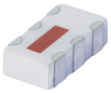
NON-CATALOG

Ceramic

High Pass Filter

HFCN-5500

50Ω 6000 to 11500 MHz



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

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

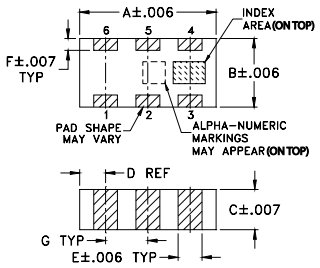
Features

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

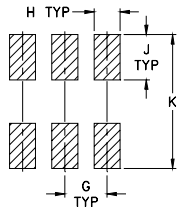
Applications

- Sub-harmonic rejection
- Transmitters / receivers

Outline Drawing



PCB Land Pattern



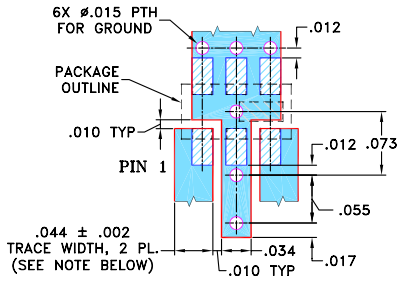
Suggested Layout, Tolerance to be within ±.002

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

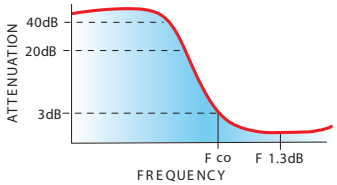
DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Electrical Specifications[1,2] at 25°C

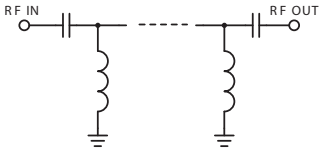
STOPBAND (MHz) (Loss > 30dB) Typ.	STOPBAND (MHz) (Loss > 20dB) Min.	fco, MHz Nom. (Loss 3 dB) Typ.	PASSBAND (MHz) (Loss < 1.5dB) Max.	PASSBAND (MHz) (Loss < 2dB) Max.	VSWR Typ. Stopband	VSWR Typ. Frequency (MHz) 1.5:1	POWER INPUT (W) Max.	NO. OF SECTIONS
4000	4500	5500	6600-10000	6000-11500	20:1	5600-11000	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



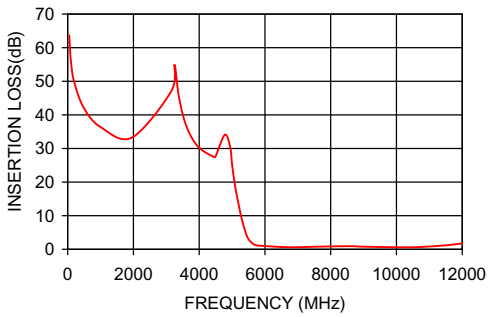
electrical schematic



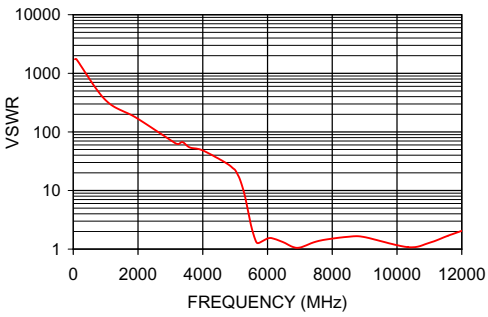
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
50	63.32	1737.18
500	41.73	868.59
1000	36.12	434.30
3250	44.07	62.05
4000	32.16	45.72
4500	27.90	34.75
5000	26.03	22.29
5500	3.24	2.44
5600	2.05	1.53
6000	1.39	1.53
6600	1.05	1.22
9000	1.09	1.60
10000	0.79	1.24
11500	1.18	1.64
12000	1.71	2.05

