

Surface Mount

Low Pass Filter

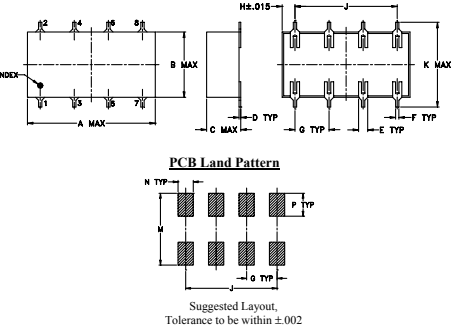
SALF-680+

50Ω DC to 680 MHz

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

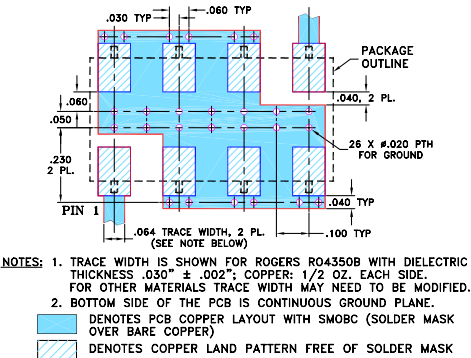
Outline Drawing



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-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.
3. DENOTES PCB COPPER LAYOUT WITH SMB (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-Circuits' 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

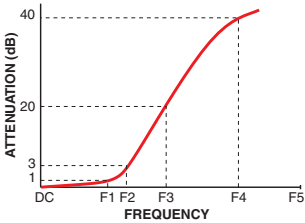
- Features**
- 7-section elliptic function
 - excellent rejection

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

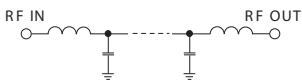
Electrical Specifications

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-680	—	1.0	dB
	Freq. Cut-Off	F2	790	3.0	—	dB
	VSWR	DC-F1	DC-680	1.4	—	:1
Stop Band	Rejection Loss	F3-F4	1090-1400	20	—	dB
		F4-F5	1400-2200	40	—	dB
	VSWR	F3-F5	1090-2200	18	—	:1

Typical Frequency Response



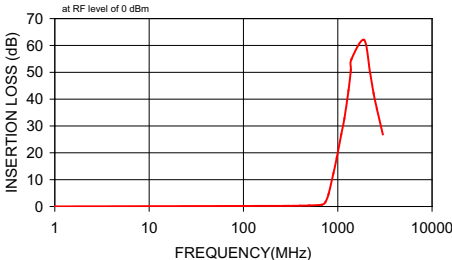
Electrical Schematic



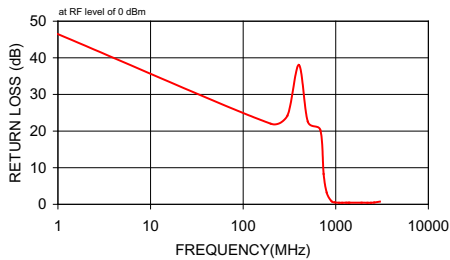
Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)
	$\bar{x}$	σ	
1.00	0.02	0.00	46.48
200.00	0.20	0.00	21.99
300.00	0.25	0.01	24.18
400.00	0.30	0.01	38.05
500.00	0.40	0.01	22.55
680.00	0.66	0.03	20.33
740.00	1.67	0.16	8.29
800.00	4.66	0.38	3.15
900.00	12.39	0.49	0.85
975.00	18.08	0.49	0.54
1090.00	26.85	0.49	0.43
1175.00	32.75	0.51	0.42
1300.00	43.21	0.64	0.44
1375.00	50.68	0.96	0.42
1400.00	54.95	1.25	0.45
1900.00	62.05	0.74	0.44
2200.00	49.91	0.38	0.44
2400.00	42.22	0.25	0.44
2600.00	36.40	0.27	0.49
3000.00	26.92	0.25	0.74

