

Surface Mount Frequency Mixer

Level 7 (LO Power +7 dBm) 5 to 1000 MHz

SCM-2+



Generic photo used for illustration purposes only

CASE STYLE: YY109

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
GROUND	2,4,5,6,7

Features

- low conversion loss, 5.76 dB typ.
- high isolation, 40 dB typ.
- wideband, 5 to 1000 MHz

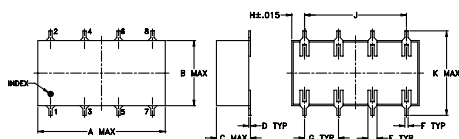
Applications

- VHF/UHF
- cellular
- GSM/ISM

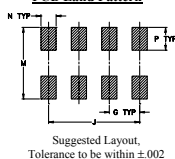
+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Outline Drawing



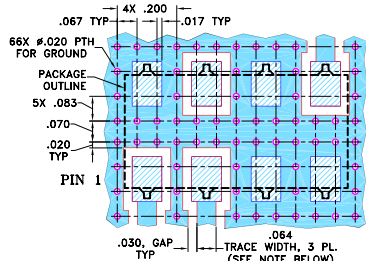
PCB Land Pattern



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-172 Suggested PCB Layout (PL-132)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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

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.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
LO/RF f_L - f_U	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.		
5-1000	DC-500	5.76	0.03	8.3	9.8	50	40	40	25	35	20	55	30	40	25	30	18	11

1 dB COMP.: +1 dBm typ.

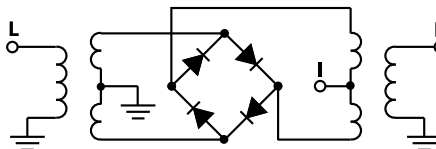
L = low range [f_L to $10 f_L$]
m= mid band [$2f_L$ to $f_U/2$]

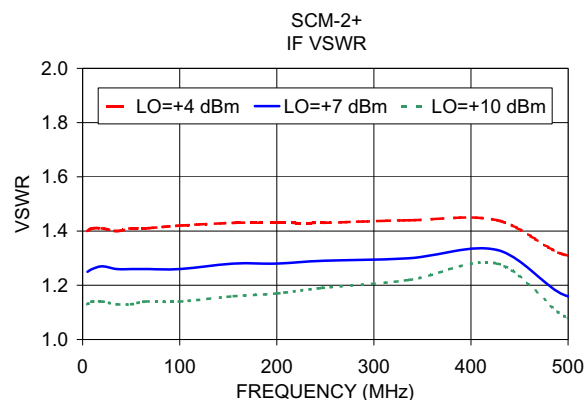
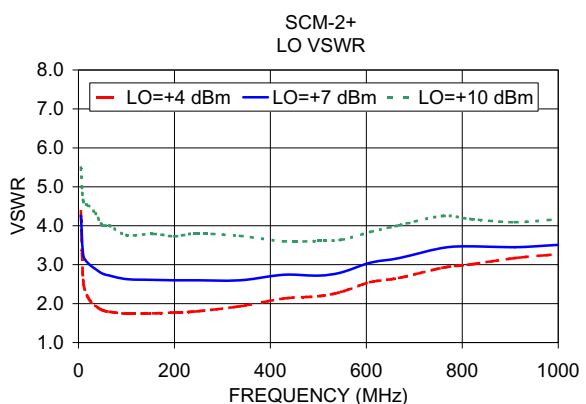
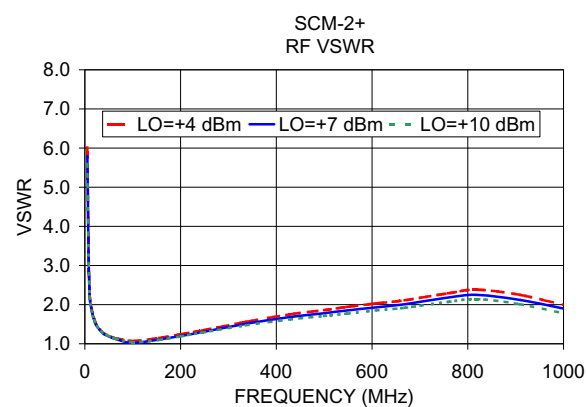
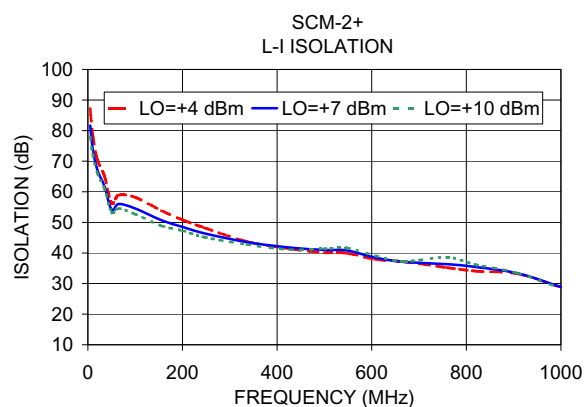
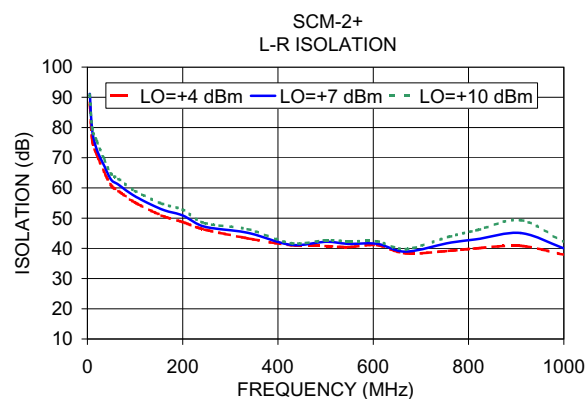
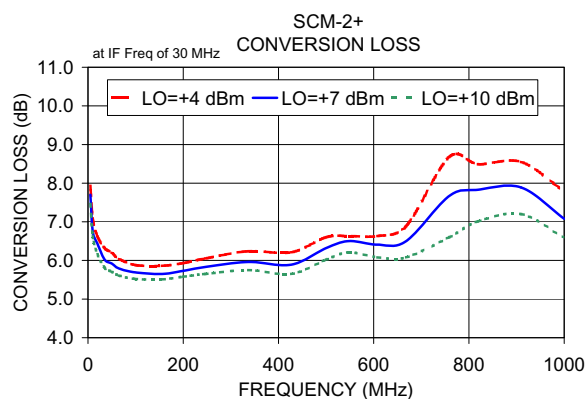
M = mid range [$10 f_L$ to $f_U/2$]
U = upper range [$f_U/2$ to f_U]

