

Low Pass Filter

50Ω DC to 450 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.

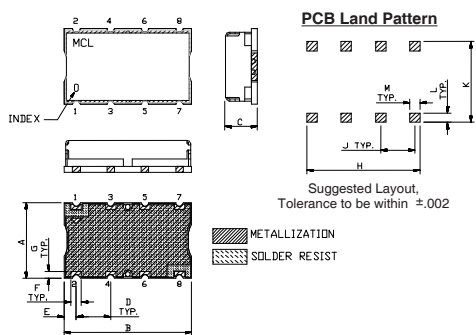
Pin Connections

INPUT 1

OUTPUT 8

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

Outline Drawing



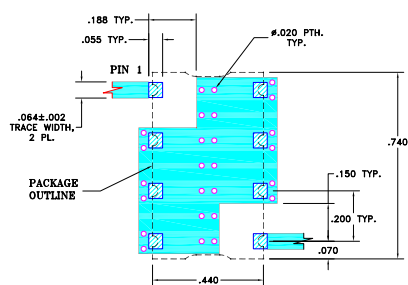
Outline Dimensions (inch/mm)

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	gr
.040	.660	.200	.470	.055	.060	
1.02	16.76	5.08	11.94	1.40	1.52	

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



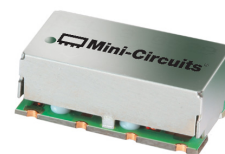
Features

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

Applications

- defense communications
- receivers / transmitters
- harmonic rejection

SXLP-450+



Generic photo used for illustration purposes only
CASE STYLE: HF1139

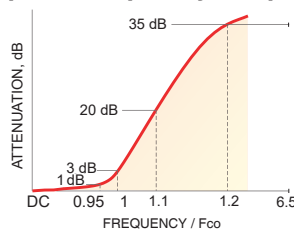
+RoHS Compliant

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

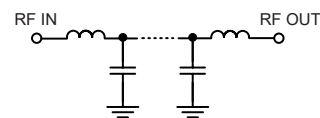
Low Pass Filter Electrical Specifications (T_{AMB} = 25°C)

PASSBAND (MHz)	f _{co} , MHz Nom.	STOPBAND (MHz)		VSWR (:1)	
		(Loss > 20dB)	(Loss > 35dB)	Passband Typ.	Stopband Typ.
DC - 450	465	495 - 545	545 - 3000	1.2	18

Typical Frequency Response

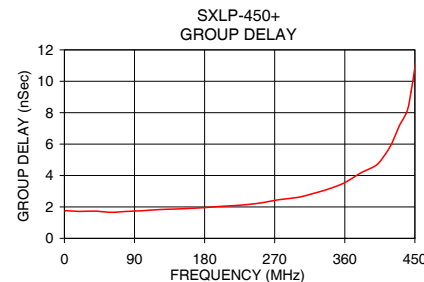
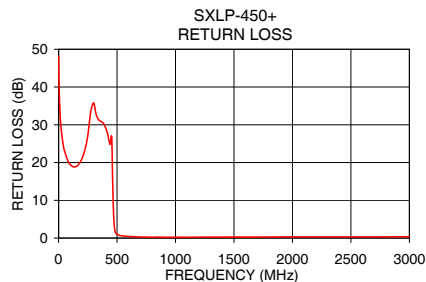


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	$\bar{x}$	σ			
1.0	0.03	0.01	48.18	1.0	1.77
10.0	0.07	0.00	34.98	5.0	1.77
100.0	0.20	0.01	19.45	10.0	1.75
340.0	0.44	0.01	31.46	20.0	1.74
420.0	0.82	0.01	27.57	40.0	1.72
450.0	1.37	0.06	27.11	80.0	1.66
460.0	2.10	0.18	18.56	100.0	1.71
465.0	3.09	0.36	11.59	150.0	1.84
470.0	5.05	0.69	6.74	200.0	1.94
475.0	8.28	1.08	3.79	225.0	2.03
485.0	17.78	1.67	1.61	250.0	2.11
495.0	30.87	2.45	1.08	275.0	2.24
545.0	60.30	2.92	0.61	320.0	2.61
870.0	43.60	0.28	0.23	340.0	2.86
1000.0	45.55	0.23	0.21	380.0	3.55
1500.0	55.39	0.53	0.27	400.0	4.15
2000.0	71.89	8.60	0.31	420.0	5.22
2500.0	56.48	0.20	0.30	440.0	7.16
3000.0	46.48	0.24	0.36	450.0	9.31



