

Bandpass Filter

SXBP-157+

50Ω 150 to 164 MHz

Maximum Ratings

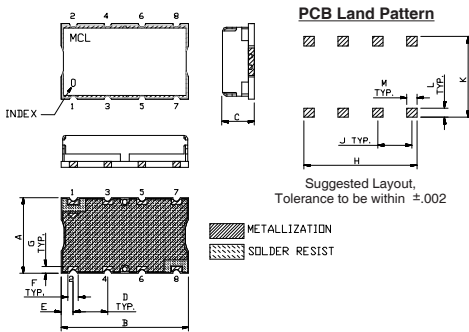
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W Max.

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

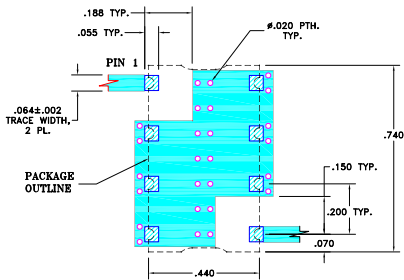


Outline Dimensions (inch/mm)

	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. grams
	.040	.660	.200	.470	.055	.060	3.0
	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)



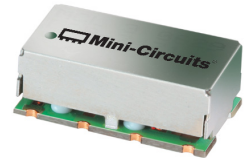
- NOTE:
- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS: .025±.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Features

- excellent rejection
- good VSWR, 1.2:1 typ @ passband
- aqueous washable

Applications

- receivers / transmitters
- professional mobile radio / public access mobile radio (PMR/ PAMR)
- CDMA base station



Generic photo used for illustration purposes only
CASE STYLE: HF1139

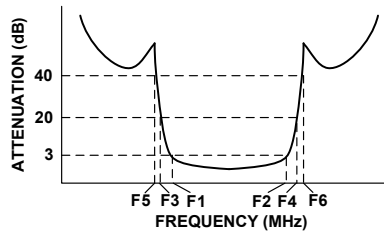
+RoHS Compliant

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

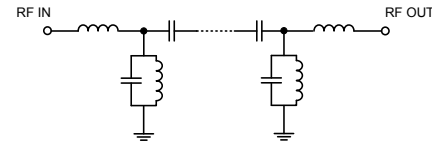
Bandpass Filter Electrical Specifications (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 3dB)	STOPBANDS (MHz)				VSWR (:1)		
		Loss > 20dB		Loss > 40dB		Passband		Stopband
F _c	F ₁ - F ₂	F ₃	F ₄	F ₅	F ₆	Typ.	Max.	Typ.
157	150 - 164	131	187	115	215 - 2000	1.2	1.7	20

Typical Frequency Response

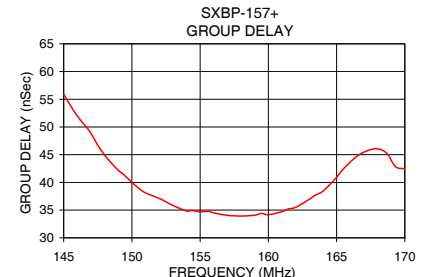
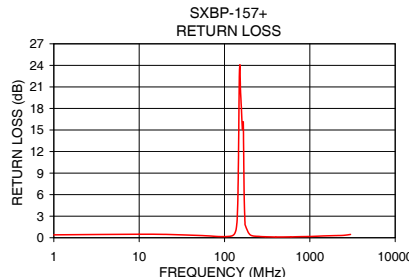
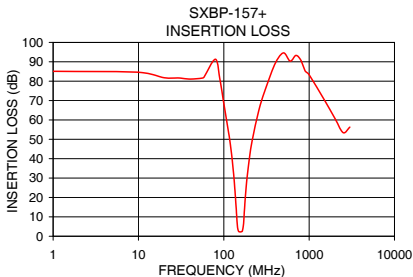