HFCN-5500
INSERTION LOSS



HFCN-5500
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

Ceramic High Pass Filter HFCN-5500

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -40˚ C	@ +25˚ C	@ +85˚ C	@ -40˚ C	@ +25˚ C	@ +85˚ C	@ -40˚ C	@ +25˚ C	@ +85˚ C
50	61.64	62.05	61.62	0.02	0.00	0.02	0.01	0.00	0.01
100	55.95	55.66	55.70	0.01	0.00	0.01	0.00	0.01	0.00
200	49.89	49.74	49.54	0.00	0.01	0.00	0.00	0.00	0.00
300	46.30	46.26	46.16	0.00	0.00	0.01	0.02	0.01	0.01
400	43.80	43.84	43.75	0.00	0.01	0.02	0.01	0.01	0.02
500	41.91	41.94	41.93	0.00	0.01	0.02	0.02	0.01	0.02
600	40.38	40.44	40.46	0.00	0.02	0.03	0.02	0.02	0.03
700	39.11	39.16	39.21	0.00	0.02	0.04	0.02	0.02	0.03
800	38.10	38.11	38.16	0.01	0.02	0.04	0.03	0.01	0.03
900	37.22	37.20	37.26	0.01	0.04	0.06	0.03	0.02	0.04
1000	36.45	36.41	36.48	0.01	0.03	0.05	0.04	0.02	0.04
1100	35.78	35.75	35.83	0.01	0.05	0.07	0.04	0.02	0.05
1200	35.16	35.15	35.24	0.01	0.05	0.08	0.04	0.03	0.05
1300	34.68	34.67	34.75	0.01	0.06	0.09	0.05	0.02	0.04
1400	34.26	34.25	34.31	0.03	0.08	0.11	0.05	0.02	0.05
1500	33.88	33.90	33.93	0.02	0.07	0.10	0.06	0.01	0.05
1600	33.57	33.62	33.62	0.04	0.09	0.12	0.06	0.02	0.06
1700	33.37	33.41	33.39	0.03	0.08	0.11	0.04	0.04	0.08
1800	33.21	33.27	33.24	0.04	0.10	0.13	0.06	0.02	0.06
1900	33.11	33.21	33.17	0.06	0.11	0.14	0.05	0.03	0.07
2000	33.11	33.23	33.19	0.06	0.12	0.15	0.05	0.04	0.07
2100	33.20	33.31	33.26	0.07	0.13	0.16	0.06	0.04	0.07
2200	33.36	33.49	33.44	0.08	0.13	0.16	0.04	0.06	0.09
2300	33.56	33.75	33.70	0.08	0.14	0.16	0.03	0.06	0.10
2400	33.88	34.12	34.06	0.10	0.16	0.17	0.01	0.08	0.12
2500	34.36	34.64	34.57	0.10	0.16	0.18	0.00	0.09	0.13
2600	34.95	35.28	35.20	0.11	0.16	0.17	0.06	0.14	0.18
2700	35.74	36.16	36.06	0.13	0.20	0.21	0.01	0.10	0.12
2800	36.69	37.24	37.12	0.13	0.19	0.20	0.05	0.15	0.18
2900	37.93	38.68	38.44	0.15	0.21	0.22	0.05	0.13	0.16
3000	39.51	40.62	40.27	0.15	0.23	0.24	0.07	0.17	0.19
3100	41.69	43.49	42.68	0.18	0.23	0.25	0.12	0.20	0.24
3200	44.80	48.49	46.61	0.17	0.24	0.27	0.13	0.19	0.22
3250	47.18	52.81	49.77	0.20	0.25	0.27	0.12	0.21	0.24
3300	49.72	62.22	53.69	0.21	0.26	0.28	0.17	0.23	0.28
3400	52.76	50.95	54.92	0.22	0.28	0.30	0.18	0.23	0.28
3500	44.17	43.29	45.47	0.23	0.29	0.33	0.21	0.25	0.31
3700	34.35	35.75	35.49	0.24	0.31	0.39	0.29	0.30	0.41
3800	31.82	33.36	32.67	0.28	0.34	0.44	0.29	0.32	0.47
4000	29.31	30.05	28.77	0.27	0.37	0.46	0.32	0.37	0.47
4500	26.65	26.98	26.72	0.32	0.48	0.60	0.43	0.54	0.59
5000	34.00	31.34	29.73	0.48	0.70	0.89	0.71	0.93	1.08
5500	4.64	4.22	3.96	3.96	5.03	5.92	3.72	4.97	6.02
5600	2.54	2.33	2.29	7.36	9.40	10.74	7.00	9.13	10.71
6000	0.71	0.92	1.06	16.49	16.82	17.35	16.55	17.03	17.58
6500	0.46	0.64	0.78	18.01	19.78	21.05	18.70	20.98	22.83
6600	0.43	0.62	0.77	20.79	22.38	23.38	21.90	24.01	25.16
7000	0.36	0.58	0.74	20.87	21.33	21.84	22.08	21.19	19.93
7500	0.50	0.71	0.89	13.36	14.14	14.71	13.87	14.38	14.31
8000	0.53	0.79	1.01	11.45	11.70	11.82	12.30	12.57	12.54
8500	0.51	0.79	1.03	11.21	11.24	11.29	12.16	12.57	12.95
9000	0.40	0.69	0.93	12.90	12.44	12.01	13.13	13.82	14.11
9500	0.28	0.59	0.86	17.28	15.63	13.96	16.49	16.58	15.91
10000	0.33	0.69	1.20	21.59	23.71	19.21	20.44	23.03	20.37
10500	0.73	0.69	0.95	39.82	20.15	18.52	21.02	22.02	20.57
11000	0.39	0.66	1.10	15.49	13.43	11.59	14.46	13.33	12.58
11500	0.56	0.86	1.42	9.28	9.54	8.45	9.20	8.79	8.63
12000	1.30	1.35	1.74	5.94	6.55	6.45	6.45	6.51	6.75
12500	2.10	2.21	2.38	4.32	4.64	4.87	5.20	5.54	5.69
13000	2.90	3.11	3.21	3.54	3.81	3.95	3.92	4.54	4.88
13500	3.73	3.58	3.37	3.04	3.52	3.96	2.58	3.77	4.60

