LTCC SURFACE MOUNT

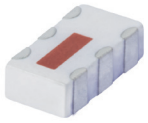
Bandpass Filter

BFCN-1560+

50Ω 1500 to 1620 MHz

THE BIG DEAL

- Good Rejection, 30 dB Typ.
- 1206 Surface Mount Footprint
- Power Handling: 1.5 Watts

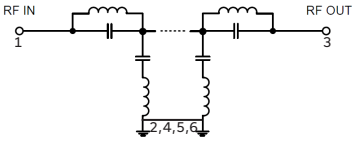


Generic photo used for illustration purposes only

APPLICATIONS

- Harmonic Rejection
- Transmitters / Receivers

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' BFCN-1560+ LTCC Band Pass Filter is constructed with multiple layers in order to achieve a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 120 MHz passband, these units offer low insertion loss and good rejection.

KEY FEATURES

Features	Advantages
Small Size, 1206	Allows for high layout density of circuit boards, while minimizing the effects of parasitics.
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.
Rugged Power handling	Handles up to 1.5 Watts in a small package.

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ELECTRICAL SPECIFICATIONS[1,2] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency[3]	—	—	—	1560	—	MHz
	Insertion Loss	F1-F2	1500 - 1620	—	—	5	dB
	Return Loss	F1-F2	1500 - 1620	11.73	—	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 1040	—	30	—	dB
		F4	1100	20	—	—	
Stop Band, Upper	Rejection	F5	2100	20	—	—	dB
		F6-F7	2105 - 4200	—	30	—	

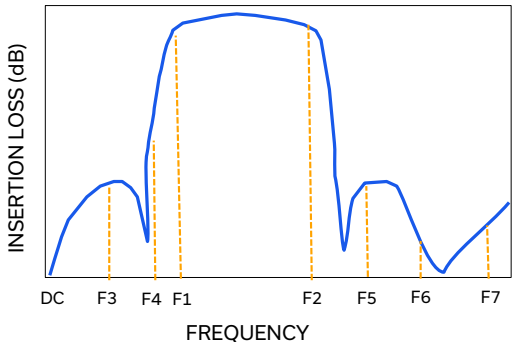
1. Tested in Evaluation Board P/N TB-BFCN-1560+.
2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.
3. Typical variation ± 5%

ABSOLUTE MAXIMUM RATINGS[4]

Parameter	Ratings
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Input Power[5]	1.5W @25°C

4. Permanent damage may occur if any of these limits are exceeded.
5. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.25W at +100°C.

