LUMPED LC SURFACE MOUNT

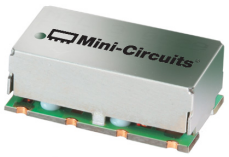
Bandpass Filter

SXBP-75+

50Ω 62 to 88 MHz

KEY FEATURES

- Low insertion loss, 1.6dB typ.
- Good Return loss, 15dB typ.
- Passband Flatness 0.5dB typ.
- Miniature shielded package.

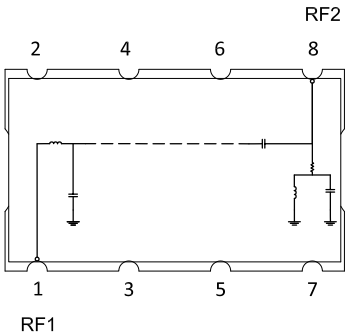


Generic photo used for illustration purposes only

APPLICATIONS

- Harmonic Rejection.
- Test Equipment.
- Transmitters / Receivers.

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

The SXBP-75+ is a 50Ω bandpass filter in a shielded package fabricated using SMT technology. This bandpass filter covers from 62 to 88MHz. This filter has high Q capacitors and inductors to achieve a low insertion loss. It has repeatable performance across production lots and consistent perfomance across temperature.

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	F1-F2	62 - 88	—	1.6	2.5	dB
	Return Loss	F1-F2	62 - 88	10	15	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 28	40	49	—	dB
		F3-F4	28 - 40	30	37	—	
Stop Band, Upper	Rejection	F5-F6	115 - 160	30	38	—	dB
		F6-F7	160 - 1500	40	52	—	
		F7-F8	1500 - 2000	—	40	—	

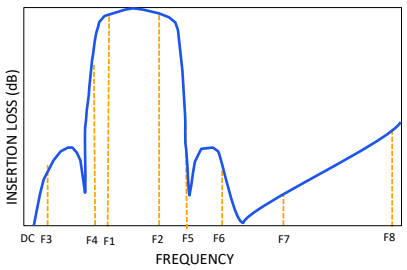
1. Tested in Evaluation Board P/N TB-SXBP-75+.

ABSOLUTE MAXIMUM RATINGS[2]

Parameter	Ratings
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-55 °C to +100 °C
Input Power[3]	0.25 W Max.

2. Permanent damage may occur if any of these limits are exceeded.
3. Power rating applies only to signals within the passband.

TYPICAL FREQUENCY RESPONSE AT +25°C



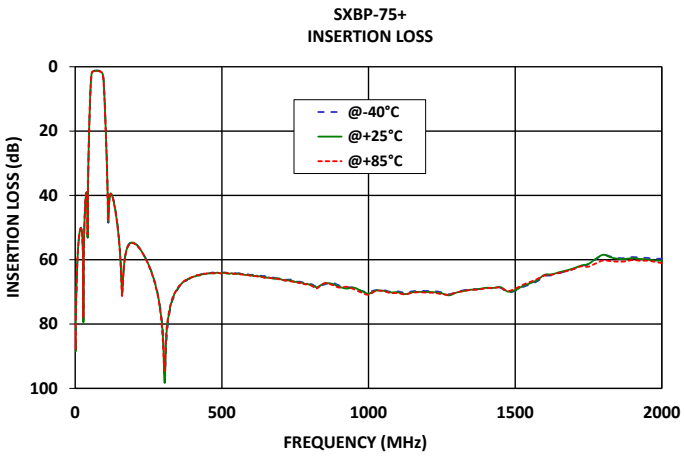
REV. OR
ECO-020325
SXBP-75+
EDU4686
URJ
231219

