



LTCC SMT

# Band Pass Filter

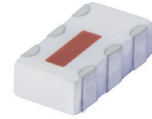
## BFCN-2900+

Mini-Circuits

50Ω 2700 to 3100 MHz

### THE BIG DEAL

- Good Rejection, 25 dB Typ.
- 1206 Surface Mount Footprint
- Power Handling: 1.5 Watts



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

### +RoHS Compliant

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

### APPLICATIONS

- Harmonic Rejection
- Transmitters / Receivers

### PRODUCT OVERVIEW

Mini-Circuits' BFCN-2900+ LTCC Band Pass Filter is constructed with multiple layers in order to achieve a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 400 MHz passband, these units offer low insertion loss and good rejection.

### KEY FEATURES

Feature	Advantages
Small Size, 1206	Allows for high layout density of circuit boards, while minimizing the effects of parasitics
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.
Rugged Power handling	Handles up to 1.5 Watts in a small package.

REV. E  
ECO-016659  
BFCN-2900+  
URJ  
230202





### ELECTRICAL SPECIFICATIONS<sup>1,2</sup> AT 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	2900	—	MHz
	Insertion Loss	F1-F2	2700 - 3100	—	3	dB
	Return Loss	F1-F2	2700 - 3100	4.96	8.09	dB
Stop Band, Lower	Rejection	DC-F3	DC - 1800	—	25	dB
		F4	1850	20	—	dB
Stop Band, Upper	Rejection	F5	4200	20	—	dB
		F6-F7	4900 - 7000	—	25	dB

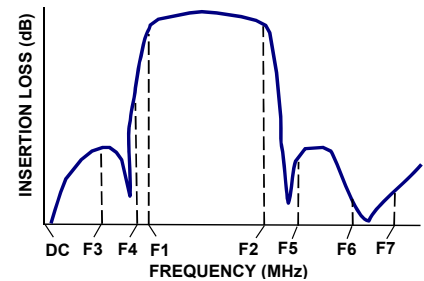
1. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.
2. Measured on Mini-Circuits Characterization Test Board TB-285.

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

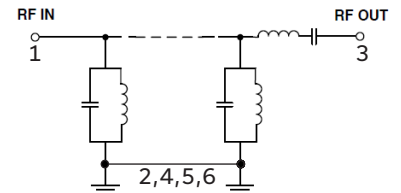
Parameter	Ratings
Operating temperature	-55°C to 100°C
Storage temperature	-55°C to 100°C
RF Power Input <sup>2</sup>	1.5W @25°C

1. Permanent damage may occur if any of these limits are exceeded.
2. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.25W at +100°C.

### TYPICAL FREQUENCY RESPONSE



### FUNCTIONAL DIAGRAM



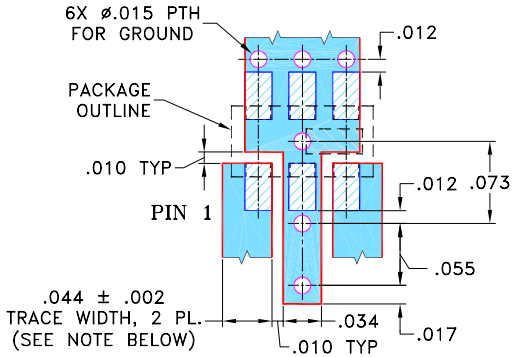


### PAD CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4,5,6

PRODUCT MARKING: RP

DEMO BOARD MCL P/N: TB-285  
SUGGESTED PCB LAYOUT (PL-158)

