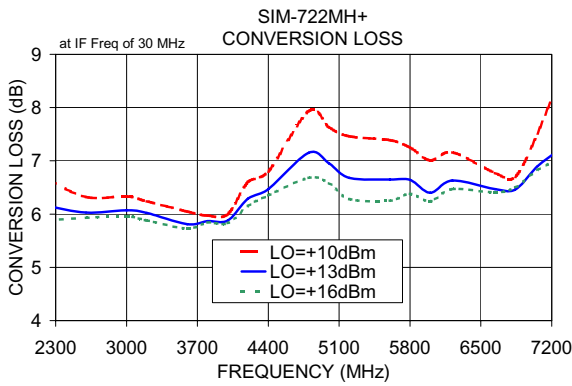
Notes

- 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

SIM-722MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	14.68	12.30	13.20
1680.1	1710.1	16.95	9.36	6.88
1860.1	1890.1	10.40	7.15	6.30
2040.1	2070.1	7.19	6.45	6.06
2220.1	2250.1	6.48	6.17	5.97
2400.1	2430.1	6.47	6.23	6.06
2580.1	2610.1	6.62	6.32	6.18
2760.1	2790.1	6.80	6.52	6.29
2920.1	2950.1	6.67	6.43	6.30
3100.1	3130.1	6.46	6.25	6.09
3260.1	3290.1	6.35	6.13	6.02
3440.1	3470.1	6.46	6.23	6.14
3600.1	3630.1	6.45	6.32	6.26
3780.1	3810.1	6.43	6.35	6.31
3940.1	3970.1	6.50	6.34	6.29
4120.1	4150.1	6.91	6.52	6.37
4280.1	4310.1	7.51	6.97	6.69
4460.1	4490.1	7.35	6.84	6.53
4620.1	4650.1	7.46	6.78	6.49
4800.1	4830.1	8.02	7.24	6.78
4960.1	4990.1	7.99	7.20	6.83
5140.1	5170.1	7.97	7.03	6.65
5300.1	5330.1	8.08	7.05	6.56
5480.1	5510.1	8.13	7.06	6.68
5640.1	5670.1	8.16	7.23	6.92
5820.1	5850.1	8.37	7.18	6.93
5980.1	6010.1	8.58	7.01	6.78
6160.1	6190.1	8.02	7.13	6.93
6320.1	6350.1	7.51	7.02	6.90
6500.1	6530.1	7.35	6.97	6.88
6660.1	6690.1	7.44	7.01	6.93
6840.1	6870.1	7.74	7.17	7.13
7000.1	7030.1	9.40	7.92	7.73
7180.1	7210.1	11.15	8.44	8.07
7340.1	7370.1	14.30	8.74	8.03
7520.1	7550.1	18.98	9.85	8.67
7680.1	7710.1	19.68	9.99	8.80
7860.1	7890.1	25.82	11.33	9.52
8020.1	8050.1	36.39	14.16	10.19
8200.1	8230.1	46.67	19.52	11.24

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	3.66	3.33	15.18
1680.1	1710.1	-0.19	6.82	15.68
1860.1	1890.1	6.27	18.80	16.04
2040.1	2070.1	20.69	17.00	17.60
2220.1	2250.1	19.66	19.86	19.17
2400.1	2430.1	22.24	19.46	19.19
2580.1	2610.1	25.70	20.40	20.21
2760.1	2790.1	22.88	21.92	19.15
2920.1	2950.1	22.83	22.77	23.18
3100.1	3130.1	22.88	22.73	22.92
3260.1	3290.1	20.64	21.74	21.98
3440.1	3470.1	20.80	18.91	20.51
3600.1	3630.1	18.99	20.20	23.95
3780.1	3810.1	19.95	24.60	24.39
3940.1	3970.1	15.89	21.12	25.40
4120.1	4150.1	20.64	18.01	19.51
4280.1	4310.1	25.35	20.29	22.71
4460.1	4490.1	22.86	19.61	19.87
4620.1	4650.1	25.37	20.97	20.09
4800.1	4830.1	21.04	21.89	19.83
4960.1	4990.1	18.42	20.48	19.38
5140.1	5170.1	18.01	20.68	18.63
5300.1	5330.1	15.84	19.04	19.05
5480.1	5510.1	15.45	19.48	19.80
5640.1	5670.1	16.34	21.23	21.54
5820.1	5850.1	15.96	22.65	24.95
5980.1	6010.1	16.18	22.63	24.33
6160.1	6190.1	15.47	22.11	23.97
6320.1	6350.1	16.06	23.55	24.53
6500.1	6530.1	16.67	22.37	24.33
6660.1	6690.1	16.39	20.64	22.66
6840.1	6870.1	16.38	19.29	21.16
7000.1	7030.1	20.86	20.91	22.84
7180.1	7210.1	18.07	20.90	23.74
7340.1	7370.1	10.19	20.78	23.50
7520.1	7550.1	5.44	18.72	22.33
7680.1	7710.1	4.66	16.71	21.52
7860.1	7890.1	1.14	16.02	19.00
8020.1	8050.1	-2.49	14.72	15.66
8200.1	8230.1	-4.77	5.47	13.63

