

Level 10 (LO Power +10 dBm) 500 to 2500 MHz



Units are not marked with NL suffix

CASE STYLE: YY101

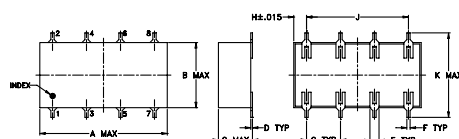
Maximum Ratings

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.	

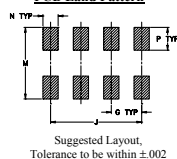
Pin Connections

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

Outline Drawing

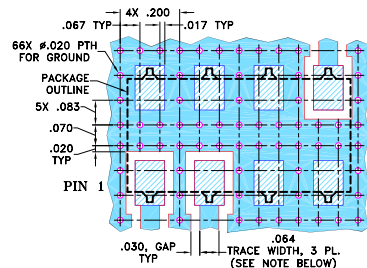


PCB Land Pattern



Outline Dimensions (inch)

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-171
Suggested PCB Layout (PL-130)

- 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

Features

- low conversion loss, 5.6 dB typ.
- wide bandwidth, 500 to 2500 MHz
- high L-R isolation, 35 dB typ.

Applications

- UHF
- cellular
- satellite distribution

Electrical Specifications

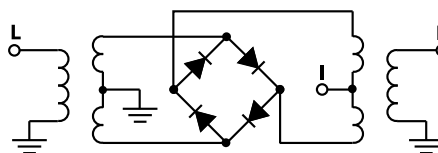
FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)	LO-IF ISOLATION (dB)	IP3 at center band (dBm)
LO/RF	Mid-Band m			
$f_L - f_U$	$\bar{X}$ σ Max. Total Range Max.	Typ. Min.	Typ. Min.	Typ.
500-2500 DC-500	5.6 .20 6.8 10	36 22	18 10	16

1 dB COMP: +5 dBm typ.
m= mid band [$2f_L$ to $f_U/2$]

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
500.00	530.00	5.89	65.85	31.29	3.95	2.63
622.45	652.45	5.56	55.50	29.50	2.87	2.52
744.90	774.90	5.48	50.54	27.28	2.24	2.54
867.35	897.35	5.13	42.15	25.72	2.22	2.62
1000.00	1030.00	5.61	37.79	23.23	2.74	2.67
1112.24	1142.24	5.70	35.91	20.77	2.97	2.54
1250.00	1280.00	5.48	36.78	19.31	3.08	2.36
1357.14	1387.14	5.65	38.10	20.17	3.27	2.32
1479.59	1509.59	5.62	36.72	22.37	3.56	2.18
1520.41	1490.41	5.85	37.24	23.28	3.76	2.07
1642.86	1612.86	6.30	36.49	25.51	4.39	1.78
1765.31	1735.31	6.79	36.28	24.69	5.09	1.61
1887.76	1857.76	7.25	35.20	21.72	5.70	1.69
2010.20	1980.20	7.54	34.85	19.66	5.94	1.99
2051.02	2021.02	7.48	34.66	19.44	5.96	2.11
2173.47	2143.47	7.34	35.19	18.10	5.72	2.33
2295.92	2265.92	7.20	37.02	17.55	5.89	2.75
2377.55	2347.55	6.78	34.65	17.01	5.28	2.94
2459.18	2429.18	6.65	32.10	16.12	4.51	3.17
2500.00	2470.00	6.69	32.24	15.44	4.25	3.32