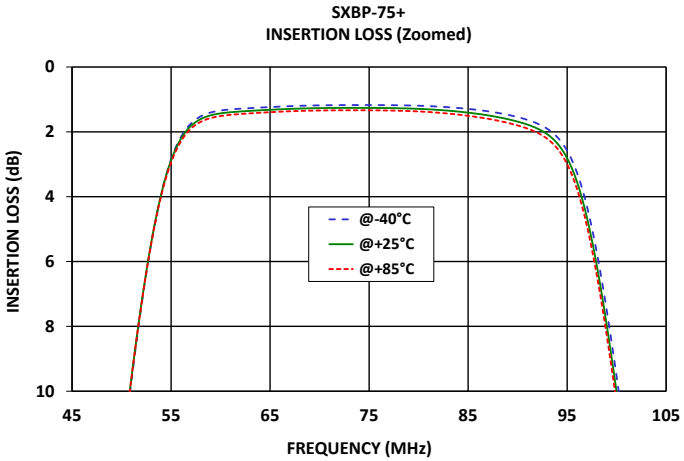
Bandpass Filter

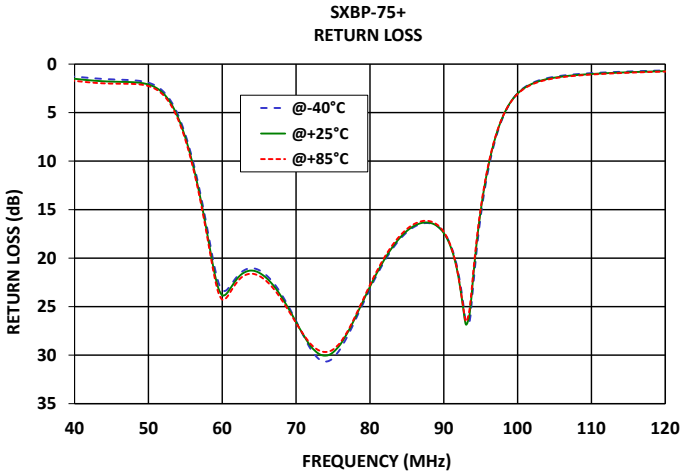
SXBP-75+

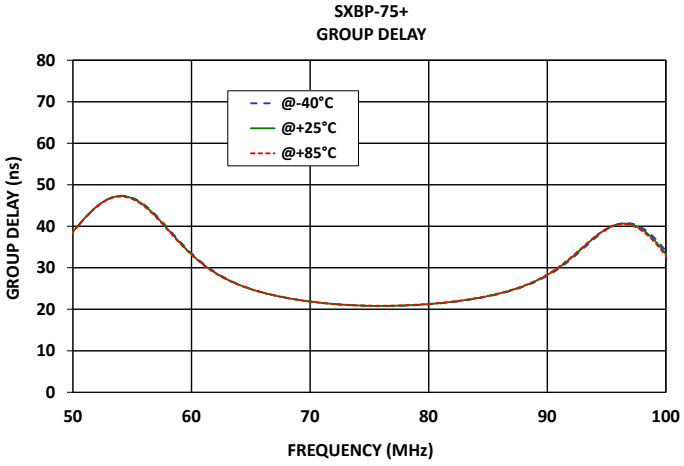
50Ω 62 to 88 MHz

TYPICAL PERFORMANCE GRAPHS









Bandpass Filter

SXBP-75+

50Ω 62 to 88 MHz

FUNCTIONAL DIAGRAM

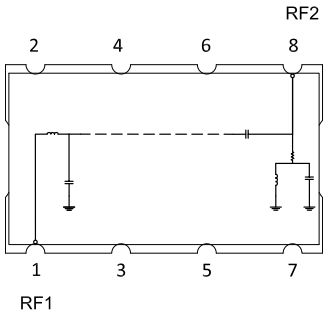


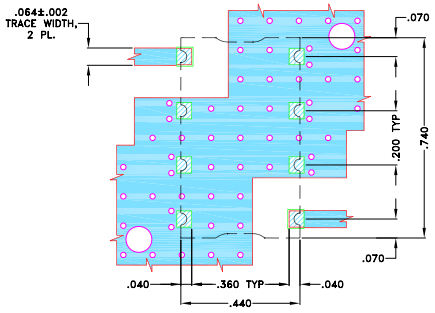
Figure 1. SXBP-75+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[(2)]	1	Connects to RF Input Port
RF2[(2)]	8	Connects to RF Output Port
GROUND	2,3,4,5,6,7	Connects to Ground on PCB, (See drawing PL-449)
NC	—	No connection, not used internally. See drawing PL-449 for connection to PCB

SUGGESTED PCB LAYOUT (PL-449)

SUGGESTED MOUNTING CONFIGURATION FOR
HF1139 CASE STYLE "08FL01" PIN CODE



NOTES:

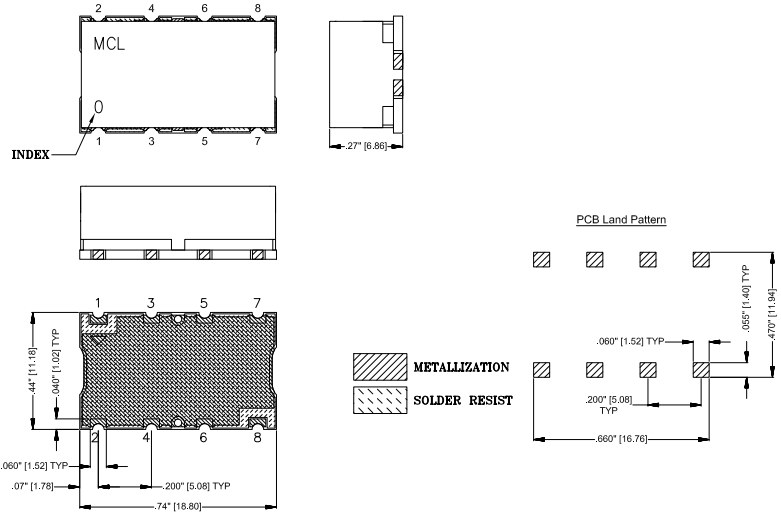
1. TRACE WIDTH IS SHOWN FOR ROGERS WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-449