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
5.00	35.00	7.70	91.15	81.65	5.79	4.26
10.00	40.00	6.74	79.06	74.26	2.25	3.25
20.00	50.00	6.43	72.63	67.23	1.59	3.04
35.15	65.15	6.02	67.42	61.82	1.30	2.89
50.00	80.00	5.92	62.72	54.16	1.19	2.77
65.30	95.30	5.79	61.08	56.02	1.12	2.72
100.00	70.00	5.69	57.24	54.55	1.02	2.63
155.76	125.76	5.65	52.92	50.70	1.11	2.61
200.00	170.00	5.73	50.87	48.52	1.20	2.60
246.21	216.21	5.83	47.20	46.40	1.30	2.60
336.67	306.67	5.96	45.14	43.55	1.51	2.60
427.12	397.12	5.89	41.17	41.75	1.68	2.74
500.00	470.00	6.32	42.19	40.98	1.78	2.72
547.73	517.73	6.50	41.49	40.81	1.85	2.80
608.03	578.03	6.41	41.53	38.45	1.93	3.05
668.33	638.33	6.50	38.93	37.08	2.01	3.17
758.79	728.79	7.67	41.79	36.35	2.18	3.43
819.09	789.09	7.83	43.08	35.42	2.25	3.47
909.55	879.55	7.89	45.07	33.32	2.12	3.45
1000.00	970.00	7.08	39.99	28.91	1.90	3.51

Electrical Schematic





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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+4	+7	+10
5.0	35.0	7.93	7.70	7.46
10.0	40.0	7.07	6.74	6.62
50.4	80.4	7.49	7.03	6.79
90.7	120.7	7.34	6.96	6.76
131.0	161.0	7.26	6.90	6.76
171.3	201.3	7.24	6.94	6.77
211.5	241.5	7.20	6.91	6.76
251.8	281.8	7.23	6.93	6.81
292.1	322.1	7.23	6.94	6.79
332.4	362.4	7.24	6.94	6.80
372.7	402.7	7.33	7.06	6.83
413.0	443.0	7.34	7.05	6.92
453.3	483.3	7.43	7.05	6.82
493.6	523.6	7.41	7.05	6.80
533.9	563.9	7.56	7.23	6.96
574.2	604.2	7.59	7.29	7.08
614.4	644.4	7.70	7.33	7.10
654.7	684.7	7.72	7.27	7.00
695.0	725.0	7.78	7.20	6.97
735.3	765.3	8.14	7.45	7.06
775.6	805.6	8.41	7.65	7.12
815.9	845.9	8.64	7.92	7.43
856.2	886.2	8.74	8.00	7.46
896.5	926.5	8.76	8.04	7.42
916.6	946.6	9.09	8.39	7.73
956.9	986.9	9.25	8.61	8.00
977.1	1007.1	9.26	8.68	8.11
1017.3	1047.3	9.46	8.86	8.37
1077.8	1107.8	9.20	8.40	7.69
1097.9	1127.9	9.23	8.32	7.58
1138.2	1168.2	8.85	7.94	7.39
1158.4	1188.4	8.74	7.85	7.41
1198.7	1228.7	8.69	8.02	7.59
1218.8	1248.8	8.60	8.00	7.65
1259.1	1289.1	9.02	8.43	8.06
1279.2	1309.2	9.31	8.72	8.35
1319.5	1349.5	9.75	9.33	8.96
1339.7	1369.7	10.23	9.75	9.46
1380.0	1410.0	10.65	10.32	10.13
1400.1	1430.1	10.66	10.35	10.17

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	18.43	18.28	22.66
50.4	80.4	16.81	21.00	18.30
90.7	120.7	17.90	19.51	18.13
131.0	161.0	16.08	20.45	17.41
171.3	201.3	18.33	16.33	19.84
211.5	241.5	17.19	20.30	16.39
251.8	281.8	14.90	16.19	16.95
292.1	322.1	16.79	16.07	16.08
332.4	362.4	15.94	17.51	17.87
372.7	402.7	12.60	14.31	16.17
413.0	443.0	12.58	12.45	14.02
453.3	483.3	17.99	20.22	19.15
493.6	523.6	13.25	17.90	16.23
533.9	563.9	11.53	12.95	18.63
574.2	604.2	9.97	10.28	11.47
614.4	644.4	10.91	11.97	13.41
654.7	684.7	16.20	21.31	23.37
695.0	725.0	20.68	15.97	15.56
735.3	765.3	11.79	13.70	14.25
775.6	805.6	8.10	13.77	12.75
815.9	845.9	7.44	11.20	14.63
856.2	886.2	7.35	10.67	13.48
896.5	926.5	6.51	9.09	11.96
916.6	946.6	5.66	7.70	10.36
956.9	986.9	5.12	6.65	8.73
977.1	1007.1	5.18	6.29	7.84
1017.3	1047.3	4.38	5.04	6.03
1037.5	1067.5	4.13	4.78	5.98
1077.8	1107.8	3.69	5.25	7.64
1097.9	1127.9	3.95	5.78	8.54
1138.2	1168.2	6.06	9.33	11.48
1158.4	1188.4	7.29	10.32	12.50
1198.7	1228.7	8.32	10.73	12.21
1218.8	1248.8	9.36	12.02	13.72
1259.1	1289.1	8.98	10.97	12.83
1279.2	1309.2	9.03	11.12	13.13
1319.5	1349.5	8.81	11.20	13.49
1339.7	1369.7	7.77	10.84	12.57
1380.0	1410.0	7.62	10.81	12.87
1400.1	1430.1	8.45	11.43	14.08

