

## Non-Catalog Model

# Frequency Mixer

# RMS-5LH

Level 10 (LO Power +10 dBm)

### Important Note

This is a non-catalog model and can be manufactured on specific request. Pricing and delivery information can be supplied upon request.



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**CASE STYLE : TT240**

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (fL to fU)	10		1500	MHz
	RF (fL to fU)	10		1500	MHz
	IF	0		900	MHz
Conversion Loss	mid band		5.3	8.0	dB
	Total Range			9.8	dB
LO-RF Isolation	Low Range	35	58		dB
	Mid Range	20	38		dB
	Upper Range	18	25		dB
LO-IF Isolation	Low Range	30	56		dB
	Mid Range	14	38		dB
	Upper Range	6	17		dB
1 dB Comp. Input Power			+5		dBm

Notes: Low Range = [fL to 10fL]  
mid band = [2fL to fU/2]

Mid Range = [10fL to fU/2]

Upper Range = [fU/2 to fU]

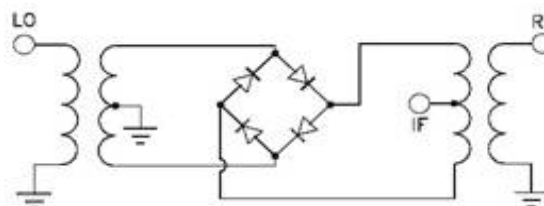
Phase detection, positive polarity.

Units are non-hermetic.

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

PIN CONNECTIONS	
LO	1
RF	4
IF	5
GROUND	2, 3, 6

### Electrical Schematics



# Frequency Mixer

# RMS-5LH

## 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=+5dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+7	+10	+13			+7	+10	+13			+7	+10	+13
10.1	40.1	6.38	5.85	5.73	10.1	40.1	19.72	23.99	24.11	10.1	40.1	0.70	0.63	0.38
70.4	100.4	6.02	5.55	5.32	70.4	100.4	21.21	24.99	25.04	70.4	100.4	1.10	0.72	0.53
130.7	160.7	5.90	5.45	5.27	130.7	160.7	22.35	21.38	21.56	130.7	160.7	1.12	0.81	0.58
190.9	220.9	5.89	5.48	5.32	190.9	220.9	19.90	20.50	22.06	190.9	220.9	1.18	0.82	0.58
251.2	281.2	5.96	5.59	5.40	251.2	281.2	18.60	20.31	23.15	251.2	281.2	1.13	0.82	0.60
311.5	341.5	6.06	5.63	5.43	311.5	341.5	18.27	19.56	22.99	311.5	341.5	1.18	0.88	0.65
371.8	401.8	6.11	5.71	5.53	371.8	401.8	19.26	21.53	24.82	371.8	401.8	1.22	0.91	0.71
432.0	462.0	6.18	5.76	5.55	432.0	462.0	19.62	21.85	28.97	432.0	462.0	1.35	1.06	0.86
492.3	522.3	6.29	5.83	5.57	492.3	522.3	19.13	23.82	25.84	492.3	522.3	1.43	1.13	0.94
552.6	582.6	6.35	5.93	5.63	552.6	582.6	21.61	24.53	24.49	552.6	582.6	1.62	1.28	1.09
612.9	642.9	6.37	5.91	5.70	612.9	642.9	20.84	29.61	28.99	612.9	642.9	1.79	1.43	1.18
673.1	703.1	6.44	5.91	5.61	673.1	703.1	24.25	25.82	25.95	673.1	703.1	1.87	1.56	1.28
733.4	763.4	6.68	6.00	5.65	733.4	763.4	20.11	25.38	31.16	733.4	763.4	1.83	1.62	1.36
793.7	823.7	6.93	6.22	5.78	793.7	823.7	19.50	22.22	32.11	793.7	823.7	1.78	1.61	1.41
854.0	884.0	7.23	6.51	6.04	854.0	884.0	20.32	27.11	28.72	854.0	884.0	1.67	1.47	1.34
914.2	944.2	7.37	6.70	6.24	914.2	944.2	23.94	31.65	25.10	914.2	944.2	1.64	1.43	1.28
974.5	1004.5	7.39	6.74	6.30	974.5	1004.5	22.14	24.57	23.78	974.5	1004.5	1.70	1.47	1.24
1034.8	1064.8	7.48	6.85	6.48	1034.8	1064.8	20.97	23.69	27.78	1034.8	1064.8	1.51	1.34	1.13
1095.1	1125.1	7.63	7.05	6.71	1095.1	1125.1	19.55	22.71	25.32	1095.1	1125.1	1.29	1.11	0.94
1155.3	1185.3	7.70	7.24	6.97	1155.3	1185.3	18.87	20.63	22.18	1155.3	1185.3	1.12	0.92	0.77
1215.6	1245.6	7.69	7.32	7.11	1215.6	1245.6	19.02	20.75	31.44	1215.6	1245.6	0.98	0.79	0.66
1275.9	1305.9	7.77	7.45	7.30	1275.9	1305.9	18.36	22.63	27.79	1275.9	1305.9	0.90	0.69	0.57
1336.2	1366.2	7.94	7.71	7.59	1336.2	1366.2	18.00	21.31	23.75	1336.2	1366.2	0.81	0.55	0.46
1396.4	1426.4	8.14	7.86	7.78	1396.4	1426.4	19.81	20.51	25.22	1396.4	1426.4	0.80	0.53	0.45
1436.6	1466.6	8.21	7.94	7.88	1436.6	1466.6	20.22	20.05	24.58	1436.6	1466.6	0.85	0.57	0.48
1496.9	1526.9	8.35	8.06	8.01	1496.9	1526.9	20.01	19.73	21.79	1496.9	1526.9	0.93	0.64	0.54
1537.1	1567.1	8.48	8.20	8.12	1537.1	1567.1	20.55	19.13	21.33	1537.1	1567.1	1.06	0.72	0.61
1597.3	1627.3	8.74	8.38	8.22	1597.3	1627.3	20.97	18.93	20.69	1597.3	1627.3	1.14	0.85	0.76
1637.5	1667.5	8.92	8.51	8.35	1637.5	1667.5	19.19	20.28	19.86	1637.5	1667.5	1.18	0.89	0.78
1697.8	1727.8	9.41	8.84	8.59	1697.8	1727.8	18.69	21.52	20.29	1697.8	1727.8	1.20	0.89	0.81
1738.0	1768.0	9.54	8.90	8.61	1738.0	1768.0	19.06	20.87	19.47	1738.0	1768.0	1.22	0.90	0.82
1798.3	1828.3	9.90	9.07	8.67	1798.3	1828.3	18.24	22.08	20.80	1798.3	1828.3	1.25	0.86	0.79
1838.4	1868.4	10.10	9.16	8.75	1838.4	1868.4	18.69	28.33	21.84	1838.4	1868.4	1.24	0.86	0.77
1898.7	1928.7	10.36	9.15	8.74	1898.7	1928.7	18.04	23.50	22.93	1898.7	1928.7	1.31	0.88	0.74
1938.9	1968.9	10.48	9.20	8.75	1938.9	1968.9	18.61	23.29	26.57	1938.9	1968.9	1.31	0.90	0.69
1999.2	2029.2	10.74	9.24	8.76	1999.2	2029.2	19.21	21.50	23.11	1999.2	2029.2	1.16	0.85	0.62
2039.4	2069.4	11.07	9.44	8.89	2039.4	2069.4	22.24	24.62	26.00	2039.4	2069.4	1.02	0.82	0.59
2099.6	2129.6	11.35	9.64	9.00	2099.6	2129.6	25.26	23.80	26.97	2099.6	2129.6	0.73	0.69	0.51
2139.8	2169.8	11.90	9.83	9.15	2139.8	2169.8	19.43	24.65	24.00	2139.8	2169.8	0.51	0.65	0.47
2200.1	2230.1	12.36	10.03	9.24	2200.1	2230.1	18.40	23.88	22.77	2200.1	2230.1	0.38	0.62	0.45



