

Low Pass Filter

50Ω DC to 135 MHz

Maximum Ratings

Operating Temperature -40°C to 85°C

Storage Temperature -55°C to 100°C

RF Power Input 0.5W Max.

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

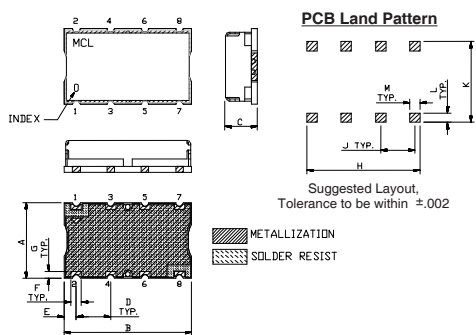
Pin Connections

INPUT 1

OUTPUT 8

GROUND 2, 3, 4, 5, 6, 7

Outline Drawing



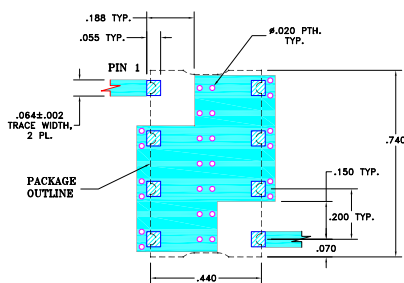
Outline Dimensions (inch mm)

A	B	C	D	E	F	
.44	.74	.27	.200	.07	.060	
11.18	18.80	6.86	5.08	1.78	1.52	
G	H	J	K	L	M	wt.
.040	.660	.200	.470	.055	.060	grams
1.02	16.76	5.08	11.94	1.40	1.52	3.0

Note: Please refer to case style drawing for details

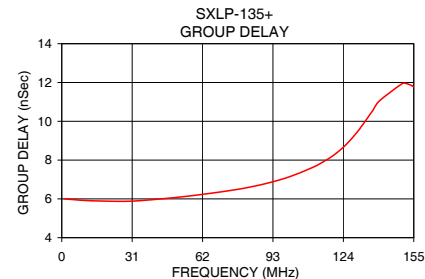
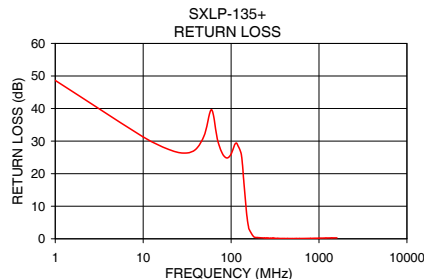
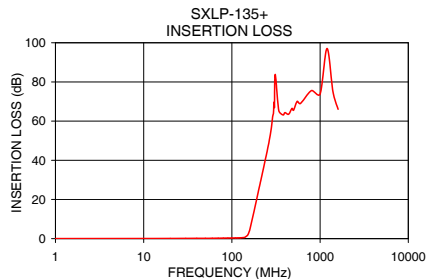
Demo Board MCL P/N: TB-368

Suggested PCB Layout (PL-230)



NOTE:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .025"±.002". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - 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

- 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



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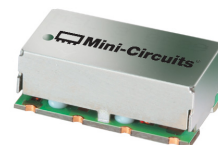
Features

- high rejection
- sharp cut-off
- shielded package
- aqueous washable
- low cost

Applications

- defense communications
- receivers / transmitters
- harmonic rejection

SXLP-135+



Generic photo used for illustration purposes only
CASE STYLE: HF1139

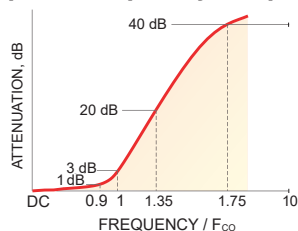
+RoHS Compliant

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

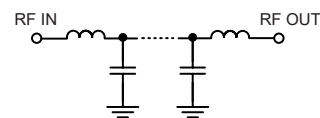
Low Pass Filter Electrical Specifications (T_{AMB} = 25°C)

PASSBAND (MHz)	f _{co} , MHz Nom.	STOPBAND (MHz)		VSWR (:1)	
		(Loss > 20dB)	(Loss > 40dB)	Passband Typ.	Stopband Typ.
DC - 135	155	210 - 300	300 - 1600	1.3	18

