LTCC Bandpass Filter BFCN-1152+

50Ω 11160 to 11970 MHz

The Big Deal

- Small size 3.2mm x 1.6mm
- Pass band (11000-12000 MHz)
- Very high rejection over wide band

CASE STYLE: FV1206-9

Product Overview

The BFCN-1152+ LTCC Band Pass Filter achieves a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 11160 to 11970 MHz, these units offer excellent rejection over a wide 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 at 2nd harmonic permits filter to be used in presence of wideband undesired 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-1152+

50Ω 11160 to 11970 MHz

Generic photo used for illustration purposes only

CASE STYLE: FV1206-9

+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

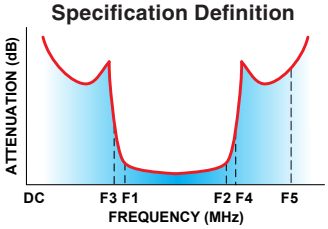
Features

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

Applications

- Harmonic Rejection
- Transmitters / Receivers

Specification Definition



Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	11540	—	MHz
	Insertion Loss	F1-F2	11160-11970	—	5.0	7	dB
	VSWR	F1-F2	11160-11970	—	1.65	—	:1
	Insertion Loss		11200-11400		4	—	dB
Stop Band, Lower	Insertion Loss	DC-F3	DC-8950	35	50	—	dB
	VSWR	DC-F3	DC-8950	—	20	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	13750-20900	25	35	—	dB
		F5-F6	20900-38000	15	25	—	dB
	VSWR	F4-F6	13750-38000	—	10	—	:1

1. Measured on Mini-Circuits Characterization Test Board TB-1003+ with feedline losses removed by normalization of S12 and S21 traces to measurement of TB thru-line.

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.

Maximum Ratings

Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input*	2W at 25°C

*Passband rating, derate linearly to 0.5W at 100°C ambient
Permanent damage may occur if any of these limits are exceeded.

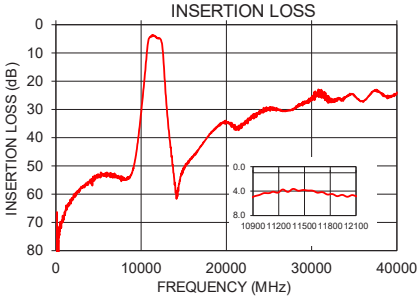
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1000	67.38	108.58
5000	54.08	86.86
9000	51.69	23.49
10000	31.18	10.56
10600	12.50	4.02
10800	6.48	1.79
11550	3.91	1.41
11800	4.50	1.79
12600	11.62	2.99
13000	29.17	10.37
17000	42.95	82.73
25000	30.09	36.20
32000	25.63	42.38
36000	27.21	8.23
40000	23.94	29.96

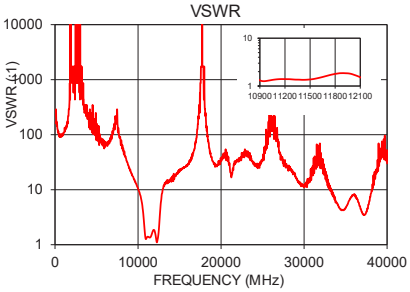
Pad Connections

Input	1
Output	3
Ground	2

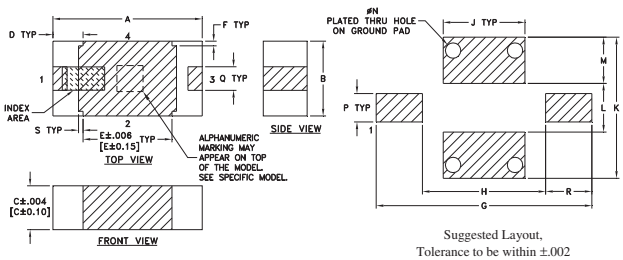
BFCN-1152+
INSERTION LOSS



BFCN-1152+
VSWR



Outline Drawing



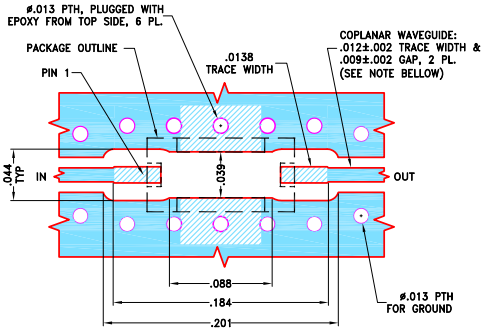
Suggested Layout,
Tolerance to be within ±.002