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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)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
730.0	20.1	6.51	10.0	20.1	6.19	900.0	600.1	9.39
711.5	38.6	6.50	29.8	39.9	6.01	879.3	620.8	9.32
693.1	57.0	6.44	49.6	59.7	6.17	858.6	641.5	9.26
674.6	75.5	6.53	69.3	79.4	6.13	837.9	662.2	9.22
656.2	93.9	6.45	89.1	99.2	6.11	817.2	682.9	9.10
637.7	112.4	6.45	108.9	119.0	6.12	796.5	703.6	9.09
619.2	130.9	6.40	128.7	138.8	6.09	775.8	724.3	9.00
600.8	149.3	6.43	148.4	158.5	6.10	755.1	745.0	9.00
582.3	167.8	6.42	168.2	178.3	6.05	734.4	765.7	8.75
563.8	186.3	6.43	188.0	198.1	6.08	713.7	786.4	8.74
545.4	204.7	6.40	207.8	217.9	6.04	693.0	807.1	8.70
526.9	223.2	6.39	227.6	237.7	6.03	672.3	827.8	8.57
508.5	241.6	6.38	247.3	257.4	6.08	651.6	848.5	8.55
490.0	260.1	6.39	267.1	277.2	6.10	630.9	869.2	8.51
471.5	278.6	6.39	286.9	297.0	6.09	610.2	889.9	8.40
453.1	297.0	6.37	306.7	316.8	6.08	589.5	910.6	8.38
434.6	315.5	6.35	326.4	336.5	6.15	568.8	931.3	8.30
416.2	333.9	6.32	346.2	356.3	6.13	548.1	952.0	8.26
397.7	352.4	6.32	366.0	376.1	6.19	527.4	972.7	8.23
379.2	370.9	6.22	385.8	395.9	6.19	506.7	993.4	8.15
360.8	389.3	6.25	405.6	415.7	6.17	486.0	1014.1	8.11
342.3	407.8	6.22	425.3	435.4	6.23	465.3	1034.8	8.05
323.8	426.3	6.24	445.1	455.2	6.23	444.7	1055.4	8.00
305.4	444.7	6.25	464.9	475.0	6.30	424.0	1076.1	7.95
286.9	463.2	6.29	484.7	494.8	6.27	403.3	1096.8	7.90
268.5	481.6	6.24	504.4	514.5	6.29	382.6	1117.5	7.84
250.0	500.1	6.25	524.2	534.3	6.32	361.9	1138.2	7.80
231.5	518.6	6.20	544.0	554.1	6.33	341.2	1158.9	7.78
213.1	537.0	6.22	583.6	593.7	6.36	320.5	1179.6	7.79
194.6	555.5	6.21	603.3	613.4	6.41	299.8	1200.3	7.77
176.2	573.9	6.20	642.9	653.0	6.45	279.1	1221.0	7.75
157.7	592.4	6.17	662.7	672.8	6.48	258.4	1241.7	7.82
139.2	610.9	6.14	702.2	712.3	6.53	217.0	1283.1	7.92
120.8	629.3	6.13	722.0	732.1	6.61	196.3	1303.8	7.84
102.3	647.8	6.09	761.6	771.7	6.76	154.9	1345.2	7.90
83.8	666.3	6.11	781.3	791.4	6.86	134.2	1365.9	7.98
65.4	684.7	6.02	820.9	831.0	6.96	92.8	1407.3	7.97
46.9	703.2	6.05	840.7	850.8	7.05	72.1	1428.0	8.03
28.5	721.6	5.99	880.2	890.3	7.18	30.7	1469.4	8.12
10.0	740.1	6.19	900.0	910.1	7.18	10.0	1490.1	8.07