CASE STYLE DRAWING



Unit weight: 3.0grams
Dimensions are in inches (mm). Tolerances: 2 Pl. ±.015"; 3 Pl. ±.01"

PRODUCT MARKING*: SXBP-75

*Marking may contain other features or characters for internal lot control.

Bandpass Filter

SXBP-75+

50Ω 62 to 88 MHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD. CLICK HERE

Performance Data and Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	HF1139 Lead Finish: Gold over Nickel Plate.
RoHS Status	Compliant
Tape and Reel	TR-F5
Suggested Layout for PCB Design	PL-449
Evaluation Board	TB-SXBP-75+
	Gerber File
Environmental Rating	ENV02T1

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/terms/viewterm.html

Surface mount Band Pass Filter SXBP-75+

Typical Performance Data

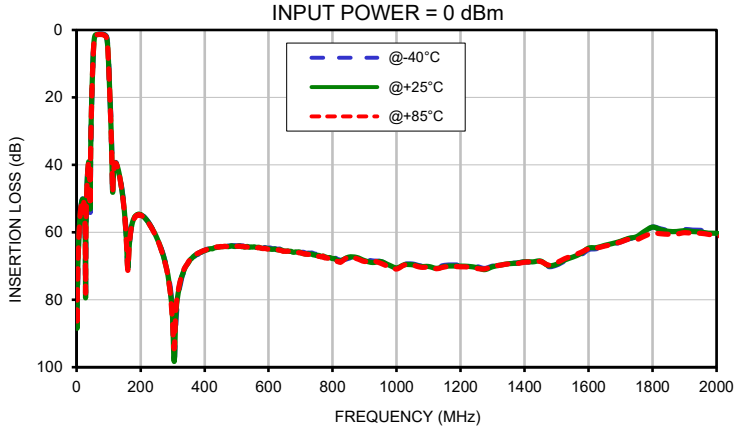
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	81.53	84.74	82.99	0.81	1.07	1.30	1.77	1.77	1.77
5	66.40	66.68	66.46	0.82	1.05	1.27	1.75	1.76	1.76
10	56.20	56.21	56.23	0.78	0.98	1.16	1.71	1.72	1.72
15	51.42	51.51	51.56	0.72	0.88	1.03	1.66	1.67	1.67
20	50.12	50.20	50.26	0.67	0.81	0.93	1.58	1.59	1.60
28	78.59	79.45	78.04	0.70	0.83	0.96	1.40	1.42	1.43
30	54.85	54.69	54.52	0.74	0.88	1.02	1.35	1.37	1.38
35	41.67	41.65	41.63	0.94	1.12	1.29	1.18	1.20	1.22
40	39.88	40.07	40.18	1.28	1.51	1.72	0.98	1.00	1.02
42	48.86	49.73	50.05	1.42	1.67	1.88	0.89	0.92	0.93
50	12.26	12.15	12.14	1.92	2.10	2.27	0.95	1.01	1.06
55	2.85	2.88	2.95	7.26	7.58	7.80	6.40	6.69	6.87
56	2.16	2.21	2.29	9.92	10.31	10.56	9.15	9.51	9.72
62	1.29	1.37	1.45	21.90	22.14	22.48	19.94	19.45	19.11
69	1.19	1.27	1.35	25.01	25.23	25.44	19.62	19.77	19.87
74	1.17	1.26	1.33	30.66	30.05	29.67	22.74	22.78	22.86
78	1.18	1.27	1.35	26.43	26.14	26.00	22.98	22.56	22.23
88	1.41	1.55	1.65	16.39	16.35	16.18	16.51	16.41	16.25
90	1.54	1.68	1.80	17.36	17.42	17.29	16.72	16.73	16.63
95	2.58	2.81	3.00	15.72	15.12	14.86	13.36	13.04	12.81
100	9.55	10.04	10.37	3.01	3.04	3.08	3.78	3.86	3.95
104	18.94	19.46	19.81	1.45	1.54	1.61	2.56	2.69	2.81
