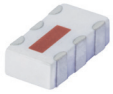
Ceramic

High Pass Filter

HFCN-3500+

50Ω 3900 to 9800 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

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	7W max. at 25°C

*Passband rating, derate linearly to 3W at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

Pin Connections

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

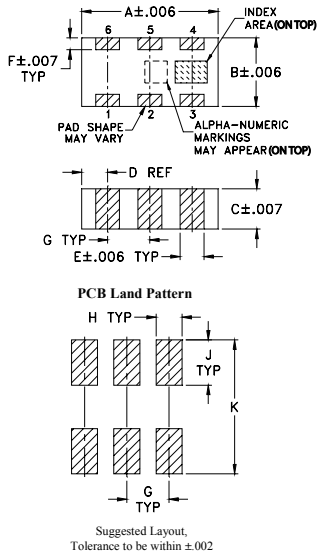
Features

- Low cost
- Small size
- 5 sections
- Temperature stable
- Excellent power handling, 7W
- Hermetically sealed
- LTCC construction
- Protected by US Patent 7,760,485

Applications

- Sub-harmonic rejection
- Transmitters / receivers

Outline Drawing

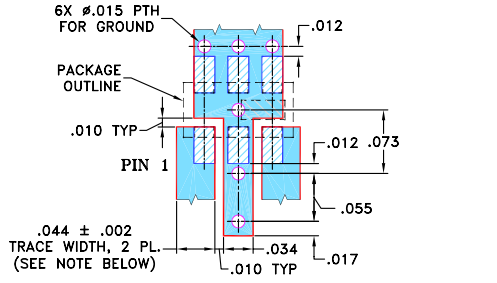


Outline Dimensions (inch / mm)

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

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

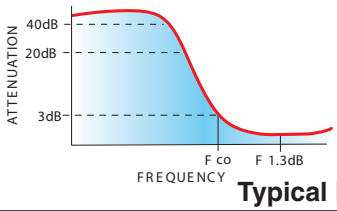
DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Electrical Specifications[1,2] at 25°C

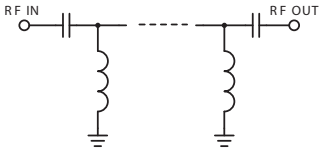
STOPBAND (MHz)		fco, MHz Nom.	PASSBAND (MHz)		VSWR Typ.		POWER INPUT (W)	NO. OF SECTIONS
(Loss > 30dB) Typ.	(Loss > 20dB) Min.	(Loss 3 dB) Typ.	(Loss < 1.5dB) Max.	(Loss < 2dB) Max.	Frequency (MHz) Stopband	Frequency (MHz) 1.5:1	Max.	
2900	2800	3500	4000-8800	3900-9800	20:1	3650-9500	7	5

(1) In Application where DC voltage is present at either input or output ports, coupling capacitors are required. Alternatively, Mini-Circuits' "D" suffix version of this model will provide>100 MOhm isolation to ground.
(2) Measured on Mini-Circuits Characterization Test Board TB-285.

typical frequency response



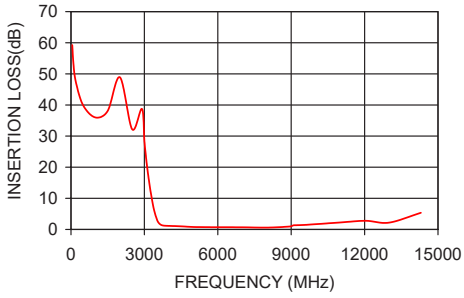
electrical schematic



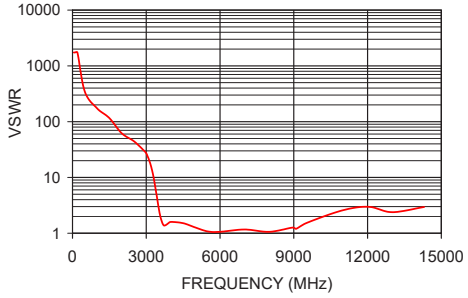
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
50	59.26	1737.18
400	41.60	434.30
1500	38.09	115.81
2800	35.62	34.75
2900	38.74	30.49
3050	24.44	24.14
3250	12.48	12.61
3400	6.15	5.42
3500	3.42	2.92
3650	1.63	1.53
3900	1.17	1.51
4000	1.14	1.59
6000	0.71	1.06
8800	0.74	1.23
9500	1.36	1.48
9800	1.41	1.87
14000	2.60	1.49

