

Ceramic

# Bandpass Filter

50Ω 1893 to 1920 MHz

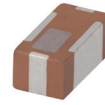
## Features

- Small size (0.126"x0.063"x0.051")
- Temperature stable
- Hermetically sealed
- LTCC construction

## Applications

- Harmonic Rejection
- Transmitters / receivers
- PCS

**BFCN-1900+**



Generic photo used for illustration purposes only

CASE STYLE: FV1206-5

**+RoHS Compliant**

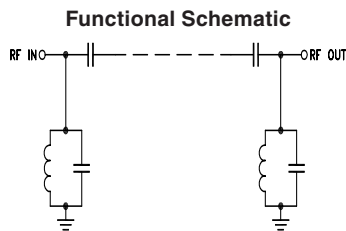
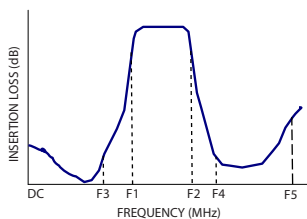
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



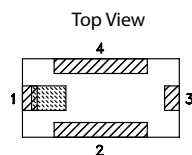
Available Tape and Reel at no extra cost

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

## Specification Definition



## Functional Schematic



## Pad Connections

|        |     |
|--------|-----|
| Input  | 1   |
| Output | 3   |
| Ground | 2,4 |

## Electrical Specifications<sup>1,2</sup> at 25°C

| Parameter        | F#               | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|------------------|------------------|-----------------|------|------|------|------|
| Pass Band        | Center Frequency | —               | —    | 1900 | —    | MHz  |
|                  | Insertion Loss   | F1 - F2         | —    | 2.6  | 3.2  | dB   |
|                  | VSWR             | F1 - F2         | —    | 1.4  | —    | :1   |
| Stop Band, Lower | Insertion Loss   | DC - F3         | —    | 35   | —    | dB   |
|                  | VSWR             | DC - F3         | —    | 30   | —    | :1   |
| Stop Band, Upper | Insertion Loss   | F4 - F5         | —    | 25   | —    | dB   |
|                  | VSWR             | F4 - F5         | —    | 50   | —    | :1   |

1. Measured on Mini-Circuits Characterization Test Board TB-518+.

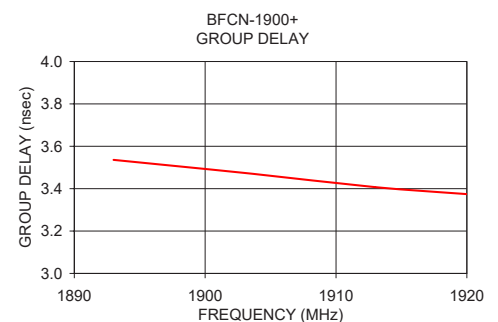
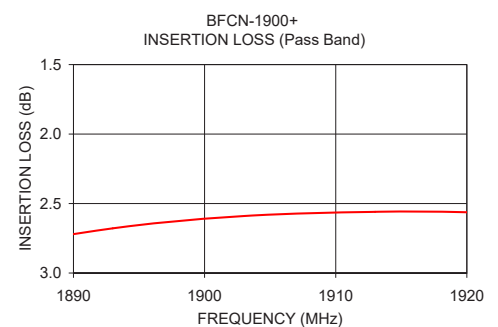
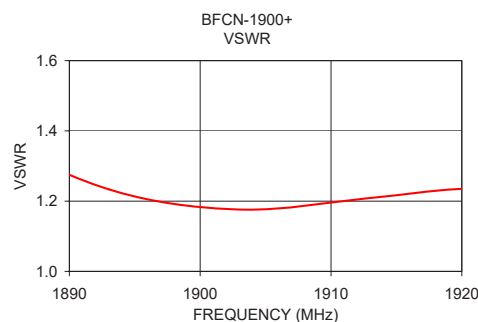
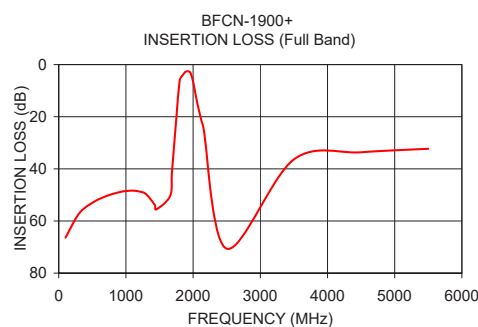
2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