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	1.62	1.52	3.54
1680.1	1710.1	-2.99	1.82	2.63
1860.1	1890.1	0.77	2.76	2.49
2040.1	2070.1	2.68	2.40	2.14
2220.1	2250.1	2.15	1.84	1.65
2400.1	2430.1	1.49	1.29	1.26
2580.1	2610.1	1.15	0.97	0.95
2760.1	2790.1	0.84	0.72	0.70
2920.1	2950.1	0.83	0.73	0.68
3100.1	3130.1	0.85	0.73	0.67
3260.1	3290.1	0.94	0.78	0.70
3440.1	3470.1	0.88	0.64	0.50
3600.1	3630.1	0.68	0.39	0.32
3780.1	3810.1	0.65	0.35	0.32
3940.1	3970.1	0.77	0.40	0.32
4120.1	4150.1	0.80	0.58	0.41
4280.1	4310.1	0.54	0.48	0.43
4460.1	4490.1	0.57	0.42	0.35
4620.1	4650.1	0.73	0.57	0.47
4800.1	4830.1	0.59	0.47	0.51
4960.1	4990.1	0.65	0.45	0.45
5140.1	5170.1	0.65	0.42	0.44
5300.1	5330.1	0.77	0.46	0.45
5480.1	5510.1	0.67	0.49	0.46
5640.1	5670.1	0.44	0.33	0.37
5820.1	5850.1	0.26	0.33	0.41
5980.1	6010.1	0.17	0.43	0.50
6160.1	6190.1	0.36	0.35	0.45
6320.1	6350.1	0.41	0.35	0.45
6500.1	6530.1	0.43	0.36	0.49
6660.1	6690.1	0.48	0.41	0.58
6840.1	6870.1	0.33	0.31	0.52
7000.1	7030.1	-0.05	0.20	0.32
7180.1	7210.1	-0.78	0.16	0.32
7340.1	7370.1	-2.92	0.06	0.30
7520.1	7550.1	-6.23	-0.27	0.26
7680.1	7710.1	-6.74	-0.23	0.37
7860.1	7890.1	-11.29	-0.23	0.21
8020.1	8050.1	-19.54	-1.11	0.32
8200.1	8230.1	-27.53	-4.68	0.86

Frequency Mixer

SIM-722MH+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=4750.1001MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2290.1001MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=7210.1001MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
3110.0	1640.1	11.70	10.0	2300.1	6.66	1810.0	5400.1	11.14
2954.0	1796.1	10.18	110.0	2400.1	6.19	1769.6	5440.5	11.36
2798.1	1952.0	8.21	210.0	2500.1	6.08	1729.1	5481.0	11.00
2642.1	2108.0	7.43	310.0	2600.1	5.98	1688.7	5521.4	11.06
2486.1	2264.0	6.62	410.0	2700.1	5.98	1648.2	5561.9	10.71
2330.1	2420.0	5.96	510.0	2800.1	6.07	1607.8	5602.3	10.63
2174.2	2575.9	6.29	610.0	2900.1	6.14	1567.3	5642.8	10.62
2018.2	2731.9	6.78	710.0	3000.1	6.31	1526.9	5683.2	10.34
1862.2	2887.9	7.74	810.0	3100.1	6.45	1486.4	5723.7	10.29
1706.2	3043.9	9.01	910.0	3200.1	6.65	1446.0	5764.1	10.03
1550.3	3199.8	8.99	1010.0	3300.1	7.07	1405.5	5804.6	9.89
1394.3	3355.8	8.72	1110.0	3400.1	7.28	1365.1	5845.0	9.82
1238.3	3511.8	8.12	1210.0	3500.1	7.16	1324.6	5885.5	9.74
1082.3	3667.8	8.02	1310.0	3600.1	6.99	1284.2	5925.9	9.67
926.4	3823.7	7.78	1410.0	3700.1	7.06	1243.7	5966.4	9.57
770.4	3979.7	7.16	1510.0	3800.1	7.04	1203.3	6006.8	9.45
614.4	4135.7	6.86	1610.0	3900.1	6.86	1162.8	6047.3	9.30
458.4	4291.7	6.56	1710.0	4000.1	6.82	1122.4	6087.7	9.34
302.5	4447.6	6.61	1810.0	4100.1	6.80	1081.9	6128.2	9.16
146.5	4603.6	7.00	1910.0	4200.1	6.84	1021.2	6188.9	9.18
10.0	4760.1	7.60	1990.0	4280.1	6.84	980.8	6229.3	9.00
174.0	4924.1	7.39	2090.0	4380.1	6.87	920.1	6290.0	8.99
338.1	5088.2	7.43	2170.0	4460.1	6.90	879.7	6330.4	8.78
502.1	5252.2	7.56	2270.0	4560.1	6.77	819.0	6391.1	8.78
666.1	5416.2	7.76	2350.0	4640.1	6.61	778.5	6431.6	8.61
830.1	5580.2	7.94	2450.0	4740.1	6.46	717.9	6492.2	8.57
994.2	5744.3	8.03	2530.0	4820.1	6.42	677.4	6532.7	8.45
1178.7	5928.8	8.05	2630.0	4920.1	6.28	616.7	6593.4	8.39
1342.7	6092.8	8.14	2710.0	5000.1	6.29	576.3	6633.8	8.33
1527.2	6277.3	8.15	2810.0	5100.1	6.17	515.6	6694.5	8.32
1691.3	6441.4	8.13	2890.0	5180.1	6.18	475.2	6734.9	8.27
1875.8	6625.9	7.93	2990.0	5280.1	6.15	414.5	6795.6	8.27
2039.8	6789.9	8.06	3070.0	5360.1	6.38	374.0	6836.1	8.20
2224.3	6974.4	8.10	3170.0	5460.1	6.80	313.4	6896.7	8.24
2388.4	7138.5	8.07	3250.0	5540.1	7.34	272.9	6937.2	8.16
2572.9	7323.0	8.15	3350.0	5640.1	7.96	212.2	6997.9	8.18
2736.9	7487.0	8.50	3430.0	5720.1	8.36	171.8	7038.3	8.10
2921.4	7671.5	9.90	3530.0	5820.1	9.09	111.1	7099.0	8.15
3085.5	7835.6	12.03	3610.0	5900.1	9.88	70.7	7139.4	8.15
3270.0	8020.1	14.51	3710.0	6000.1	10.85	10.0	7200.1	8.71

