

Frequency Mixer

SYM-EDR5091/1

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 : TTT167

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (f _L to f _U)	880		1030	MHz
	RF (f _L to f _U)	880		1030	MHz
	IF	170.6		170.6	MHz
Conversion Loss			8.0		dB
LO-RF Isolation		25	35		dB
LO-IF Isolation		22	35		dB

MAXIMUM RATINGS	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

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

Frequency Mixer

SYM-EDR5091/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	6.66	6.12	6.09
70.3	100.3	6.52	6.05	5.84
130.6	160.6	6.47	6.01	5.83
190.8	220.8	6.57	6.10	5.88
251.0	281.0	6.60	6.14	5.88
311.3	341.3	6.69	6.18	5.90
371.5	401.5	6.77	6.20	5.92
431.7	461.7	6.83	6.19	5.93
492.0	522.0	6.87	6.22	5.97
552.2	582.2	6.88	6.26	6.02
612.4	642.4	6.89	6.29	6.07
672.7	702.7	6.77	6.28	6.08
732.9	762.9	6.69	6.29	6.10
793.1	823.1	6.65	6.28	6.11
853.4	883.4	6.68	6.32	6.15
913.6	943.6	6.74	6.38	6.21
993.9	1023.9	6.88	6.48	6.27
1054.1	1084.1	6.97	6.54	6.32
1134.4	1164.4	7.05	6.62	6.38
1194.7	1224.7	7.10	6.61	6.39
1275.0	1305.0	7.20	6.62	6.43
1335.2	1365.2	7.42	6.73	6.51
1415.5	1445.5	7.70	6.95	6.64
1475.8	1505.8	7.92	7.16	6.82
1556.1	1586.1	8.23	7.39	7.00
1616.3	1646.3	8.53	7.56	7.13
1696.6	1726.6	9.11	8.01	7.42
1756.8	1786.8	9.39	8.27	7.63
1837.2	1867.2	9.84	8.71	7.97
1897.4	1927.4	10.20	8.90	8.12
1977.7	2007.7	10.37	8.95	8.17
2037.9	2067.9	10.33	9.06	8.32
2118.2	2148.2	10.28	9.18	8.58
2178.5	2208.5	10.44	9.29	8.67
2258.8	2288.8	10.48	9.49	8.90
2319.0	2349.0	10.37	9.60	9.09
2399.3	2429.3	10.40	9.70	9.33
2459.6	2489.6	10.47	9.79	9.46
2539.9	2569.9	10.60	9.94	9.61
2600.1	2630.1	10.91	10.20	9.85

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	26.39	32.93	27.92
70.3	100.3	27.93	29.09	30.20
130.6	160.6	29.09	31.47	30.88
190.8	220.8	26.68	29.71	31.59
251.0	281.0	28.12	29.45	25.21
311.3	341.3	26.53	30.50	24.39
371.5	401.5	25.64	24.60	24.96
431.7	461.7	26.20	22.97	25.68
492.0	522.0	25.31	22.83	26.20
552.2	582.2	22.99	23.23	27.27
612.4	642.4	21.77	23.94	26.21
672.7	702.7	20.06	23.65	28.78
732.9	762.9	21.27	25.08	32.07
793.1	823.1	23.00	25.79	28.90
853.4	883.4	22.80	26.11	29.85
913.6	943.6	23.56	29.31	44.40
993.9	1023.9	24.04	27.60	45.37
1054.1	1084.1	29.76	31.26	37.44
1134.4	1164.4	28.08	31.31	31.20
1194.7	1224.7	33.00	28.04	26.96
1275.0	1305.0	25.45	34.33	28.89
1335.2	1365.2	24.38	29.87	35.93
1415.5	1445.5	24.06	28.70	33.57
1475.8	1505.8	22.67	28.10	36.86
1556.1	1586.1	20.12	23.79	30.54
1616.3	1646.3	19.51	22.62	29.70
1696.6	1726.6	18.31	20.86	26.25
1756.8	1786.8	17.82	20.41	24.13
1837.2	1867.2	18.00	21.65	26.88
1897.4	1927.4	17.49	21.78	27.56
1977.7	2007.7	18.53	23.68	30.76
2037.9	2067.9	20.21	25.25	30.95
2118.2	2148.2	22.36	26.29	28.07
2178.5	2208.5	23.12	28.89	27.72
2258.8	2288.8	25.90	31.29	27.06
2319.0	2349.0	26.01	30.06	27.71
2399.3	2429.3	24.03	26.93	25.87
2459.6	2489.6	23.36	25.32	24.30
2539.9	2569.9	23.64	25.00	25.26
2600.1	2630.1	22.41	22.75	28.25

