

Surface Mount Low Pass Filter

50Ω DC to 325 MHz

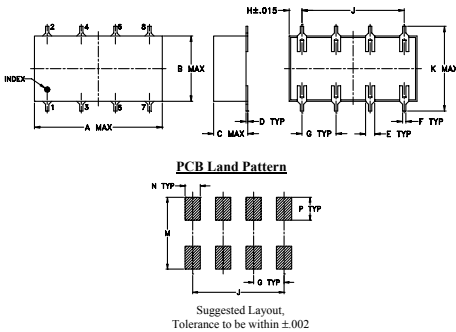
Maximum Ratings

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

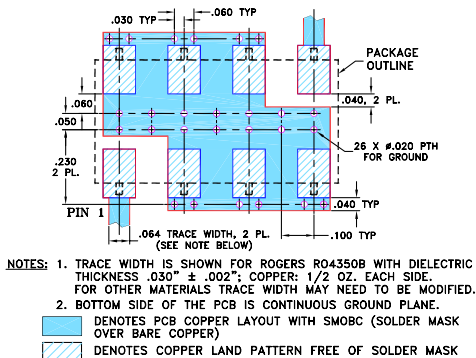
Outline Drawing



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

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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

**SALF-325+
SALF-325**



Generic photo used for illustration purposes only

CASE STYLE: YY101

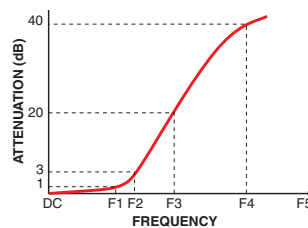
+RoHS Compliant

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

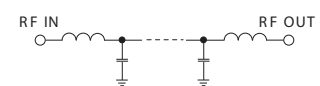
Electrical Specifications

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-325	—	—	1.0 dB
	Freq. Cut-Off	F2	383	—	3.0	dB
	VSWR	DC-F1	DC-325	—	1.3	:1
Stop Band	Rejection Loss	F3-F4	480-580	20	—	dB
		F4-F5	580-1250	40	—	dB
	VSWR	F3-F5	480-1250	—	18	:1

Typical Frequency Response



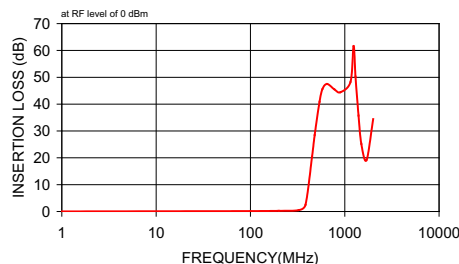
Electrical Schematic



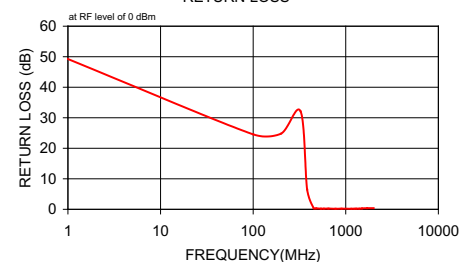
Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)
	$\bar{x}$	σ	
1	0.03	0.00	49.25
100	0.14	0.00	24.56
200	0.25	0.00	24.79
325	0.53	0.01	32.09
383	2.48	0.15	6.52
450	20.40	0.39	0.41
480	28.51	0.42	0.33
540	40.90	0.45	0.23
580	45.61	0.44	0.22
650	47.49	0.43	0.23
775	45.50	0.45	0.18
900	44.43	0.49	0.20
1150	48.25	1.01	0.19
1240	61.59	3.99	0.19
1300	50.26	1.97	0.20
1400	35.73	0.73	0.22
1500	25.20	0.88	0.30
1700	19.14	0.76	0.37
2000	34.41	0.57	0.38

SALF-325 INSERTION LOSS



SALF-325 RETURN LOSS



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Surface Mount Low Pass Filter

