Surface Mount NON-CATALOG

Frequency Mixer

SCM-2NL+
SCM-2NL

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

Units are not marked with NL suffix

CASE STYLE: YY101
PRICE: Contact Sales Dept.

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

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

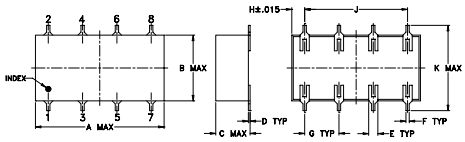
Features

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

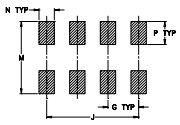
Applications

- VHF/UHF
- cellular
- GSM/ISM

Outline Drawing



PCB Land Pattern



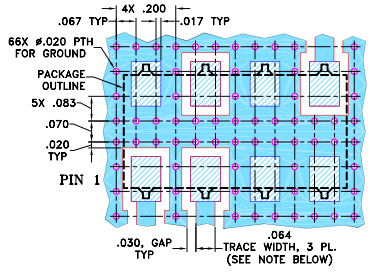
Suggested Layout,
Tolerance to be within ±.002

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	.450	.470	.100	.150	grams
1.91	15.24	11.43	11.94	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.
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
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

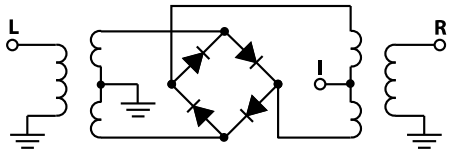
1 dB COMP.: +1 dBm typ.

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

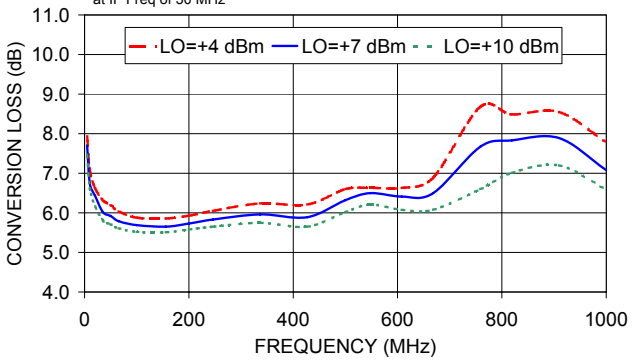
Electrical Schematic



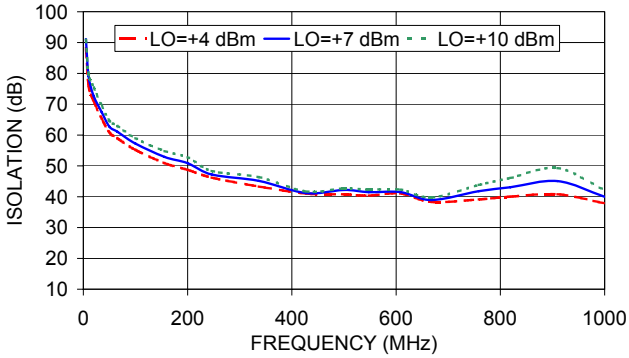
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Performance Charts

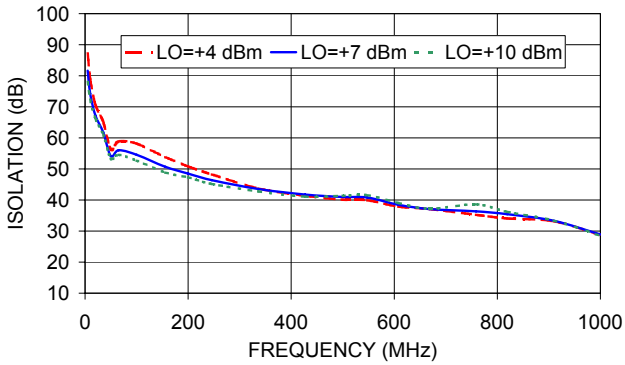
SCM-2NL
CONVERSION LOSS
at IF Freq of 30 MHz