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	0.65	0.45	0.32
50.4	80.4	0.61	0.39	0.25
90.7	120.7	0.63	0.36	0.22
131.0	161.0	0.60	0.36	0.21
171.3	201.3	0.66	0.36	0.21
211.5	241.5	0.54	0.33	0.23
251.8	281.8	0.55	0.34	0.22
292.1	322.1	0.58	0.37	0.27
332.4	362.4	0.57	0.39	0.26
372.7	402.7	0.58	0.41	0.30
413.0	443.0	0.64	0.44	0.31
453.3	483.3	0.71	0.52	0.38
493.6	523.6	0.77	0.61	0.48
533.9	563.9	0.86	0.67	0.54
574.2	604.2	0.99	0.75	0.59
614.4	644.4	1.08	0.81	0.63
654.7	684.7	1.31	1.00	0.82
695.0	725.0	1.53	1.23	0.99
735.3	765.3	1.43	1.29	1.10
775.6	805.6	1.37	1.30	1.20
815.9	845.9	1.28	1.20	1.09
856.2	886.2	1.28	1.24	1.15
896.5	926.5	1.29	1.25	1.19
916.6	946.6	1.22	1.17	1.15
956.9	986.9	1.15	1.05	1.04
977.1	1007.1	1.20	1.06	1.02
1017.3	1047.3	1.19	1.00	0.93
1037.5	1067.5	1.28	1.14	1.07
1077.8	1107.8	1.36	1.28	1.24
1097.9	1127.9	1.65	1.53	1.45
1138.2	1168.2	1.92	1.72	1.45
1158.4	1188.4	2.19	1.83	1.51
1198.7	1228.7	2.43	1.88	1.53
1218.8	1248.8	2.25	1.78	1.48
1259.1	1289.1	2.30	1.85	1.58
1279.2	1309.2	2.09	1.73	1.51
1319.5	1349.5	1.77	1.54	1.43
1339.7	1369.7	1.50	1.26	1.18
1380.0	1410.0	1.31	0.97	0.82
1400.1	1430.1	1.10	0.79	0.64

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)
		+7			+7			+7
490.0	10.1	6.84	10.0	20.1	6.95	500.0	500.1	7.37
477.7	22.4	6.78	22.6	32.7	6.75	487.4	512.7	7.39
465.4	34.7	6.73	35.1	45.2	6.74	474.9	525.2	7.43
453.1	47.0	6.73	47.7	57.8	6.76	462.3	537.8	7.48
440.8	59.3	6.78	60.3	70.4	6.74	449.7	550.4	7.50
428.5	71.6	6.73	72.8	82.9	6.76	437.2	562.9	7.54
416.2	83.9	6.67	85.4	95.5	6.76	424.6	575.5	7.60
403.8	96.3	6.65	97.9	108.0	6.77	412.1	588.0	7.62
391.5	108.6	6.62	110.5	120.6	6.75	399.5	600.6	7.55
379.2	120.9	6.62	123.1	133.2	6.73	386.9	613.2	7.63
366.9	133.2	6.61	135.6	145.7	6.73	374.4	625.7	7.65
354.6	145.5	6.59	148.2	158.3	6.77	361.8	638.3	7.60
342.3	157.8	6.63	160.8	170.9	6.79	349.2	650.9	7.52
330.0	170.1	6.65	173.3	183.4	6.78	336.7	663.4	7.43
317.7	182.4	6.64	185.9	196.0	6.81	324.1	676.0	7.29
305.4	194.7	6.68	198.5	208.6	6.77	311.5	688.6	7.16
293.1	207.0	6.65	211.0	221.1	6.78	299.0	701.1	7.06
280.8	219.3	6.66	223.6	233.7	6.78	286.4	713.7	7.04
268.5	231.6	6.70	236.2	246.3	6.79	273.8	726.3	7.08
256.2	243.9	6.69	248.7	258.8	6.85	261.3	738.8	6.99
243.8	256.3	6.74	261.3	271.4	6.84	248.7	751.4	7.12
231.5	268.6	6.76	273.8	283.9	6.84	236.2	763.9	7.23
219.2	280.9	6.72	286.4	296.5	6.86	223.6	776.5	7.25
206.9	293.2	6.78	299.0	309.1	6.87	211.0	789.1	7.25
194.6	305.5	6.78	311.5	321.6	6.88	198.5	801.6	7.37
182.3	317.8	6.77	324.1	334.2	6.92	185.9	814.2	7.41
170.0	330.1	6.80	336.7	346.8	6.89	173.3	826.8	7.40
157.7	342.4	6.84	349.2	359.3	6.89	160.8	839.3	7.43
145.4	354.7	6.84	361.8	371.9	6.92	148.2	851.9	7.65
133.1	367.0	6.88	374.4	384.5	6.98	135.6	864.5	7.74
120.8	379.3	6.90	386.9	397.0	7.02	123.1	877.0	7.61
108.5	391.6	6.90	399.5	409.6	7.00	110.5	889.6	7.75
96.2	403.9	6.93	412.1	422.2	6.96	97.9	902.2	7.85
83.8	416.3	6.93	424.6	434.7	7.02	85.4	914.7	7.85
71.5	428.6	6.98	437.2	447.3	7.03	72.8	927.3	7.84
59.2	440.9	7.01	449.7	459.8	6.98	60.3	939.8	8.11
46.9	453.2	6.96	462.3	472.4	7.01	47.7	952.4	8.20
34.6	465.5	6.97	474.9	485.0	6.95	35.1	965.0	8.33
22.3	477.8	7.02	487.4	497.5	6.98	22.6	977.5	8.35
10.0	490.1	7.11	500.0	510.1	7.02	10.0	990.1	8.59