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	0.96	0.56	0.41
70.3	100.3	1.03	0.56	0.39
130.6	160.6	0.99	0.58	0.37
190.8	220.8	1.03	0.56	0.40
251.0	281.0	1.06	0.59	0.42
311.3	341.3	0.92	0.54	0.41
371.5	401.5	0.93	0.57	0.42
431.7	461.7	0.96	0.65	0.43
492.0	522.0	0.95	0.66	0.43
552.2	582.2	1.00	0.66	0.43
612.4	642.4	1.10	0.66	0.40
672.7	702.7	1.10	0.59	0.36
732.9	762.9	1.29	0.64	0.42
793.1	823.1	1.33	0.65	0.44
853.4	883.4	1.33	0.60	0.42
913.6	943.6	1.23	0.54	0.38
993.9	1023.9	1.23	0.54	0.38
1054.1	1084.1	1.18	0.50	0.35
1134.4	1164.4	1.16	0.51	0.33
1194.7	1224.7	1.23	0.58	0.37
1275.0	1305.0	1.23	0.65	0.39
1335.2	1365.2	1.18	0.68	0.44
1415.5	1445.5	1.10	0.72	0.48
1475.8	1505.8	1.21	0.76	0.54
1556.1	1586.1	1.20	0.79	0.57
1616.3	1646.3	1.17	0.80	0.59
1696.6	1726.6	0.88	0.66	0.55
1756.8	1786.8	0.73	0.53	0.51
1837.2	1867.2	0.52	0.37	0.43
1897.4	1927.4	0.36	0.32	0.43
1977.7	2007.7	0.27	0.36	0.43
2037.9	2067.9	0.42	0.41	0.46
2118.2	2148.2	0.58	0.42	0.38
2178.5	2208.5	0.60	0.47	0.46
2258.8	2288.8	0.75	0.49	0.51
2319.0	2349.0	0.82	0.50	0.47
2399.3	2429.3	1.05	0.58	0.50
2459.6	2489.6	1.17	0.66	0.55
2539.9	2569.9	1.32	0.74	0.60
2600.1	2630.1	1.31	0.74	0.57

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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)
		+17			+17			+17
730.0	20.1	6.09	10.0	20.1	6.48	1000.0	500.1	7.12
711.5	38.6	6.10	30.2	40.3	6.32	979.8	520.3	7.14
693.1	57.0	6.13	50.4	60.5	6.38	959.6	540.5	7.10
674.6	75.5	6.22	70.6	80.7	6.35	939.4	560.7	7.09
656.2	93.9	6.18	90.8	100.9	6.33	919.2	580.9	7.08
637.7	112.4	6.14	111.0	121.1	6.36	899.0	601.1	7.02
619.2	130.9	6.08	131.2	141.3	6.28	878.8	621.3	7.01
600.8	149.3	6.13	151.4	161.5	6.29	858.6	641.5	7.01
582.3	167.8	6.12	171.6	181.7	6.36	838.4	661.7	6.97
563.8	186.3	6.14	191.8	201.9	6.38	818.2	681.9	6.93
545.4	204.7	6.09	212.0	222.1	6.31	798.0	702.1	6.95
526.9	223.2	6.08	232.2	242.3	6.33	777.8	722.3	6.90
508.5	241.6	6.10	252.4	262.5	6.38	757.6	742.5	6.86
490.0	260.1	6.15	272.7	282.8	6.32	737.3	762.8	6.91
471.5	278.6	6.16	292.9	303.0	6.36	717.1	783.0	6.89
453.1	297.0	6.11	313.1	323.2	6.38	696.9	803.2	6.91
434.6	315.5	6.11	333.3	343.4	6.33	676.7	823.4	6.87
416.2	333.9	6.13	353.5	363.6	6.28	656.5	843.6	6.87
397.7	352.4	6.15	373.7	383.8	6.40	636.3	863.8	6.88
379.2	370.9	6.08	393.9	404.0	6.33	616.1	884.0	6.84
360.8	389.3	6.09	434.3	444.4	6.32	575.7	924.4	6.84
342.3	407.8	6.04	454.5	464.6	6.24	555.5	944.6	6.86
323.8	426.3	6.09	494.9	505.0	6.27	515.1	985.0	6.83
305.4	444.7	6.11	515.1	525.2	6.22	494.9	1005.2	6.84
286.9	463.2	6.12	555.5	565.6	6.29	454.5	1045.6	6.87
268.5	481.6	6.07	575.7	585.8	6.25	434.3	1065.8	6.87
250.0	500.1	6.09	616.1	626.2	6.20	393.9	1106.2	6.87
231.5	518.6	6.11	636.3	646.4	6.16	373.7	1126.4	6.88
213.1	537.0	6.17	676.7	686.8	6.14	333.3	1166.8	6.81
194.6	555.5	6.13	696.9	707.0	6.07	313.1	1187.0	6.82
176.2	573.9	6.12	737.3	747.4	6.11	272.7	1227.4	6.83
157.7	592.4	6.13	757.6	767.7	6.09	252.4	1247.7	6.84
139.2	610.9	6.13	798.0	808.1	6.09	212.0	1288.1	6.94
120.8	629.3	6.14	818.2	828.3	6.10	191.8	1308.3	6.95
102.3	647.8	6.11	858.6	868.7	6.10	151.4	1348.7	7.00
83.8	666.3	6.15	878.8	888.9	6.09	131.2	1368.9	6.98
65.4	684.7	6.15	919.2	929.3	6.12	90.8	1409.3	7.04
46.9	703.2	6.20	939.4	949.5	6.10	70.6	1429.5	7.08
28.5	721.6	6.24	979.8	989.9	6.11	30.2	1469.9	7.18
10.0	740.1	6.31	1000.0	1010.1	6.07	10.0	1490.1	7.27

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
10.1	31.02	35.75	40.74	28.35	30.32	32.30
70.3	44.25	50.06	54.46	36.56	40.57	44.61
130.6	48.66	51.88	50.32	37.32	41.65	44.30
190.8	50.48	48.41	46.41	37.59	40.81	41.48
251.0	48.61	45.13	42.96	37.62	39.54	38.99
311.3	45.98	42.35	41.38	37.78	38.49	37.48
371.5	43.59	40.26	39.95	37.50	37.42	36.09
431.7	41.24	38.81	39.19	37.72	36.61	34.87
492.0	39.21	37.54	38.13	38.06	36.09	34.22
552.2	37.79	37.44	38.07	38.04	35.78	33.45
612.4	36.80	37.27	37.86	38.19	35.05	33.03
672.7	35.79	36.32	37.23	38.04	34.44	32.57
732.9	34.73	35.71	36.81	37.74	33.82	31.90
793.1	34.12	35.35	36.65	37.09	33.23	31.62
853.4	34.08	35.16	36.45	36.58	32.73	31.12
913.6	34.00	35.06	36.43	36.71	32.95	31.26
993.9	33.52	34.68	36.12	36.68	33.68	31.97
1054.1	32.65	33.68	35.27	36.02	33.12	31.68
1134.4	30.89	32.59	34.60	35.11	33.38	31.90
1194.7	30.13	32.11	34.32	34.71	33.59	32.16
1275.0	30.01	31.90	33.99	33.75	33.74	32.76
1335.2	29.73	31.54	33.65	32.97	34.09	33.45
1415.5	29.28	31.08	33.06	32.54	34.62	34.76
1475.8	28.80	30.36	32.12	32.63	35.16	35.90
1556.1	27.95	29.19	30.92	32.49	35.68	37.43
1616.3	27.24	28.48	30.16	32.33	36.54	39.46
1696.6	26.59	27.89	29.44	32.32	37.79	42.81
1756.8	25.84	27.25	28.89	31.79	36.89	40.64
1837.2	24.98	26.62	28.44	29.70	32.62	34.37
1897.4	24.40	26.25	28.15	28.68	30.36	31.07
1977.7	23.80	26.03	28.39	27.53	28.13	28.39
2037.9	23.39	25.86	28.40	26.87	27.19	27.25
2118.2	22.87	25.62	28.42	26.13	26.09	26.05
2178.5	22.62	25.33	28.11	25.72	25.45	25.21
2258.8	22.38	25.00	27.52	24.89	24.39	23.98
2319.0	22.07	24.61	26.86	24.72	23.99	23.38
2399.3	21.88	24.27	25.95	24.62	23.71	23.01
2459.6	21.88	24.20	25.53	24.57	23.44	22.66
2539.9	21.62	23.70	24.56	24.71	23.62	22.51
2600.1	21.41	23.49	24.35	24.70	23.46	22.15

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	19.63	19.76	19.78
70.3	100.3	23.35	23.31	23.22
130.6	160.6	23.61	23.56	23.59
190.8	220.8	23.76	23.71	23.74
251.0	281.0	24.00	24.05	24.17
311.3	341.3	24.28	24.44	24.46
371.5	401.5	24.62	24.75	24.63
431.7	461.7	25.11	25.27	25.23
492.0	522.0	25.63	25.70	25.68
552.2	582.2	26.34	25.93	25.82
612.4	642.4	27.27	26.76	26.71
672.7	702.7	28.01	27.44	27.26
732.9	762.9	28.83	27.98	27.51
793.1	823.1	29.33	28.79	28.40
853.4	883.4	29.77	29.42	29.15
913.6	943.6	29.86	29.28	28.87
993.9	1023.9	30.50	29.59	29.06
1054.1	1084.1	31.08	29.70	29.05
1134.4	1164.4	31.73	29.85	29.01
1194.7	1224.7	32.47	30.35	29.39
1275.0	1305.0	32.90	30.16	29.08
1335.2	1365.2	33.08	29.76	28.67
1415.5	1445.5	30.79	28.66	27.86
1475.8	1505.8	29.48	27.76	27.19
1556.1	1586.1	27.57	26.34	26.15
1616.3	1646.3	26.57	25.76	25.49
1696.6	1726.6	25.64	25.26	25.39
1756.8	1786.8	25.09	25.00	25.49
1837.2	1867.2	25.64	26.38	27.49
1897.4	1927.4	26.36	27.64	28.69
1977.7	2007.7	26.80	28.06	29.17
2037.9	2067.9	26.60	27.94	28.98
2118.2	2148.2	26.52	27.19	27.54
2178.5	2208.5	25.93	26.66	26.86
2258.8	2288.8	25.60	26.16	26.34
2319.0	2349.0	25.79	26.31	26.49
2399.3	2429.3	25.60	26.28	26.62
2459.6	2489.6	25.84	26.78	27.20
2539.9	2569.9	26.26	27.29	27.88
2600.1	2630.1	26.06	27.36	27.92

