

Frequency Mixer

SCM-1



CASE STYLE: YY109

Level 7 (LO Power +7 dBm) 1 to 500 MHz

Maximum Ratings

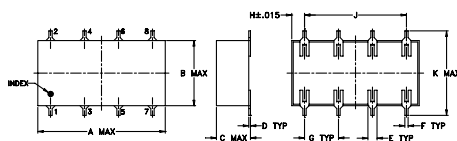
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

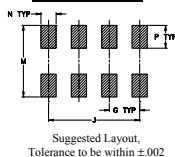
LO	8
RF	1
IF	3,4^
GROUND	2,5,6,7

^ pins must be connected together externally

Outline Drawing

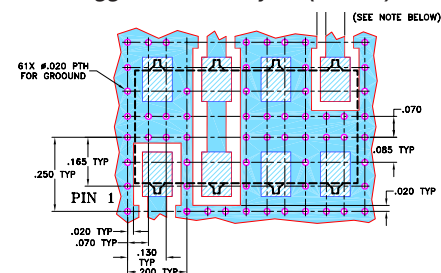


PCB Land Pattern



Outline Dimensions (inch mm)

A	B	C	D	E	F	G
.75	.38	.20	.010	.050	.020	.200
19.05	9.65	5.08	0.25	1.27	0.51	5.08
H	J	K	M	N	P	wt
.075	.600	.720	.740	.100	.150	grams
1.91	15.24	18.29	18.80	2.54	3.81	1.6

Demo Board MCL P/N: TB-170
Suggested PCB Layout (PL-084)

- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 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.
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Features

- low conversion loss, 5.72 dB typ.
- excellent L-R & L-I isolation, 45 dB typ.
- IF response to DC

Applications

- VHF/UHF
- defense-federal communications
- instrumentation

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
LO/RF	IF	Mid-Band m			Total Range Max.	L		M		U		L		M		U		
		$\overline{X}$	σ	Max.		Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	
		f_L - f_U																
1-500	DC-500	5.72	0.10	7.0	8.0	60	40	45	35	40	30	50	40	45	35	40	25	10

1 dB COMP.: +1 dBm typ.

L = low range [f_L to $10 f_L$]
m = mid band [$2 f_L$ to $f_U/2$]

M = mid range [$10 f_L$ to $f_U/2$]
U = upper range [$f_U/2$ to f_U]

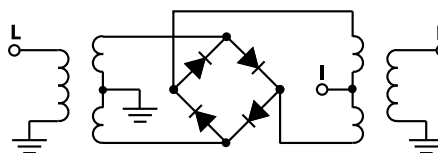
1 dB COMP.: +1 dBm typ.

L = low range [f_L to $10 f_L$]m = mid band [$2f_L$ to $f_U/2$]M = mid range [$10 f_L$ to $f_U/2$]U = upper range [$f_U/2$ to f_U]

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
1.00	31.00	6.20	72.88	66.78	1.23	2.68
2.00	32.00	6.16	72.45	67.15	1.14	2.55
5.00	35.00	5.16	72.07	67.07	1.11	2.69
10.00	40.00	5.46	70.97	66.57	1.12	2.66
20.00	50.00	5.51	68.99	65.69	1.13	2.52
32.19	62.19	5.48	65.97	64.17	1.13	2.50
50.00	80.00	5.52	62.51	62.11	1.15	2.48
78.97	48.97	5.53	59.28	58.98	1.15	2.49
100.00	70.00	5.46	57.50	57.03	1.16	2.50
125.75	95.75	5.33	56.16	55.12	1.17	2.52
156.94	126.94	5.36	54.05	52.46	1.19	2.54
188.13	158.13	5.50	51.97	51.08	1.22	2.54
219.31	189.31	5.56	50.13	49.66	1.27	2.53
250.00	220.00	5.61	50.85	46.65	1.30	2.50
281.69	251.69	5.72	48.93	45.50	1.36	2.56
328.47	298.47	5.69	46.10	46.51	1.47	2.61
375.25	345.25	5.80	43.70	44.36	1.67	2.59
422.03	392.03	6.12	45.26	41.75	1.76	2.72
453.22	423.22	6.26	45.18	41.16	1.84	2.87
500.00	470.00	6.56	43.13	42.64	1.92	3.00