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
5.0	88.15	91.15	90.85	87.15	81.65	77.95
10.0	75.96	79.06	79.76	78.96	74.26	72.26
50.4	61.36	62.53	63.15	81.09	77.35	74.17
90.7	56.14	57.19	58.08	74.46	79.37	78.21
131.0	53.25	54.41	55.17	66.20	73.03	79.57
171.3	50.48	51.83	52.82	60.83	67.19	85.68
211.5	49.01	50.38	51.28	58.19	64.22	79.43
251.8	47.66	48.94	49.82	56.61	63.24	77.36
292.1	46.37	47.74	48.67	54.44	59.92	67.81
332.4	45.53	46.87	47.97	53.89	59.46	66.20
372.7	44.81	46.12	47.27	53.32	58.70	61.36
413.0	44.21	45.81	47.12	51.40	56.15	59.55
453.3	43.21	44.72	46.00	51.45	54.51	55.13
493.6	42.51	44.14	45.49	50.85	52.94	52.14
533.9	42.05	43.77	45.21	49.83	51.62	50.65
574.2	41.16	42.97	44.55	48.01	49.07	48.43
614.4	40.81	42.58	44.16	46.03	46.49	46.25
654.7	40.34	42.03	43.67	44.44	44.06	43.65
695.0	40.39	42.37	44.11	42.76	41.98	41.53
735.3	40.44	42.27	43.87	42.47	41.04	40.30
775.6	40.17	42.15	43.77	43.08	41.02	39.47
815.9	39.92	42.08	43.80	42.84	40.55	38.56
856.2	38.89	41.25	43.22	41.44	39.78	37.86
896.5	38.59	40.88	42.94	39.30	38.30	36.80
916.6	38.22	40.44	42.44	38.61	37.67	36.30
956.9	37.51	39.67	41.98	36.54	36.23	35.65
977.1	37.35	39.51	41.72	35.71	35.49	35.13
1017.3	37.18	39.33	41.55	33.69	33.71	33.78
1077.8	36.05	38.26	40.88	31.63	31.44	31.41
1097.9	35.91	38.15	40.71	31.11	30.98	30.94
1138.2	35.61	38.50	41.82	30.34	30.31	30.03
1158.4	36.55	40.03	43.82	29.80	29.70	29.27
1198.7	36.57	40.42	45.07	28.67	28.50	28.19
1218.8	36.78	40.97	46.56	28.06	28.04	27.72
1259.1	37.29	41.84	48.79	26.95	26.93	26.79
1279.2	36.48	40.98	47.58	26.41	26.46	26.37
1319.5	36.24	40.88	47.34	25.28	25.51	25.43
1339.7	37.04	41.84	47.31	24.98	25.13	25.13
1380.0	35.69	39.99	43.62	24.01	24.38	24.44
1400.1	35.81	39.62	41.73	23.71	24.12	24.19

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	45.95	55.28	66.28
50.4	80.4	36.89	36.99	36.24
90.7	120.7	32.46	32.14	32.06
131.0	161.0	29.87	29.74	29.54
171.3	201.3	28.19	28.23	28.17
211.5	241.5	27.20	27.17	27.16
251.8	281.8	26.67	26.75	26.76
292.1	322.1	26.66	26.76	26.80
332.4	362.4	26.86	27.15	27.32
372.7	402.7	26.91	27.25	27.43
413.0	443.0	26.36	26.48	26.60
453.3	483.3	25.94	26.31	26.70
493.6	523.6	25.68	26.29	27.14
533.9	563.9	24.91	25.57	26.25
574.2	604.2	23.22	23.44	23.65
614.4	644.4	20.68	20.57	20.51
654.7	684.7	18.42	18.10	17.86
695.0	725.0	16.94	16.58	16.45
735.3	765.3	15.88	15.53	15.22
775.6	805.6	15.17	14.76	14.52
815.9	845.9	14.53	14.20	13.93
856.2	886.2	13.95	13.80	13.52
896.5	926.5	13.57	13.51	13.35
916.6	946.6	13.45	13.41	13.36
956.9	986.9	13.23	13.29	13.36
977.1	1007.1	13.11	13.18	13.29
1017.3	1047.3	12.92	13.06	13.22
1037.5	1067.5	12.98	13.13	13.37
1077.8	1107.8	13.02	13.24	13.46
1097.9	1127.9	12.94	13.25	13.36
1138.2	1168.2	13.05	13.30	13.41
1158.4	1188.4	12.95	13.19	13.31
1198.7	1228.7	12.74	12.95	12.98
1218.8	1248.8	12.66	12.77	12.80
1259.1	1289.1	12.19	12.28	12.30
1279.2	1309.2	11.99	12.05	12.04
1319.5	1349.5	11.51	11.50	11.45
1339.7	1369.7	11.22	11.19	11.10
1380.0	1410.0	10.93	10.76	10.62
1400.1	1430.1	10.70	10.52	10.34