SALF-325+

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	0.03	0.03	0.03	49.48	50.00	48.19	50.28	50.76	48.94
10	0.04	0.04	0.05	39.74	40.73	41.36	39.88	40.78	41.58
20	0.05	0.06	0.06	33.95	34.90	35.78	34.04	34.81	35.80
30	0.07	0.07	0.08	30.65	31.48	32.28	30.76	31.39	32.30
40	0.08	0.08	0.09	28.52	29.18	29.82	28.71	29.14	29.90
50	0.09	0.10	0.11	27.10	27.58	28.01	27.34	27.59	28.13
60	0.10	0.11	0.12	26.21	26.47	26.66	26.47	26.49	26.79
70	0.11	0.12	0.13	25.76	25.76	25.69	26.01	25.74	25.78
80	0.12	0.13	0.15	25.67	25.38	25.02	25.84	25.28	25.01
90	0.12	0.14	0.16	25.90	25.27	24.58	26.02	25.12	24.54
100	0.13	0.15	0.17	26.52	25.51	24.47	26.59	25.31	24.37
110	0.14	0.16	0.18	27.56	26.08	24.63	27.60	25.84	24.51
120	0.14	0.17	0.20	29.16	27.07	25.13	29.20	26.79	25.02
130	0.15	0.18	0.21	31.57	28.61	26.06	31.59	28.33	25.98
150	0.16	0.20	0.22	44.15	35.27	30.11	38.23	33.97	29.88
200	0.22	0.27	0.30	25.68	26.12	27.13	25.41	25.87	26.80
250	0.30	0.37	0.42	21.92	21.07	20.13	22.39	21.36	20.45
300	0.38	0.47	0.54	24.96	24.66	23.50	27.84	27.34	26.03
325	0.46	0.58	0.67	26.28	26.24	25.81	28.28	28.54	28.40
350	0.65	0.81	0.93	20.88	21.30	21.40	20.06	20.12	19.94
383	2.72	3.13	3.46	5.53	5.44	5.34	5.41	5.29	5.16
400	6.43	7.03	7.53	2.17	2.22	2.21	2.13	2.16	2.14
450	21.02	21.62	22.23	0.36	0.46	0.51	0.36	0.46	0.51
480	29.15	29.68	30.27	0.25	0.34	0.38	0.27	0.35	0.39
500	34.00	34.50	35.04	0.22	0.30	0.34	0.24	0.31	0.36
540	41.77	42.15	42.56	0.18	0.25	0.28	0.21	0.27	0.31
550	43.29	43.64	43.99	0.17	0.24	0.27	0.21	0.26	0.30
580	46.63	46.88	47.03	0.16	0.22	0.25	0.21	0.25	0.29
590	47.33	47.51	47.57	0.16	0.21	0.24	0.21	0.25	0.29
600	47.80	47.95	47.98	0.15	0.21	0.24	0.21	0.25	0.29
650	48.73	48.73	48.57	0.14	0.19	0.22	0.21	0.24	0.27
700	48.05	48.14	47.93	0.13	0.18	0.21	0.21	0.23	0.27
750	47.51	47.57	47.36	0.13	0.17	0.20	0.21	0.23	0.27
775	47.60	47.70	47.45	0.13	0.18	0.20	0.22	0.24	0.27
800	46.64	46.76	46.54	0.13	0.17	0.20	0.21	0.23	0.27
850	46.47	46.65	46.39	0.12	0.16	0.19	0.22	0.23	0.27
900	46.36	46.59	46.38	0.12	0.16	0.19	0.21	0.23	0.27
950	46.73	46.92	46.64	0.12	0.16	0.19	0.22	0.24	0.28
1000	47.37	47.70	47.46	0.12	0.16	0.19	0.22	0.24	0.28
1050	48.41	48.73	48.52	0.11	0.16	0.19	0.22	0.24	0.28
1100	51.37	51.97	51.71	0.11	0.17	0.20	0.21	0.24	0.29
1150	53.40	54.48	54.52	0.11	0.17	0.21	0.22	0.25	0.30
1200	74.31	69.28	68.23	0.11	0.17	0.21	0.21	0.25	0.30
1240	54.10	53.09	52.52	0.11	0.17	0.22	0.21	0.25	0.32
1300	42.82	42.40	41.99	0.11	0.19	0.24	0.21	0.27	0.33
1400	32.90	32.55	32.04	0.13	0.21	0.28	0.24	0.31	0.39
1500	21.56	20.95	20.10	0.25	0.38	0.52	0.41	0.56	0.75
1600	12.68	14.16	15.37	0.84	0.80	0.78	1.33	1.18	1.12
1700	22.97	23.44	23.84	0.23	0.35	0.46	0.35	0.45	0.56
1800	27.69	28.01	28.23	0.23	0.36	0.49	0.34	0.45	0.58
1900	31.66	31.94	32.09	0.26	0.40	0.55	0.34	0.47	0.62
2000	38.14	38.70	38.95	0.29	0.45	0.62	0.36	0.51	0.68
2500	2.20	2.57	2.93	6.22	6.27	6.39	6.43	6.62	6.87
3000	3.72	3.93	4.23	3.12	3.61	4.02	3.28	3.67	4.02