Electrical Schematic

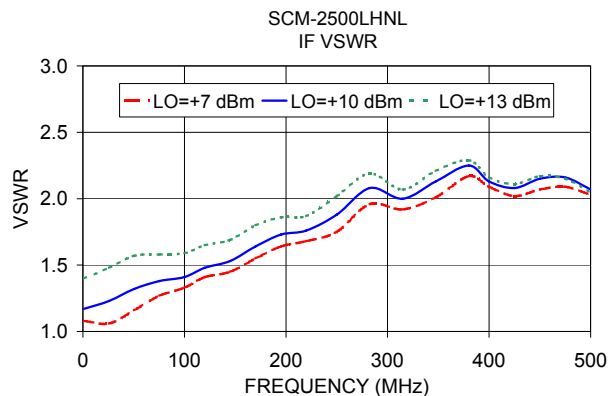
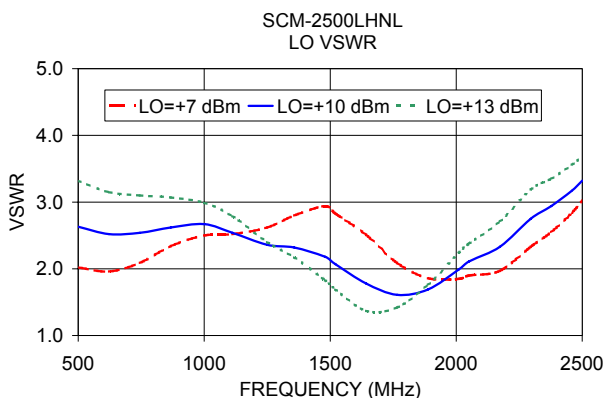
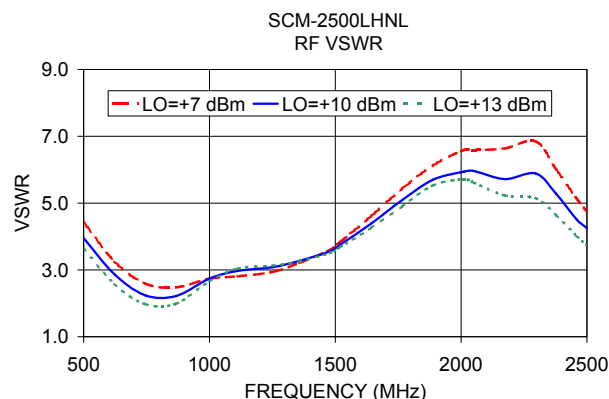
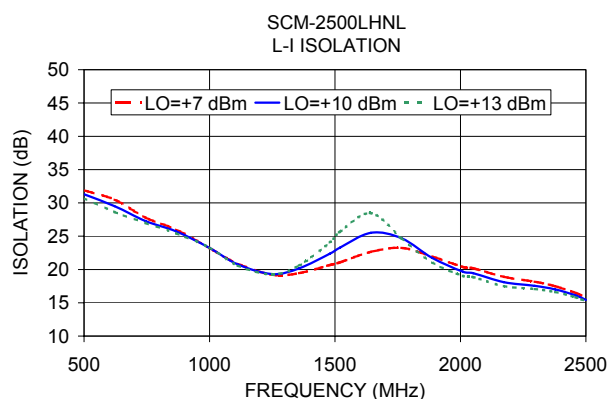
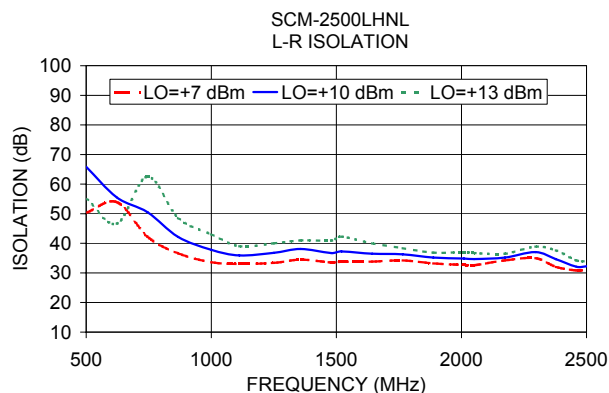
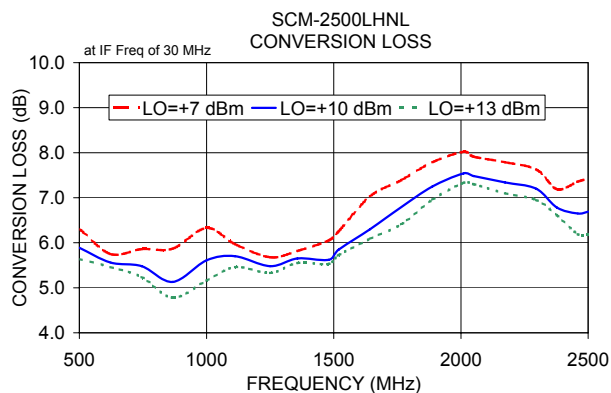