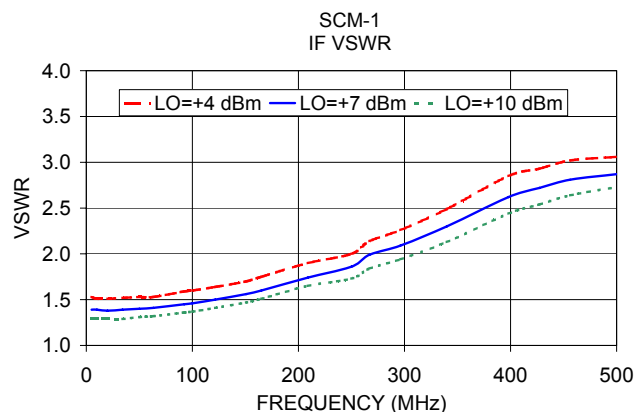
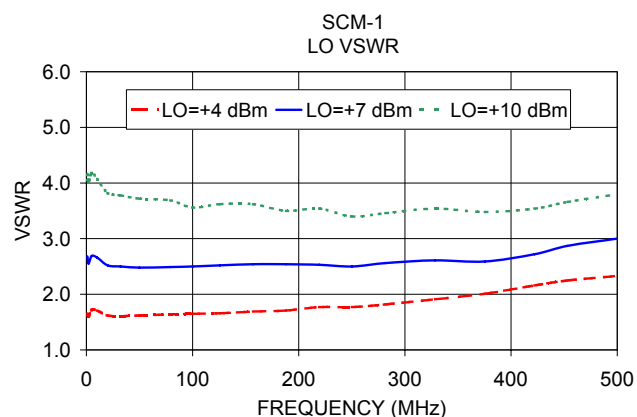
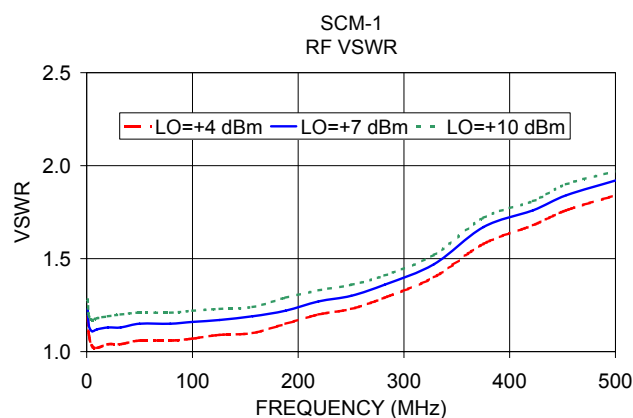
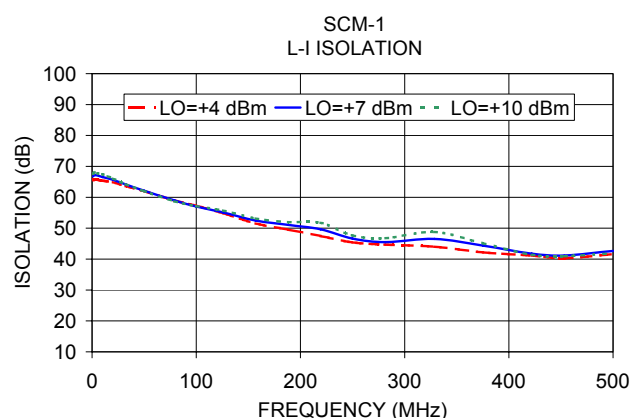
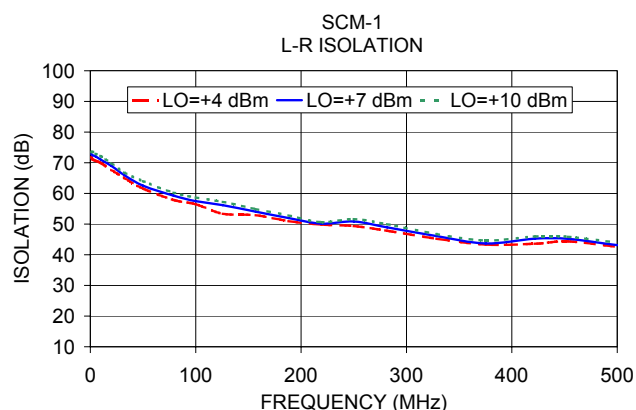
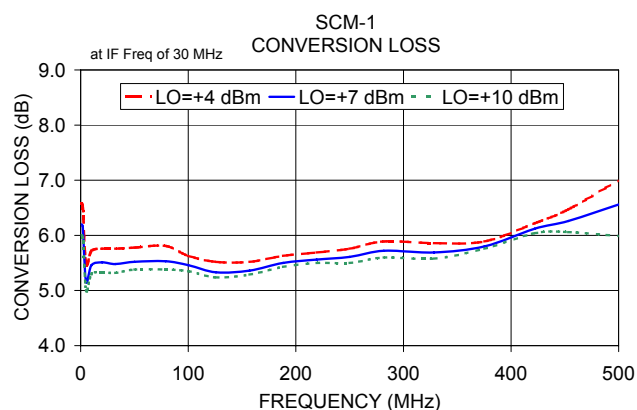
Electrical Schematic



Notes

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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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=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
+4	+7	+10	+4	+7	+10	+4	+7	+10	+4	+7	+10			
1.0	31.0	6.58	6.20	6.00	10.1	40.1	17.20	16.57	26.49	10.1	40.1	1.56	1.23	0.96
2.0	32.0	6.53	6.16	5.97	29.9	59.9	21.93	19.53	22.48	29.9	59.9	1.43	1.19	0.89
5.0	35.0	5.48	5.16	5.00	49.7	79.7	17.74	21.95	24.06	49.7	79.7	1.45	1.13	0.88
10.0	40.0	5.72	5.46	5.30	69.4	99.4	20.19	24.52	20.76	69.4	99.4	1.42	1.08	0.85
29.9	59.9	5.70	5.35	5.24	89.2	119.2	16.06	23.84	19.89	89.2	119.2	1.28	1.09	0.80
49.7	79.7	5.69	5.42	5.29	109.0	139.0	23.09	20.18	17.98	109.0	139.0	1.33	0.99	0.75
69.4	99.4	5.63	5.45	5.29	128.8	158.8	21.75	19.22	19.01	128.8	158.8	1.27	1.03	0.77
89.2	119.2	5.67	5.42	5.32	148.5	178.5	22.77	20.61	20.12	148.5	178.5	1.28	0.97	0.75
109.0	139.0	5.65	5.43	5.32	168.3	198.3	20.59	20.23	19.02	168.3	198.3	1.26	0.96	0.74
128.8	158.8	5.70	5.43	5.35	188.1	218.1	17.88	17.08	17.35	188.1	218.1	1.25	0.92	0.72
148.5	178.5	5.69	5.45	5.35	207.9	237.9	15.95	17.58	19.00	207.9	237.9	1.23	0.95	0.72
188.1	218.1	5.74	5.52	5.41	227.7	257.7	16.36	15.56	16.35	227.7	257.7	1.25	0.95	0.76
207.9	237.9	5.71	5.51	5.40	247.4	277.4	13.90	12.99	14.54	247.4	277.4	1.15	0.88	0.68
227.7	257.7	5.78	5.56	5.46	267.2	297.2	14.42	15.63	18.83	267.2	297.2	1.21	0.94	0.75
247.4	277.4	5.80	5.59	5.46	287.0	317.0	14.49	16.34	24.65	287.0	317.0	1.21	0.95	0.75
267.2	297.2	5.87	5.63	5.49	306.8	336.8	15.29	14.43	16.86	306.8	336.8	1.18	0.93	0.73
287.0	317.0	5.88	5.65	5.48	326.5	356.5	15.68	14.77	17.58	326.5	356.5	1.26	0.96	0.75
306.8	336.8	5.98	5.74	5.60	346.3	376.3	17.53	17.91	20.54	346.3	376.3	1.36	1.05	0.82
326.5	356.5	6.03	5.79	5.65	366.1	396.1	16.32	25.40	20.84	366.1	396.1	1.42	1.12	0.88
346.3	376.3	6.02	5.76	5.66	385.9	415.9	10.89	15.77	21.75	385.9	415.9	1.47	1.15	0.91
366.1	396.1	6.16	5.89	5.68	405.7	435.7	9.12	10.79	14.75	405.7	435.7	1.56	1.30	1.05
385.9	415.9	6.15	5.89	5.72	425.4	455.4	8.25	9.04	12.36	425.4	455.4	1.64	1.32	1.07
405.7	435.7	6.24	5.97	5.80	445.2	475.2	7.51	8.05	9.44	445.2	475.2	1.81	1.46	1.21
445.2	475.2	6.43	6.21	6.03	465.0	495.0	7.13	7.79	8.86	465.0	495.0	1.94	1.57	1.28
465.0	495.0	6.50	6.21	6.07	484.8	514.8	7.29	8.49	9.79	484.8	514.8	2.05	1.65	1.37
484.8	514.8	6.51	6.28	6.08	504.5	534.5	7.29	9.16	11.77	504.5	534.5	2.20	1.81	1.53
504.5	534.5	6.63	6.32	6.13	524.3	554.3	8.10	11.69	16.75	524.3	554.3	2.21	1.81	1.52
524.3	554.3	6.62	6.29	6.07	544.1	574.1	8.86	14.08	22.59	544.1	574.1	2.44	2.02	1.70
544.1	574.1	6.73	6.29	6.10	583.7	613.7	7.98	19.40	17.77	583.7	613.7	2.34	2.05	1.66
583.7	613.7	7.07	6.43	6.16	603.4	633.4	6.26	13.86	16.63	603.4	633.4	2.33	2.11	1.76
603.4	633.4	7.26	6.58	6.18	643.0	673.0	5.33	9.10	15.05	643.0	673.0	2.12	1.99	1.78
643.0	673.0	7.79	7.01	6.43	662.8	692.8	5.62	8.78	14.77	662.8	692.8	1.97	1.86	1.67
662.8	692.8	7.84	7.11	6.50	702.3	732.3	6.15	8.50	12.32	702.3	732.3	1.79	1.68	1.54
702.3	732.3	8.32	7.56	6.93	722.1	752.1	5.88	8.15	10.61	722.1	752.1	1.56	1.47	1.38
722.1	752.1	8.71	8.00	7.38	761.7	791.7	5.50	6.77	8.82	761.7	791.7	1.45	1.35	1.29
781.4	811.4	9.54	8.91	8.28	781.4	811.4	5.39	6.24	8.02	781.4	811.4	1.23	1.06	1.04
821.0	851.0	9.94	9.41	8.91	821.0	851.0	5.56	5.46	6.24	821.0	851.0	1.18	1.02	0.96
840.8	870.8	10.25	9.63	9.09	840.8	870.8	5.38	5.41	6.10	840.8	870.8	1.11	0.97	0.91
880.3	910.3	10.69	10.12	9.56	880.3	910.3	6.41	6.45	7.56	880.3	910.3	1.02	0.89	0.91
900.1	930.1	10.72	10.22	9.73	900.1	930.1	7.38	7.27	8.91	900.1	930.1	0.95	0.86	0.91