HFCN-3500+
INSERTION LOSS



HFCN-3500+
VSWR



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

REV. E
M151107
EDR-8120/2
HFCN-3500+
RAV/CP/AM
150729page
1 of 1

Ceramic High Pass Filter HFCN-3500+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
50	59.91	60.08	58.78	0.03	0.02	0.02	0.01	0.01	0.01
100	53.31	53.23	52.94	0.04	0.03	0.03	0.02	0.01	0.01
200	47.47	47.26	47.04	0.03	0.01	0.00	0.01	0.01	0.02
500	39.77	39.85	39.83	0.04	0.01	0.02	0.03	0.00	0.02
1000	35.91	35.96	36.12	0.01	0.05	0.09	0.00	0.05	0.08
1500	37.56	37.96	38.36	0.07	0.14	0.19	0.07	0.13	0.17
2000	52.98	49.79	47.86	0.19	0.27	0.33	0.14	0.23	0.26
2500	32.40	32.26	32.25	0.29	0.38	0.45	0.29	0.39	0.45
2800	34.36	35.48	36.63	0.32	0.44	0.52	0.42	0.56	0.66
2850	36.84	38.30	38.86	0.40	0.52	0.61	0.43	0.59	0.70
2900	39.48	38.50	35.95	0.41	0.55	0.65	0.43	0.59	0.71
3000	31.05	28.37	26.19	0.46	0.62	0.74	0.53	0.73	0.88
3100	22.70	20.92	19.38	0.57	0.76	0.93	0.63	0.88	1.09
3200	16.41	15.06	13.86	0.81	1.09	1.35	0.94	1.29	1.62
3300	11.15	10.09	9.18	1.27	1.71	2.17	1.50	2.04	2.57
3400	6.88	6.16	5.57	2.47	3.23	4.02	2.85	3.76	4.68
3500	3.73	3.41	3.17	4.96	6.16	7.37	5.75	7.31	8.83
3650	1.53	1.63	1.69	12.17	13.49	14.91	15.91	20.02	24.94
3700	1.27	1.40	1.51	14.62	15.34	16.33	22.33	27.80	30.47
3900	0.98	1.18	1.31	14.21	13.69	13.76	15.90	15.01	14.66
4000	0.93	1.13	1.26	13.21	12.85	12.91	14.06	13.52	13.34
4500	0.76	0.93	1.08	13.76	13.97	13.82	13.80	13.98	13.76
5000	0.61	0.77	0.92	19.17	18.90	18.30	18.43	18.39	18.05
5500	0.56	0.73	0.91	26.53	27.15	25.99	22.43	23.92	23.45
6000	0.57	0.74	0.88	39.85	34.15	35.48	27.43	25.54	25.15
7000	0.50	0.71	0.90	24.07	24.40	25.80	23.44	23.22	23.17
8000	0.42	0.62	0.79	23.33	28.95	30.21	23.70	37.59	29.16
8800	0.44	0.76	1.09	20.66	19.30	18.08	19.25	18.15	15.93
9300	1.21	1.15	1.32	21.47	19.00	17.46	12.44	14.82	15.22
9500	0.96	1.29	1.56	15.29	14.70	13.92	13.09	13.90	13.43
9800	1.21	1.30	1.45	10.58	10.61	10.78	9.84	10.52	11.24
11000	1.62	2.11	2.42	7.16	6.69	6.75	7.46	6.87	6.86
12050	2.19	2.69	3.11	6.28	5.87	5.64	6.49	6.03	5.57
13000	2.56	2.29	2.51	5.81	7.72	8.50	5.61	7.71	7.88
14300	4.56	5.68	6.73	6.50	6.40	6.24	5.20	5.79	5.61
14600	9.11	10.48	11.53	3.64	4.15	4.60	3.38	4.29	5.33
16000	10.19	10.02	9.85	3.34	4.24	4.60	6.05	4.80	4.90
17000	5.35	7.24	8.98	7.10	6.57	6.62	9.90	6.07	4.37
18000	8.88	9.66	11.31	5.94	4.87	4.90	4.22	4.47	3.49
19000	9.64	10.28	11.63	6.72	4.50	3.56	2.43	3.59	4.40
20000	11.33	11.76	10.86	2.43	3.08	4.06	1.77	2.42	4.19

