

Non-Catalog Model

Frequency Mixer

LRMS-2MHJ

Level 13 (LO Power +13 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 : QQQ569

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (fL to fU)	5		1000	MHz
	RF (fL to fU)	5		1000	MHz
	IF	0		1000	MHz
Conversion Loss	mid band		6.7	8.5	dB
	Total Range			9.5	dB
LO-RF Isolation	Low Range	40	55		dB
	Mid Range	20	39		dB
	Upper Range	16	22		dB
LO-IF Isolation	Low Range	35	52		dB
	Mid Range	17	30		dB
	Upper Range	12	18		dB
1 dB Comp. Input Power			+9		dBm

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

Mid Range = [10fL to fU/2]

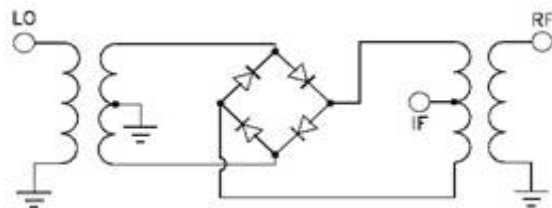
Upper Range = [fU/2 to fU]

Phase detection, positive polarity.
Aqueous washable.

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

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

Electrical Schematics



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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
5.0	35.0	7.41	6.87	6.60
10.0	40.0	7.27	6.71	6.43
50.4	80.4	7.19	6.70	6.49
90.7	120.7	7.20	6.68	6.45
131.0	161.0	7.02	6.62	6.46
171.3	201.3	7.07	6.68	6.48
211.5	241.5	6.99	6.65	6.50
251.8	281.8	7.04	6.70	6.53
292.1	322.1	7.03	6.70	6.52
332.4	362.4	7.07	6.75	6.56
372.7	402.7	7.10	6.77	6.56
413.0	443.0	7.13	6.76	6.56
453.3	483.3	7.18	6.78	6.57
493.6	523.6	7.17	6.75	6.52
533.9	563.9	7.25	6.86	6.57
574.2	604.2	7.26	6.89	6.61
614.4	644.4	7.32	6.96	6.69
654.7	684.7	7.38	6.95	6.69
695.0	725.0	7.44	6.97	6.69
735.3	765.3	7.66	7.03	6.74
775.6	805.6	7.80	7.08	6.73
815.9	845.9	8.09	7.27	6.82
856.2	886.2	8.28	7.47	6.93
896.5	926.5	8.48	7.73	7.13
916.6	946.6	8.53	7.86	7.25
956.9	986.9	8.61	8.02	7.46
977.1	1007.1	8.61	8.08	7.57
1017.3	1047.3	8.69	8.24	7.83
1077.8	1107.8	8.72	8.31	8.04
1097.9	1127.9	8.74	8.35	8.11
1138.2	1168.2	8.79	8.44	8.27
1158.4	1188.4	8.88	8.54	8.35
1198.7	1228.7	9.03	8.72	8.58
1218.8	1248.8	9.09	8.83	8.66
1259.1	1289.1	9.29	9.05	8.88
1279.2	1309.2	9.39	9.15	9.03
1319.5	1349.5	9.62	9.41	9.31
1339.7	1369.7	9.76	9.55	9.49
1380.0	1410.0	10.25	9.97	9.90
1400.1	1430.1	10.47	10.11	10.07

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	21.12	24.69	27.08
50.4	80.4	20.54	24.19	24.98
90.7	120.7	20.11	22.61	24.83
131.0	161.0	21.09	23.08	27.86
171.3	201.3	19.96	22.88	27.73
211.5	241.5	20.02	23.71	29.05
251.8	281.8	20.66	25.57	27.23
292.1	322.1	21.33	25.28	27.90
332.4	362.4	21.79	25.50	26.96
372.7	402.7	21.55	25.23	26.88
413.0	443.0	22.32	24.39	26.41
453.3	483.3	21.28	22.95	25.74
493.6	523.6	21.30	21.89	23.74
533.9	563.9	20.65	23.98	24.45
574.2	604.2	21.64	23.64	28.95
614.4	644.4	21.80	22.85	24.91
654.7	684.7	22.74	26.33	30.34
695.0	725.0	21.30	25.22	27.96
735.3	765.3	21.38	22.43	23.76
775.6	805.6	20.42	21.64	21.44
815.9	845.9	17.60	22.49	21.46
856.2	886.2	16.63	22.63	21.25
896.5	926.5	16.55	20.98	21.75
916.6	946.6	16.82	20.78	20.75
956.9	986.9	17.89	20.88	21.22
977.1	1007.1	18.15	21.23	22.15
1017.3	1047.3	19.87	25.39	24.88
1037.5	1067.5	21.39	26.56	25.73
1077.8	1107.8	24.05	21.86	22.15
1097.9	1127.9	20.67	20.47	21.44
1138.2	1168.2	18.18	19.54	21.39
1158.4	1188.4	17.80	19.73	21.86
1198.7	1228.7	17.33	19.96	21.56
1218.8	1248.8	17.35	19.85	21.39
1259.1	1289.1	17.50	20.11	21.46
1279.2	1309.2	17.28	20.00	20.84
1319.5	1349.5	17.53	20.44	20.47
1339.7	1369.7	17.24	20.05	20.77
1380.0	1410.0	16.87	19.29	19.35
1400.1	1430.1	16.66	19.09	19.34

