LTCC Bandpass Filter BFCN-1052+

50Ω 9700 to 11950 MHz

CASE STYLE: FV1206-9

The Big Deal

- Small size 3.2mm x 1.6mm
- Low loss in passband (1.5 dB typ over 9700 to 11950 MHz)
- Very high rejection over wide band

Product Overview

The BFCN-1052+ LTCC bandpass Filter achieves a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Passing 9700-11950 MHz, these units offer excellent rejection over a wide stopband.

Key Features	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	Reduced 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-1052+

50Ω 9700 to 11950 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

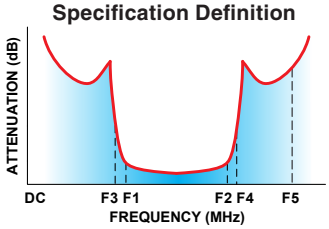
Features

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

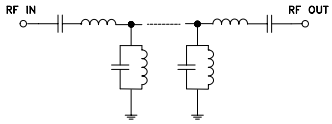
Applications

- Harmonic Rejection
- Transmitters / Receivers
- Test and Measurement

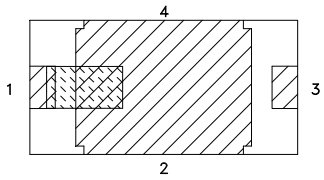
Specification Definition



Functional Schematic



Top View



Pad Connections

Input	1
Output	3
Ground	2

Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	10770	—	MHz
	Insertion Loss	F1-F2	9700-11950	—	1.6	3.0	dB
	VSWR	F1-F2	9700-11950	—	1.9	—	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC-8100	30	38	—	dB
	Insertion Loss		8100-8400	20	32	—	dB
Stop Band, Upper	Insertion Loss	F4-F5	14000-28500	20	28	—	dB
	Insertion Loss	F5-F6	28500-44000	—	25	—	dB

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 can not be used as a DC Blocking circuit element. In applications where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

Maximum Ratings

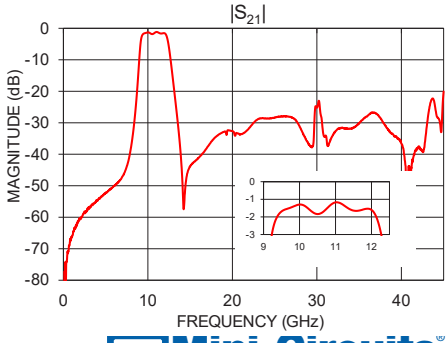
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input*	2W at 25°C

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

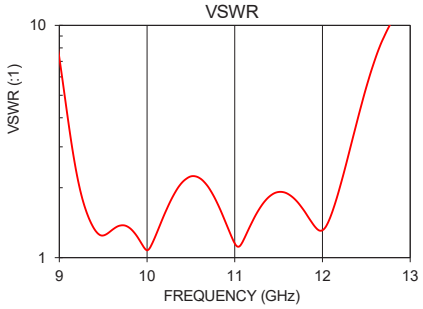
Typical Performance Data at 25°C

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)
1	-67.66	50.51
5	-53.39	26.26
8	-37.87	16.83
9	-12.22	7.04
10	-1.28	1.06
11	-1.38	1.63
12	-1.43	1.57
13	-13.21	5.03
15	-43.13	9.36
17	-37.34	11.85
20	-31.96	9.70
25	-28.59	6.41
35	-32.06	6.05
40	-40.15	5.17
41	-35.93	4.53

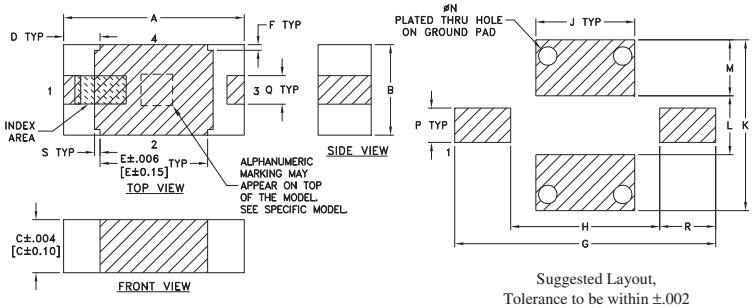
BFCN-1052+
$|S_{21}|$



BFCN-1052+
VSWR

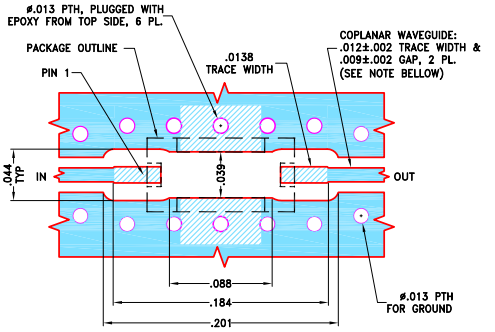


Outline Drawing



Suggested Layout,
Tolerance to be within ±.002

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.