Frequency Mixer

SIM-722MH+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+10	+13	+16	+10	+13	+16			+10	+13	+16
1530.1	39.83	38.54	29.62	21.00	21.04	23.15	1500.1	1530.1	14.53	13.88	20.11
1710.1	35.16	35.97	32.68	19.01	19.28	21.05	1680.1	1710.1	13.16	12.35	10.82
1890.1	33.27	33.18	33.41	17.07	18.99	21.47	1860.1	1890.1	13.62	11.49	10.69
2070.1	32.93	33.83	34.50	17.55	20.27	22.77	2040.1	2070.1	13.24	12.22	11.70
2250.1	33.64	34.39	34.66	19.48	22.54	25.36	2220.1	2250.1	14.12	13.60	13.26
2430.1	33.59	34.64	34.64	22.22	25.44	27.62	2400.1	2430.1	16.21	16.02	15.86
2610.1	32.58	32.86	32.94	24.84	26.72	26.89	2580.1	2610.1	18.11	18.02	18.02
2790.1	31.50	31.46	30.70	26.03	25.64	24.18	2760.1	2790.1	19.25	19.44	19.46
2950.1	30.24	29.95	29.48	26.39	25.00	23.77	2920.1	2950.1	20.25	20.30	20.34
3130.1	29.87	29.41	28.77	26.52	24.98	23.37	3100.1	3130.1	20.50	20.61	20.34
3290.1	30.14	29.42	28.92	23.96	22.60	21.66	3260.1	3290.1	20.11	19.73	19.31
3470.1	29.79	29.16	28.60	22.45	21.32	20.60	3440.1	3470.1	19.67	18.98	18.58
3630.1	29.63	28.88	28.56	21.86	20.89	20.39	3600.1	3630.1	19.25	18.90	18.62
3810.1	29.74	28.94	28.61	21.70	21.19	20.95	3780.1	3810.1	19.51	19.12	18.82
3970.1	30.18	29.70	28.99	22.45	22.53	22.19	3940.1	3970.1	20.28	19.61	19.25
4150.1	29.57	29.23	28.60	24.31	24.81	24.90	4120.1	4150.1	21.53	20.72	20.11
4310.1	29.87	29.25	28.67	28.76	29.77	30.56	4280.1	4310.1	22.05	21.67	21.20
4490.1	29.80	29.14	28.55	32.83	31.19	29.86	4460.1	4490.1	22.01	21.81	21.49
4650.1	29.04	27.88	27.28	22.74	22.03	21.47	4620.1	4650.1	25.16	25.23	25.07
4830.1	27.83	26.65	26.09	17.43	17.23	17.00	4800.1	4830.1	34.10	34.01	33.94
4990.1	26.86	25.63	25.19	15.46	15.41	15.44	4960.1	4990.1	26.94	26.79	26.73
5170.1	26.56	25.34	24.95	14.75	14.87	15.04	5140.1	5170.1	20.91	20.79	20.69
5330.1	26.45	25.60	24.92	14.64	15.24	15.45	5300.1	5330.1	18.57	18.56	18.47
5510.1	26.16	24.99	24.33	15.46	15.94	16.32	5480.1	5510.1	17.34	17.32	17.22
5670.1	25.39	24.22	23.45	16.17	16.80	17.27	5640.1	5670.1	16.84	16.89	16.74
5850.1	24.53	23.42	22.67	17.19	18.06	18.77	5820.1	5850.1	16.75	16.77	16.69
6010.1	23.50	22.64	21.80	18.21	19.41	20.43	5980.1	6010.1	16.89	16.99	16.85
6190.1	22.37	21.87	21.04	19.73	21.42	22.87	6160.1	6190.1	17.21	17.09	16.90
6350.1	21.69	21.37	20.23	22.14	24.20	26.04	6320.1	6350.1	17.91	17.62	17.43
6530.1	21.03	21.01	20.34	25.51	28.18	31.20	6500.1	6530.1	20.68	20.56	20.33
6690.1	20.53	20.78	20.38	28.26	30.92	34.12	6660.1	6690.1	23.45	23.83	23.89
6870.1	20.29	20.90	20.68	27.89	29.05	30.44	6840.1	6870.1	27.26	27.88	27.95
7030.1	20.17	20.68	20.96	24.67	24.09	24.56	7000.1	7030.1	34.25	33.83	32.60
7210.1	20.43	21.09	21.40	21.00	20.00	20.32	7180.1	7210.1	34.39	31.20	29.78
7370.1	21.23	21.76	21.77	18.61	17.35	17.21	7340.1	7370.1	27.95	27.81	26.05
7550.1	22.33	22.72	22.94	15.98	15.04	15.00	7520.1	7550.1	24.24	25.59	27.03
7710.1	23.53	23.82	24.04	13.74	13.16	13.51	7680.1	7710.1	21.74	22.32	22.77
7890.1	24.59	24.84	24.93	11.48	11.05	11.12	7860.1	7890.1	19.69	20.35	20.99
8050.1	25.30	25.61	25.32	9.47	9.37	8.99	8020.1	8050.1	18.02	18.57	19.40
8230.1	24.50	24.42	24.70	7.34	7.17	7.39	8200.1	8230.1	16.67	17.00	18.86