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nSec)
	\bar{x}	σ			
1.0	85.08	2.10	0.41	147.5	47.32
115.0	52.32	0.36	0.19	149.0	43.31
131.0	30.98	0.35	0.54	150.0	40.88
139.0	15.86	0.38	1.77	151.0	39.12
143.0	7.41	0.39	4.92	152.5	36.95
146.0	3.62	0.21	11.89	154.0	35.47
150.0	2.44	0.03	24.24	155.0	34.82
157.0	2.22	0.03	18.56	156.0	34.59
164.0	2.53	0.04	15.44	157.0	34.33
169.0	4.80	0.31	7.92	159.0	33.98
172.0	9.17	0.42	3.23	160.0	33.89
178.0	18.91	0.32	1.19	161.4	34.36
187.0	29.82	0.22	0.64	163.0	35.53
215.0	49.38	0.19	0.31	163.4	36.37
750.0	93.83	3.88	0.13	164.0	36.97
1000.0	83.28	1.86	0.18	165.4	40.43
1500.0	70.47	0.42	0.26	166.7	43.96
2000.0	60.88	0.91	0.30	168.0	46.31



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-Circuit's 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-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp



Surface Mount Band Pass Filter

SXBP-157+

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	85.39	79.16	81.93	0.27	0.36	0.44	0.30	0.40	0.44
1	84.34	108.51	78.90	0.30	0.38	0.47	0.30	0.39	0.47
50	77.45	72.97	78.18	0.24	0.30	0.32	0.26	0.31	0.33
100	67.97	68.80	67.77	0.12	0.14	0.15	0.12	0.15	0.19
115	53.15	53.15	52.93	0.14	0.17	0.19	0.13	0.17	0.20
120	47.67	47.40	47.20	0.16	0.20	0.22	0.14	0.19	0.23
130	34.39	33.96	33.63	0.31	0.38	0.44	0.28	0.36	0.43
131	32.83	32.40	32.07	0.34	0.42	0.49	0.32	0.40	0.47
139	18.25	17.71	17.26	1.06	1.32	1.53	0.95	1.19	1.39
146	4.26	4.36	4.42	9.64	11.51	13.18	8.57	10.04	11.33
150	2.32	2.63	2.86	28.61	27.24	26.16	28.46	29.25	29.46
157	1.97	2.27	2.52	27.27	28.21	29.07	26.98	27.85	28.69
164	2.13	2.53	2.84	24.36	24.27	24.44	24.15	24.24	24.70
169	3.41	4.22	4.91	11.76	10.46	9.55	12.50	11.21	10.25
178	16.95	17.90	18.68	1.35	1.46	1.51	1.39	1.51	1.59
187	28.57	29.22	29.77	0.65	0.73	0.78	0.63	0.73	0.80
200	39.77	40.25	40.64	0.36	0.43	0.46	0.36	0.43	0.48
215	48.77	49.12	49.40	0.26	0.29	0.33	0.22	0.29	0.34
230	55.51	56.14	56.10	0.20	0.24	0.27	0.16	0.22	0.27
240	59.20	59.38	59.39	0.17	0.21	0.22	0.14	0.19	0.23
250	62.01	62.76	61.95	0.15	0.18	0.20	0.11	0.18	0.21
300	75.68	73.92	73.71	0.09	0.13	0.14	0.07	0.12	0.16
400	84.90	92.54	87.71	0.06	0.10	0.12	0.03	0.10	0.12
500	82.63	101.93	84.81	0.05	0.09	0.11	0.01	0.08	0.11
600	82.97	94.11	81.17	0.06	0.09	0.11	0.02	0.09	0.14
700	78.35	83.71	81.75	0.06	0.08	0.11	0.02	0.10	0.15
750	84.72	77.38	82.91	0.05	0.10	0.14	0.01	0.11	0.15
800	81.60	76.64	79.20	0.07	0.11	0.15	0.03	0.14	0.18
900	86.02	83.32	92.31	0.10	0.15	0.16	0.03	0.14	0.21
1000	86.35	82.69	84.77	0.10	0.15	0.18	0.04	0.14	0.21
1200	78.76	79.68	77.31	0.12	0.19	0.24	0.05	0.17	0.24
1400	78.10	77.05	75.81	0.15	0.22	0.27	0.07	0.21	0.29
1500	78.70	71.23	80.11	0.17	0.23	0.28	0.09	0.23	0.32
1600	69.27	71.97	76.23	0.18	0.24	0.29	0.10	0.25	0.34
1800	71.39	73.26	75.08	0.20	0.28	0.32	0.13	0.29	0.38
2000	65.35	63.42	62.68	0.24	0.31	0.35	0.13	0.31	0.40
2200	75.36	65.05	68.48	0.23	0.31	0.36	0.13	0.31	0.42
2400	47.96	52.28	49.94	0.27	0.35	0.40	0.16	0.34	0.47
2500	51.99	48.46	50.29	0.24	0.36	0.39	0.13	0.35	0.47
2600	49.92	45.01	50.32	0.25	0.37	0.40	0.13	0.34	0.46
2800	50.98	45.46	46.32	0.25	0.36	0.43	0.14	0.35	0.50
3000	43.49	44.24	41.80	0.29	0.38	0.46	0.12	0.39	0.53
3200	38.83	40.57	41.78	0.30	0.44	0.56	0.15	0.41	0.57
3400	36.19	38.87	35.17	0.37	0.70	0.81	0.15	0.46	0.61
3500	33.38	35.45	33.98	0.97	1.43	1.61	0.17	0.44	0.67
3600	35.66	34.89	36.42	0.95	0.81	0.96	0.33	0.54	0.77
3800	35.42	31.28	38.22	0.54	0.72	0.94	0.29	0.64	0.90
4000	27.24	27.02	28.15	0.69	0.90	1.04	0.27	0.75	0.87
4200	26.84	25.94	25.17	0.81	0.99	1.20	0.54	0.96	1.18
4400	23.68	27.03	25.47	1.09	1.43	1.54	0.93	1.21	1.71
4500	20.93	22.41	22.39	1.51	1.62	2.12	1.04	1.41	2.02
4600	20.72	18.83	19.11	1.97	2.34	3.02	1.31	1.87	2.26
4800	11.23	10.00	11.18	4.90	7.36	6.60	3.93	6.01	5.31
5000	9.65	11.82	13.14	6.05	9.44	8.54	4.91	7.28	6.87