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	1.40	1.34	1.34	10.1	1.43	1.74	2.39	10.0	1.44	1.22	1.10
70.3	100.3	1.27	1.12	1.04	70.3	1.06	1.59	2.38	30.2	1.50	1.28	1.17
130.6	160.6	1.28	1.12	1.02	130.6	1.06	1.63	2.47	50.4	1.44	1.22	1.13
190.8	220.8	1.31	1.15	1.05	190.8	1.04	1.55	2.30	70.6	1.41	1.17	1.05
251.0	281.0	1.32	1.16	1.06	251.0	1.04	1.58	2.34	90.8	1.44	1.20	1.07
311.3	341.3	1.35	1.18	1.07	311.3	1.02	1.57	2.31	111.0	1.48	1.23	1.09
371.5	401.5	1.38	1.18	1.09	371.5	1.02	1.53	2.23	131.2	1.49	1.25	1.11
431.7	461.7	1.39	1.19	1.10	431.7	1.03	1.54	2.25	151.4	1.45	1.21	1.08
492.0	522.0	1.40	1.19	1.12	492.0	1.04	1.51	2.19	171.6	1.43	1.18	1.06
552.2	582.2	1.39	1.20	1.13	552.2	1.04	1.49	2.15	191.8	1.46	1.22	1.09
612.4	642.4	1.38	1.21	1.15	612.4	1.05	1.49	2.14	212.0	1.50	1.25	1.12
672.7	702.7	1.35	1.21	1.16	672.7	1.07	1.45	2.07	232.2	1.46	1.22	1.09
732.9	762.9	1.34	1.23	1.18	732.9	1.09	1.43	2.05	252.4	1.43	1.19	1.06
793.1	823.1	1.33	1.23	1.18	793.1	1.13	1.41	2.02	272.7	1.45	1.21	1.08
853.4	883.4	1.33	1.23	1.19	853.4	1.17	1.40	1.97	292.9	1.47	1.23	1.11
913.6	943.6	1.35	1.25	1.21	913.6	1.21	1.39	1.96	313.1	1.47	1.23	1.10
993.9	1023.9	1.40	1.28	1.24	993.9	1.25	1.38	1.91	333.3	1.47	1.23	1.10
1054.1	1084.1	1.42	1.31	1.27	1054.1	1.28	1.36	1.88	353.5	1.46	1.22	1.10
1134.4	1164.4	1.46	1.34	1.29	1134.4	1.31	1.32	1.83	373.7	1.44	1.21	1.10
1194.7	1224.7	1.50	1.37	1.31	1194.7	1.34	1.29	1.77	393.9	1.46	1.22	1.11
1275.0	1305.0	1.53	1.37	1.30	1275.0	1.39	1.26	1.72	434.3	1.47	1.24	1.12
1335.2	1365.2	1.58	1.39	1.31	1335.2	1.43	1.25	1.70	454.5	1.44	1.21	1.10
1415.5	1445.5	1.63	1.43	1.33	1415.5	1.44	1.22	1.65	494.9	1.48	1.25	1.16
1475.8	1505.8	1.66	1.45	1.35	1475.8	1.43	1.20	1.61	515.1	1.48	1.25	1.16
1556.1	1586.1	1.71	1.50	1.40	1556.1	1.43	1.16	1.58	555.5	1.47	1.25	1.15
1616.3	1646.3	1.76	1.55	1.44	1616.3	1.44	1.13	1.56	575.7	1.46	1.25	1.17
1696.6	1726.6	1.84	1.65	1.55	1696.6	1.43	1.08	1.52	616.1	1.49	1.27	1.18
1756.8	1786.8	1.87	1.71	1.62	1756.8	1.43	1.06	1.48	636.3	1.50	1.28	1.19
1837.2	1867.2	1.95	1.80	1.73	1837.2	1.46	1.09	1.46	676.7	1.47	1.25	1.17
1897.4	1927.4	2.02	1.85	1.77	1897.4	1.48	1.14	1.47	696.9	1.50	1.28	1.20
1977.7	2007.7	2.05	1.89	1.80	1977.7	1.51	1.22	1.48	737.3	1.48	1.28	1.21
2037.9	2067.9	2.04	1.89	1.82	2037.9	1.54	1.26	1.48	757.6	1.51	1.29	1.22
2118.2	2148.2	2.01	1.88	1.80	2118.2	1.56	1.31	1.51	798.0	1.50	1.30	1.24
2178.5	2208.5	2.00	1.87	1.78	2178.5	1.54	1.35	1.55	818.2	1.50	1.30	1.24
2258.8	2288.8	1.96	1.84	1.75	2258.8	1.51	1.40	1.58	858.6	1.52	1.33	1.28
2319.0	2349.0	1.91	1.81	1.73	2319.0	1.51	1.43	1.60	878.8	1.53	1.33	1.28
2399.3	2429.3	1.87	1.76	1.68	2399.3	1.48	1.49	1.67	919.2	1.52	1.33	1.28
2459.6	2489.6	1.82	1.70	1.60	2459.6	1.47	1.54	1.73	939.4	1.50	1.32	1.29
2539.9	2569.9	1.74	1.62	1.49	2539.9	1.47	1.58	1.76	979.8	1.54	1.36	1.31
2600.1	2630.1	1.71	1.59	1.45	2600.1	1.46	1.59	1.77	1000.0	1.53	1.35	1.30

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	23	16	25	24	30	39	54	46	37
1	-	22	+0	35	11	36	25	33	29	45	38	54
2	>100	57	46	54	48	54	47	57	55	57	61	64
3	>100	70	61	70	59	70	58	68	57	67	58	88
4	>100	93	78	82	88	81	90	84	80	92	91	93
5	>100	>93	92	>93	>93	>93	91	92	90	91	91	>93
6	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
7	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -1.00 dBm.
LO IN: 780.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.28 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	20	32	28	34	35	44	57	68	49	59
1	-	22	+0	32	12	36	26	38	35	49	47	56
2	99	44	40	46	43	48	44	51	46	50	59	65
3	>100	54	51	52	46	55	43	50	50	47	48	56
4	>100	61	56	67	54	64	55	57	55	58	62	61
5	>100	66	55	66	55	64	53	60	53	56	53	62
6	>100	75	63	79	66	73	76	73	79	75	64	78
7	>100	88	70	92	73	82	69	80	67	74	66	69
8	>100	>103	82	93	80	81	76	84	76	87	73	84
9	>100	101	92	>103	84	86	84	87	82	83	81	78
10	>100	92	96	98	93	95	94	93	96	95	88	99
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; 9.00 dBm.
LO IN: 780.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.74 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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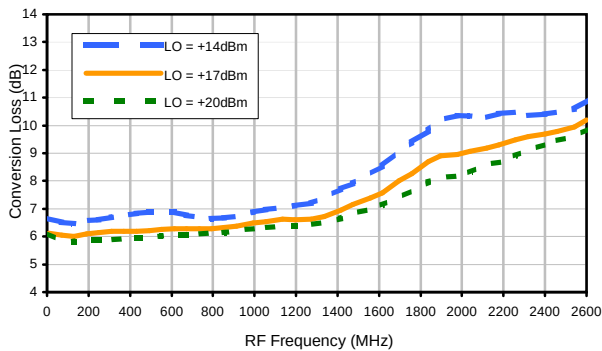