113	48.53	48.15	47.79	0.82	0.90	0.95	2.05	2.16	2.25
115	43.73	43.45	43.25	0.76	0.84	0.89	1.97	2.08	2.17
120	39.45	39.54	39.58	0.65	0.72	0.77	1.80	1.89	1.97
125	39.66	39.82	39.92	0.57	0.64	0.68	1.63	1.71	1.79
130	41.19	41.39	41.53	0.51	0.57	0.61	1.47	1.55	1.62
135	43.42	43.66	43.83	0.46	0.52	0.56	1.33	1.40	1.46
140	46.22	46.50	46.69	0.42	0.48	0.51	1.19	1.26	1.31
145	49.70	49.99	50.22	0.38	0.44	0.47	1.06	1.13	1.18
150	54.18	54.57	54.75	0.35	0.40	0.43	0.95	1.02	1.07
155	60.69	61.20	61.49	0.32	0.37	0.40	0.85	0.92	0.97
160	70.38	70.64	71.30	0.30	0.35	0.38	0.77	0.84	0.89
200	54.69	54.78	54.94	0.18	0.22	0.25	0.57	0.66	0.71
250	61.44	61.50	61.63	0.14	0.18	0.20	0.90	1.00	1.07
300	84.17	85.62	87.12	0.12	0.15	0.17	1.29	1.39	1.48
350	69.09	68.93	68.67	0.09	0.12	0.14	1.57	1.68	1.76
400	65.35	65.46	65.34	0.07	0.10	0.11	1.74	1.85	1.93
450	64.21	64.30	64.19	0.04	0.07	0.09	1.85	1.96	2.04
500	64.04	64.17	64.15	0.04	0.07	0.09	1.96	2.06	2.14
550	64.27	64.39	64.45	0.05	0.09	0.11	2.05	2.15	2.24
600	64.70	64.85	65.00	0.06	0.10	0.12	2.12	2.22	2.30
650	65.28	65.54	65.59	0.05	0.09	0.11	2.14	2.25	2.32
700	66.00	66.05	66.07	0.02	0.06	0.09	2.14	2.26	2.33
750	66.42	66.92	67.02	0.01	0.05	0.08	2.16	2.29	2.35
800	67.54	67.80	67.78	0.03	0.07	0.09	2.19	2.33	2.40
850	67.68	67.36	67.30	0.04	0.09	0.12	2.22	2.37	2.44
900	67.99	68.40	68.65	0.05	0.10	0.12	2.23	2.38	2.45
950	68.68	68.67	69.17	0.04	0.09	0.12	2.24	2.38	2.46
1000	69.98	70.55	70.88	0.01	0.07	0.10	2.24	2.38	2.46
1050	69.43	69.64	69.74	0.01	0.06	0.09	2.26	2.40	2.48
1100	69.84	70.13	70.37	0.02	0.08	0.11	2.28	2.43	2.52
1200	69.73	70.03	70.23	0.05	0.11	0.14	2.28	2.43	2.53
1300	70.03	70.21	70.13	0.02	0.08	0.11	2.25	2.39	2.50
1400	68.76	68.72	68.86	0.03	0.09	0.13	2.22	2.36	2.49
1500	69.68	69.48	69.03	0.05	0.12	0.16	2.11	2.26	2.40
1600	65.10	64.69	64.90	0.02	0.09	0.13	1.99	2.15	2.30
1700	62.84	62.66	62.86	0.04	0.11	0.15	1.86	2.04	2.19
1800	58.46	58.46	60.23	0.06	0.13	0.18	1.67	1.86	2.00
2000	59.71	60.29	61.03	0.05	0.13	0.17	1.30	1.52	1.68