REV. X2
SXBP-157+
101118
Page 1 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 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 Band Pass Filter

SXBP-157+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (nsec)		
	@ -40° C	@ +25° C	@ +85° C
110	3.51	3.21	5.66
120	4.76	4.66	5.12
124	5.82	5.94	6.40
125	6.01	6.42	6.64
126	6.50	6.67	7.07
127	7.04	7.53	7.67
128	7.51	8.05	8.26
129	8.14	8.50	8.66
130	8.72	9.23	9.47
134	12.65	13.39	13.98
135	14.13	15.03	15.63
136	15.94	16.87	17.66
137	18.13	19.27	20.16
138	20.82	22.06	23.09
139	24.12	25.43	26.53
140	27.79	29.14	30.21
145	43.95	44.12	44.34
146	44.80	44.90	45.02
146	45.57	45.54	45.53
147	46.15	46.03	45.91
147	46.58	46.30	46.13
149	46.77	46.18	45.69
149	46.48	45.76	45.22
150	45.99	45.24	44.65
150	45.36	44.53	43.88
151	43.70	42.87	42.25
152	41.83	41.05	40.53
153	40.04	39.42	39.02
154	38.51	38.07	37.78
155	37.33	37.03	36.83
156	36.50	36.30	36.18
157	35.90	35.80	35.77
158	35.53	35.53	35.55
159	35.33	35.39	35.54
160	35.41	35.58	35.75
161	35.70	35.98	36.26
162	36.28	36.63	36.97
163	37.16	37.57	37.95
164	38.22	38.60	38.91
165	39.34	39.62	39.81
166	39.85	40.04	40.14
166	40.29	40.36	40.36
167	40.66	40.59	40.49
167	40.90	40.69	40.47
168	40.97	40.49	40.05
169	40.60	39.86	39.17
170	39.66	38.67	37.81
180	14.60	13.91	13.36
190	5.90	5.86	5.70
200	3.37	3.46	3.65
210	2.58	2.38	2.32
220	2.03	1.66	1.86
230	1.90	0.76	2.03
240	0.63	0.76	1.60

REV. X2
 SXBP-157+
 101118
 Page 2 of 2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant
 P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

