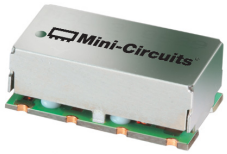
Surface Mount

Bandpass Filter

SXBP-45-75+

75Ω 5 to 85 MHz



Generic photo used for illustration purposes only
CASE STYLE: HF1139

The Big Deal

- High Q
- Low VSWR
- Good rejection, 30dB Typ.
- Miniature shielded package

Product Overview

SXBP-45-75+ is a 75Ω bandpass filter in a shielded package fabricated using SMT technology. This bandpass filter covers from 5 to 85 MHz. This filter offers low insertion loss, low VSWR and very good rejection.

Key Features

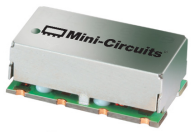
Feature	Advantages
Low VSWR	This model is used in digital television and test and measurement systems.
30 dB Typ rejection up to 3GHz	This enables the filter to attenuate spurious signals and reject harmonics for broad frequency band
Miniature package	The small surface mount package enables the SXBP-45-75+ to use in compact design

Surface Mount

Bandpass Filter

SXBP-45-75+

75Ω 5 to 85 MHz



Generic photo used for illustration purposes only

CASE STYLE: HF1139

Features

- High Q
- Low VSWR
- Good rejection, 30dB Typ.
- Miniature shielded package

Applications

- Digital Television
- CATV applications
- Test and measurement

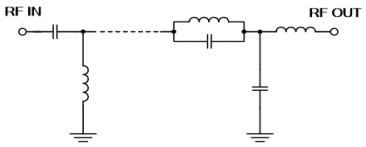
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	45	—	MHz
	Insertion Loss	F1-F2	5-85	—	1.4	2.2	dB
	VSWR	F1-F2	5-85	—	1.2	1.92	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-1	28	36	—	dB
	VSWR	DC-F3	DC-1	—	20	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	116-3000	30	39	—	dB
	VSWR	F4-F5	116-3000	—	20	—	:1

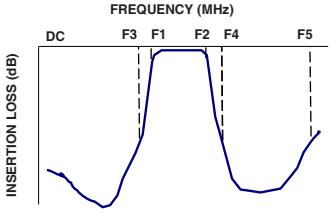
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W

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

Functional Schematic



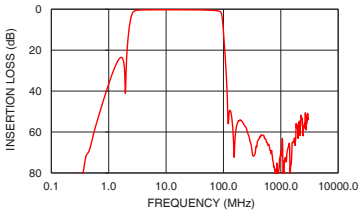
Typical Frequency Response



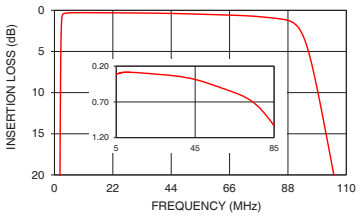
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
0.30	80.53	681.04	5	68.51
1.00	36.50	157.71	6	47.64
1.20	30.28	105.30	8	28.99
2.05	24.20	34.36	9	24.29
2.10	19.34	30.07	10	21.00
2.50	3.04	3.97	15	13.68
2.55	2.38	3.24	20	10.94
5.00	0.32	1.10	25	9.81
45.00	0.39	1.04	30	9.30
85.00	1.03	1.16	35	9.12
92.00	2.11	1.69	40	9.12
94.00	3.32	2.53	45	9.27
106.00	21.23	14.18	50	9.50
112.00	32.32	16.61	55	9.87
116.00	41.47	17.48	60	10.39
500.00	61.65	1.71	65	11.13
1000.00	71.90	12.73	70	12.14
1750.00	64.94	5.03	75	13.52
2250.00	51.74	10.33	80	15.46
3000.00	53.20	3.42	85	18.90

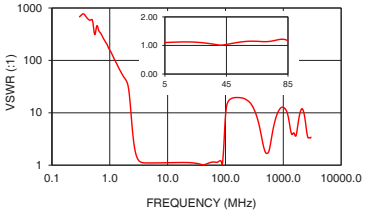
SXBP-45-75+
INSERTION LOSS (Full band)



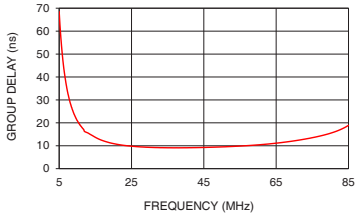
SXBP-45-75+
INSERTION LOSS (Pass band)



SXBP-45-75+
VSWR



SXBP-45-75+
GROUP DELAY



+RoHS Compliant

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

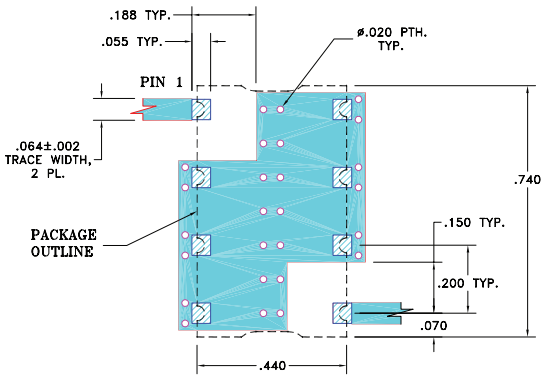
Notes

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-Circuit's 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

Pad Connections

INPUT	1
OUTPUT	8
GROUND	2,3,4,5,6,7

Demo Board MCL P/N: TB-683+
Suggested PCB Layout (PL-281)



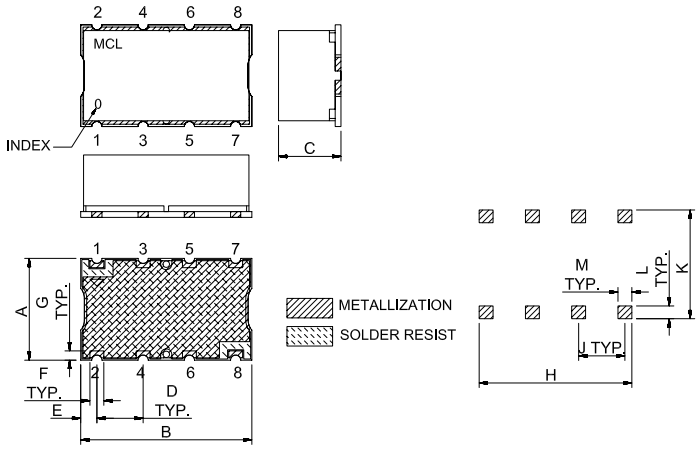
NOTE:

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

Outline Drawing



Outline Dimensions (inch / mm)