Typical Performance Data

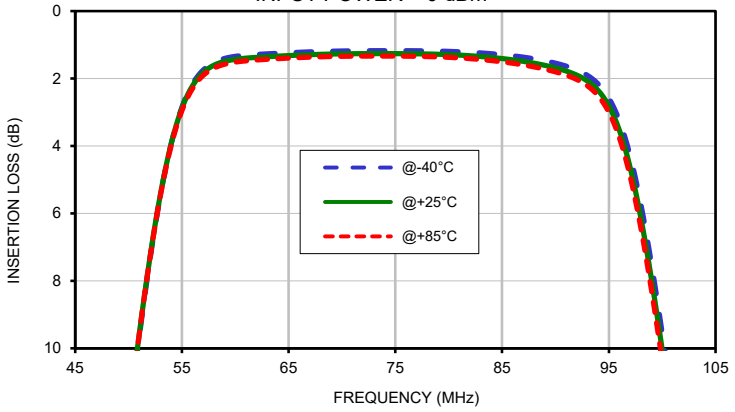
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
62.00	28.95	28.80	28.72
62.50	28.08	27.95	27.88
63.00	27.31	27.20	27.14
63.50	26.61	26.52	26.47
64.00	25.99	25.91	25.87
64.50	25.44	25.36	25.33
65.50	24.48	24.43	24.40
66.00	24.08	24.03	24.00
66.50	23.71	23.66	23.64
67.00	23.37	23.33	23.32
67.50	23.06	23.03	23.02
68.00	22.78	22.75	22.74
68.50	22.53	22.50	22.49
69.00	22.29	22.27	22.26
69.50	22.08	22.06	22.05
70.00	21.88	21.87	21.86
70.50	21.70	21.69	21.69
71.00	21.54	21.53	21.53
71.50	21.40	21.39	21.40
72.00	21.27	21.27	21.28
72.50	21.16	21.16	21.17
73.00	21.06	21.07	21.08
73.50	20.98	20.99	21.00
74.00	20.91	20.92	20.94
74.50	20.85	20.87	20.89
75.00	20.81	20.84	20.86
75.50	20.79	20.82	20.84
76.00	20.78	20.81	20.84
76.50	20.78	20.82	20.85
77.00	20.80	20.84	20.87
78.00	20.88	20.93	20.97
79.00	21.01	21.06	21.11
80.00	21.19	21.25	21.30
81.00	21.43	21.50	21.55
82.00	21.73	21.81	21.86
83.00	22.11	22.18	22.23
84.00	22.55	22.64	22.69
85.00	23.10	23.18	23.23
86.00	23.74	23.84	23.89
87.00	24.52	24.62	24.68
88.00	25.46	25.59	25.66

Typical Performance Curves

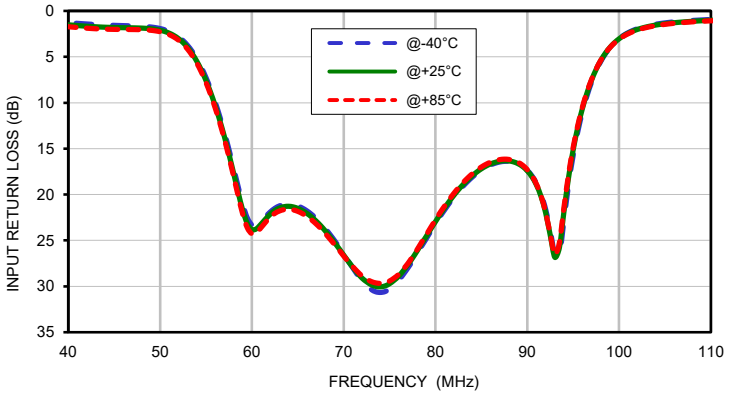
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



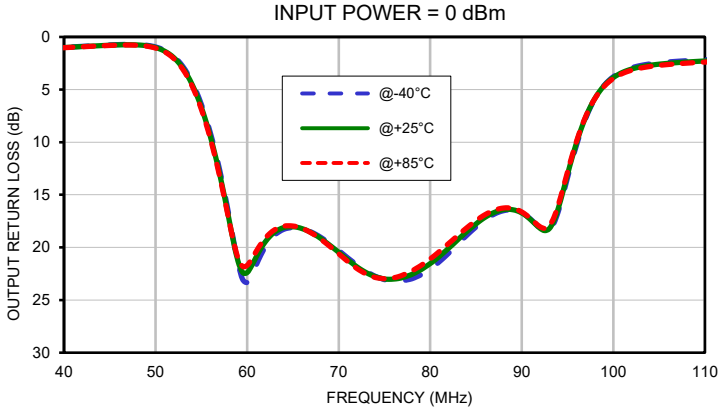
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



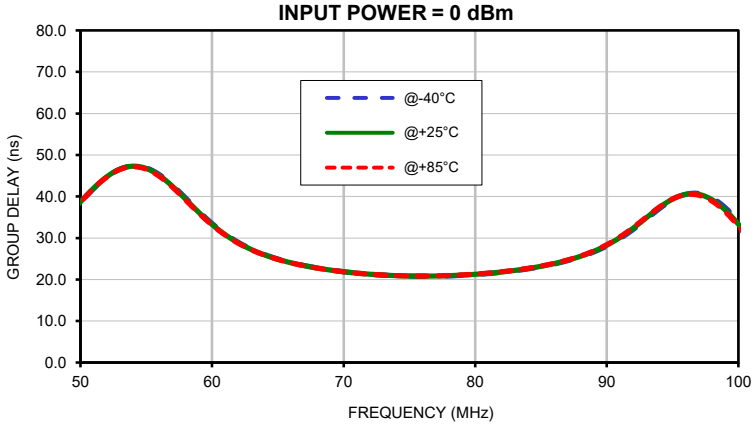
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



