Ceramic

Bandpass Filter

BFCN-2491+

50Ω 1950 to 3190 MHz

The Big Deal

- Small size 3.2mm x 1.6mm
- Pass band (1950 to 3190 MHz)
- High rejection in upper stopband

CASE STYLE: FV1206-7

Product Overview

The BFCN-2491+ LTCC Band Pass Filter achieves a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 1950 to 3190 MHz, these units offer excellent rejection over a deep stopband.

Key Features

Feature	Advantages
Small Size (3.20mm x1.6 mm)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Rejection peaks close to pass band	Provides good rejection of signals close to the pass band, for improved system performance.
Wide stopband	No regrowth out to 3rd harmonic permits filter to be used in presence of wideband interfering signals.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.

Ceramic

Bandpass Filter

BFCN-2491+

50Ω 1950 to 3190 MHz

Features

- Small size
- Temperature stable
- Hermetically sealed
- LTCC construction

Applications

- Harmonic Rejection
- Transmitters / Receivers

Generic photo used for illustration purposes only

CASE STYLE: FV1206-7

+RoHS Compliant

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

Available Tape and Reel at no extra cost

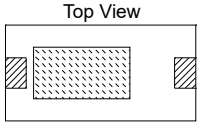
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500,1000, 3000

Maximum Ratings

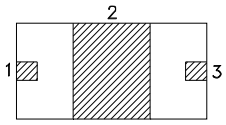
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input	1W max.

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

Top View



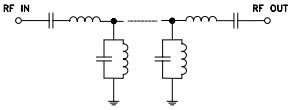
Bottom View



Pad Connections

Input	1
Output	3
Ground	2

Functional Schematic



Electrical Specifications[1,2] at 25°C

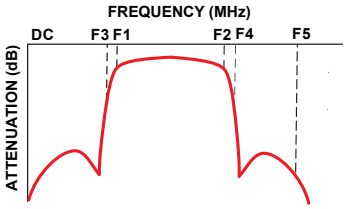
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—			2491		MHz
	Insertion Loss	F1-F2	1950-3190	—	1.2	3.0	dB
	Return Loss	F1-F2	1950-3190	—	15	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	DC-1440	20	22	—	dB
Stop Band, Upper	Insertion Loss	F4-F5	4500-10000	20	29	—	dB

1. Measured on Mini-Circuits Characterization Test Board TB-812+.
2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

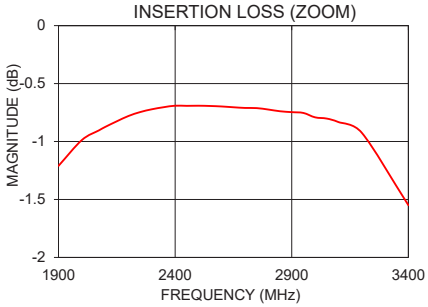
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
500	-46.14	-0.06
1000	-25.95	-0.26
1400	-21.64	-0.56
1700	-9.28	-2.41
1800	-2.67	-9.20
2200	-0.78	-20.19
2600	-0.70	-23.38
3200	-0.92	-25.70
3400	-1.55	-11.95
3600	-4.30	-4.19
4200	-22.20	-0.49
4600	-36.37	-0.34
7000	-31.12	-0.29
8600	-33.77	-0.29
10000	-29.70	-0.21

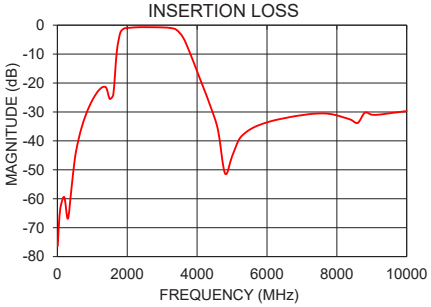
Specification Definition



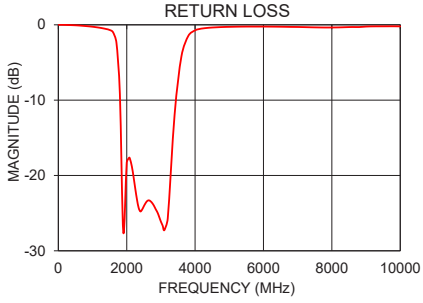
BFCN-2491+
INSERTION LOSS (ZOOM)