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

Note: Please refer to case style drawing for details

Band Pass Filter SXBP-45-75+

Typical Performance Data

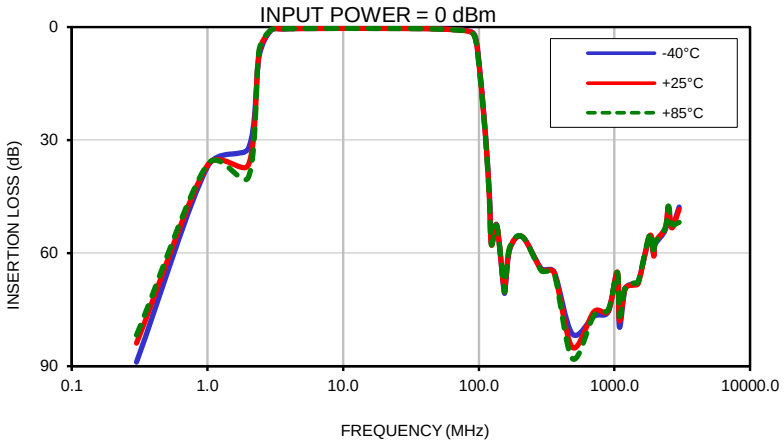
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25˚C	@+85˚C	@-40°C	@+25˚C	@+85˚C	@-40°C	@+25˚C	@+85˚C
0.3	88.93	83.91	81.76	0.00	0.01	0.01	0.05	0.06	0.08
1.0	37.12	36.72	36.44	0.12	0.12	0.13	0.44	0.56	0.65
2.0	32.26	36.66	39.93	0.66	0.65	0.62	0.86	0.91	0.92
2.4	7.88	6.90	6.24	2.05	2.26	2.45	1.97	2.17	2.34
2.9	1.12	1.02	0.96	11.65	12.28	12.77	11.63	12.32	12.87
3.6	0.54	0.53	0.52	20.88	21.45	21.92	23.69	25.68	27.62
4.2	0.46	0.45	0.46	22.09	22.84	23.43	27.16	30.82	34.95
4.6	0.43	0.43	0.44	22.01	22.87	23.54	27.28	30.90	34.26
5.0	0.42	0.42	0.42	21.81	22.75	23.51	26.81	29.94	32.44
10.0	0.37	0.38	0.38	21.21	22.24	23.09	22.52	23.51	24.32
12.0	0.37	0.38	0.39	21.36	22.30	23.07	21.86	22.65	23.33
14.0	0.38	0.38	0.39	21.56	22.40	23.10	21.42	22.08	22.67
22.0	0.39	0.40	0.41	23.10	23.58	24.00	21.00	21.50	21.91
25.0	0.39	0.40	0.41	24.16	24.57	24.92	21.38	21.91	22.27
36.0	0.42	0.43	0.45	33.14	34.99	36.20	26.46	27.79	28.35
37.5	0.42	0.44	0.46	34.57	37.05	39.24	27.90	29.60	30.35
42.0	0.44	0.47	0.49	30.76	31.10	31.73	32.68	35.89	38.18
51.5	0.52	0.56	0.58	21.87	21.68	21.78	23.61	23.43	23.51
61.0	0.64	0.68	0.71	19.10	18.99	19.05	19.08	19.19	19.31
65.0	0.68	0.73	0.76	19.24	19.17	19.24	18.71	18.96	19.12
75.0	0.81	0.87	0.92	22.04	21.61	21.47	20.91	21.19	21.31
76.0	0.83	0.90	0.94	22.07	21.55	21.36	21.19	21.33	21.40
79.5	0.92	1.00	1.05	21.05	20.37	20.15	21.40	21.01	20.86
82.5	1.02	1.10	1.17	19.86	19.34	19.22	21.08	20.42	20.24
84.0	1.08	1.17	1.24	19.66	19.26	19.21	21.21	20.53	20.39
84.5	1.10	1.19	1.26	19.70	19.33	19.32	21.36	20.68	20.58
85.0	1.12	1.21	1.29	19.79	19.48	19.51	21.59	20.93	20.85
88.5	1.33	1.43	1.53	23.32	23.57	23.94	28.78	28.45	28.74
89.5	1.41	1.53	1.64	25.01	25.08	25.04	34.21	33.30	31.26
92.0	1.81	1.98	2.13	18.13	17.14	16.44	18.23	17.42	16.62
94.0	2.50	2.76	2.99	11.53	10.86	10.43	11.37	10.81	10.36
96.0	3.79	4.18	4.49	7.16	6.77	6.54	7.01	6.67	6.42
98.0	5.82	6.32	6.71	4.44	4.26	4.17	4.31	4.15	4.04
104.0	14.74	15.35	15.81	1.62	1.70	1.75	1.47	1.53	1.57
108.0	21.40	21.99	22.44	1.23	1.32	1.39	1.04	1.12	1.16
114.0	31.95	32.54	33.00	1.03	1.13	1.19	0.79	0.87	0.91
120.0	45.04	45.77	46.38	0.96	1.05	1.11	0.66	0.74	0.78
124.0	57.45	57.82	57.78	0.93	1.02	1.07	0.60	0.68	0.72
136.0	52.70	52.82	52.95	0.89	0.96	1.01	0.49	0.56	0.59
154.0	70.40	69.97	69.87	0.86	0.92	0.96	0.39	0.45	0.48
158.0	68.03	67.22	66.65	0.86	0.91	0.95	0.37	0.43	0.47
170.0	58.78	58.57	58.22	0.85	0.89	0.93	0.33	0.39	0.42
210.0	55.74	55.68	55.68	0.84	0.85	0.87	0.24	0.30	0.33
290.0	64.17	64.46	64.72	0.95	0.98	0.95	0.15	0.20	0.23
360.0	65.07	65.26	65.48	1.42	1.35	1.30	0.10	0.16	0.18
490.0	81.46	85.00	88.00	1.63	1.90	1.91	0.05	0.10	0.13
710.0	76.72	75.48	76.38	4.57	4.75	4.73	0.01	0.06	0.09
900.0	75.57	75.46	75.02	1.73	1.68	1.74	0.02	0.07	0.12
1050.0	65.21	65.02	65.13	1.26	1.36	1.42	0.01	0.10	0.15
1090.0	79.68	77.99	76.78	1.22	1.33	1.37	0.02	0.12	0.17
1200.0	69.54	69.40	69.04	1.20	1.35	1.40	0.07	0.17	0.23
1400.0	68.05	68.49	67.95	1.69	2.22	2.28	0.19	0.30	0.36
1500.0	67.77	68.04	67.63	2.84	3.19	3.34	0.27	0.38	0.45
1825.0	55.66	55.37	54.83	1.37	1.71	1.89	0.49	0.61	0.68
1950.0	60.52	60.79	60.32	1.56	2.04	2.18	0.55	0.67	0.76
2000.0	57.63	57.07	57.25	1.75	2.32	2.47	0.56	0.69	0.78
2375.0	53.75	53.33	53.20	4.92	4.69	4.74	0.53	0.71	0.78
2500.0	47.94	47.60	47.53	4.35	4.39	4.51	0.49	0.66	0.72
2650.0	53.25	53.31	52.29	4.63	5.27	5.46	0.35	0.54	0.61
3000.0	47.79	48.39	51.84	9.35	11.51	11.56	0.00	0.19	0.28

Typical Performance Data

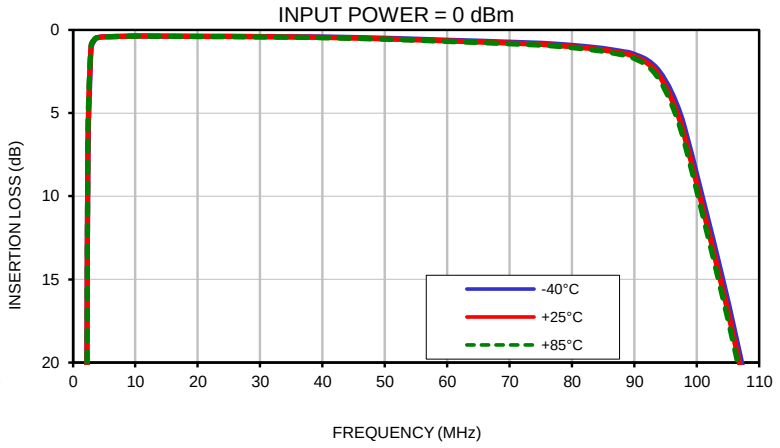
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25˚C	@+85˚C
5	70.94	69.99	69.21
6	49.08	48.50	48.03
7	37.10	36.71	36.40
8	29.64	29.36	29.19
9	24.72	24.45	24.38
10	21.26	21.09	20.94
12	16.40	16.29	16.19
14	14.66	14.62	14.57
16	12.91	12.87	12.84
18	11.71	11.68	11.66
20	10.88	10.87	10.86
22	10.30	10.30	10.30
24	9.87	9.88	9.88
26	9.57	9.57	9.58
28	9.35	9.36	9.37
30	9.19	9.20	9.21
31	9.14	9.15	9.16
32	9.08	9.10	9.12
33	9.05	9.05	9.07
34	9.02	9.03	9.05
35	9.00	9.01	9.03
36	8.99	9.00	9.01
37	8.99	9.00	9.01
38	8.98	8.99	9.01
39	8.98	8.99	9.01
40	9.00	9.01	9.03
41	9.01	9.03	9.05
42	9.03	9.04	9.07
43	9.05	9.06	9.08
44	9.07	9.09	9.11
45	9.11	9.14	9.15
46	9.14	9.16	9.18
47	9.18	9.19	9.22
48	9.22	9.25	9.27
49	9.26	9.29	9.31
50	9.31	9.33	9.36
51	9.37	9.39	9.41
52	9.43	9.45	9.47
53	9.49	9.52	9.54
54	9.57	9.57	9.61
55	9.63	9.65	9.68
56	9.71	9.73	9.76
57	9.78	9.82	9.85
58	9.88	9.91	9.94
60	10.08	10.11	10.15
62	10.31	10.36	10.40
64	10.58	10.63	10.68
66	10.89	10.95	11.00
68	11.24	11.31	11.37
70	11.66	11.73	11.80
72	12.13	12.21	12.28
74	12.65	12.74	12.82
76	13.24	13.33	13.42
78	13.91	14.00	14.12
80	14.68	14.78	14.90
82	15.59	15.71	15.86
83	16.11	16.25	16.41
84	16.71	16.87	17.05
85	17.04	17.22	17.40
85	17.39	17.58	17.77

Typical Performance Curves

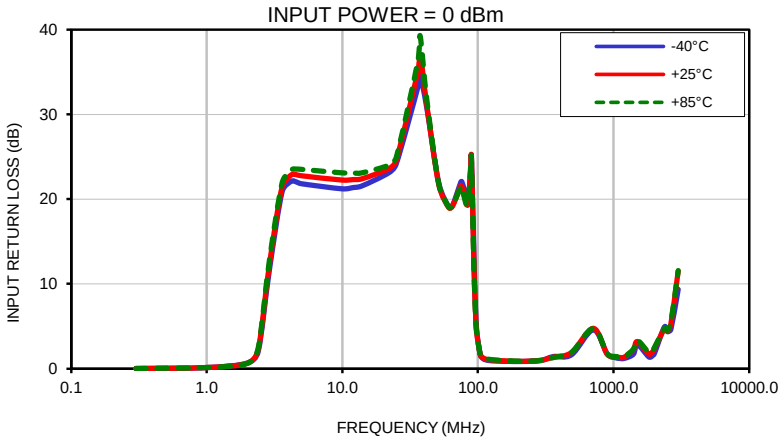
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