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	0.89	0.70	0.56
50.4	80.4	0.85	0.66	0.54
90.7	120.7	0.83	0.66	0.54
131.0	161.0	0.92	0.69	0.52
171.3	201.3	0.80	0.63	0.49
211.5	241.5	0.89	0.63	0.51
251.8	281.8	0.91	0.64	0.51
292.1	322.1	0.86	0.63	0.53
332.4	362.4	0.87	0.66	0.55
372.7	402.7	0.88	0.69	0.60
413.0	443.0	0.91	0.73	0.63
453.3	483.3	0.95	0.76	0.65
493.6	523.6	1.03	0.87	0.76
533.9	563.9	1.08	0.90	0.82
574.2	604.2	1.18	0.96	0.88
614.4	644.4	1.27	1.02	0.91
654.7	684.7	1.38	1.11	1.00
695.0	725.0	1.47	1.22	1.09
735.3	765.3	1.42	1.25	1.10
775.6	805.6	1.37	1.31	1.14
815.9	845.9	1.23	1.27	1.16
856.2	886.2	1.19	1.24	1.22
896.5	926.5	1.17	1.20	1.26
916.6	946.6	1.16	1.16	1.21
956.9	986.9	1.13	1.09	1.15
977.1	1007.1	1.19	1.09	1.12
1017.3	1047.3	1.21	1.05	1.02
1037.5	1067.5	1.24	1.05	0.98
1077.8	1107.8	1.32	1.15	1.01
1097.9	1127.9	1.37	1.12	0.96
1138.2	1168.2	1.37	1.08	0.92
1158.4	1188.4	1.39	1.06	0.89
1198.7	1228.7	1.40	1.02	0.90
1218.8	1248.8	1.35	0.98	0.87
1259.1	1289.1	1.38	0.93	0.87
1279.2	1309.2	1.38	0.91	0.87
1319.5	1349.5	1.30	0.84	0.84
1339.7	1369.7	1.31	0.81	0.81
1380.0	1410.0	1.43	0.83	0.79
1400.1	1430.1	1.39	0.81	0.77

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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)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
490.0	10.1	6.88	10.0	20.1	6.52	990.0	10.1	8.14
477.7	22.4	6.80	30.0	40.1	6.47	970.0	30.1	8.08
465.4	34.7	6.75	50.0	60.1	6.56	950.0	50.1	7.98
453.1	47.0	6.78	70.0	80.1	6.57	930.0	70.1	8.00
440.8	59.3	6.81	90.0	100.1	6.58	910.0	90.1	8.00
428.5	71.6	6.76	110.0	120.1	6.58	890.0	110.1	7.90
416.2	83.9	6.74	130.0	140.1	6.53	870.0	130.1	7.81
403.8	96.3	6.68	150.0	160.1	6.56	850.0	150.1	7.81
391.5	108.6	6.64	170.0	180.1	6.62	830.0	170.1	7.83
379.2	120.9	6.62	190.0	200.1	6.65	810.0	190.1	7.75
366.9	133.2	6.56	210.0	220.1	6.62	790.0	210.1	7.72
354.6	145.5	6.56	230.0	240.1	6.63	770.0	230.1	7.68
342.3	157.8	6.58	250.0	260.1	6.71	750.0	250.1	7.57
330.0	170.1	6.59	270.0	280.1	6.73	730.0	270.1	7.66
317.7	182.4	6.61	290.0	300.1	6.74	710.0	290.1	7.65
305.4	194.7	6.58	310.0	320.1	6.76	690.0	310.1	7.61
293.1	207.0	6.55	330.0	340.1	6.81	670.0	330.1	7.57
280.8	219.3	6.55	350.0	360.1	6.81	650.0	350.1	7.59
268.5	231.6	6.58	370.0	380.1	6.91	630.0	370.1	7.58
256.2	243.9	6.58	390.0	400.1	6.91	610.0	390.1	7.54
243.8	256.3	6.58	430.0	440.1	6.95	570.0	430.1	7.49
231.5	268.6	6.61	450.0	460.1	6.98	550.0	450.1	7.51
219.2	280.9	6.59	490.0	500.1	6.97	510.0	490.1	7.47
206.9	293.2	6.61	510.0	520.1	7.01	490.0	510.1	7.44
194.6	305.5	6.62	550.0	560.1	7.13	450.0	550.1	7.47
182.3	317.8	6.58	570.0	580.1	7.17	430.0	570.1	7.48
170.0	330.1	6.59	610.0	620.1	7.16	390.0	610.1	7.44
157.7	342.4	6.63	630.0	640.1	7.16	370.0	630.1	7.46
145.4	354.7	6.64	670.0	680.1	7.15	330.0	670.1	7.44
133.1	367.0	6.69	690.0	700.1	7.11	310.0	690.1	7.42
120.8	379.3	6.68	730.0	740.1	7.18	270.0	730.1	7.39
108.5	391.6	6.64	750.0	760.1	7.19	250.0	750.1	7.39
96.2	403.9	6.66	790.0	800.1	7.27	210.0	790.1	7.40
83.8	416.3	6.67	810.0	820.1	7.28	190.0	810.1	7.43
71.5	428.6	6.68	850.0	860.1	7.45	150.0	850.1	7.59
59.2	440.9	6.72	870.0	880.1	7.50	130.0	870.1	7.73
46.9	453.2	6.70	910.0	920.1	7.62	90.0	910.1	7.86
34.6	465.5	6.74	930.0	940.1	7.71	70.0	930.1	7.93
22.3	477.8	6.75	970.0	980.1	7.81	30.0	970.1	8.12
10.0	490.1	6.90	990.0	1000.1	7.79	10.0	990.1	8.39