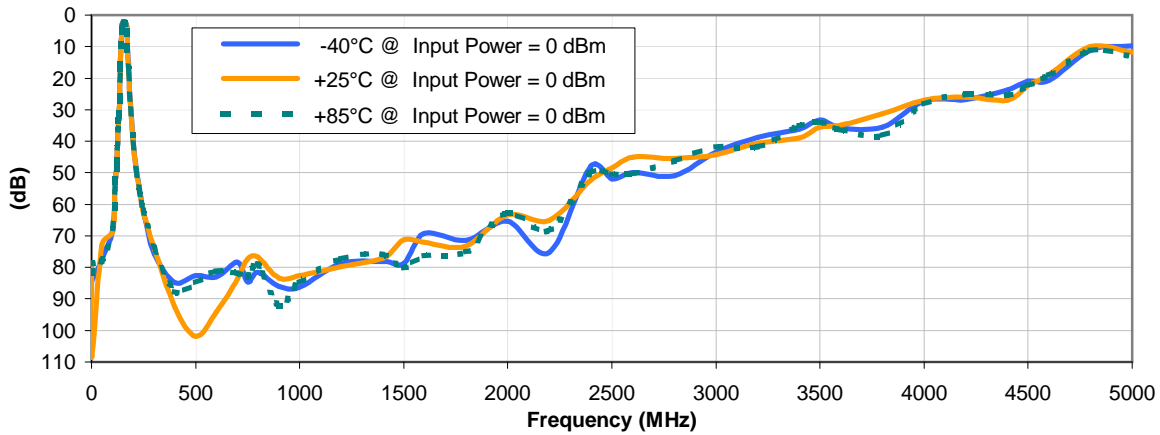


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

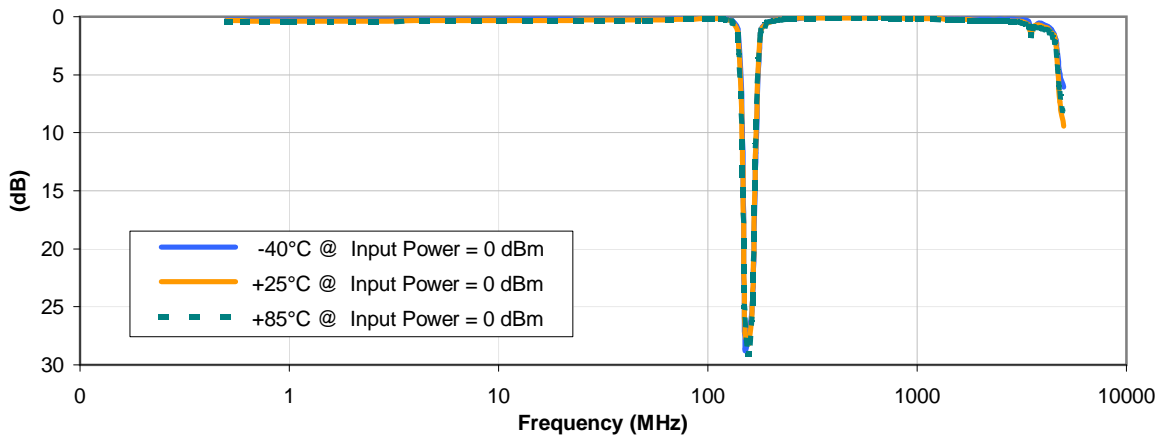


Typical Performance Curves

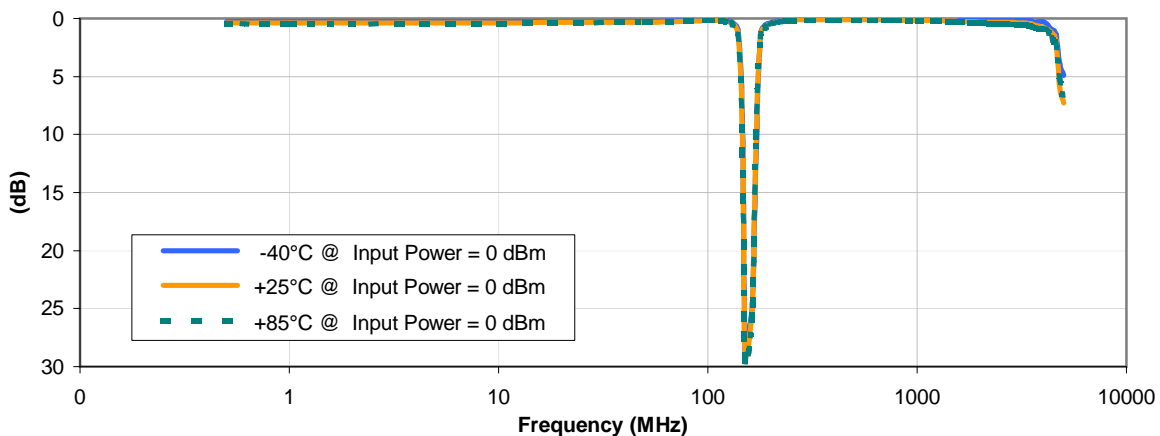
INSERTION LOSS vs. TEMPERATURE