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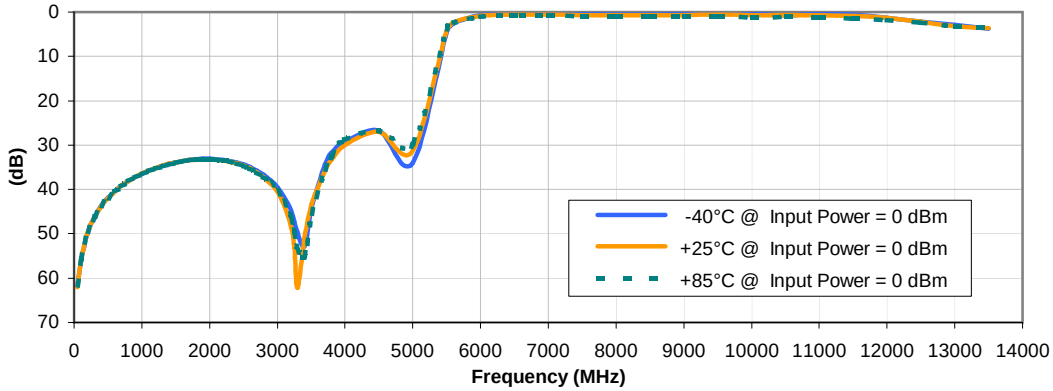
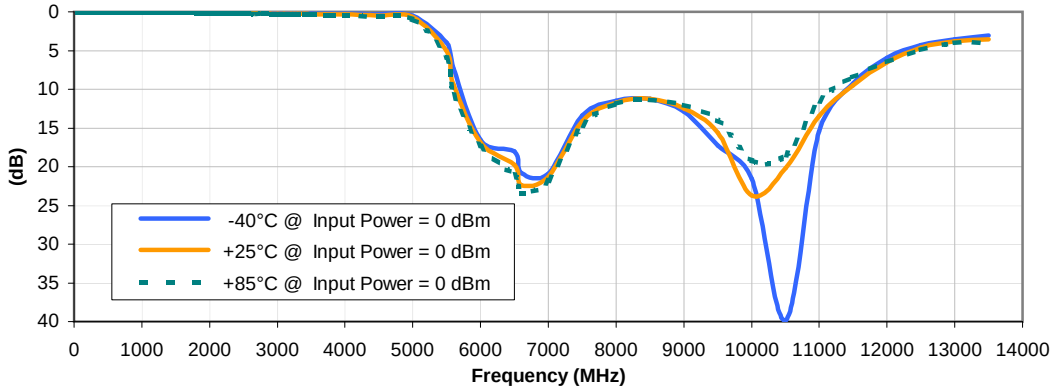
Ceramic High Pass Filter HFCN-5500

