

# 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

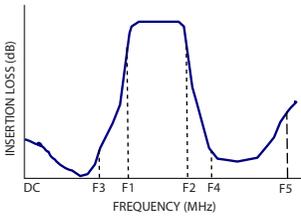
### +RoHS Compliant

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

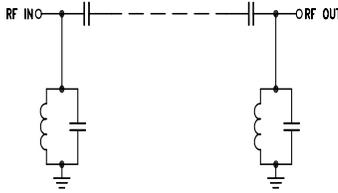
Available Tape and Reel at no extra cost

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

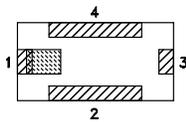
## Specification Definition



## Functional Schematic



## Top View



## 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	1893 - 1920	—	2.6	3.2	dB
	VSWR	F1 - F2	1893 - 1920	—	1.4	—	:1
Stop Band, Lower	Insertion Loss	DC - F3	—	—	35	dB	
	VSWR	DC - F3	—	—	30	:1	
Stop Band, Upper	Insertion Loss	F4 - F5	2153 - 5500	—	25	dB	
	VSWR	F4 - F5	2153 - 5500	—	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.

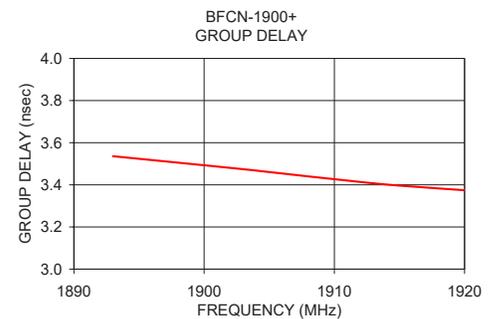
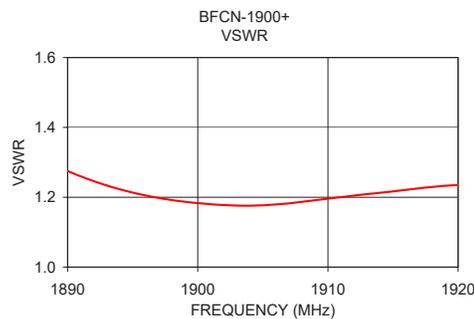
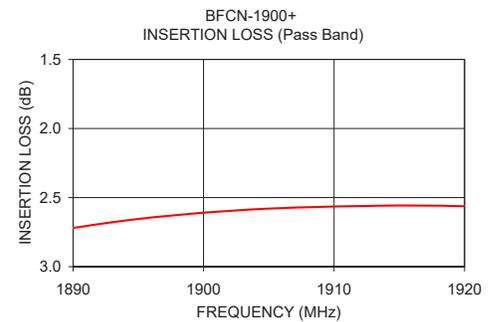
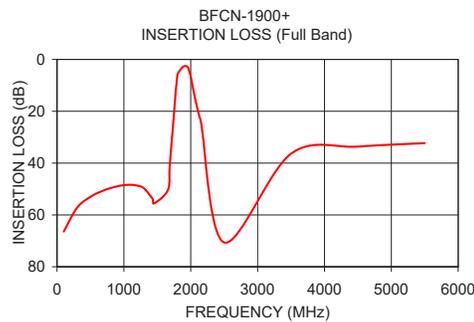
## Maximum Ratings

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.



### Full Band Performance

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
100.00	66.39	138.63
500.00	53.03	102.96
1000.00	48.53	94.67
1200.00	48.68	92.97
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

### Pass Band Performance

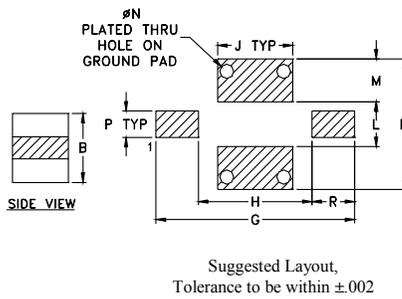
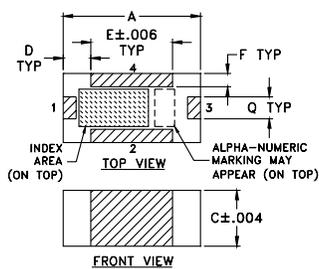
Frequency (MHz)	Insertion Loss (dB)	Group Delay (nsec)
1893.00	2.68	3.54
1903.00	2.59	3.47
1913.00	2.56	3.41
1920.00	2.56	3.37