SALF-680
INSERTION LOSS



SALF-680
RETURN LOSS



Surface Mount Low Pass Filter

SALF-680+

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	0.04	0.05	0.05	46.11	45.70	45.30	47.38	46.57	46.22
2	0.04	0.05	0.05	45.80	45.22	44.87	46.97	46.23	45.81
3	0.04	0.05	0.05	45.37	44.71	44.26	46.40	45.57	45.26
4	0.04	0.05	0.05	44.97	44.31	43.77	45.80	44.83	44.36
5	0.04	0.05	0.05	44.17	43.56	43.09	45.15	44.30	43.55
6	0.05	0.05	0.05	43.49	42.69	42.30	44.16	43.32	42.67
7	0.05	0.05	0.05	42.93	42.06	41.58	43.46	42.56	41.99
8	0.04	0.05	0.05	42.22	41.36	40.80	42.83	41.87	41.26
9	0.05	0.05	0.05	41.59	40.72	40.08	42.09	41.07	40.54
10	0.05	0.05	0.05	40.97	40.02	39.43	41.41	40.37	39.86
14	0.05	0.05	0.05	38.84	37.77	37.14	39.10	38.09	37.42
15	0.05	0.05	0.06	38.29	37.26	36.62	38.59	37.53	36.91
20	0.05	0.06	0.06	36.17	35.10	34.46	36.42	35.38	34.73
30	0.06	0.07	0.07	33.01	31.99	31.34	33.15	32.14	31.50
40	0.07	0.08	0.08	30.73	29.78	29.16	30.75	29.83	29.23
50	0.07	0.09	0.09	28.93	28.09	27.55	28.86	28.07	27.57
60	0.08	0.10	0.10	27.43	26.73	26.29	27.28	26.65	26.25
70	0.09	0.10	0.11	26.09	25.59	25.28	25.96	25.51	25.25
80	0.10	0.11	0.12	24.92	24.58	24.41	24.85	24.57	24.45
90	0.11	0.12	0.13	23.87	23.74	23.73	23.87	23.78	23.81
100	0.11	0.13	0.14	22.94	23.00	23.14	22.98	23.08	23.26
200	0.19	0.21	0.21	18.62	19.92	21.42	18.51	19.86	21.44
300	0.18	0.24	0.26	22.17	23.07	24.62	21.86	22.83	24.52
400	0.19	0.27	0.31	34.04	35.12	36.05	35.50	36.34	36.86
500	0.30	0.39	0.44	18.71	18.56	19.33	18.85	18.64	19.33
600	0.38	0.50	0.56	17.73	17.80	18.76	17.63	17.68	18.53
680	0.44	0.60	0.73	24.77	23.33	21.39	24.89	23.09	20.90
700	0.59	0.77	0.92	16.43	15.67	14.85	16.61	15.74	14.77
740	1.39	1.68	1.89	8.17	7.82	7.59	8.30	7.91	7.61
800	4.51	4.96	5.22	2.78	2.74	2.77	2.85	2.80	2.79
900	12.56	13.03	13.28	0.62	0.74	0.83	0.66	0.78	0.85
975	18.48	18.88	19.15	0.33	0.48	0.58	0.36	0.51	0.60
1000	20.53	20.92	21.20	0.30	0.45	0.55	0.32	0.47	0.57
1090	27.18	27.55	27.88	0.24	0.39	0.51	0.25	0.41	0.52
1100	28.04	28.42	28.75	0.23	0.39	0.51	0.24	0.41	0.52
1200	35.53	35.97	36.41	0.22	0.38	0.50	0.22	0.39	0.51
1300	44.18	44.79	45.59	0.21	0.38	0.51	0.22	0.40	0.53
1400	60.87	63.60	66.68	0.21	0.37	0.51	0.22	0.40	0.54
1500	57.42	56.66	55.73	0.21	0.37	0.52	0.21	0.40	0.55
1600	52.03	51.95	51.73	0.20	0.36	0.50	0.21	0.39	0.55
1700	52.38	52.93	52.85	0.20	0.36	0.50	0.21	0.39	0.55
1800	52.73	53.20	54.05	0.18	0.34	0.48	0.20	0.39	0.55
1900	57.98	60.07	63.24	0.17	0.33	0.47	0.20	0.38	0.54
2000	64.39	72.74	72.35	0.15	0.31	0.45	0.19	0.37	0.53
2100	60.55	56.82	54.06	0.13	0.30	0.44	0.18	0.36	0.53
2200	55.30	52.14	49.87	0.13	0.30	0.44	0.18	0.37	0.53
2300	46.23	44.97	43.92	0.13	0.30	0.45	0.19	0.38	0.55
2400	43.08	42.25	41.11	0.15	0.33	0.48	0.21	0.40	0.58
2500	39.48	38.38	37.49	0.16	0.34	0.50	0.23	0.44	0.63
2600	38.68	37.52	36.66	0.20	0.40	0.57	0.27	0.48	0.69
2700	35.79	34.79	33.95	0.21	0.42	0.60	0.30	0.52	0.74
2800	34.00	33.12	32.38	0.26	0.48	0.68	0.38	0.61	0.87
2900	29.69	28.71	28.16	0.35	0.60	0.83	0.43	0.69	0.97
3000	27.42	26.78	26.28	0.41	0.67	0.92	0.49	0.76	1.05