Typical Frequency Response



Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	$\bar{x}$	σ			
1.0	0.02	0.00	48.64	1.0	6.00
10.0	0.07	0.00	31.28	10.0	5.92
30.0	0.14	0.01	26.33	20.0	5.88
90.0	0.29	0.01	24.81	30.0	5.88
135.0	0.53	0.01	22.58	40.0	5.96
150.0	1.66	0.08	7.91	50.0	6.07
155.0	2.98	0.16	4.92	60.0	6.20
160.0	4.95	0.25	2.97	70.0	6.36
180.0	15.25	0.53	0.69	80.0	6.54
210.0	29.11	0.75	0.34	90.0	6.79
280.0	56.34	2.26	0.18	100.0	7.13
300.0	66.63	5.05	0.16	110.0	7.60
400.0	64.93	2.59	0.09	115.0	7.90
600.0	70.93	3.59	0.10	120.0	8.28
800.0	79.87	3.41	0.15	130.0	9.43
1000.0	79.15	5.76	0.19	135.0	10.24
1200.0	83.19	8.67	0.24	140.0	11.06
1400.0	75.49	3.01	0.27	150.0	11.95
1600.0	66.38	2.01	0.28	155.0	11.77

Surface Mount Low Pass Filter

SXLP-135+

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
0.5	0.02	0.03	0.04	49.24	47.30	45.70	49.37	47.42	45.78
1	0.03	0.03	0.04	46.10	44.88	43.74	46.09	44.85	43.78
10	0.09	0.09	0.11	30.51	29.85	29.40	30.60	29.95	29.51
30	0.12	0.15	0.16	24.68	24.42	24.31	24.87	24.64	24.55
50	0.15	0.18	0.20	27.79	28.26	28.82	28.51	29.07	29.97
60	0.18	0.21	0.23	32.79	33.87	34.79	35.49	37.39	39.76
70	0.20	0.23	0.26	31.29	31.17	30.82	32.37	31.91	31.23
80	0.22	0.26	0.30	26.96	26.95	26.82	26.91	26.80	26.62
90	0.25	0.30	0.33	25.77	26.12	26.32	25.44	25.72	25.93
135	0.45	0.54	0.60	29.09	28.88	28.85	26.13	25.56	25.10
150	1.57	1.76	1.91	7.66	7.51	7.36	7.54	7.39	7.23
155	2.93	3.19	3.40	4.51	4.44	4.37	4.46	4.38	4.31
160	5.02	5.33	5.58	2.59	2.60	2.57	2.55	2.55	2.54
180	15.47	15.76	16.02	0.55	0.60	0.63	0.50	0.56	0.61
210	29.19	29.46	29.66	0.28	0.32	0.34	0.23	0.29	0.33
280	53.27	53.40	53.67	0.16	0.19	0.21	0.11	0.17	0.19
300	59.34	59.56	59.79	0.14	0.17	0.19	0.10	0.14	0.18
400	78.99	83.77	79.73	0.09	0.12	0.14	0.06	0.11	0.14
500	77.54	78.73	79.05	0.06	0.09	0.11	0.02	0.08	0.12
600	83.15	77.30	77.57	0.06	0.09	0.11	0.02	0.09	0.14
700	80.81	79.98	86.94	0.04	0.07	0.10	0.02	0.10	0.15
800	85.29	85.89	97.07	0.02	0.07	0.10	0.02	0.07	0.13
900	95.46	86.76	79.61	0.01	0.08	0.12	0.05	0.15	0.23
1000	84.06	84.59	99.21	0.04	0.09	0.13	0.02	0.12	0.19
1100	94.56	78.45	80.41	0.01	0.07	0.11	0.04	0.17	0.24
1200	88.63	82.96	89.60	0.04	0.08	0.13	0.04	0.17	0.25
1300	88.38	90.50	84.44	0.05	0.11	0.17	0.05	0.17	0.27
1400	76.22	82.13	82.05	0.05	0.13	0.17	0.06	0.21	0.28
1500	77.92	83.22	78.17	0.05	0.11	0.16	0.10	0.22	0.33
1600	71.20	67.27	69.84	0.08	0.15	0.19	0.07	0.21	0.30
1700	72.00	74.05	75.07	0.09	0.16	0.21	0.09	0.22	0.33
1800	65.33	61.21	64.01	0.12	0.20	0.23	0.11	0.25	0.35
1900	66.79	64.02	70.68	0.13	0.20	0.25	0.11	0.25	0.36
2000	52.57	52.26	50.96	0.18	0.25	0.29	0.12	0.28	0.38
2100	62.26	58.11	58.81	0.18	0.26	0.31	0.13	0.29	0.39
2200	65.83	69.47	66.88	0.19	0.27	0.32	0.15	0.30	0.41
2300	54.99	58.57	60.69	0.22	0.29	0.35	0.19	0.33	0.44
2400	49.27	53.83	48.61	0.29	0.34	0.41	0.19	0.35	0.46
2500	47.26	49.75	53.34	0.29	0.37	0.42	0.25	0.36	0.49
2600	29.71	30.31	30.26	0.37	0.43	0.51	1.12	0.92	1.07
2700	42.01	39.27	36.36	0.37	0.47	0.58	0.28	0.50	0.66
2800	39.90	40.31	41.30	0.37	0.46	0.51	0.24	0.41	0.58
2900	40.88	39.34	38.99	0.44	0.64	0.72	0.20	0.41	0.54
3000	36.23	37.59	36.57	0.43	0.49	0.58	0.18	0.40	0.53
3100	37.66	39.35	38.77	0.39	0.50	0.60	0.25	0.48	0.59
3200	36.89	36.00	35.21	0.39	0.56	0.74	0.30	0.52	0.74
3300	34.48	34.39	37.19	0.41	0.55	0.64	0.39	0.56	0.75
3400	30.85	30.93	29.37	0.50	0.68	0.73	0.39	0.61	0.80
3500	26.33	24.45	24.83	0.56	0.89	1.07	0.49	0.82	1.07
3600	17.57	22.87	26.82	1.55	1.25	1.15	2.22	1.44	1.41
3700	32.34	35.89	32.58	0.92	1.01	1.39	0.44	0.81	1.18
3800	44.76	28.85	27.06	1.32	2.42	2.09	0.45	0.89	1.07
3900	27.74	28.85	27.66	0.99	1.08	1.18	0.62	0.96	1.12
4000	24.22	33.99	28.46	1.14	0.90	1.15	1.15	1.19	1.79