### Pad Connections

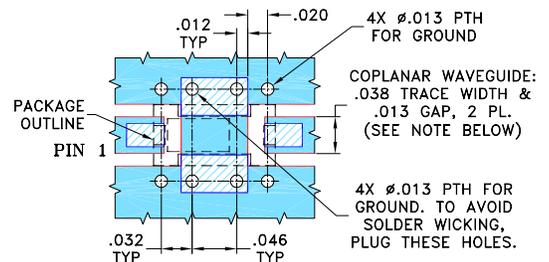
Input	1
Output	3
Ground	2,4

### PCB Land Pattern

### Outline Drawing



### Demo Board MCL P/N: TB-518+ Suggested PCB Layout (PL-305)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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

### Outline Dimensions (inch / mm)

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

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

# Ceramic Bandpass Filter

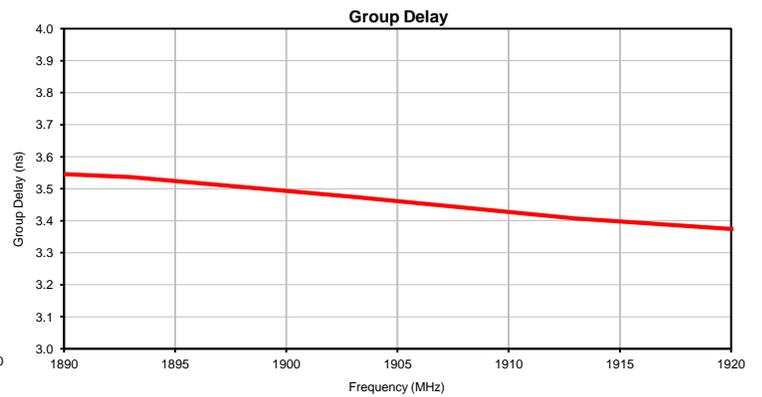
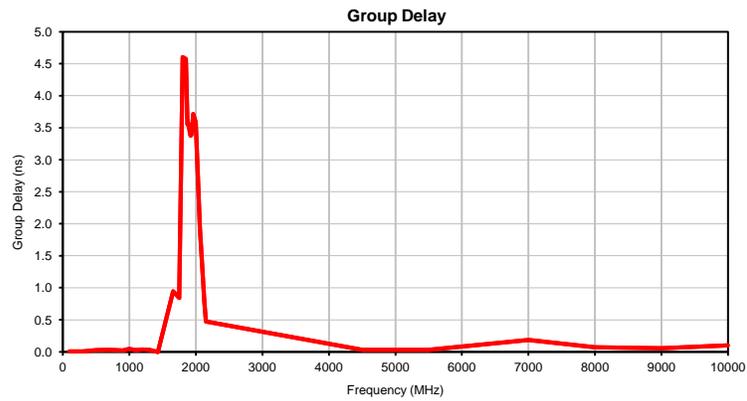
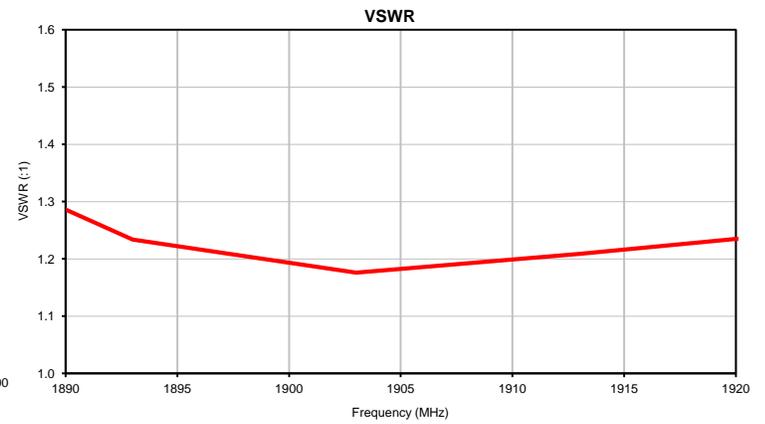
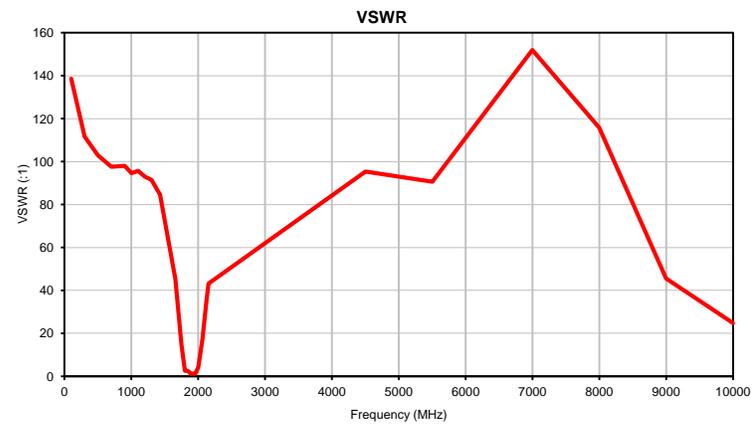
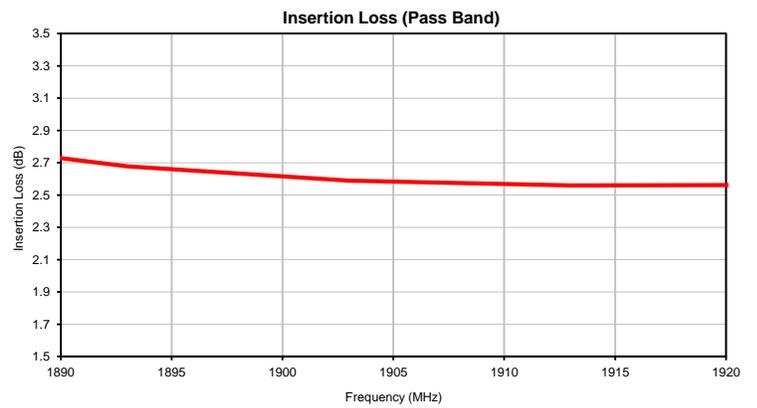
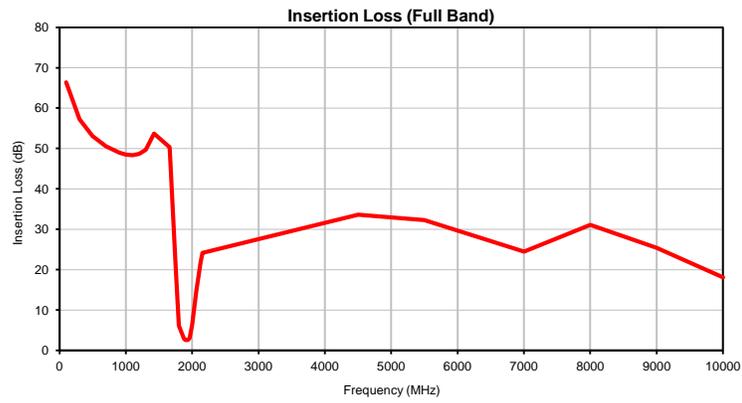
# BFCN-1900+

## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	VSWR (:1)	GROUP DELAY (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



## Typical Performance Curves

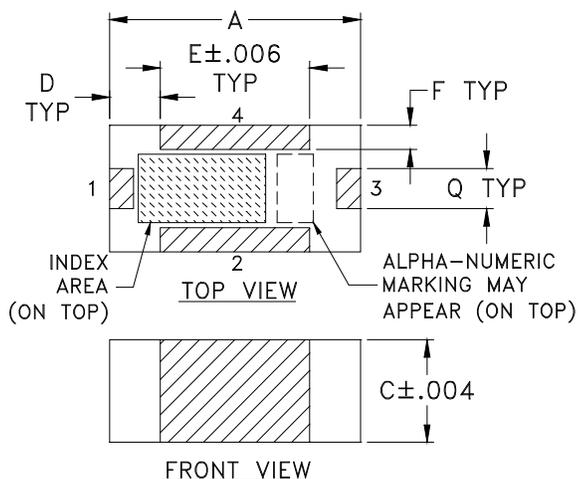


# Case Style

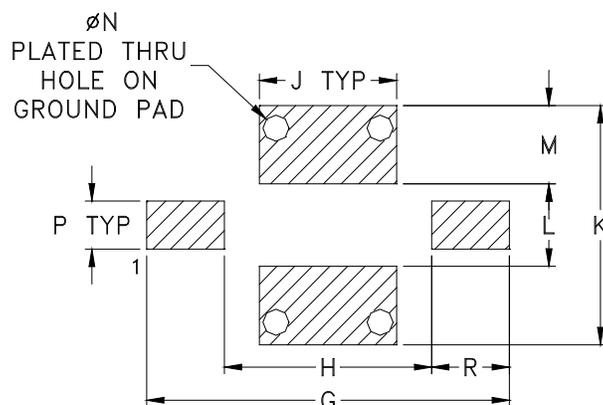
# FV

## 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 (3.20)	.063 (1.60)	.051 (1.30)	.026 (0.66)	.075 (1.91)	.012 (0.30)	.182 (4.62)	.104 (2.64)	.069 (1.75)	.119 (3.02)	.041 (1.04)	.039 (0.99)

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

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

### Notes:

1. Open style, ceramic base.
2. 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

## DEVICE ORIENTATION IN T&R

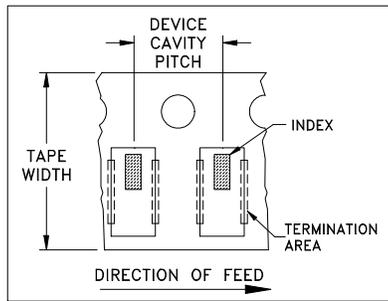


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

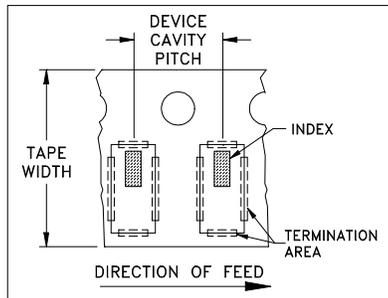


ILLUSTRATION 2

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

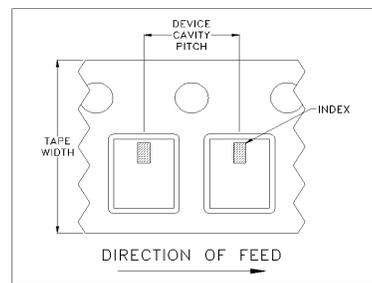


ILLUSTRATION 3

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

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.

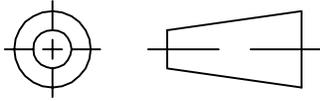
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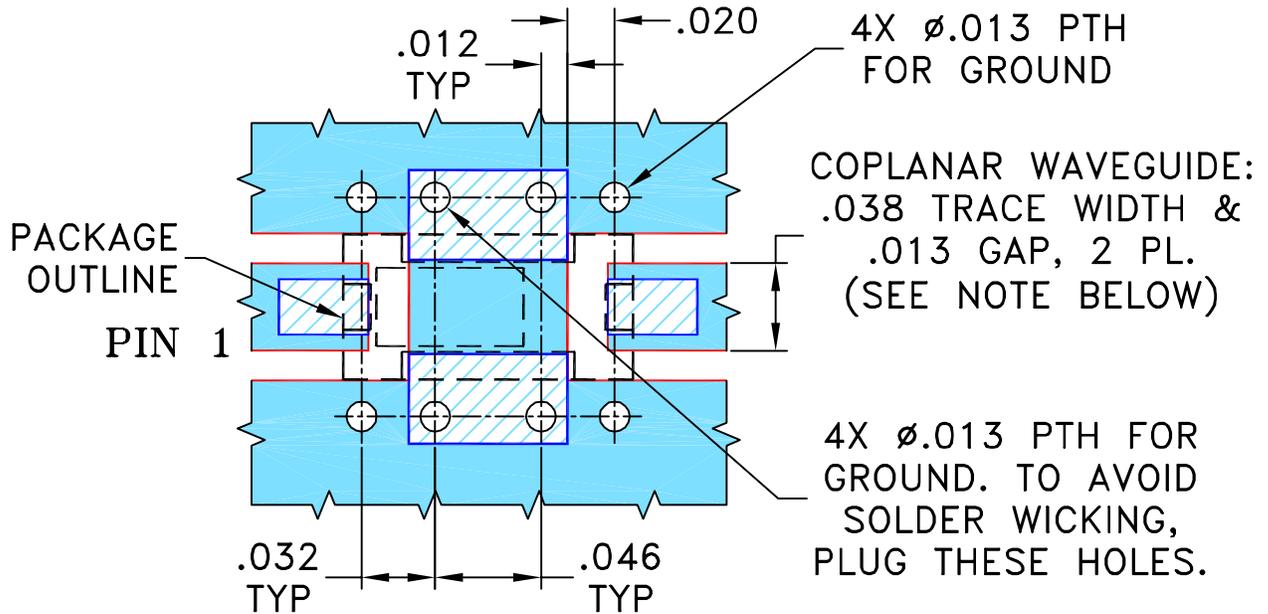
THIRD ANGLE PROJECTION