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
5.0	68.00	67.46	67.25	64.60	60.42	58.26
10.0	61.75	61.14	60.85	58.56	54.89	52.71
50.4	55.33	55.91	56.13	51.88	50.93	50.19
90.7	50.79	51.08	51.07	47.44	46.46	45.24
131.0	47.38	47.98	48.34	44.52	43.39	42.76
171.3	45.33	45.81	46.35	42.67	41.55	40.81
211.5	43.57	44.22	44.61	40.95	40.09	39.23
251.8	42.35	43.05	43.54	40.54	39.23	38.06
292.1	41.11	41.88	42.35	39.44	37.98	36.94
332.4	40.09	40.82	41.25	38.20	36.70	35.56
372.7	39.08	39.84	40.29	37.29	35.51	34.39
413.0	38.11	38.85	39.34	35.37	34.18	33.08
453.3	36.92	37.62	38.11	33.81	32.78	32.06
493.6	36.06	36.77	37.21	32.40	31.06	30.51
533.9	35.15	35.91	36.21	31.31	30.13	29.13
574.2	34.31	35.06	35.49	30.12	29.45	28.61
614.4	33.81	34.33	34.78	28.38	28.04	27.56
654.7	33.21	33.62	33.91	27.06	26.85	26.67
695.0	32.65	32.87	33.12	25.59	25.33	25.20
735.3	32.03	32.22	32.23	24.35	23.80	23.54
775.6	31.45	31.61	31.53	23.58	22.94	22.51
815.9	30.70	31.01	30.86	22.53	22.07	21.57
856.2	29.93	30.41	30.44	21.60	21.34	20.93
896.5	29.54	30.15	30.44	20.55	20.55	20.19
916.6	29.45	30.23	30.86	20.05	20.16	19.83
956.9	29.04	29.87	30.66	19.17	19.47	19.26
977.1	28.85	29.70	30.69	18.81	19.14	19.12
1017.3	28.70	29.75	30.97	17.78	18.27	18.35
1077.8	28.37	29.74	31.24	16.60	17.23	17.50
1097.9	28.63	30.50	32.66	16.15	16.80	17.06
1138.2	28.93	31.45	34.21	15.35	16.11	16.27
1158.4	29.31	32.14	35.10	15.07	15.78	15.98
1198.7	30.27	34.41	39.34	14.24	14.99	15.19
1218.8	30.37	34.80	40.16	13.88	14.72	14.86
1259.1	31.57	38.33	52.26	13.26	14.07	14.20
1279.2	31.66	39.93	52.66	12.97	13.75	13.99
1319.5	31.38	39.32	40.34	12.23	13.07	13.32
1339.7	31.67	38.84	37.55	12.03	12.89	13.12
1380.0	30.05	34.26	33.23	11.46	12.33	12.66
1400.1	29.46	33.14	32.30	11.19	12.09	12.47

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	54.33	51.69	49.04
50.4	80.4	37.17	37.26	37.19
90.7	120.7	32.63	32.62	32.85
131.0	161.0	29.96	30.07	30.21
171.3	201.3	28.32	28.44	28.38
211.5	241.5	27.12	27.19	27.30
251.8	281.8	26.33	26.48	26.54
292.1	322.1	25.92	26.15	26.21
332.4	362.4	25.55	25.82	26.01
372.7	402.7	25.37	25.74	25.93
413.0	443.0	25.24	25.66	26.02
453.3	483.3	25.22	25.70	26.03
493.6	523.6	25.04	25.54	25.82
533.9	563.9	24.08	24.49	24.67
574.2	604.2	22.37	22.70	22.83
614.4	644.4	20.48	20.50	20.54
654.7	684.7	18.71	18.59	18.59
695.0	725.0	17.42	17.24	17.20
735.3	765.3	16.42	16.22	16.17
775.6	805.6	15.70	15.57	15.51
815.9	845.9	15.08	15.04	15.05
856.2	886.2	14.48	14.56	14.64
896.5	926.5	13.99	14.18	14.38
916.6	946.6	13.83	14.07	14.31
956.9	986.9	13.56	13.89	14.25
977.1	1007.1	13.54	13.94	14.34
1017.3	1047.3	13.43	13.93	14.43
1037.5	1067.5	13.42	13.95	14.45
1077.8	1107.8	13.34	13.89	14.31
1097.9	1127.9	13.26	13.79	14.21
1138.2	1168.2	13.17	13.59	13.90
1158.4	1188.4	13.10	13.43	13.71
1198.7	1228.7	12.89	13.13	13.26
1218.8	1248.8	12.79	12.91	13.03
1259.1	1289.1	12.39	12.53	12.48
1279.2	1309.2	12.15	12.20	12.16
1319.5	1349.5	11.65	11.70	11.56
1339.7	1369.7	11.36	11.38	11.23
1380.0	1410.0	10.69	10.70	10.55
1400.1	1430.1	10.47	10.43	10.26