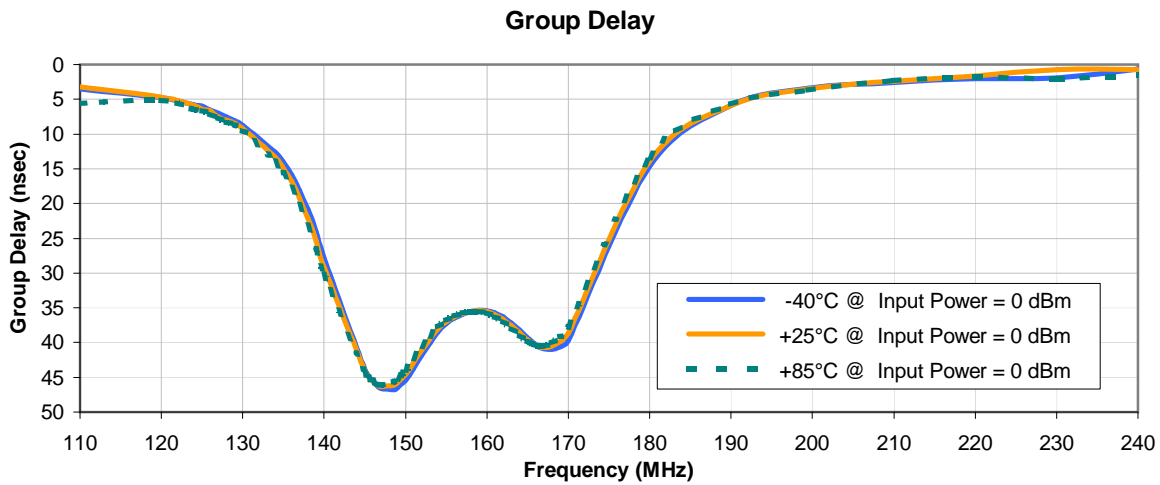
INPUT RETURN LOSS vs. TEMPERATURE



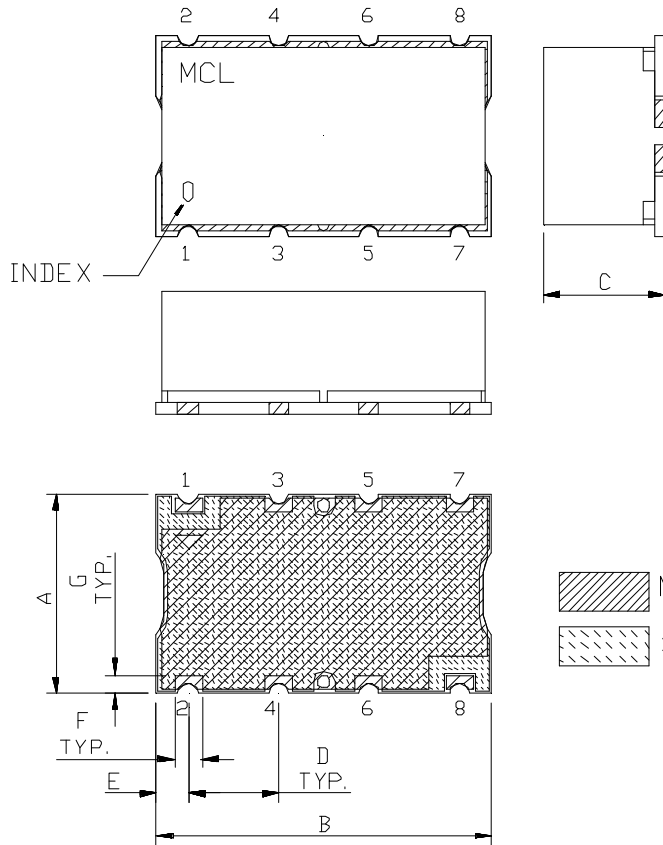
OUTPUT RETURN LOSS vs. TEMPERATURE



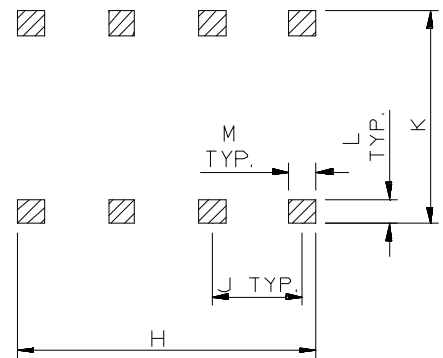
Typical Performance Curves