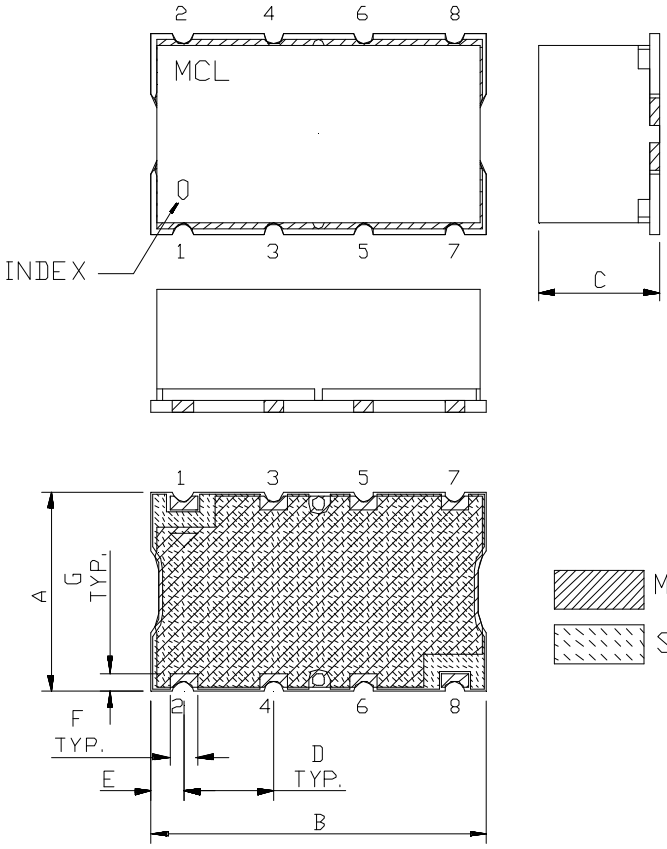
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



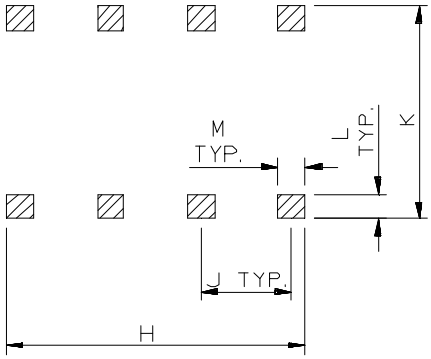
Case Style HF

HF1139

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

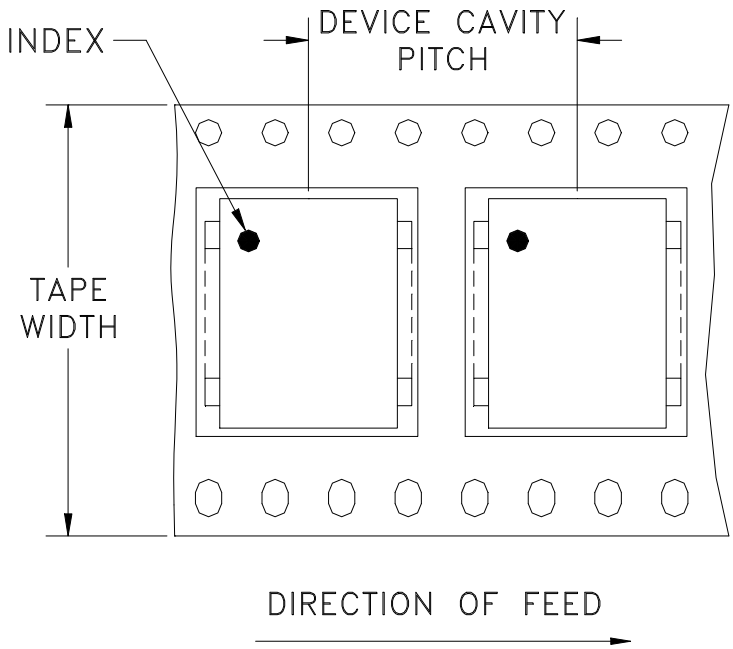
Dimensions are in inches (mm). Tolerances: 2 Pl. ±.015"; 3 Pl. ±.01"

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. 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.

