Surface Mount

Low Pass Filter

SALF-116

50Ω DC to 116 MHz

CASE STYLE: YY101

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input	0.5W max.

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

INPUT	1
OUTPUT	8
GROUND	2,3,4,5,6,7

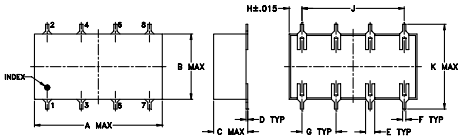
Features

- 7-section elliptic function
- excellent rejection

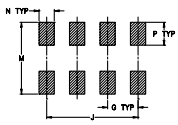
Applications

- defense communications
- receivers/transmitters
- harmonic rejection of VCOs

Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

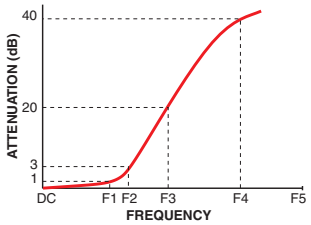
A	B	C	D	E	F	G
.75	.38	.20	.010	.050	.020	.200
19.05	9.65	5.08	0.25	1.27	0.51	5.08

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

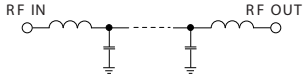
Electrical Specifications

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-116	—	—	1.0	dB
	Freq. Cut-Off	F2	142	—	3.0	—	dB
	VSWR	DC-F1	DC-116	—	1.3	—	:1
Stop Band	Rejection Loss	F3-F4	182-220	20	—	—	dB
		F4-F5	220-825	40	—	—	dB
	VSWR	F3-F5	182-825	—	18	—	:1

Typical Frequency Response



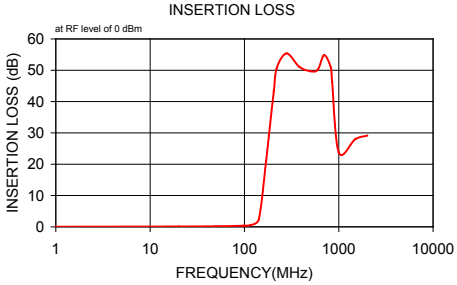
Electrical Schematic



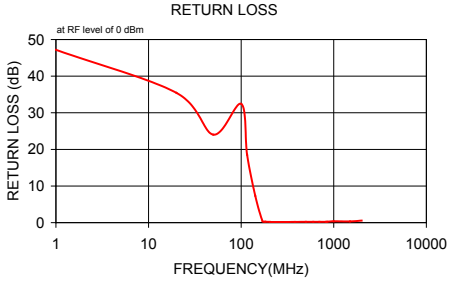
Typical Performance Data

Frequency (MHz)	Insertion Loss (dB) x̄	Insertion Loss (dB) σ	Return Loss (dB)
1.00	0.03	0.00	47.20
20.00	0.10	0.00	35.44
50.00	0.19	0.00	24.04
100.00	0.37	0.00	32.44
116.00	0.54	0.01	18.55
142.00	2.41	0.24	7.34
170.00	21.20	0.50	0.42
182.00	29.28	0.50	0.27
205.00	43.25	0.60	0.20
220.00	50.74	0.62	0.19
280.00	55.38	0.32	0.18
380.00	51.16	0.40	0.21
500.00	49.70	0.49	0.21
600.00	50.21	0.59	0.23
700.00	54.82	1.02	0.23
825.00	50.82	1.12	0.22
850.00	46.29	0.96	0.25
1000.00	23.73	2.39	0.39
1500.00	28.01	1.01	0.34
2000.00	29.12	1.29	0.55

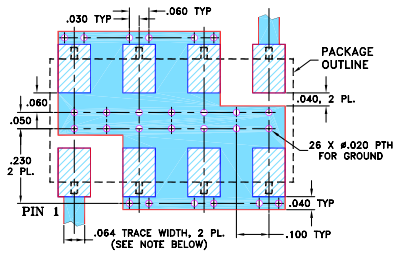
SALF-116
INSERTION LOSS



SALF-116
RETURN LOSS



Demo Board MCL P/N: TB-187+
Suggested PCB Layout (PL-049)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .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