Pad Connections

Input	1
Output	3
Ground	2

Product Marking: JP

Demo Board MCL P/N: TB- 1003+
Suggested PCB Layout (PL-610)



NOTES:
1. TRACE WIDTH AND GAP PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066"±.0007". 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.
3. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J
.126	.063	.037	.026	.075	.004	.182	.104	.069
3.20	1.60	0.94	0.66	1.91	0.10	4.62	2.64	1.753

K	L	M	N	P	Q	R	S	wt
0.119	0.041	.039	.013	.024	.020	.039	.004	grams
3.023	1.041	0.99	0.33	0.61	0.51	0.99	0.10	.020

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

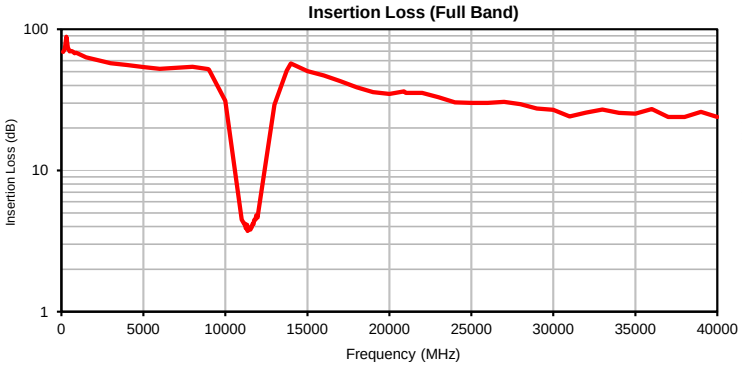
Ceramic Bandpass Filter BFCN-1152+

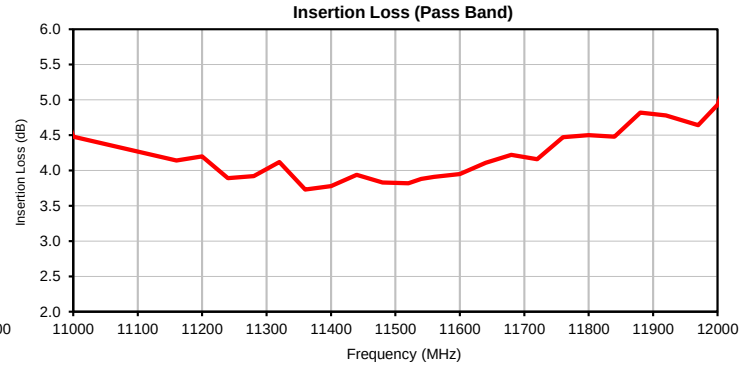
Typical Performance Data

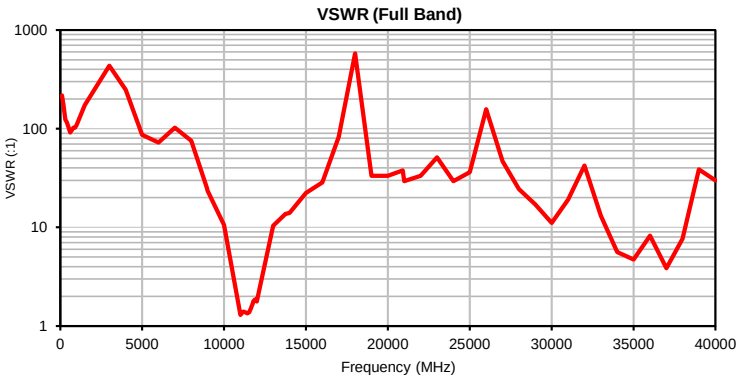
FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)
100	69.17	217.15
500	69.76	102.19
1000	67.38	108.58
1500	63.18	173.72
3000	57.45	434.30
4000	55.90	248.17
5000	54.08	86.86
6000	52.35	72.39
7000	53.21	102.19