REV. X2

SXLP-135+

101124

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Surface Mount Low Pass Filter

SXLP-135+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
0.5	5.68	5.82	5.78
1	5.69	5.80	5.77
2	5.68	5.78	5.76
3	5.67	5.75	5.75
4	5.67	5.73	5.74
5	5.66	5.71	5.72
10	5.64	5.65	5.68
15	5.62	5.64	5.66
20	5.63	5.65	5.66
25	5.64	5.66	5.66
30	5.66	5.68	5.68
35	5.70	5.70	5.72
40	5.73	5.74	5.75
45	5.77	5.78	5.80
50	5.84	5.84	5.85
55	5.89	5.91	5.92
60	5.96	5.97	5.98
65	6.04	6.05	6.07
70	6.12	6.13	6.14
75	6.21	6.22	6.23
80	6.31	6.32	6.33
85	6.42	6.43	6.45
90	6.55	6.57	6.58
95	6.73	6.74	6.75
100	6.90	6.92	6.94
105	7.12	7.13	7.15
110	7.37	7.39	7.41
115	7.66	7.68	7.70
120	8.00	8.04	8.09
125	8.29	8.37	8.41
130	8.57	8.63	8.68
131	9.07	9.16	9.21
132	9.29	9.30	9.41
133	9.38	9.45	9.56
134	9.61	9.61	9.72
135	9.84	9.91	9.91
140	10.92	10.98	11.04
150	13.41	13.31	13.37
160	11.58	11.46	11.24
170	8.04	7.94	7.75
180	5.84	5.70	5.68
190	4.14	4.17	4.08
200	3.12	3.07	3.10
210	2.59	2.59	2.55
220	2.46	2.44	2.35
225	2.22	2.14	2.11
230	1.99	1.88	2.04
235	1.71	1.78	1.83
240	1.66	1.35	1.43
245	1.28	1.81	1.62
250	1.74	1.56	1.40
255	1.87	1.34	1.42
260	1.43	1.40	1.71
270	1.32	1.76	1.24
280	0.91	1.49	0.44