Notes

- 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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Performance Charts



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Frequency Mixer

SCM-2500LHNL+

Typical Performance Data

RF (MHz)	LO (MHz)	CONVERSION LOSS (dB)			LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
		@LO (dBm)				@LO (dBm)			@LO (dBm)		
		+7	+10	+13		+7	+10	+13	+7	+10	+13
500.0	530.0	6.31	5.89	5.64	500.0	50.32	65.85	55.19	31.90	31.29	30.70
622.5	652.5	5.75	5.56	5.46	622.5	53.94	55.50	46.66	30.48	29.50	28.62
744.9	774.9	5.86	5.48	5.24	744.9	42.25	50.54	62.54	27.79	27.28	26.98
867.4	897.4	5.87	5.13	4.78	867.4	36.62	42.15	48.57	26.00	25.72	25.43
1000.0	1030.0	6.33	5.61	5.16	1000.0	33.64	37.79	43.07	23.22	23.23	23.29
1112.2	1142.2	5.97	5.70	5.46	1112.2	33.03	35.91	39.05	20.89	20.77	20.60
1250.0	1280.0	5.68	5.48	5.33	1250.0	33.41	36.78	40.00	19.21	19.31	19.27
1357.1	1387.1	5.82	5.65	5.55	1357.1	34.51	38.10	41.00	19.45	20.17	20.60
1479.6	1509.6	6.05	5.62	5.53	1479.6	33.57	36.72	40.94	20.68	22.37	24.06
1520.4	1490.4	6.26	5.85	5.73	1520.4	33.77	37.24	42.27	21.08	23.28	25.69
1642.9	1612.9	7.03	6.30	6.09	1642.9	33.84	36.49	40.00	22.66	25.51	28.47
1765.3	1735.3	7.39	6.79	6.41	1765.3	34.23	36.28	38.37	23.26	24.69	24.70
1887.8	1857.8	7.79	7.25	6.96	1887.8	33.22	35.20	36.85	21.96	21.72	21.07
2010.2	1980.2	8.02	7.54	7.33	2010.2	32.71	34.85	37.04	20.38	19.66	19.04
2051.0	2021.0	7.91	7.48	7.30	2051.0	32.61	34.66	36.76	20.18	19.44	18.85
2173.5	2143.5	7.79	7.34	7.10	2173.5	34.23	35.19	36.49	18.91	18.10	17.51
2295.9	2265.9	7.63	7.20	6.95	2295.9	35.01	37.02	38.88	18.17	17.55	17.08
2377.6	2347.6	7.19	6.78	6.61	2377.6	32.07	34.65	37.61	17.50	17.01	16.62
2459.2	2429.2	7.36	6.65	6.19	2459.2	30.88	32.10	34.23	16.49	16.12	15.82
2500.0	2470.0	7.42	6.69	6.18	2500.0	31.16	32.24	33.95	15.78	15.44	15.24

