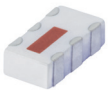
Ceramic

Bandpass Filter

BFCN-1690+

50Ω 1570 to 1810 MHz



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

+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

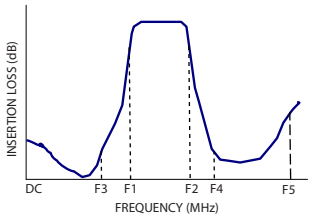
Features

- Good VSWR, 1.29:1 typ. @ passband
- Small size(0.126 x .063 x .035)
- Temperature stable
- LTCC construction

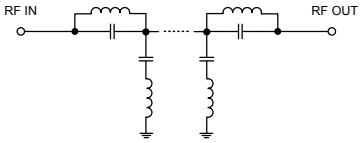
Applications

- Harmonic rejection
- Transmitters / Receivers

Specification Definition



Functional Schematic



Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—			1690		MHz
	Insertion Loss	F1 - F2	1570 - 1810	—	2.5	5.0	dB
	VSWR	F1 - F2	1570 - 1810	—	1.29	2.0	:1
Stop Band, Lower	Insertion Loss	DC - F3	1200	17	25.5	—	dB
	VSWR	DC - F3	1200	17	24	—	:1
Stop Band, Upper	Insertion Loss	F4 - F5	2170 - 4400	20	30	—	dB
	VSWR	F4 - F5	2170 - 4400	5	20	—	:1

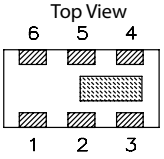
1. Measured on Mini-Circuits Characterization Test Board TB-285.
2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

Maximum Ratings

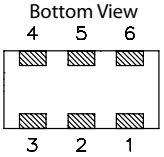
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input*	1.0W at 25°C

*Passband rating, derate linearly to 0.25W at 100°C ambient
Permanent damage may occur if any of these limits are exceeded.

Top View



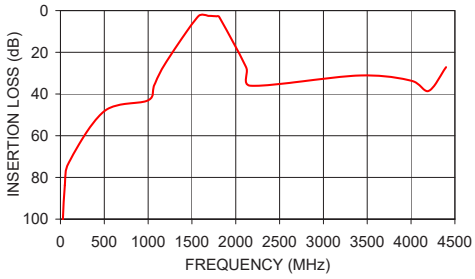
Bottom View



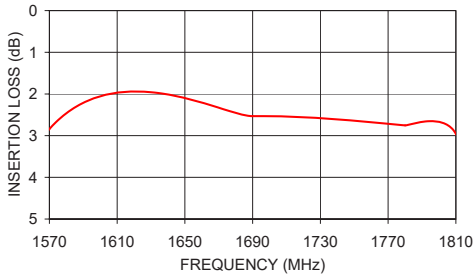
Pad Connections

Input	1
Output	3
Ground	2,4,5,6

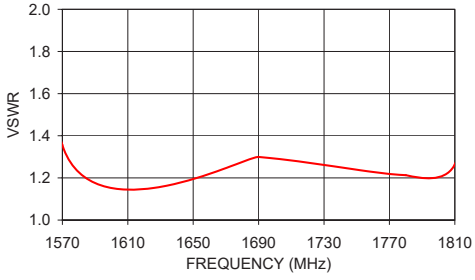
BFCN-1690+
INSERTION LOSS (Full Band)



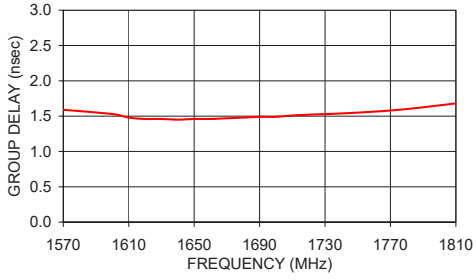
BFCN-1690+
INSERTION LOSS (Pass Band)



BFCN-1690+
VSWR



BFCN-1690+
GROUP DELAY



Bandpass Filter

BFCN-1690+

Full Band Performance

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10.00	116.31	177.17
50.00	83.75	147.73
100.00	72.51	119.76
500.00	48.23	62.19
1000.00	43.02	35.56
1070.00	35.77	30.60
1200.00	25.09	20.81
1570.00	2.84	1.36
1690.00	2.53	1.30
1780.00	2.75	1.21
1810.00	2.95	1.27
2120.00	27.35	6.94
2170.00	36.01	8.07
3400.00	31.15	70.42
4000.00	33.62	56.00
4200.00	38.51	39.90
4400.00	27.14	19.50

Pass Band Performance

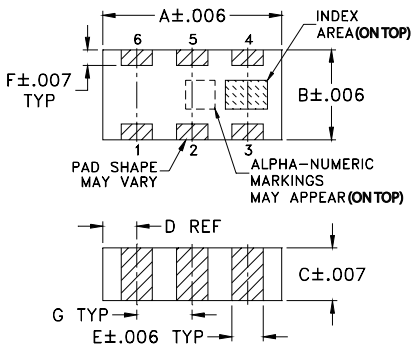
Frequency (MHz)	Insertion Loss (dB)	Group Delay (nsec)
1570.00	2.84	1.59
1600.00	2.72	1.53
1610.00	2.69	1.48
1620.00	2.66	1.46
1630.00	2.63	1.46
1640.00	2.61	1.45
1650.00	2.59	1.46
1660.00	2.57	1.46
1670.00	2.55	1.47
1680.00	2.54	1.48
1690.00	2.53	1.49
1700.00	2.53	1.49
1710.00	2.53	1.51
1720.00	2.54	1.52
1750.00	2.62	1.55
1780.00	2.75	1.60
1810.00	2.95	1.68

Pad Connections

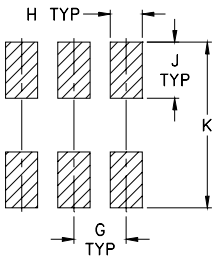
Input	1
Output	3
Ground	2,4,5,6

Product Marking: BL

Outline Drawing

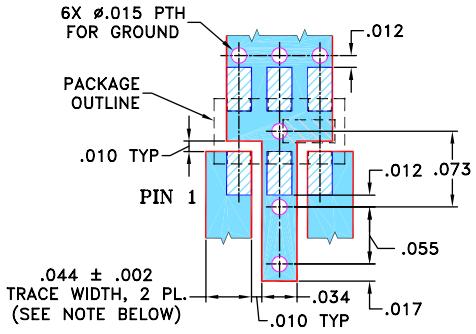


PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Demo Board MCL P/N: TB-285
Suggested PCB Layout (PL-158)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 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

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Outline Dimensions (inch / mm)

A	B	C	D	E	F
.126	.063	.035	.024	.022	.011
3.20	1.60	0.89	0.61	0.56	0.28

G	H	J	K	wt
.039	.024	.042	.123	grams
0.99	0.61	1.07	3.12	.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

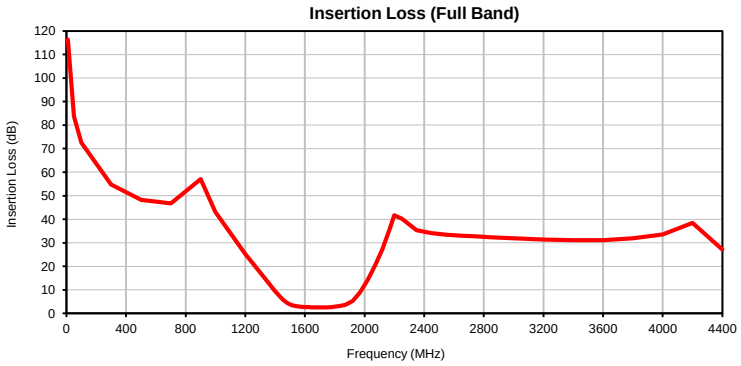
Ceramic Bandpass Filter BFCN-1690+

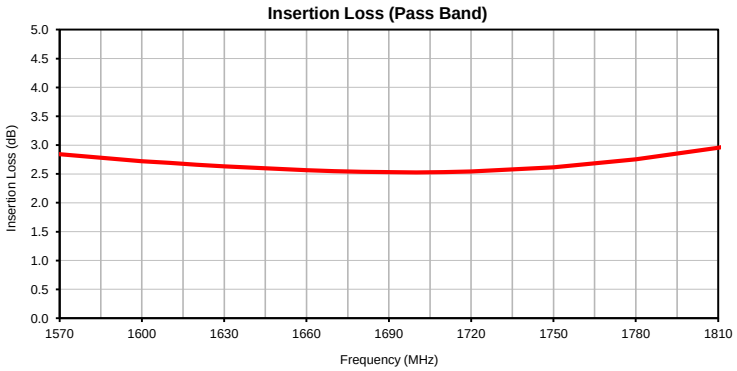
Typical Performance Data

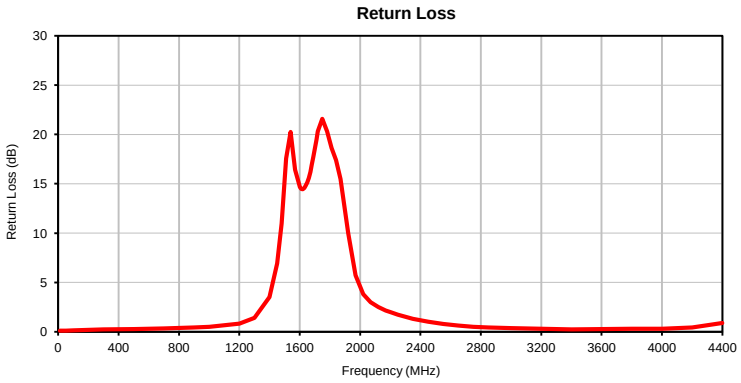
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)	FREQUENCY (MHz)	GROUP DELAY (ns)
10.0	116.31	0.10	70.0	0.02
50.0	83.75	0.12	90.0	0.17
100.0	72.51	0.15	300.0	0.19
300.0	54.76	0.23	500.0	0.20
500.0	48.23	0.28	700.0	0.20
700.0	46.75	0.34	900.0	0.21
900.0	57.11	0.42	1000.0	0.21
1000.0	43.02	0.49	1070.0	0.09
1200.0	25.09	0.84	1185.0	0.12
1300.0	17.32	1.40	1200.0	0.23
1400.0	9.34	3.51	1250.0	0.48
1450.0	5.90	6.92	1300.0	0.67
1480.0	4.44	10.98	1350.0	0.94
1510.0	3.54	17.55	1400.0	1.30
1540.0	3.06	20.24	1450.0	1.59
1570.0	2.84	16.41	1480.0	1.87
1600.0	2.72	14.67	1510.0	1.83
1610.0	2.69	14.48	1540.0	1.71
1620.0	2.66	14.45	1570.0	1.59
1630.0	2.63	14.56	1600.0	1.53
1640.0	2.61	14.79	1610.0	1.48
1650.0	2.59	15.13	1620.0	1.46
1660.0	2.57	15.60	1630.0	1.46
1670.0	2.55	16.19	1640.0	1.45
1680.0	2.54	16.90	1650.0	1.46
1690.0	2.53	17.71	1660.0	1.46
1700.0	2.53	18.58	1670.0	1.47
1710.0	2.53	19.48	1680.0	1.48
1720.0	2.54	20.32	1690.0	1.49
1750.0	2.62	21.57	1700.0	1.49
1780.0	2.75	20.32	1710.0	1.51
1810.0	2.95	18.63	1720.0	1.52
1840.0	3.24	17.38	1750.0	1.55
1870.0	3.69	15.48	1780.0	1.60
1920.0	5.32	10.01	1810.0	1.68
1970.0	8.90	5.72	1840.0	1.80
2020.0	14.19	3.82	1870.0	1.90
2070.0	20.36	2.98	1920.0	2.24
2120.0	27.35	2.52	1970.0	2.26
2170.0	36.01	2.16	2020.0	1.84
2200.0	41.68	1.99	2070.0	1.36
2250.0	40.25	1.73	2120.0	0.91
2350.0	35.37	1.31	2170.0	0.43
2450.0	34.04	1.01	2350.0	0.14
2550.0	33.42	0.78	2550.0	0.26
2650.0	33.06	0.62	2650.0	0.22
2750.0	32.72	0.51	2750.0	0.19
2850.0	32.33	0.44	2850.0	0.16
3000.0	31.90	0.37	3000.0	0.13
3200.0	31.44	0.30	3200.0	0.12
3400.0	31.15	0.25	3400.0	0.09
3600.0	31.12	0.27	3600.0	0.11
3800.0	31.87	0.29	3800.0	0.08
4000.0	33.62	0.31	4000.0	0.10
4200.0	38.51	0.44	4200.0	0.08
4400.0	27.14	0.89	4400.0	0.02

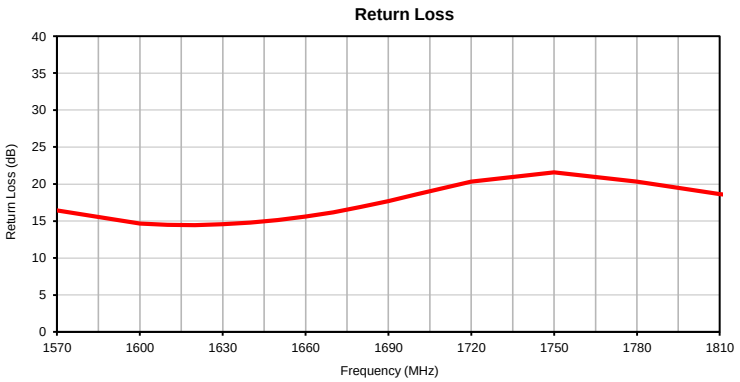
Ceramic Bandpass Filter BFCN-1690+

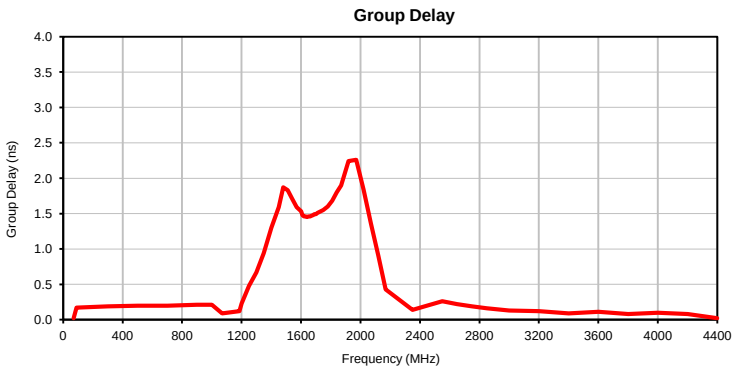
Typical Performance Curves

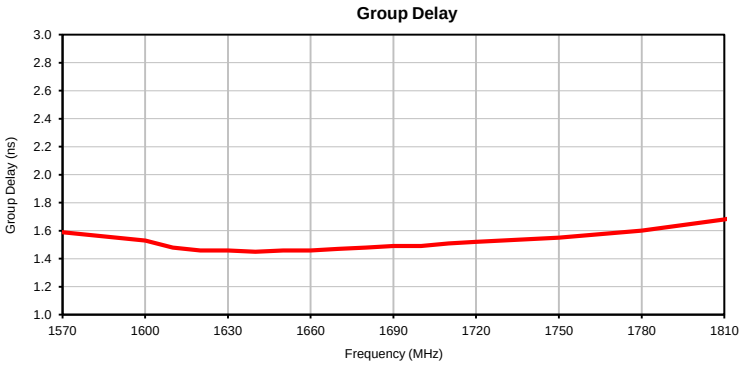








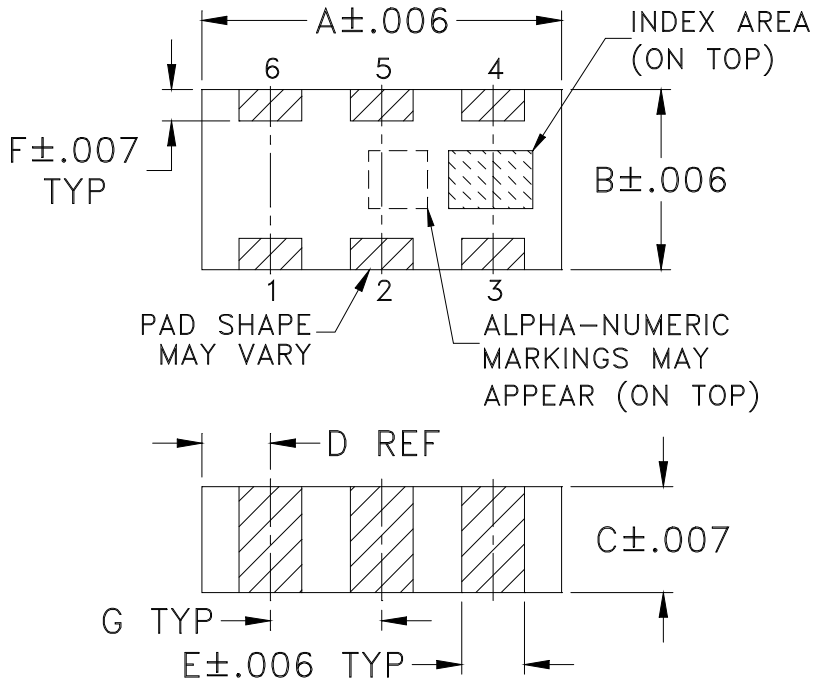




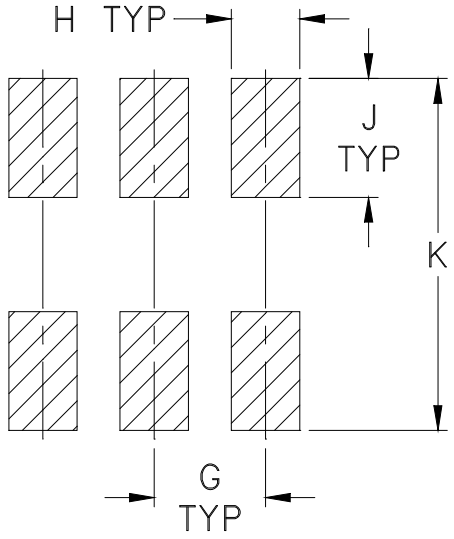
Case Style FV

FV1206-1

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	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. ± .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

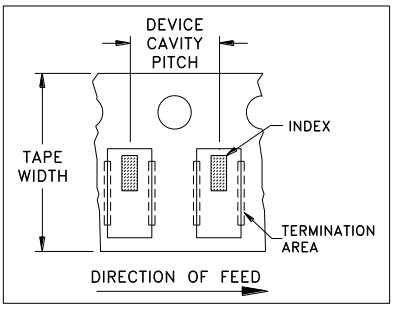


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

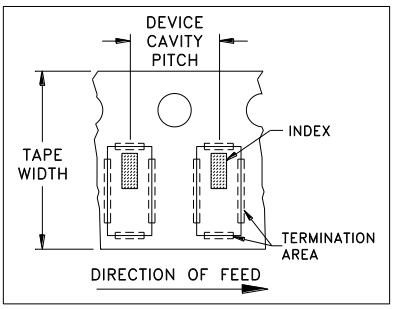


ILLUSTRATION 2

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

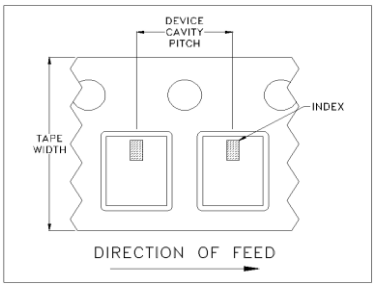


ILLUSTRATION 3

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.

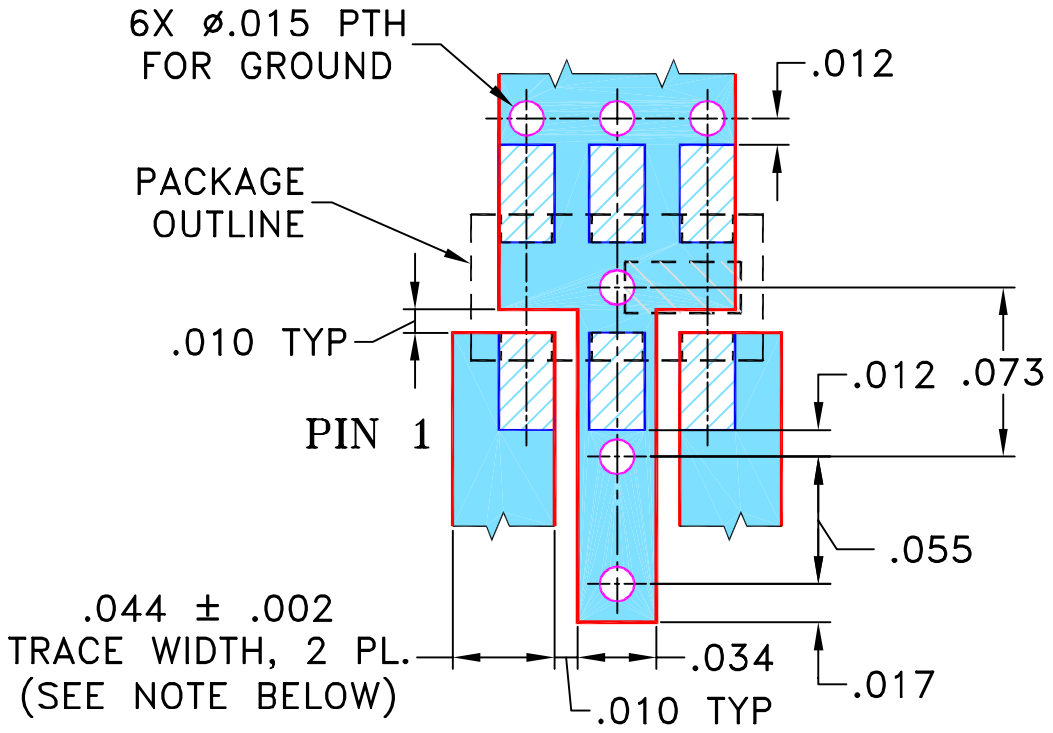
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	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 RO4350B 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	DRAWN	AV	05/03/04
TOLERANCES ON:	CHECKED	IL	05/24/04
2 PL DECIMALS ±	APPROVED	ABD	05/24/04
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