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



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

Surface Mount Low Pass Filter

SXLP-450+

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	0.02	0.04	0.04	51.14	48.24	46.21	51.17	48.24	46.18
10	0.04	0.05	0.06	37.29	35.88	34.85	37.38	35.89	34.90
50	0.08	0.11	0.12	23.28	23.67	23.99	23.21	23.59	23.87
100	0.15	0.19	0.20	18.92	19.61	20.28	18.86	19.54	20.18
150	0.17	0.23	0.26	18.66	19.34	19.86	18.61	19.26	19.77
200	0.17	0.24	0.28	21.51	22.79	24.04	21.42	22.70	23.90
210	0.16	0.24	0.28	22.87	24.18	25.52	22.81	24.13	25.38
220	0.16	0.25	0.29	24.70	26.07	27.45	24.64	26.05	27.38
230	0.17	0.25	0.30	27.11	28.68	30.18	27.10	28.72	30.25
240	0.18	0.27	0.32	30.34	32.28	34.02	30.43	32.66	34.67
250	0.17	0.27	0.32	34.79	37.04	38.23	35.67	39.68	43.04
260	0.18	0.28	0.34	40.49	38.67	36.95	47.07	44.40	40.69
270	0.21	0.31	0.36	38.12	34.25	32.76	40.09	35.49	33.71
280	0.21	0.31	0.37	32.86	30.66	29.66	33.37	31.09	30.05
290	0.21	0.32	0.38	29.42	28.19	27.50	29.72	28.50	27.79
300	0.22	0.34	0.40	27.25	26.65	26.19	27.45	26.82	26.36
310	0.25	0.36	0.42	25.97	25.81	25.58	25.99	25.83	25.62
320	0.26	0.38	0.44	25.36	25.52	25.53	25.24	25.40	25.42
330	0.28	0.40	0.46	25.45	25.86	26.15	25.20	25.63	25.88
340	0.30	0.41	0.49	26.12	26.77	27.37	25.89	26.54	27.09
350	0.30	0.43	0.50	27.69	28.70	29.74	27.59	28.54	29.48
360	0.32	0.45	0.53	30.96	32.68	34.72	30.89	32.58	34.38
370	0.34	0.49	0.57	39.16	45.56	66.43	38.83	44.71	60.02
380	0.37	0.52	0.61	39.99	35.75	33.41	40.93	36.33	33.96
390	0.41	0.58	0.68	29.49	27.91	26.95	29.91	28.24	27.30
400	0.47	0.64	0.75	24.78	23.81	23.26	25.00	24.02	23.47
410	0.54	0.74	0.85	21.81	21.17	20.87	21.91	21.28	20.96
420	0.62	0.82	0.95	19.78	19.39	19.25	19.83	19.44	19.29
430	0.72	0.94	1.08	18.39	18.24	18.21	18.41	18.23	18.16
440	0.87	1.13	1.29	17.37	17.39	17.44	17.30	17.22	17.22
450	1.11	1.41	1.62	16.02	16.02	16.01	15.62	15.54	15.44
460	1.64	2.07	2.38	12.61	12.39	12.12	12.07	11.79	11.46
465	2.26	2.81	3.26	9.85	9.59	9.24	9.42	9.13	8.76
470	3.47	4.22	4.89	6.88	6.71	6.41	6.60	6.41	6.11
475	5.74	6.74	7.66	4.37	4.36	4.21	4.21	4.20	4.05
485	14.05	15.36	16.64	1.82	2.03	2.10	1.79	2.00	2.07
490	19.77	21.18	22.62	1.37	1.59	1.68	1.37	1.59	1.70
495	26.90	28.50	30.17	1.12	1.33	1.43	1.13	1.36	1.47
500	36.95	38.73	40.42	0.96	1.17	1.26	0.98	1.20	1.30
545	51.13	52.22	53.02	0.48	0.63	0.72	0.52	0.69	0.77
600	50.47	50.71	50.88	0.32	0.45	0.52	0.36	0.49	0.57
700	48.57	49.09	49.32	0.17	0.31	0.38	0.20	0.33	0.41
800	43.92	44.31	44.50	0.11	0.25	0.33	0.12	0.26	0.34
870	43.85	44.23	44.64	0.08	0.22	0.30	0.08	0.23	0.30
900	44.34	44.71	45.10	0.08	0.21	0.31	0.08	0.24	0.31
1000	45.55	46.01	46.15	0.05	0.20	0.29	0.04	0.20	0.28
1500	55.15	54.89	55.38	0.04	0.24	0.36	0.03	0.22	0.34
2000	63.29	63.94	62.68	0.11	0.34	0.48	0.07	0.30	0.45
2500	52.69	51.95	51.54	0.14	0.39	0.55	0.14	0.39	0.55
3000	50.18	45.28	46.96	0.19	0.52	0.73	0.12	0.46	0.64
3500	43.50	44.49	40.18	0.25	0.68	0.92	0.23	0.58	0.79
4000	32.73	32.41	30.32	0.44	0.88	1.24	0.50	0.85	1.13
4500	23.33	27.06	26.19	0.53	1.00	1.59	0.94	1.16	1.76
5000	28.05	25.45	27.03	1.28	1.72	2.39	1.19	1.79	1.83