8000	54.28	75.53
8950	52.29	25.19
9000	51.69	23.49
10000	31.18	10.56
11000	4.48	1.30
11160	4.14	1.40
11200	4.20	1.39
11240	3.89	1.39
11280	3.92	1.38
11320	4.12	1.37
11360	3.73	1.36
11400	3.78	1.35
11440	3.94	1.35
11480	3.83	1.36
11520	3.82	1.37
11540	3.88	1.39
11560	3.91	1.41
11600	3.95	1.47
11640	4.11	1.51
11680	4.22	1.59
11720	4.16	1.63
11760	4.47	1.72
11800	4.50	1.79
11840	4.48	1.82
11880	4.82	1.86
11920	4.78	1.86
11970	4.64	1.84
12000	4.93	1.78
13000	29.17	10.37
13750	50.98	13.70
14000	57.30	14.03
15000	50.50	22.29
16000	47.00	28.49
17000	42.95	82.73
18000	38.77	579.06
19000	35.89	33.42
20000	34.82	33.42
20900	36.24	37.77
21000	35.40	29.46
22000	35.39	33.42
23000	33.02	51.10
24000	30.37	29.46
25000	30.09	36.20
26000	30.08	157.93
27000	30.58	46.96
28000	29.46	24.48
29000	27.40	17.05
30000	26.85	11.09
31000	24.08	19.11
32000	25.63	42.38
33000	27.00	13.09
34000	25.56	5.63
35000	25.25	4.72
36000	27.21	8.23
37000	23.97	3.86
38000	23.89	7.66
39000	25.97	38.61
40000	23.94	29.96