Pad Connections

Input	1
Output	3
Ground	2

Product Marking: KL

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.

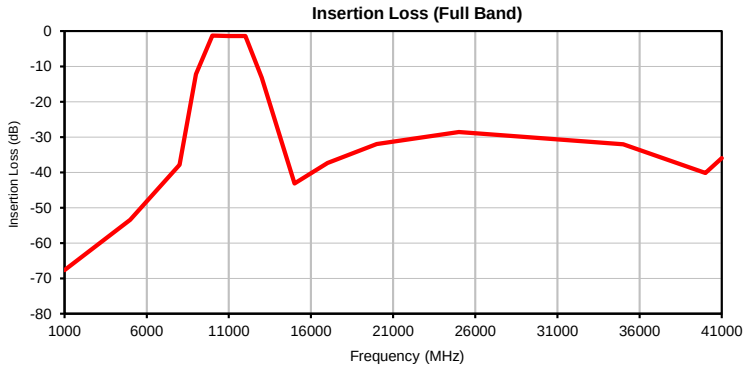
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

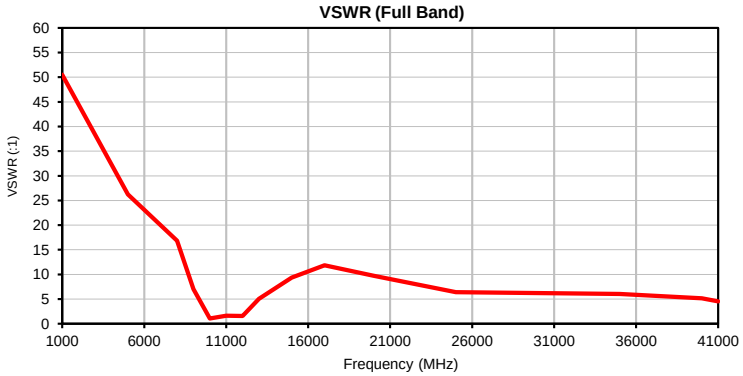
Ceramic Bandpass Filter BFCN-1052+

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)
1000	-67.66	50.51
5000	-53.39	26.26
8000	-37.87	16.83
9000	-12.22	7.04
10000	-1.28	1.06
11000	-1.38	1.63
12000	-1.43	1.57
13000	-13.21	5.03
15000	-43.13	9.36
17000	-37.34	11.85
20000	-31.96	9.70
25000	-28.59	6.41
35000	-32.06	6.05
40000	-40.15	5.17
41000	-35.93	4.53