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Surface Mount Low Pass Filter

SALF-325+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
0.1	1.56	1.70	1.75
1	1.82	1.84	1.84
10	1.82	1.83	1.84
20	1.81	1.82	1.82
30	1.81	1.82	1.82
40	1.81	1.82	1.82
50	1.82	1.82	1.82
60	1.83	1.83	1.83
70	1.84	1.84	1.84
80	1.85	1.85	1.86
90	1.87	1.87	1.87
100	1.89	1.89	1.89
110	1.91	1.91	1.91
120	1.93	1.93	1.93
130	1.96	1.96	1.96
140	1.99	1.99	2.00
150	2.03	2.03	2.03
200	2.24	2.25	2.26
250	2.58	2.59	2.60
300	3.23	3.25	3.28
325	3.77	3.81	3.85
350	4.79	4.87	4.94
360	5.43	5.53	5.61
370	6.15	6.24	6.32
380	6.66	6.66	6.69
383	6.69	6.66	6.66
390	6.51	6.39	6.32
400	5.67	5.49	5.36
410	4.65	4.46	4.33
420	3.79	3.64	3.52
430	3.18	3.06	2.97
440	2.75	2.66	2.57
450	2.41	2.34	2.27
460	2.09	2.04	1.98
470	1.81	1.77	1.72
480	1.57	1.54	1.50
500	1.25	1.26	1.22
510	1.18	1.20	1.18
520	1.22	1.21	1.18
530	1.18	1.17	1.19
540	1.15	1.15	1.18
550	1.10	1.09	1.06
560	1.08	1.05	1.03
570	0.90	0.92	0.99
580	0.87	0.87	0.76
590	0.79	0.79	0.92
600	0.75	0.73	0.72
650	0.34	0.34	0.41
700	0.38	0.42	0.33
750	0.32	0.36	0.38
775	0.72	0.65	0.65
800	0.75	0.69	0.63
850	0.18	0.24	0.19
900	0.58	0.24	0.08

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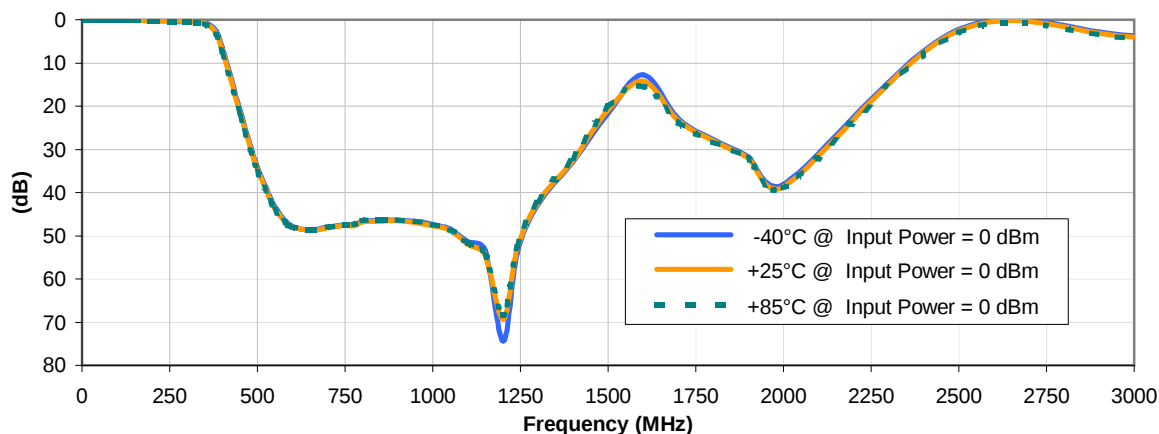