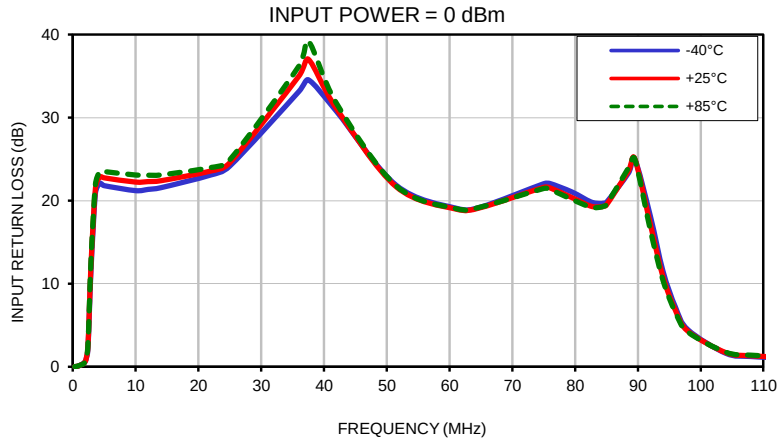
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



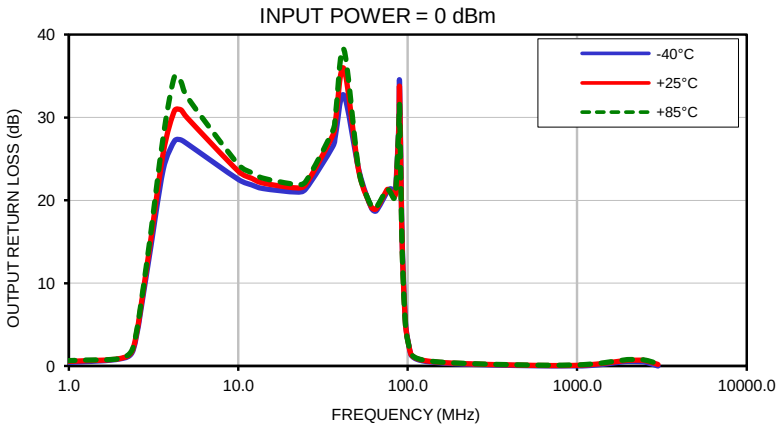
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



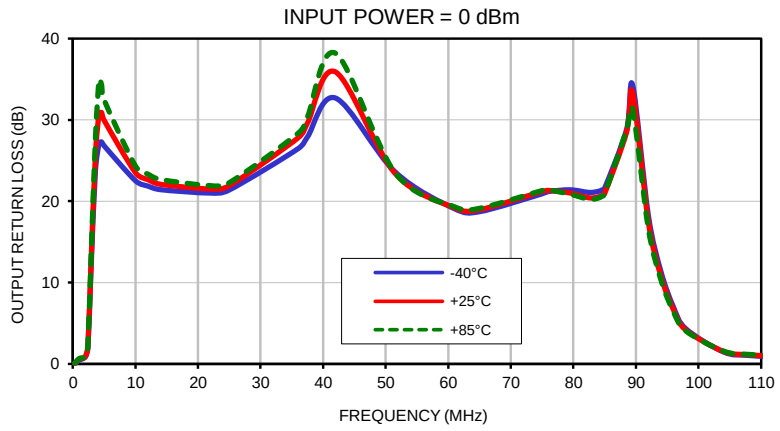
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



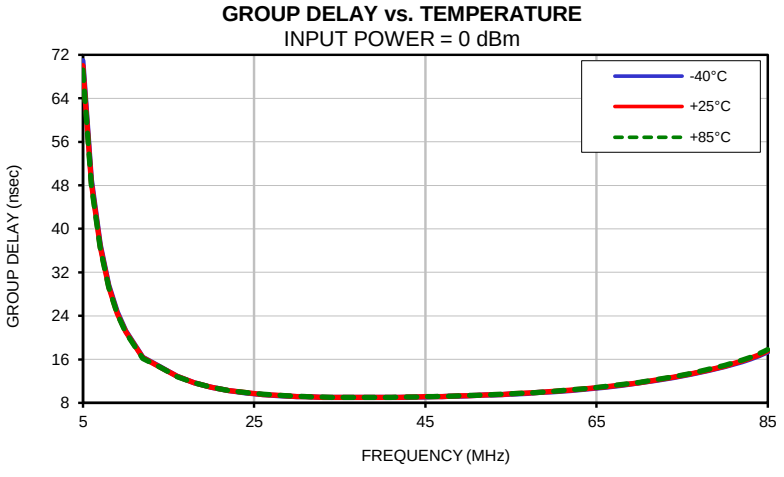
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