## Maximum Ratings

|                       |                 |
|-----------------------|-----------------|
| Operating Temperature | -40°C to +85°C  |
| Storage Temperature*  | -55°C to +100°C |
| RF Power Input**      | 2W at 25°C      |

\* 12 months

\*\*Passband rating, derate linearly to 0.5W at 85°C ambient  
Permanent damage may occur if any of these limits are exceeded.



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REV. A  
M151107  
ED-15019/1  
BFCN-1900+  
WZ/CP/AM  
190725  
Page 1 of 2

# BFCN-1900+

### Pass Band Performance

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | VSWR<br>(:1) | Frequency<br>(MHz) | Insertion Loss<br>(dB) | Group Delay<br>(nsec) |
|--------------------|------------------------|--------------|--------------------|------------------------|-----------------------|
| 100.00             | 66.39                  | 138.63       | 1893.00            | 2.68                   | 3.54                  |
| 500.00             | 53.03                  | 102.96       | 1903.00            | 2.59                   | 3.47                  |
| 1000.00            | 48.53                  | 94.67        | 1913.00            | 2.56                   | 3.41                  |
| 1200.00            | 48.68                  | 92.97        | 1920.00            | 2.56                   | 3.37                  |
| 1660.00            | 50.31                  | 45.30        |                    |                        |                       |
| 1687.00            | 40.78                  | 37.21        |                    |                        |                       |
| 1800.00            | 6.13                   | 2.56         |                    |                        |                       |
| 1893.00            | 2.68                   | 1.23         |                    |                        |                       |
| 1920.00            | 2.56                   | 1.23         |                    |                        |                       |
| 2000.00            | 6.53                   | 4.20         |                    |                        |                       |
| 2153.00            | 24.20                  | 43.19        |                    |                        |                       |
| 3500.00            | 36.36                  | 137.82       |                    |                        |                       |
| 4500.00            | 33.62                  | 95.34        |                    |                        |                       |
| 5500.00            | 32.30                  | 90.59        |                    |                        |                       |

|        |     |
|--------|-----|
| Input  | 1   |
| Output | 3   |
| Ground | 2,4 |

$\varnothing N$   
 PLATED THRU  
 HOLE ON  
 GROUND PAD

J TYP  
 M  
 L  
 P TYP  
 1  
 H  
 R  
 G  
 B  
 SIDE VIEW

Suggested Layout,  
 Tolerance to be within  $\pm 0.02$

**NOTE:** 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B  
WITH DIELECTRIC THICKNESS .020"  $\pm$  .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

| A    | B    | C    | D    | E    | F    | G    | H    | J     |
|------|------|------|------|------|------|------|------|-------|
| .126 | .063 | .051 | .026 | .075 | .012 | .182 | .104 | .069  |
| 3.20 | 1.60 | 1.30 | 0.66 | 1.91 | 0.30 | 4.62 | 2.64 | 1.75  |
| K    | L    | M    | N    | P    | Q    | R    |      | wt    |
| .119 | .041 | .039 | .013 | .024 | .020 | .039 |      | grams |
| 3.02 | 1.04 | 0.99 | 0.33 | 0.61 | 0.51 | 0.99 |      | .020  |

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](http://www.minicircuits.com/MCLStore/terms.jsp)