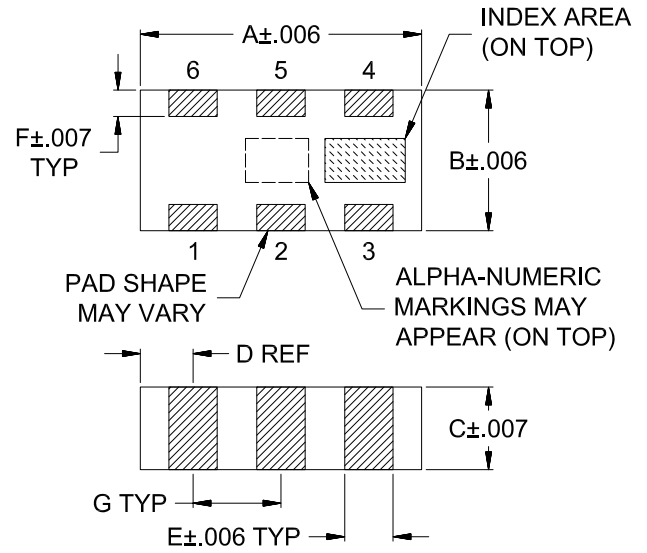


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020"  $\pm$  .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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

### OUTLINE DRAWING



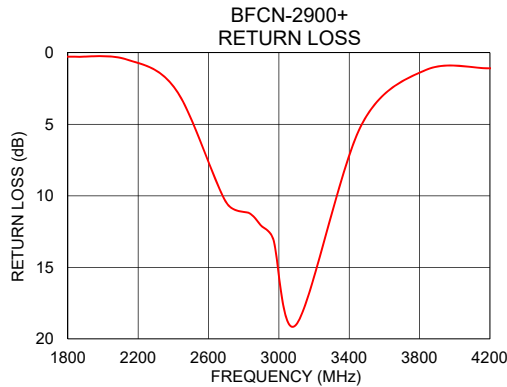
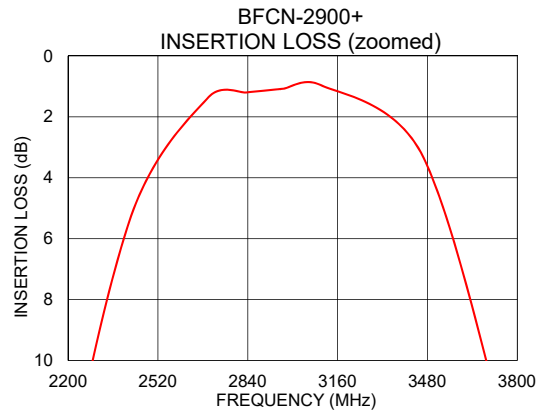
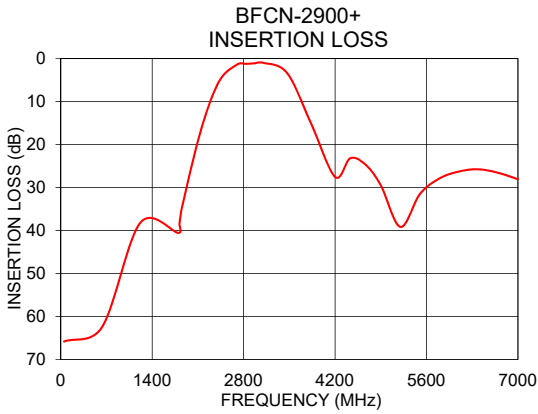
### OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F	G	Wt.
.126	.063	.035	.024	.022	.011	.039	grams
3.20	1.60	0.89	0.61	0.56	0.28	0.99	.020



### TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
50.00	65.81	0.03
1800.00	40.54	0.27
1850.00	34.99	0.28
2133.33	17.29	0.46
2416.67	5.46	2.62
2700.00	1.36	10.45
2833.33	1.20	11.22
2900.00	1.14	12.10
2966.67	1.08	12.98
3100.00	0.96	18.98
3466.67	3.35	5.12
3833.33	15.10	1.22
4200.00	27.52	1.09
4900.00	29.47	0.73
5800.00	27.85	0.41
7000.00	28.03	0.44