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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Surface Mount Low Pass Filter SALF-116

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C	@ -40° C	@ +25° C	@ +85° C
1	0.06	0.04	0.06	42.51	46.90	43.55	43.03	46.94	43.76
10	0.09	0.07	0.09	38.41	40.60	38.86	41.84	44.77	41.94
20	0.12	0.10	0.12	34.79	35.68	34.54	46.47	49.33	43.53
30	0.14	0.13	0.15	31.73	31.61	30.95	39.21	40.09	38.24
40	0.16	0.16	0.18	28.13	27.72	27.58	30.42	31.43	31.11
50	0.19	0.19	0.21	24.49	24.29	24.55	25.11	26.09	26.23
60	0.22	0.22	0.25	21.64	21.70	22.23	21.71	22.63	23.03
70	0.26	0.26	0.29	19.92	20.19	20.88	19.81	20.65	21.21
80	0.29	0.30	0.33	19.72	20.14	20.96	19.54	20.34	21.03
90	0.30	0.32	0.35	21.93	22.53	23.49	21.81	22.61	23.51
100	0.32	0.35	0.39	29.74	30.95	31.13	33.39	34.59	37.37
116	0.49	0.53	0.58	17.38	17.49	17.65	17.54	17.87	18.02
120	0.56	0.61	0.66	15.43	15.58	15.83	15.35	15.69	15.87
130	0.79	0.86	0.93	13.33	13.49	13.75	12.41	12.58	12.62
142	1.90	2.10	2.28	8.10	8.00	7.85	6.75	6.58	6.37
150	5.41	5.70	5.94	2.88	2.94	2.94	2.31	2.32	2.29
160	12.63	12.90	13.12	0.82	0.91	0.96	0.61	0.67	0.70
170	20.01	20.26	20.47	0.37	0.45	0.47	0.29	0.33	0.36
182	28.13	28.38	28.61	0.22	0.28	0.30	0.20	0.23	0.26
190	33.15	33.43	33.67	0.18	0.23	0.25	0.18	0.19	0.23
205	41.89	42.19	42.46	0.13	0.18	0.19	0.17	0.17	0.20
220	49.41	49.71	49.96	0.12	0.15	0.16	0.17	0.15	0.19
280	55.82	55.87	55.89	0.10	0.13	0.13	0.20	0.15	0.19
300	54.48	54.62	54.72	0.10	0.13	0.13	0.21	0.15	0.19
380	52.00	51.98	51.99	0.09	0.12	0.13	0.23	0.16	0.21
400	51.56	51.56	51.58	0.10	0.12	0.13	0.23	0.16	0.21
500	50.79	50.82	50.76	0.09	0.12	0.13	0.25	0.17	0.23
600	51.79	51.88	51.77	0.09	0.12	0.14	0.25	0.17	0.24
700	57.79	58.28	58.31	0.09	0.13	0.14	0.26	0.18	0.25
800	54.83	54.31	53.86	0.10	0.14	0.16	0.26	0.20	0.26
825	49.90	49.55	49.10	0.10	0.13	0.16	0.27	0.20	0.27
850	46.13	45.86	45.50	0.09	0.13	0.16	0.27	0.21	0.27
900	39.45	39.24	38.88	0.10	0.15	0.17	0.27	0.22	0.29
1000	25.13	24.77	24.12	0.17	0.24	0.29	0.38	0.37	0.47
1100	23.94	24.38	24.66	0.17	0.23	0.27	0.38	0.34	0.42
1200	32.52	32.79	32.85	0.12	0.19	0.24	0.31	0.30	0.39
1300	42.12	42.70	42.93	0.12	0.21	0.27	0.35	0.37	0.47
1400	37.93	37.52	37.09	0.14	0.24	0.32	0.50	0.57	0.70
1500	23.79	23.61	23.35	0.19	0.31	0.41	1.40	1.71	1.98
1600	19.09	19.32	19.58	0.26	0.39	0.50	2.73	2.83	2.90
1700	24.94	25.22	25.70	0.25	0.40	0.53	0.77	0.78	0.91
1800	31.88	32.33	32.87	0.26	0.42	0.57	0.52	0.55	0.70
1900	48.17	45.48	43.33	0.30	0.47	0.64	0.46	0.52	0.68
2000	28.61	27.83	27.24	0.34	0.54	0.74	0.46	0.55	0.73
2100	21.07	20.42	19.91	0.43	0.67	0.90	0.50	0.62	0.84
2200	15.26	14.58	14.01	0.66	1.00	1.36	0.64	0.84	1.13
2300	9.73	8.96	8.44	1.38	2.19	3.31	1.06	1.49	2.05
2400	4.71	4.86	6.92	4.55	9.71	16.87	2.66	3.51	3.29
2500	5.00	9.64	8.43	8.61	15.52	22.62	2.87	1.90	2.37
2600	7.17	10.40	8.16	6.84	7.91	14.27	1.66	1.81	3.04
2700	6.53	4.22	4.29	11.30	13.57	9.46	2.77	4.31	4.35
2800	3.86	4.44	4.90	4.84	4.90	5.03	3.15	3.13	3.22
2900	4.92	5.27	5.66	3.15	3.72	4.14	2.31	2.55	2.76
3000	5.54	5.74	6.05	2.31	2.89	3.33	1.78	2.06	2.29