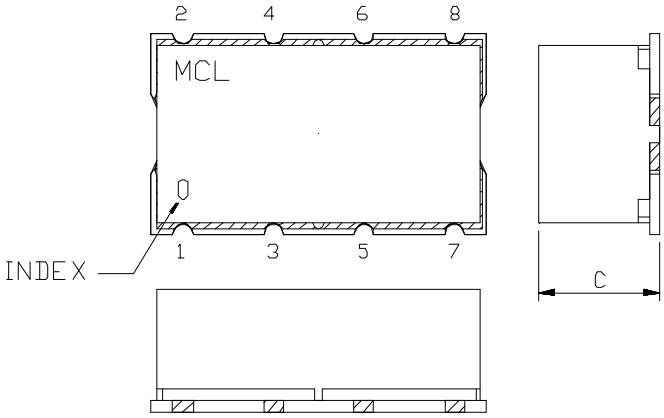
Typical Performance Curves

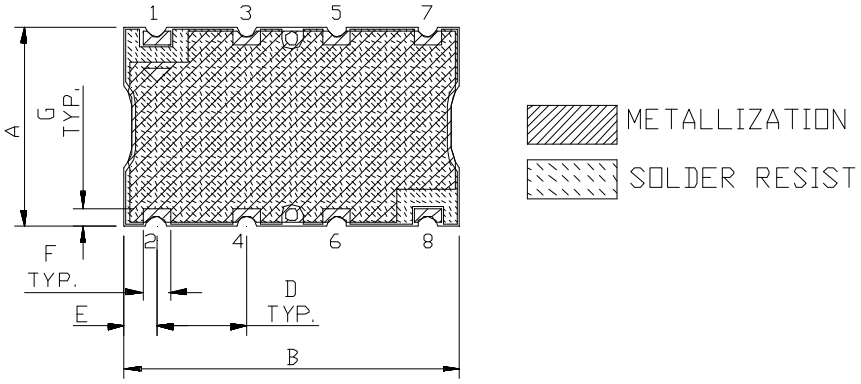


Case Style HF

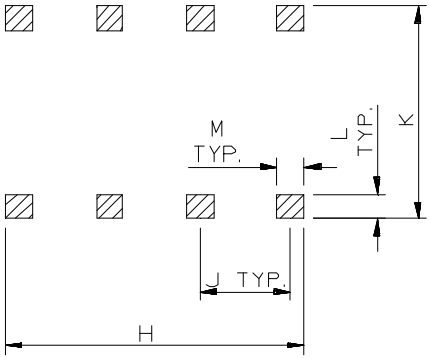
HF1139

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

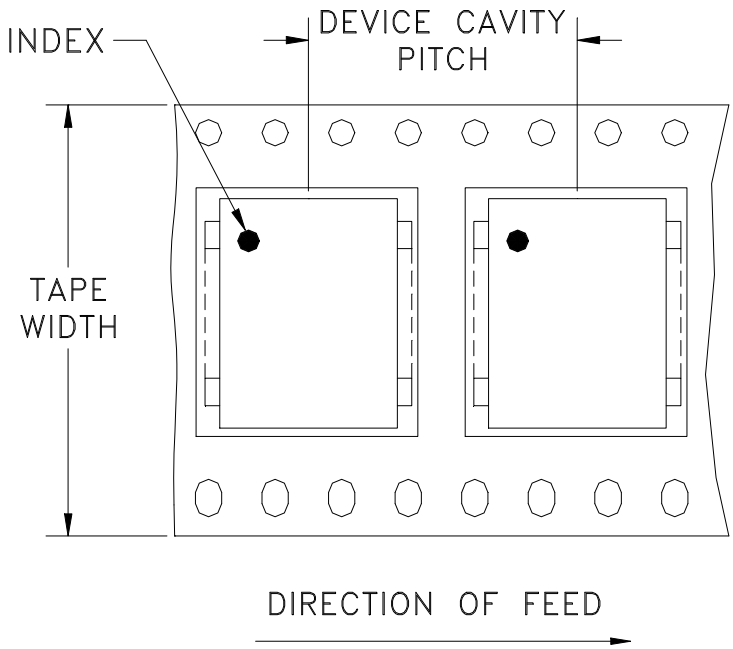
Dimensions are in inches (mm). Tolerances: 2 Pl. ±.015"; 3 Pl. ±.01"

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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