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
5.0	35.0	6.01	5.79	5.59	5.0	4.37	4.26	5.49	5.0	1.40	1.25	1.13
10.0	40.0	2.30	2.25	2.21	10.0	2.57	3.25	4.63	10.0	1.41	1.26	1.14
50.4	80.4	1.22	1.31	1.37	50.4	1.97	2.80	3.86	22.6	2.85	2.50	2.24
90.7	120.7	1.24	1.33	1.38	90.7	1.87	2.65	3.62	35.1	2.61	2.31	2.05
131.0	161.0	1.25	1.33	1.38	131.0	1.92	2.71	3.70	47.7	2.38	2.15	1.91
171.3	201.3	1.25	1.33	1.38	171.3	1.86	2.58	3.49	60.3	2.33	2.08	1.86
211.5	241.5	1.26	1.32	1.37	211.5	1.90	2.64	3.54	72.8	2.37	2.13	1.90
251.8	281.8	1.25	1.31	1.35	251.8	1.94	2.68	3.56	85.4	2.46	2.20	1.97
292.1	322.1	1.23	1.28	1.33	292.1	1.92	2.62	3.45	97.9	2.57	2.29	2.04
332.4	362.4	1.22	1.28	1.32	332.4	2.03	2.77	3.61	110.5	2.66	2.37	2.11
372.7	402.7	1.20	1.25	1.29	372.7	2.11	2.84	3.67	123.1	2.71	2.41	2.14
413.0	443.0	1.18	1.22	1.25	413.0	2.13	2.86	3.67	135.6	2.66	2.37	2.11
453.3	483.3	1.19	1.23	1.27	453.3	2.21	2.91	3.70	148.2	2.54	2.27	2.03
493.6	523.6	1.20	1.24	1.28	493.6	2.20	2.86	3.60	160.8	2.46	2.20	1.96
533.9	563.9	1.20	1.23	1.26	533.9	2.32	2.98	3.71	173.3	2.48	2.22	1.97
574.2	604.2	1.20	1.21	1.23	574.2	2.34	2.99	3.70	185.9	2.58	2.30	2.05
614.4	644.4	1.19	1.20	1.21	614.4	2.44	3.07	3.76	198.5	2.67	2.40	2.13
654.7	684.7	1.17	1.18	1.20	654.7	2.54	3.13	3.79	211.0	2.70	2.42	2.15
695.0	725.0	1.18	1.18	1.19	695.0	2.61	3.20	3.88	223.6	2.63	2.36	2.10
735.3	765.3	1.21	1.20	1.20	735.3	2.80	3.41	4.07	236.2	2.55	2.29	2.03
775.6	805.6	1.26	1.24	1.23	775.6	2.81	3.40	4.01	248.7	2.51	2.25	2.00
815.9	845.9	1.34	1.31	1.30	815.9	2.95	3.56	4.17	261.3	2.54	2.28	2.03
856.2	886.2	1.42	1.38	1.37	856.2	3.01	3.61	4.23	273.8	2.58	2.33	2.08
896.5	926.5	1.51	1.47	1.44	896.5	3.14	3.74	4.36	286.4	2.62	2.36	2.11
916.6	946.6	1.57	1.53	1.49	916.6	3.27	3.89	4.52	299.0	2.63	2.37	2.11
956.9	986.9	1.66	1.62	1.58	956.9	3.30	3.89	4.51	311.5	2.63	2.36	2.10
977.1	1007.1	1.70	1.66	1.63	977.1	3.42	4.00	4.61	324.1	2.64	2.37	2.11
1017.3	1047.3	1.78	1.74	1.70	1017.3	3.60	4.20	4.83	336.7	2.63	2.36	2.11
1037.5	1067.5	1.79	1.75	1.72	1037.5	3.50	4.04	4.64	349.2	2.60	2.35	2.09
1077.8	1107.8	1.85	1.81	1.76	1077.8	3.51	3.98	4.54	361.8	2.57	2.32	2.07
1097.9	1127.9	1.89	1.84	1.80	1097.9	3.51	3.97	4.53	374.4	2.56	2.31	2.06
1138.2	1168.2	1.98	1.94	1.92	1138.2	3.59	4.02	4.61	386.9	2.58	2.32	2.07
1158.4	1188.4	2.03	2.00	1.98	1158.4	3.66	4.15	4.77	399.5	2.61	2.35	2.10
1198.7	1228.7	2.18	2.15	2.13	1198.7	3.73	4.24	4.86	412.1	2.62	2.36	2.11
1218.8	1248.8	2.27	2.23	2.20	1218.8	3.85	4.31	4.88	424.6	2.58	2.32	2.07
1259.1	1289.1	2.42	2.40	2.36	1259.1	4.21	4.62	5.17	437.2	2.53	2.28	2.03
1279.2	1309.2	2.51	2.49	2.45	1279.2	4.29	4.63	5.14	449.7	2.52	2.26	2.02
1319.5	1349.5	2.67	2.67	2.62	1319.5	4.68	4.91	5.38	462.3	2.52	2.27	2.04
1339.7	1369.7	2.74	2.78	2.76	1339.7	4.92	5.19	5.68	474.9	2.55	2.30	2.06
1380.0	1410.0	2.84	2.93	2.95	1380.0	5.20	5.31	5.70	487.4	2.55	2.30	2.06
1400.1	1430.1	2.89	2.97	3.01	1400.1	5.38	5.47	5.83	500.0	2.50	2.25	2.02

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	25	23	29	23	38	35	40	45	56
1	-	19	+0	30	12	31	24	38	46	36	42	44
2	>100	74	59	62	63	67	61	71	65	79	70	>79
3	>100	63	65	64	60	65	58	66	69	78	>79	73
4	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -21.12 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	32	36	35	41	34	49	49	51	57	69
1	-	21	+0	27	12	35	25	44	46	42	46	50
2	97	57	51	56	54	62	53	60	59	66	64	72
3	>100	48	45	53	62	50	45	54	54	57	70	51
4	>100	73	68	67	71	69	76	68	74	85	79	>89
5	>100	68	75	61	54	62	54	62	53	63	65	>89
6	>100	>89	>89	>89	83	>89	>89	>89	85	87	>89	>89
7	>100	83	>89	86	77	79	>89	83	81	79	74	79
8	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	87	88	85	86	86
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	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; +7.00 dBm
IF OUT: 29.91 MHz; -11.1 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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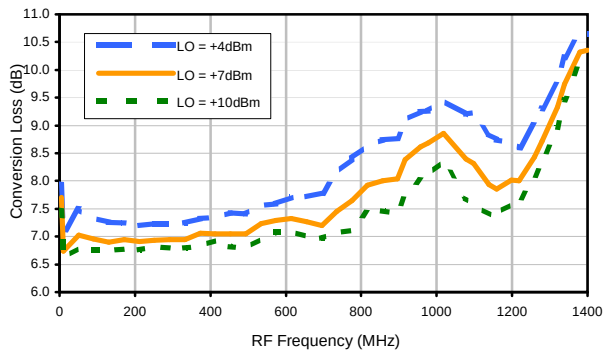
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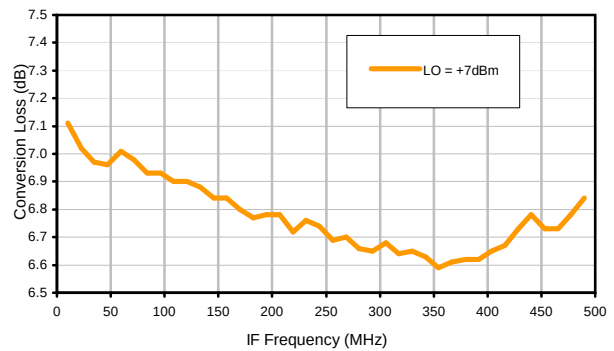


Typical Performance Curves

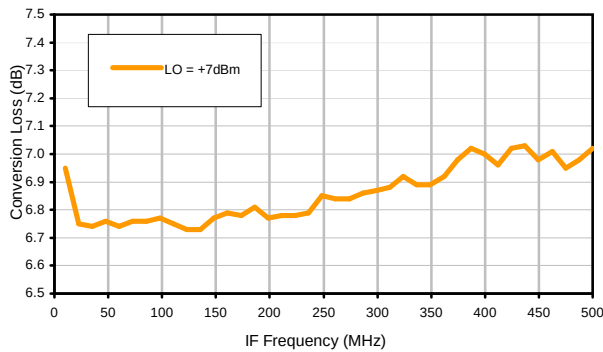
Conversion Loss @ IF=30MHz



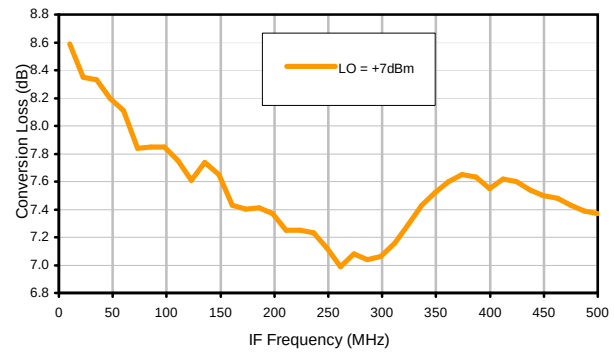
Conversion Loss vs. IF @ RF=500.1MHz



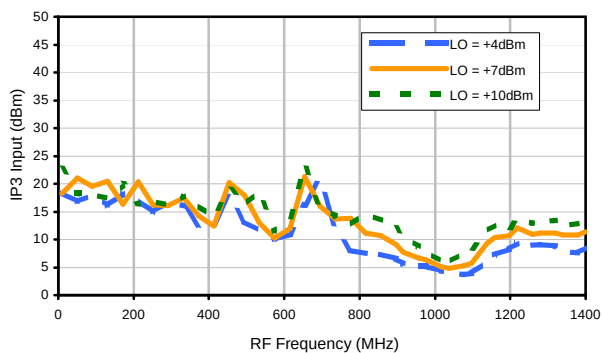
Conversion Loss vs. IF @ RF=10.1MHz



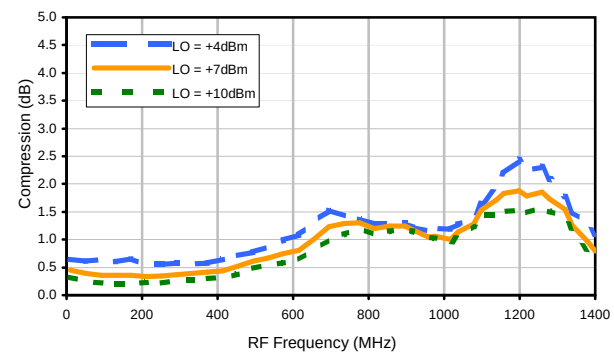
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

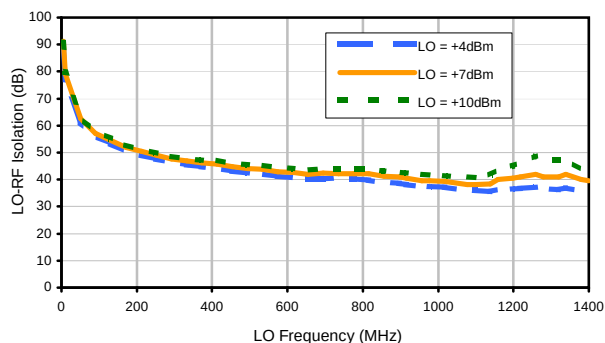


Compression @ RF IN=+1dBm

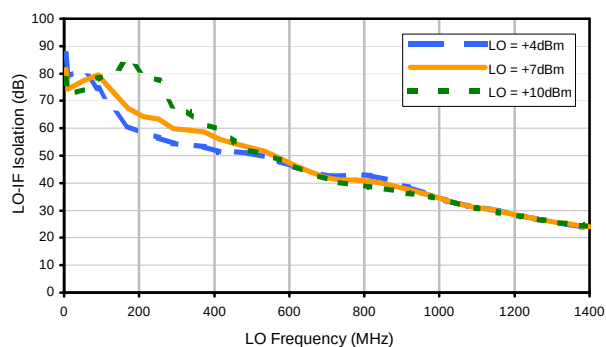


Typical Performance Curves

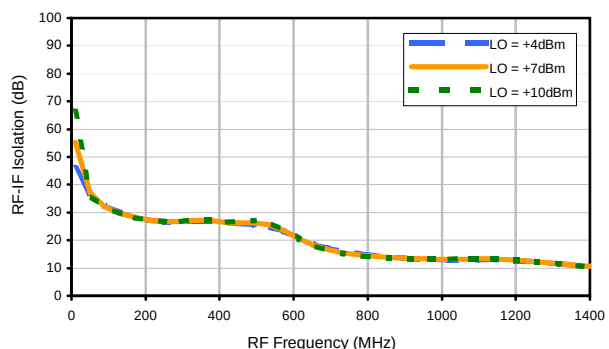
LO-RF Isolation



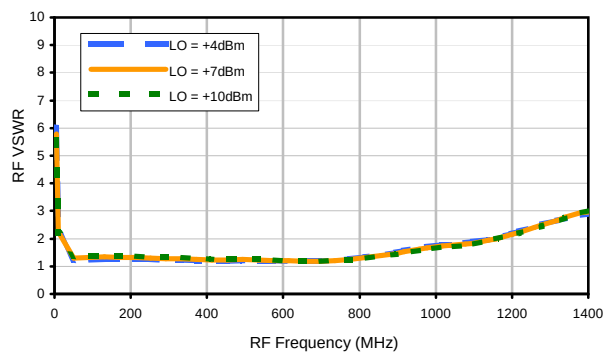
LO-IF Isolation



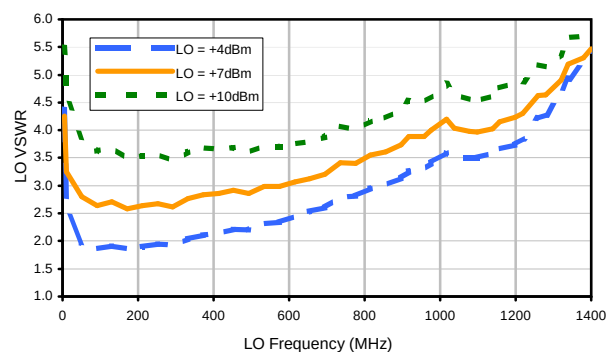
RF-IF Isolation



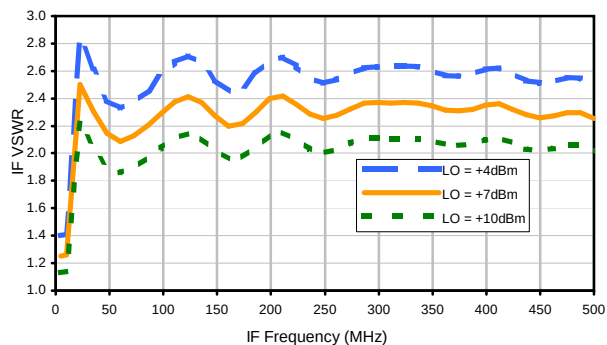
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	25	23	29	23	38	35	40	45	56
1	-	19	+0	30	12	31	24	38	46	36	42	44
2	>100	74	59	62	63	67	61	71	65	79	70	>79
3	>100	63	65	64	60	65	58	66	69	78	>79	73
4	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -21.12 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	32	36	35	41	34	49	49	51	57	69
1	-	21	+0	27	12	35	25	44	46	42	46	50
2	97	57	51	56	54	62	53	60	59	66	64	72
3	>100	48	45	53	62	50	45	54	54	57	70	51
4	>100	73	68	67	71	69	76	68	74	85	79	>89
5	>100	68	75	61	54	62	54	62	53	63	65	>89
6	>100	>89	>89	>89	83	>89	>89	>89	85	87	>89	>89
7	>100	83	>89	86	77	79	>89	83	81	79	74	79
8	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	87	88	85	86	86
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	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; +7.00 dBm
IF OUT: 29.91 MHz; -11.1 dBm

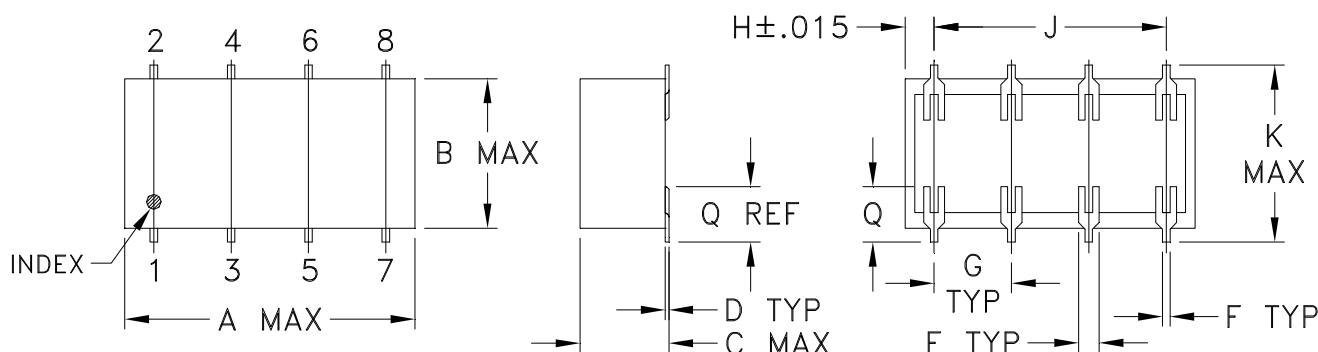
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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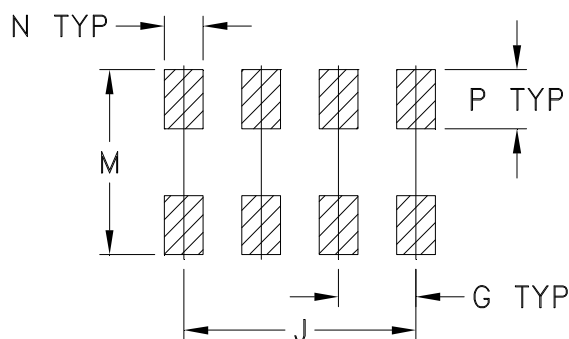


Outline Dimensions

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.