TYPICAL FREQUENCY RESPONSE

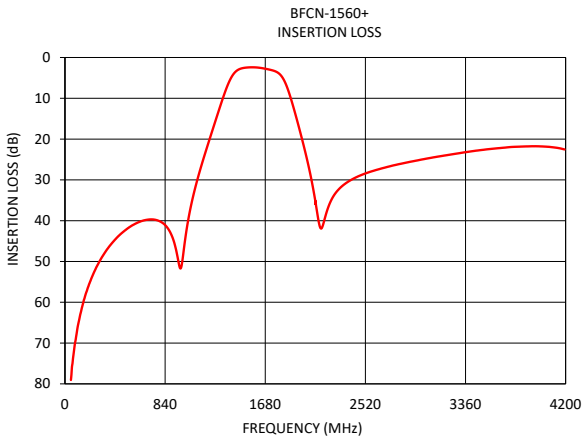


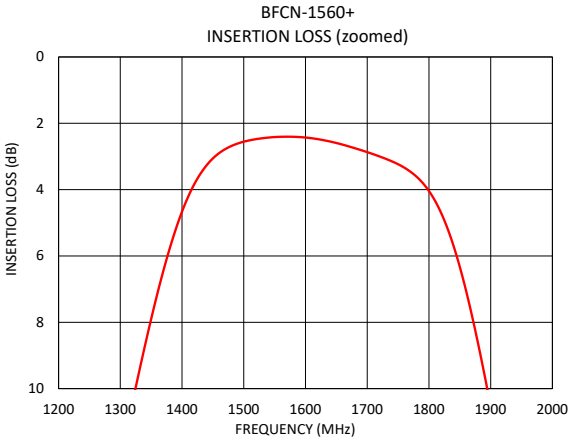
Bandpass Filter

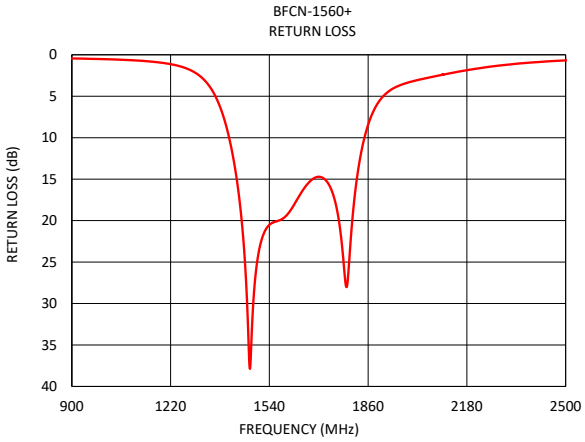
BFCN-1560+

50Ω 1500 to 1620 MHz

TYPICAL PERFORMANCE GRAPHS AT +25°C







Bandpass Filter

BFCN-1560+

50Ω 1500 to 1620 MHz

FUNCTIONAL DIAGRAM

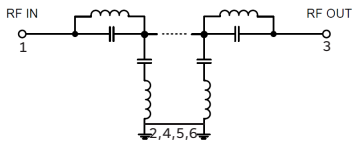
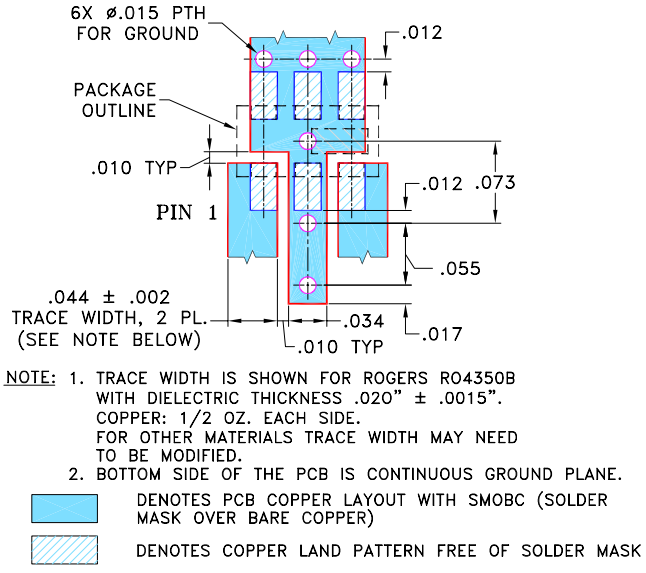


Figure 1. BFCN-1560+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1[2]	1	Connects to RF Input Port
RF2[2]	3	Connects to RF Output Port
GROUND	2,4,5,6	Connects to Ground on PCB, (See drawing PL-158)

SUGGESTED PCB LAYOUT (PL-158)



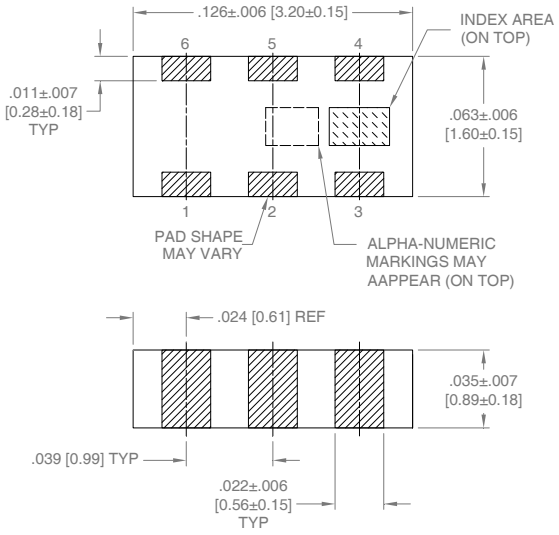
NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Figure 2. Suggested PCB Layout PL-158