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" ± .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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:  
2 PL DECIMALS ±  
3 PL DECIMALS ± .005  
ANGLES ±  
FRACTIONS ±

	INITIALS	DATE
DRAWN	AV	07/10/09
CHECKED	IL	01/15/09
APPROVED	ABD	01/15/09



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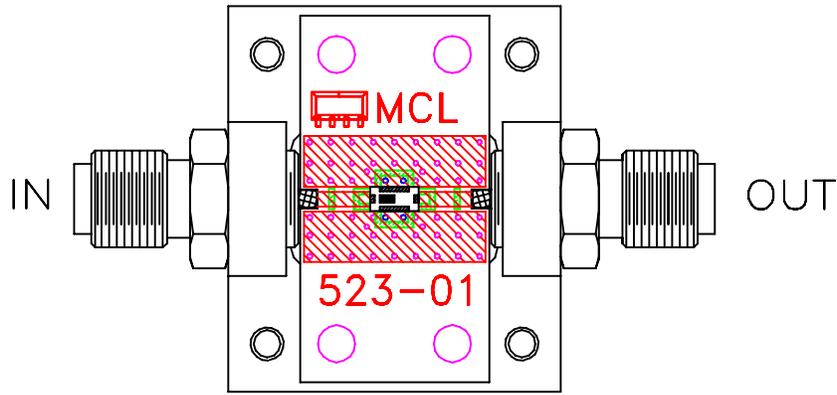
PL, 04FL01, FV1206-4, BFCN, TB-518+

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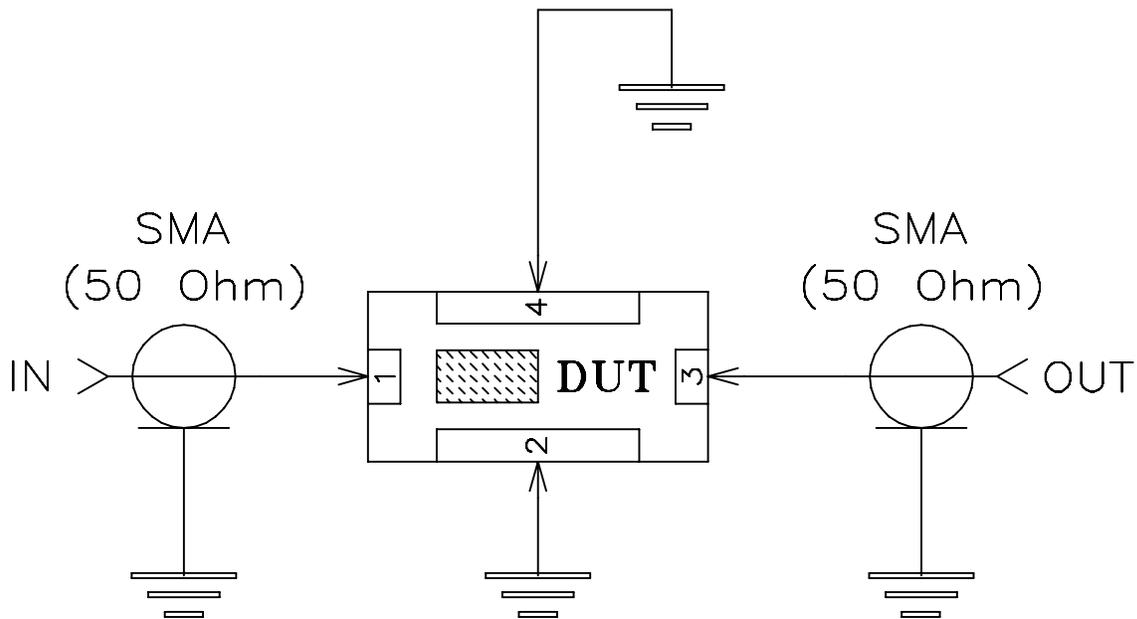
ASHEETA1.DWG REV:A DATE:01/12/95

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-305	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 Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C 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