Mini-Circuits®
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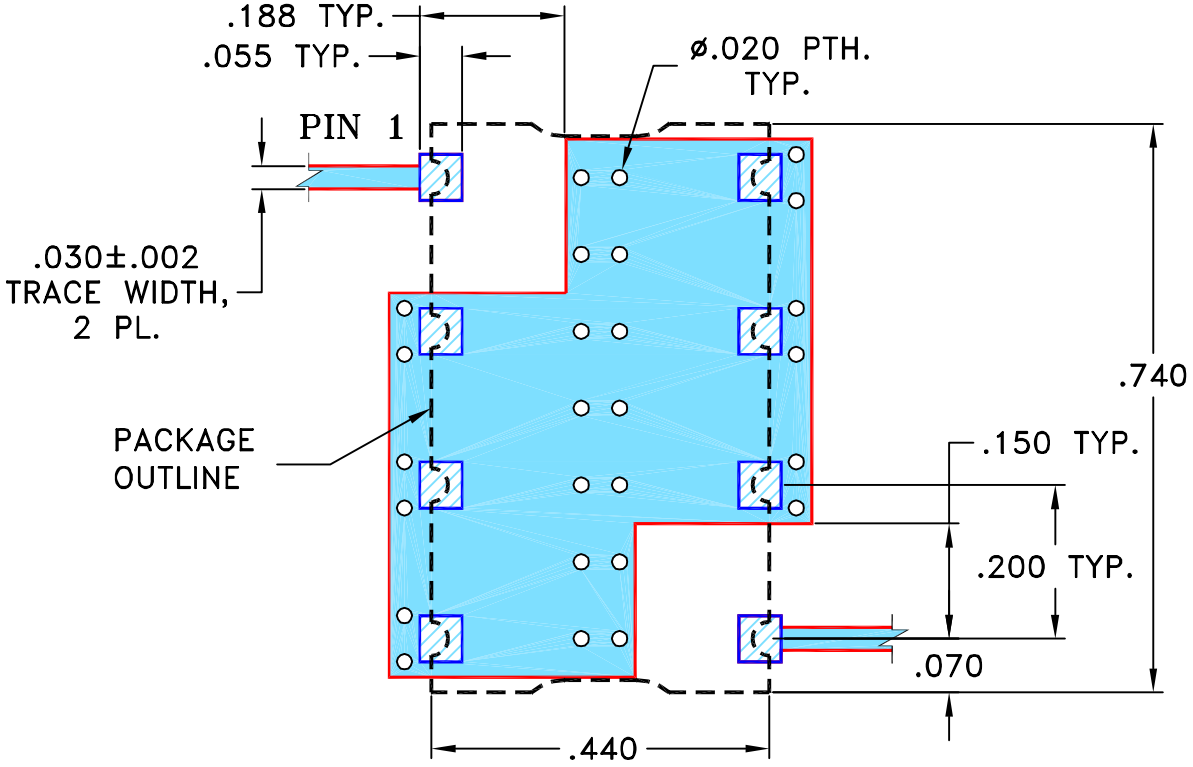
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M114157	NEW RELEASE (FROM RAVON)	10/07	DK	HH
OR	R70641	NEW RELEASE (FROM RAVON)	10/07	DK	HH

SUGGESTED MOUNTING CONFIGURATION
FOR HF1317 CASE STYLE, cr PIN CONNECTION, 75 OHM



NOTE:

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.

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 OCT 07
TOLERANCES ON:	CHECKED	RZ (RAVON)	29 OCT 07
2 PL DECIMALS ±	APPROVED	HH (RAVON)	29 OCT 07
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