CASE STYLE DRAWING



Weight : .020 grams.
Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .005

PRODUCT MARKING*: RS

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

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

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	FV1206-1 Lead Finish: Nickel Tin
RoHS Status	Compliant
Tape and Reel	TR-F75
Suggested Layout for PCB Design	PL-158
Evaluation Board	TB-BFCN-1560+ Gerber File
Environmental Rating	ENV06

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

Ceramic Band Pass Filter BFCN-1560+

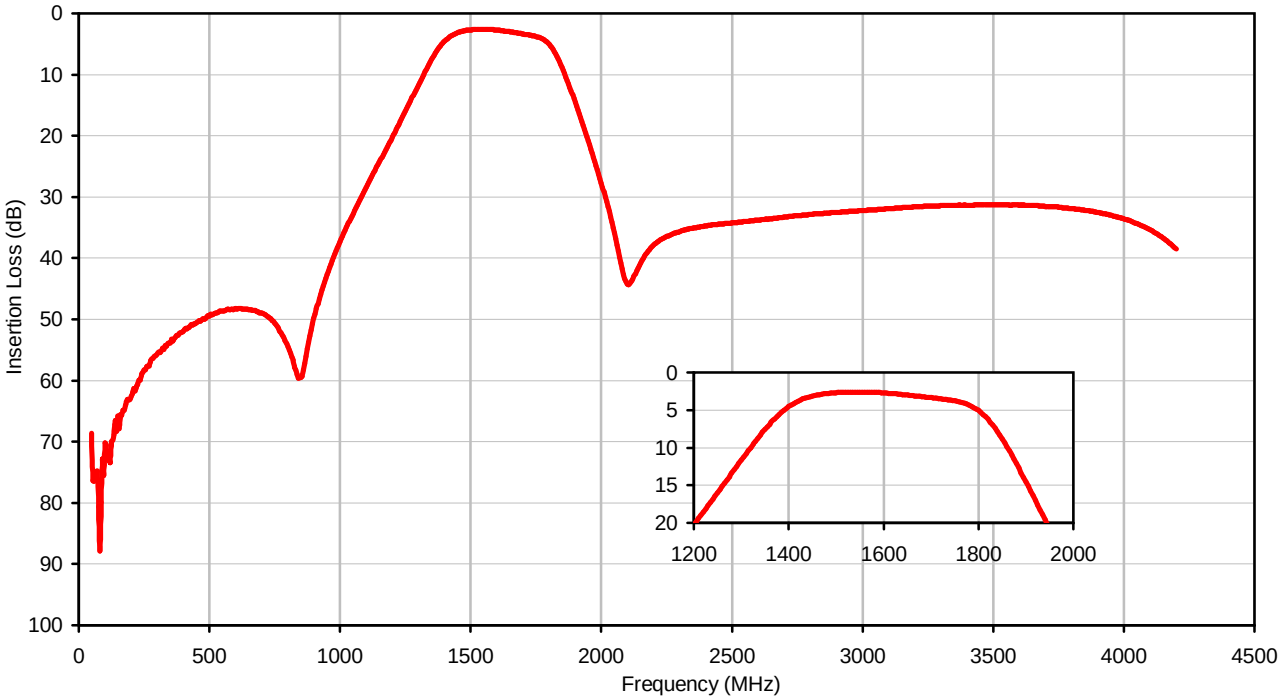
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
50	68.59	0.09
200	62.54	0.19
500	49.47	0.33
1040	33.62	0.67
1100	28.46	0.76
1250	16.02	1.52
1340	8.35	3.76
1400	4.54	9.05
1500	2.69	29.20
1560	2.61	22.42
1620	2.81	15.30
1780	4.32	16.63
1850	8.81	6.45
1910	15.77	3.69
2000	27.69	2.67
2100	44.20	2.15
2105	44.37	2.11
3500	31.29	0.39
4200	38.45	0.49