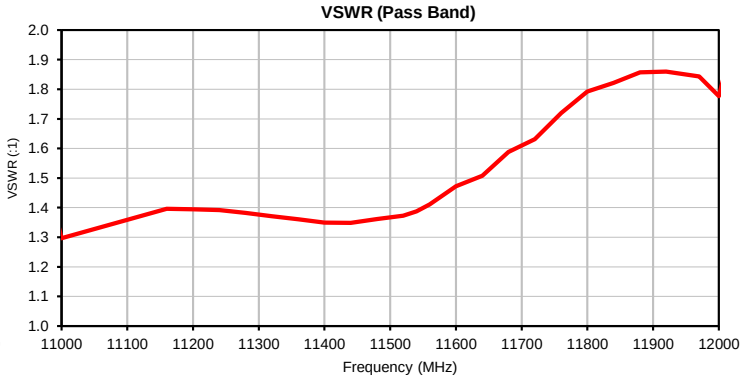
Ceramic Bandpass Filter BFCN-1152+

Typical Performance Curves





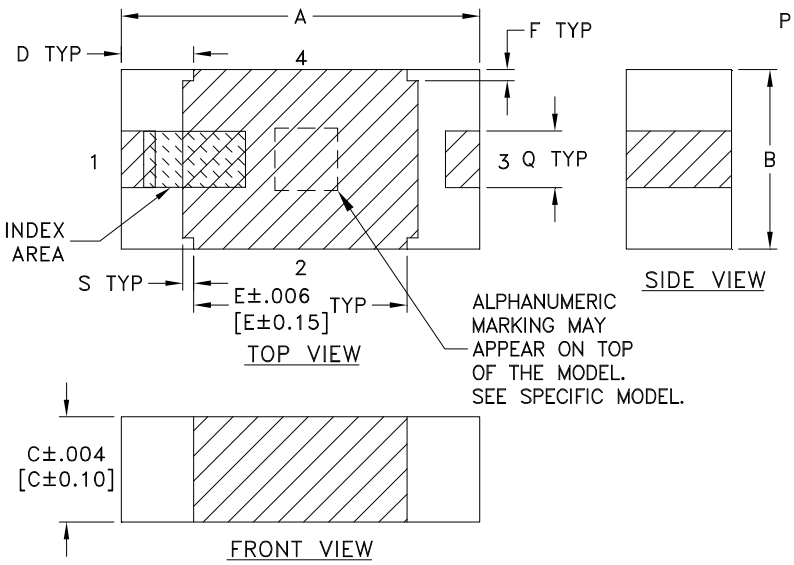




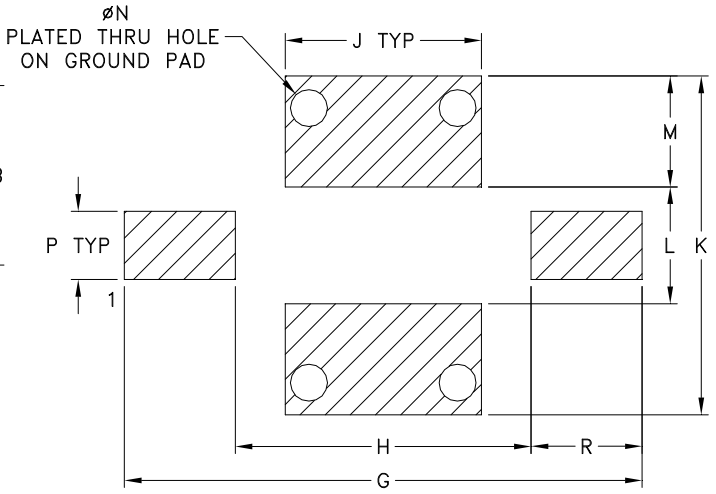
Case Style FV

FV1206-9

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
FV1206-9	.126 (3.20)	.063 (1.60)	.037 (0.94)	.026 (0.66)	.075 (1.91)	.004 (0.10)	.182 (4.62)	.104 (2.64)	.069 (1.75)	.119 (3.02)	.041 (1.04)	.039 (0.99)

CASE #	N	P	Q	R	S	WT. GRAM
FV1206-9	.013 (0.33)	.024 (0.61)	.020 (0.51)	.039 (0.99)	.004 (0.10)	.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