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Frequency Mixer

SCM-2500LHNL+

Typical Performance Data

RF/LO (MHz)	RF VSWR (:1)			LO VSWR (:1)			IF (MHz)	IF VSWR (:1)			LO/RF (MHz)	max. DC output (mV)	DC Offset (mV)
	@LO (dBm)			@LO (dBm)				@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13		+7	+10	+13	+10		
500.0	4.43	3.95	3.64	2.02	2.63	3.32	1.0	1.08	1.17	1.40	500.00	-250.9	1.88
622.5	3.25	2.87	2.58	1.96	2.52	3.15	25.8	1.06	1.23	1.48	605.26	-264.3	-0.91
744.9	2.59	2.24	1.98	2.09	2.54	3.10	50.5	1.16	1.32	1.57	710.53	-226.2	0.56
867.4	2.48	2.22	1.99	2.34	2.62	3.07	75.3	1.27	1.38	1.58	815.79	-188.4	4.62
1000.0	2.74	2.74	2.66	2.50	2.67	2.99	100.0	1.33	1.41	1.59	921.05	-171.7	4.07
1112.2	2.81	2.97	3.04	2.52	2.54	2.79	120.0	1.41	1.48	1.65	1026.32	-188.4	3.27
1250.0	2.94	3.08	3.13	2.62	2.36	2.40	145.0	1.45	1.53	1.69	1131.58	-202.5	-0.19
1357.1	3.21	3.27	3.26	2.80	2.32	2.17	170.0	1.55	1.64	1.80	1236.84	-198.1	-1.51
1479.6	3.60	3.56	3.51	2.94	2.18	1.83	195.0	1.64	1.73	1.86	1342.11	-194.4	-2.40
1520.4	3.84	3.76	3.69	2.83	2.07	1.69	220.0	1.68	1.76	1.87	1447.37	-205.6	-2.02
1642.9	4.61	4.39	4.26	2.51	1.78	1.37	250.0	1.75	1.88	2.02	1552.63	-191.5	-2.36
1765.3	5.43	5.09	4.90	2.09	1.61	1.42	282.5	1.96	2.08	2.19	1657.89	-143.3	-2.01
1887.8	6.13	5.70	5.53	1.86	1.69	1.76	315.0	1.92	2.00	2.07	1763.16	-121.7	-1.36
2010.2	6.59	5.94	5.72	1.85	1.99	2.24	347.5	2.01	2.13	2.21	1868.42	-96.2	-0.68
2051.0	6.59	5.96	5.61	1.90	2.11	2.38	380.0	2.17	2.25	2.29	1973.68	-68.2	-0.45
2173.5	6.64	5.72	5.23	1.97	2.33	2.71	400.0	2.09	2.13	2.16	2078.95	-38.2	4.52
2295.9	6.85	5.89	5.15	2.33	2.75	3.19	425.0	2.02	2.08	2.11	2184.21	-10.2	3.48
2377.6	6.01	5.28	4.64	2.55	2.94	3.35	450.0	2.07	2.15	2.17	2289.47	3.0	4.41
2459.2	5.13	4.51	4.01	2.84	3.17	3.56	475.0	2.09	2.16	2.15	2394.74	4.1	6.89
2500.0	4.74	4.25	3.73	3.02	3.32	3.68	500.0	2.03	2.07	2.05	2500.00	-31.2	7.09

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Page 2 of 2



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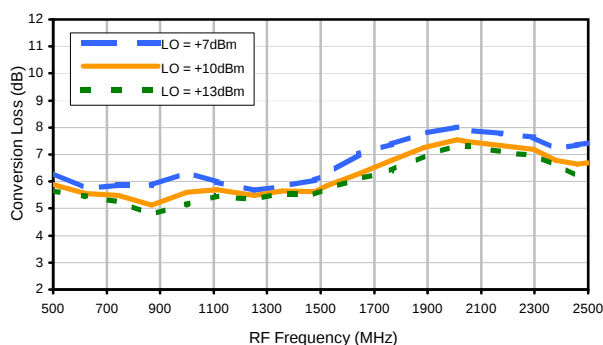


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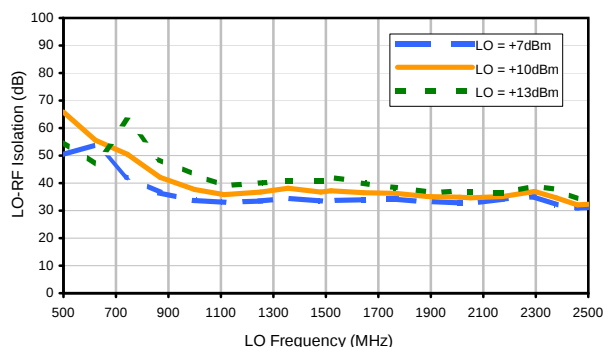