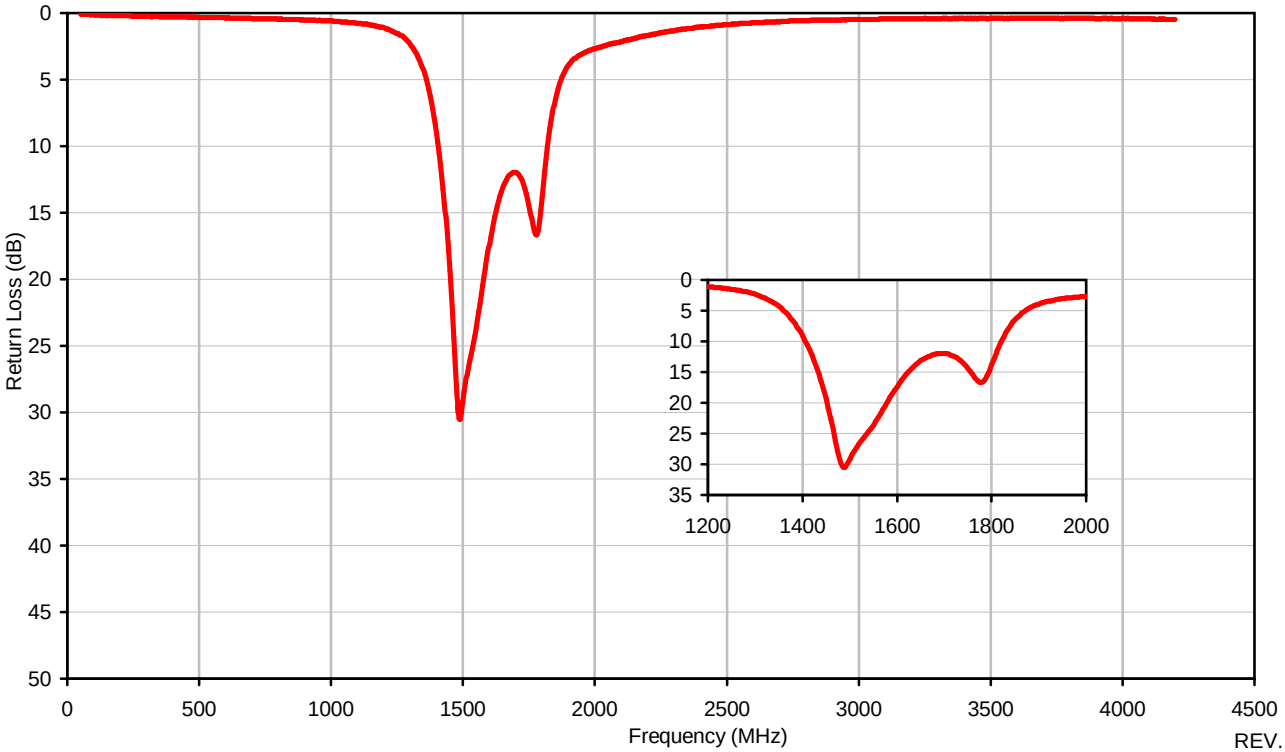
Ceramic Band Pass Filter BFCN-1560+

Typical Performance Curves

Insertion Loss



Return Loss

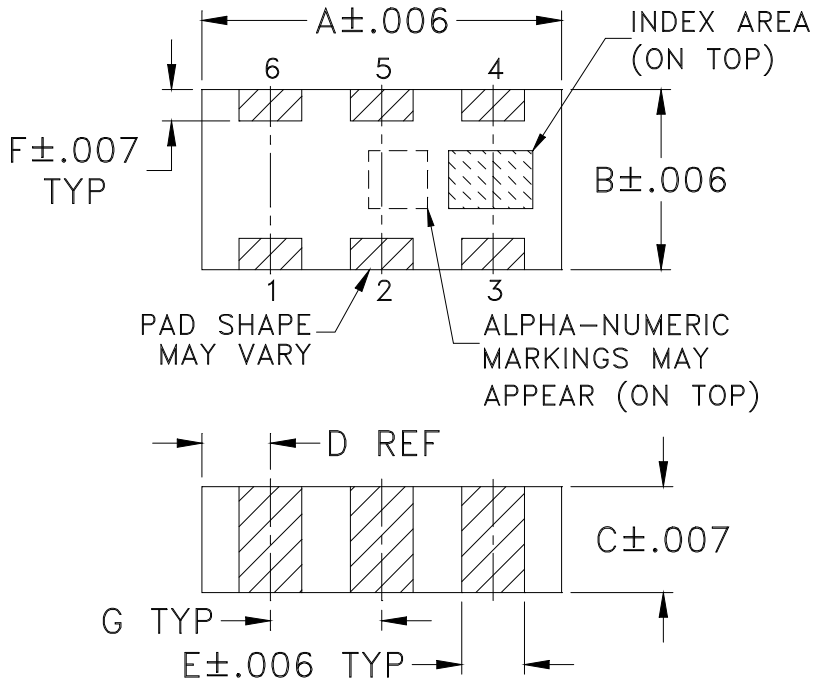


REV. X1
BFCN-1560+
080219
Page 1 of 1

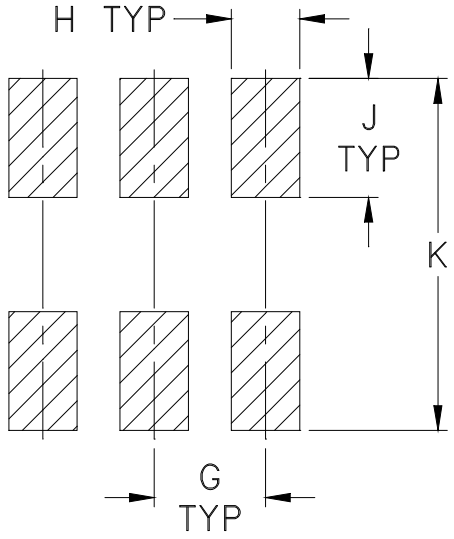
Case Style FV

FV1206-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	-- --	-- --	-- --	-- --	.020

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. Termination finish: **as shown below or indicated on Data Sheet.**
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