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
5.0	35.0	1.43	2.23	3.52
10.0	40.0	1.34	2.14	3.44
50.4	80.4	1.15	1.24	1.32
90.7	120.7	1.15	1.26	1.34
131.0	161.0	1.18	1.28	1.34
171.3	201.3	1.17	1.28	1.34
211.5	241.5	1.20	1.29	1.35
251.8	281.8	1.20	1.29	1.34
292.1	322.1	1.21	1.29	1.35
332.4	362.4	1.22	1.30	1.36
372.7	402.7	1.24	1.31	1.37
413.0	443.0	1.26	1.33	1.39
453.3	483.3	1.29	1.36	1.42
493.6	523.6	1.34	1.42	1.48
533.9	563.9	1.37	1.44	1.51
574.2	604.2	1.42	1.48	1.55
614.4	644.4	1.48	1.54	1.59
654.7	684.7	1.53	1.59	1.66
695.0	725.0	1.60	1.66	1.73
735.3	765.3	1.67	1.74	1.81
775.6	805.6	1.77	1.84	1.91
815.9	845.9	1.92	1.96	2.03
856.2	886.2	2.08	2.11	2.16
896.5	926.5	2.27	2.28	2.31
916.6	946.6	2.37	2.38	2.41
956.9	986.9	2.59	2.61	2.63
977.1	1007.1	2.72	2.75	2.77
1017.3	1047.3	2.95	3.00	3.03
1037.5	1067.5	3.07	3.13	3.17
1077.8	1107.8	3.27	3.34	3.40
1097.9	1127.9	3.36	3.43	3.48
1138.2	1168.2	3.58	3.65	3.72
1158.4	1188.4	3.66	3.73	3.79
1198.7	1228.7	3.86	3.95	4.00
1218.8	1248.8	3.99	4.07	4.11
1259.1	1289.1	4.09	4.16	4.20
1279.2	1309.2	4.16	4.23	4.27
1319.5	1349.5	4.24	4.30	4.33
1339.7	1369.7	4.28	4.33	4.36
1380.0	1410.0	4.36	4.39	4.43
1400.1	1430.1	4.37	4.40	4.42

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.22	1.26	1.31
10.0	1.11	1.16	1.23
50.4	1.71	2.62	3.82
90.7	1.61	2.37	3.38
131.0	1.68	2.55	3.70
171.3	1.62	2.41	3.45
211.5	1.67	2.50	3.58
251.8	1.69	2.53	3.60
292.1	1.70	2.51	3.54
332.4	1.80	2.66	3.74
372.7	1.80	2.60	3.62
413.0	1.90	2.75	3.80
453.3	1.95	2.76	3.78
493.6	2.01	2.82	3.82
533.9	2.12	2.95	3.95
574.2	2.15	2.96	3.95
614.4	2.27	3.10	4.10
654.7	2.33	3.10	4.06
695.0	2.44	3.20	4.15
735.3	2.56	3.30	4.21
775.6	2.66	3.40	4.29
815.9	2.80	3.56	4.44
856.2	2.88	3.64	4.51
896.5	2.99	3.76	4.64
916.6	3.03	3.80	4.68
956.9	3.10	3.83	4.70
977.1	3.14	3.86	4.72
1017.3	3.21	3.90	4.75
1037.5	3.24	3.90	4.73
1077.8	3.29	3.90	4.69
1097.9	3.31	3.90	4.66
1138.2	3.38	3.93	4.64
1158.4	3.42	3.93	4.62
1198.7	3.48	3.92	4.55
1218.8	3.53	3.94	4.54
1259.1	3.63	3.97	4.53
1279.2	3.69	3.98	4.50
1319.5	3.79	4.01	4.48
1339.7	3.86	4.06	4.52
1380.0	3.95	4.10	4.48
1400.1	3.99	4.10	4.46

IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.70	1.38	1.18
10.0	1.70	1.38	1.18
30.2	2.50	2.04	1.67
50.4	2.39	1.97	1.59
70.6	2.35	1.95	1.59
90.8	2.39	1.98	1.61
111.0	2.45	2.02	1.64
131.2	2.44	2.01	1.64
151.4	2.37	1.96	1.61
171.6	2.33	1.93	1.58
191.8	2.36	1.97	1.62
212.0	2.40	2.00	1.65
232.2	2.39	1.99	1.64
252.4	2.38	1.99	1.64
272.7	2.40	2.01	1.66
292.9	2.38	2.00	1.66
313.1	2.34	1.96	1.64
333.3	2.32	1.95	1.64
353.5	2.34	1.98	1.68
373.7	2.33	1.98	1.68
393.9	2.30	1.95	1.65
434.3	2.21	1.91	1.65
454.5	2.22	1.92	1.68
494.9	2.26	1.96	1.71
515.1	2.18	1.90	1.68
555.5	2.17	1.91	1.71
575.7	2.19	1.95	1.75
616.1	2.14	1.90	1.71
636.3	2.10	1.87	1.70
676.7	2.09	1.88	1.73
696.9	2.11	1.90	1.75
737.3	2.00	1.81	1.67
757.6	1.95	1.78	1.66
798.0	1.93	1.78	1.68
818.2	1.92	1.78	1.68
858.6	1.84	1.70	1.62
878.8	1.79	1.66	1.59
919.2	1.78	1.68	1.63
939.4	1.78	1.67	1.62
979.8	1.69	1.60	1.56
1000.0	1.75	1.85	2.04

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	21	9	41	23	26	19	32	35	43
1	-	18	+0	32	13	32	28	37	40	37	65	43
2	>100	58	44	60	45	58	47	74	57	65	54	54
3	>100	69	78	69	64	67	60	69	71	72	63	85
4	>100	>87	87	>87	86	>87	81	85	>87	>87	85	>87
5	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
6	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
7	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
8	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
9	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
10	>100	>87	>87	>87	>87	>87	>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: 500.1 MHz; -6.00 dBm.

LO IN: 530.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -12.86 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	32	21	57	35	38	33	51	50	74
1	-	19	+0	30	13	36	29	43	41	42	57	51
2	>100	50	37	50	36	55	40	60	52	65	46	53
3	>100	50	48	65	48	53	45	52	58	54	51	54
4	>100	78	62	74	59	67	63	61	56	78	69	64
5	>100	91	75	77	57	63	54	62	53	63	62	72
6	>100	93	80	97	81	74	71	69	64	68	67	77
7	>100	78	83	86	81	78	75	82	75	93	95	86
8	>100	94	>97	>97	>97	>97	92	89	87	88	82	81
9	>100	>97	>97	>97	>97	95	91	86	83	88	83	92
10	>100	>97	>97	>97	>97	>97	>97	>97	94	>97	91	95
	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; +13.00 dBm

IF OUT: 29.91 MHz; -2.79 dBm

Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.

2. + entry denotes harmonics are in (dBc) above IF OUTPUT.

3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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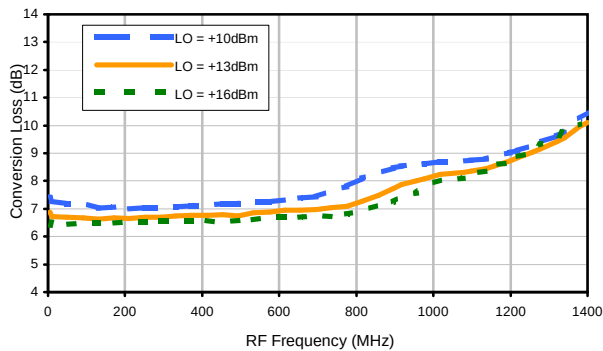


Frequency Mixer

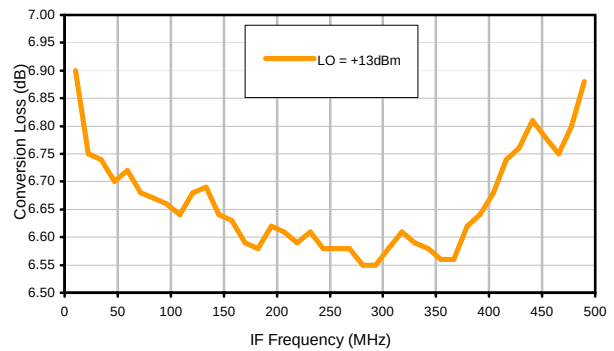
LRMS-2MHJ

Typical Performance Curves

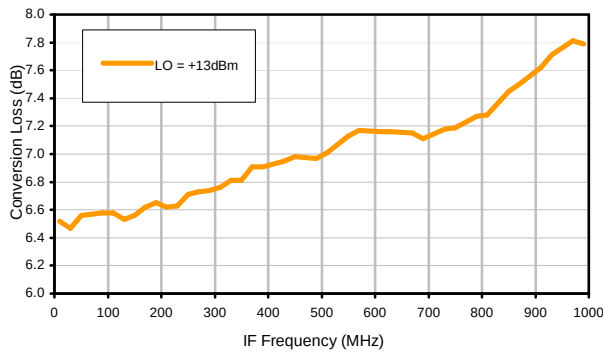
Conversion Loss @ IF=30MHz



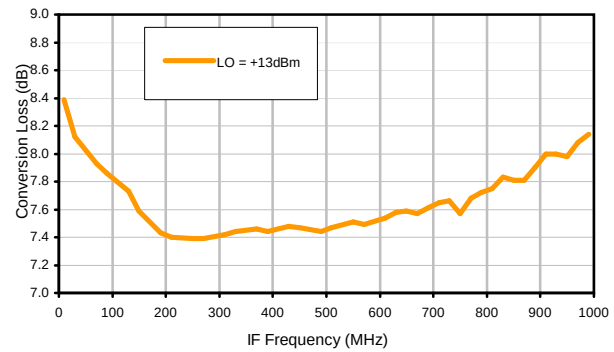
Conversion Loss vs. IF @ RF=500.1MHz



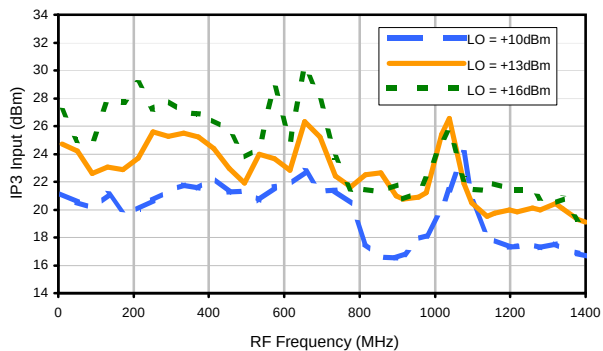
Conversion Loss vs. IF @ RF=10.1MHz



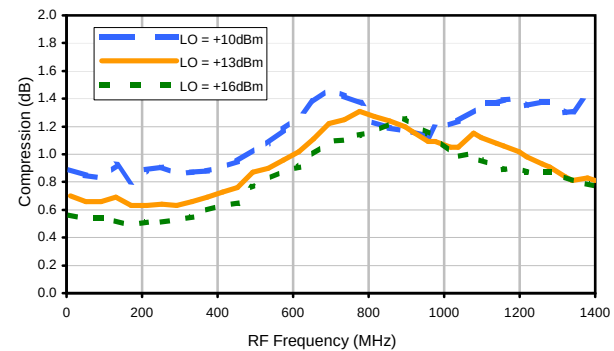
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input