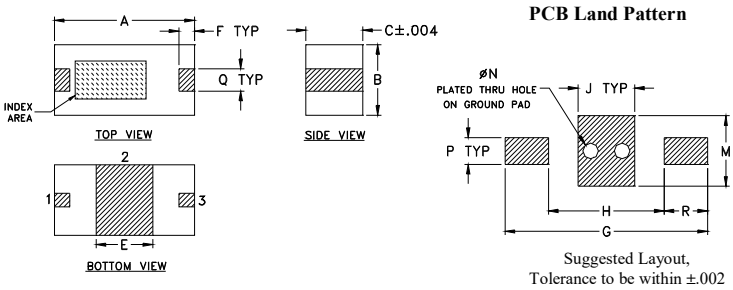
BFCN-2491+
INSERTION LOSS



BFCN-2491+
RETURN LOSS



Outline Drawing



Product Marking: N/A

Pad Connections

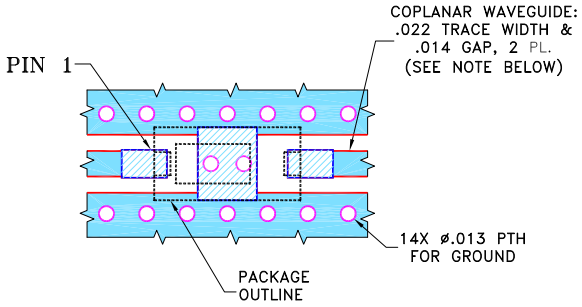
Input	1
Output	3
Ground	2

Outline Dimensions (inch / mm)

A	B	C	E	F	G	H
.126	.063	.051	.051	.014	.183	.104
3.20	1.60	1.30	1.30	0.36	4.65	2.64

J	M	N	P	Q	R	wt
.051	.063	.014	.024	.020	.039	grams
1.30	1.60	0.36	0.61	0.51	0.99	.020

Demo Board MCL P/N: TB- 812+
Suggested PCB Layout (PL-439)



NOTES:

1. COPLANAR WAVEGUIDE IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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.