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# RMS-5LH

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13
10.1	75.50	72.40	70.01	53.13	56.51	57.54
70.4	72.34	64.44	59.93	36.89	39.91	43.34
130.7	72.44	61.87	55.43	31.88	35.51	39.61
190.9	64.02	60.33	53.12	29.06	32.66	36.22
251.2	59.25	57.72	51.58	27.15	30.81	34.23
311.5	55.85	54.55	49.14	25.93	29.49	32.80
371.8	52.03	51.70	47.70	24.64	28.01	31.08
432.0	48.79	49.25	46.50	23.58	27.05	30.00
492.3	46.95	46.55	43.99	23.23	26.56	29.13
552.6	44.48	44.37	42.59	22.76	26.31	28.47
612.9	42.61	43.00	41.69	22.25	25.66	27.31
673.1	40.52	41.55	40.43	21.74	24.84	25.70
733.4	38.71	40.30	40.09	21.30	23.80	23.63
793.7	37.46	38.74	38.85	21.27	22.87	22.27
854.0	36.28	37.76	37.92	21.15	21.69	20.67
914.2	35.13	37.19	37.84	20.32	19.92	18.67
974.5	33.75	35.97	37.20	19.16	18.12	16.75
1034.8	32.60	34.76	36.16	17.77	16.33	15.01
1095.1	31.51	33.56	35.08	16.67	15.14	13.79
1155.3	30.40	32.35	33.84	15.83	14.13	12.75
1215.6	29.13	30.85	32.31	15.06	13.18	11.81
1275.9	28.45	29.91	31.10	14.26	12.32	10.87
1336.2	28.06	29.40	30.46	13.18	11.34	9.98
1396.4	27.46	28.77	29.66	12.27	10.57	9.27
1436.6	27.03	28.28	29.25	11.62	9.93	8.80
1496.9	26.05	27.29	28.20	10.91	9.32	8.11
1537.1	25.55	26.73	27.79	10.39	8.91	7.88
1597.3	24.39	25.51	26.48	9.83	8.43	7.33
1637.5	23.71	24.80	25.72	9.27	7.95	6.91
1697.8	22.78	23.78	24.67	8.77	7.60	6.60
1738.0	22.40	23.32	24.20	8.43	7.21	6.45
1798.3	21.75	22.51	23.25	8.04	6.93	6.22
1838.4	21.46	22.37	23.06	7.76	6.80	6.11
1898.7	21.02	21.83	22.43	7.45	6.60	6.00
1938.9	20.77	21.63	22.09	7.29	6.52	5.84
1999.2	20.26	21.03	21.57	7.18	6.41	5.82
2039.4	20.10	20.87	21.33	7.01	6.38	5.72
2099.6	19.49	20.21	20.76	6.93	6.34	5.83
2139.8	19.52	20.11	20.59	6.86	6.31	5.88
2200.1	19.00	19.70	20.15	6.82	6.53	6.14

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	49.69	53.10	49.69
70.4	100.4	43.88	43.33	41.99
130.7	160.7	38.68	37.93	37.41
190.9	220.9	35.63	34.89	34.58
251.2	281.2	33.61	32.93	32.47
311.5	341.5	32.13	31.76	31.34
371.8	401.8	30.70	30.06	29.91
432.0	462.0	29.43	29.03	28.70
492.3	522.3	28.18	27.89	27.51
552.6	582.6	27.15	26.84	26.58
612.9	642.9	26.49	26.04	25.68
673.1	703.1	25.54	25.11	24.59
733.4	763.4	24.79	24.73	24.61
793.7	823.7	24.62	24.59	24.75
854.0	884.0	24.50	24.18	23.96
914.2	944.2	24.71	24.34	23.84
974.5	1004.5	24.66	24.16	23.63
1034.8	1064.8	23.98	23.71	23.33
1095.1	1125.1	23.38	23.44	23.26
1155.3	1185.3	22.43	23.04	23.40
1215.6	1245.6	21.43	22.26	22.95
1275.9	1305.9	20.82	21.76	22.53
1336.2	1366.2	20.83	21.72	22.42
1396.4	1426.4	20.57	21.35	21.86
1436.6	1466.6	20.57	21.20	21.51
1496.9	1526.9	19.97	20.44	20.68
1537.1	1567.1	19.51	19.98	20.25
1597.3	1627.3	18.61	19.09	19.40
1637.5	1667.5	18.13	18.65	19.12
1697.8	1727.8	17.69	18.25	18.81
1738.0	1768.0	17.33	17.80	18.25
1798.3	1828.3	17.34	17.75	18.01
1838.4	1868.4	17.26	17.65	17.89
1898.7	1928.7	17.22	17.52	17.82
1938.9	1968.9	17.47	17.79	18.10
1999.2	2029.2	17.62	17.85	18.19
2039.4	2069.4	18.21	18.28	18.56
2099.6	2129.6	18.85	18.77	18.99
2139.8	2169.8	19.31	19.05	19.09
2200.1	2230.1	20.42	20.16	19.98



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# RMS-5LH

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	1.75	1.69	1.66
70.4	100.4	1.26	1.14	1.11
130.7	160.7	1.20	1.07	1.03
190.9	220.9	1.20	1.07	1.03
251.2	281.2	1.19	1.10	1.07
311.5	341.5	1.22	1.14	1.11
371.8	401.8	1.25	1.18	1.15
432.0	462.0	1.29	1.23	1.20
492.3	522.3	1.35	1.29	1.26
552.6	582.6	1.44	1.38	1.35
612.9	642.9	1.56	1.49	1.45
673.1	703.1	1.68	1.60	1.55
733.4	763.4	1.87	1.75	1.68
793.7	823.7	2.09	1.95	1.85
854.0	884.0	2.34	2.20	2.08
914.2	944.2	2.57	2.43	2.33
974.5	1004.5	2.73	2.60	2.50
1034.8	1064.8	2.81	2.68	2.61
1095.1	1125.1	2.82	2.72	2.67
1155.3	1185.3	2.77	2.69	2.66
1215.6	1245.6	2.73	2.65	2.62
1275.9	1305.9	2.71	2.62	2.57
1336.2	1366.2	2.72	2.62	2.54
1396.4	1426.4	2.73	2.59	2.50
1436.6	1466.6	2.72	2.57	2.46
1496.9	1526.9	2.73	2.58	2.46
1537.1	1567.1	2.78	2.62	2.48
1597.3	1627.3	2.89	2.71	2.55
1637.5	1667.5	2.96	2.78	2.60
1697.8	1727.8	3.14	2.94	2.75
1738.0	1768.0	3.21	3.00	2.81
1798.3	1828.3	3.29	3.07	2.85
1838.4	1868.4	3.34	3.10	2.89
1898.7	1928.7	3.42	3.17	2.97
1938.9	1968.9	3.50	3.22	3.05
1999.2	2029.2	3.62	3.34	3.16
2039.4	2069.4	3.72	3.42	3.24
2099.6	2129.6	3.80	3.50	3.34
2139.8	2169.8	3.85	3.54	3.40
2200.1	2230.1	3.85	3.53	3.40

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+7	+10	+13
10.1	1.11	1.42	1.99
70.4	1.09	1.46	2.02
130.7	1.17	1.53	2.11
190.9	1.22	1.51	2.04
251.2	1.26	1.57	2.12
311.5	1.27	1.62	2.18
371.8	1.28	1.64	2.18
432.0	1.30	1.72	2.28
492.3	1.32	1.77	2.33
552.6	1.36	1.83	2.40
612.9	1.40	1.90	2.47
673.1	1.44	1.94	2.50
733.4	1.49	2.02	2.57
793.7	1.54	2.06	2.61
854.0	1.58	2.10	2.64
914.2	1.62	2.14	2.68
974.5	1.66	2.15	2.67
1034.8	1.69	2.16	2.65
1095.1	1.73	2.17	2.62
1155.3	1.79	2.22	2.62
1215.6	1.80	2.20	2.59
1275.9	1.82	2.20	2.55
1336.2	1.85	2.20	2.52
1396.4	1.85	2.16	2.44
1436.6	1.86	2.14	2.41
1496.9	1.83	2.09	2.33
1537.1	1.86	2.08	2.31
1597.3	1.84	2.03	2.22
1637.5	1.86	2.03	2.20
1697.8	1.86	1.98	2.14
1738.0	1.87	1.97	2.11
1798.3	1.88	1.95	2.05
1838.4	1.92	1.96	2.07
1898.7	1.97	1.97	2.07
1938.9	2.04	2.04	2.13
1999.2	2.14	2.09	2.16
2039.4	2.23	2.15	2.20
2099.6	2.36	2.24	2.20
2139.8	2.45	2.30	2.27
2200.1	2.62	2.40	2.34

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
	@LO (dBm)		
	+7	+10	+13
10.0	1.12	1.10	1.35
29.8	1.19	1.06	1.30
49.6	1.17	1.08	1.35
69.3	1.19	1.06	1.34
89.1	1.19	1.06	1.33
108.9	1.20	1.06	1.31
128.7	1.22	1.06	1.30
148.4	1.21	1.07	1.32
168.2	1.19	1.08	1.35
188.0	1.20	1.09	1.34
207.8	1.21	1.08	1.32
227.6	1.21	1.09	1.34
247.3	1.20	1.12	1.36
267.1	1.20	1.12	1.38
286.9	1.20	1.13	1.38
306.7	1.19	1.14	1.40
326.4	1.20	1.16	1.41
346.2	1.21	1.16	1.41
366.0	1.20	1.17	1.43
385.8	1.20	1.20	1.47
405.6	1.20	1.21	1.48
425.3	1.19	1.21	1.47
445.1	1.18	1.21	1.48
464.9	1.19	1.22	1.50
484.7	1.20	1.24	1.52
504.4	1.19	1.24	1.53
524.2	1.17	1.25	1.55
544.0	1.18	1.25	1.54
583.6	1.18	1.27	1.57
603.3	1.19	1.31	1.62
642.9	1.15	1.29	1.59
662.7	1.17	1.31	1.60
702.2	1.22	1.37	1.68
722.0	1.20	1.39	1.72
761.6	1.20	1.38	1.67
781.3	1.22	1.39	1.68
820.9	1.26	1.48	1.81
840.7	1.24	1.48	1.79
880.2	1.25	1.47	1.75
900.0	1.30	1.53	1.83

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	6	24	18	42	25	50	40	54	56	56
1	-	18	+0	41	19	48	43	54	51	59	56	60
2	81	42	25	49	25	53	40	63	45	61	54	64
3	>100	50	43	47	42	56	46	58	56	69	54	79
4	>100	64	56	52	51	49	43	63	55	64	67	66
5	>100	73	58	64	54	55	55	55	58	69	66	70
6	>100	78	72	75	70	69	52	61	54	65	64	70
7	>100	87	78	91	70	78	65	70	58	63	69	78
8	>100	>94	83	93	84	87	80	72	65	74	64	72
9	>100	89	>94	90	>94	85	86	84	84	69	68	81
10	>100	>94	>94	>94	>94	>94	90	85	>94	77	74	72
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 0.00 dBm.  
 LO IN: 780.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -6.17 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+3	14	7	28	12	34	29	40	38	38
1	-	18	+0	40	18	43	37	49	42	54	57	56
2	>100	53	34	53	32	57	46	64	52	63	60	66
3	>100	77	66	67	61	68	61	72	71	72	65	75
4	>100	>84	>84	84	67	76	66	81	83	>84	82	>84
5	>100	>84	>84	>84	>84	>84	77	>84	>84	>84	>84	>84
6	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
7	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
8	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
9	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
10	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -10.00 dBm.  
 LO IN: 780.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -16.12 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.

REV. X2  
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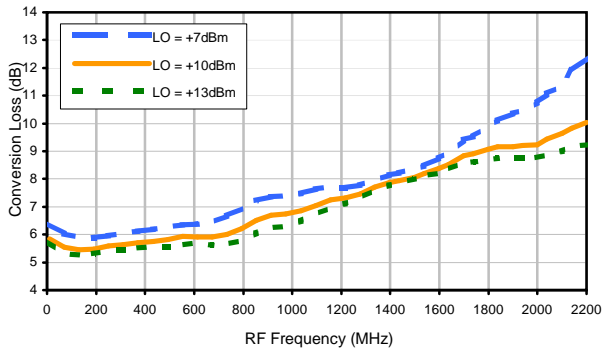


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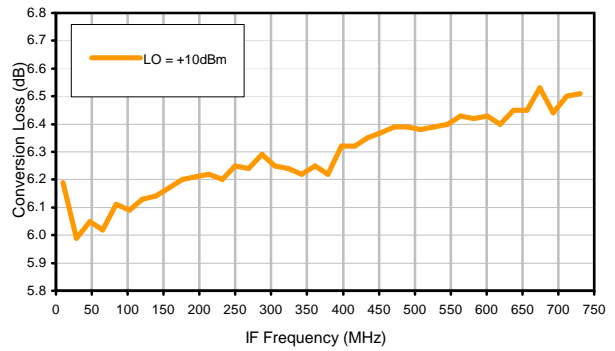