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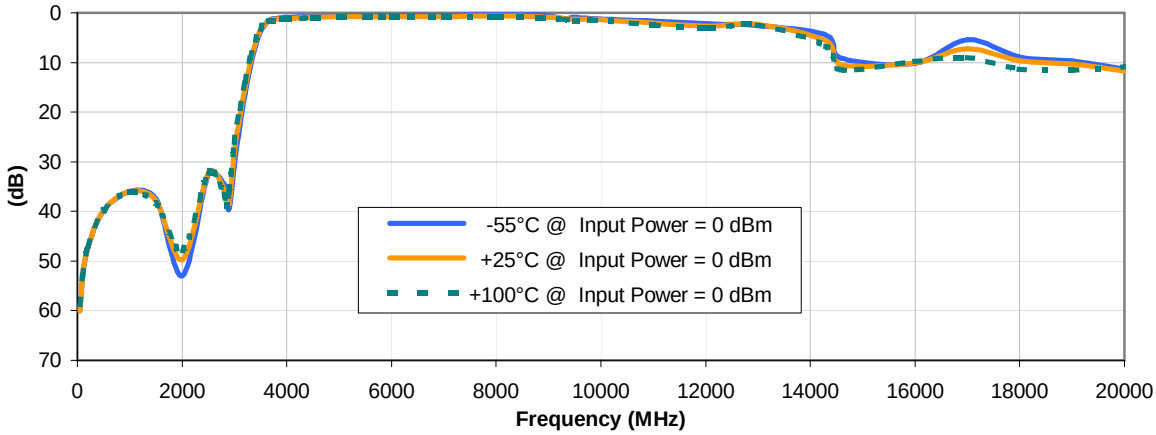
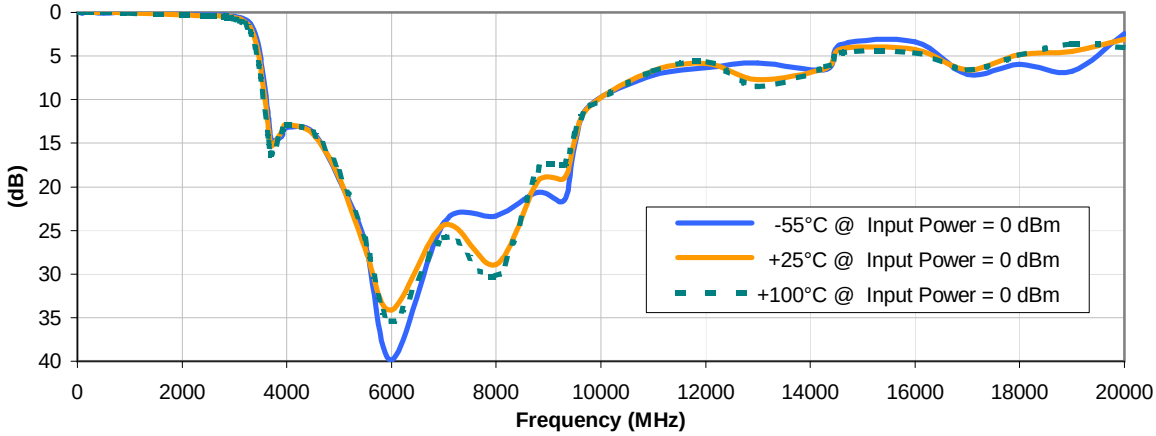
Typical Performance Curves