Frequency Mixer

SIM-722MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=7200MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
1500.1	1530.1	3.79	2.53	1.12	1530.1	32.79	30.49	13.49	10.0	1.72	1.14	1.38
1680.1	1710.1	4.48	2.32	1.57	1710.1	25.19	18.70	10.82	89.8	1.73	1.19	1.45
1860.1	1890.1	3.30	2.17	1.89	1890.1	15.53	7.22	6.49	169.5	1.84	1.26	1.46
2040.1	2070.1	2.84	2.49	2.32	2070.1	4.72	4.33	5.06	269.3	2.00	1.35	1.51
2220.1	2250.1	3.03	2.84	2.73	2250.1	2.72	3.28	4.25	349.0	2.21	1.46	1.55
2400.1	2430.1	3.30	3.13	3.02	2430.1	1.98	2.73	3.70	448.8	2.45	1.59	1.61
2580.1	2610.1	3.43	3.22	3.13	2610.1	1.65	2.38	3.26	528.5	2.72	1.72	1.67
2760.1	2790.1	3.56	3.37	3.17	2790.1	1.50	2.17	2.96	628.2	2.96	1.89	1.79
2920.1	2950.1	3.56	3.36	3.22	2950.1	1.43	2.06	2.80	708.0	3.21	2.01	1.86
3100.1	3130.1	3.59	3.40	3.20	3130.1	1.46	2.11	2.88	807.7	3.47	2.15	1.97
3260.1	3290.1	3.56	3.31	3.15	3290.1	1.52	2.20	3.02	887.5	3.59	2.21	2.00
3440.1	3470.1	3.16	2.88	2.75	3470.1	1.54	2.22	3.05	987.2	3.97	2.37	2.11
3600.1	3630.1	2.89	2.75	2.63	3630.1	1.62	2.29	3.11	1067.0	4.16	2.44	2.14
3780.1	3810.1	2.95	2.77	2.64	3810.1	2.01	2.59	3.42	1166.7	4.53	2.52	2.18
3940.1	3970.1	3.13	2.84	2.69	3970.1	2.43	2.90	3.70	1246.5	4.66	2.62	2.24
4120.1	4150.1	3.50	3.02	2.72	4150.1	2.93	3.26	3.87	1346.2	4.68	2.57	2.17
4280.1	4310.1	3.86	3.40	3.09	4310.1	3.46	3.63	4.16	1426.0	5.20	2.80	2.35
4460.1	4490.1	3.91	3.43	3.02	4490.1	4.02	4.03	4.50	1525.7	5.38	2.86	2.37
4620.1	4650.1	3.77	3.22	2.86	4650.1	4.68	4.36	4.67	1605.5	5.68	2.91	2.39
4800.1	4830.1	4.25	3.72	3.27	4830.1	5.36	4.54	4.59	1705.2	5.63	2.88	2.36
4960.1	4990.1	4.11	3.59	3.20	4990.1	5.95	4.67	4.59	1785.0	5.65	2.89	2.35
5140.1	5170.1	3.98	3.45	3.04	5170.1	6.97	5.16	4.88	1884.7	5.75	2.87	2.34
5300.1	5330.1	4.26	3.68	3.32	5330.1	7.56	4.99	4.60	1964.5	5.68	2.84	2.32
5480.1	5510.1	4.09	3.54	3.27	5510.1	7.60	4.84	4.31	2064.2	5.42	2.77	2.29
5640.1	5670.1	3.71	3.24	3.04	5670.1	7.41	4.66	4.09	2143.9	5.06	2.64	2.20
5820.1	5850.1	4.02	3.35	3.16	5850.1	6.86	4.06	3.50	2243.7	4.59	2.49	2.11
5980.1	6010.1	4.31	3.41	3.19	6010.1	6.09	3.48	2.91	2323.4	4.14	2.36	2.03
6160.1	6190.1	3.98	3.40	3.19	6190.1	5.07	2.95	2.48	2423.2	3.61	2.21	1.96
6320.1	6350.1	3.78	3.37	3.17	6350.1	3.95	2.53	2.27	2502.9	3.26	2.13	1.93
6500.1	6530.1	3.67	3.30	3.10	6530.1	3.34	2.29	2.17	2602.6	2.82	2.03	1.91
6660.1	6690.1	3.95	3.50	3.31	6690.1	3.24	2.29	2.21	2682.4	2.55	2.00	1.95
6840.1	6870.1	4.22	3.64	3.43	6870.1	3.62	2.57	2.41	2782.1	2.19	1.97	2.01
7000.1	7030.1	4.68	3.80	3.55	7030.1	4.56	3.27	3.00	2861.9	1.89	1.92	2.05
7180.1	7210.1	5.38	4.24	3.81	7210.1	5.70	4.05	3.56	2961.6	1.61	2.00	2.25
7340.1	7370.1	6.39	4.61	3.97	7370.1	6.63	4.87	3.99	3041.4	1.43	2.11	2.45
7520.1	7550.1	7.44	5.25	4.52	7550.1	7.56	5.91	4.64	3141.1	1.37	2.31	2.77
7680.1	7710.1	8.35	5.77	5.00	7710.1	7.66	6.30	4.98	3220.9	1.52	2.57	3.10
7860.1	7890.1	8.77	6.03	5.17	7890.1	7.38	6.61	5.36	3320.6	1.83	2.92	3.52
8020.1	8050.1	9.13	6.58	5.31	8050.1	6.51	6.13	5.27	3400.4	2.21	3.19	3.81
8200.1	8230.1	9.23	7.38	5.04	8230.1	5.30	5.13	4.78	3500.1	2.88	3.66	4.29

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+8	13	27	41	28	---	---	---	---	---
1	-	24	+0	51	16	39	53	53	---	---	---	---
2	75	58	63	58	60	60	61	76	65	---	---	---
3	>90	66	57	>77	66	>77	70	>77	>77	>77	---	---
4	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	---	---
5	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	---
6	---	---	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
7	---	---	---	>77	>77	>77	>77	>77	>77	>77	>77	>77
8	---	---	---	---	>77	>77	>77	>77	>77	>77	>77	>77
9	---	---	---	---	---	>77	>77	>77	>77	>77	>77	>77
10	---	---	---	---	---	---	>77	>77	>77	>77	>77	>77
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

Test conditions: RF IN: 4750 MHz; -6.00 dBm.
 LO IN: 4780 MHz; +13.00 dBm
 IF OUT: 30 MHz; -13.25 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	2	24	40	54	41	---	---	---	---	---
1	-	24	+0	54	17	42	56	54	---	---	---	---
2	55	45	52	49	51	55	52	68	59	---	---	---
3	79	45	36	61	53	68	56	59	67	72	---	---
4	>90	83	77	69	77	60	73	63	74	85	---	---
5	>90	82	84	>87	66	83	62	>87	66	85	83	---
6	---	---	>87	>87	>87	85	>87	82	>87	>87	>87	>87
7	---	---	---	>87	>87	>87	86	>87	>87	>87	>87	>87
8	---	---	---	---	>87	>87	>87	>87	>87	>87	>87	>87
9	---	---	---	---	---	>87	>87	>87	>87	>87	>87	>87
10	---	---	---	---	---	---	>87	>87	>87	>87	>87	>87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