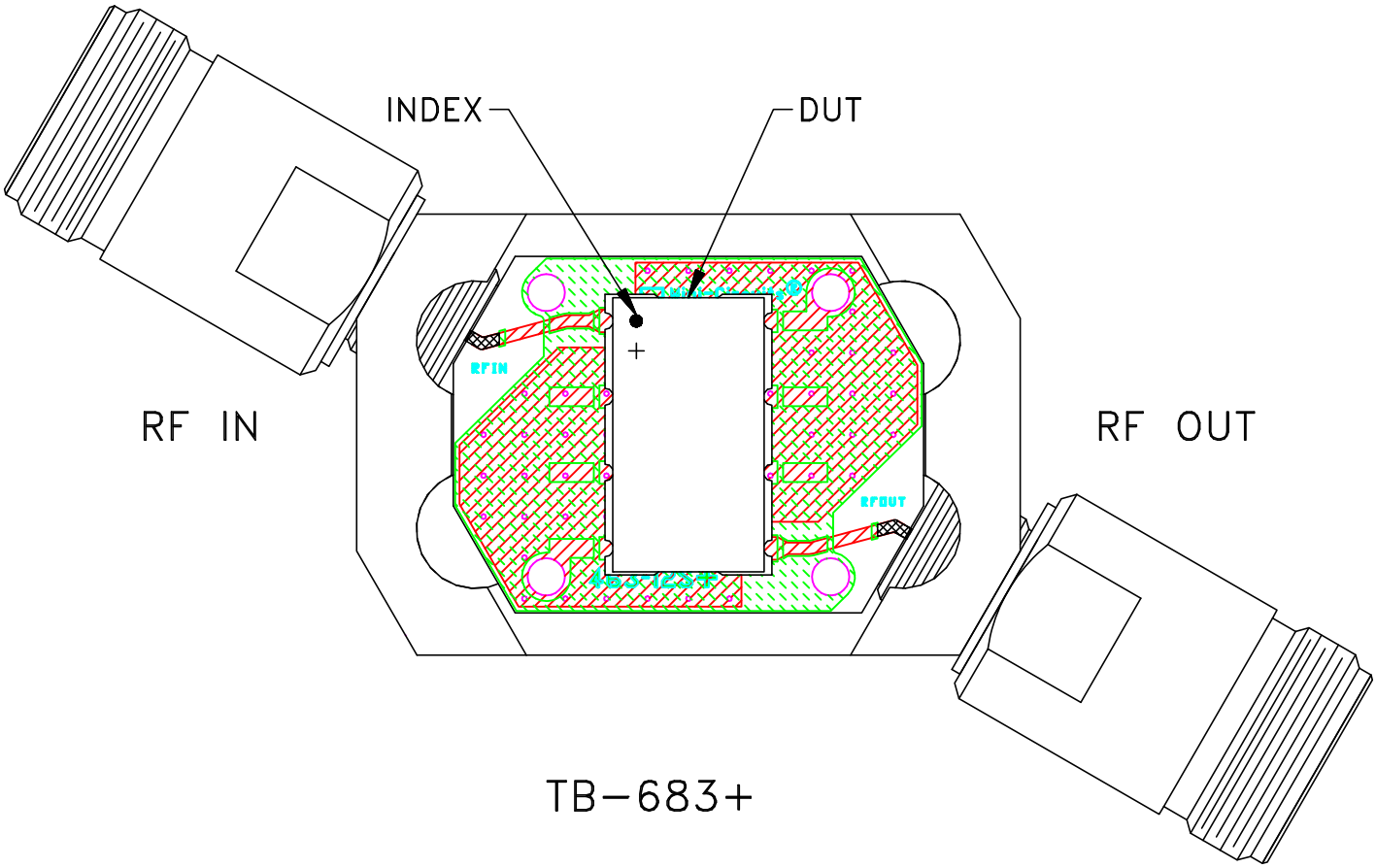
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL,cr,HF1317,SXBP,TB-466+,75 OHM

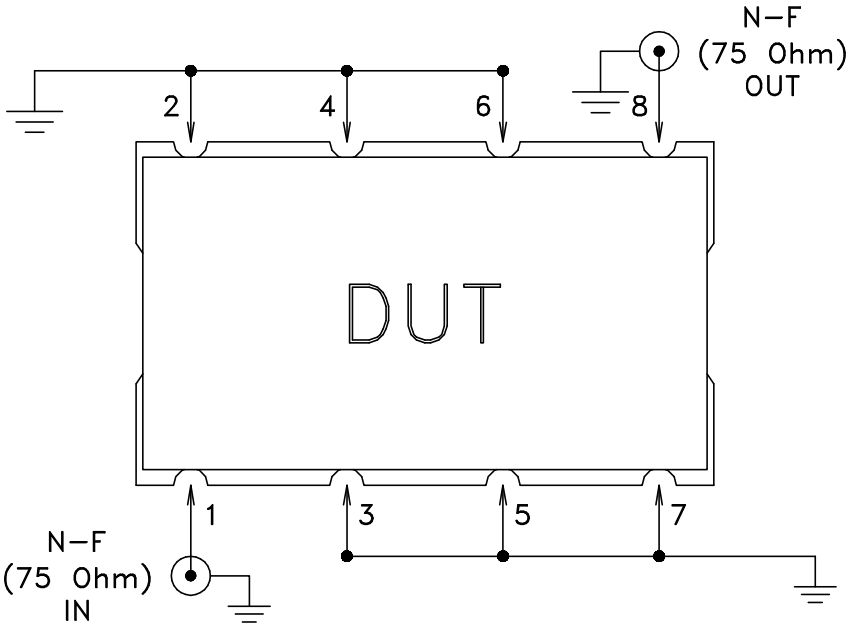
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-281	OR

FILE:	SCALE:	SHEET:
98PL281	4:1	1 OF 1

Evaluation Board and Circuit



TB-683+



Schematic Diagram

Notes:

1. 75 Ohm N Female connectors.
2. PCB Material: ROGERS (RO4350B) OR Equivalent
   Dielectric Constant=3.48±.05, Thickness=.030 inch.

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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