Frequency Mixer

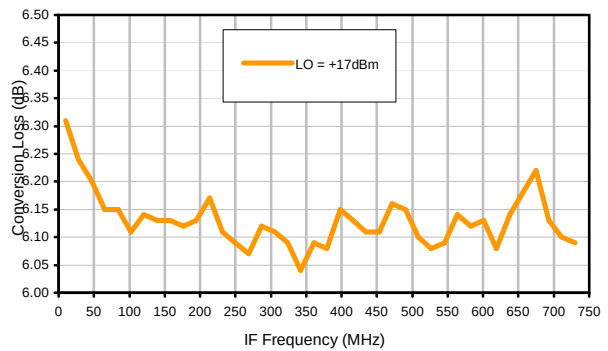
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Typical Performance Curves

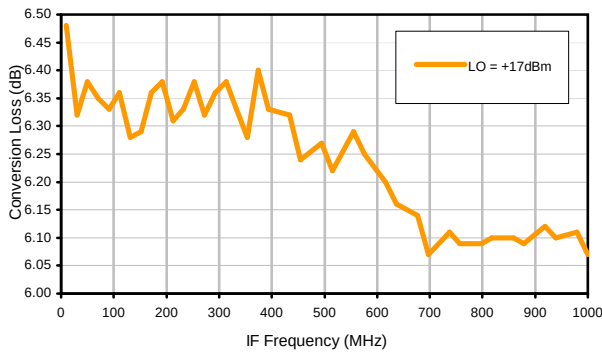
Conversion Loss @ IF=30MHz



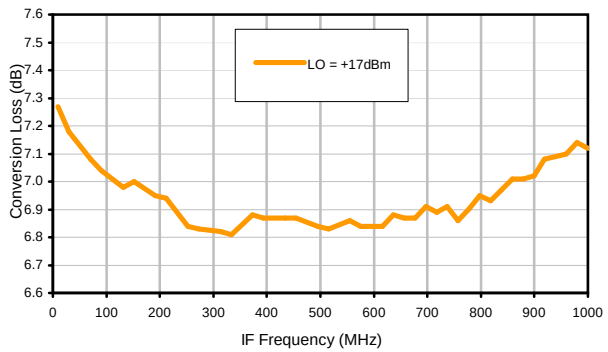
Conversion Loss vs. IF @ RF=750.1MHz



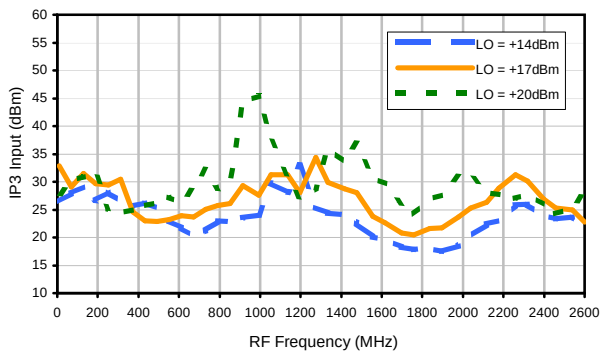
Conversion Loss vs. IF @ RF=10.1MHz



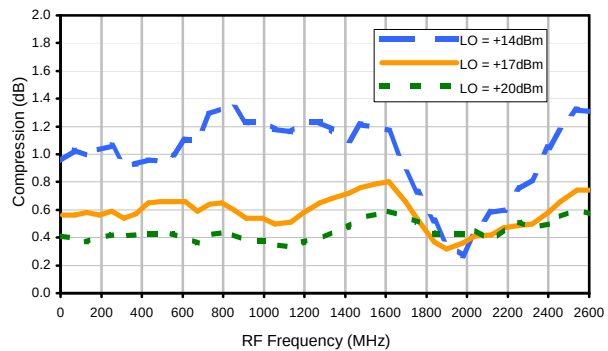
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



Compression @ RF IN=+14dBm



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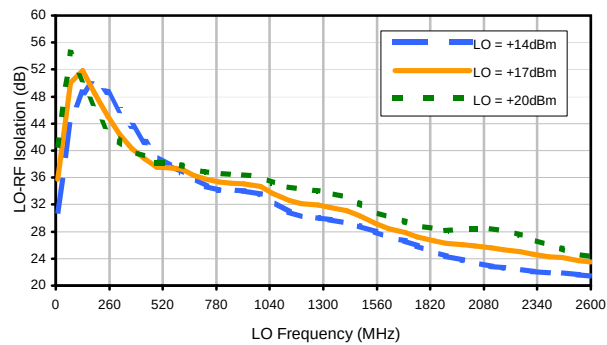


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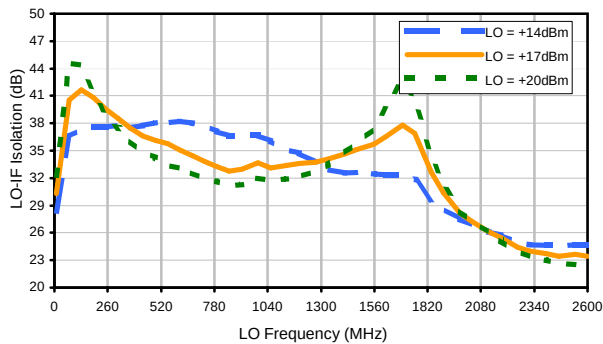