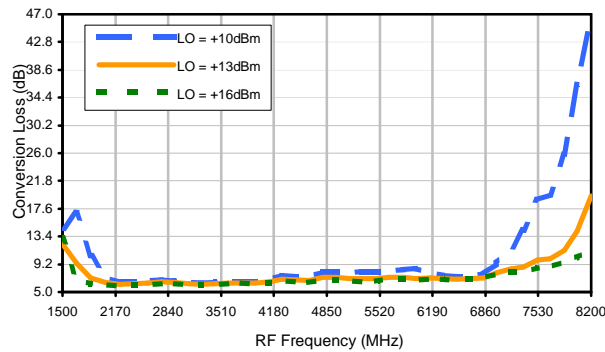
LO HARMONICS ORDER

Test conditions: RF IN: 4750 MHz; 4.00 dBm.
 LO IN: 4780 MHz; +13.00 dBm
 IF OUT: 30 MHz; -3.29 dBm

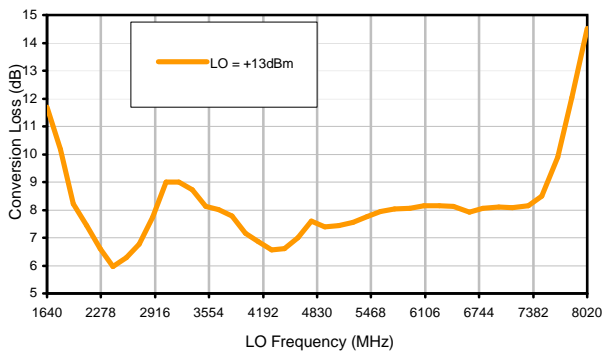
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

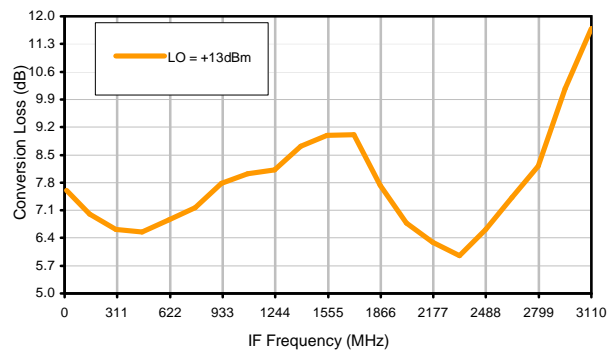
Conversion Loss @ IF=30MHz



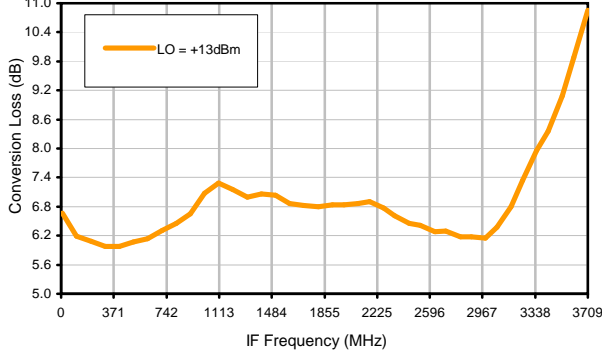
Conversion Loss vs. LO @ RF=4750.1001MHz



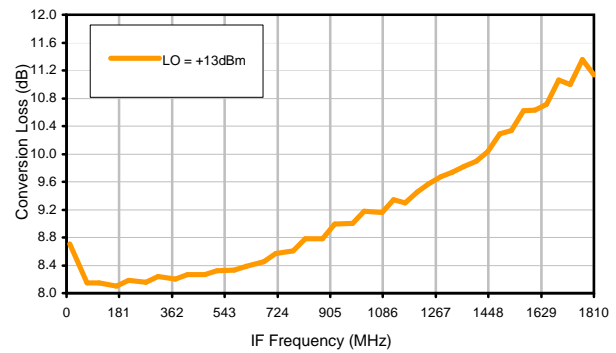
Conversion Loss vs. IF @ RF=4750.1001MHz



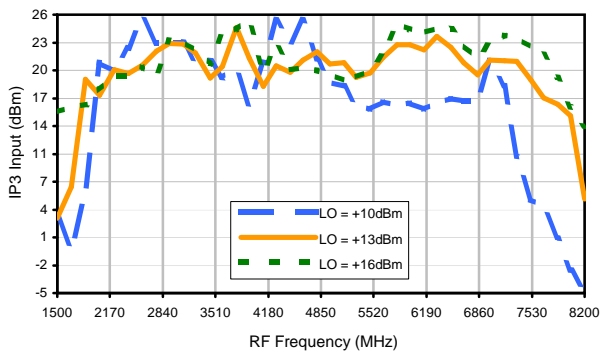
Conversion Loss vs. IF @ RF=2290.1001MHz



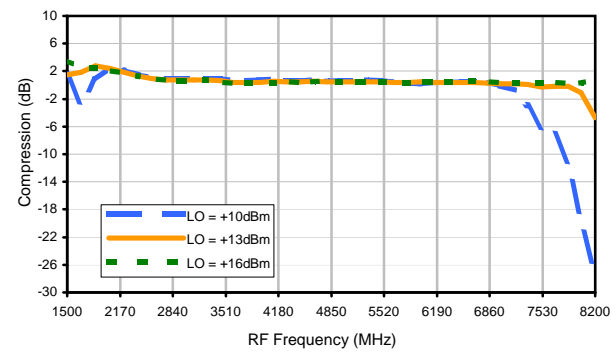
Conversion Loss vs. IF @ RF=7210.1001MHz