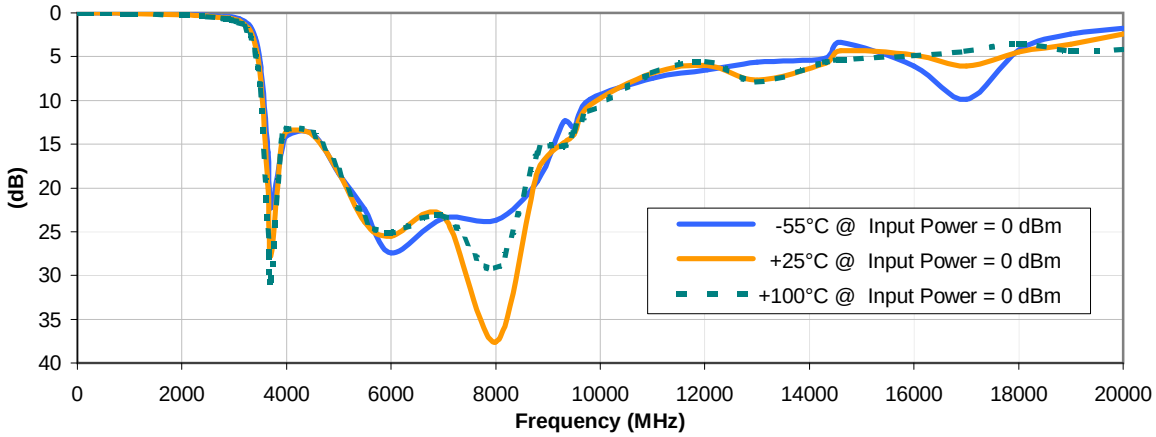
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



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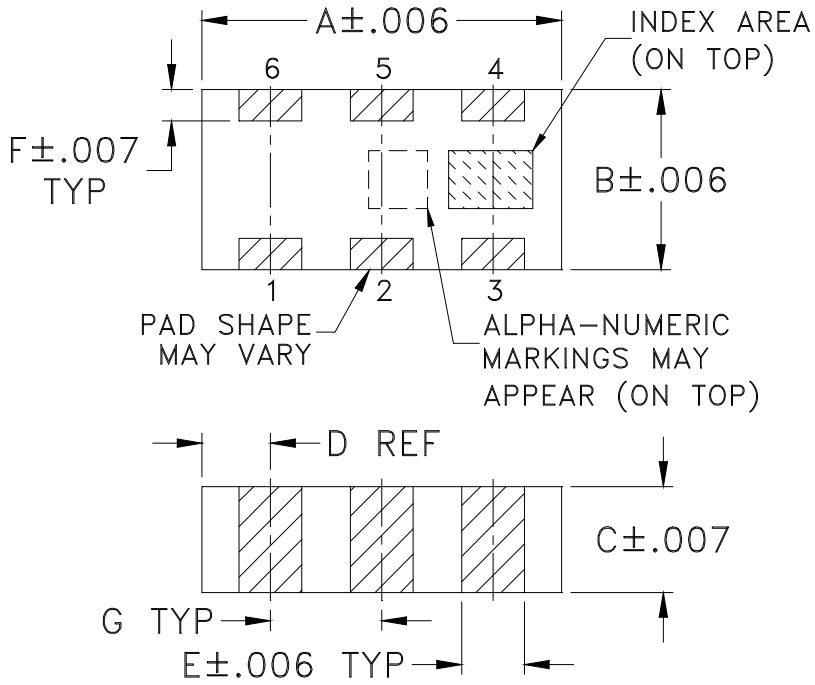
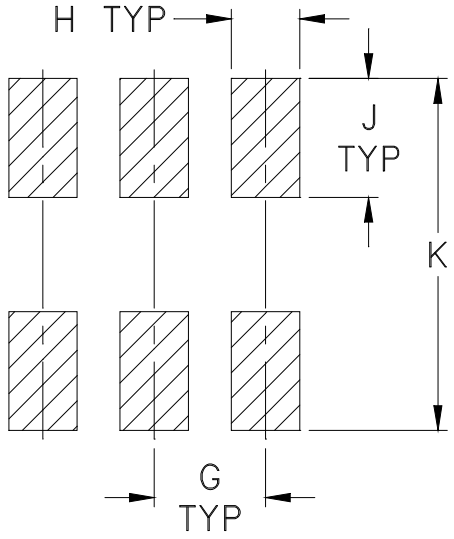
Case Style FV

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.