Typical Performance Curves

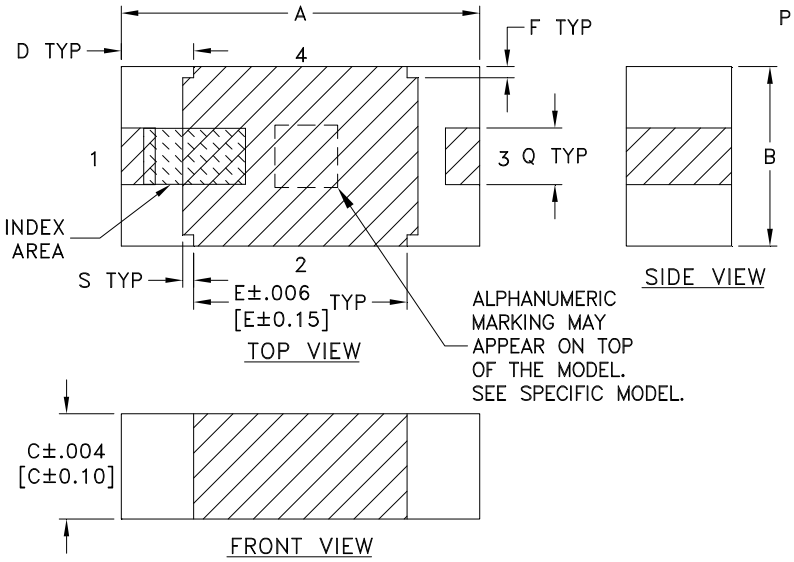




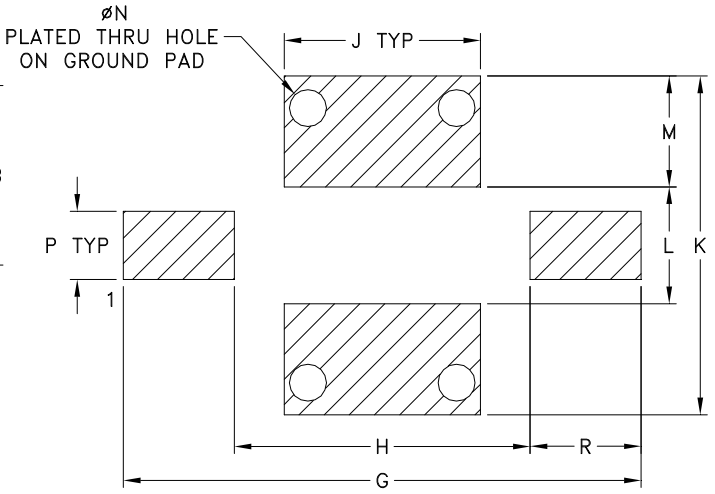
Case Style FV

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

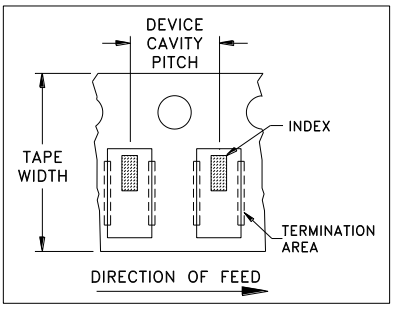


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

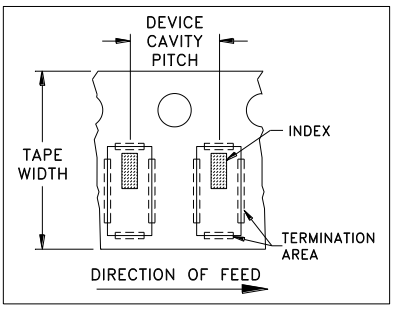


ILLUSTRATION 2

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

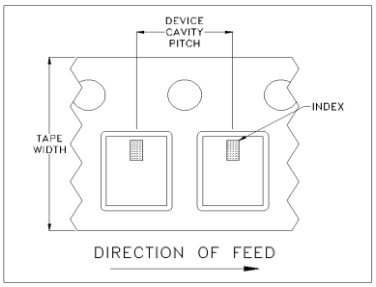


ILLUSTRATION 3

Applicable Case Styles
FV1206-12
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.

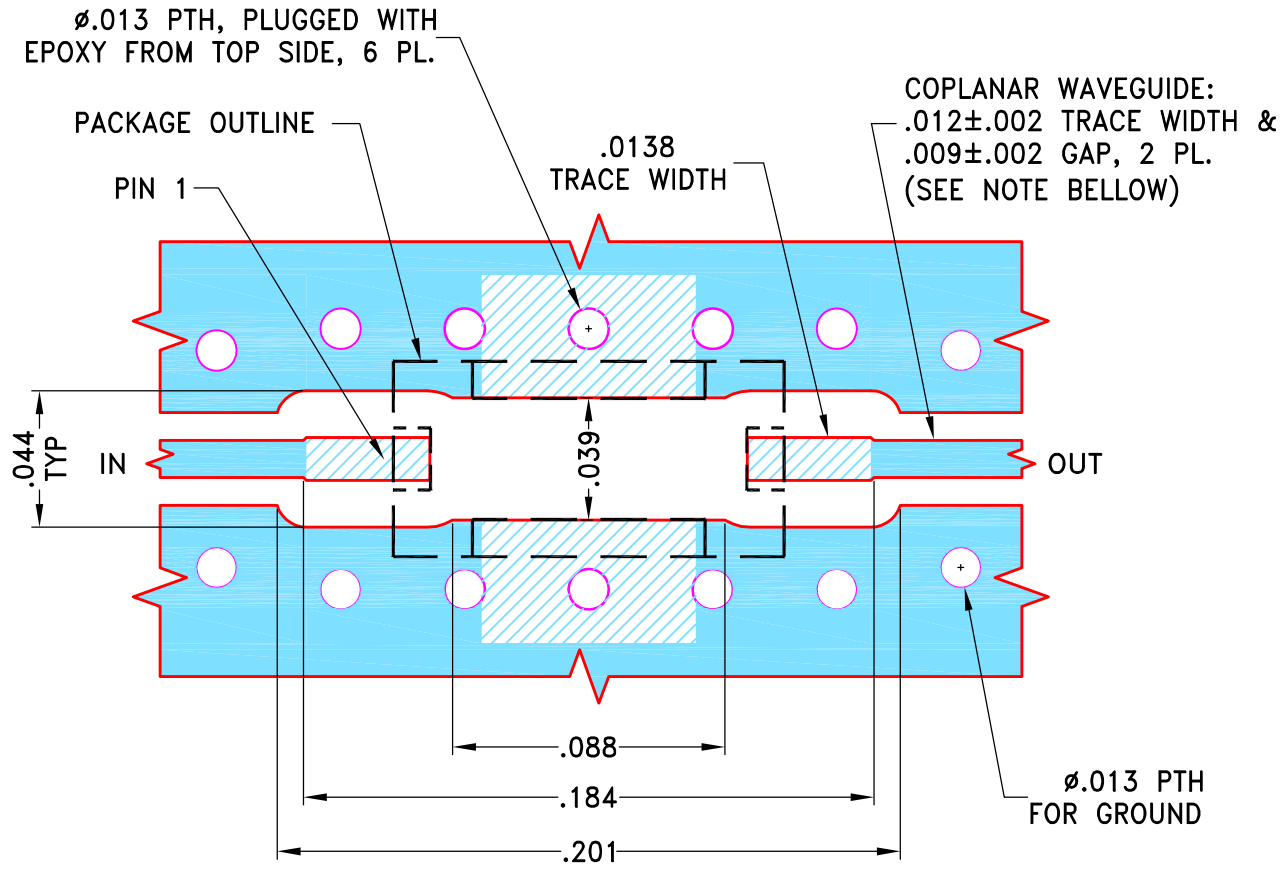
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