Outline Dimensions



PCB Land Pattern



 METALLIZATION
 SOLDER RESIST

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.



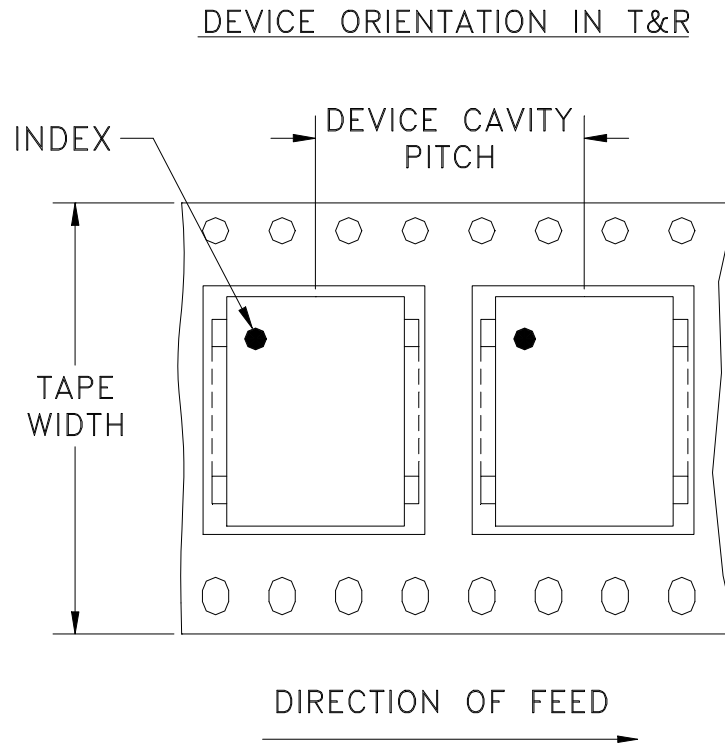
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