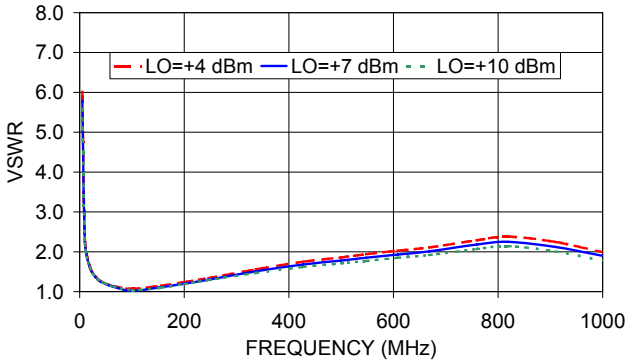
SCM-2NL
L-R ISOLATION



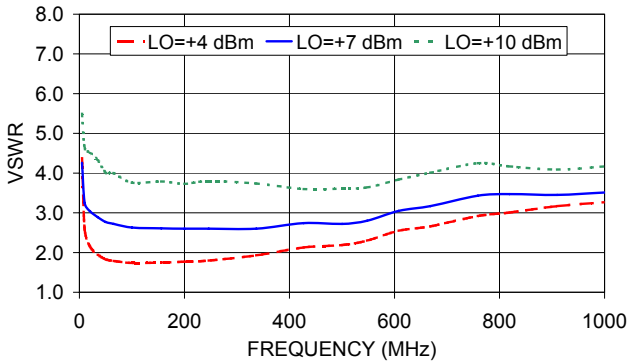
SCM-2NL
L-I ISOLATION



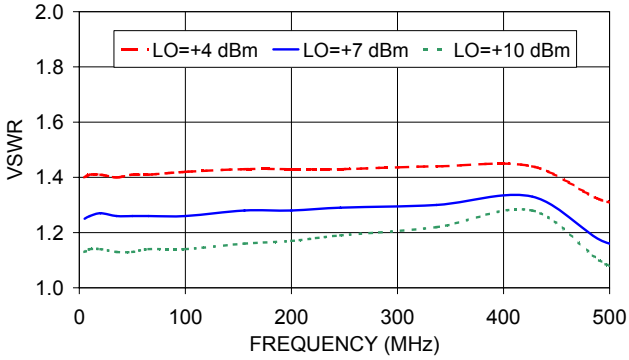
SCM-2NL
RF VSWR



SCM-2NL
LO VSWR



SCM-2NL
IF VSWR



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

Frequency Mixer SCM-2NL+

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)
		@LO (dBm)
		+7
490.0	10.1	6.84
477.7	22.4	6.78
465.4	34.7	6.73
453.1	47.0	6.73
440.8	59.3	6.78
428.5	71.6	6.73
416.2	83.9	6.67
403.8	96.3	6.65
391.5	108.6	6.62
379.2	120.9	6.62
366.9	133.2	6.61
354.6	145.5	6.59
342.3	157.8	6.63
330.0	170.1	6.65
317.7	182.4	6.64
305.4	194.7	6.68
293.1	207.0	6.65
280.8	219.3	6.66
268.5	231.6	6.70
256.2	243.9	6.69
243.8	256.3	6.74
231.5	268.6	6.76
219.2	280.9	6.72
206.9	293.2	6.78
194.6	305.5	6.78
182.3	317.8	6.77
170.0	330.1	6.80
157.7	342.4	6.84
145.4	354.7	6.84
133.1	367.0	6.88
120.8	379.3	6.90
108.5	391.6	6.90
96.2	403.9	6.93
83.8	416.3	6.93
71.5	428.6	6.98
59.2	440.9	7.01
46.9	453.2	6.96
34.6	465.5	6.97
22.3	477.8	7.02
10.0	490.1	7.11

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+7
10.0	20.1	6.95
22.6	32.7	6.75
35.1	45.2	6.74
47.7	57.8	6.76
60.3	70.4	6.74
72.8	82.9	6.76
85.4	95.5	6.76
97.9	108.0	6.77
110.5	120.6	6.75
123.1	133.2	6.73
135.6	145.7	6.73
148.2	158.3	6.77
160.8	170.9	6.79
173.3	183.4	6.78
185.9	196.0	6.81
198.5	208.6	6.77
211.0	221.1	6.78
223.6	233.7	6.78
236.2	246.3	6.79
248.7	258.8	6.85
261.3	271.4	6.84
273.8	283.9	6.84
286.4	296.5	6.86
299.0	309.1	6.87
311.5	321.6	6.88
324.1	334.2	6.92
336.7	346.8	6.89
349.2	359.3	6.89
361.8	371.9	6.92
374.4	384.5	6.98
386.9	397.0	7.02
399.5	409.6	7.00
412.1	422.2	6.96
424.6	434.7	7.02
437.2	447.3	7.03
449.7	459.8	6.98
462.3	472.4	7.01
474.9	485.0	6.95
487.4	497.5	6.98
500.0	510.1	7.02