Typical Performance Curves

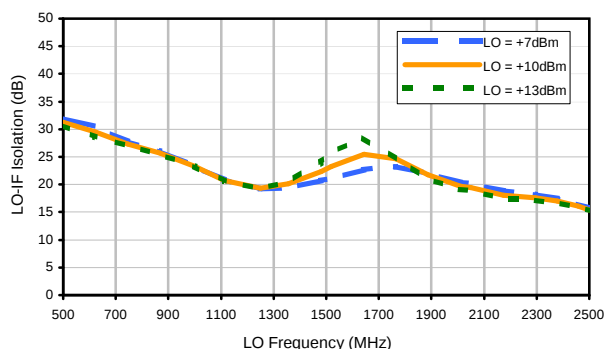
Conversion Loss



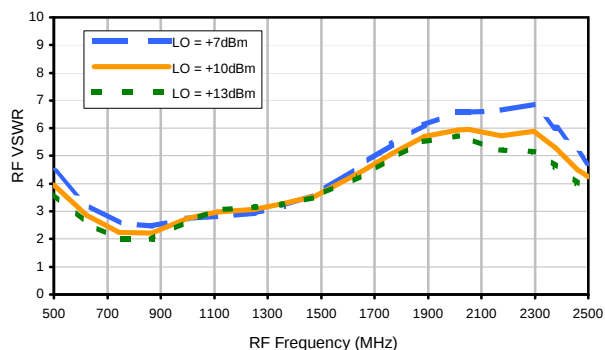
LO-RF Isolation



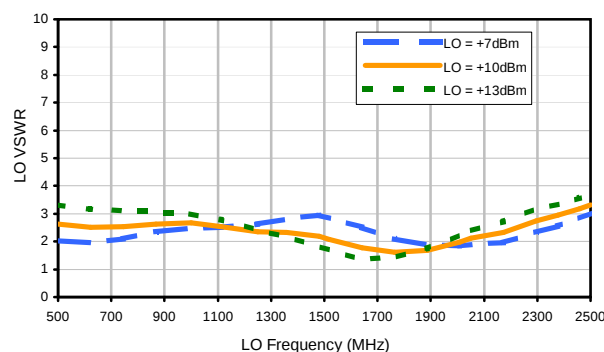
LO-IF Isolation



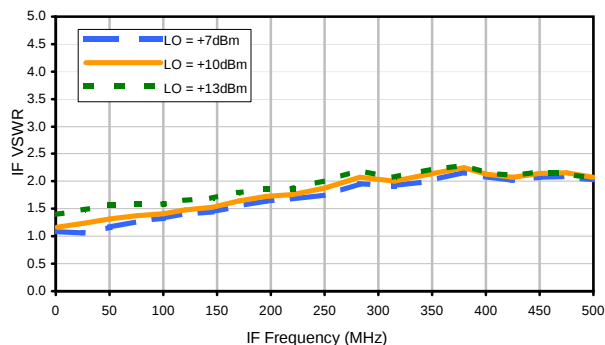
RF VSWR



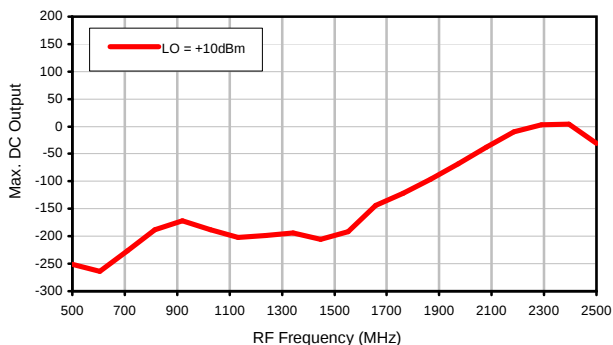
LO VSWR



IF VSWR



Max. DC Output