Typical Performance Curves

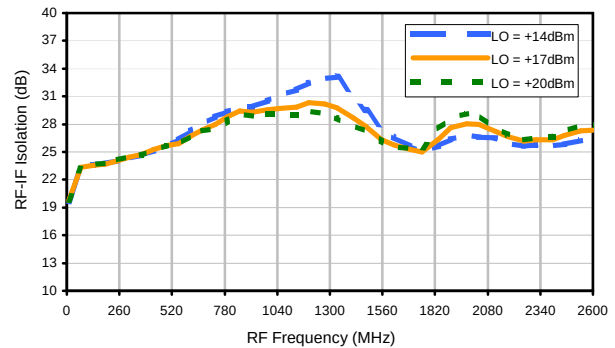
LO-RF Isolation



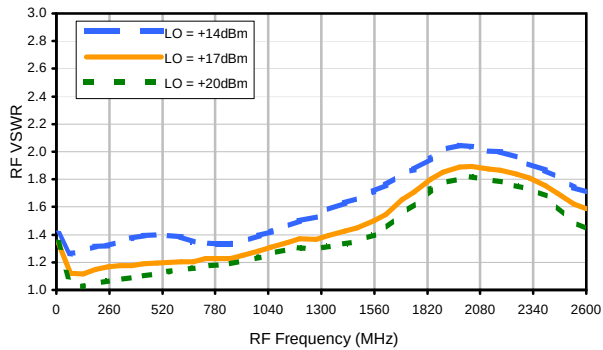
LO-IF Isolation



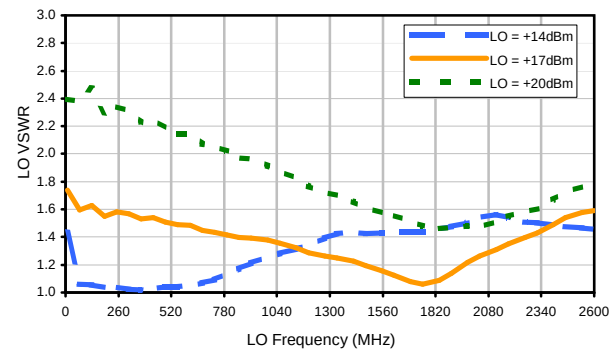
RF-IF Isolation



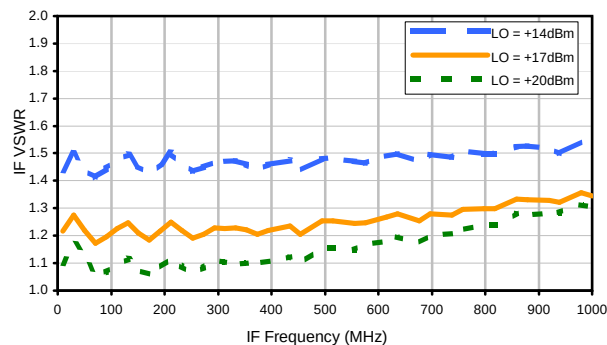
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

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	(-dBm)	(-dBc)										
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2	>100	57	46	54	48	54	47	57	55	57	61	64
3	>100	70	61	70	59	70	58	68	57	67	58	88
4	>100	93	78	82	88	81	90	84	80	92	91	93
5	>100	>93	92	>93	>93	>93	91	92	90	91	91	>93
6	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
7	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -1.00 dBm.
LO IN: 780.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.28 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	20	32	28	34	35	44	57	68	49	59
1	-	22	+0	32	12	36	26	38	35	49	47	56
2	99	44	40	46	43	48	44	51	46	50	59	65
3	>100	54	51	52	46	55	43	50	50	47	48	56
4	>100	61	56	67	54	64	55	57	55	58	62	61
5	>100	66	55	66	55	64	53	60	53	56	53	62
6	>100	75	63	79	66	73	76	73	79	75	64	78
7	>100	88	70	92	73	82	69	80	67	74	66	69
8	>100	>103	82	93	80	81	76	84	76	87	73	84
9	>100	101	92	>103	84	86	84	87	82	83	81	78
10	>100	92	96	98	93	95	94	93	96	95	88	99
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; 9.00 dBm.
LO IN: 780.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.74 dBm

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



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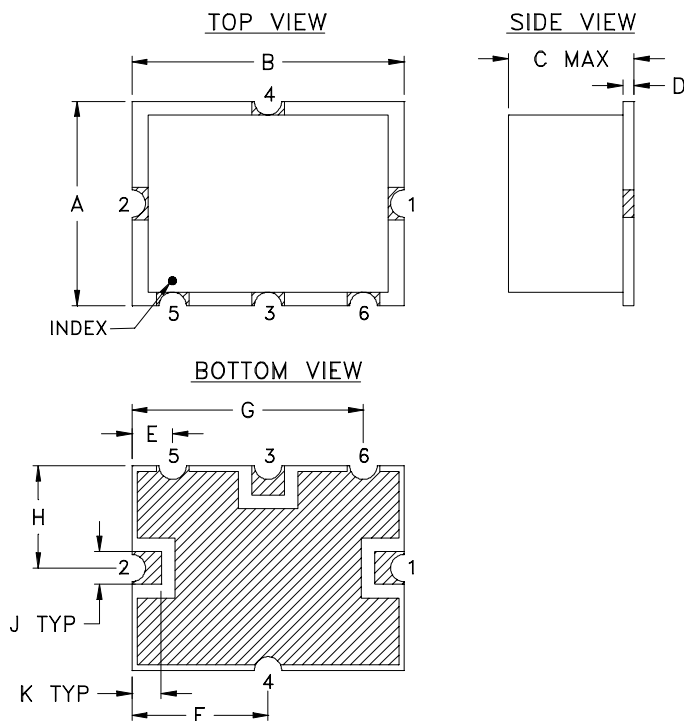
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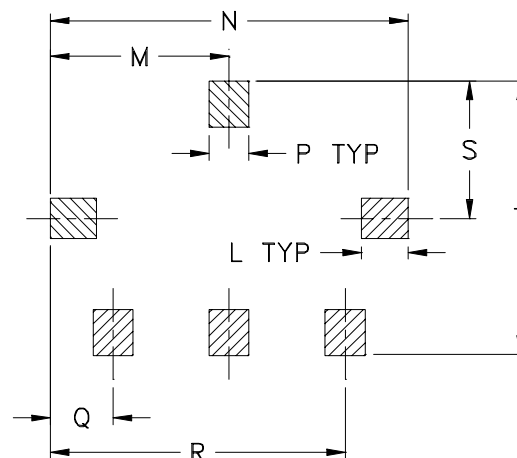