IP3 Input

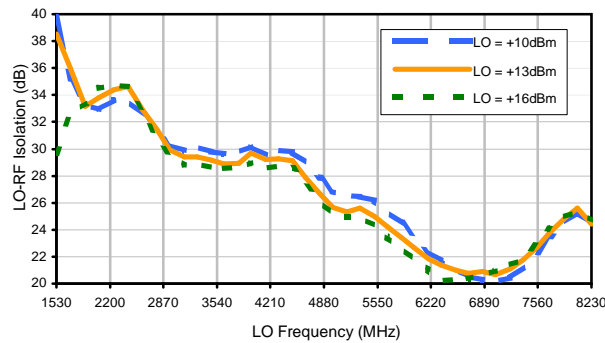


Compression @ RF IN=+9dBm

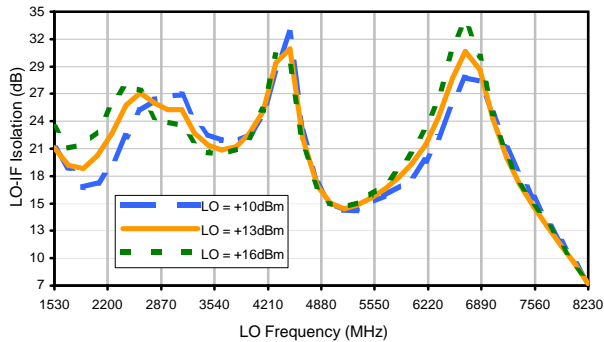


Typical Performance Curves

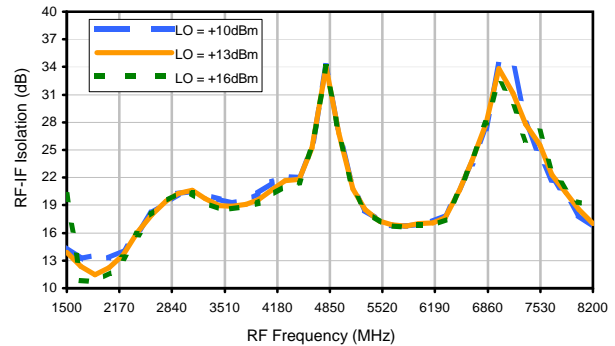
LO-RF Isolation



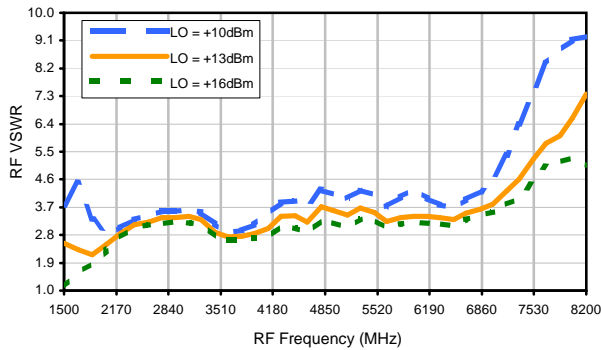
LO-IF Isolation



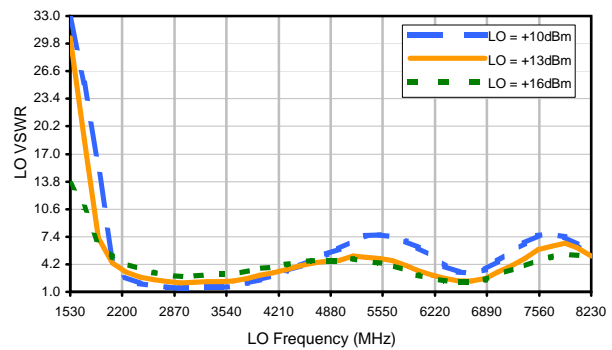
RF-IF Isolation



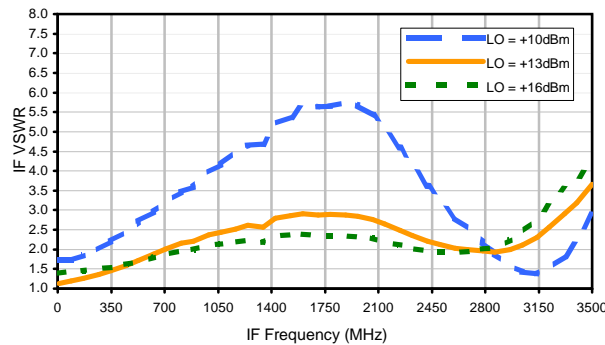
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+8	13	27	41	28	---	---	---	---	---
1	-	24	+0	51	16	39	53	53	---	---	---	---
2	75	58	63	58	60	60	61	76	65	---	---	---
3	>90	66	57	>77	66	>77	70	>77	>77	>77	---	---
4	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	---	---
5	>90	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77	---
6	---	---	>77	>77	>77	>77	>77	>77	>77	>77	>77	>77
7	---	---	---	>77	>77	>77	>77	>77	>77	>77	>77	>77
8	---	---	---	---	>77	>77	>77	>77	>77	>77	>77	>77
9	---	---	---	---	---	>77	>77	>77	>77	>77	>77	>77
10	---	---	---	---	---	---	>77	>77	>77	>77	>77	>77
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

Test conditions: RF IN: 4750 MHz; -6.00 dBm.
 LO IN: 4780 MHz; +13.00 dBm
 IF OUT: 30 MHz; -13.25 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	2	24	40	54	41	---	---	---	---	---
1	-	24	+0	54	17	42	56	54	---	---	---	---
2	55	45	52	49	51	55	52	68	59	---	---	---
3	79	45	36	61	53	68	56	59	67	72	---	---
4	>90	83	77	69	77	60	73	63	74	85	---	---
5	>90	82	84	>87	66	83	62	>87	66	85	83	---
6	---	---	>87	>87	>87	85	>87	82	>87	>87	>87	>87
7	---	---	---	>87	>87	>87	86	>87	>87	>87	>87	>87
8	---	---	---	---	>87	>87	>87	>87	>87	>87	>87	>87
9	---	---	---	---	---	>87	>87	>87	>87	>87	>87	>87
10	---	---	---	---	---	---	>87	>87	>87	>87	>87	>87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