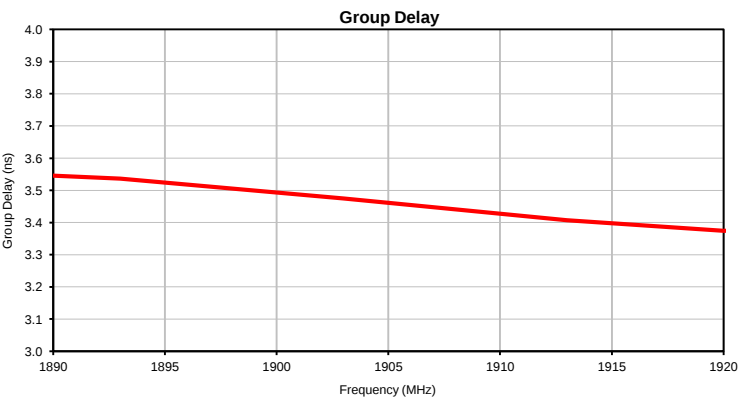
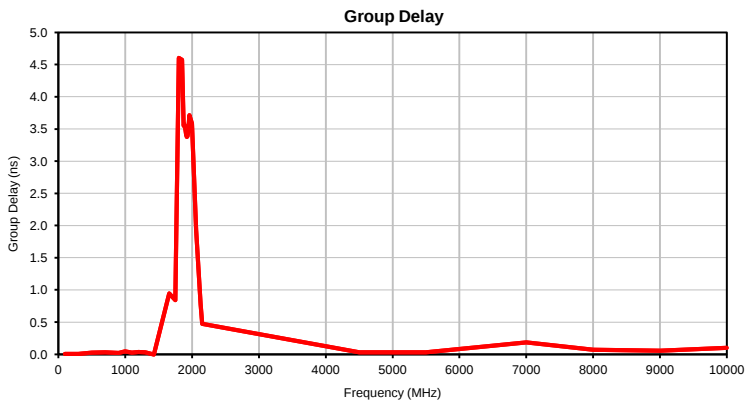
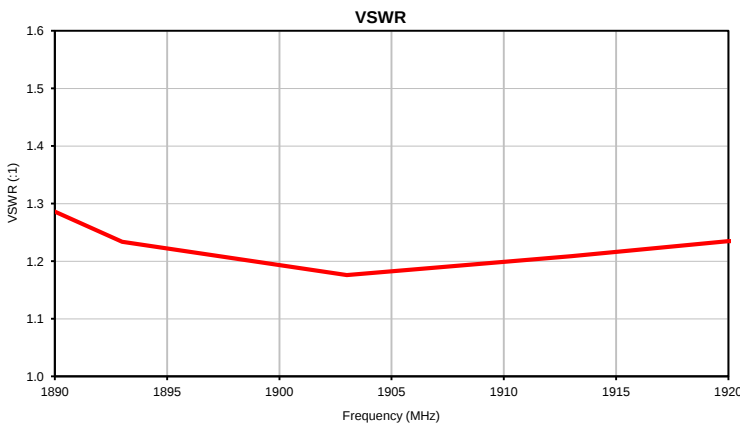
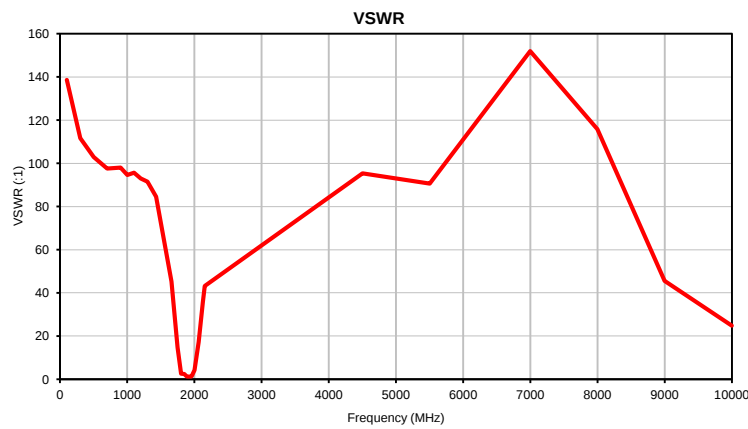
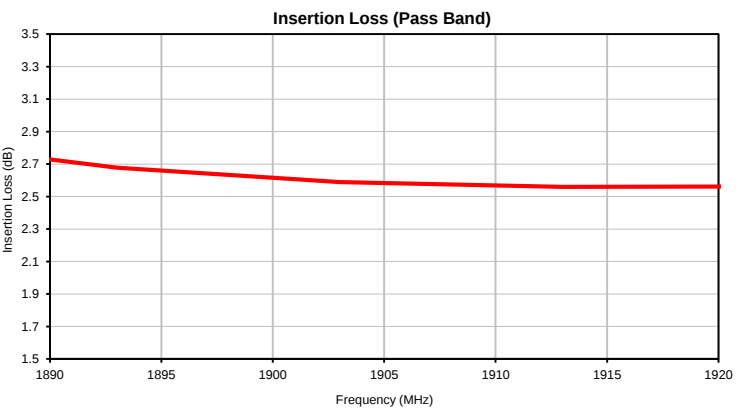
## Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION LOSS<br>(dB) | VSWR<br>(:1) | GROUP DELAY<br>(ns) |
|--------------------|------------------------|--------------|---------------------|
| 100                | 66.39                  | 138.63       | 0.00                |
| 300                | 57.20                  | 111.73       | 0.00                |
| 500                | 53.03                  | 102.96       | 0.02                |
| 700                | 50.51                  | 97.53        | 0.03                |
| 900                | 48.95                  | 97.96        | 0.02                |
| 1000               | 48.53                  | 94.67        | 0.04                |
| 1100               | 48.36                  | 95.69        | 0.03                |
| 1200               | 48.68                  | 92.97        | 0.04                |
| 1300               | 49.71                  | 91.46        | 0.03                |
| 1427               | 53.74                  | 84.51        | 0.00                |
| 1660               | 50.31                  | 45.30        | 0.94                |
| 1750               | 20.63                  | 14.74        | 0.84                |
| 1800               | 6.13                   | 2.56         | 4.60                |
| 1850               | 3.94                   | 2.45         | 4.57                |
| 1873               | 3.10                   | 1.67         | 3.55                |
| 1883               | 2.85                   | 1.41         | 3.57                |
| 1893               | 2.68                   | 1.23         | 3.54                |
| 1903               | 2.59                   | 1.18         | 3.47                |
| 1913               | 2.56                   | 1.21         | 3.41                |
| 1920               | 2.56                   | 1.23         | 3.37                |
| 1930               | 2.60                   | 1.24         | 3.38                |
| 1940               | 2.67                   | 1.22         | 3.45                |
| 1950               | 2.83                   | 1.25         | 3.58                |
| 1960               | 3.13                   | 1.43         | 3.71                |
| 2000               | 6.53                   | 4.20         | 3.58                |
| 2063               | 14.89                  | 17.27        | 1.93                |
| 2126               | 21.72                  | 35.57        | 0.78                |
| 2153               | 24.20                  | 43.19        | 0.47                |
| 4500               | 33.62                  | 95.34        | 0.03                |
| 5500               | 32.30                  | 90.59        | 0.03                |
| 7000               | 24.46                  | 151.95       | 0.18                |
| 8000               | 31.13                  | 115.87       | 0.07                |
| 9000               | 25.40                  | 45.51        | 0.06                |
| 10000              | 18.13                  | 24.80        | 0.10                |