REV. X2

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (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)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
240.0	10.1	5.58	10.0	20.1	5.30	490.0	10.1	6.22
234.1	16.0	5.58	22.3	32.4	5.13	477.7	22.4	6.14
228.2	21.9	5.51	34.6	44.7	5.12	465.4	34.7	6.08
222.3	27.8	5.50	46.9	57.0	5.17	453.1	47.0	6.09
216.4	33.7	5.48	59.2	69.3	5.15	440.8	59.3	6.14
210.5	39.6	5.47	71.5	81.6	5.16	428.5	71.6	6.09
204.6	45.5	5.48	83.8	93.9	5.16	416.2	83.9	6.05
198.7	51.4	5.45	96.2	106.3	5.16	403.8	96.3	6.04
192.8	57.3	5.43	108.5	118.6	5.16	391.5	108.6	6.01
186.9	63.2	5.41	120.8	130.9	5.16	379.2	120.9	6.05
181.0	69.1	5.44	133.1	143.2	5.16	366.9	133.2	6.07
175.1	75.0	5.45	145.4	155.5	5.20	354.6	145.5	6.04
169.2	80.9	5.44	157.7	167.8	5.26	342.3	157.8	6.06
163.3	86.8	5.42	170.0	180.1	5.22	330.0	170.1	6.06
157.4	92.7	5.42	182.3	192.4	5.25	317.7	182.4	6.05
151.5	98.6	5.43	194.6	204.7	5.24	305.4	194.7	6.09
145.6	104.5	5.45	206.9	217.0	5.25	293.1	207.0	6.06
139.7	110.4	5.46	219.2	229.3	5.28	280.8	219.3	6.06
133.8	116.3	5.44	231.5	241.6	5.28	268.5	231.6	6.10
127.9	122.2	5.41	243.8	253.9	5.30	256.2	243.9	6.11
122.1	128.0	5.42	256.2	266.3	5.34	243.8	256.3	6.17
116.2	133.9	5.44	268.5	278.6	5.29	231.5	268.6	6.16
110.3	139.8	5.47	280.8	290.9	5.34	219.2	280.9	6.12
104.4	145.7	5.47	293.1	303.2	5.35	206.9	293.2	6.17
98.5	151.6	5.45	305.4	315.5	5.35	194.6	305.5	6.16
92.6	157.5	5.46	317.7	327.8	5.42	182.3	317.8	6.14
86.7	163.4	5.46	330.0	340.1	5.44	170.0	330.1	6.18
80.8	169.3	5.48	342.3	352.4	5.46	157.7	342.4	6.19
74.9	175.2	5.48	354.6	364.7	5.49	145.4	354.7	6.17
69.0	181.1	5.47	366.9	377.0	5.51	133.1	367.0	6.17
63.1	187.0	5.46	379.2	389.3	5.52	120.8	379.3	6.15
57.2	192.9	5.47	391.5	401.6	5.53	108.5	391.6	6.14
51.3	198.8	5.49	403.8	413.9	5.48	96.2	403.9	6.18
45.4	204.7	5.51	416.2	426.3	5.59	83.8	416.3	6.16
39.5	210.6	5.53	428.5	438.6	5.59	71.5	428.6	6.23
33.6	216.5	5.53	440.8	450.9	5.55	59.2	440.9	6.27
27.7	222.4	5.52	453.1	463.2	5.50	46.9	453.2	6.24
21.8	228.3	5.55	465.4	475.5	5.46	34.6	465.5	6.30
15.9	234.2	5.57	477.7	487.8	5.42	22.3	477.8	6.35
10.0	240.1	5.66	490.0	500.1	5.38	10.0	490.1	6.41