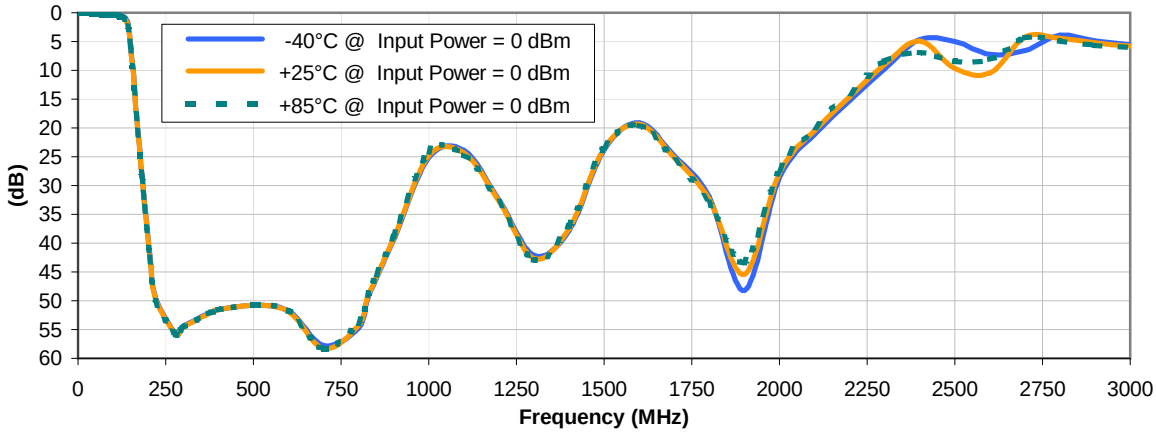
Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
0.1	4.90	5.21	5.13
1	5.19	5.16	5.19
2	5.17	5.05	5.13
3	5.13	5.11	5.12
4	5.11	5.09	5.15
5	5.13	5.09	5.12
6	5.10	5.06	5.11
7	5.09	5.07	5.12
8	5.08	5.07	5.10
9	5.09	5.08	5.10
10	5.10	5.07	5.11
11	5.09	5.07	5.10
12	5.08	5.07	5.09
13	5.08	5.07	5.10
14	5.08	5.07	5.10
15	5.10	5.08	5.11
16	5.09	5.07	5.10
17	5.10	5.09	5.11
18	5.10	5.09	5.11
19	5.11	5.09	5.12
20	5.11	5.11	5.12
21	5.12	5.11	5.13
22	5.12	5.11	5.14
23	5.12	5.12	5.13
24	5.13	5.12	5.14
25	5.14	5.13	5.15
26	5.15	5.14	5.15
27	5.16	5.14	5.16
28	5.16	5.15	5.16
29	5.16	5.15	5.17
30	5.18	5.18	5.19
31	5.19	5.19	5.20
32	5.19	5.19	5.20
33	5.21	5.20	5.21
34	5.22	5.22	5.24
35	5.23	5.22	5.23
36	5.24	5.24	5.26
37	5.25	5.24	5.26
38	5.27	5.26	5.28
39	5.26	5.27	5.27
40	5.30	5.28	5.30
45	5.36	5.35	5.37
50	5.44	5.43	5.45
60	5.62	5.62	5.65
70	5.86	5.85	5.88
80	6.20	6.17	6.21
90	6.67	6.64	6.69
100	7.31	7.29	7.34
105	7.71	7.68	7.72
110	8.14	8.11	8.16
116	8.72	8.68	8.77
120	9.22	9.16	9.28
130	11.27	11.13	11.41