Outline Dimensions

TTT166
TTT167



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N
TTT166	.38 (9.65)	.50 (12.70)	.15 (3.81)	.020 (0.51)	.075 (1.91)	.250 (6.35)	.425 (10.80)	.187 (4.75)	.050 (1.27)	.050 (1.27)	.070 (1.78)	.270 (6.86)	.540 (13.72)
TTT167			.23 (5.84)										

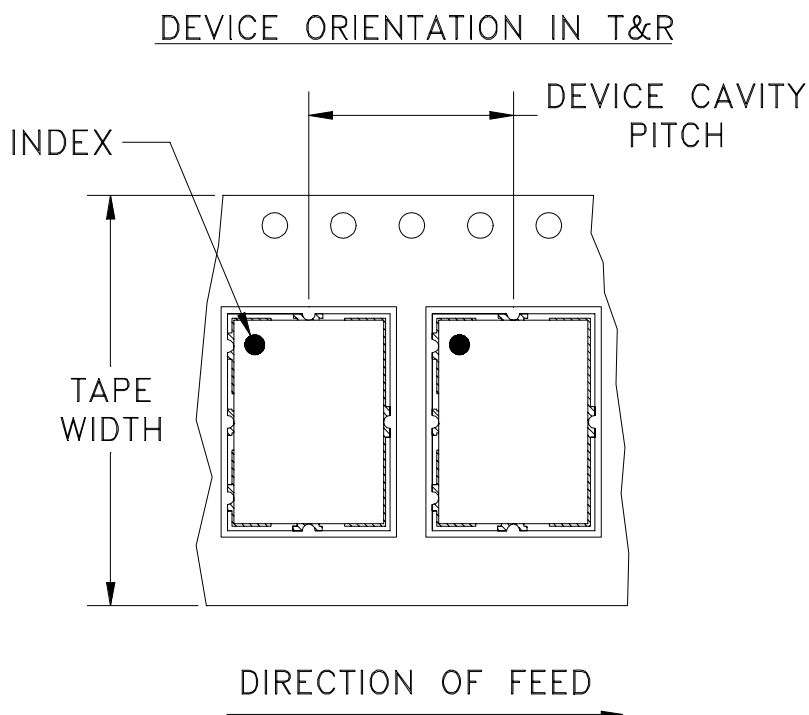
CASE #	P	Q	R	S	T	WT. GRAM
TTT166	.060 (1.52)	.095 (2.41)	.445 (11.30)	.208 (5.28)	.415 (10.54)	.8
TTT167						.8

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

Note:

- Case material: Plastic.
- Base material: Printed wiring laminate.
- Termination finish:
 - For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate. All models, (+) suffix.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F12



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	12	7	Small quantity standards (see note)	10
				20
				50
				100
				200
		13	Standard	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



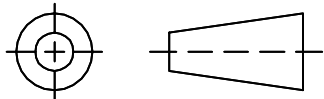
INTERNET <http://www.minicircuits.com>

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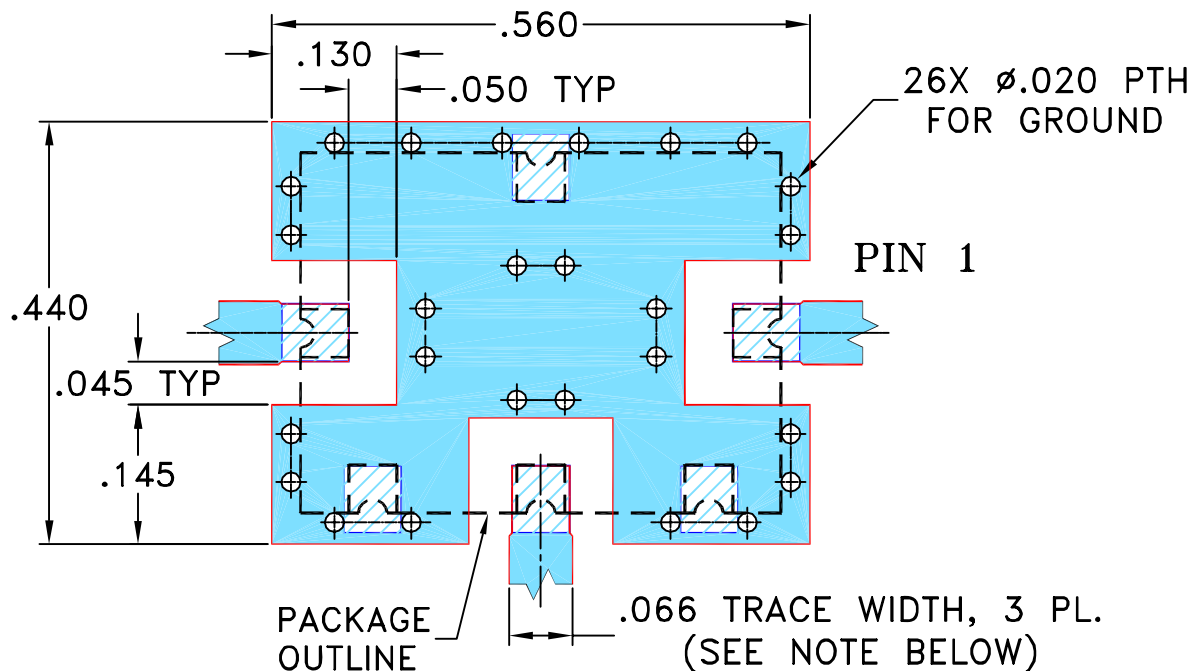
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M86762	ADDED CONNECTIONS "lp & lq"	05/23/03	MMG	WL
B	M94598	ADDED CONNECTION "hk"	10/08/04	MMG	HY
C	M102713	UPDATED NOTES & DESCRIPTION	01/14/06	GF	IL
D	M132989	UPDATED NOTE 2	08/24/11	GF	DJ