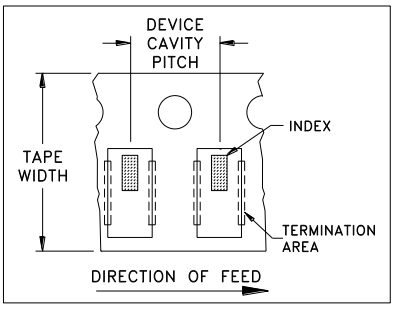


ILLUSTRATION 1

Applicable Case Styles
FV1206-1 FV1206-3

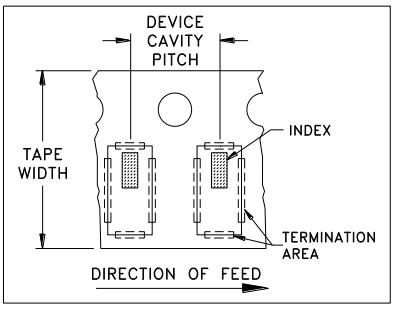


ILLUSTRATION 2

Applicable Case Styles
FV1206-4 FV1206-5 FV1206-6 FV1206-7 FV1206-9

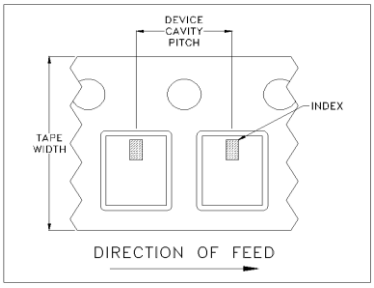


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

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

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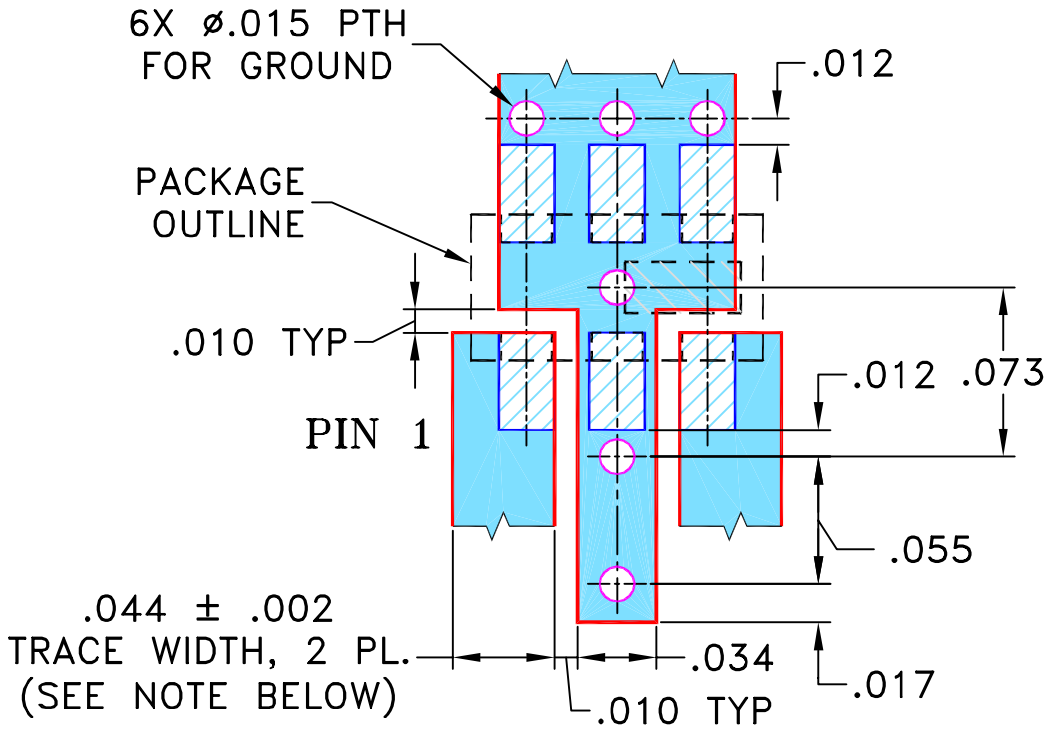
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M92199	NEW RELEASE	05/24/04	AV	ABD
A	M99247	ADD GROUND PTH	06/05	RZ	RZ
A	R60782	ADD GROUND PTH	06/05	RZ	RZ
B	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-1 CASE STYLE, "pr" PIN CONNECTION.



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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 SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	AV	05/03/04
TOLERANCES ON:	CHECKED	IL	05/24/04
2 PL DECIMALS ±	APPROVED	ABD	05/24/04
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