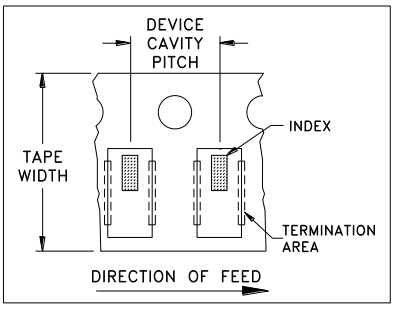


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

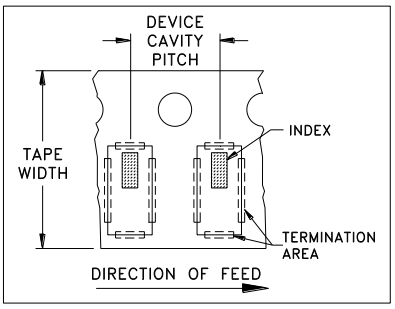


ILLUSTRATION 2

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

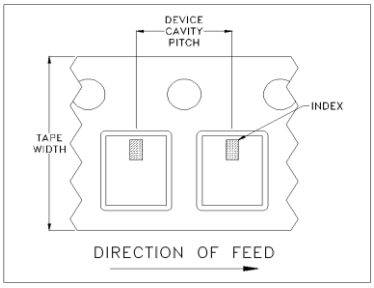


ILLUSTRATION 3

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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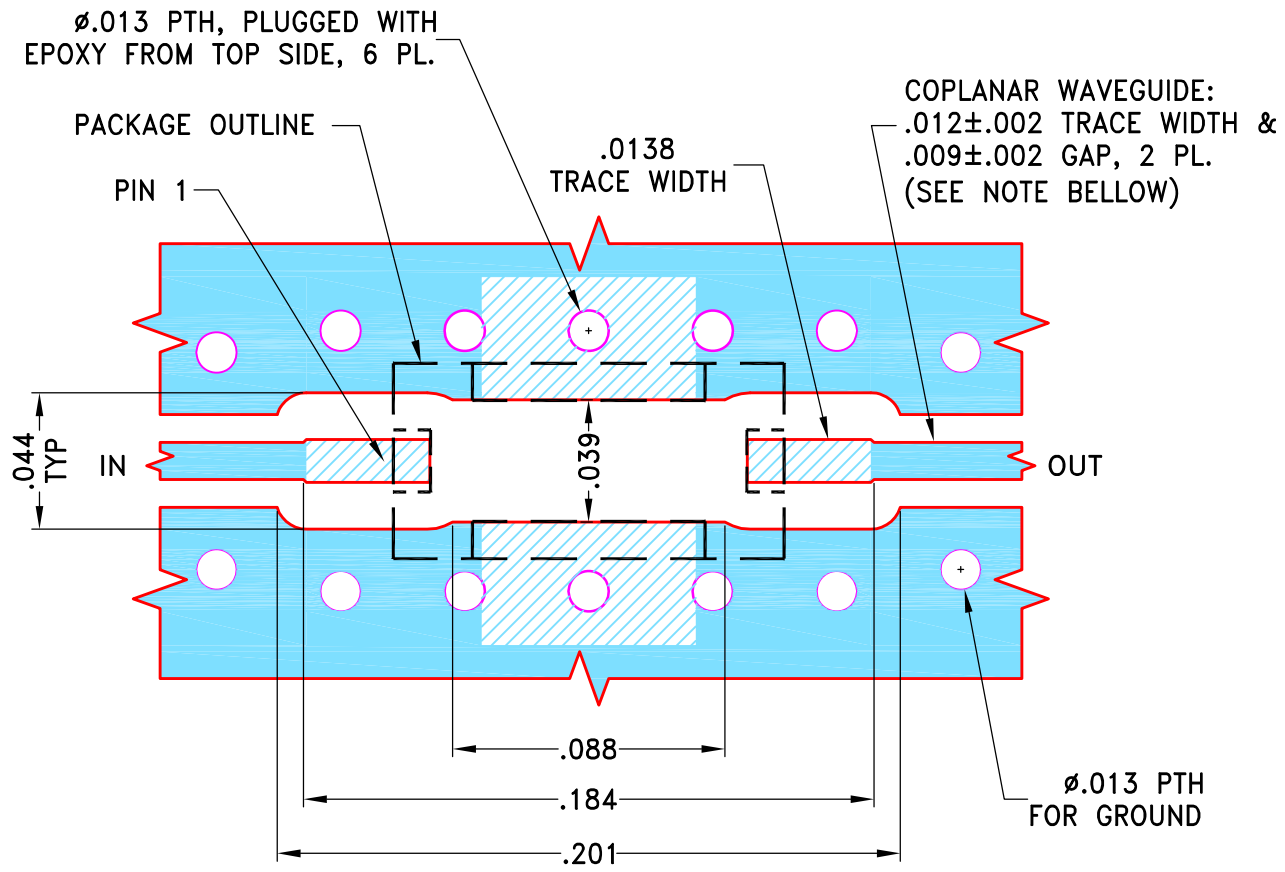
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M170506	NEW RELEASE	12/06/18	ITG	BK

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-9 CASE STYLE, "04FL01" PIN CODE



NOTES:

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2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.