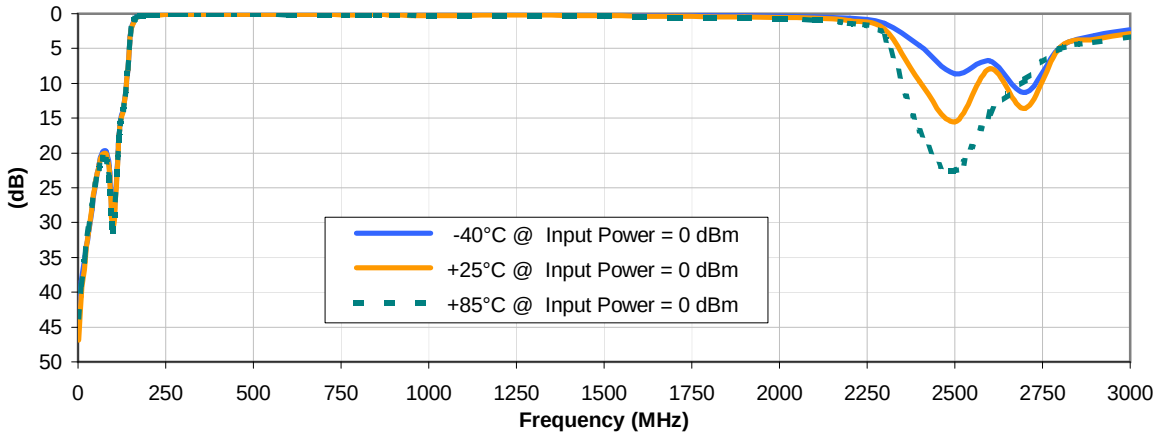
Surface Mount Low Pass Filter SALF-116

Typical Performance Curves

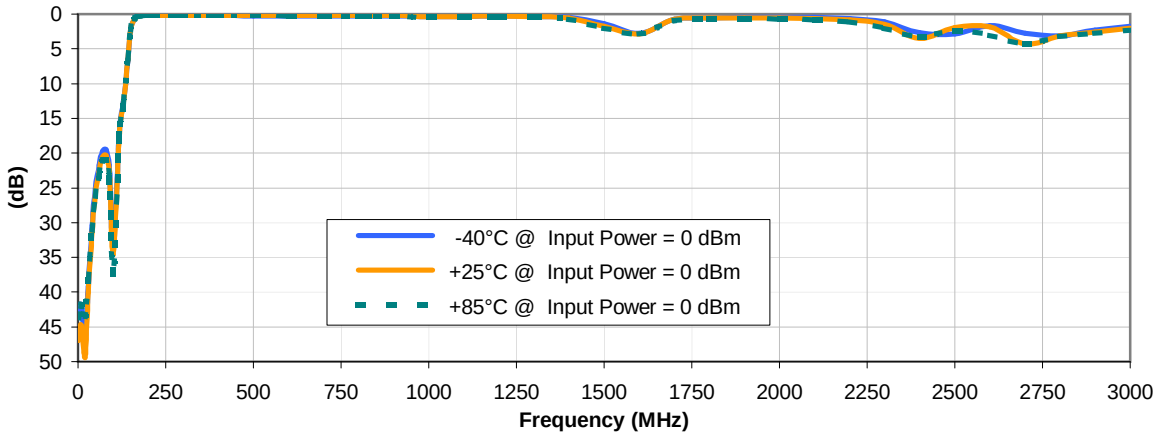
INSERTION LOSS vs. TEMPERATURE



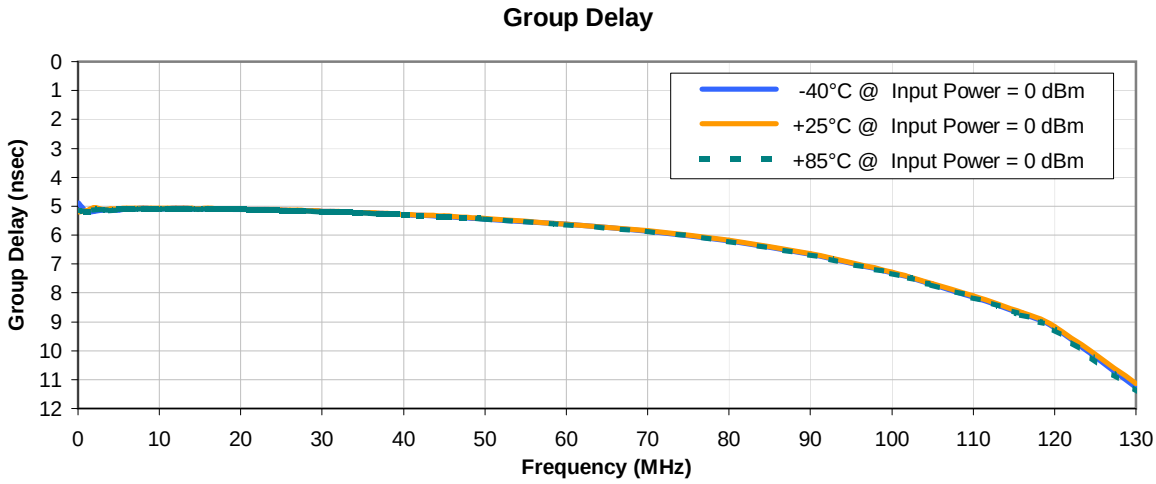