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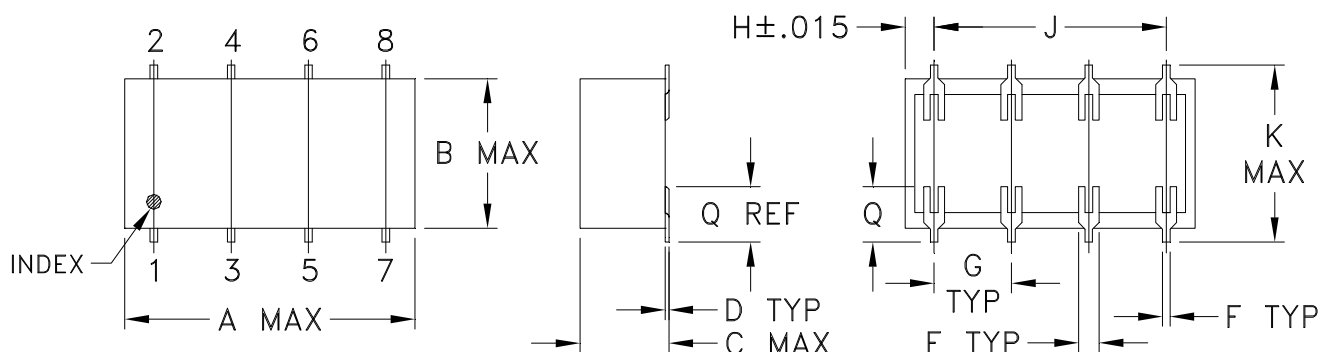


Case Style

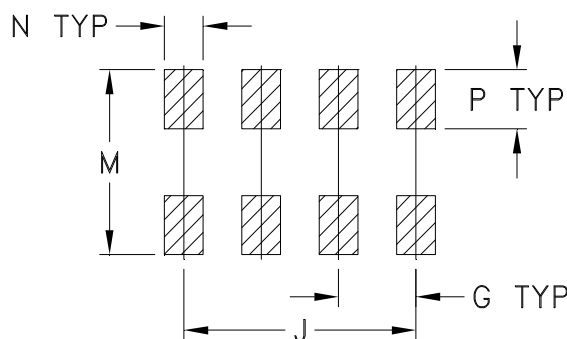
YY

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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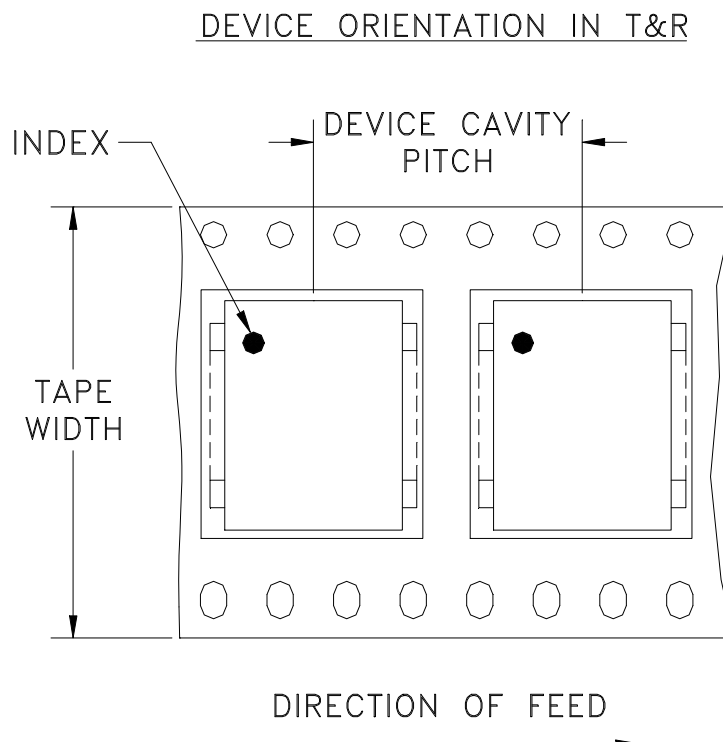
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Tape & Reel Packaging TR-F5