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB)
		@LO (dBm)
		+7
500.0	500.1	7.37
487.4	512.7	7.39
474.9	525.2	7.43
462.3	537.8	7.48
449.7	550.4	7.50
437.2	562.9	7.54
424.6	575.5	7.60
412.1	588.0	7.62
399.5	600.6	7.55
386.9	613.2	7.63
374.4	625.7	7.65
361.8	638.3	7.60
349.2	650.9	7.52
336.7	663.4	7.43
324.1	676.0	7.29
311.5	688.6	7.16
299.0	701.1	7.06
286.4	713.7	7.04
273.8	726.3	7.08
261.3	738.8	6.99
248.7	751.4	7.12
236.2	763.9	7.23
223.6	776.5	7.25
211.0	789.1	7.25
198.5	801.6	7.37
185.9	814.2	7.41
173.3	826.8	7.40
160.8	839.3	7.43
148.2	851.9	7.65
135.6	864.5	7.74
123.1	877.0	7.61
110.5	889.6	7.75
97.9	902.2	7.85
85.4	914.7	7.85
72.8	927.3	7.84
60.3	939.8	8.11
47.7	952.4	8.20
35.1	965.0	8.33
22.6	977.5	8.35
10.0	990.1	8.59

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @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 (dBm)		
		+4	+7	+10
5.0	35.0	6.01	5.79	5.59
10.0	40.0	2.30	2.25	2.21
50.4	80.4	1.22	1.31	1.37
90.7	120.7	1.24	1.33	1.38
131.0	161.0	1.25	1.33	1.38
171.3	201.3	1.25	1.33	1.38
211.5	241.5	1.26	1.32	1.37
251.8	281.8	1.25	1.31	1.35
292.1	322.1	1.23	1.28	1.33
332.4	362.4	1.22	1.28	1.32
372.7	402.7	1.20	1.25	1.29
413.0	443.0	1.18	1.22	1.25
453.3	483.3	1.19	1.23	1.27
493.6	523.6	1.20	1.24	1.28
533.9	563.9	1.20	1.23	1.26
574.2	604.2	1.20	1.21	1.23
614.4	644.4	1.19	1.20	1.21
654.7	684.7	1.17	1.18	1.20
695.0	725.0	1.18	1.18	1.19
735.3	765.3	1.21	1.20	1.20
775.6	805.6	1.26	1.24	1.23
815.9	845.9	1.34	1.31	1.30
856.2	886.2	1.42	1.38	1.37
896.5	926.5	1.51	1.47	1.44
916.6	946.6	1.57	1.53	1.49
956.9	986.9	1.66	1.62	1.58
977.1	1007.1	1.70	1.66	1.63
1017.3	1047.3	1.78	1.74	1.70
1037.5	1067.5	1.79	1.75	1.72
1077.8	1107.8	1.85	1.81	1.76
1097.9	1127.9	1.89	1.84	1.80
1138.2	1168.2	1.98	1.94	1.92
1158.4	1188.4	2.03	2.00	1.98
1198.7	1228.7	2.18	2.15	2.13
1218.8	1248.8	2.27	2.23	2.20
1259.1	1289.1	2.42	2.40	2.36
1279.2	1309.2	2.51	2.49	2.45
1319.5	1349.5	2.67	2.67	2.62
1339.7	1369.7	2.74	2.78	2.76
1380.0	1410.0	2.84	2.93	2.95
1400.1	1430.1	2.89	2.97	3.01

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+4	+7	+10
5.0	4.37	4.26	5.49
10.0	2.57	3.25	4.63
50.4	1.97	2.80	3.86
90.7	1.87	2.65	3.62
131.0	1.92	2.71	3.70
171.3	1.86	2.58	3.49
211.5	1.90	2.64	3.54
251.8	1.94	2.68	3.56
292.1	1.92	2.62	3.45
332.4	2.03	2.77	3.61
372.7	2.11	2.84	3.67
413.0	2.13	2.86	3.67
453.3	2.21	2.91	3.70
493.6	2.20	2.86	3.60
533.9	2.32	2.98	3.71
574.2	2.34	2.99	3.70
614.4	2.44	3.07	3.76
654.7	2.54	3.13	3.79
695.0	2.61	3.20	3.88
735.3	2.80	3.41	4.07
775.6	2.81	3.40	4.01
815.9	2.95	3.56	4.17
856.2	3.01	3.61	4.23
896.5	3.14	3.74	4.36
916.6	3.27	3.89	4.52
956.9	3.30	3.89	4.51
977.1	3.42	4.00	4.61
1017.3	3.60	4.20	4.83
1037.5	3.50	4.04	4.64
1077.8	3.51	3.98	4.54
1097.9	3.51	3.97	4.53
1138.2	3.59	4.02	4.61
1158.4	3.66	4.15	4.77
1198.7	3.73	4.24	4.86
1218.8	3.85	4.31	4.88
1259.1	4.21	4.62	5.17
1279.2	4.29	4.63	5.14
1319.5	4.68	4.91	5.38
1339.7	4.92	5.19	5.68
1380.0	5.20	5.31	5.70
1400.1	5.38	5.47	5.83

IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1) @LO (dBm)		
	+4	+7	+10
5.0	1.40	1.25	1.13
10.0	1.41	1.26	1.14
22.6	2.85	2.50	2.24
35.1	2.61	2.31	2.05
47.7	2.38	2.15	1.91
60.3	2.33	2.08	1.86
72.8	2.37	2.13	1.90
85.4	2.46	2.20	1.97
97.9	2.57	2.29	2.04
110.5	2.66	2.37	2.11
123.1	2.71	2.41	2.14
135.6	2.66	2.37	2.11
148.2	2.54	2.27	2.03
160.8	2.46	2.20	1.96
173.3	2.48	2.22	1.97
185.9	2.58	2.30	2.05
198.5	2.67	2.40	2.13
211.0	2.70	2.42	2.15
223.6	2.63	2.36	2.10
236.2	2.55	2.29	2.03
248.7	2.51	2.25	2.00
261.3	2.54	2.28	2.03
273.8	2.58	2.33	2.08
286.4	2.62	2.36	2.11
299.0	2.63	2.37	2.11
311.5	2.63	2.36	2.10
324.1	2.64	2.37	2.11
336.7	2.63	2.36	2.11
349.2	2.60	2.35	2.09
361.8	2.57	2.32	2.07
374.4	2.56	2.31	2.06
386.9	2.58	2.32	2.07
399.5	2.61	2.35	2.10
412.1	2.62	2.36	2.11
424.6	2.58	2.32	2.07
437.2	2.53	2.28	2.03
449.7	2.52	2.26	2.02
462.3	2.52	2.27	2.04
474.9	2.55	2.30	2.06
487.4	2.55	2.30	2.06
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

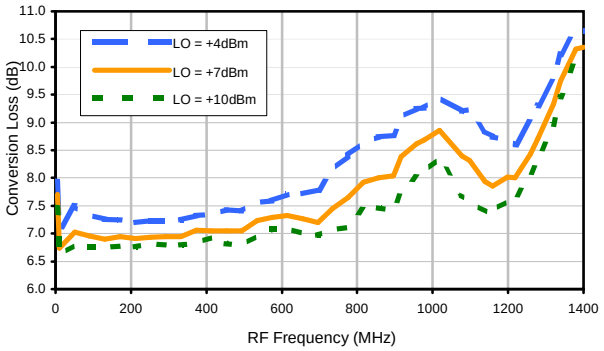
LO HARMONICS ORDER

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

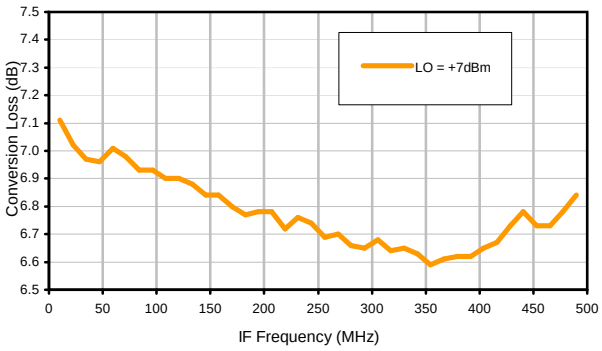
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