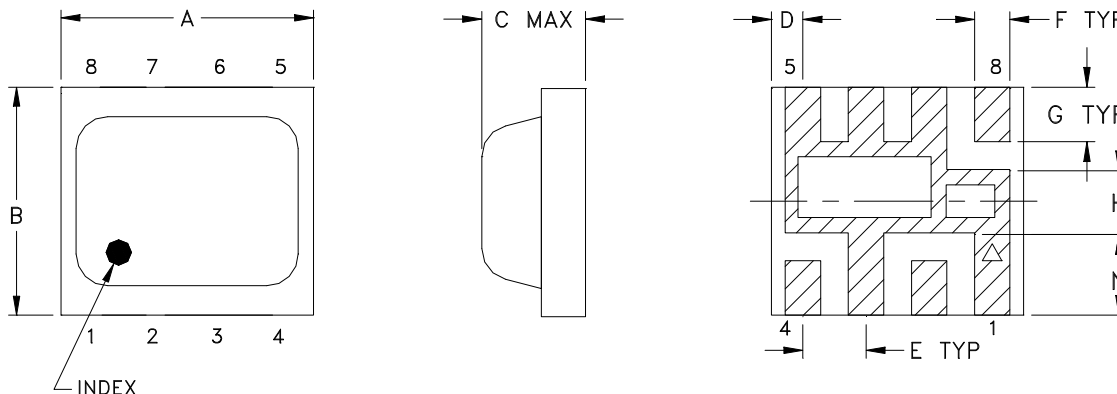
LO HARMONICS ORDER

Test conditions: RF IN: 4750 MHz; 4.00 dBm.
 LO IN: 4780 MHz; +13.00 dBm
 IF OUT: 30 MHz; -3.29 dBm

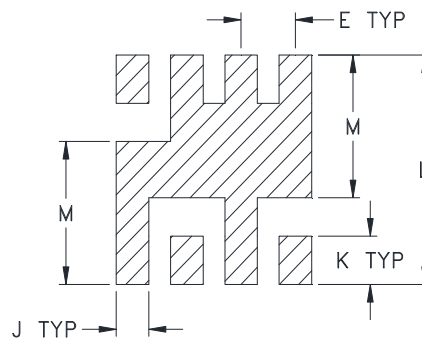
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Outline Dimensions

HV1195



PCB Metal Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
HV1195	0.200 (5.08)	0.180 (4.57)	0.087 (2.21)	0.025 (0.64)	0.050 (1.27)	0.028 (0.71)	0.043 (1.09)	0.050 (1.27)	0.030 (0.76)	0.043 (1.09)	0.204 (5.18)	0.127 (3.23)	0.065 (1.65)

CASE#	WT, GRAM
HV1195	.08

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

1. Case material: Plastic encapsulation on Ceramic base.
2. Termination finish: Palladium Silver.



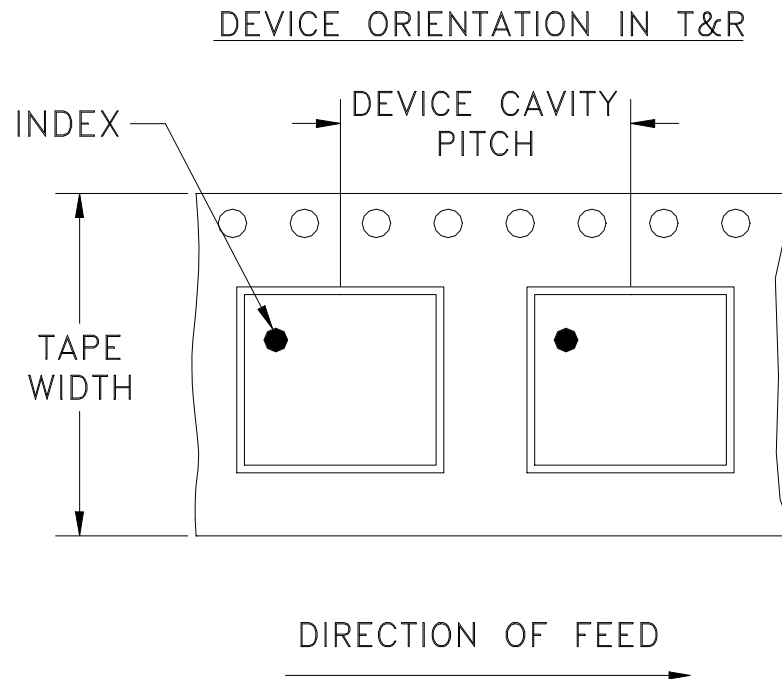
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F82