# Ceramic Bandpass Filter

## Typical Performance Curves

BFCN-1900+



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IF/RF MICROWAVE COMPONENTS

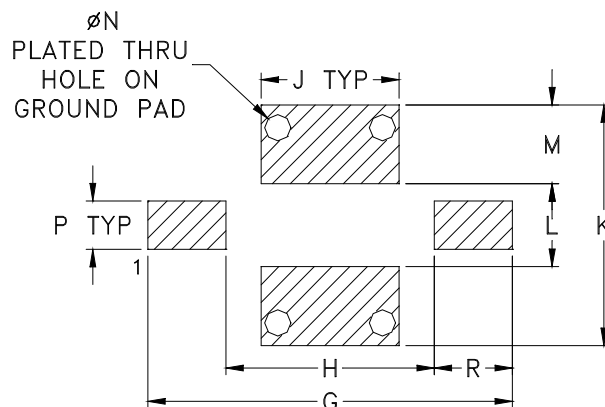
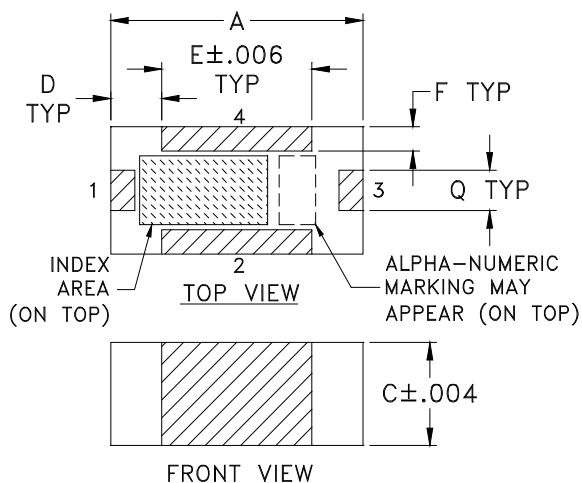