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Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

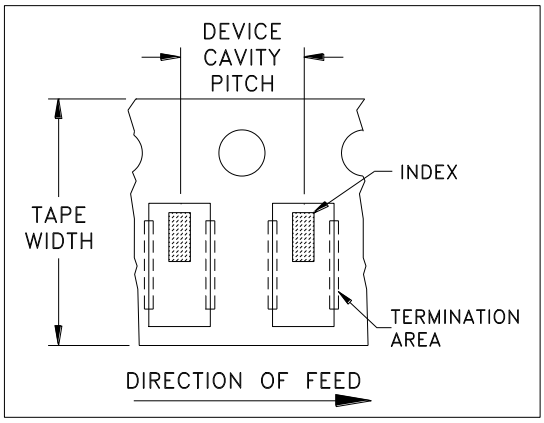

ILLUSTRATION 1

Applicable Case Styles
FV1206-1 FV1206-3

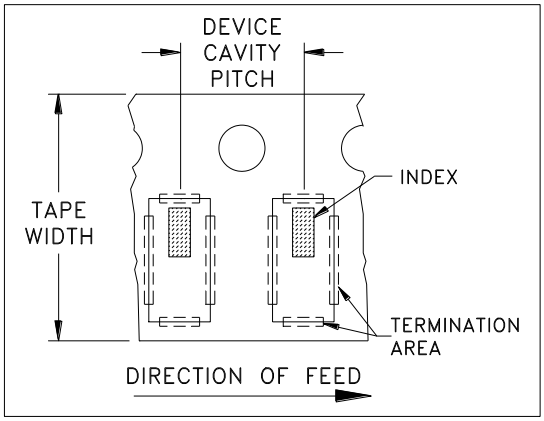

ILLUSTRATION 2

Applicable Case Styles
FV1206-4 FV1206-5 FV1206-6 FV1206-7 FV1206-9 JC0603C-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.

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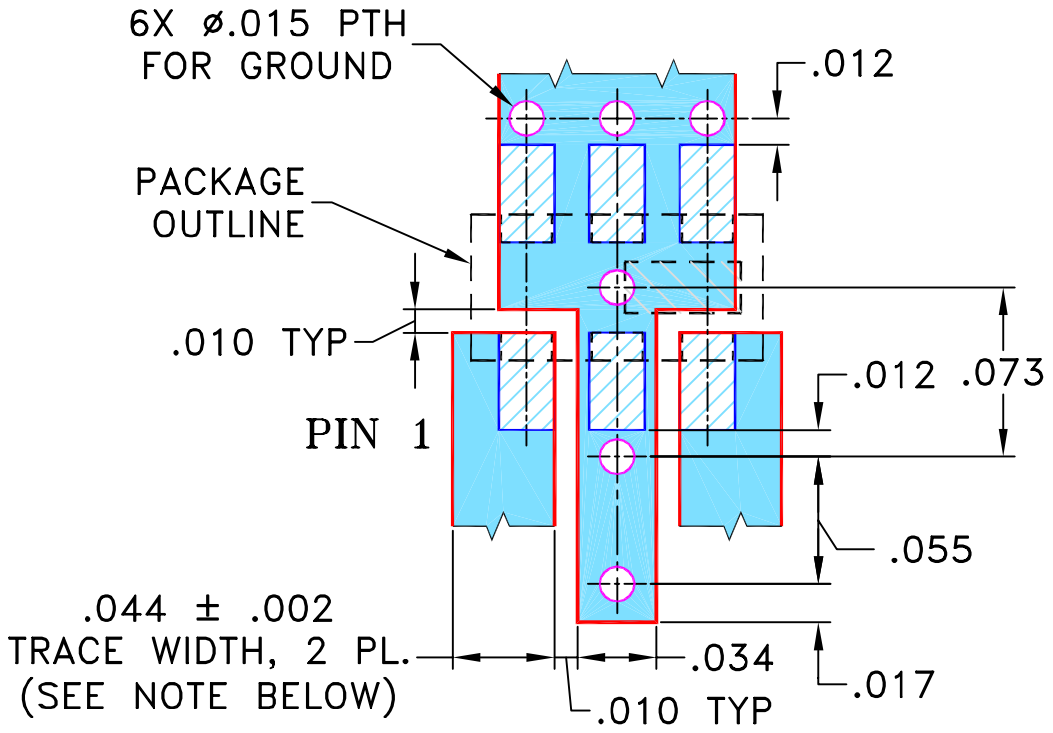
THIRD ANGLE PROJECTION

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 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 ±			