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
12	8	7	500

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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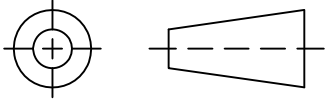
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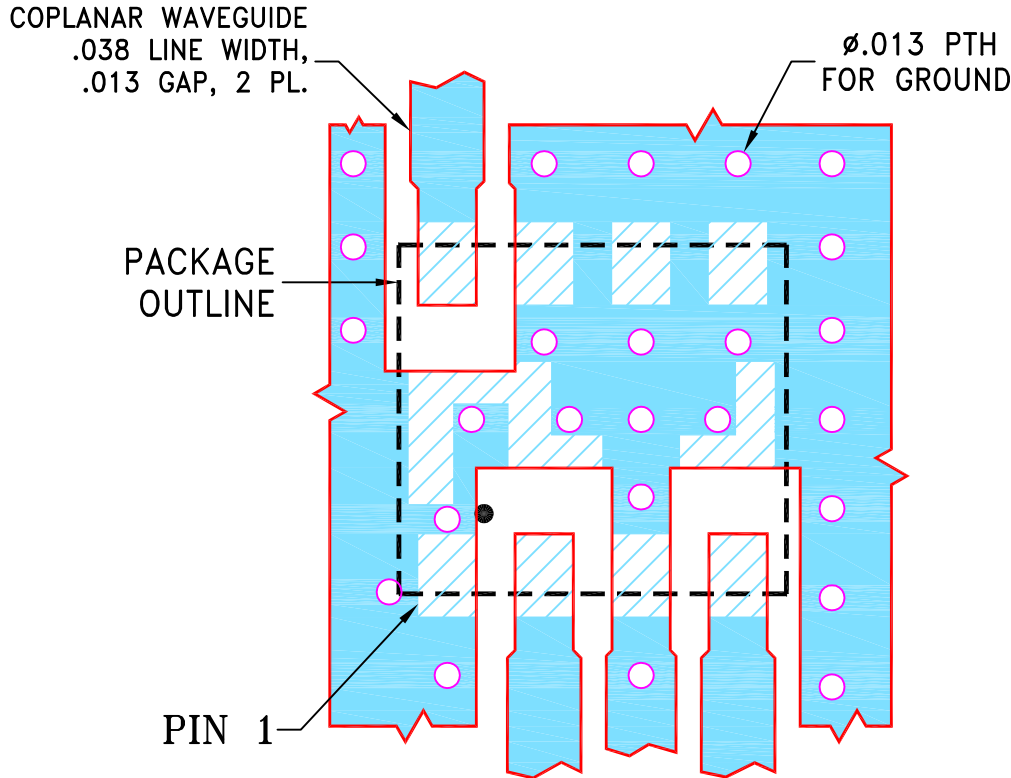
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M104559	NEW RELEASE	04/11/06	MMG	DJ
A	M109513	MODIFIED SMOBC AREA, REMOVED NOTE 3	01/31/07	PW	DJ
B	M176274	MODIFIED CASE STYLE	09/23/19	ITG	RB

SUGGESTED MOUNTING CONFIGURATION FOR HV1195 CASE STYLE, "rh" PIN CONNECTION



NOTES:

1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.020" \pm .0015"$; COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	MMG 04/10/06
	CHECKED	IL 04/11/06
	APPROVED	DJ 04/11/06

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PL, rh, HV1195, SIM, TB-382

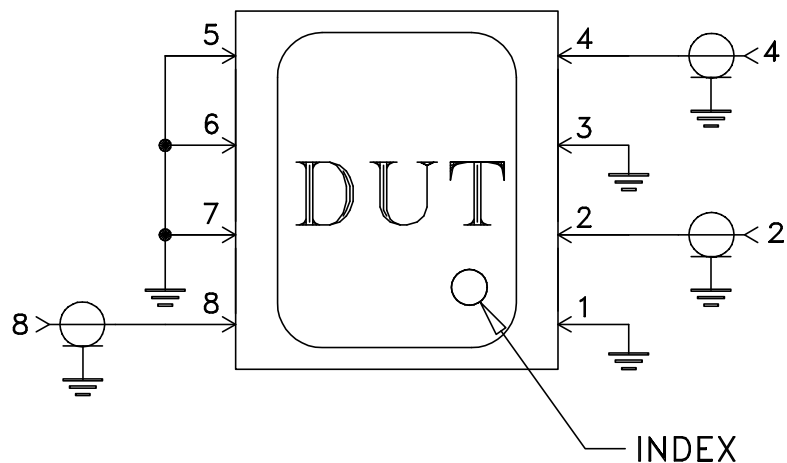
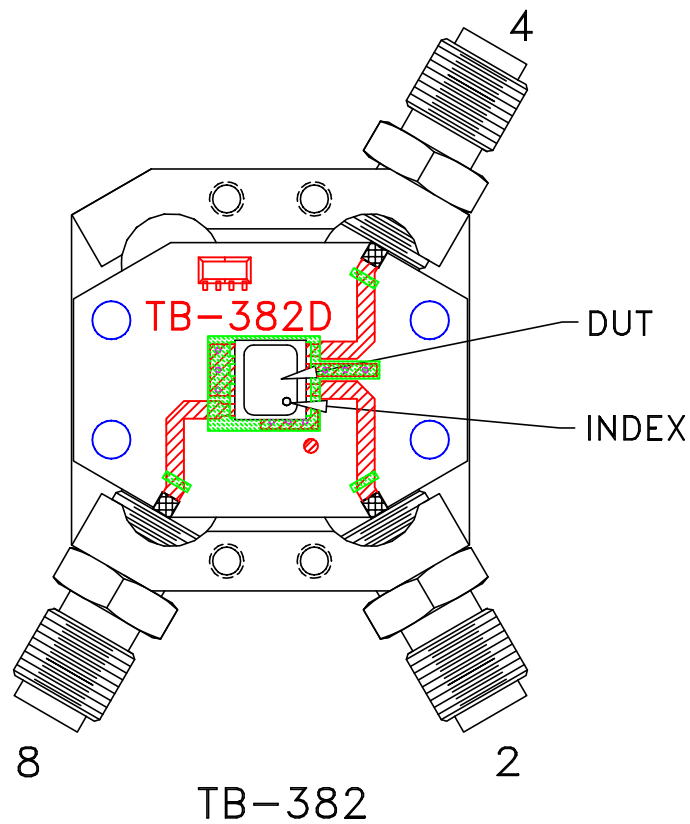
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ASHEETA1.DWG REV:A DATE:01/12/95

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-239	REV: B
FILE: 98PL239	SCALE: 10:1	SHEET: 1 OF 1	

Evaluation Board and Circuit


For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

Notes:

1. 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	-40° to 85° C Case Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
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: 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 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