REV. X2
SALF-680+
101025
Page 1 of 2



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Surface Mount Low Pass Filter

SALF-680+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
0	0.25	0.60	0.31
1	0.68	0.70	0.69
3	0.71	0.73	0.72
4	0.71	0.72	0.72
5	0.72	0.72	0.72
6	0.71	0.72	0.72
7	0.72	0.72	0.72
8	0.71	0.72	0.72
9	0.71	0.72	0.72
10	0.71	0.72	0.72
11	0.71	0.72	0.72
12	0.71	0.71	0.72
13	0.71	0.71	0.72
14	0.71	0.71	0.71
15	0.71	0.71	0.71
16	0.71	0.71	0.71
17	0.71	0.71	0.71
18	0.71	0.71	0.71
19	0.71	0.71	0.71
20	0.71	0.71	0.71
21	0.70	0.71	0.71
22	0.70	0.71	0.71
23	0.70	0.70	0.71
24	0.70	0.71	0.71
25	0.70	0.71	0.71
26	0.70	0.71	0.71
27	0.70	0.70	0.71
28	0.70	0.70	0.70
29	0.70	0.70	0.71
30	0.70	0.70	0.70
31	0.70	0.70	0.70
32	0.70	0.70	0.70
33	0.70	0.70	0.70
34	0.70	0.70	0.70
35	0.70	0.70	0.70
36	0.70	0.70	0.70
37	0.70	0.70	0.70
38	0.70	0.70	0.70
39	0.70	0.70	0.70
40	0.70	0.70	0.70
50	0.70	0.70	0.70
60	0.70	0.69	0.69
70	0.70	0.69	0.69
80	0.70	0.69	0.69
90	0.70	0.69	0.69
100	0.69	0.69	0.69
200	0.70	0.70	0.71
300	0.75	0.75	0.75
400	0.83	0.83	0.83
500	0.93	0.93	0.93
600	1.11	1.11	1.12
700	1.65	1.66	1.67
800	1.65	1.60	1.57
900	0.88	0.87	0.83

REV. X2
SALF-680+
101025
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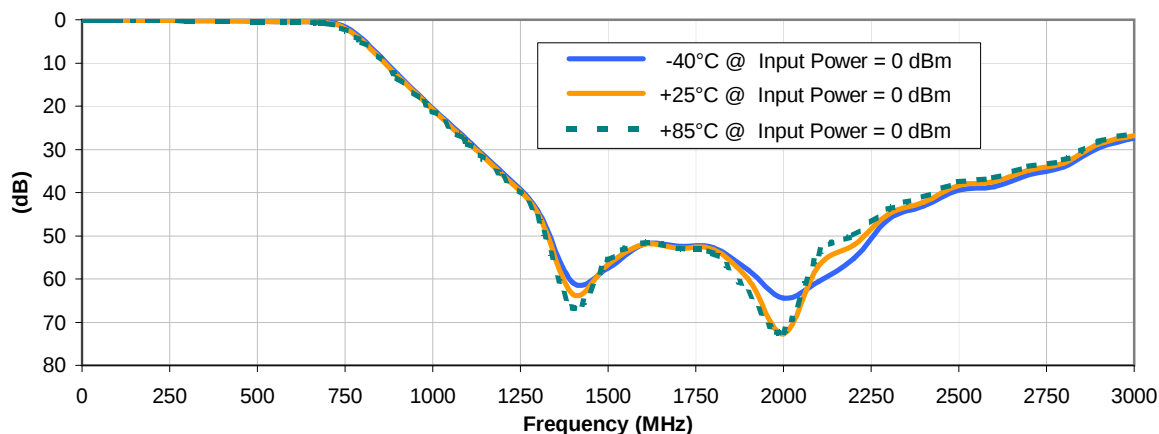