REV. X2
SXLP-135+
101124
Page 2 of 2



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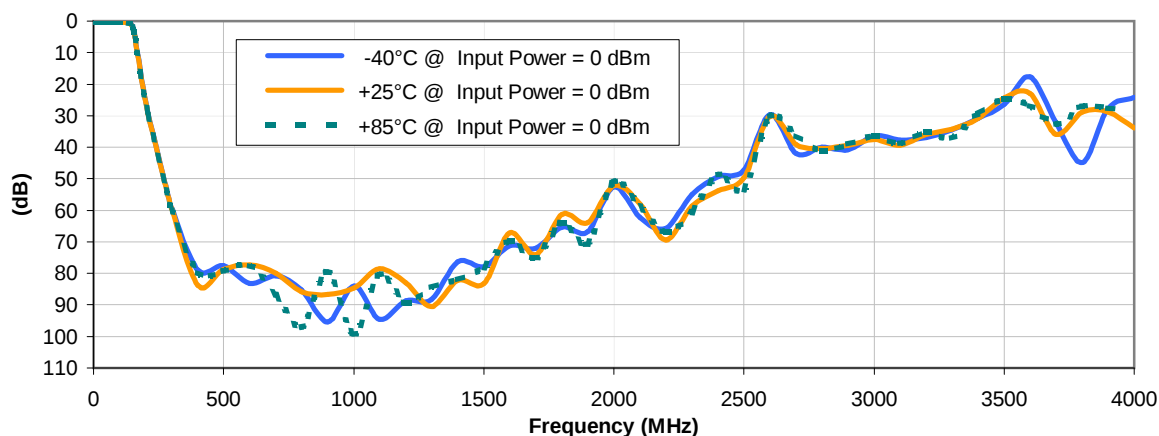


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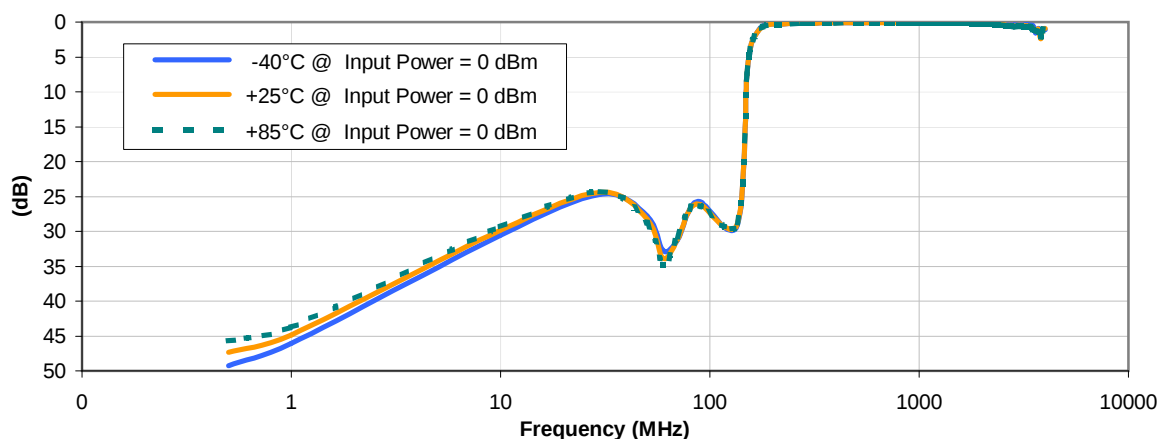