REV. OR  
BFCN-1900+  
4/28/2015  
Page 1 of 1

## Outline Dimensions

FV1206-5

## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| CASE #   | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | M              |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FV1206-5 | .126<br>(3.20) | .063<br>(1.60) | .051<br>(1.30) | .026<br>(0.66) | .075<br>(1.91) | .012<br>(0.30) | .182<br>(4.62) | .104<br>(2.64) | .069<br>(1.75) | .119<br>(3.02) | .041<br>(1.04) | .039<br>(0.99) |

| CASE #   | N              | P              | Q              | R              | WT.<br>GRAM |
|----------|----------------|----------------|----------------|----------------|-------------|
| FV1206-5 | .013<br>(0.33) | .024<br>(0.61) | .020<br>(0.51) | .039<br>(0.99) | .020        |

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

### Notes:

- Open style, ceramic base.
- Termination finish: **as shown below or indicated on Data Sheet.**  
For RoHS Case Styles: Silver plate over Nickel plate. All models, (+) suffix.



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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F71

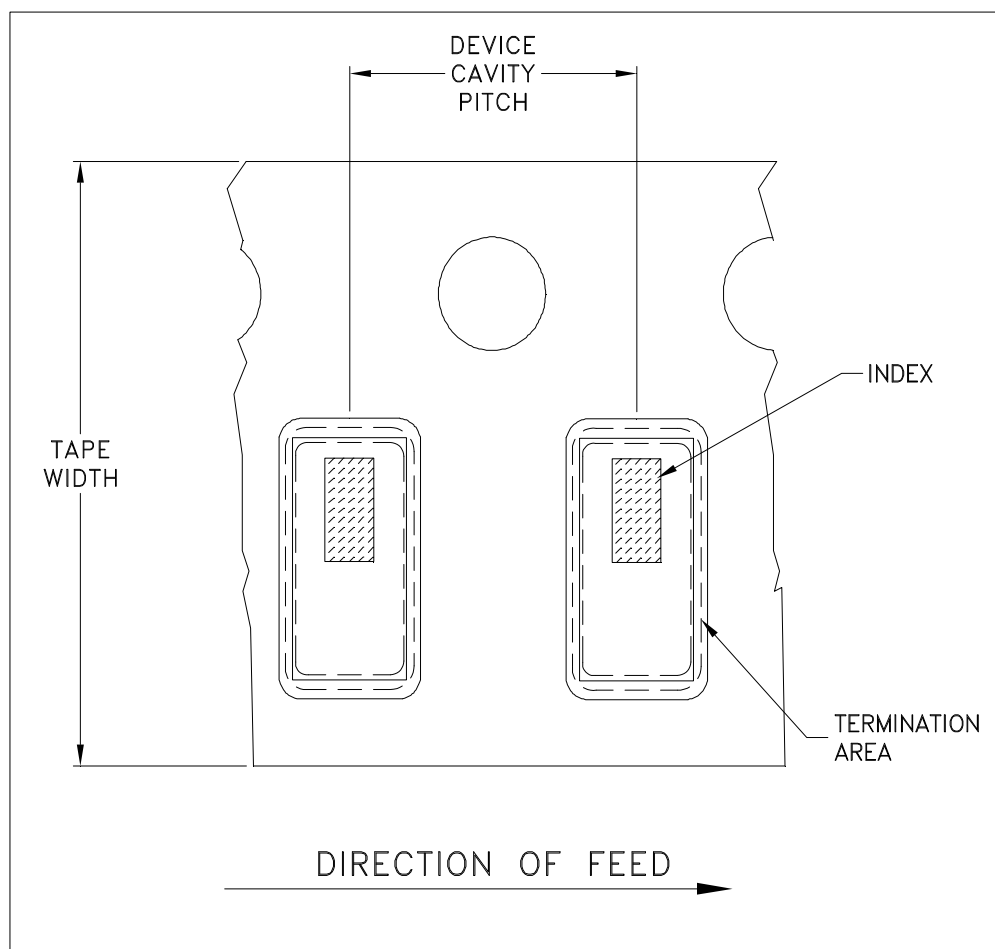


ILLUSTRATION 1

| 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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



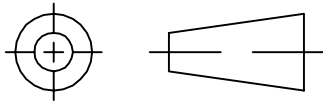
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RF/IF MICROWAVE COMPONENTS

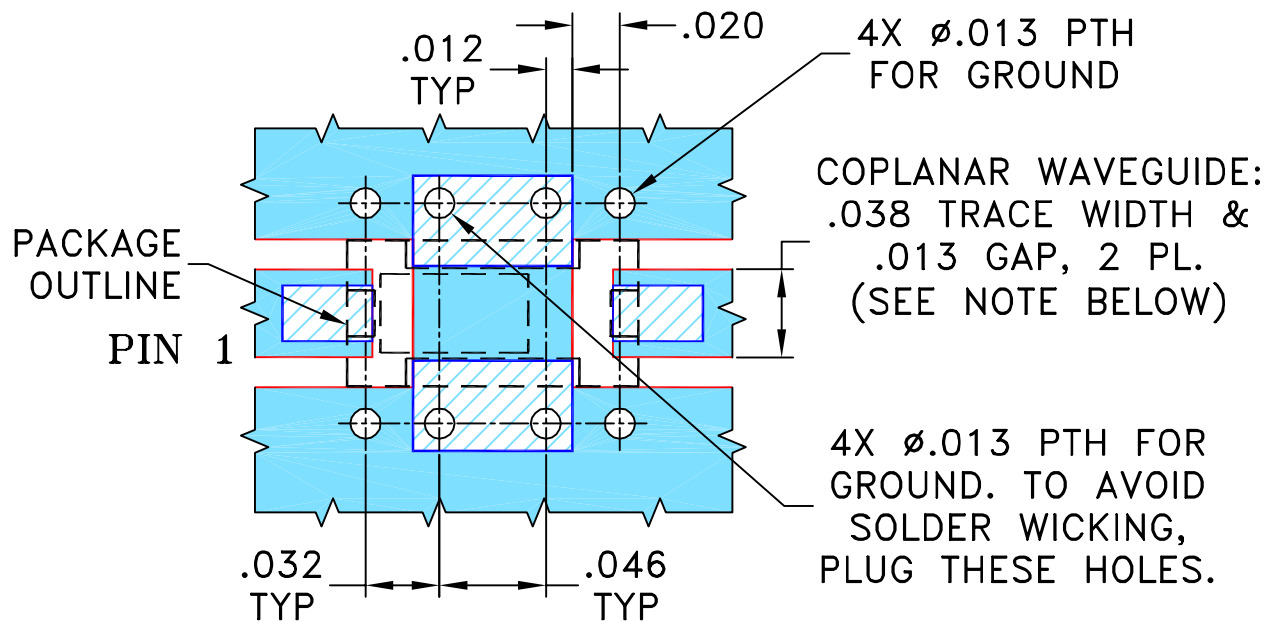
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION | DATE     | DR | AUTH |
|-----|---------|-------------|----------|----|------|
| OR  | M123589 | NEW RELEASE | 01/15/09 | AV | ABD  |
|     |         |             |          |    |      |
|     |         |             |          |    |      |

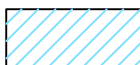
**SUGGESTED MOUNTING CONFIGURATION  
FOR FV1206-4 CASE STYLE, "04FL01" PIN CODE**