REV. X2
SXLP-450+
101125
Page 1 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Surface Mount Low Pass Filter

SXLP-450+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
1	1.53	1.49	1.64
5	1.61	1.63	1.67
10	1.65	1.67	1.63
20	1.61	1.59	1.61
30	1.63	1.62	1.61
40	1.56	1.57	1.56
50	1.61	1.63	1.60
60	1.56	1.57	1.56
70	1.57	1.54	1.54
80	1.62	1.65	1.64
90	1.61	1.61	1.59
100	1.59	1.62	1.60
110	1.64	1.58	1.63
120	1.65	1.61	1.64
130	1.67	1.60	1.61
135	1.63	1.63	1.64
140	1.64	1.68	1.64
145	1.70	1.66	1.70
150	1.68	1.68	1.64
155	1.69	1.69	1.71
160	1.65	1.68	1.71
170	1.73	1.71	1.73
180	1.74	1.79	1.75
190	1.77	1.76	1.81
200	1.73	1.81	1.80
210	1.77	1.82	1.74
220	1.89	1.84	1.88
230	1.83	1.79	1.85
240	1.97	1.88	1.92
250	1.97	2.00	1.93
260	2.15	2.14	2.12
270	2.20	2.18	2.11
280	2.08	2.09	2.11
290	2.22	2.21	2.25
300	2.27	2.26	2.24
310	2.18	2.31	2.26
320	2.41	2.42	2.46
330	2.55	2.54	2.56
340	2.61	2.63	2.62
350	2.87	2.84	2.84
360	2.93	2.94	2.95
370	3.09	3.05	3.05
380	3.33	3.31	3.36
390	3.62	3.54	3.59
400	3.82	3.83	3.97
410	4.23	4.25	4.33
420	4.70	4.81	4.85
430	5.40	5.45	5.54
440	6.32	6.45	6.58
450	7.79	7.98	8.19
460	10.31	10.59	10.92
470	14.44	14.52	14.55
480	14.40	13.59	12.88
490	8.72	7.97	6.80
495	5.22	3.57	1.88

REV. X2
SXLP-450+
101125
Page 2 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