Typical Performance Curves

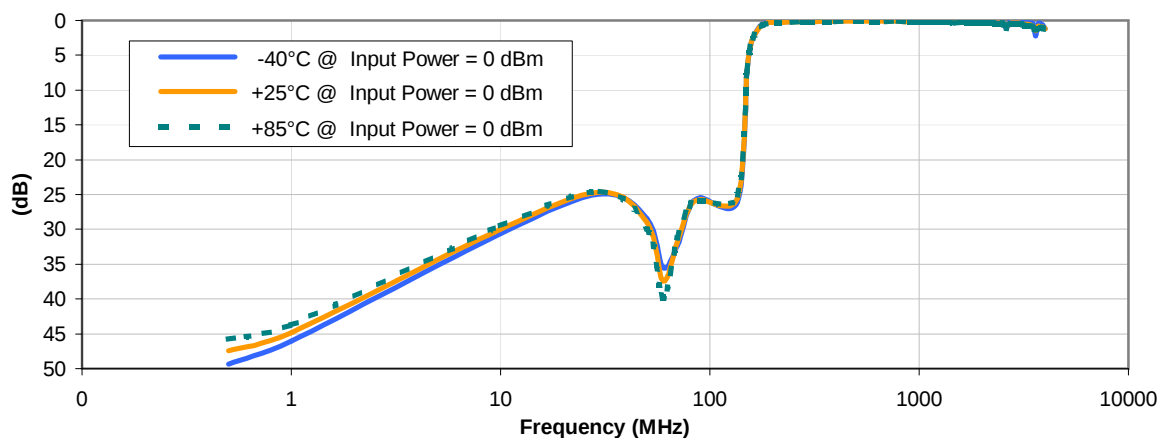
INSERTION LOSS vs. TEMPERATURE



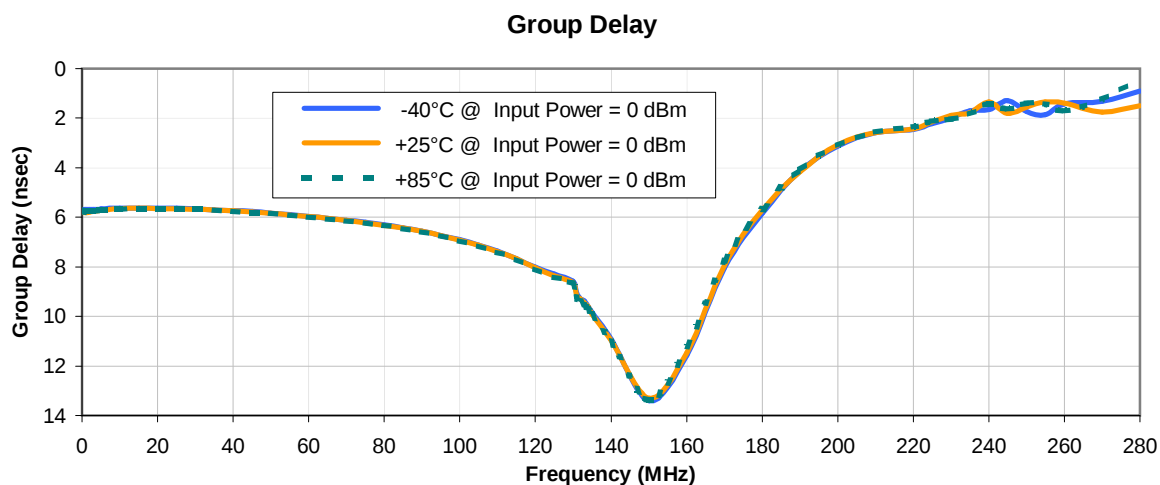
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



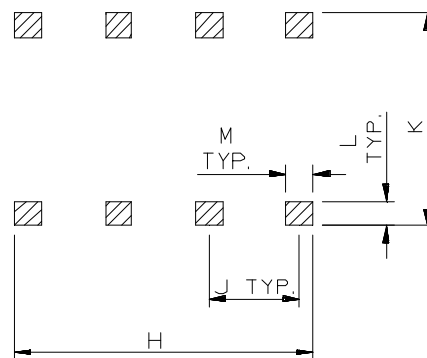
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
HF1139	.44 (11.18)	.74 (18.80)	.27 (6.86)	.200 (5.08)	.07 (1.78)	.060 (1.52)	.040 (1.02)	.660 (16.76)	.200 (5.08)	.470 (11.94)	.055 (1.40)	.060 (1.52)	3.0

Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.015 "; 3 Pl. ± 0.01 "

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
 - For RoHS Case Styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
 - For RoHS-5 Case Styles: Tin-Lead plate.