Compression @ RF IN=+9dBm

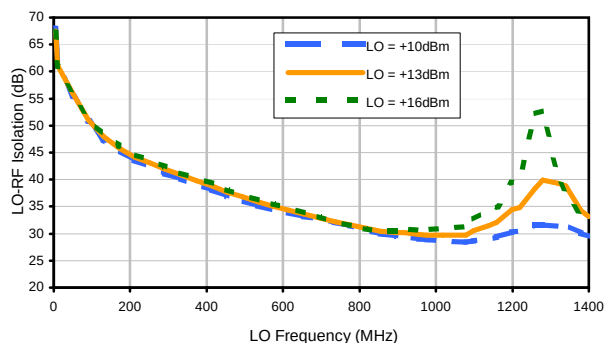


Frequency Mixer

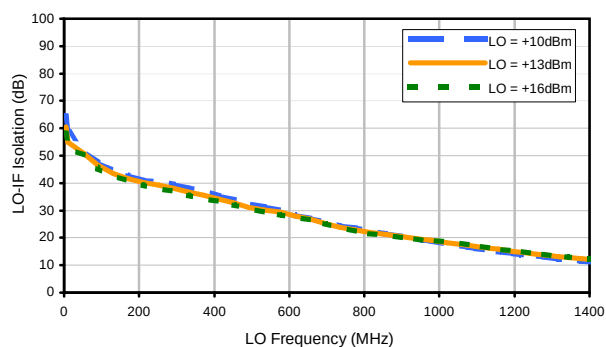
LRMS-2MHJ

Typical Performance Curves

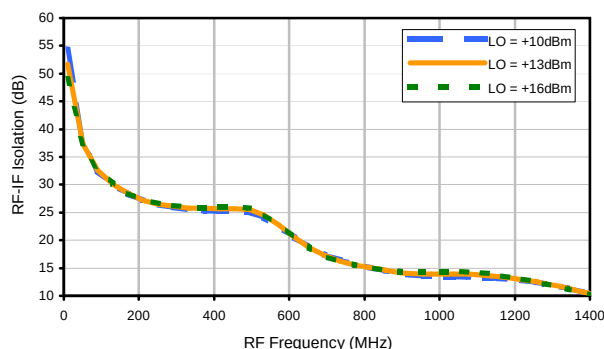
LO-RF Isolation



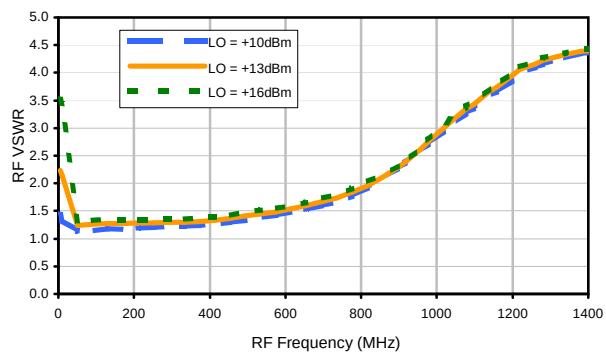
LO-IF Isolation



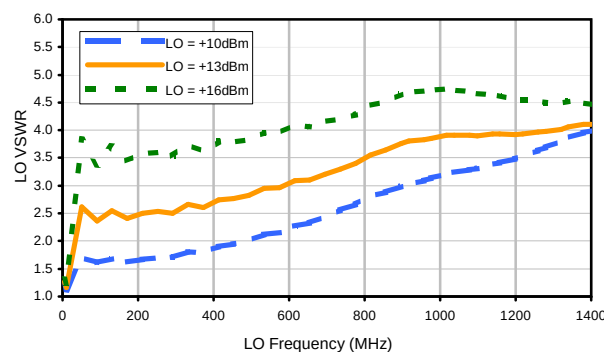
RF-IF Isolation



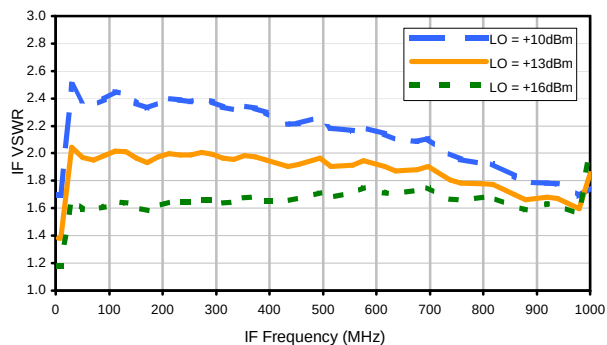
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	21	9	41	23	26	19	32	35	43
1	-	18	+0	32	13	32	28	37	40	37	65	43
2	>100	58	44	60	45	58	47	74	57	65	54	54
3	>100	69	78	69	64	67	60	69	71	72	63	85
4	>100	>87	87	>87	86	>87	81	85	>87	>87	85	>87
5	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
6	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
7	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
8	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
9	>100	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87	>87
10	>100	>87	>87	>87	>87	>87	>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: 500.1 MHz; -6.00 dBm.

LO IN: 530.01 MHz; +13.00 dBm

IF OUT: 29.91 MHz; -12.86 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	32	21	57	35	38	33	51	50	74
1	-	19	+0	30	13	36	29	43	41	42	57	51
2	>100	50	37	50	36	55	40	60	52	65	46	53
3	>100	50	48	65	48	53	45	52	58	54	51	54
4	>100	78	62	74	59	67	63	61	56	78	69	64
5	>100	91	75	77	57	63	54	62	53	63	62	72
6	>100	93	80	97	81	74	71	69	64	68	67	77
7	>100	78	83	86	81	78	75	82	75	93	95	86
8	>100	94	>97	>97	>97	>97	92	89	87	88	82	81
9	>100	>97	>97	>97	>97	95	91	86	83	88	83	92
10	>100	>97	>97	>97	>97	>97	>97	>97	94	>97	91	95
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; +13.00 dBm

IF OUT: 29.91 MHz; -2.79 dBm

Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.