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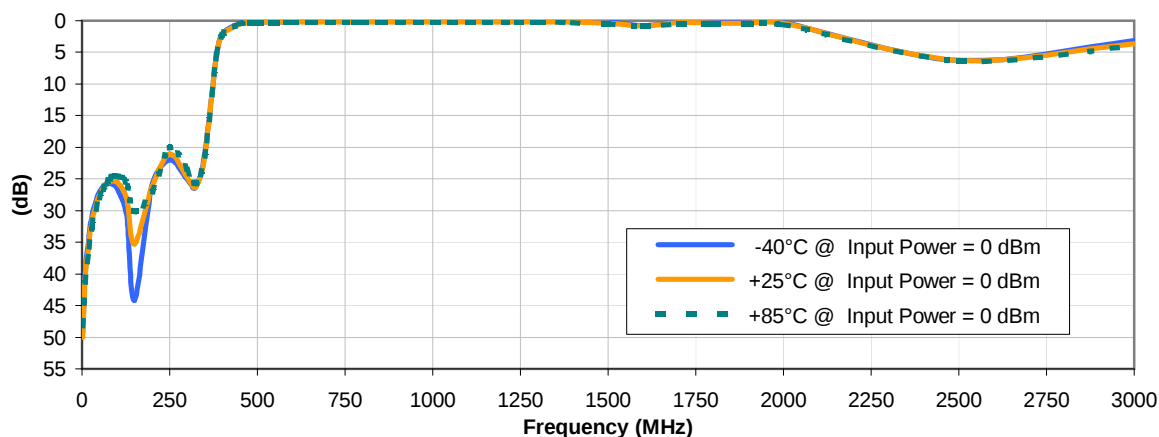


Typical Performance Curves

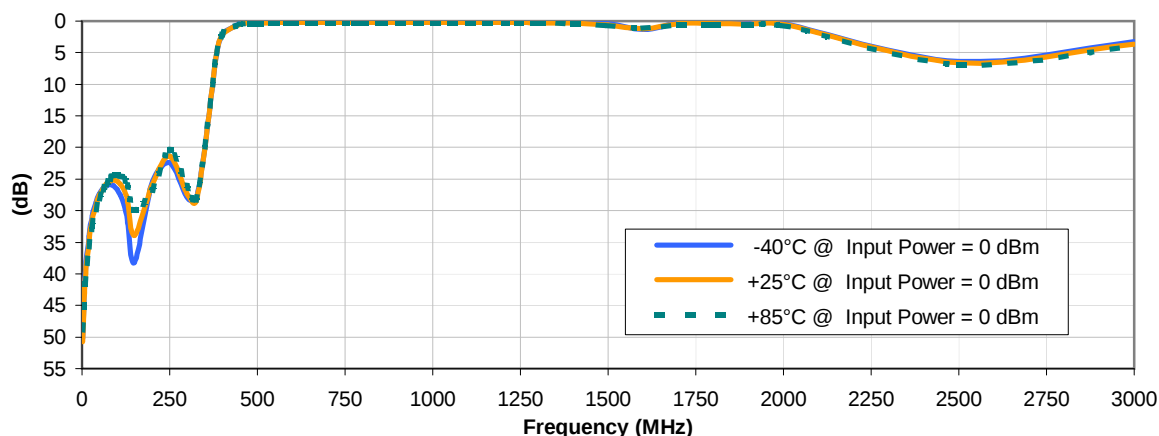
INSERTION LOSS vs. TEMPERATURE



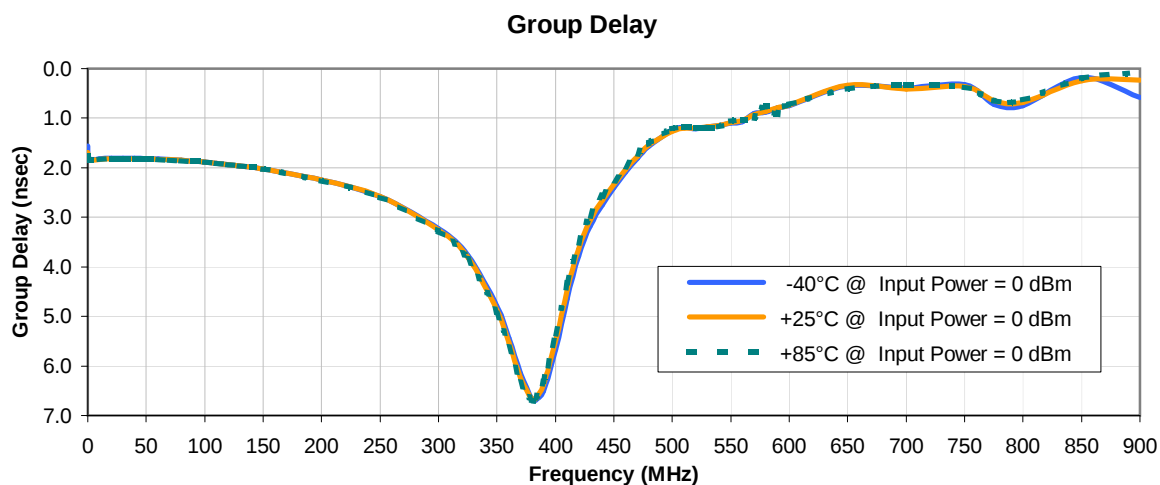
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



Typical Performance Curves



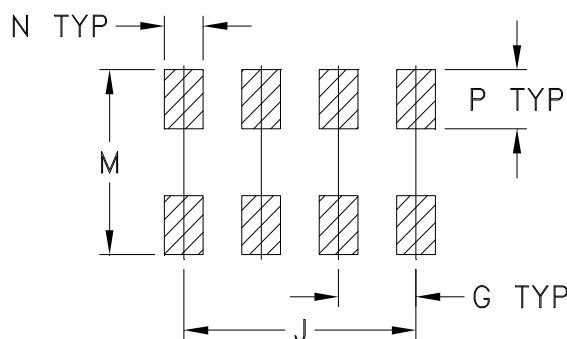
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Outline Dimensions

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

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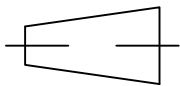


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REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M81561	NEW RELEASE	09/11/02	GF	ABD
A	M101145	ADDED YY101 CASE STYLE & NOTE 2	10/07/05	MMG	ABD
B	M102713	ADDED "...WITH SMOBC"	01/16/06	GT	IL
C	M165986	TB-187+ (WAS TB-187)	02/01/18	ITG	IL

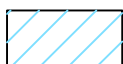
Figure 1: PCB layout for the 74VHC04. The diagram shows a rectangular PCB with a blue solder mask and red copper traces. It features a 4x4 grid of vias (26 x 0.020 PTH for ground) and four rectangular pads (0.060 x 0.060) for components. Dimensions include .030 TYP for pad spacing, .060 TYP for pad width, .040 TYP for pad length, .040 TYP for pad spacing, .064 TRACE WIDTH, 2 PL. for the main traces, .100 TYP for the overall width, .050 TYP for the overall height, .060 TYP for the overall width, .040 TYP for the overall height, .040 TYP for the overall width, .040 TYP for the overall height, .040 TYP for the overall width, .040 TYP for the overall height. The package outline is shown as a dashed line. Pin 1 is indicated at the bottom left.

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 ±			



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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