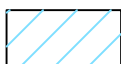
**SUGGESTED MOUNTING CONFIGURATION FOR
TTT166/167 CASE STYLE, "hk"/"lp"/"lq"
"x"/"ck"/"ec" PIN CONNECTIONS**

**NOTE:**

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

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INITIALS

DATE

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03/18/03

CHECKED

IL

04/15/03

APPROVED

DJ

04/15/03



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Brooklyn NY 11235

PL, hk/lp/lq/x/ck/ec, TTT166/167,
SYM/HJK/SYAS/SYPD, TB-12

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-079

REV:
D

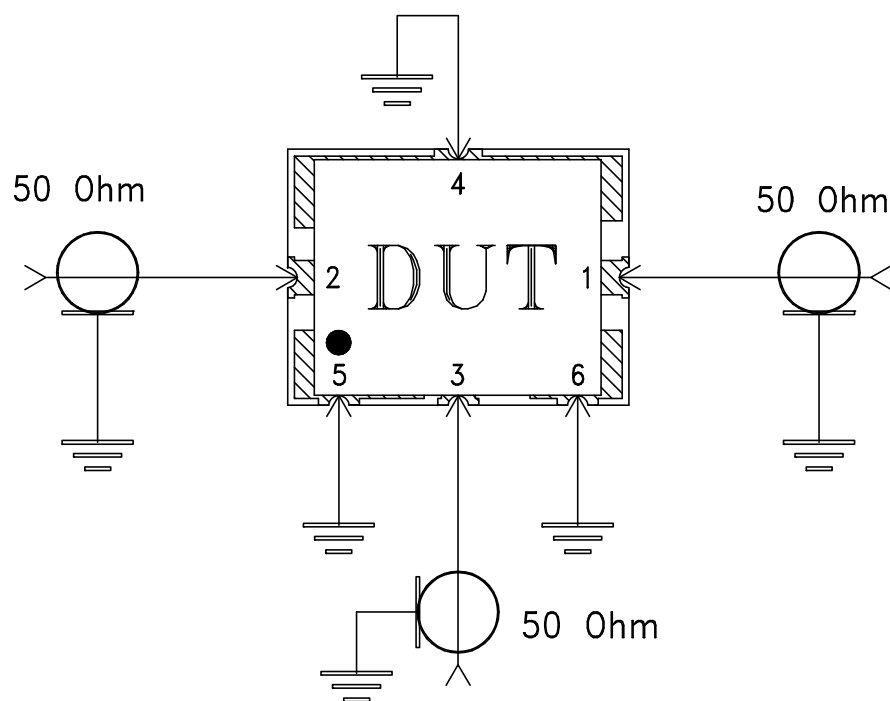
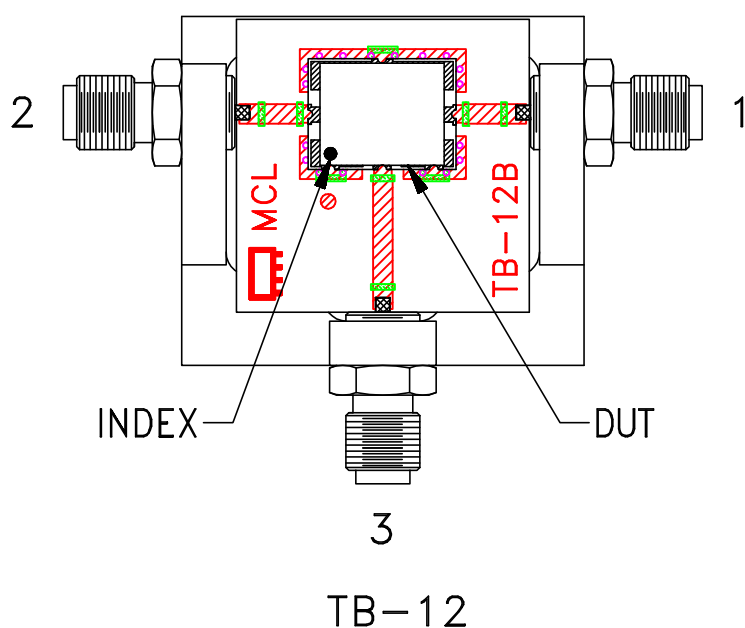
FILE: 98PL079

SCALE: 5:1

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=.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