- NOTE:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020"  $\pm$  .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

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS  $\pm$ 3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

DRAWN

AV

07/10/09

CHECKED

IL

01/15/09

APPROVED

ABD

01/15/09

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



Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

PL, 04FL01, FV1206-4, BFCN, TB-518+

SIZE  
ACODE IDENT  
15542

DRAWING NO:

98-PL-305

REV:

OR

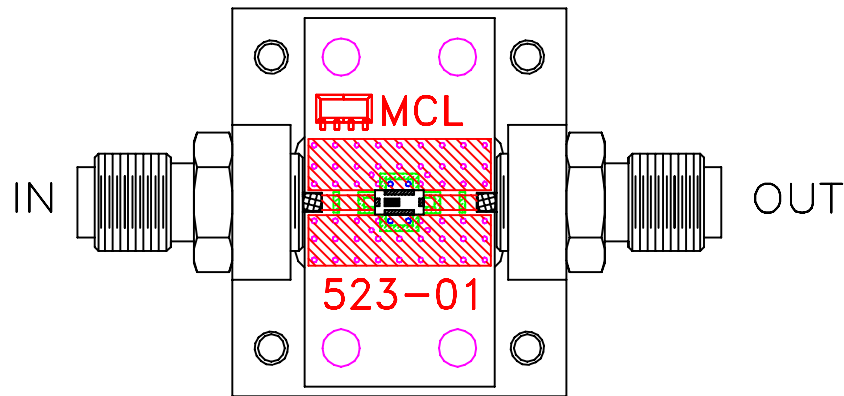
FILE: 98PL305

SCALE: 12:1

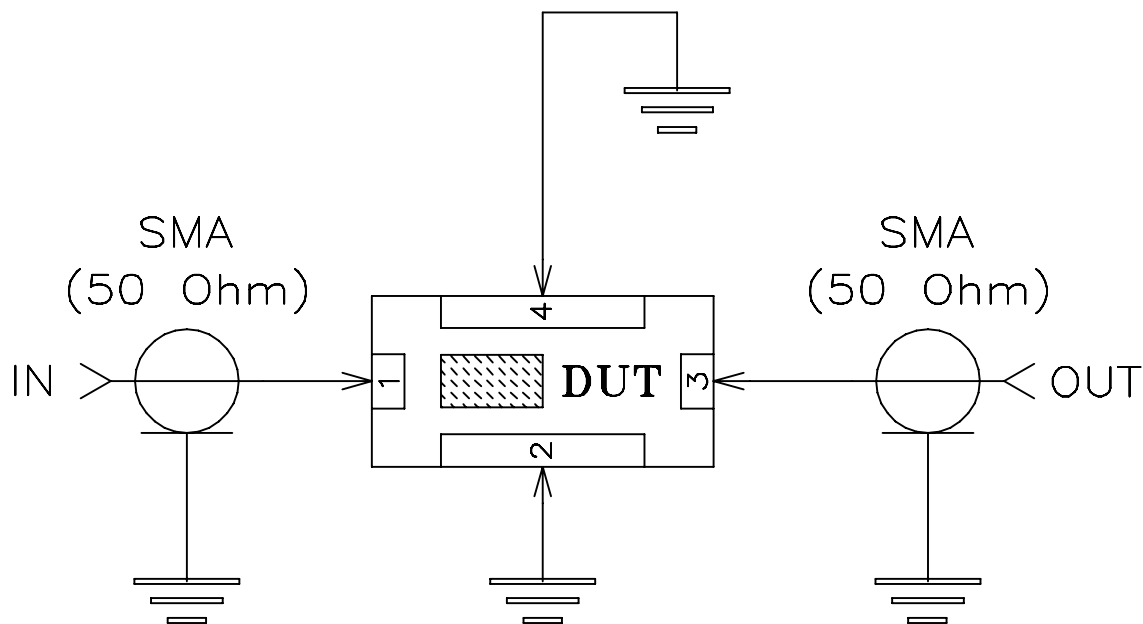
SHEET:

1 OF 1

# Evaluation Board and Circuit



**TB-518+**



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 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                                                                           | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| 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           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |