CERAMIC

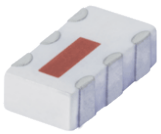
High Pass Filter

HFCN-3500D+

50Ω 3900 to 9800 MHz

FEATURES

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



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

- Sub-harmonic rejection
- Transmitters/receivers

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C

Parameter		Frequency (MHz)	Min.	Typ.	Max.	Units
Stop Band	Rejection Loss	2900	—	30	—	dB
		2800	20	—	—	
	Freq. Cut-Off	3500	—	3.0	—	dB
	VSWR	2800-2900	—	20	—	:1
Pass Band	Insertion Loss	3900-9800	—	—	2.0	dB
		4000-8800	—	—	1.5	dB
	VSWR	3650-9500	—	1.5	—	:1

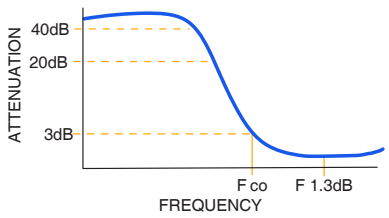
1. DC Resistance to ground is 100 Mohms min.
2. Measured on Mini-Circuits Characterization Test Board TB-285.

ABSOLUTE MAXIMUM RATINGS

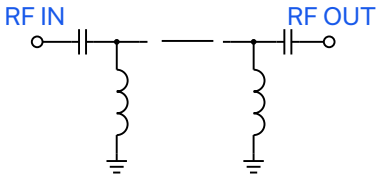
Parameter	Ratings
Operating temperature	-55°C to +100°C
Storage temperature	-55°C to +100°C
RF Power Input[3]	7W max.at 25°C
Max. DC Voltage at pins 1&3	25 VDC

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

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



REV. D
ECO-023234
HFCN-3500D+
MCL NY
241015

High Pass Filter

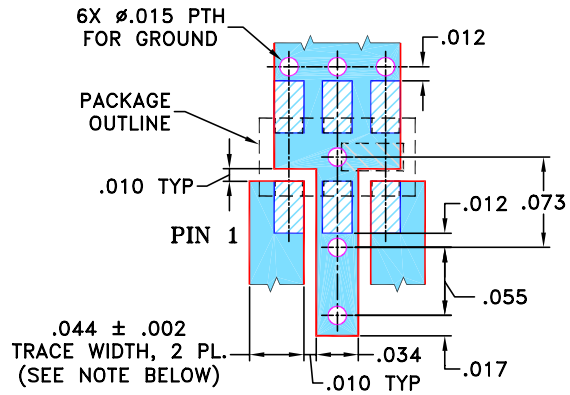
HFCN-3500D+

PIN CONNECTIONS

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

PRODUCT MARKING: H4

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

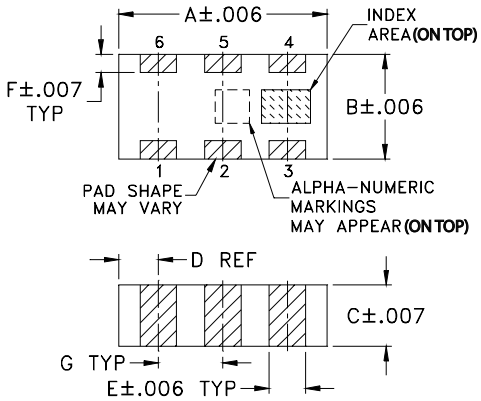


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS: .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

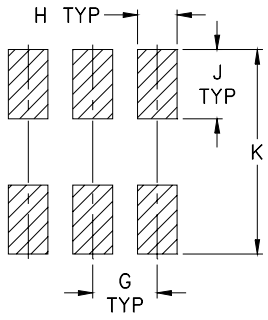
DENOTES PCB COPPER LAYOUT

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS (Inches / 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

TAPE & REEL INFORMATION: F75

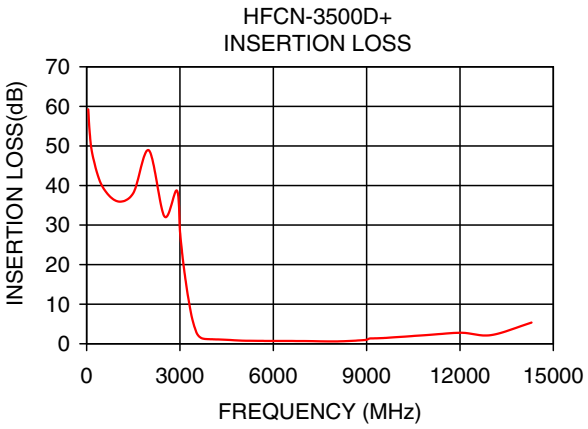
CERAMIC

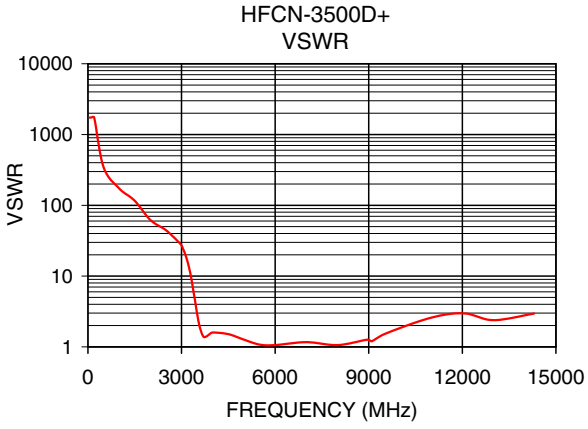
High Pass Filter

HFCN-3500D+

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





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

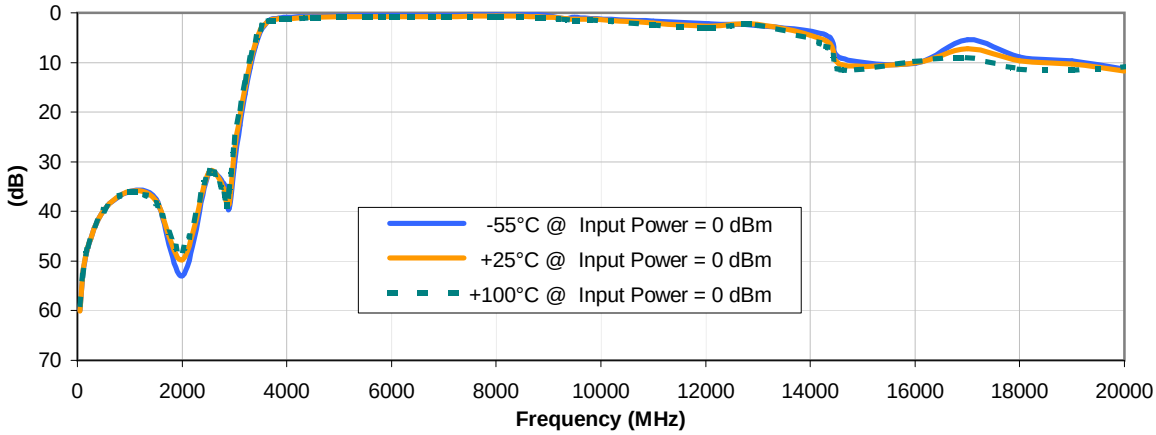
Ceramic High Pass Filter HFCN-3500D+

Typical Performance Data

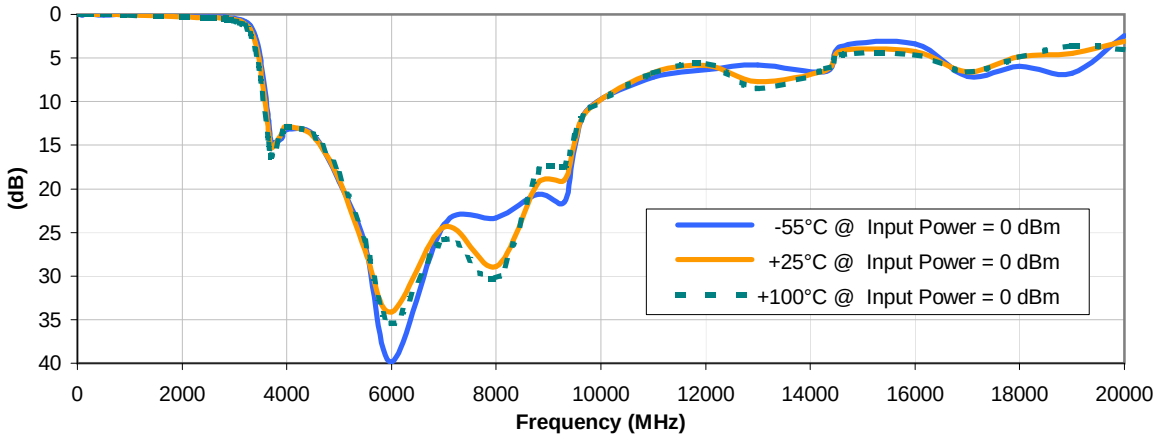
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
50	59.91	60.08	58.78	0.03	0.02	0.02	0.01	0.01	0.01
100	53.31	53.23	52.94	0.04	0.03	0.03	0.02	0.01	0.01
200	47.47	47.26	47.04	0.03	0.01	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

Typical Performance Curves

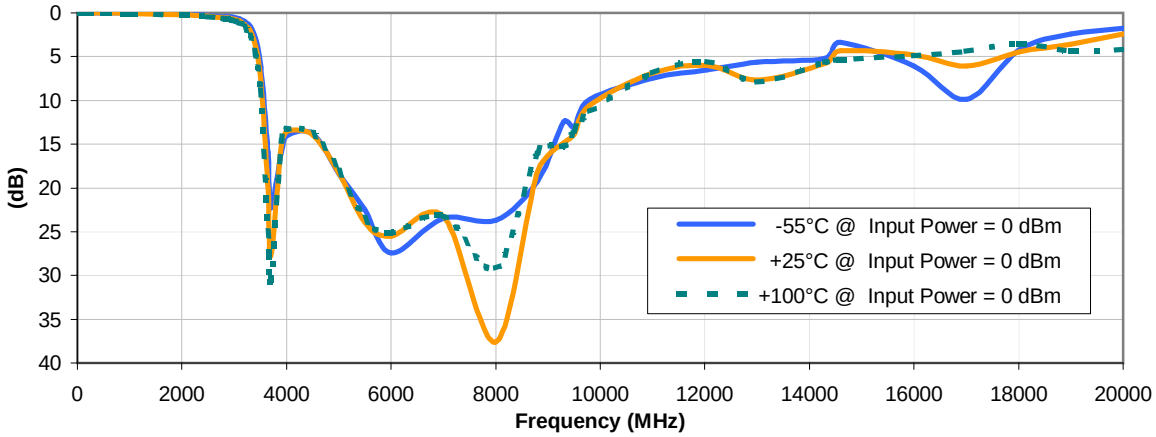
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



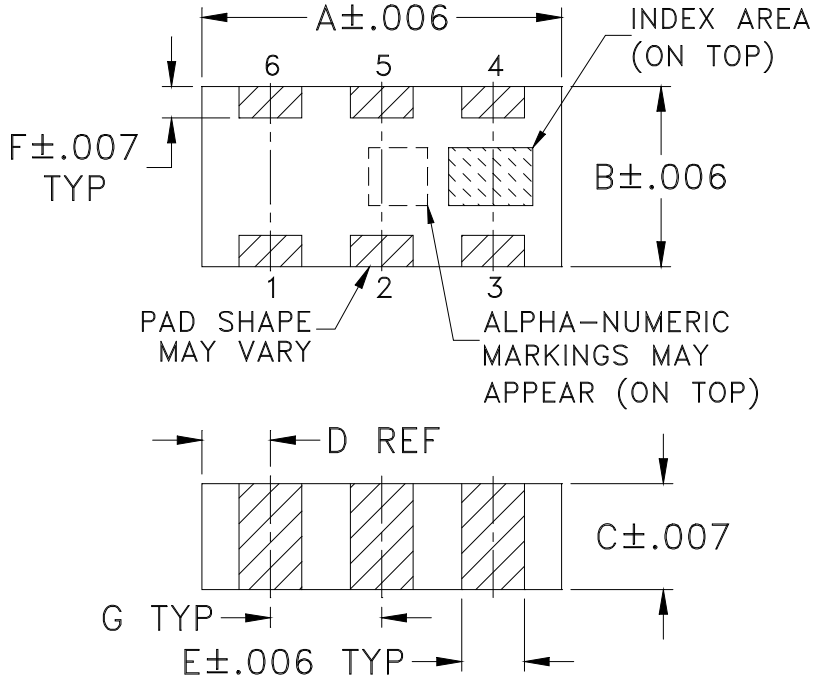
OUTPUT RETURN LOSS vs. TEMPERATURE



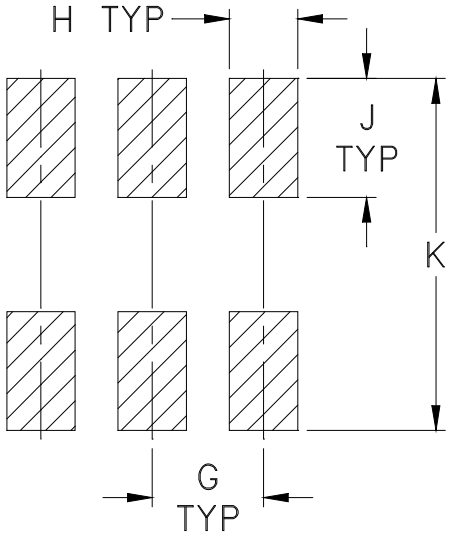
Case Style FV

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

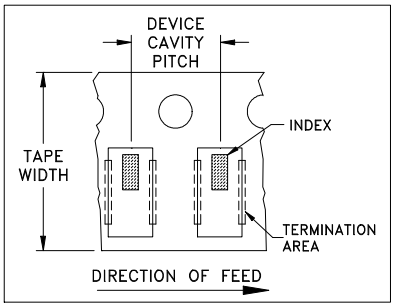


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

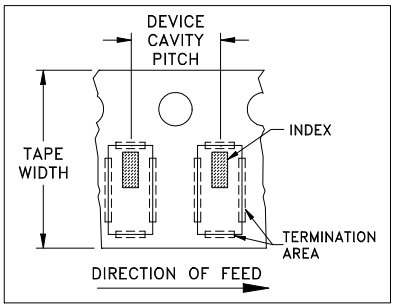


ILLUSTRATION 2

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

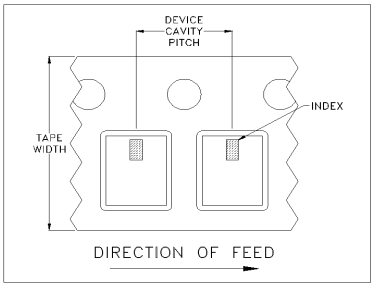


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
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.

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

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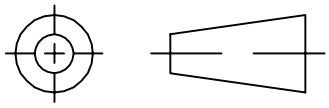
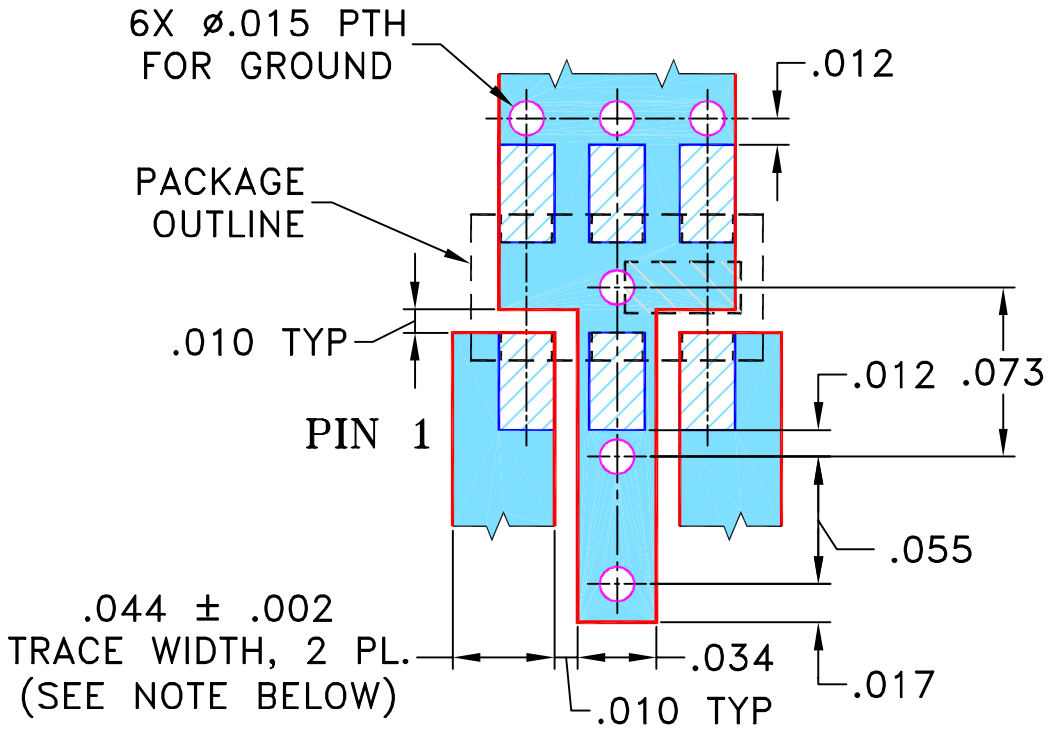
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION



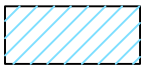
REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M92199	NEW RELEASE	05/24/04	AV	ABD
A	M99247	ADD GROUND PTH	06/05	RZ	RZ
A	R60782	ADD GROUND PTH	06/05	RZ	RZ
B	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

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

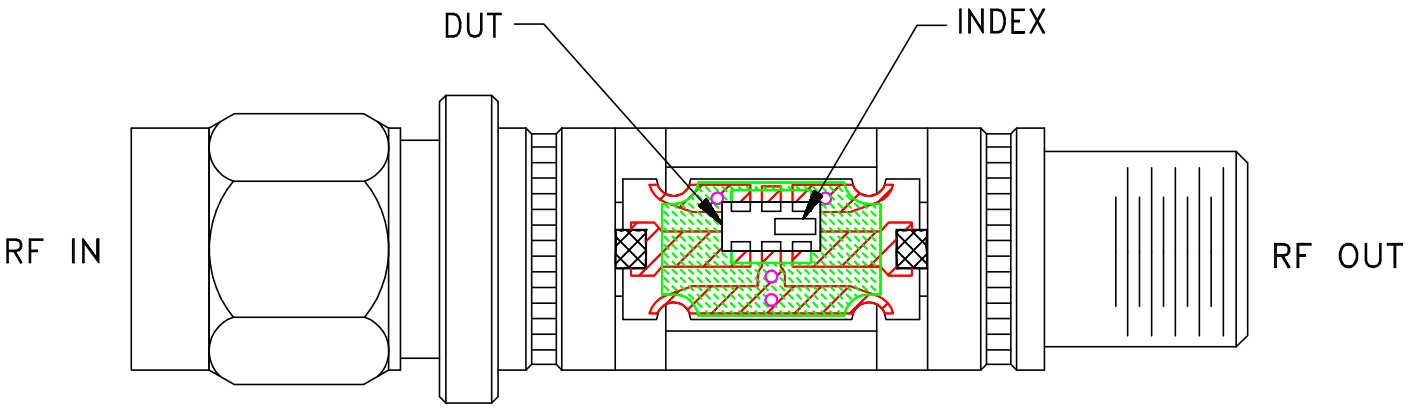
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

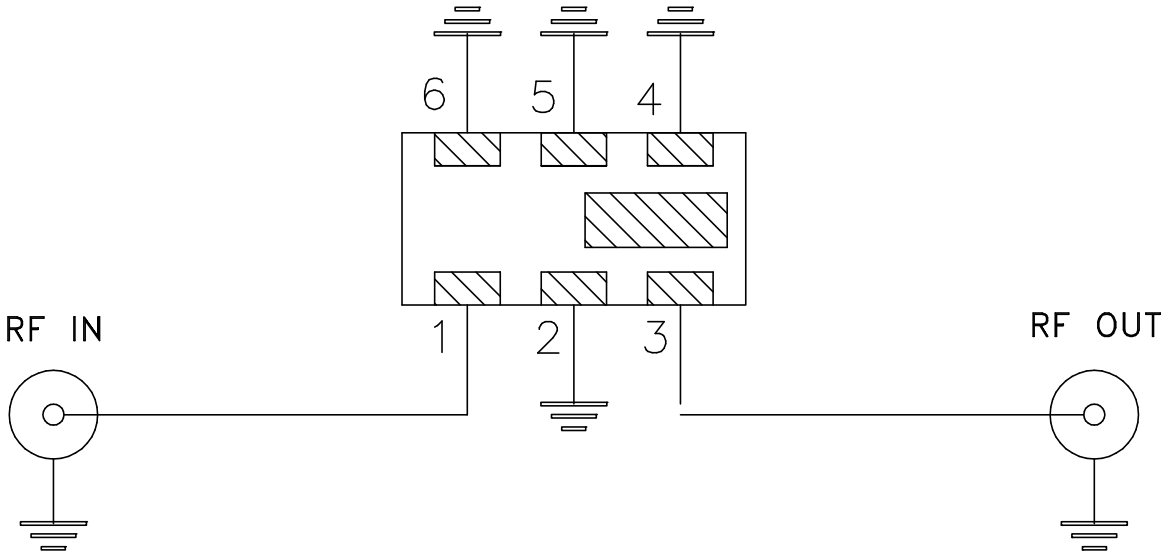
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

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