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



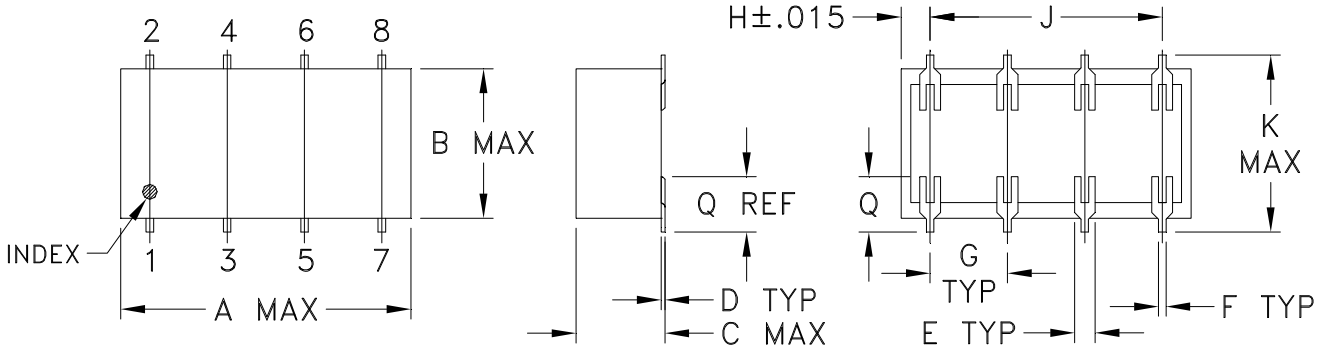
Typical Performance Curves



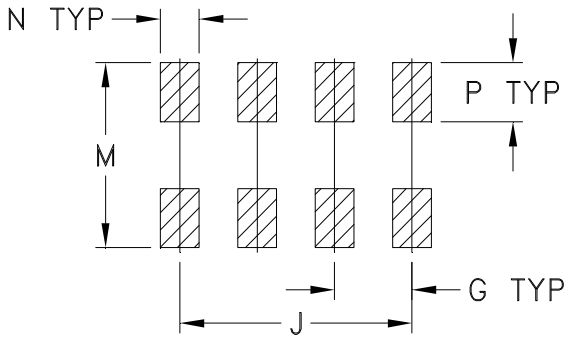
Case Style YY

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.