## Typical Performance Curves

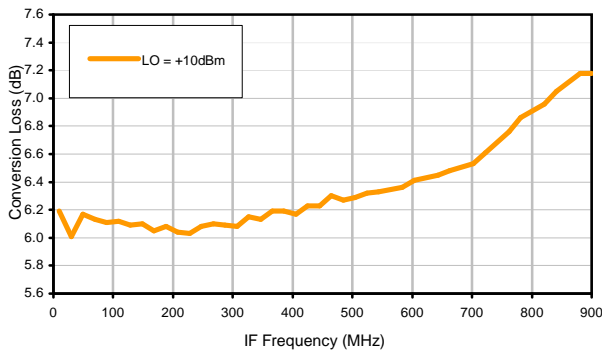
Conversion Loss @ IF=30MHz



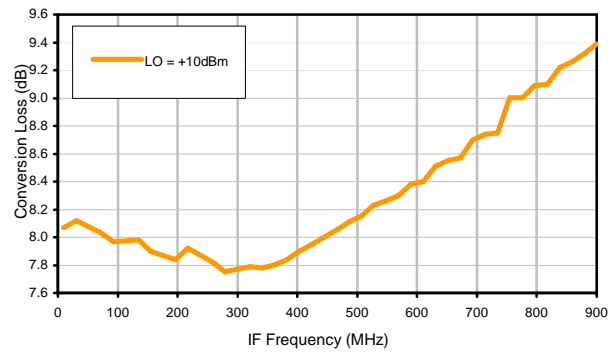
Conversion Loss vs. IF @ RF=750.1MHz



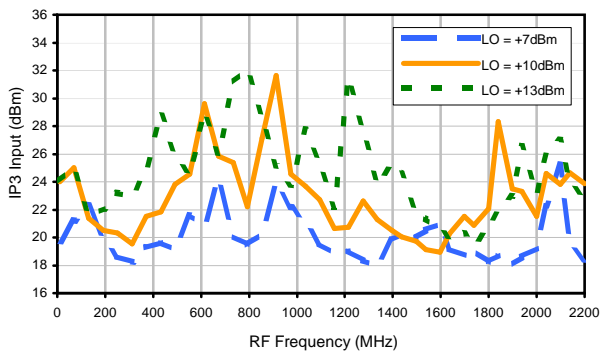
Conversion Loss vs. IF @ RF=10.1MHz



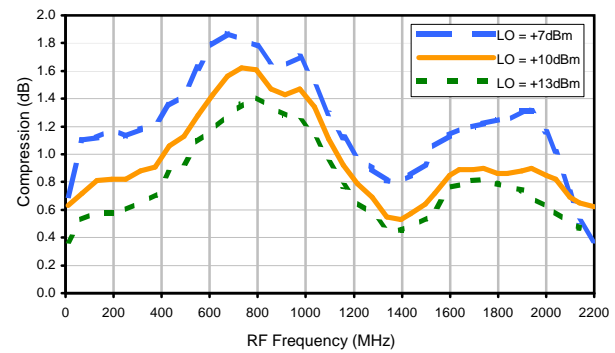
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input

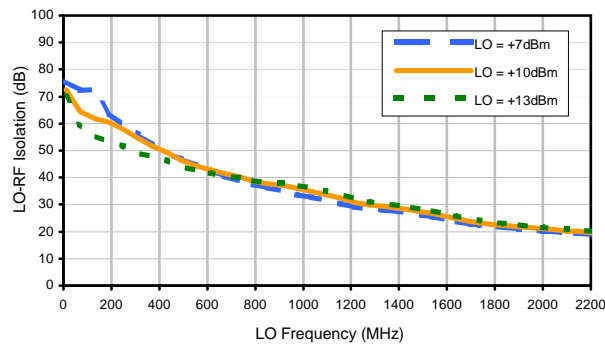


Compression @ RF IN=+5dBm

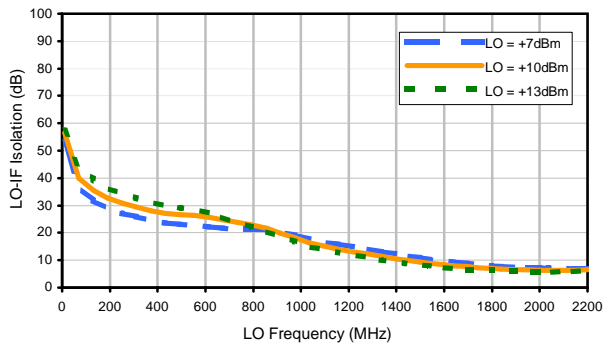


## Typical Performance Curves

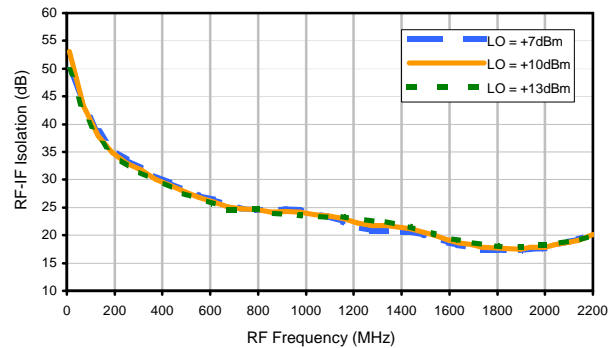
LO-RF Isolation



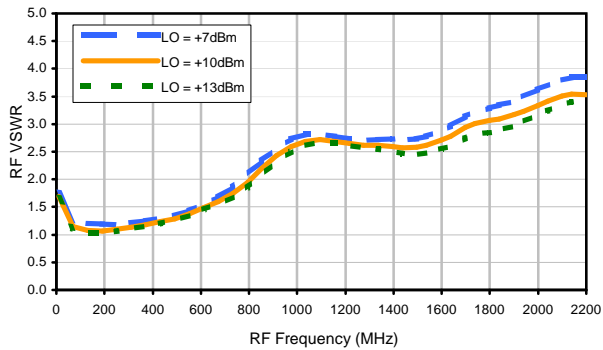
LO-IF Isolation



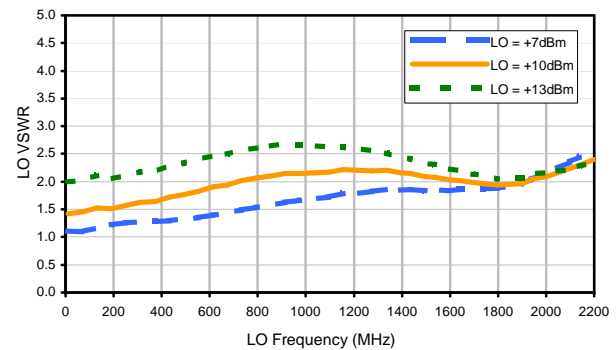
RF-IF Isolation



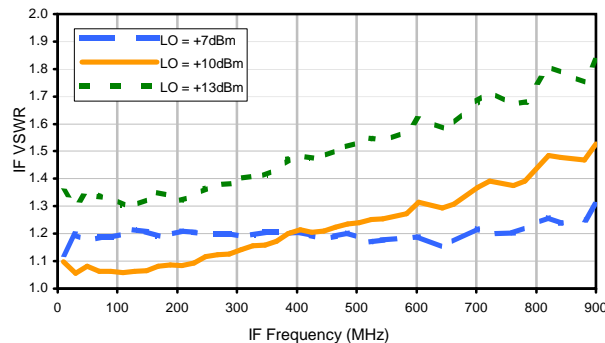
RF VSWR



LO VSWR



IF VSWR



## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	6	24	18	42	25	50	40	54	56	56
1	-	18	+0	41	19	48	43	54	51	59	56	60
2	81	42	25	49	25	53	40	63	45	61	54	64
3	>100	50	43	47	42	56	46	58	56	69	54	79
4	>100	64	56	52	51	49	43	63	55	64	67	66
5	>100	73	58	64	54	55	55	55	58	69	66	70
6	>100	78	72	75	70	69	52	61	54	65	64	70
7	>100	87	78	91	70	78	65	70	58	63	69	78
8	>100	>94	83	93	84	87	80	72	65	74	64	72
9	>100	89	>94	90	>94	85	86	84	84	69	68	81
10	>100	>94	>94	>94	>94	>94	90	85	>94	77	74	72
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 0.00 dBm.  
 LO IN: 780.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -6.17 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+3	14	7	28	12	34	29	40	38	38
1	-	18	+0	40	18	43	37	49	42	54	57	56
2	>100	53	34	53	32	57	46	64	52	63	60	66
3	>100	77	66	67	61	68	61	72	71	72	65	75
4	>100	>84	>84	84	67	76	66	81	83	>84	82	>84
5	>100	>84	>84	>84	>84	>84	77	>84	>84	>84	>84	>84
6	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
7	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
8	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
9	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
10	>100	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -10.00 dBm.  
 LO IN: 780.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -16.12 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.

REV. X2  
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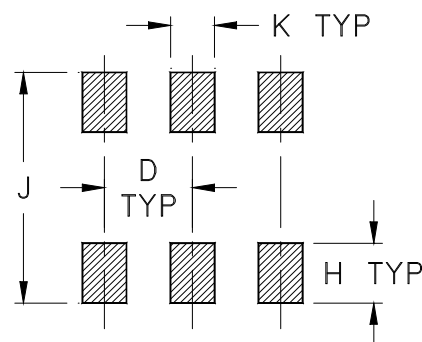
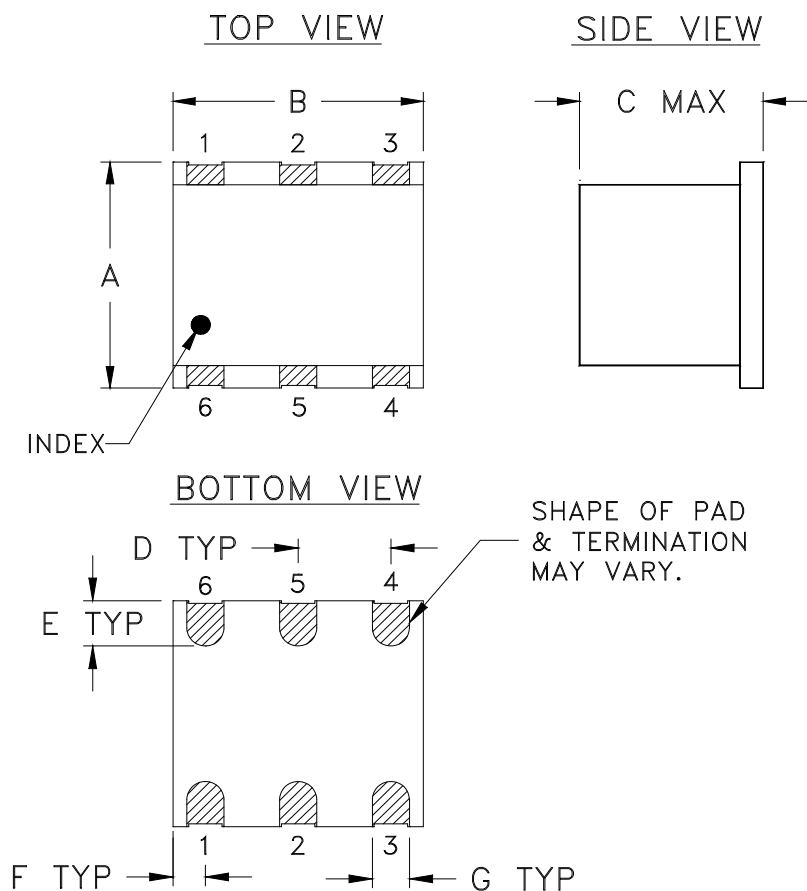


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### Outline Dimensions

### PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
TT240	.250 (6.35)	.31 (7.87)	.20 (5.08)	.100 (2.54)	.050 (1.27)	.055 (1.40)	.040 (1.02)	.070 (1.78)	.270 (6.86)	.050 (1.27)	.50

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

#### Notes:

- Case material: Ceramic.
- Termination finish:
  - For RoHS Case Styles: 2-10 $\mu$  inch (.05-.25 microns) Gold plate over 100-300  $\mu$  inch (2.54-7.62 microns) Nickel plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



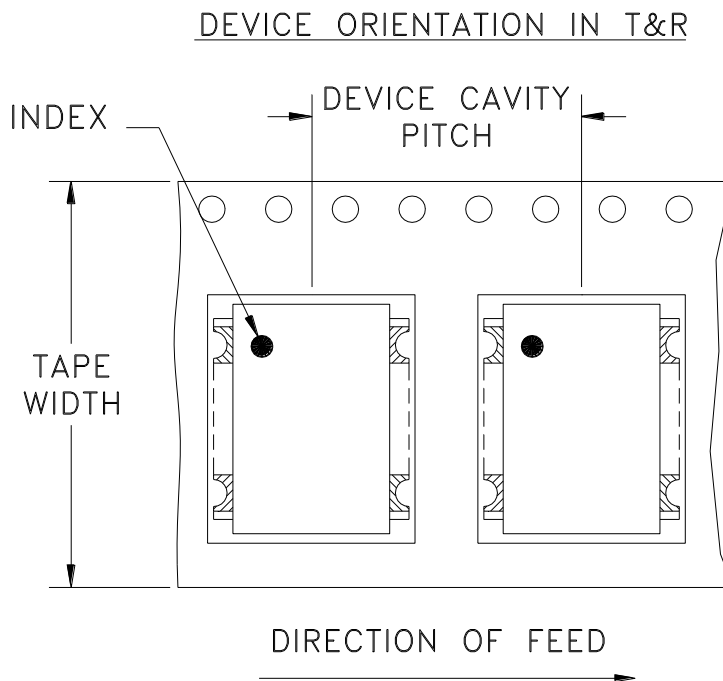
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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500

Note: Please consult individual model data sheet to determine device per reel availability

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.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



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THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M101143	ADDED "gk" PIN CONNECTION, TT100 CASE STYLE & NOTE 2	10/10/05	MMG	DJ
B	M102713	ADDED "...WITH SMOBC"	01/17/06	MMG	IL
C	M108637	REMOVED "PIN 1", ADDED INDEX ON UNIT	12/01/06	MYG	FL

SUGGESTED MOUNTING CONFIGURATION  
FOR BH292, CD541/542/636/637, TT100/240 CASE  
STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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	MMG	07/17/02
TOLERANCES ON:	WL	08/02/02
2 PL DECIMALS ±	DJ	08/05/02
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

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 Brooklyn NY 11235

PL, gk/ht/hu/nd/w, BH292,  
 CD541/542/636/637, TT100/240, TB-03

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-052	REV: C
FILE: 98PL052	SCALE: 8:1	SHEET: 1 OF 1	

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REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
E	M119737	UPDATED PCB	10.08	MF	AD
F	M127659	UPDATED CARR	06.10	SW	SG
G	M127846	UPDATED SCHEMATIC DIAGRAM	06.10	SW	SG
H	M131840	UPDATED DWG	05.11	MF	AD



**NOTES:**

1. REFER TO -09 PAGE FOR ITEM DESCRIPTIONS.  
DESIGNATION NUMBERS ON -20 PAGE CORRESPOND TO THE NUMBERS ON -09 PAGE.
2. FOR TEXT HEIGHT & STYLE ON THE LABEL REFER TO: D3-G209.

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± ANGLES ± FRACTIONS ±	DRAWN	S.WOLYNSKI	06.29.99
	CHECKED	SG	07.06.99
	APPROVED	MG	07.10.99

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TB,ADE,CD542/636,06MX01,50

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SIZE A	CODE IDENT 15542	DRAWING NO: TB-03-20	REV: H
FILE: WTB-03	SCALE: 1.5:1	SHEET: 1 OF 2	

# Evaluation Board and Circuit

For Pin Connections and DUT Orientation Refer to  
Data Sheet of the DUT



TB-03



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

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