**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 Band Pass Filter

# BFCN-2900+

## Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	OUTPUT RETURN LOSS (dB)
	@ +25° C	@ +25° C	@ +25° C
50	68.92	0.01	0.00
100	66.82	0.01	0.01
200	60.69	0.02	0.01
300	58.50	0.04	0.02
400	58.18	0.04	0.03
500	59.22	0.06	0.04
600	63.99	0.09	0.05
700	91.84	0.11	0.08
800	61.25	0.14	0.10
900	54.63	0.17	0.13
1000	51.09	0.21	0.16
1100	49.13	0.22	0.18
1200	48.32	0.25	0.22
1300	49.16	0.27	0.25
1400	53.51	0.30	0.29
1500	52.02	0.33	0.33
1600	41.89	0.36	0.37
1700	35.13	0.39	0.42
1800	29.79	0.41	0.48
1850	27.43	0.44	0.51
1900	25.18	0.47	0.54
2000	20.94	0.53	0.66
2100	16.89	0.66	0.82
2200	12.97	0.93	1.16
2300	9.10	1.51	1.89
2380	6.22	2.53	3.17
2400	5.57	2.93	3.68
2480	3.38	5.23	6.84
2500	2.96	6.00	8.04
2600	1.82	9.79	15.74
2700	1.71	9.52	12.17
2800	1.89	8.15	9.06
2900	1.98	7.79	8.16
3000	1.88	8.57	8.68
3100	1.65	11.12	11.00
3200	1.52	19.37	17.51
3300	1.93	14.29	13.32
3400	3.55	6.32	6.02
3500	6.47	3.19	2.92
3600	10.26	1.93	1.61
3650	12.39	1.63	1.27
3700	14.70	1.43	1.04
3800	20.14	1.25	0.79
3900	28.00	1.20	0.66
4000	39.40	1.23	0.62
4100	29.88	1.26	0.58
4200	26.22	1.29	0.57
4500	24.91	1.24	0.52
4900	33.76	0.99	0.45
5000	39.34	0.93	0.46
5200	41.01	0.85	0.45
5500	31.08	0.75	0.45
6000	27.02	0.67	0.47
6500	26.24	0.62	0.55
7000	26.56	0.57	0.64



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant  
 P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



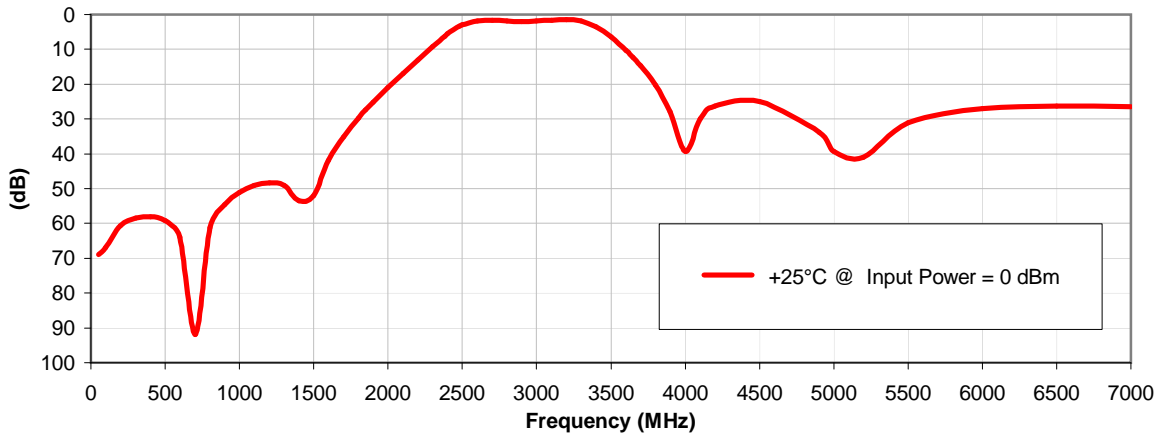
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