Additional 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

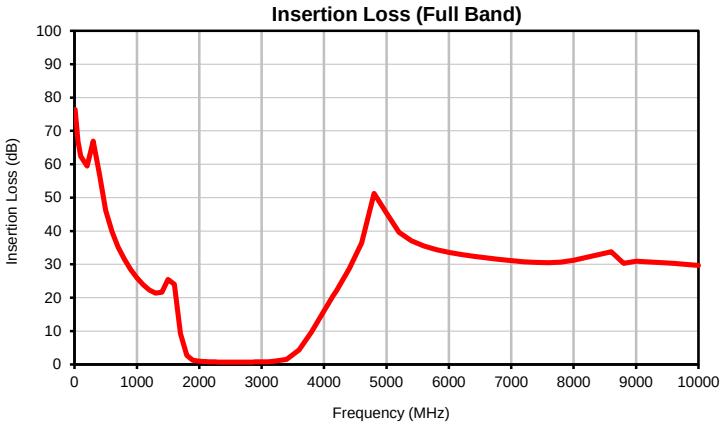
Ceramic Bandpass Filter BFCN-2491+

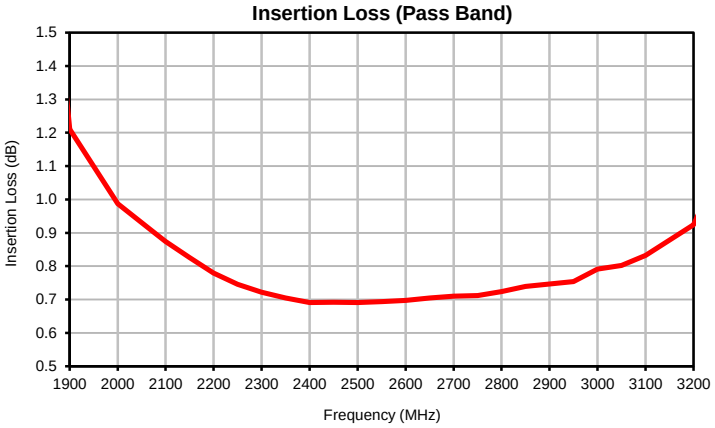
Typical Performance Data

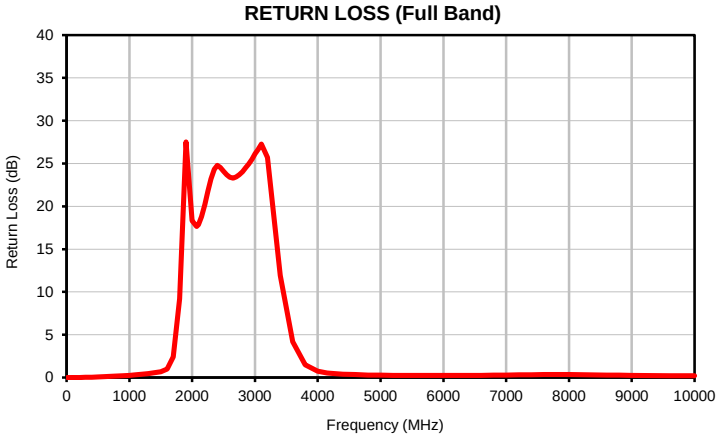
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
10	76.41	0.00
55	66.83	0.00
100	62.35	0.00
200	59.49	0.01
300	66.91	0.03
400	56.80	0.04
500	46.14	0.06
600	39.80	0.09
700	35.15	0.13
800	31.46	0.17
900	28.46	0.21
1000	25.95	0.26
1100	23.89	0.32
1200	22.32	0.38
1300	21.38	0.46
1400	21.64	0.56
1500	25.51	0.69
1600	24.02	0.99
1700	9.28	2.41
1800	2.67	9.20
1900	1.21	27.52
2000	0.99	18.31
2073	0.90	17.64
2100	0.87	17.87
2150	0.83	18.80
2200	0.78	20.19
2250	0.75	21.75
2300	0.72	23.19
2350	0.70	24.32
2400	0.69	24.78
2450	0.69	24.53
2500	0.69	24.09
2550	0.69	23.68
2600	0.70	23.38
2650	0.70	23.30
2700	0.71	23.44
2750	0.71	23.69
2800	0.72	24.05
2850	0.74	24.50
2900	0.75	24.91
2950	0.75	25.50
3000	0.79	26.13
3050	0.80	26.65
3100	0.83	27.26
3200	0.92	25.70
3400	1.55	11.95
3600	4.30	4.19
3800	9.74	1.48
4000	15.98	0.74
4146	20.52	0.54
4200	22.20	0.49
4400	28.64	0.39
4600	36.37	0.34
4800	51.28	0.29
5000	45.37	0.27
5200	39.56	0.25
5400	37.02	0.24
5600	35.48	0.23
5800	34.42	0.23
6000	33.62	0.23
6200	32.93	0.24
6400	32.40	0.25
6600	31.92	0.26
6800	31.46	0.28
7000	31.12	0.29
7200	30.78	0.31
7400	30.58	0.33
7600	30.50	0.35
7800	30.68	0.36
8000	31.18	0.35
8600	33.77	0.29
8800	30.27	0.30
9000	30.95	0.23
9600	30.31	0.20
10000	29.70	0.21