2. + entry denotes harmonics are in (dBc) above IF OUTPUT.

3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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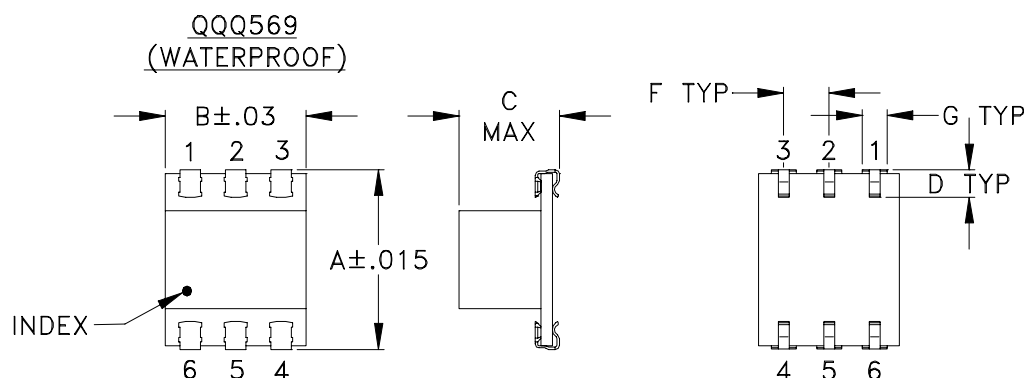


Case Style

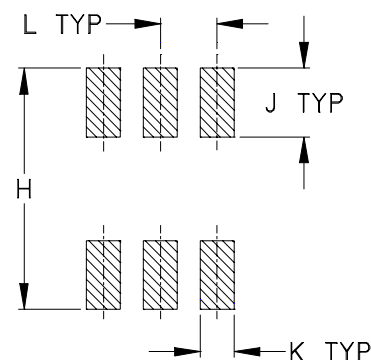
QQQ

QQQ569 (waterproof)

Outline Dimensions



PCB Land Pattern



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

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
QQQ569	.390 (9.90)	.31 (7.87)	.225 (5.72)	.060 (1.52)	-	.100 (2.54)	.045 (1.14)	.420 (10.67)	.120 (3.05)	.060 (1.52)	.100 (2.54)	-	.50

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

Notes:

- Case material: Ceramic.
- Termination finish:
 - For RoHS Case Styles: Tin plate over Nickel plate.
 - For RoHS-5 Case Styles: Tin-Lead plate.



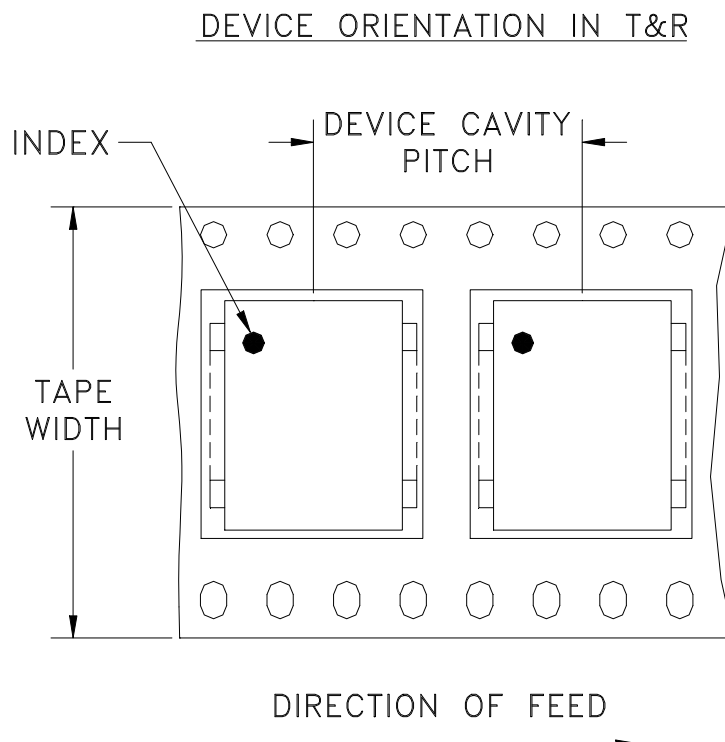
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Tape & Reel Packaging TR-F5