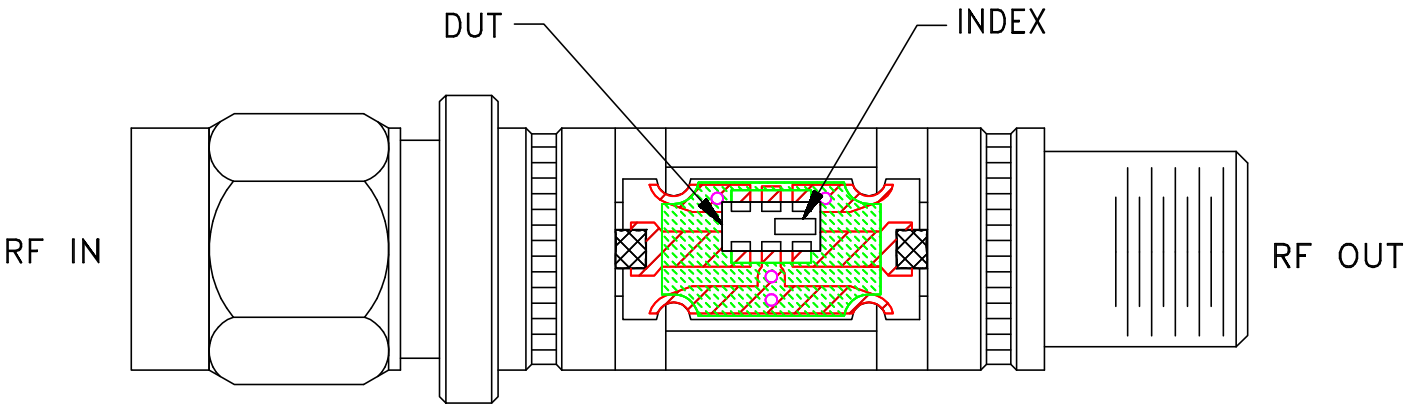
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

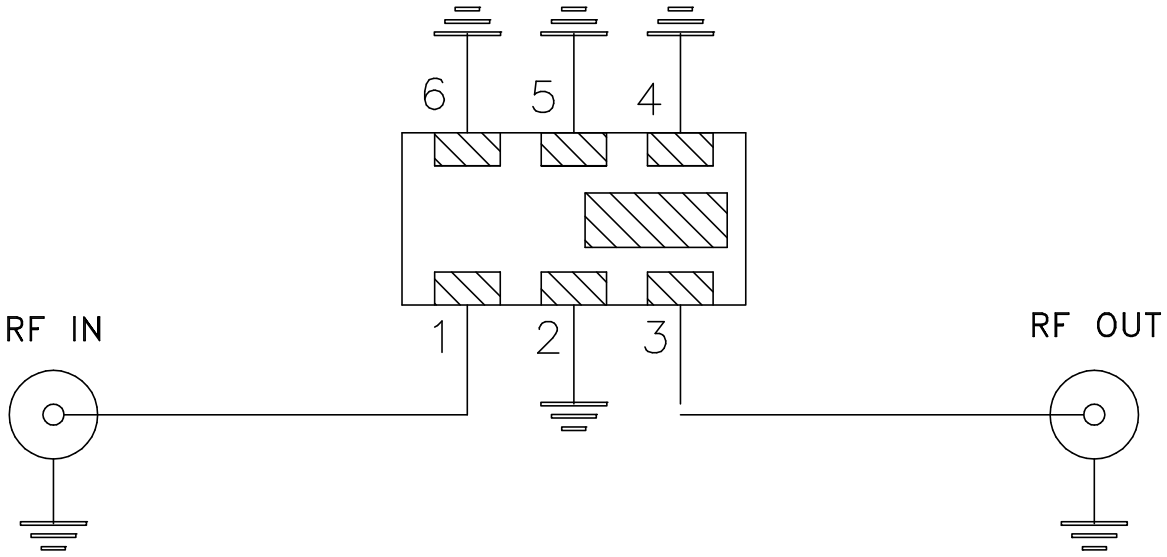
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

FILE:	SCALE:	SHEET:
98PL158	12:1	1 OF 1

Evaluation Board and Circuit



TB-285



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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