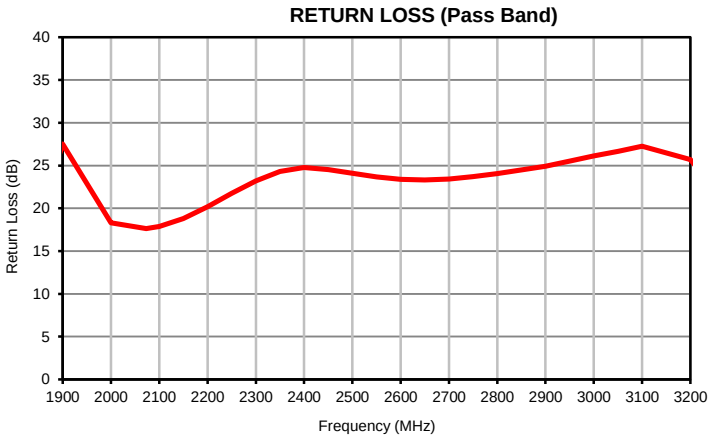
Ceramic Bandpass Filter BFCN-2491+

Typical Performance Curves





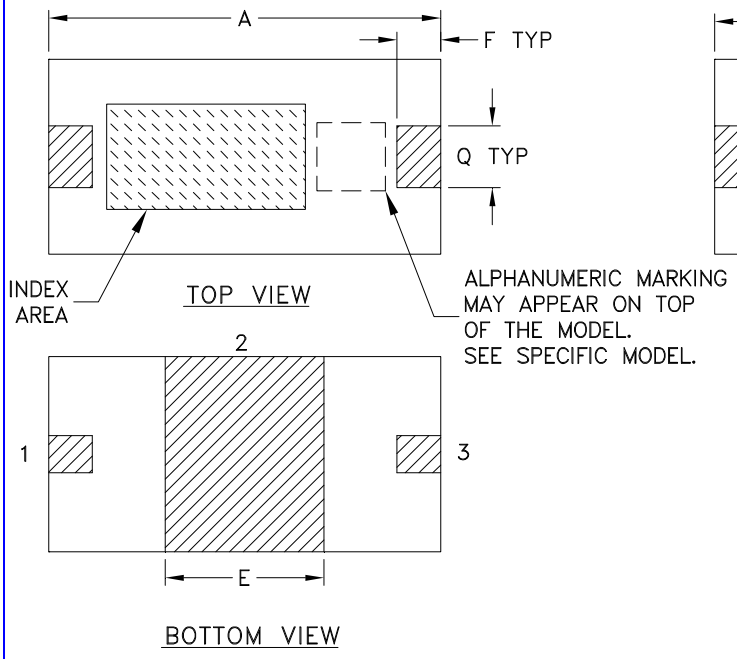




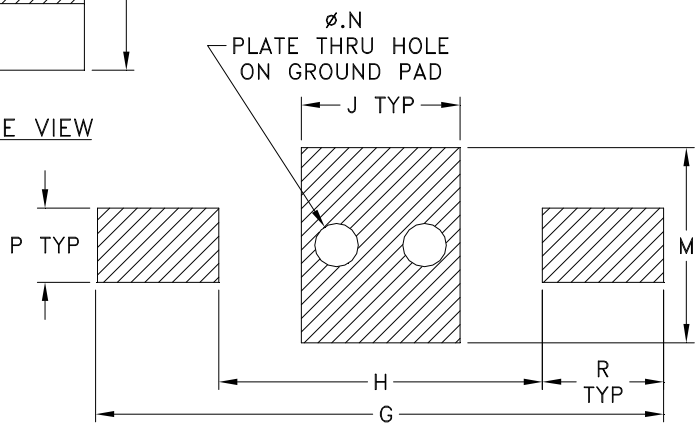
Case Style FV

FV1206-7

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
FV1206-7	.126 (3.20)	.063 (1.60)	.051 (1.30)	-- --	.051 (1.30)	.014 (0.35)	.183 (4.65)	.104 (2.65)	.051 (1.30)	-- --	-- --	.063 (1.60)

CASE #	N	P	Q	R	S	WT. GRAM
FV1206-7	.014 (0.35)	.024 (0.60)	.020 (0.50)	.039 (1.00)	-- --	.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.
3. Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