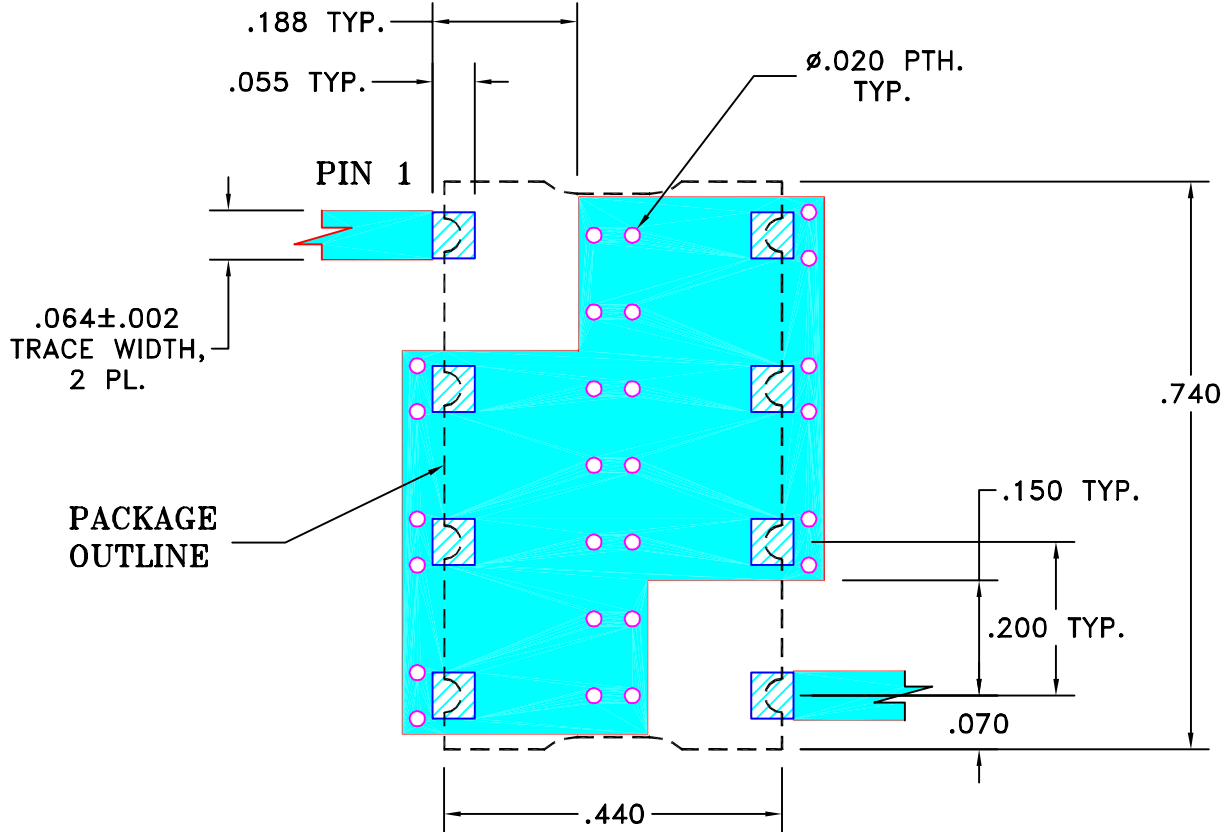
THIRD ANGLE PROJECTION



REVISIONS

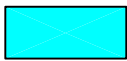
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M101757	NEW RELEASE (FROM RAVON)	11/05	DK	HH
OR	R62293	NEW RELEASE (FROM RAVON)	11/05	DK	HH

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

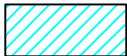


NOTE:

- 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

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	DK (RAVON)	29 NOV 05
	CHECKED	RZ (RAVON)	29 NOV 05
	APPROVED	HH (RAVON)	29 NOV 05