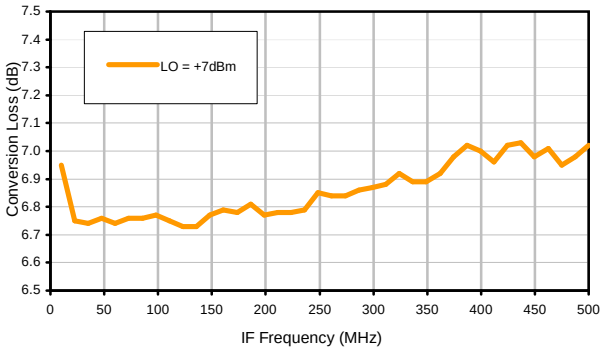
Conversion Loss @ IF=30MHz



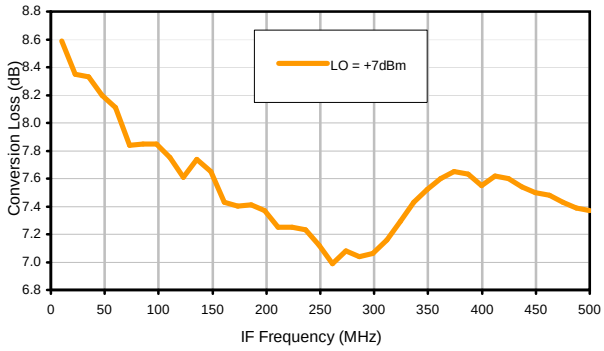
Conversion Loss vs. IF @ RF=500.1MHz



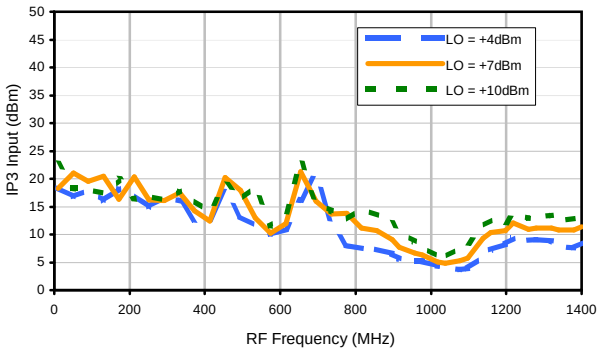
Conversion Loss vs. IF @ RF=10.1MHz



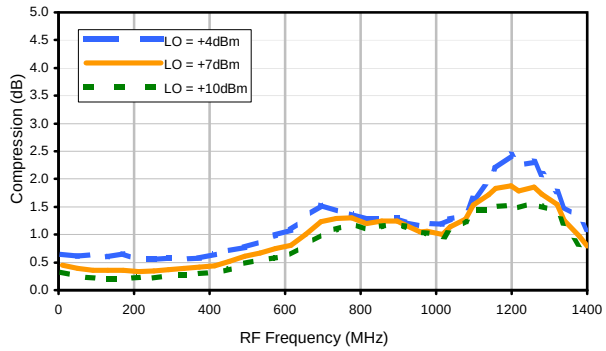
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