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	ITG	12/05/18
TOLERANCES ON:	CHECKED	GF	12/05/18
2 PL DECIMALS ±	APPROVED	BK	12/06/18
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

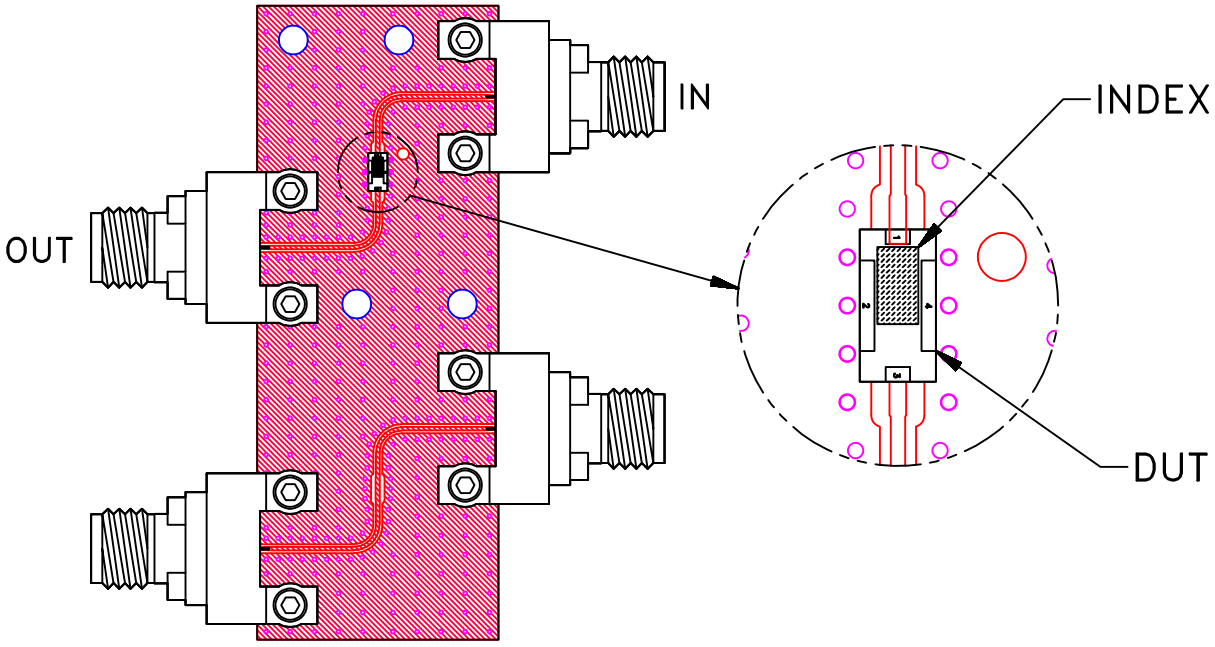
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 04FL01, FV1206-9, TB-1003+

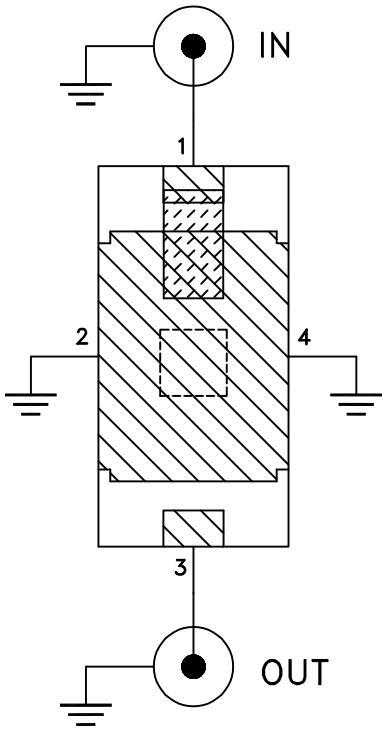
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-610	OR

FILE:	SCALE:	SHEET:
98PL610	16:1	1 OF 1

Evaluation Board and Circuit



TB-1003+



Schematic Diagram

Notes:

1. 50 Ohm 2.92 mm Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.0066 inch.

Mini-Circuits®

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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