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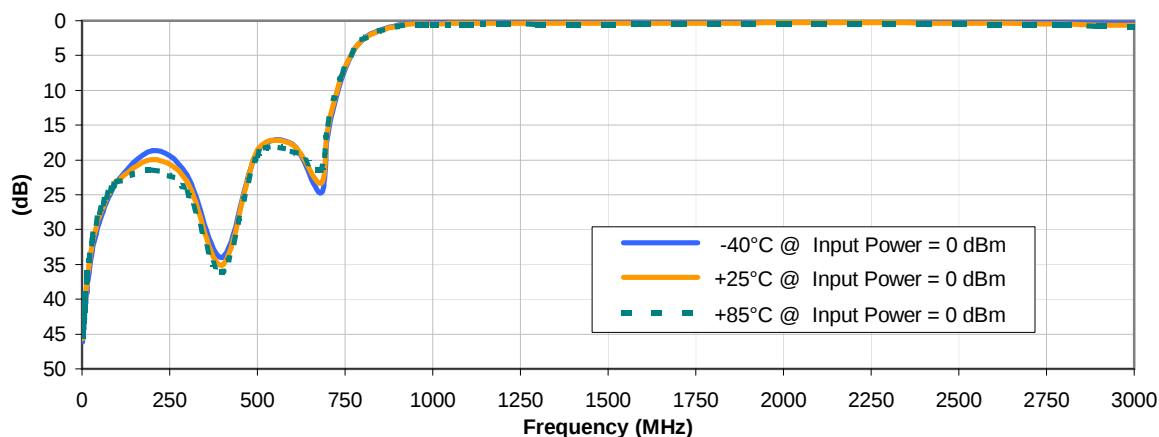