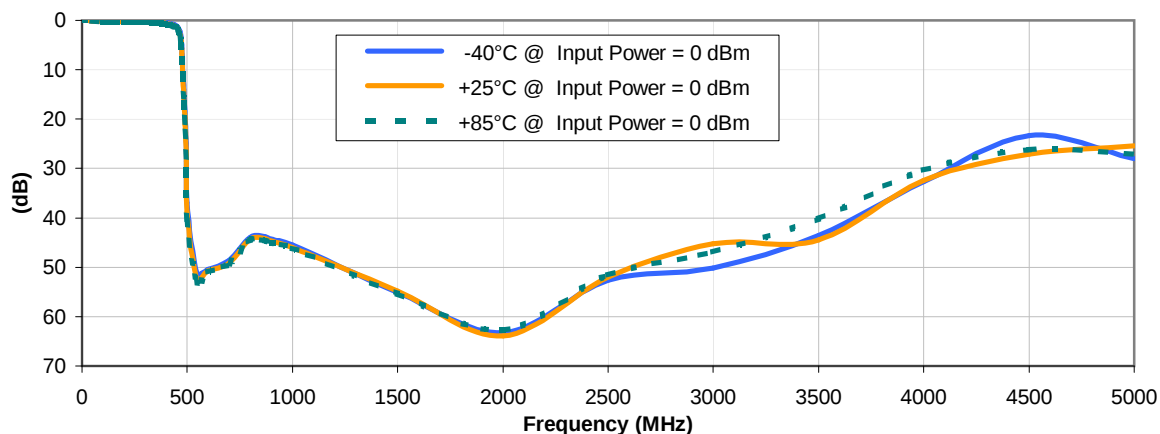


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

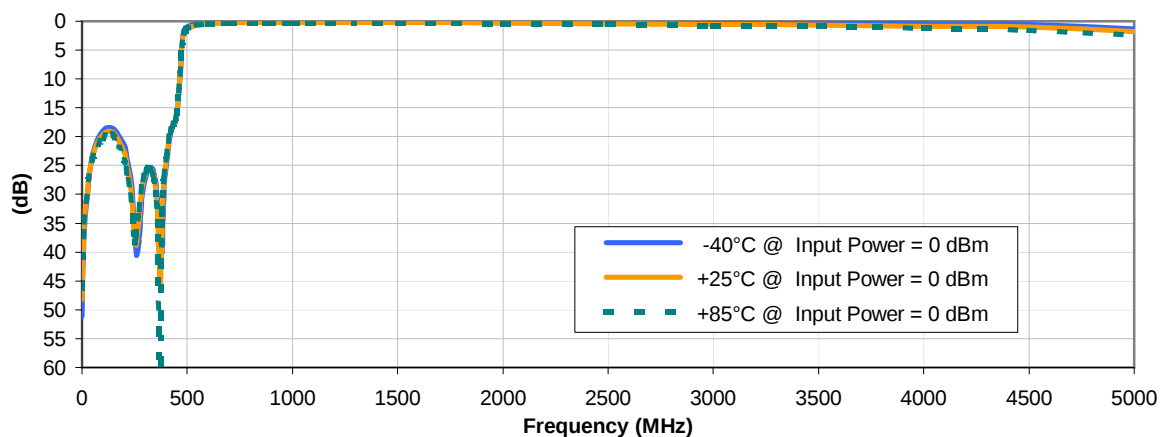


Typical Performance Curves

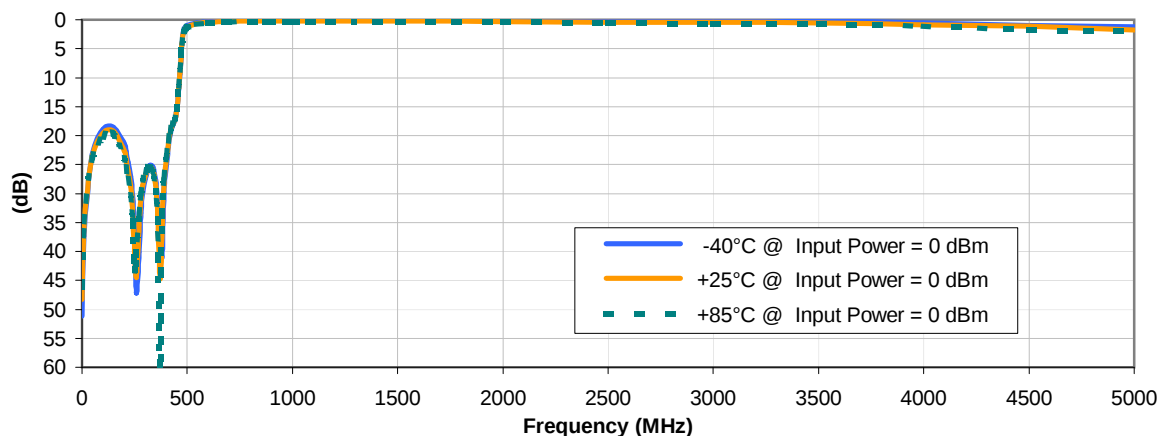
INSERTION LOSS vs. TEMPERATURE