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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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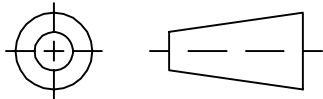
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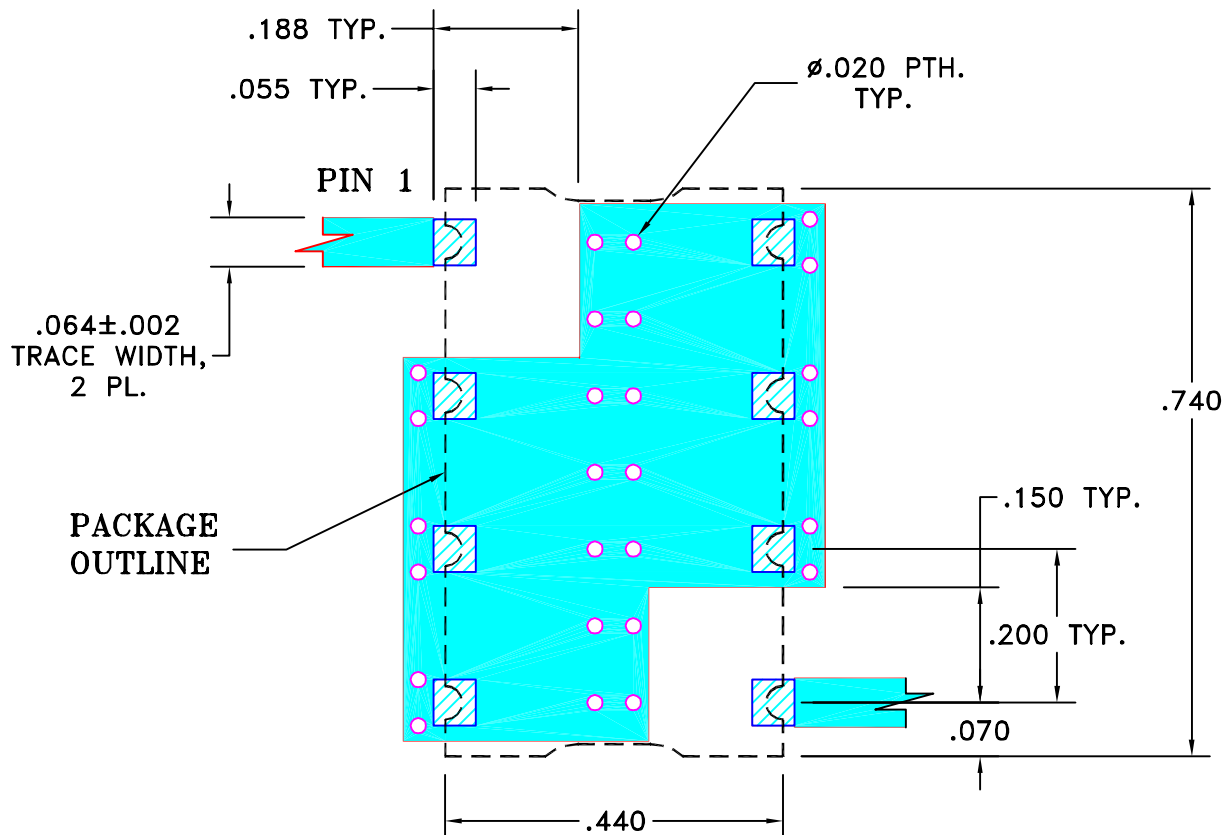
THIRD ANGLE PROJECTION



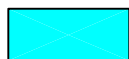
REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101757	NEW RELEASE (FROM RAVON)	11/05	DK	HH
OR	R62293	NEW RELEASE (FROM RAVON)	11/05	DK	HH

SUGGESTED MOUNTING CONFIGURATION
FOR HF1139 CASE STYLE, cr PIN CONNECTION, 50 OHM.

**NOTE:**

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .025" ± .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

DK (RAVON)

29 NOV 05

TOLERANCES ON:

CHECKED

RZ (RAVON)

29 NOV 05

2 PL DECIMALS ± .005

APPROVED

HH (RAVON)

29 NOV 05

ANGLES ±

FRACTIONS ±

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PL, cr, HF1139, SCLF, TB-368

SIZE
ACODE IDENT
15542DRAWING NO:
98-PL-230REV:
OR

FILE: 98PL230

SCALE: 4:1

SHEET: 1 OF 1

Evaluation Board and Circuit



TB-368



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS R04350B or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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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