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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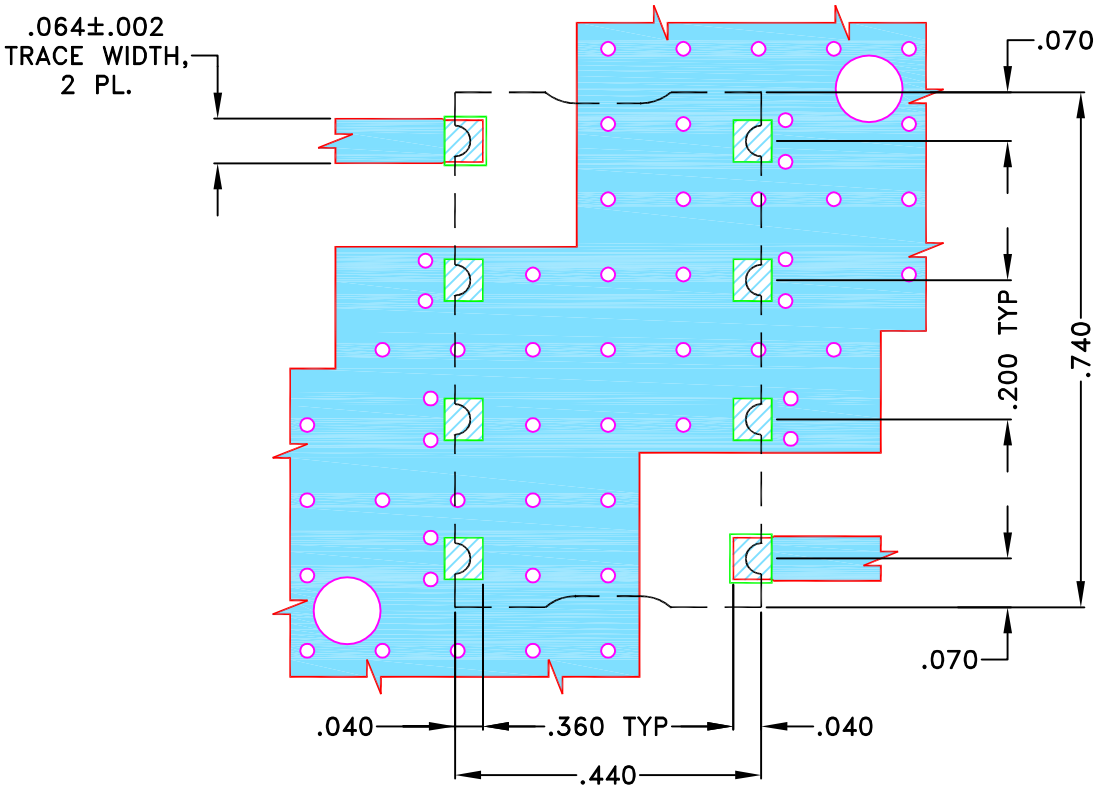
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M150680	NEW RELEASE	APR 15	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR HF1139 CASE STYLE "08FL01" PIN CODE



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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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	TM	10 APR 15
TOLERANCES ON:	CHECKED	MD	10 APR 15
2 PL DECIMALS ± .005"	APPROVED	RK	10 APR 15
3 PL DECIMALS ±			
ANGLES ±			
FRACTIONS ±			

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

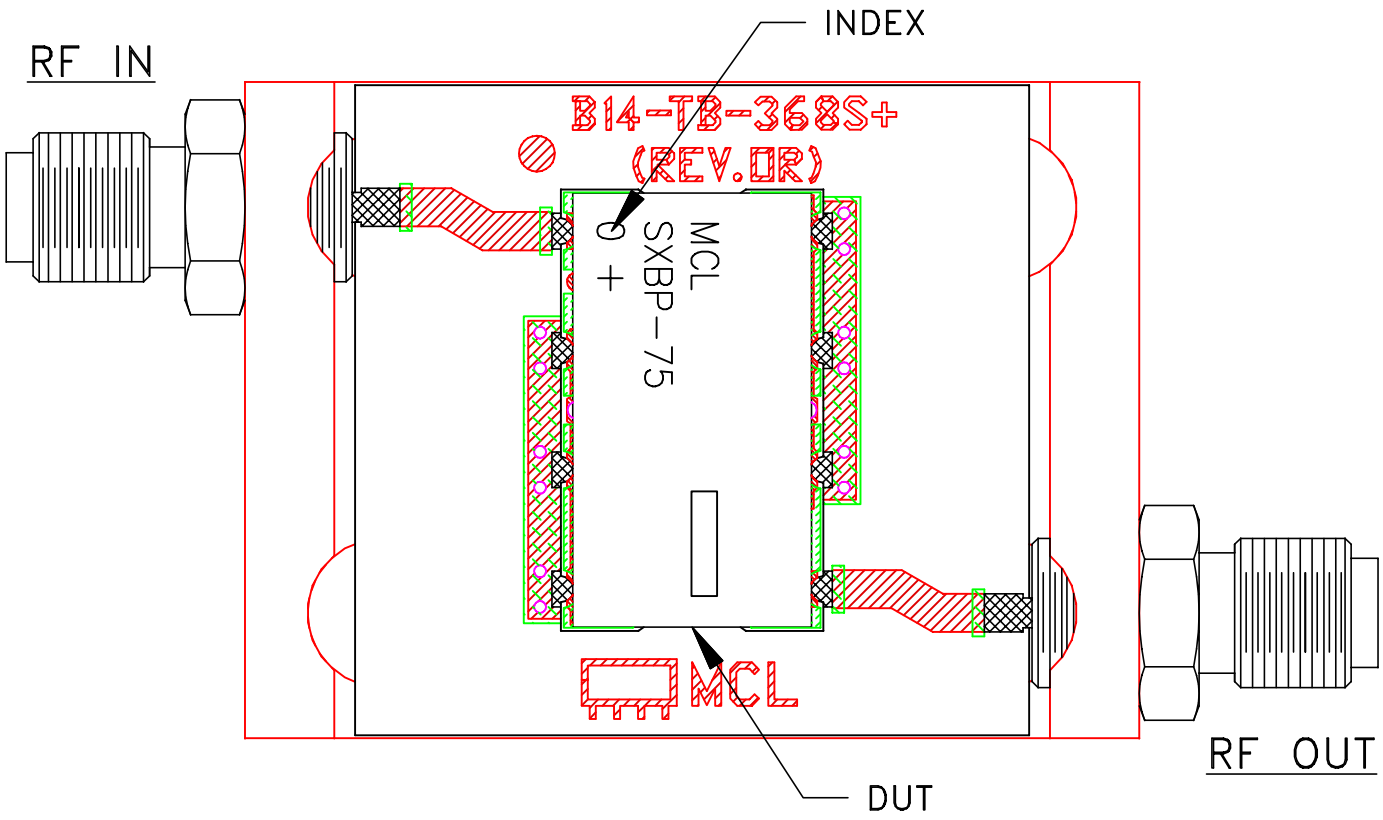
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, 08FL01, HF1139
TB-368+, 50 OHM