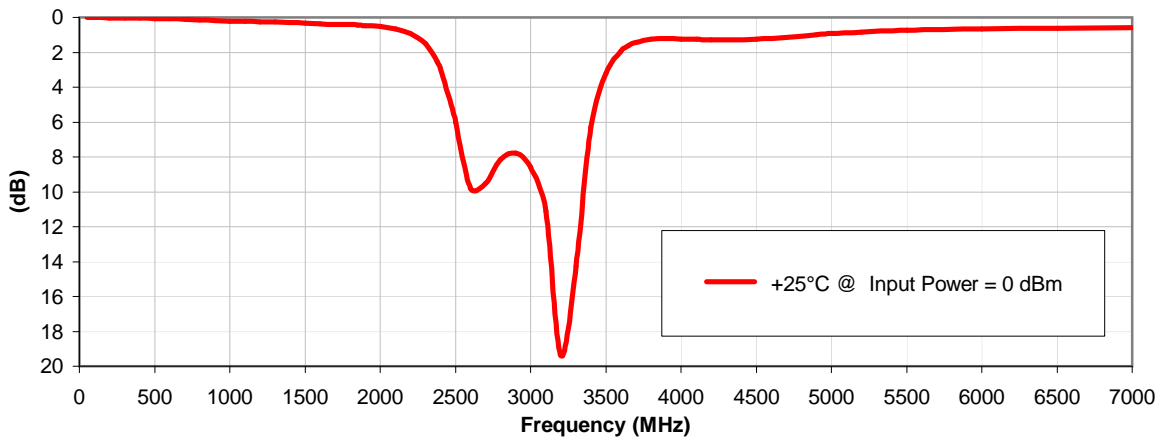
REV. X1  
 BFCN-2900+  
 090820  
 Page 1 of 1

## Typical Performance Curves

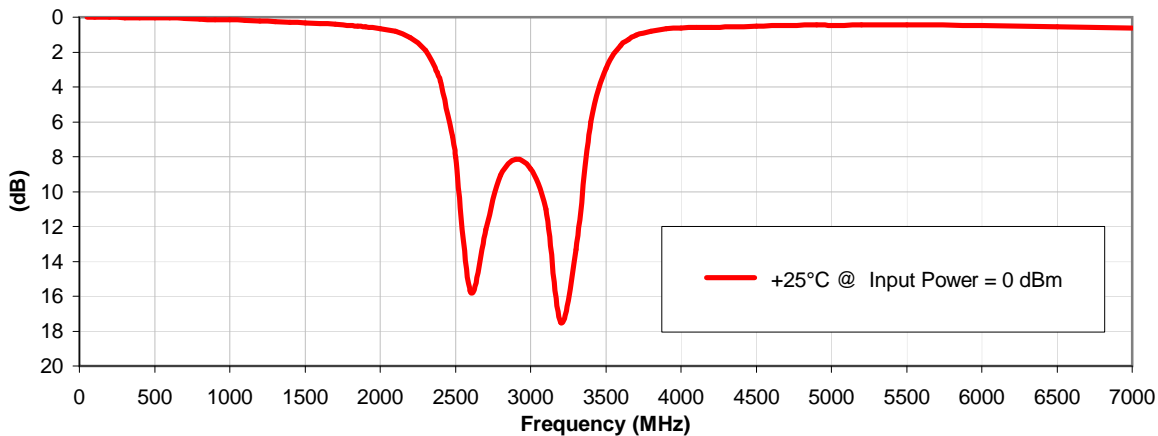
### INSERTION LOSS vs. TEMPERATURE



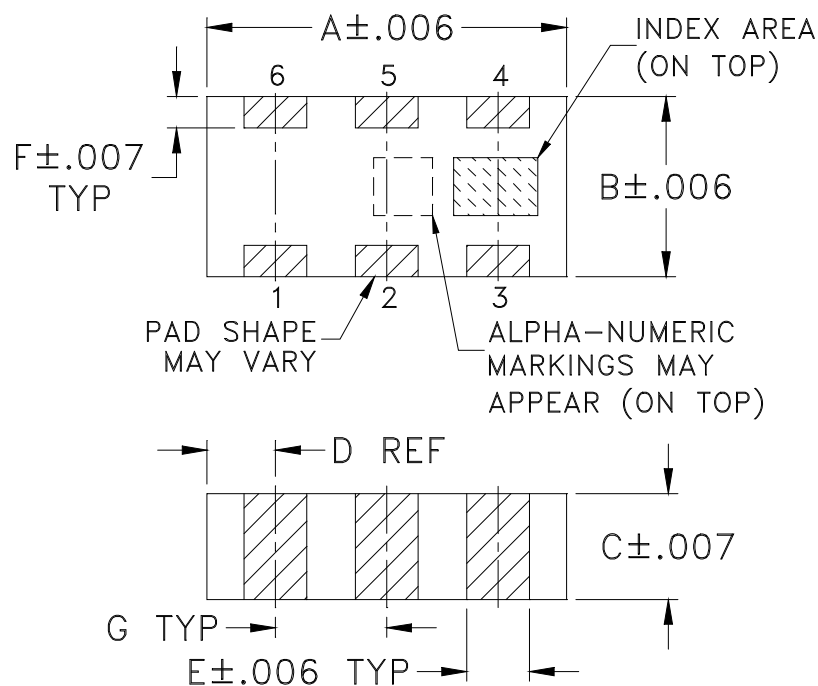
### INPUT RETURN LOSS vs. TEMPERATURE



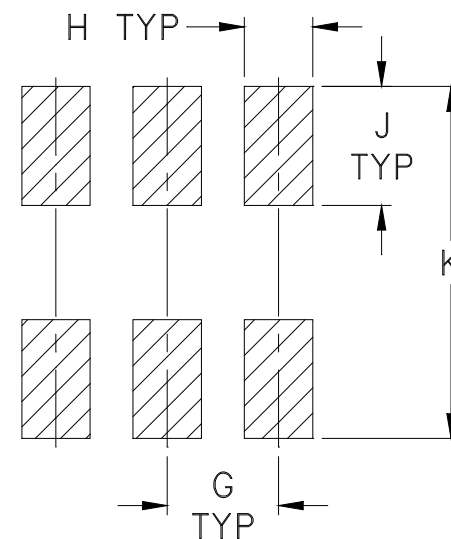
### OUTPUT RETURN LOSS vs. TEMPERATURE



### Outline Dimensions



### PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	--	--	--	--	.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: Tin plate over Nickel plate. All models, (+) suffix.  
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

## DEVICE ORIENTATION IN T&R

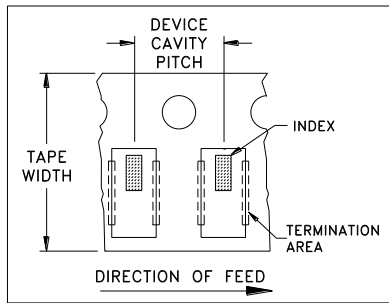


ILLUSTRATION 1

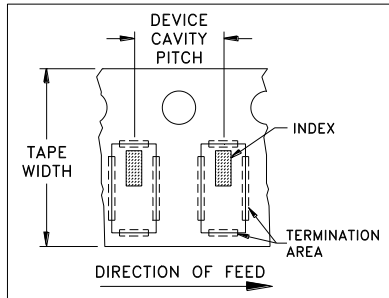


ILLUSTRATION 2

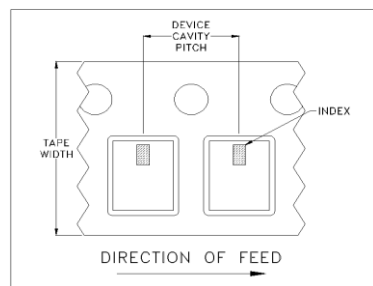


ILLUSTRATION 3

### Applicable Case Styles

FV1206-1  
FV1206-3

### Applicable Case Styles

FV1206-4  
FV1206-5  
FV1206-6  
FV1206-7  
FV1206-9

### 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.

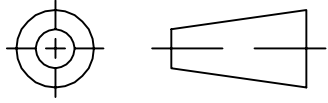
Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



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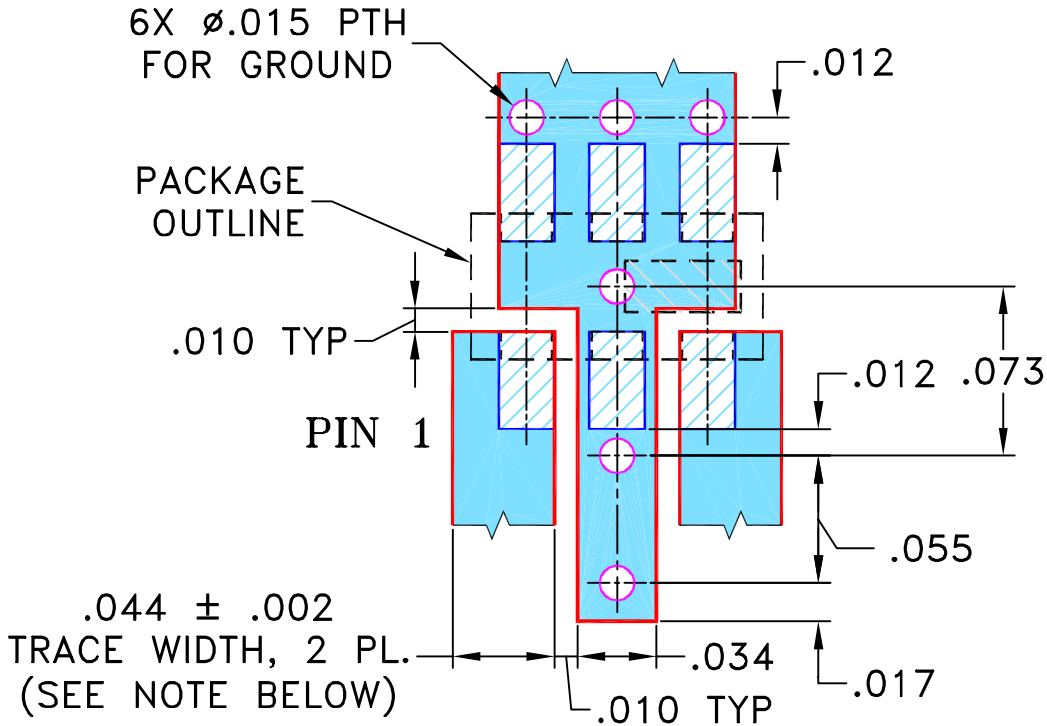
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M92199	NEW RELEASE	05/24/04	AV	ABD
A	M99247	ADD GROUND PTH	06/05	RZ	RZ
A	R60782	ADD GROUND PTH	06/05	RZ	RZ
B	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

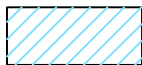
SUGGESTED MOUNTING CONFIGURATION  
FOR FV1206-1 CASE STYLE, "pr" PIN CONNECTION.



- 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

INITIALS

DATE

DIMENSIONS ARE IN INCHES  
 TOLERANCES ON:  
 2 PL DECIMALS ±  
 3 PL DECIMALS ± .005  
 ANGLES ±  
 FRACTIONS ±

DRAWN

AV

05/03/04

CHECKED

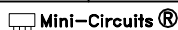
IL

05/24/04

APPROVED

ABD

05/24/04



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



Mini-Circuits®

13 Neptune Avenue  
 Brooklyn NY 11235

PL, pr, FV1206-1, HFCN, TB-285

SIZE  
 A

CODE IDENT  
 15542

DRAWING NO:  
 98-PL-158

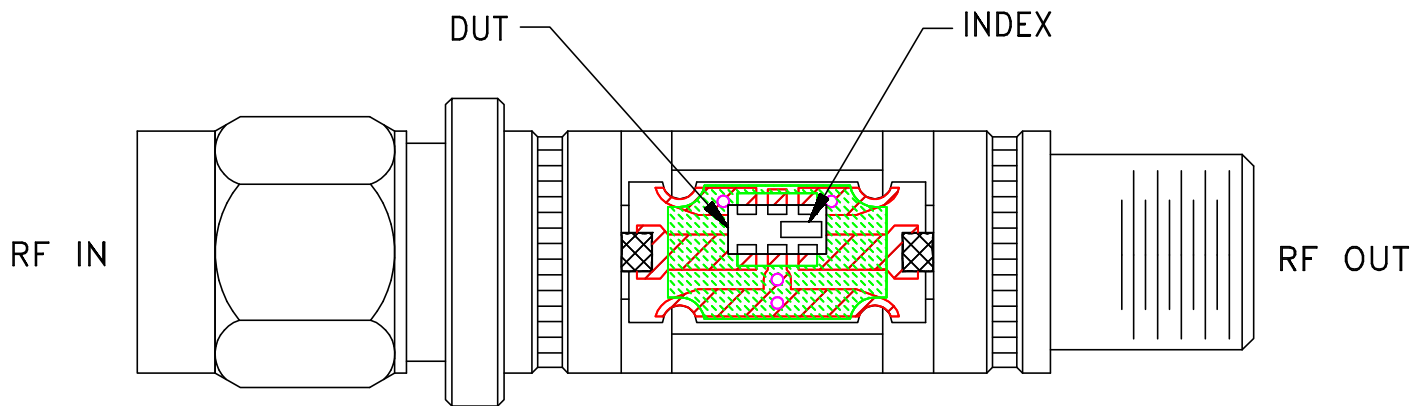
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FILE: 98PL158

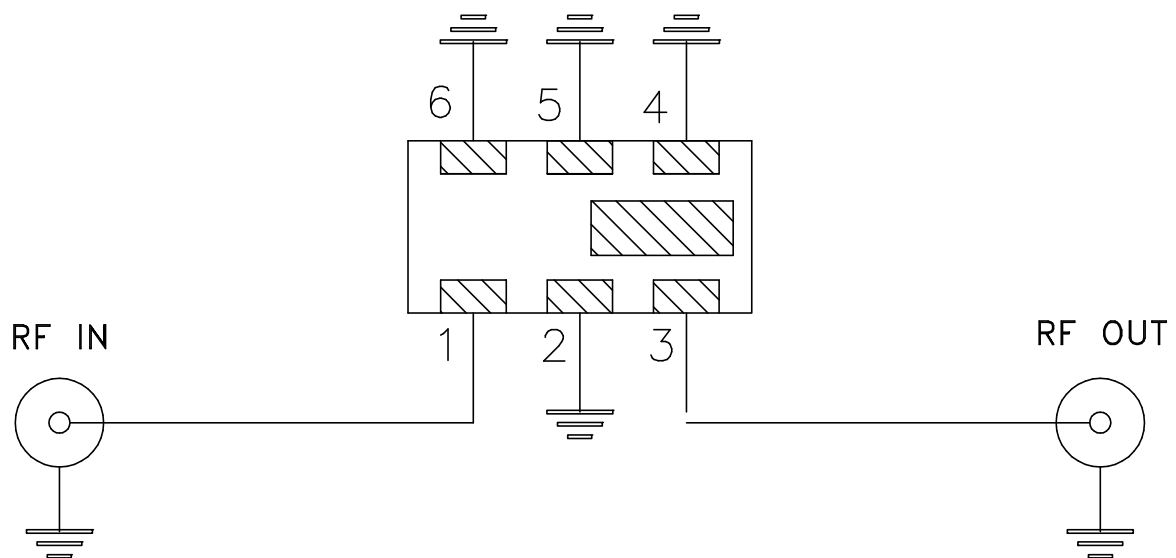
SCALE: 12:1

SHEET: 1 OF 1

# Evaluation Board and Circuit




TB-285



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers 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	-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