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

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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



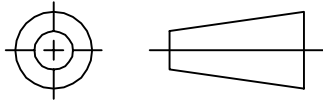
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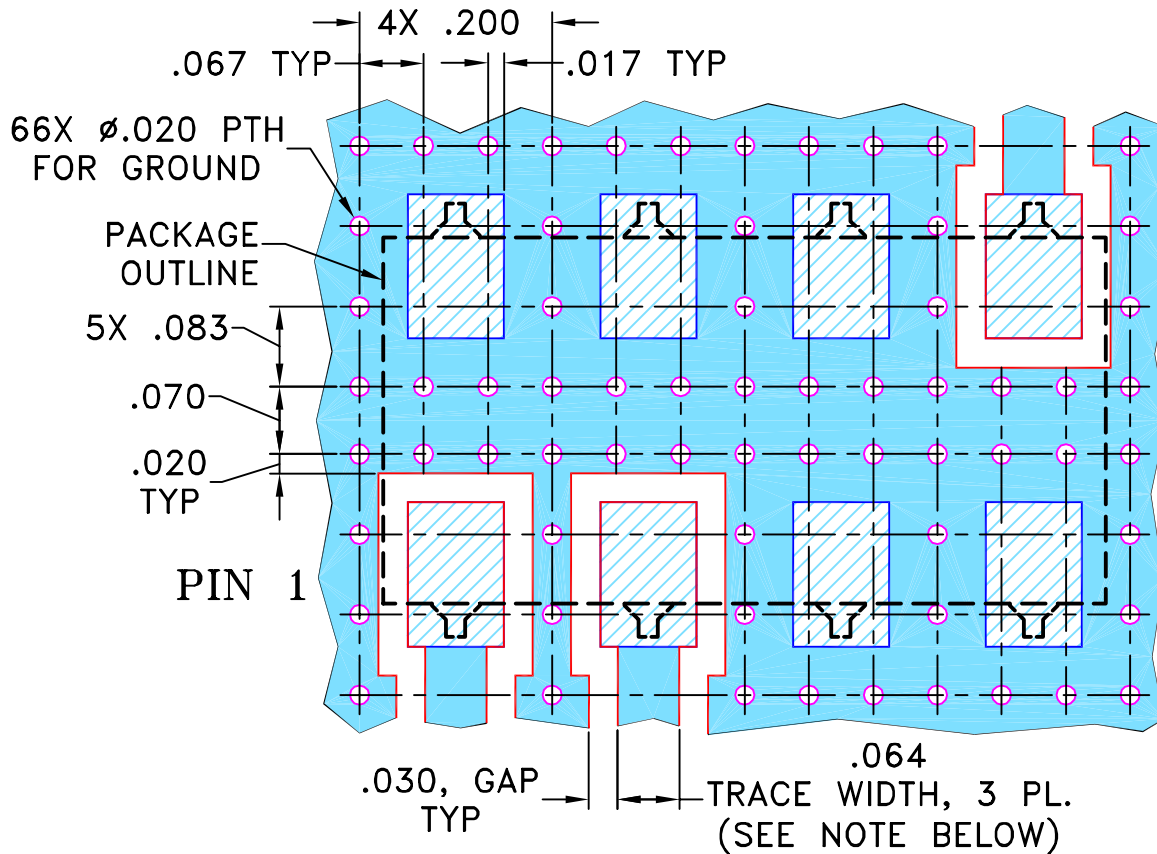
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M86774	NEW RELEASE	05/27/03	MMG	WL
A	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
B	M102713	ADDED "...WITH SMOBC"	01/16/08	GF	IL

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



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.030" \pm 0.002"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