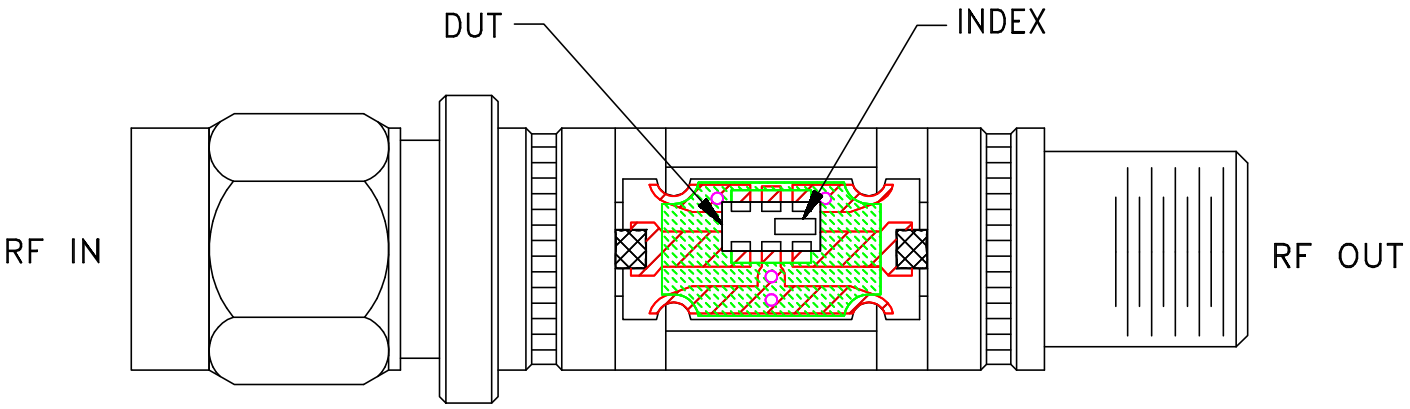
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, pr, FV1206-1, HFCN, TB-285

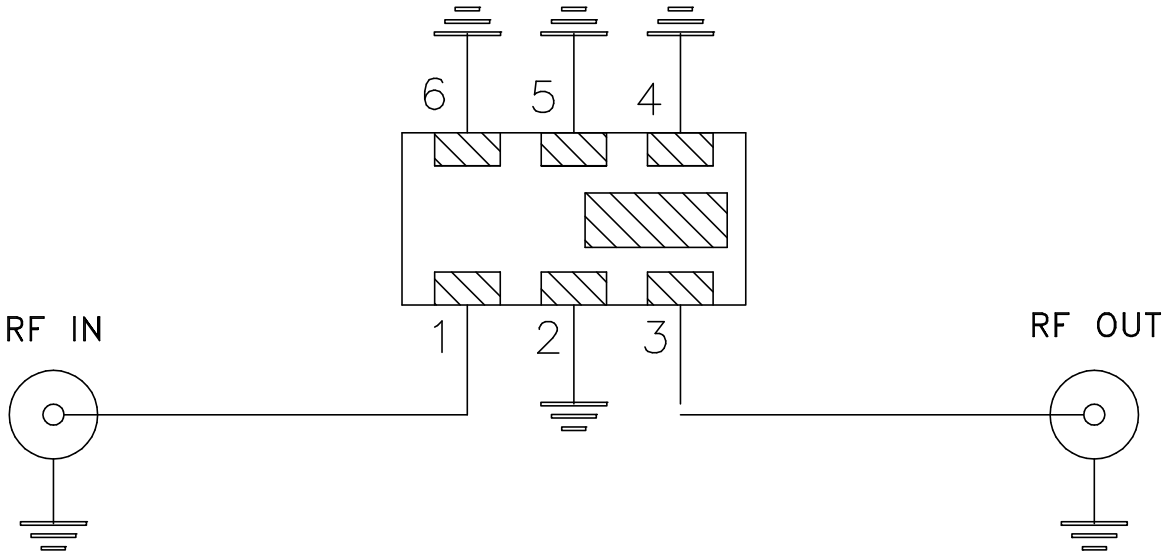
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

FILE:	SCALE:	SHEET:
98PL158	12:1	1 OF 1

Evaluation Board and Circuit



TB-285



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV06

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	-55° to 100°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
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, Para 4.2.5, Test S, 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