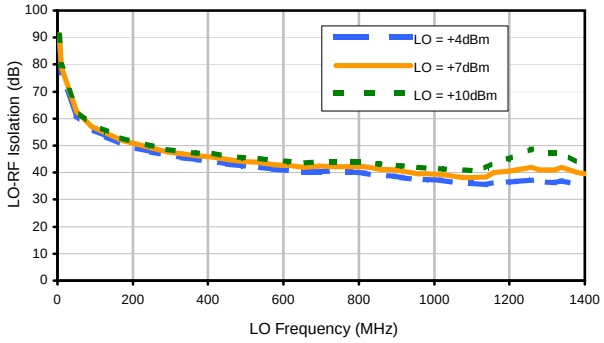


Compression @ RF IN=+1dBm

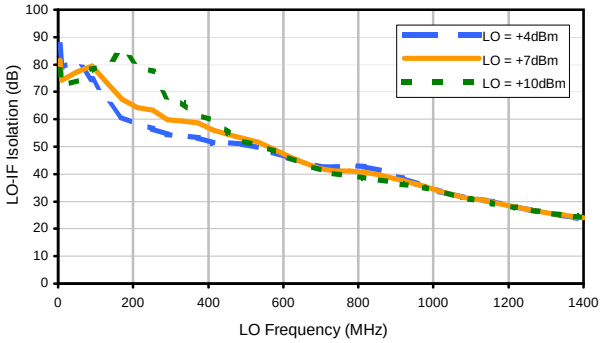


Typical Performance Curves

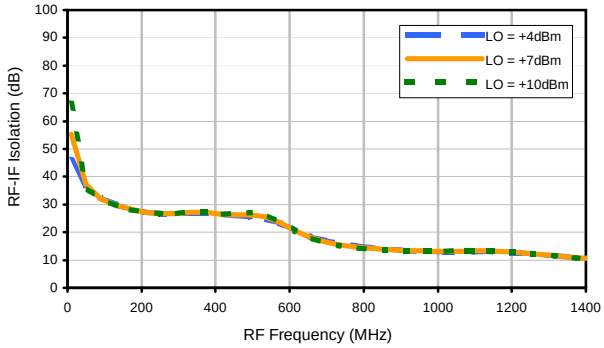
LO-RF Isolation



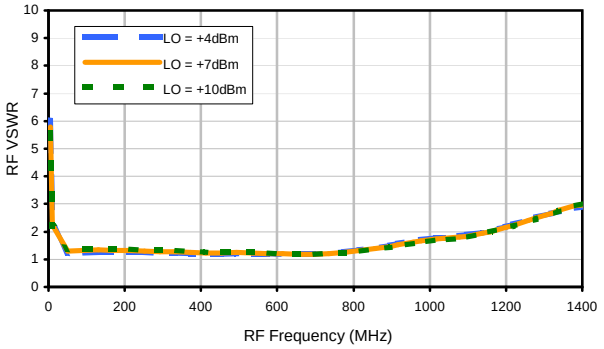
LO-IF Isolation



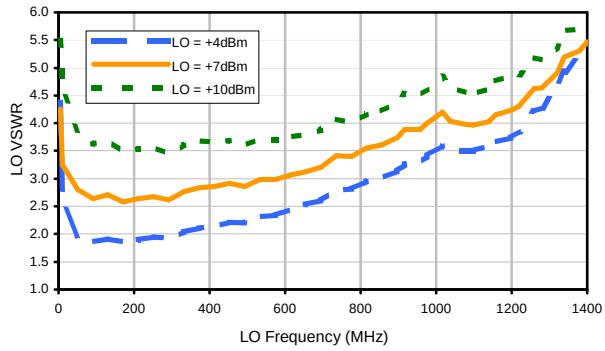
RF-IF Isolation



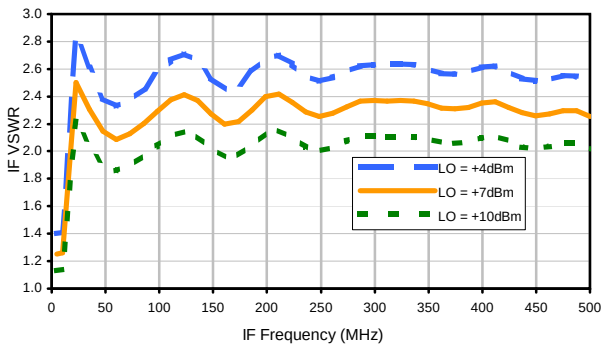
RF VSWR



LO VSWR



IF VSWR



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

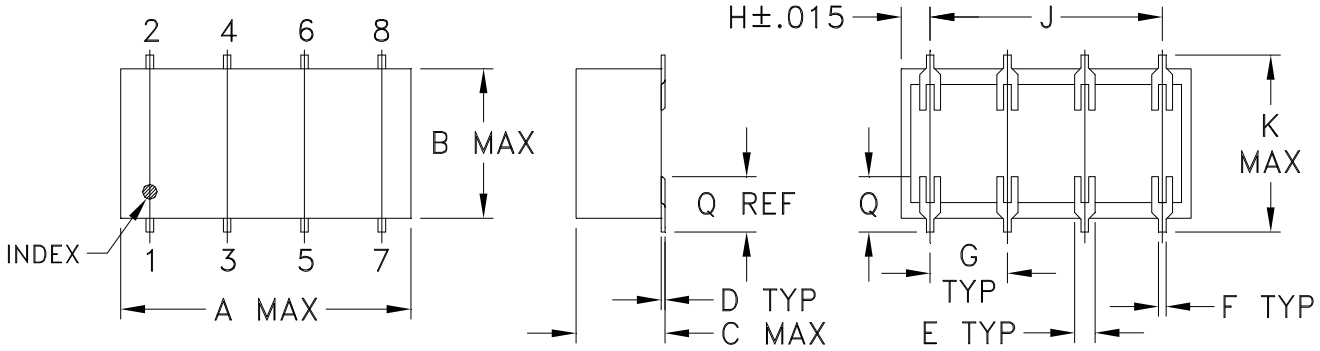
Test conditions: **RF IN: 500.1 MHz; -4.00 dBm.**
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -11.1 dBm

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.

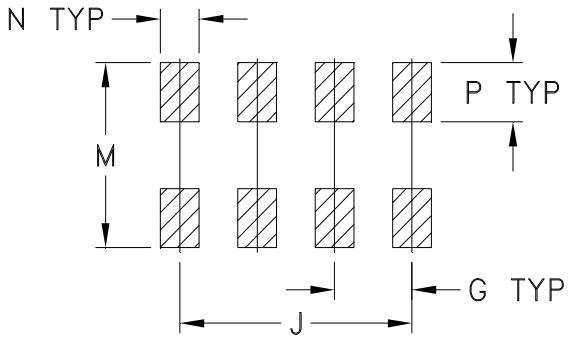
Case Style YY

Outline Dimensions

YY101
YY109
YY161



PCB Land Pattern



Suggested Layout
Tolerance to be within ±.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	WT. GRAMS
YY101*	.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)	.450 (11.43)	-- --	.470 (11.94)	.100 (2.54)	.150 (3.81)	.148 (3.76)	1.6
YY109*			.20 (5.08)							.720 (18.29)	-- --	.740 (18.80)				1.6
YY161			.28 (7.11)							.450 (11.43)	-- --	.470 (11.94)				1.6