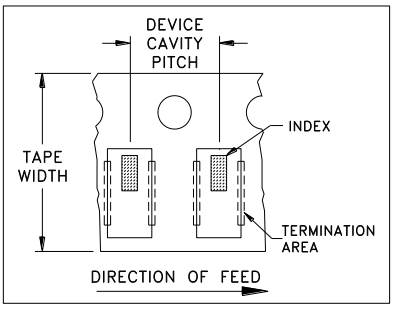


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

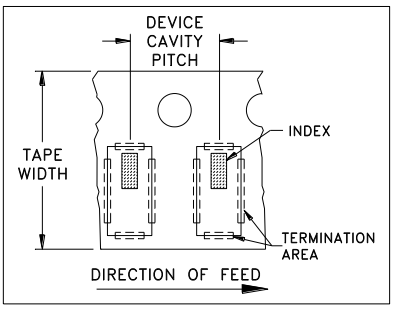


ILLUSTRATION 2

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

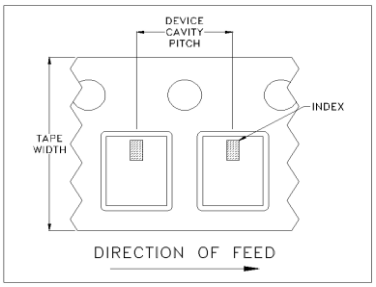


ILLUSTRATION 3

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

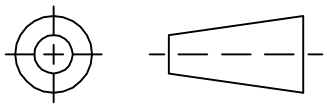
Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

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.

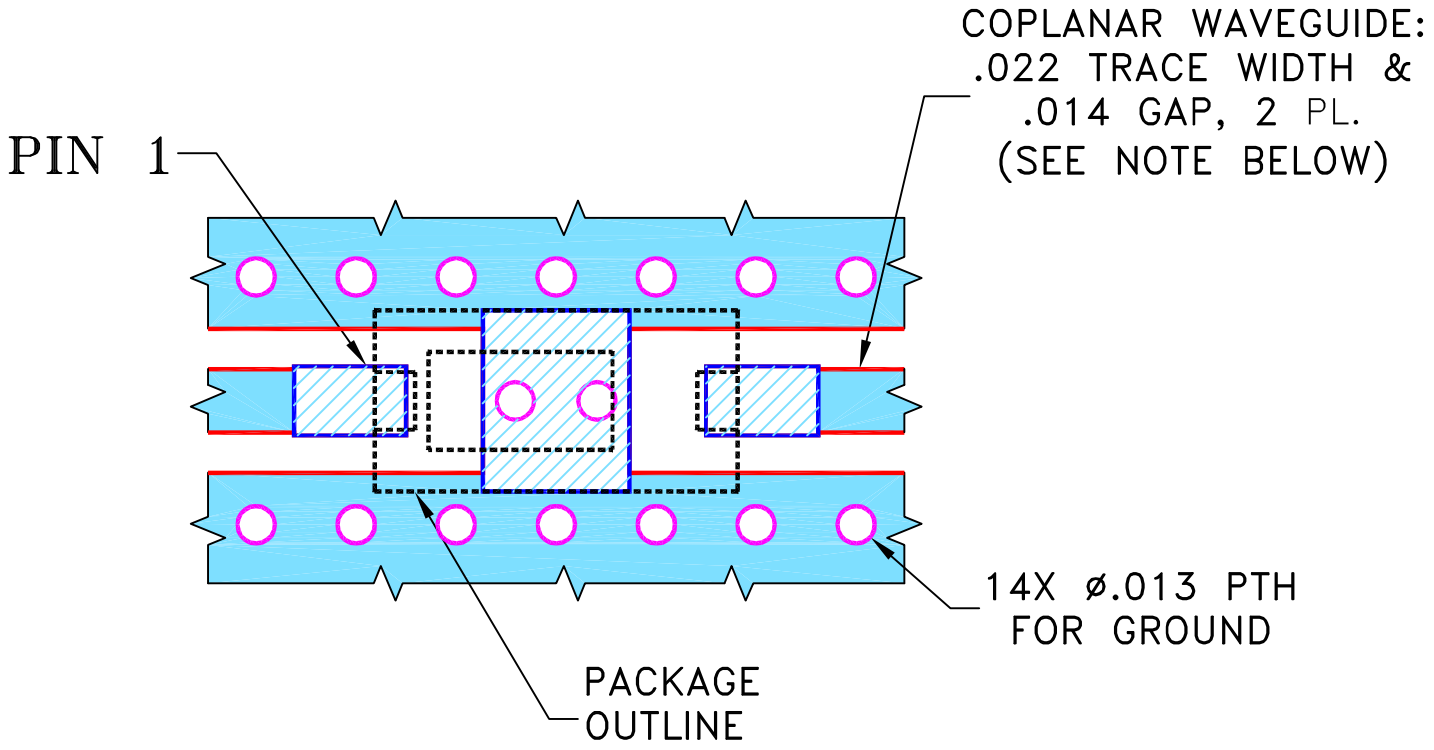
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M148536	NEW RELEASE	10/14/14	GF	MY