DRAWN

MMG

05/23/03

TOLERANCES ON:

CHECKED

AV

05/27/03

2 PL DECIMALS $\pm$

APPROVED

WL

05/27/03

3 PL DECIMALS $\pm$.005

ANGLES $\pm$

FRACTIONS $\pm$

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



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, r, YY101, SCM, TB-171

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-130

REV:

B

FILE:

98PL130

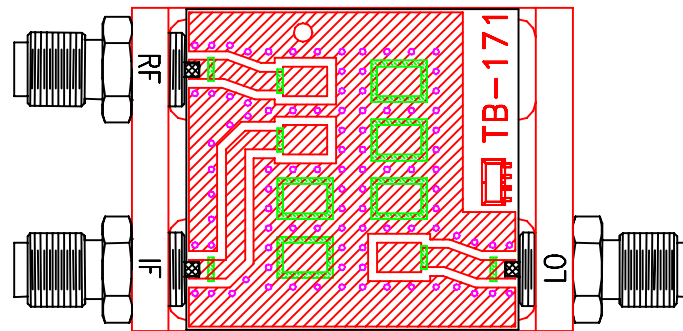
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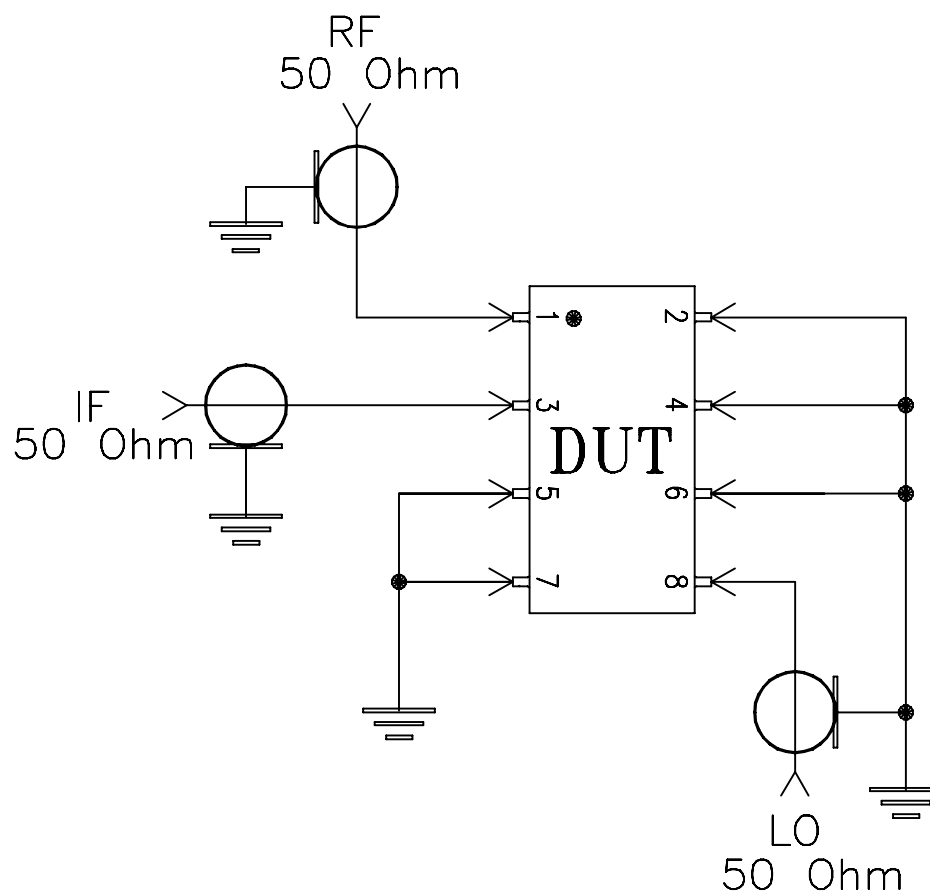
SHEET:

1 OF 1

Evaluation Board and Circuit



TB-171



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