Mini-Circuits®

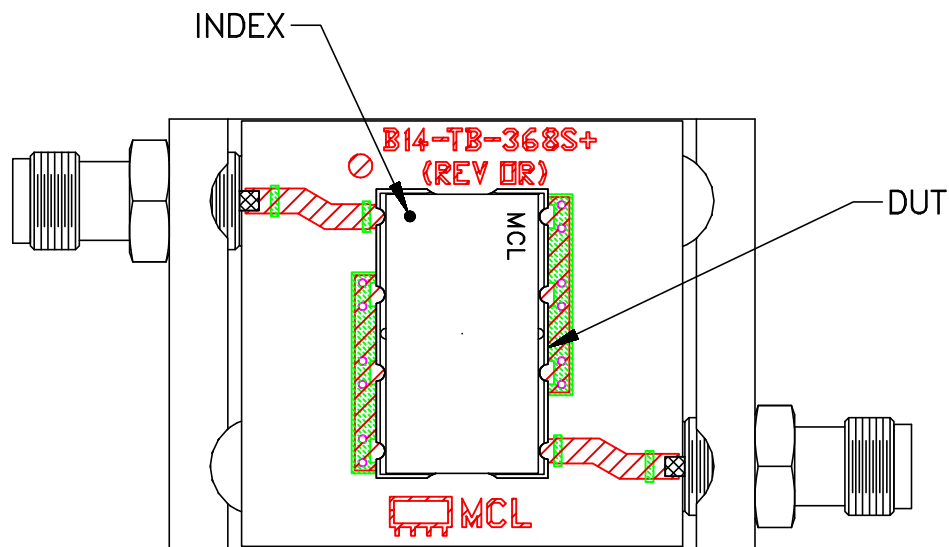
13 Neptune Avenue
Brooklyn NY 11235

PL, cr, HF1139, SCLF, TB-368

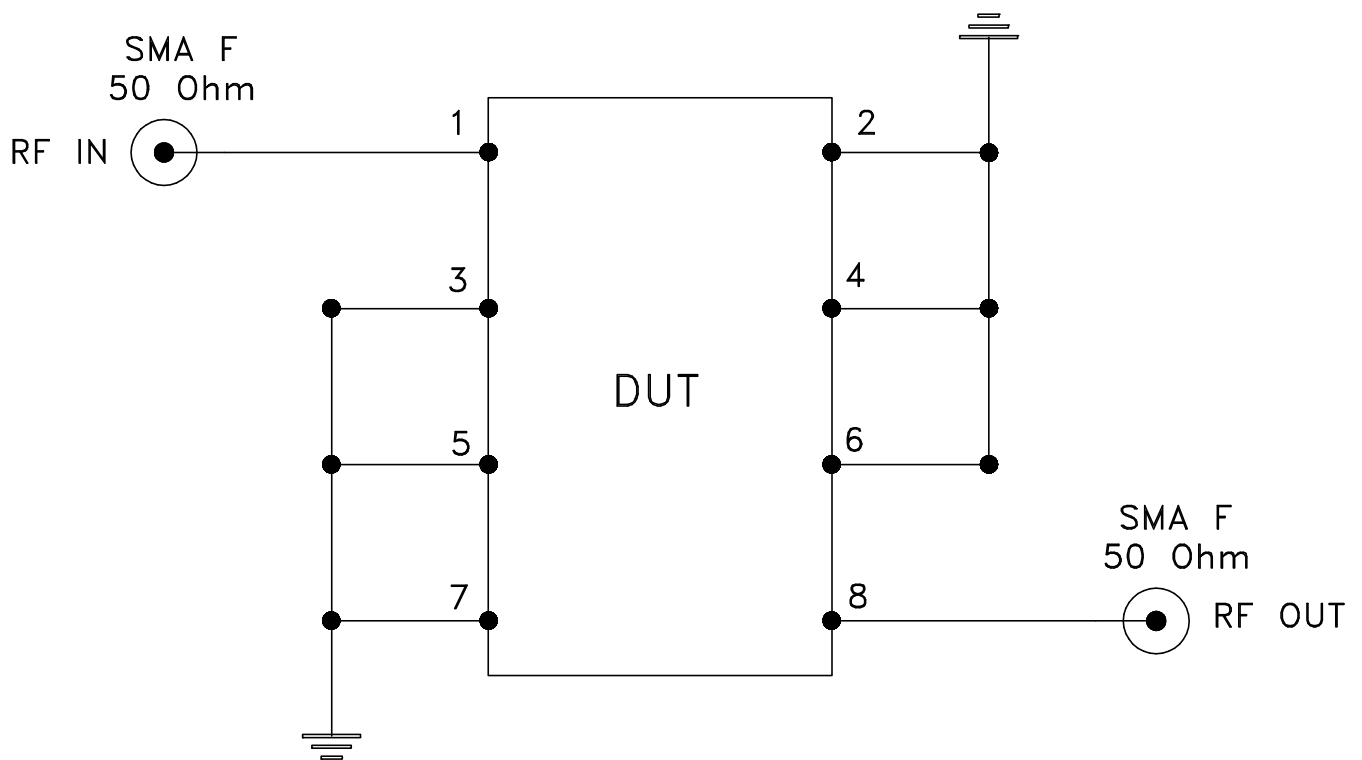
Mini-Circuits®
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL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

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