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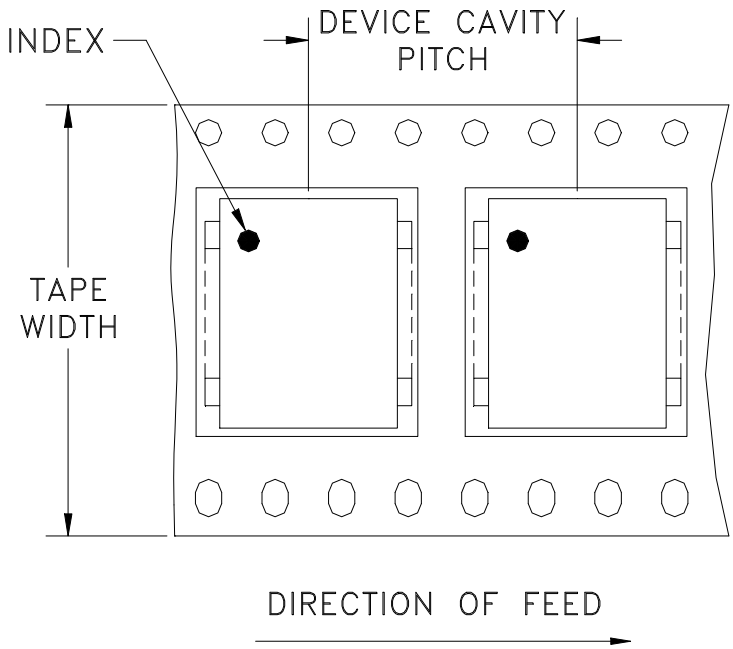
Tape & Reel Packaging TR-F5

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.

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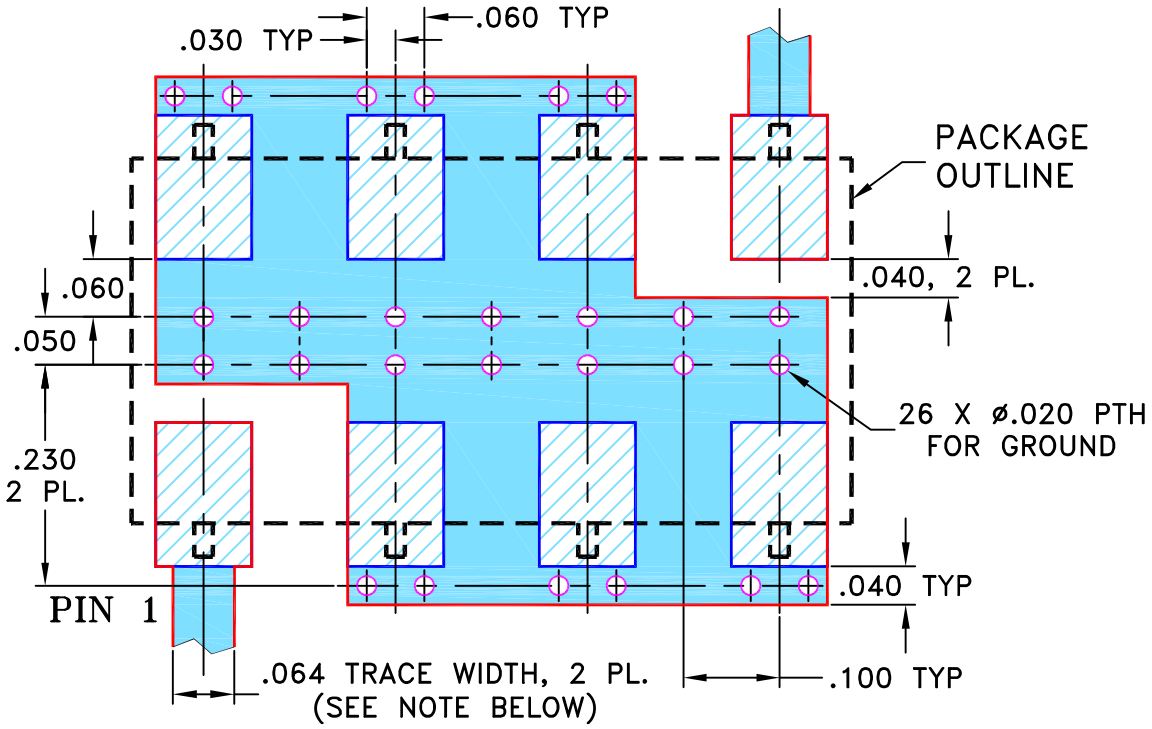
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M81561	NEW RELEASE	09/11/02	GF	ABD
A	M101145	ADDED YY101 CASE STYLE & NOTE 2	10/07/05	MMG	ABD
B	M102713	ADDED "...WITH SMOBC"	01/16/06	GT	IL
C	M165986	TB-187+ (WAS TB-187)	02/01/18	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR YY101/YY161 CASE STYLE, "cr" PIN CONNECTION