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
1.0	71.78	72.88	73.48	65.58	66.78	67.58
2.0	71.15	72.45	73.65	65.65	67.15	68.05
5.0	70.67	72.07	72.97	65.67	67.07	67.77
10.0	69.97	70.97	72.17	65.37	66.57	67.47
29.9	59.00	60.81	62.36	61.78	62.73	62.05
49.7	54.88	56.45	58.18	60.63	60.96	61.51
69.4	51.66	53.55	55.32	58.79	60.68	59.12
89.2	49.56	51.53	53.33	57.51	58.39	57.35
109.0	47.77	49.77	51.60	56.01	57.00	56.31
128.8	46.83	48.98	50.63	53.79	55.11	54.76
148.5	45.65	47.70	49.45	52.16	53.70	53.53
188.1	43.80	45.72	47.28	48.95	51.10	51.83
207.9	42.99	45.04	46.64	47.51	49.71	50.63
227.7	42.33	44.30	45.93	46.36	48.66	49.89
247.4	41.37	43.43	45.09	45.16	47.64	49.00
267.2	41.03	42.85	44.53	44.04	46.54	48.26
287.0	40.47	42.15	43.69	43.17	45.39	47.26
306.8	39.84	41.81	43.48	42.26	44.66	46.31
326.5	39.76	41.76	43.46	41.59	44.31	46.15
346.3	39.53	41.26	42.93	40.66	43.22	45.66
366.1	39.30	41.11	42.60	40.15	42.86	45.36
385.9	38.47	40.27	41.80	39.40	42.16	44.99
405.7	38.51	40.65	42.36	39.16	41.91	44.37
445.2	37.23	39.41	41.42	37.58	40.45	43.09
465.0	37.33	39.43	41.35	37.52	40.31	43.01
484.8	36.51	38.65	40.67	36.49	39.14	41.94
504.5	36.16	38.27	40.27	36.29	38.93	41.70
524.3	35.43	37.50	39.52	35.83	38.35	41.10
544.1	35.50	37.73	39.95	35.60	38.18	40.91
583.7	34.80	37.30	39.67	35.34	37.86	40.61
603.4	35.12	37.59	39.83	35.85	38.35	41.06
643.0	34.67	37.28	39.63	36.07	38.69	41.07
662.8	34.05	36.61	39.22	35.55	38.41	40.85
702.3	34.38	36.82	39.30	35.60	38.70	41.65
722.1	34.53	37.03	39.74	35.08	38.05	41.28
781.4	35.84	38.43	41.32	34.21	35.79	37.09
821.0	36.95	39.66	42.51	33.48	34.35	34.86
840.8	37.27	39.91	42.88	33.34	33.82	34.10
880.3	38.34	40.94	43.45	32.69	32.62	32.45
900.1	38.45	41.14	43.27	32.21	32.00	31.61

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	43.36	44.14	50.29
29.9	59.9	41.81	42.55	41.55
49.7	79.7	37.80	38.48	38.81
69.4	99.4	34.74	35.66	36.08
89.2	119.2	33.47	33.95	34.43
109.0	139.0	32.03	32.53	32.86
128.8	158.8	31.21	31.65	32.25
148.5	178.5	30.40	30.95	31.45
168.3	198.3	30.05	30.62	31.06
188.1	218.1	29.95	30.62	31.12
207.9	237.9	29.49	30.40	31.13
227.7	257.7	29.54	30.58	31.45
247.4	277.4	29.33	30.32	31.07
267.2	297.2	29.29	30.27	31.12
287.0	317.0	29.80	30.69	31.54
306.8	336.8	29.95	30.78	31.45
326.5	356.5	31.06	32.24	32.96
346.3	376.3	31.07	32.44	33.50
366.1	396.1	30.60	31.92	33.06
385.9	415.9	29.60	30.59	31.17
405.7	435.7	27.51	27.82	27.98
425.4	455.4	26.54	26.60	26.52
445.2	475.2	24.88	24.79	24.66
465.0	495.0	24.25	24.07	23.78
484.8	514.8	23.60	23.43	23.20
504.5	534.5	22.85	22.59	22.31
524.3	554.3	22.76	22.54	22.29
544.1	574.1	22.42	22.10	21.84
583.7	613.7	22.42	21.89	21.48
603.4	633.4	22.69	21.98	21.38
643.0	673.0	23.30	22.63	21.80
662.8	692.8	23.67	23.01	22.18
702.3	732.3	23.32	22.84	22.23
722.1	752.1	22.94	22.56	22.03
761.7	791.7	21.19	20.89	20.43
781.4	811.4	20.27	20.03	19.64
821.0	851.0	18.40	18.08	17.71
840.8	870.8	17.41	16.92	16.51
880.3	910.3	15.87	15.14	14.46
900.1	930.1	14.95	14.10	13.42