Typical Performance Curves

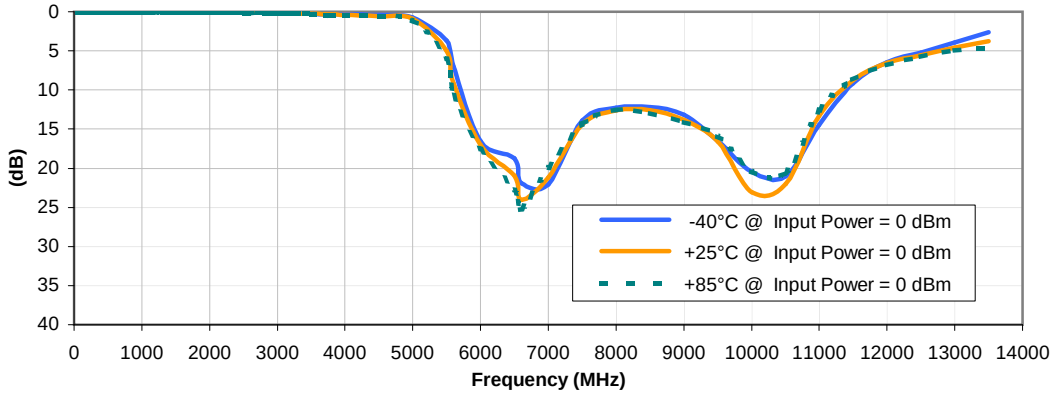
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