Typical Performance Curves

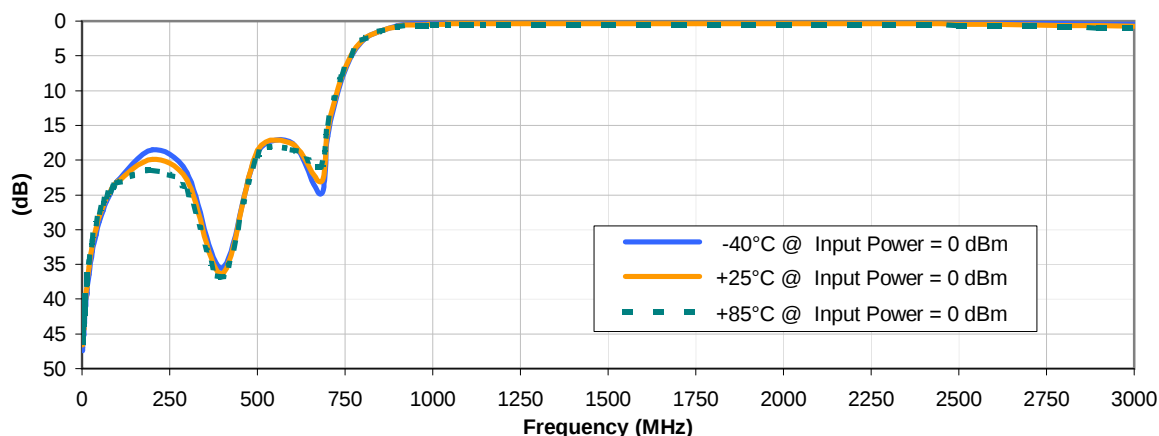
INSERTION LOSS vs. TEMPERATURE



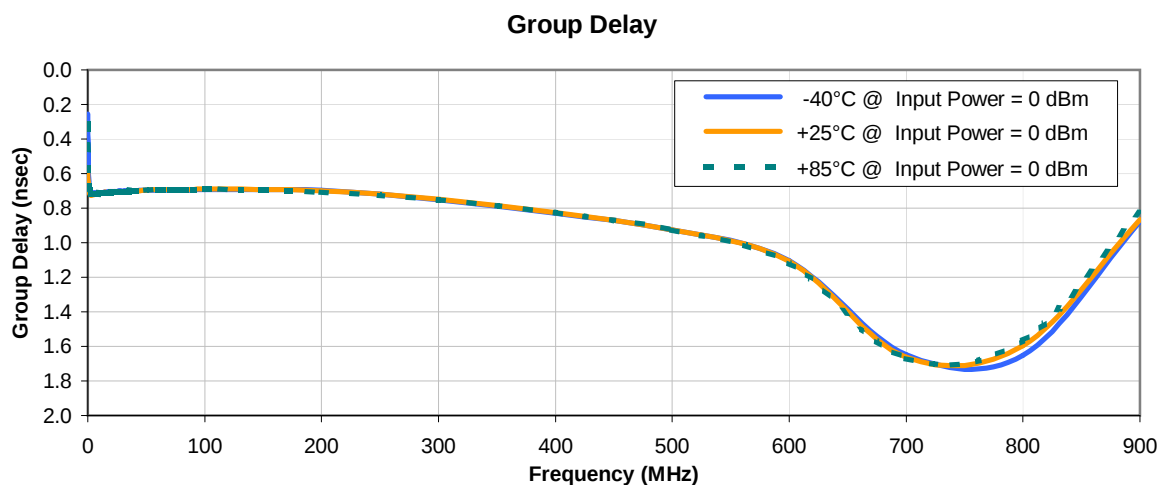
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



Typical Performance Curves



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SALF-680+
101025
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Case Style

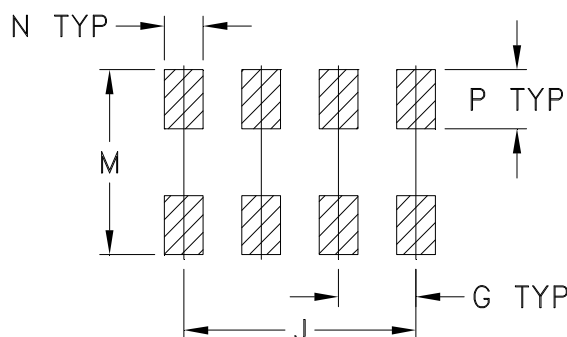
YY

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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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

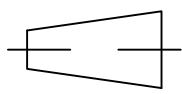


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REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M81561	NEW RELEASE	09/11/02	GF	ABD
A	M101145	ADDED YY101 CASE STYLE & NOTE 2	10/07/05	MMG	ABD
B	M102713	ADDED "...WITH SMOBC"	01/16/06	GT	IL
C	M165986	TB-187+ (WAS TB-187)	02/01/18	ITG	IL

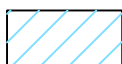
.030 TYP
 .060 TYP
 .060
 .050
 .230
 2 PL.
 PIN 1
 .064 TRACE WIDTH, 2 PL.
 (SEE NOTE BELOW)
 .100 TYP
 .040 TYP
 .040, 2 PL.
 PACKAGE OUTLINE
 26 X ϕ .020 PTH FOR GROUND

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" $\pm$.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	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® 13 Neptune Avenue
Brooklyn NY 11235

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

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-049		REV: C
FILE: 98PL049		SCALE: 5:1	SHEET: 1 OF 1	

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

Evaluation Board and Circuit



TB-187+



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