THIRD ANGLE PROJECTION

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

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



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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

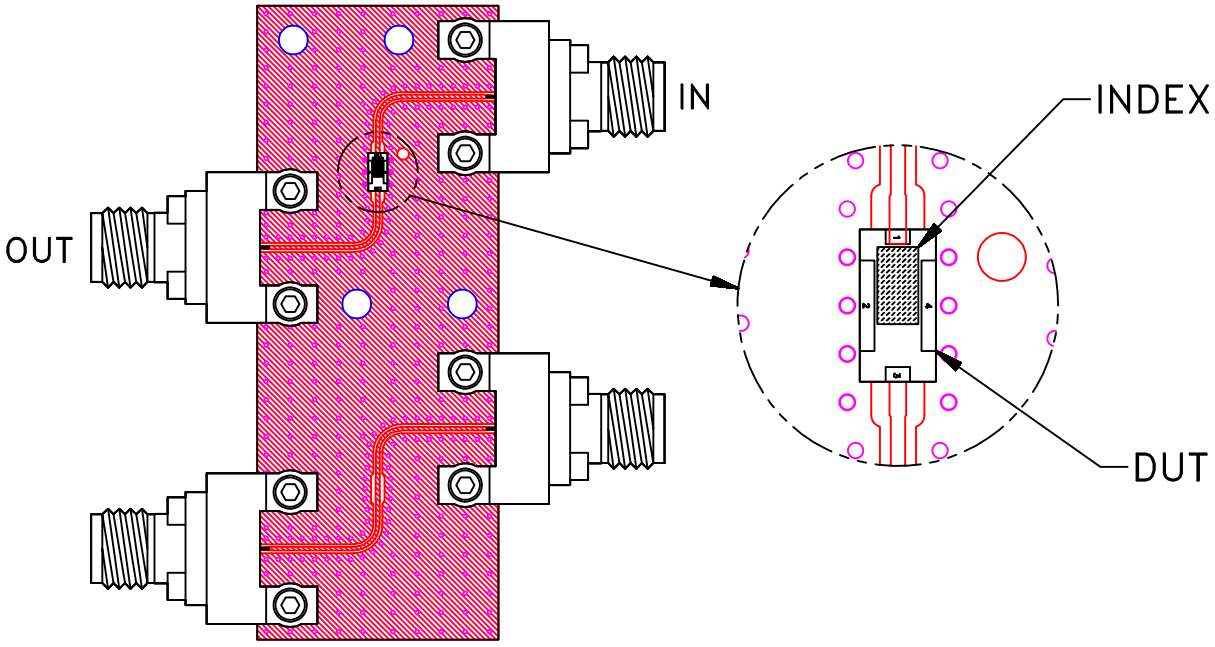
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

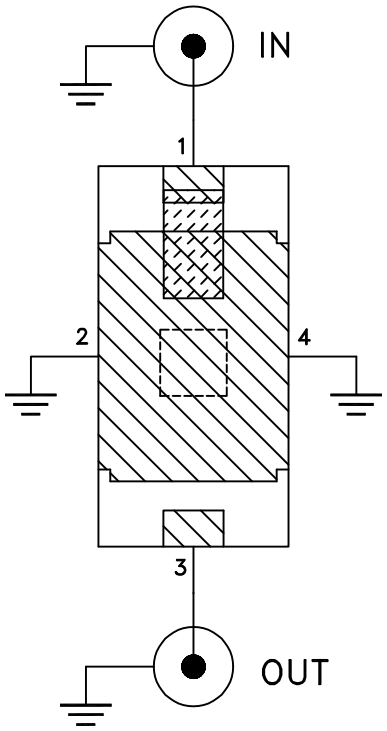
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-610	OR

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®

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