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

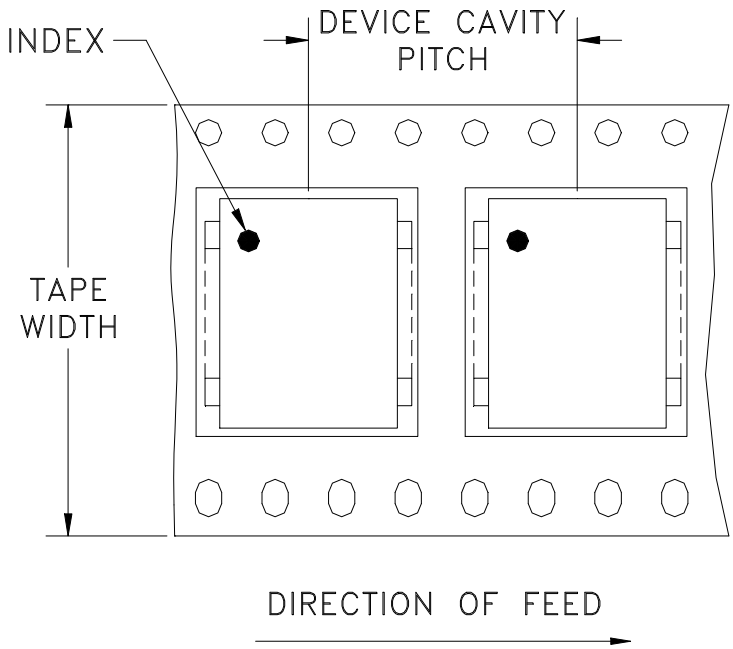
Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate.
   For RoHS-5 Case Styles: Tin-Lead plate.
3. Special Tolerances: Termination thickness ± .003 inch.
4. * 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.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

Tape & Reel Packaging TR-F5

DEVICE ORIENTATION IN T&R



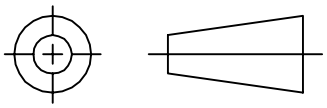
Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	500

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

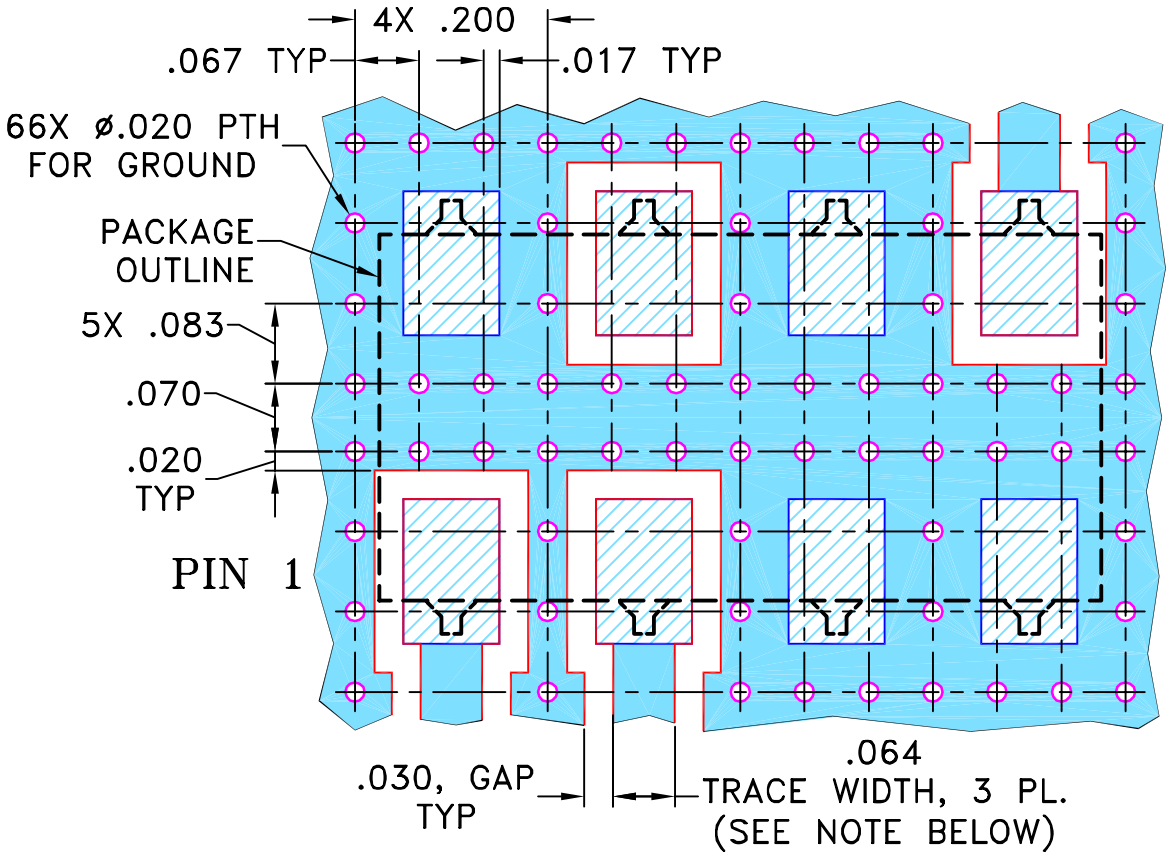
Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