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

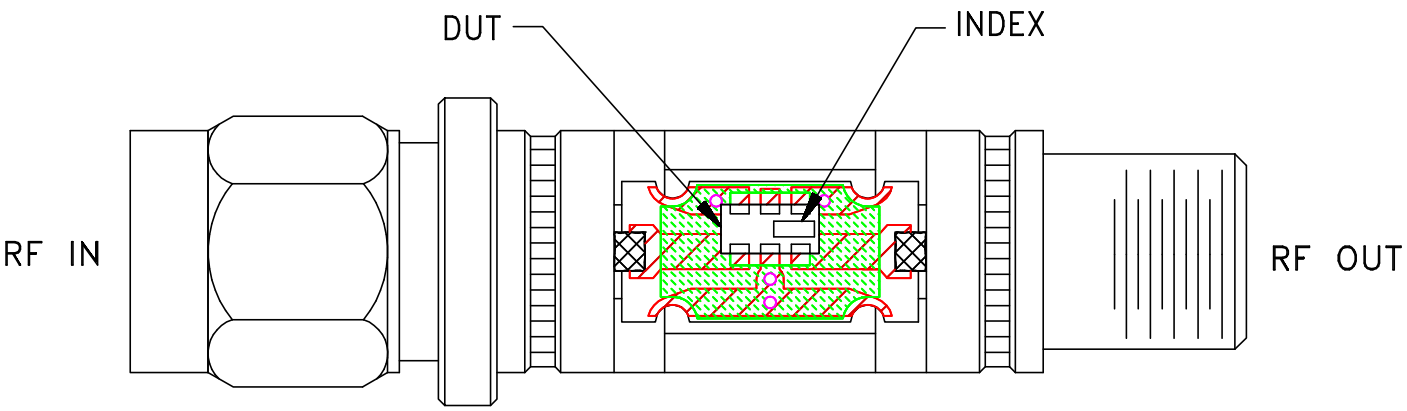
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

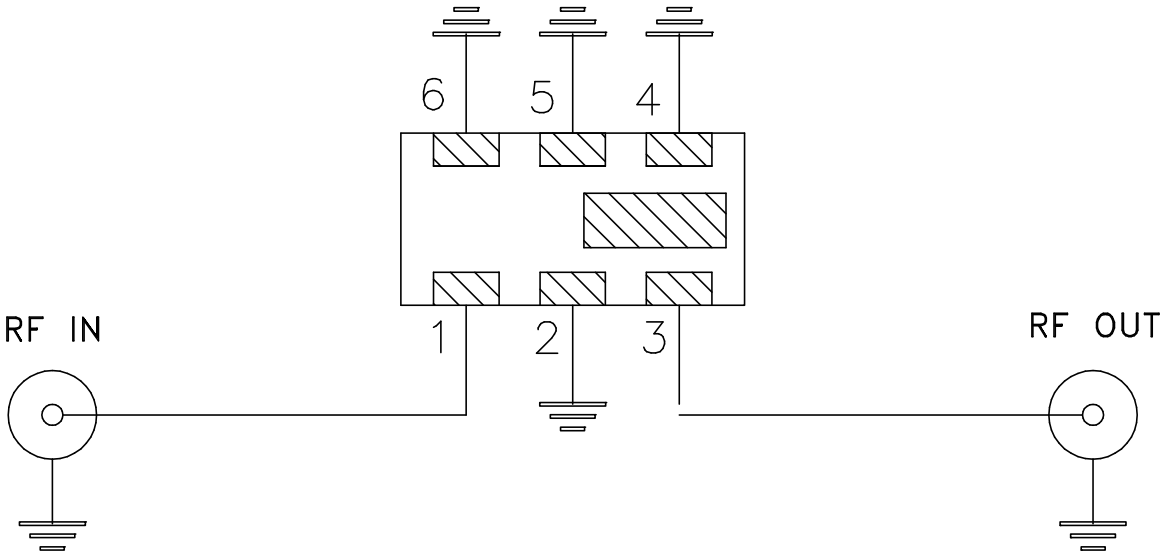
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

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.

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Environmental Specifications **ENV06**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specific
any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Refe
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Metho and end-point electric
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1
Solderability	10X Magnification	J-STD-002, Para 4.2.
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Metho
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Metho

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