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



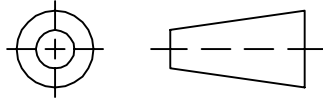
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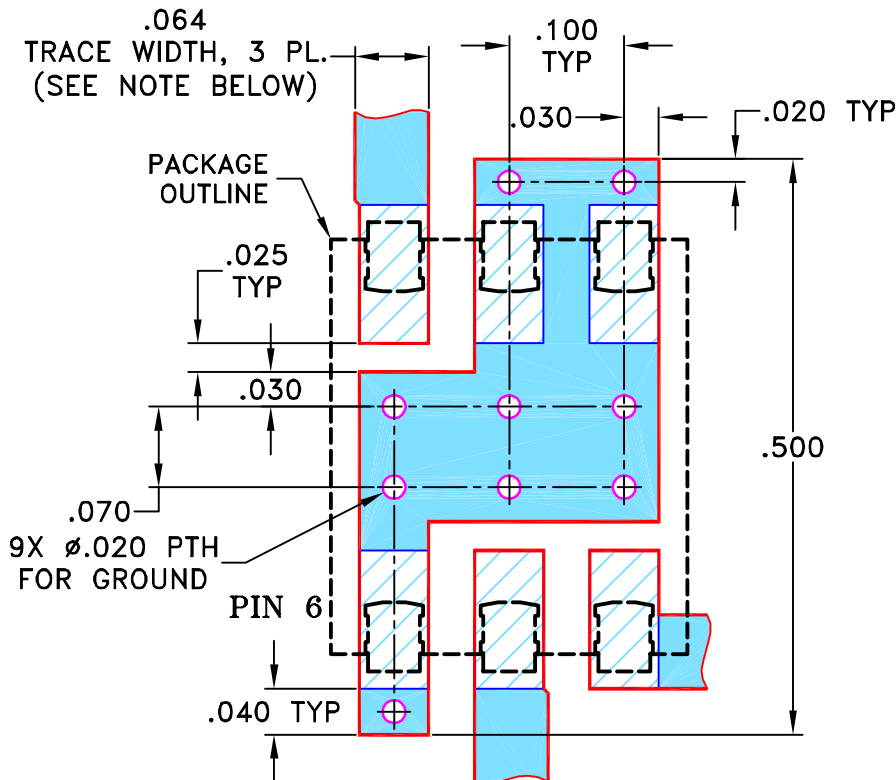
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/02/02	AV	DJ
A	M102713	UPDATED NOTES	01/14/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR QQQ569 CASE STYLE, "w" PIN CONNECTION



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" $\pm$ 0.002"; 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

DRAWN

AV

07/19/02

TOLERANCES ON:

CHECKED

WL

08/02/02

2 PL DECIMALS $\pm$.005

APPROVED

DJ

08/02/02

ANGLES $\pm$

FRACTIONS $\pm$

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



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Brooklyn NY 11235

PL, w, QQQ569, LRMS-J, TB-44

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-083

REV:

A

FILE:

98PL083

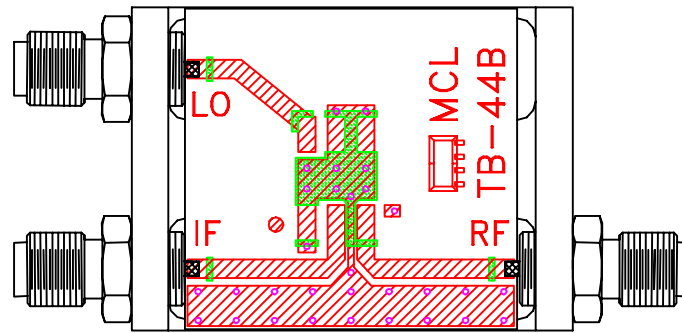
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6:1

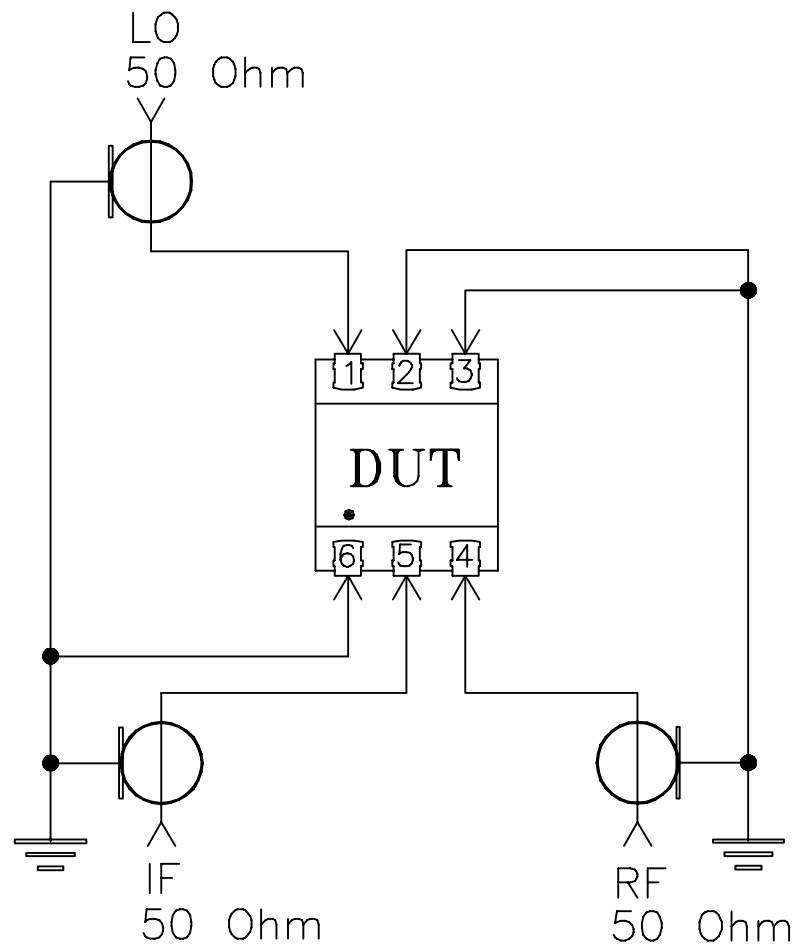
SHEET:

1 OF 1

Evaluation Board and Circuit



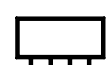
TB-44+



Schematic Diagram

Notes:

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

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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	-40° 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 Eutetic Process: 225°C peak Pb-Free Process 245° - 250°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