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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=500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
5.0	35.0	1.19	1.23	1.28	5.0	1.65	2.68	4.16	5.0	1.53	1.39	1.29
10.0	40.0	1.09	1.14	1.19	10.0	1.60	2.55	4.01	10.0	1.51	1.39	1.29
29.9	59.9	1.14	1.06	1.00	29.9	1.94	2.82	3.87	22.6	2.01	1.84	1.68
49.7	79.7	1.12	1.05	1.03	49.7	1.96	2.81	3.91	35.1	1.93	1.75	1.61
69.4	99.4	1.10	1.03	1.04	69.4	1.88	2.65	3.62	47.7	1.84	1.66	1.53
89.2	119.2	1.12	1.04	1.06	89.2	1.89	2.72	3.72	60.3	1.83	1.66	1.53
109.0	139.0	1.08	1.05	1.08	109.0	1.86	2.63	3.61	72.8	1.88	1.71	1.57
128.8	158.8	1.08	1.05	1.08	128.8	1.94	2.75	3.76	85.4	1.93	1.76	1.63
148.5	178.5	1.08	1.07	1.10	148.5	1.94	2.74	3.73	97.9	1.97	1.81	1.67
168.3	198.3	1.08	1.07	1.11	168.3	1.90	2.65	3.58	110.5	2.00	1.83	1.69
188.1	218.1	1.07	1.09	1.12	188.1	1.95	2.74	3.67	123.1	2.01	1.83	1.70
207.9	237.9	1.07	1.11	1.14	207.9	1.94	2.71	3.65	135.6	1.98	1.81	1.67
227.7	257.7	1.08	1.10	1.14	227.7	2.04	2.84	3.81	148.2	1.93	1.77	1.65
247.4	277.4	1.08	1.11	1.14	247.4	2.01	2.78	3.70	160.8	1.92	1.77	1.65
267.2	297.2	1.09	1.11	1.15	267.2	2.05	2.81	3.72	173.3	1.96	1.81	1.69
287.0	317.0	1.11	1.14	1.18	287.0	2.07	2.77	3.63	185.9	2.03	1.88	1.75
306.8	336.8	1.12	1.15	1.18	306.8	2.07	2.81	3.70	198.5	2.08	1.92	1.80
326.5	356.5	1.13	1.17	1.20	326.5	2.15	2.91	3.79	211.0	2.09	1.94	1.81
346.3	376.3	1.15	1.20	1.24	346.3	2.17	2.89	3.76	223.6	2.05	1.90	1.79
366.1	396.1	1.15	1.21	1.26	366.1	2.28	3.06	3.93	236.2	2.01	1.87	1.75
385.9	415.9	1.17	1.23	1.29	385.9	2.19	2.87	3.70	248.7	2.01	1.87	1.76
405.7	435.7	1.16	1.21	1.27	405.7	2.27	2.98	3.80	261.3	2.05	1.91	1.80
425.4	455.4	1.17	1.21	1.26	425.4	2.34	3.05	3.89	273.8	2.10	1.96	1.86
445.2	475.2	1.16	1.20	1.23	445.2	2.34	3.05	3.87	286.4	2.12	1.99	1.88
465.0	495.0	1.16	1.19	1.22	465.0	2.48	3.20	4.02	299.0	2.09	1.96	1.86
484.8	514.8	1.18	1.20	1.22	484.8	2.39	3.07	3.86	311.5	2.06	1.94	1.84
504.5	534.5	1.20	1.21	1.22	504.5	2.51	3.20	4.01	324.1	2.05	1.93	1.83
524.3	554.3	1.25	1.26	1.27	524.3	2.50	3.16	3.94	336.7	2.06	1.94	1.85
544.1	574.1	1.32	1.31	1.32	544.1	2.59	3.25	4.01	349.2	2.08	1.96	1.87
583.7	613.7	1.52	1.49	1.49	583.7	2.66	3.25	3.97	361.8	2.07	1.97	1.88
603.4	633.4	1.65	1.60	1.60	603.4	2.82	3.43	4.15	374.4	2.07	1.96	1.88
643.0	673.0	1.96	1.88	1.84	643.0	2.98	3.65	4.35	386.9	2.08	1.97	1.89
662.8	692.8	2.12	2.04	1.98	662.8	2.90	3.52	4.23	399.5	2.11	2.00	1.91
702.3	732.3	2.52	2.41	2.31	702.3	3.05	3.67	4.37	412.1	2.12	2.00	1.92
722.1	752.1	2.76	2.65	2.54	722.1	3.08	3.69	4.42	424.6	2.08	1.97	1.89
761.7	791.7	3.20	3.07	2.95	761.7	3.17	3.75	4.45	437.2	2.04	1.93	1.86
781.4	811.4	3.45	3.32	3.20	781.4	3.29	3.87	4.57	449.7	2.03	1.93	1.86
821.0	851.0	3.82	3.72	3.60	821.0	3.39	3.97	4.66	462.3	2.07	1.96	1.88
840.8	870.8	4.00	3.88	3.76	840.8	3.45	3.95	4.61	474.9	2.11	2.00	1.92
880.3	910.3	4.27	4.12	3.98	880.3	3.52	4.00	4.62	487.4	2.11	2.01	1.94
900.1	930.1	4.31	4.18	4.04	900.1	3.50	3.90	4.51	500.0	2.22	2.29	2.34

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	24	19	26	30	41	38	51	38	39
1	-	25	+0	34	11	40	16	38	35	66	49	39
2	>100	70	55	63	54	73	53	65	63	77	71	76
3	>100	67	61	67	61	75	56	72	64	>80	76	>80
4	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
5	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
6	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
7	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
8	>100	>80	>80	>80	>80	>80	>80	>80	79	>80	>80	>80
9	>100	>80	>80	>80	>80	>80	>80	>80	>80	66	>80	>80
10	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	68	>80
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.
LO IN: 280.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -19.78 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	29	36	30	40	41	54	50	65	50	54
1	-	26	+0	35	12	40	18	43	37	66	52	48
2	>100	51	49	59	49	54	51	54	70	67	63	70
3	>100	48	41	50	42	58	38	63	41	57	57	73
4	>100	62	70	64	64	63	61	67	58	70	70	81
5	>100	70	68	69	54	66	52	70	54	64	62	79
6	>100	86	80	76	90	78	86	77	81	73	77	76
7	>100	>90	75	90	73	84	75	88	68	>90	64	74
8	>100	>90	>90	88	>90	80	>90	84	>90	85	86	>90
9	>100	>90	>90	>90	82	>90	77	90	82	71	83	>90
10	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	83	>90
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -4.00 dBm.
LO IN: 280.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -9.68 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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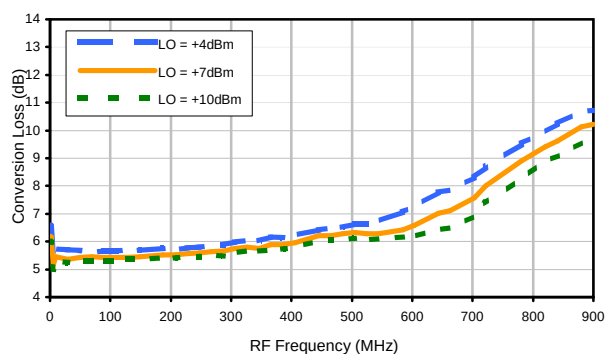
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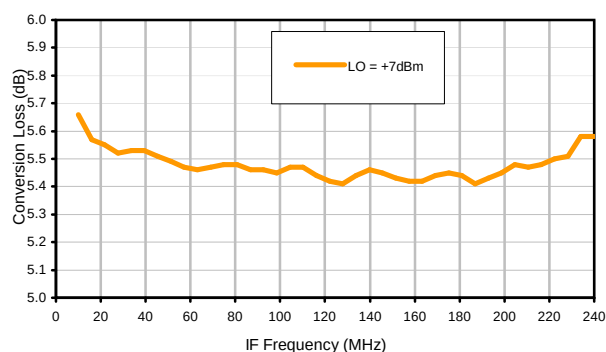