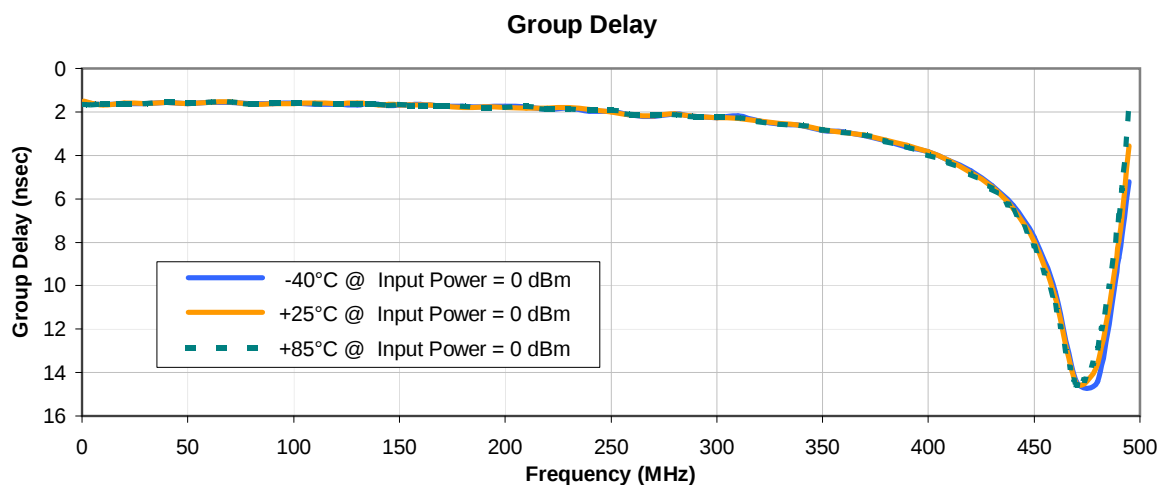
INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

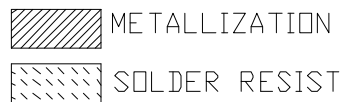
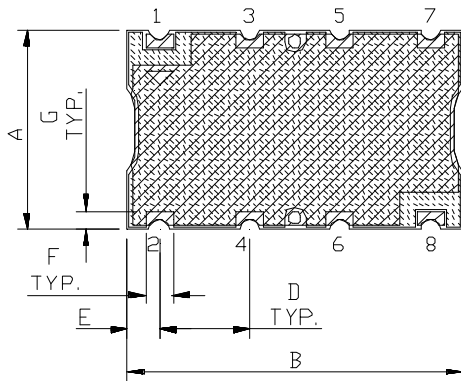
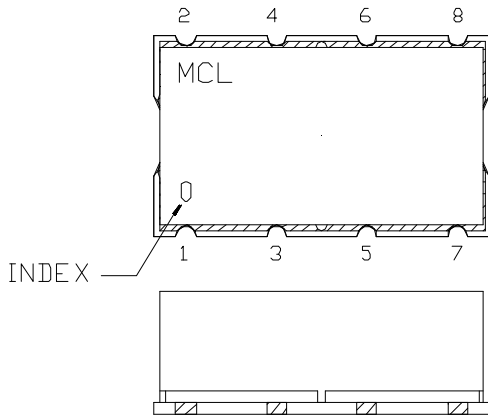