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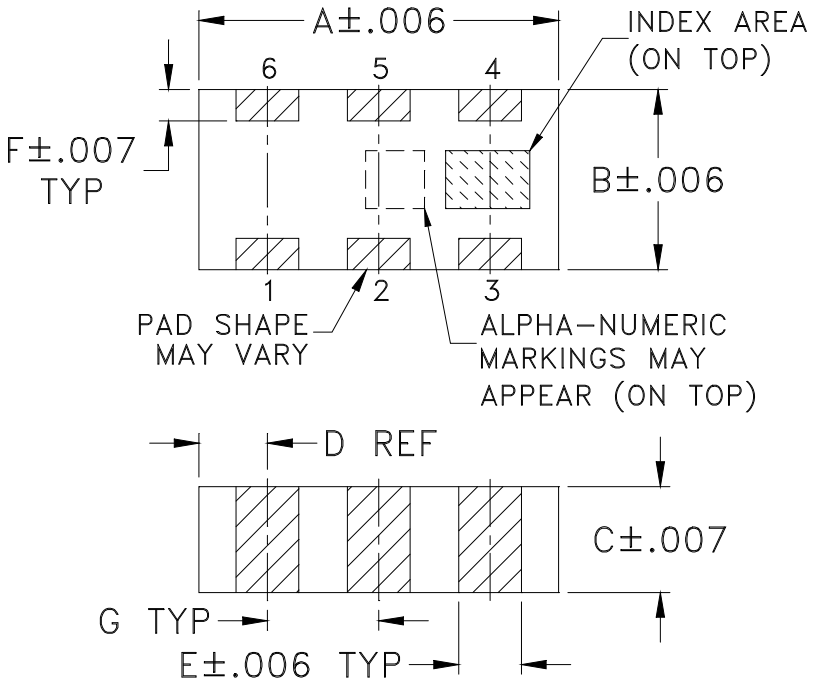
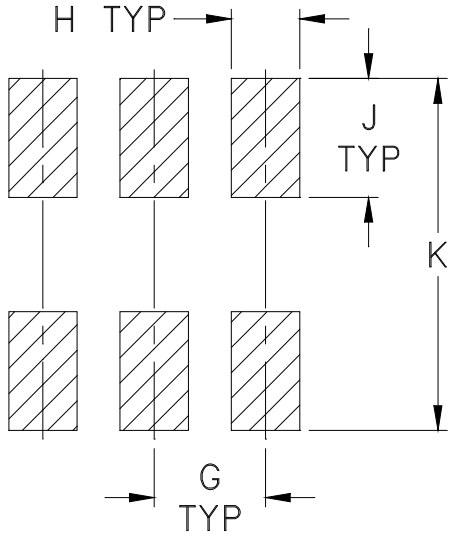
Case Style FV