Typical Performance Curves

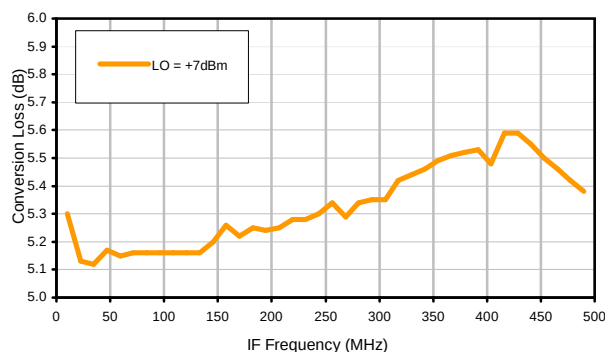
Conversion Loss @ IF=30MHz



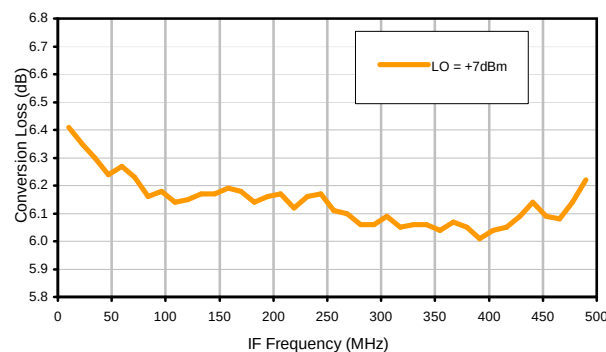
Conversion Loss vs. IF @ RF=250.1MHz



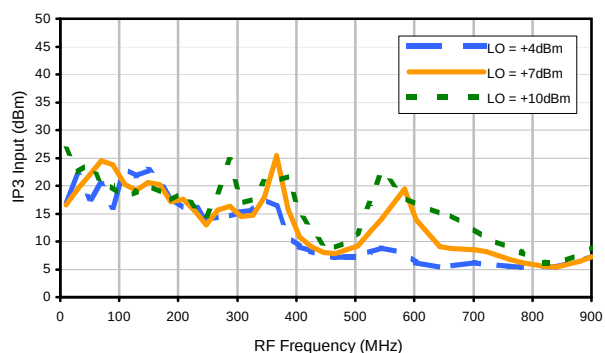
Conversion Loss vs. IF @ RF=10.1MHz



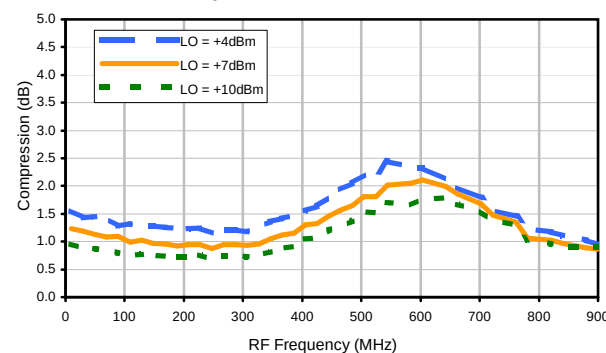
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input