Typical Performance Curves

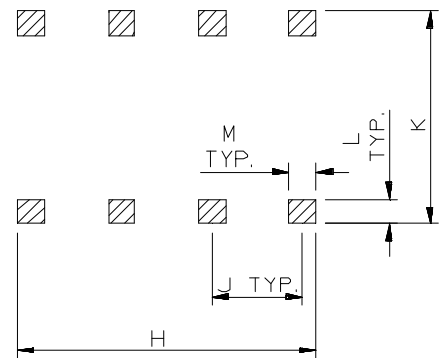


REV. X2
SXLP-450+
101125
Page 2 of 2

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.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



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



Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

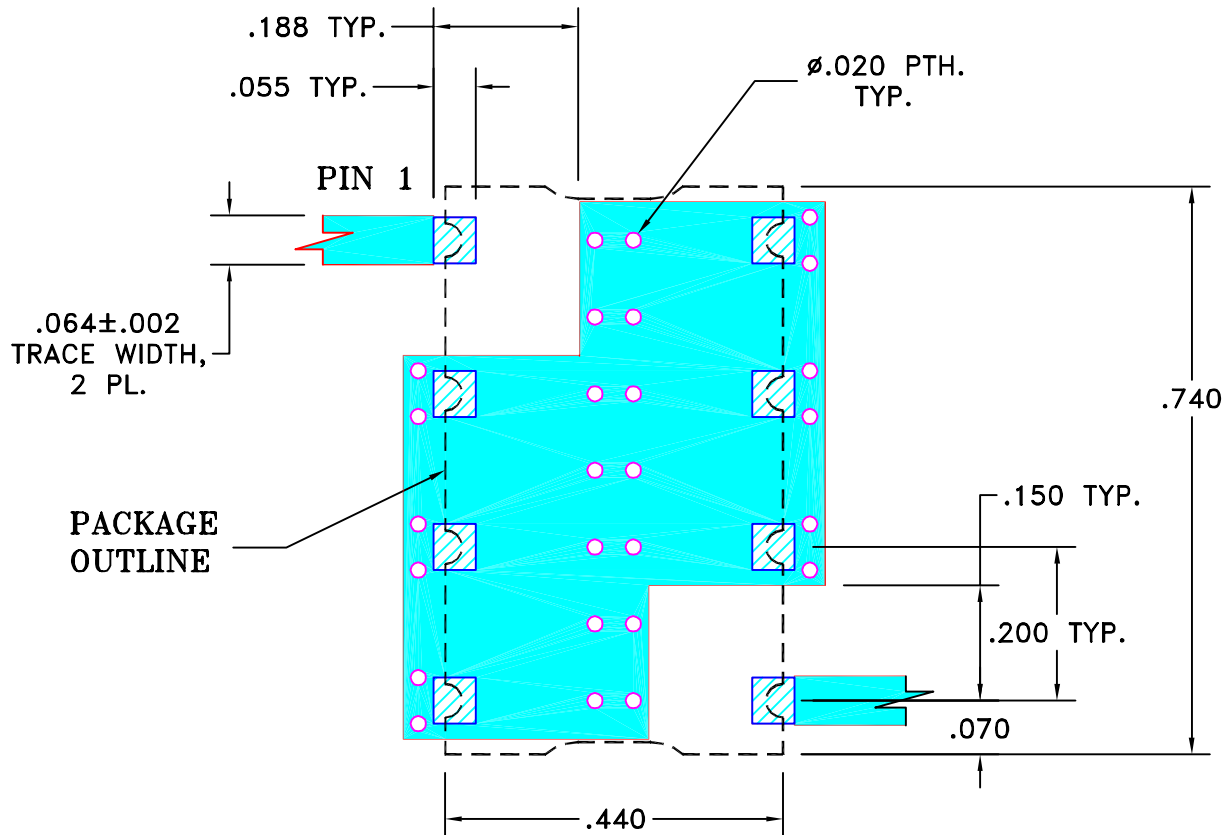
THIRD ANGLE PROJECTION



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 ±	APPROVED HH (RAVON)	29 NOV 05
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, cr, HF1139, SCLF, TB-368

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-230	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.

 **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