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"	01/16/06	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" ± 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	07/28/03
TOLERANCES ON:	CHECKED	IL	08/06/03
2 PL DECIMALS ±	APPROVED	WL	08/06/03
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

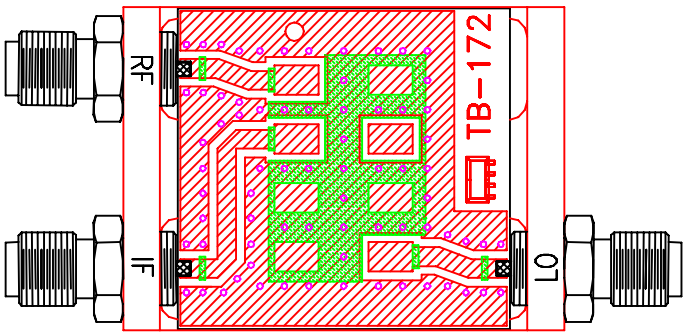
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, k, YY101, SCM, TB-172

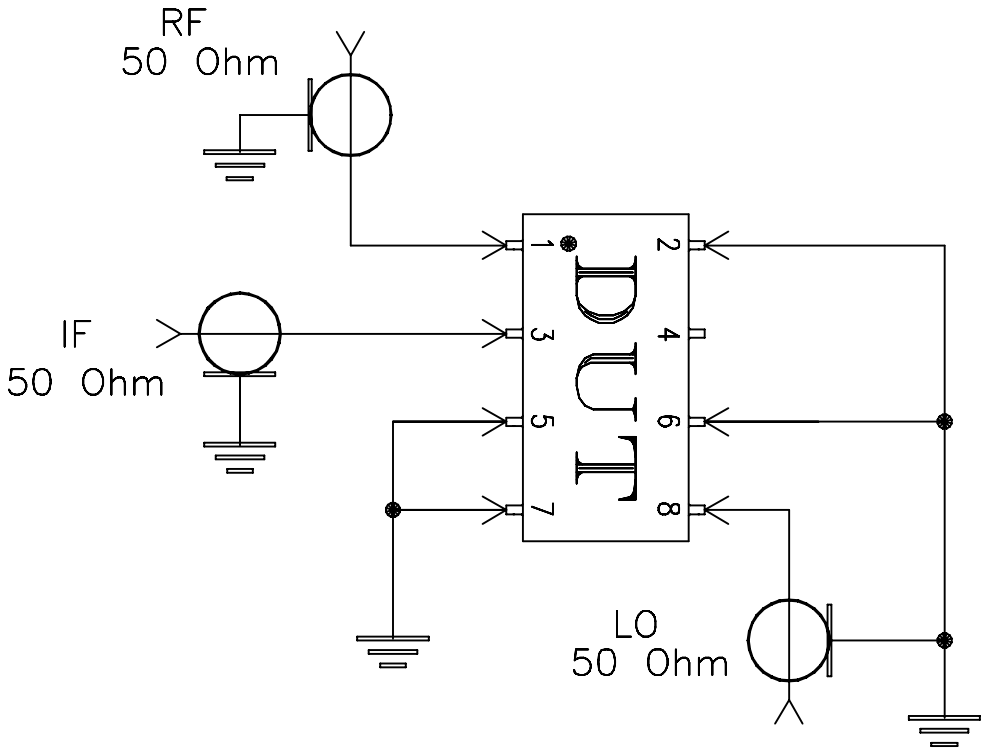
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-132	B

FILE:	SCALE:	SHEET:
98PL132	5:1	1 OF 1

Evaluation Board and Circuit



TB-172



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV02T1

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