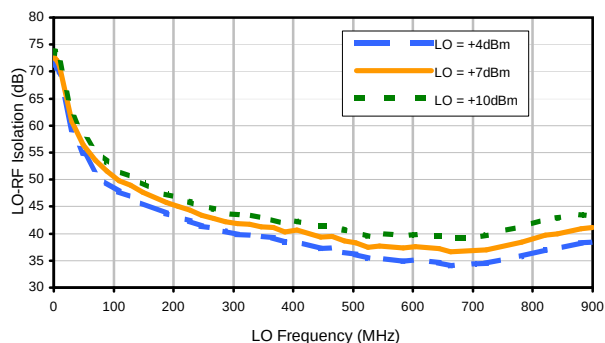


Compression @ RF IN=+1dBm

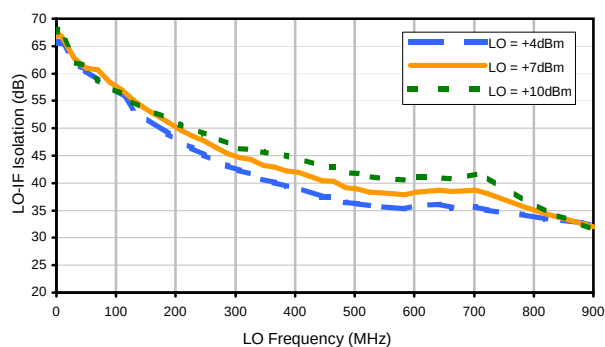


Typical Performance Curves

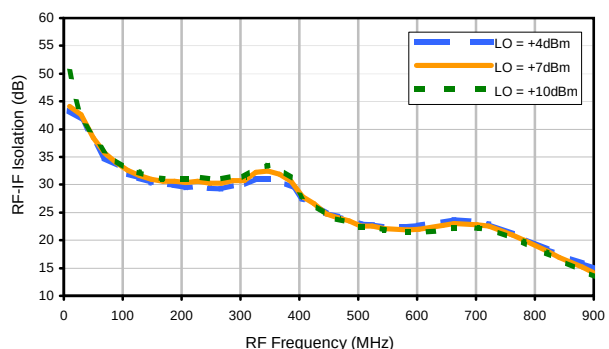
LO-RF Isolation



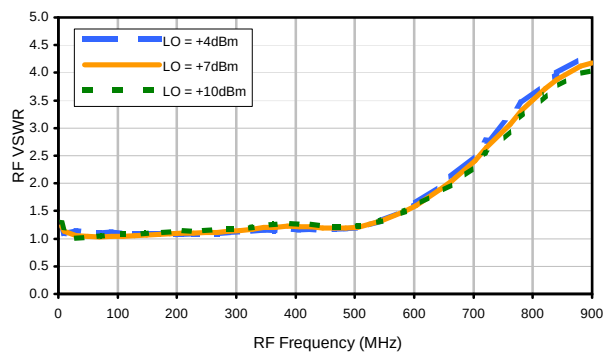
LO-IF Isolation



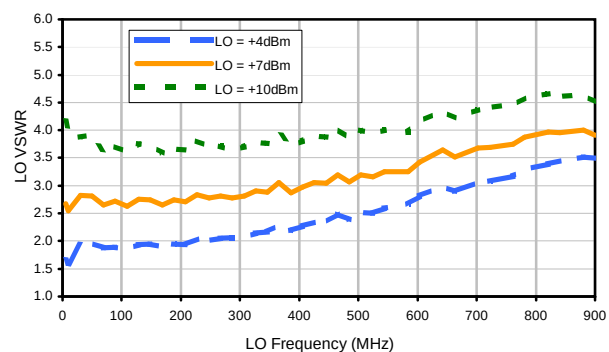
RF-IF Isolation



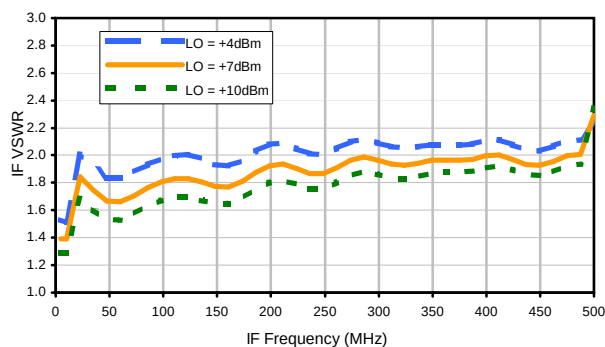
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	24	19	26	30	41	38	51	38	39
1	-	25	+0	34	11	40	16	38	35	66	49	39
2	>100	70	55	63	54	73	53	65	63	77	71	76
3	>100	67	61	67	61	75	56	72	64	>80	76	>80
4	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
5	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
6	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
7	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
8	>100	>80	>80	>80	>80	>80	>80	>80	79	>80	>80	>80
9	>100	>80	>80	>80	>80	>80	>80	>80	>80	66	>80	>80
10	>100	>80	>80	>80	>80	>80	>80	>80	>80	>80	68	>80
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.
LO IN: 280.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -19.78 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	29	36	30	40	41	54	50	65	50	54
1	-	26	+0	35	12	40	18	43	37	66	52	48
2	>100	51	49	59	49	54	51	54	70	67	63	70
3	>100	48	41	50	42	58	38	63	41	57	57	73
4	>100	62	70	64	64	63	61	67	58	70	70	81
5	>100	70	68	69	54	66	52	70	54	64	62	79
6	>100	86	80	76	90	78	86	77	81	73	77	76
7	>100	>90	75	90	73	84	75	88	68	>90	64	74
8	>100	>90	>90	88	>90	80	>90	84	>90	85	86	>90
9	>100	>90	>90	>90	82	>90	77	90	82	71	83	>90
10	>100	>90	>90	>90	>90	>90	>90	>90	>90	>90	83	>90
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -4.00 dBm.
LO IN: 280.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -9.68 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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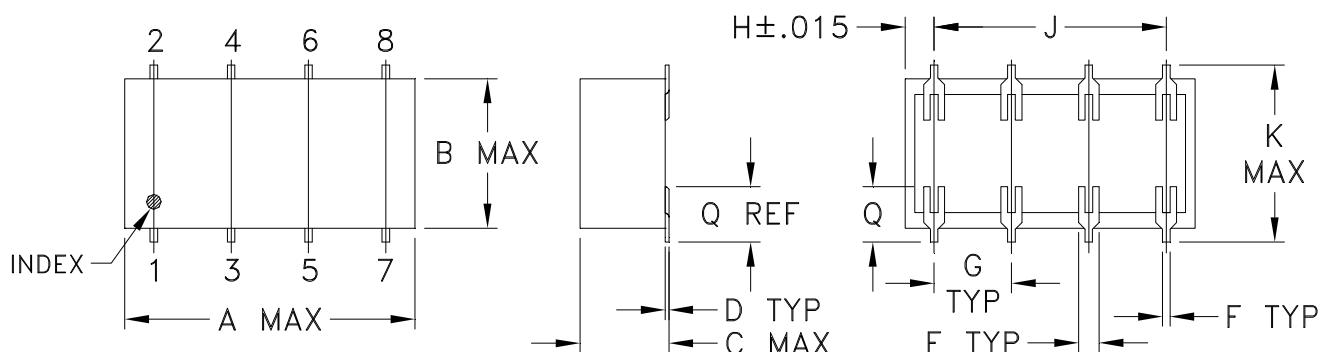
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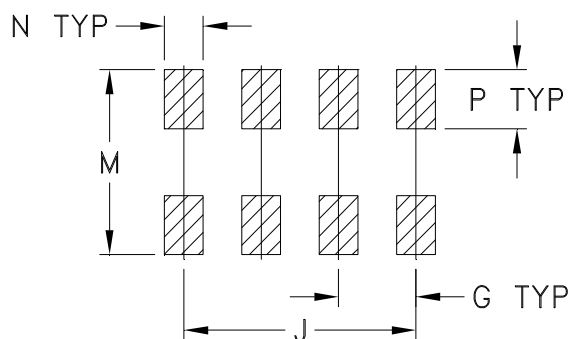


Outline Dimensions

YY101
YY109
YY161



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	P	Q	WT. GRAM S
YY101*			.20 (5.08)							.450 (11.43)	--	.470 (11.94)				1.6
YY109*	.75 (19.05)	.38 (9.65)	.20 (5.08)	.010 (0.25)	.050 (1.27)	.020 (0.51)	.200 (5.08)	.075 (1.91)	.600 (15.24)	.720 (18.29)	--	.740 (18.80)	.100 (2.54)	.150 (3.81)	.148 (3.76)	1.6
YY161			.28 (7.11)							.450 (11.43)	--	.470 (11.94)				1.6

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

Notes:

- Case material: Plastic.
- Termination finish:
For RoHS Case Styles: Tin plate over Nickel plate.
For RoHS-5 Case Styles: Tin-Lead plate.
- Special Tolerances: Termination thickness $\pm .003$ inch.
- * Denotes: For SCM mixers, long termination version (case YY109) is available upon request, consult factory. To order short termination version (case YY101) add -NL suffix.