NOTES:
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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	GF	08/12/02
TOLERANCES ON:	CHECKED	AV	09/11/02
2 PL DECIMALS ±	APPROVED	ABD	09/11/02
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

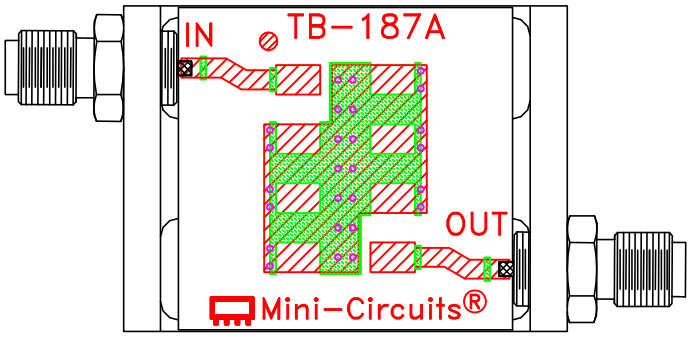
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, cr, YY101/YY161, SCLF, TB-187+

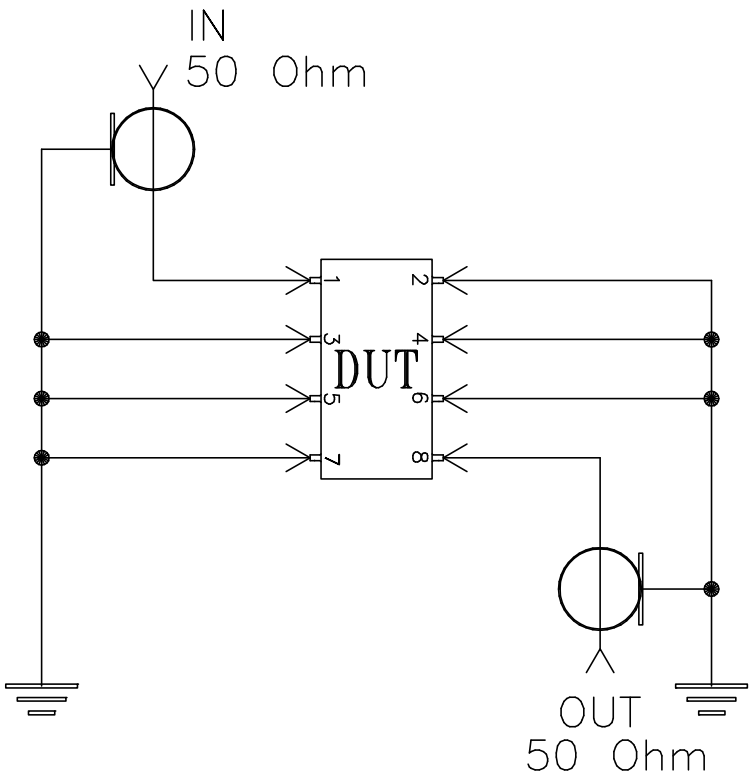
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-049	C

FILE:	SCALE:	SHEET:
98PL049	5:1	1 OF 1

Evaluation Board and Circuit



TB-187+



Schematic Diagram

Notes:

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

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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