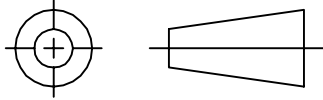
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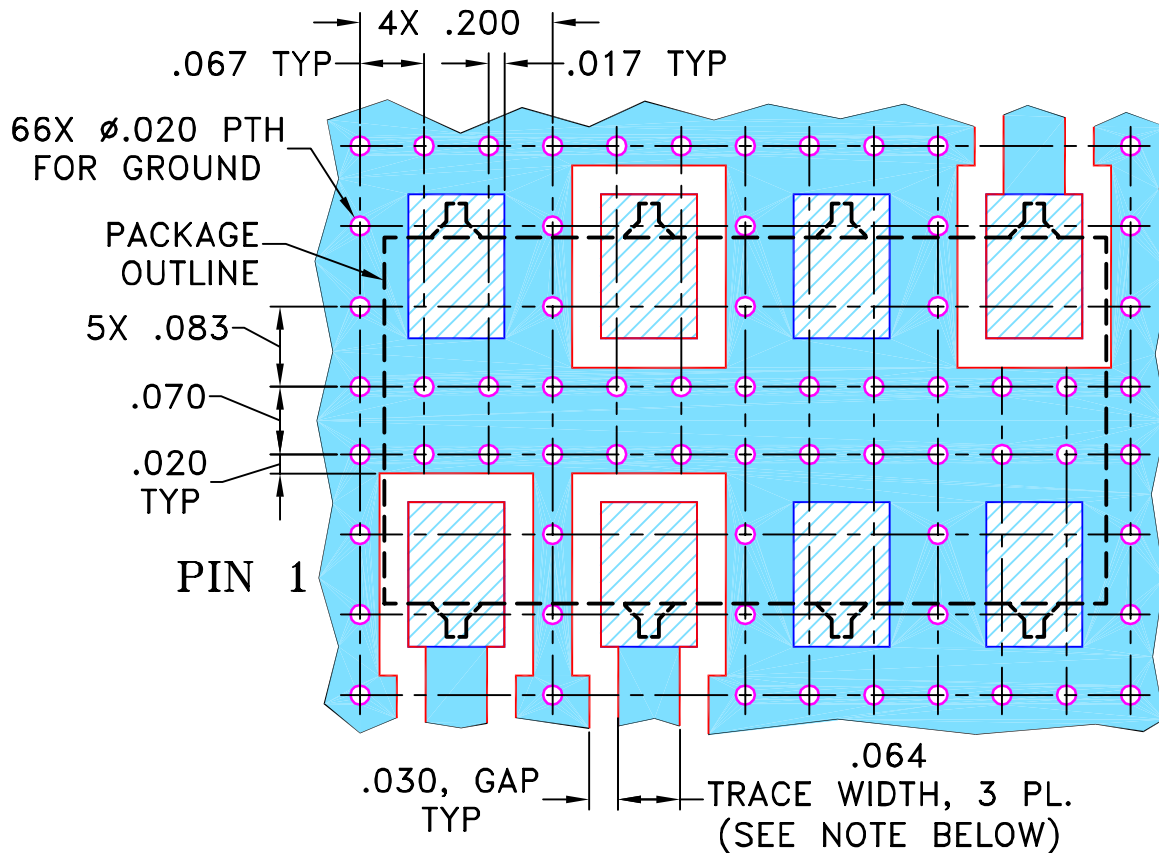
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M88234	NEW RELEASE	08/06/03	AV	WL
A	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
B	M102713	ADDED "...WITH SMOBC"	01/18/08	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR YY101 CASE STYLE, "k" PIN CONNECTION



NOTE: 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

07/28/03

CHECKED

IL

08/06/03

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



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, k, YY101, SCM, TB-172

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-132

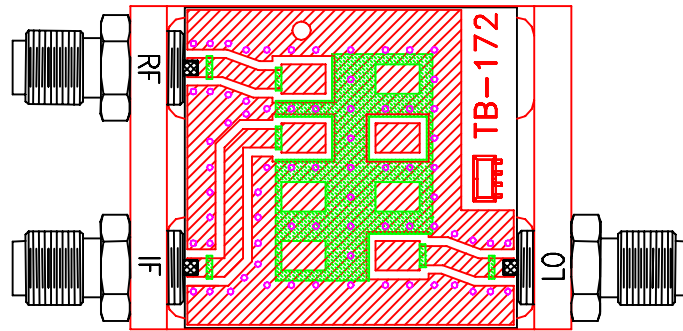
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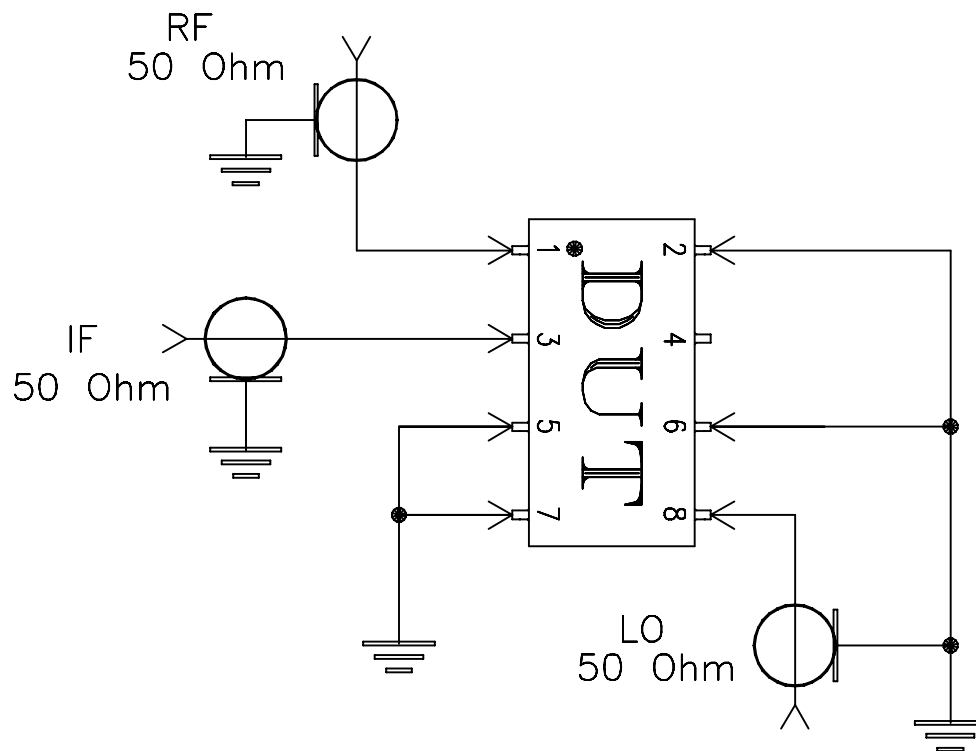
SCALE: 5:1

SHEET: 1 OF 1

Evaluation Board and Circuit



TB-172



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