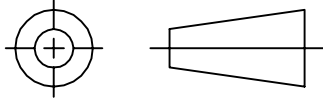
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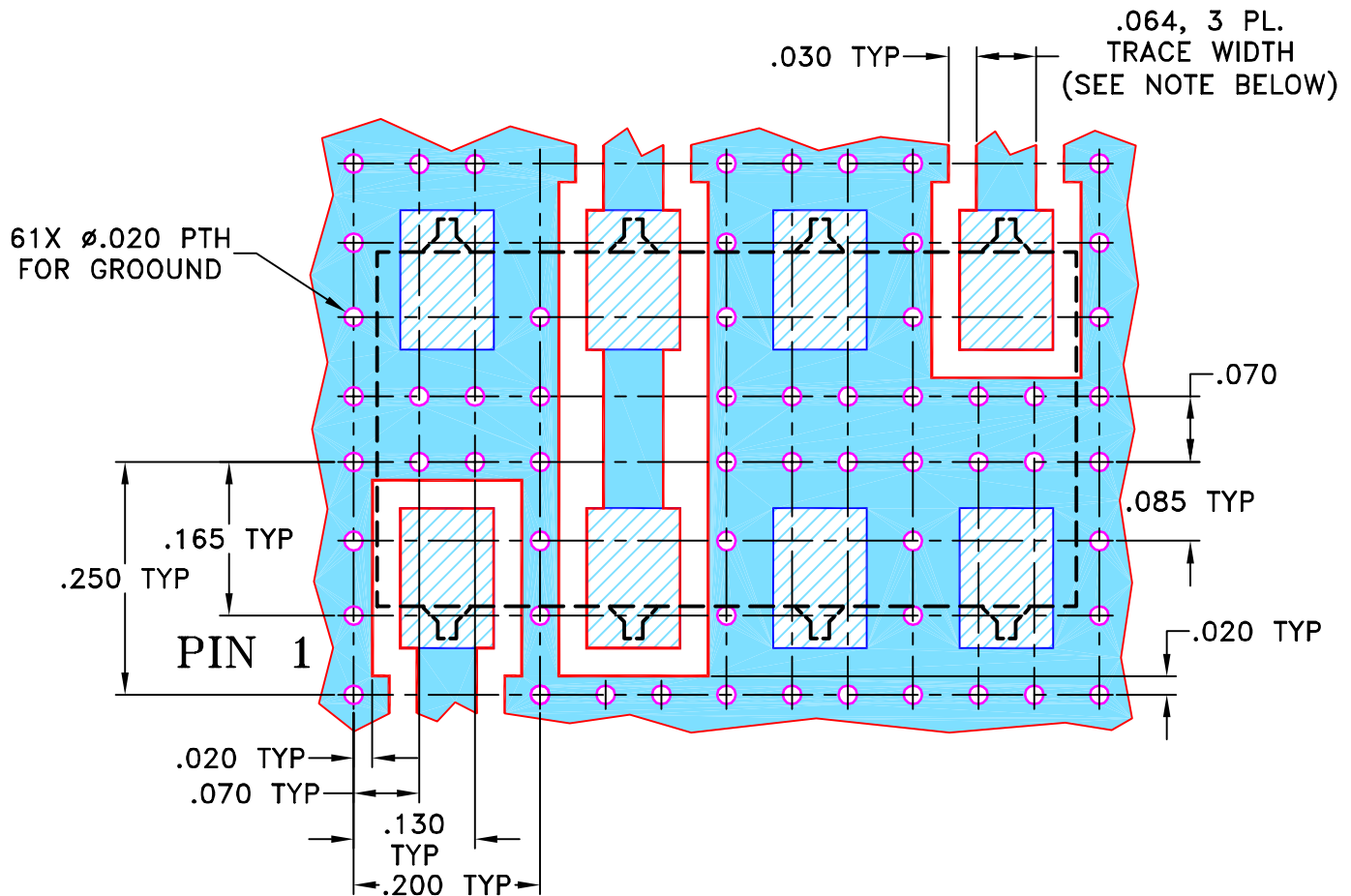
THIRD ANGLE PROJECTION



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 YY101 CASE STYLE, "d" 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

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$.005
ANGLES $\pm$
FRACTIONS $\pm$

DRAWN

AV

07/22/02

CHECKED

WL

08/02/02

APPROVED

DJ

08/02/02



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, d, YY101, SCM, TB-170

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SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-084

REV:
A

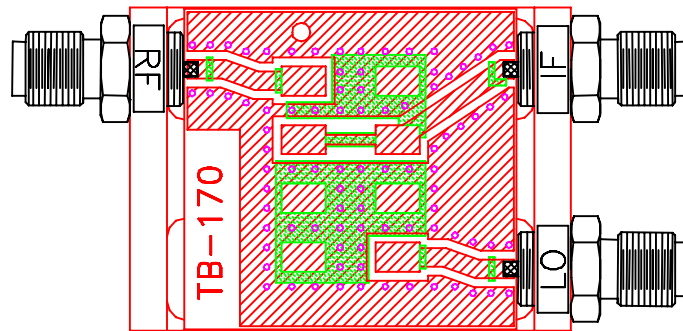
FILE: 98PL084

SCALE: 5:1

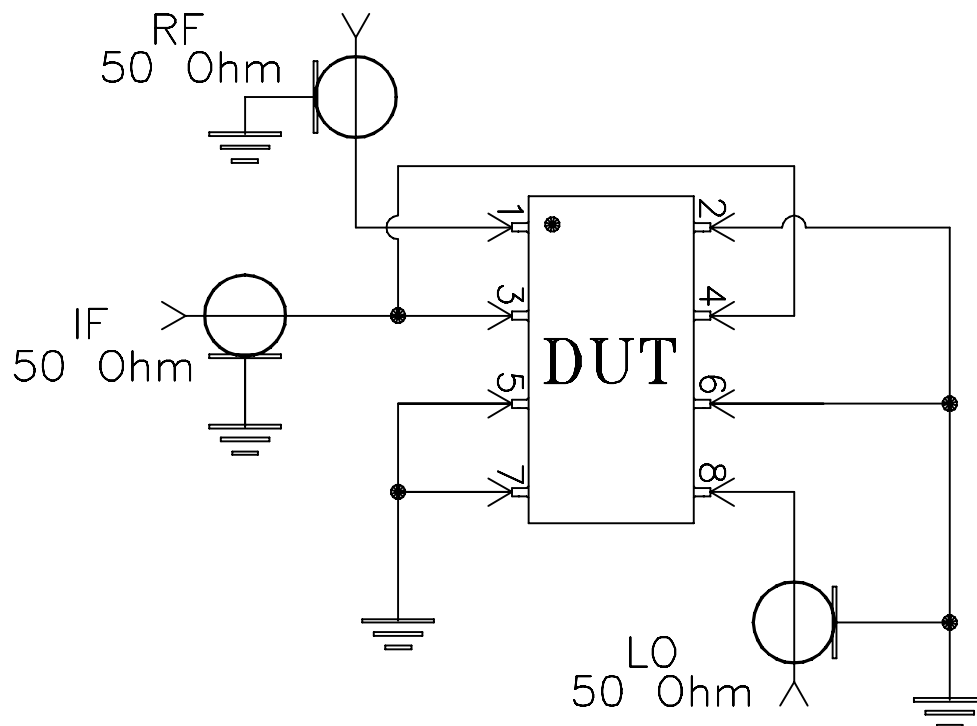
SHEET: 1 OF 1

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

Evaluation Board and Circuit



TB-170



Schematic Diagram

Notes:

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