SUGGESTED MOUNTING CONFIGURATION FOR FV1206-7 CASE STYLE, "03FL02" PIN CODE



NOTES:

1. COPLANAR WAVEGUIDE IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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	GF	10/07/14
TOLERANCES ON:	CHECKED	AV	10/14/14
2 PL DECIMALS ±	APPROVED	MY	10/14/14
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

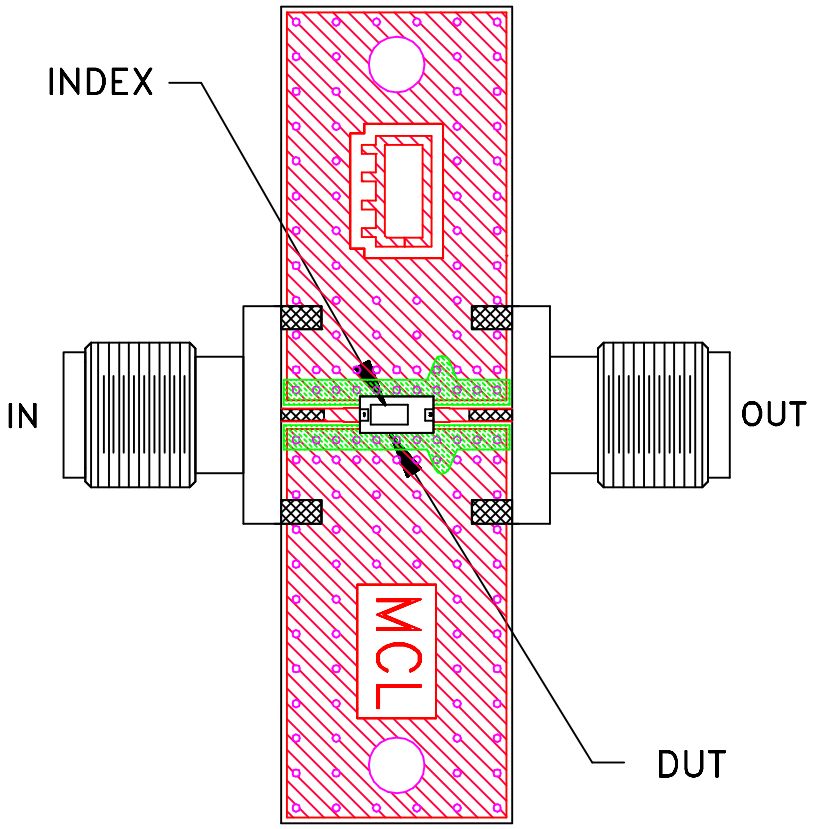
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 03FL02, FV1206-7, TB-812+

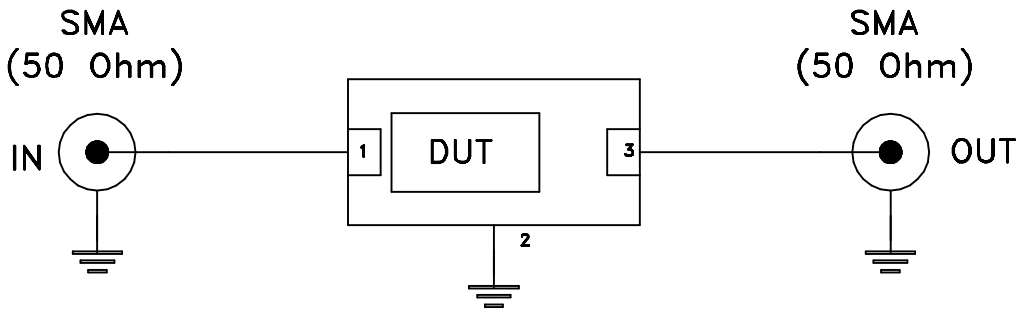
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-439	OR

FILE:	SCALE:	SHEET:
98PL439	15:1	1 OF 1

Evaluation Board and Circuit



TB-812+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.010 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