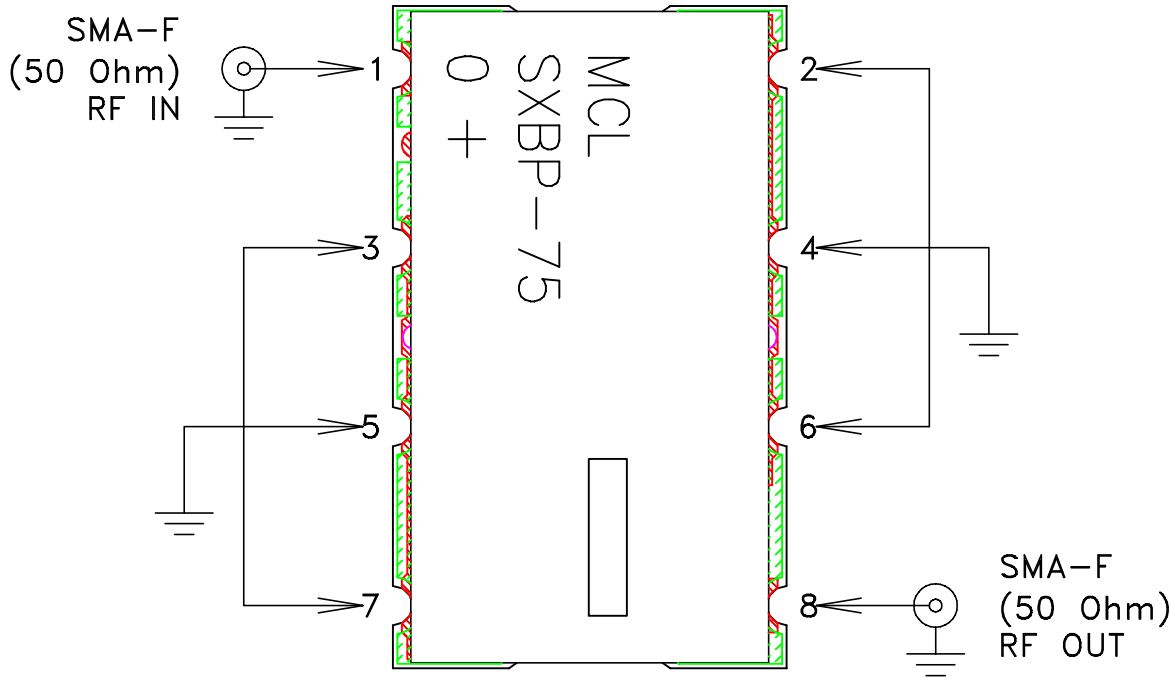
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-449	OR
FILE: 98PL449		SCALE: 3:1	SHEET: 1 OF 1

Evaluation Board and Circuit

TB-SXBP-75+



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4350B) OR Equivalent, Dielectric Constant=3.48±0.05
Dielectric Thickness: .030±.002 inch
2. 50 Ohm SMA Female Connectors.

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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