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

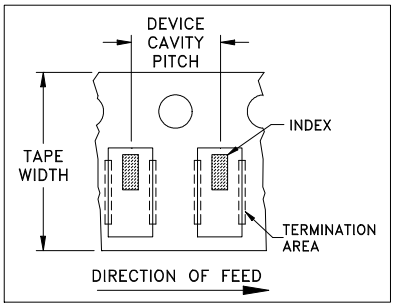

ILLUSTRATION 1

Applicable Case Styles
FV1206-1 FV1206-3

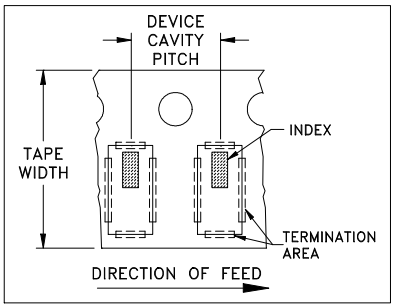

ILLUSTRATION 2

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

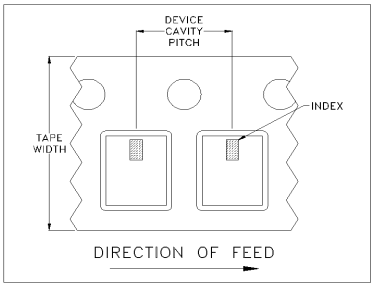

ILLUSTRATION 3

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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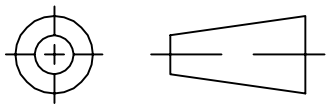
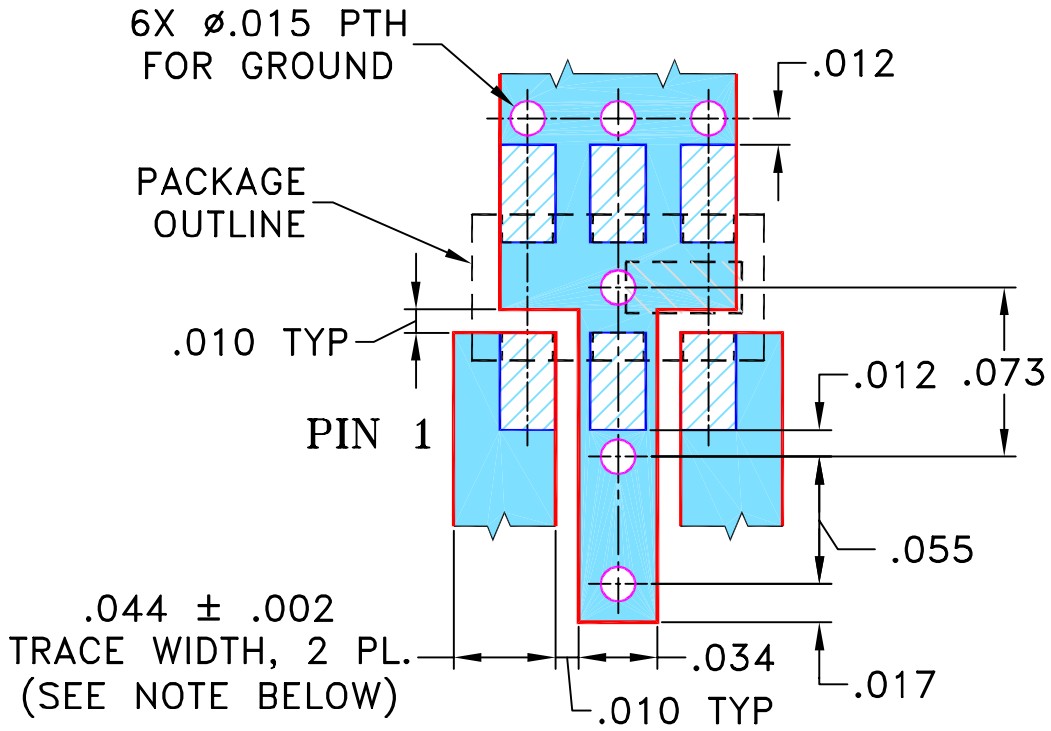
THIRD ANGLE PROJECTION



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

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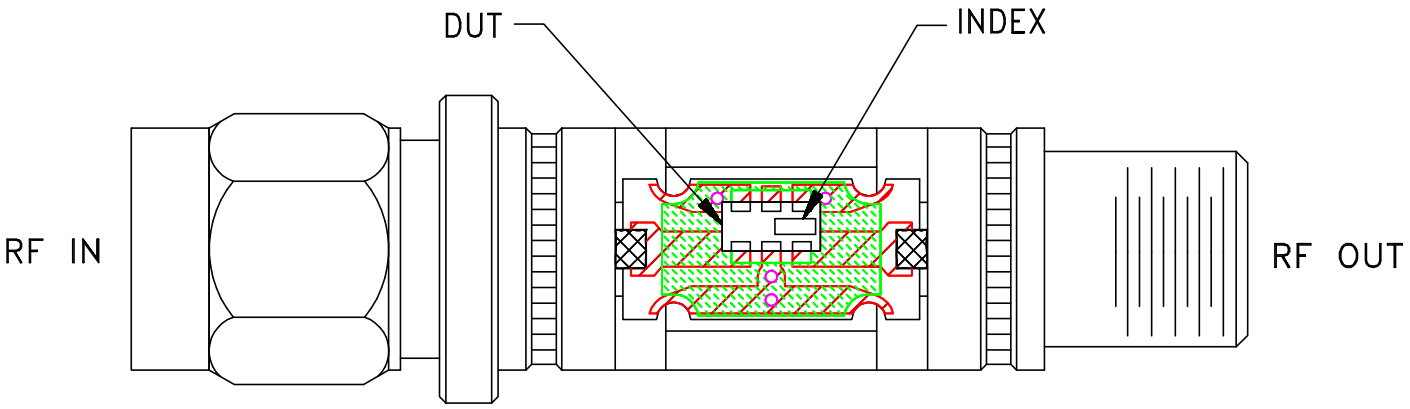
Brooklyn NY 11235

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

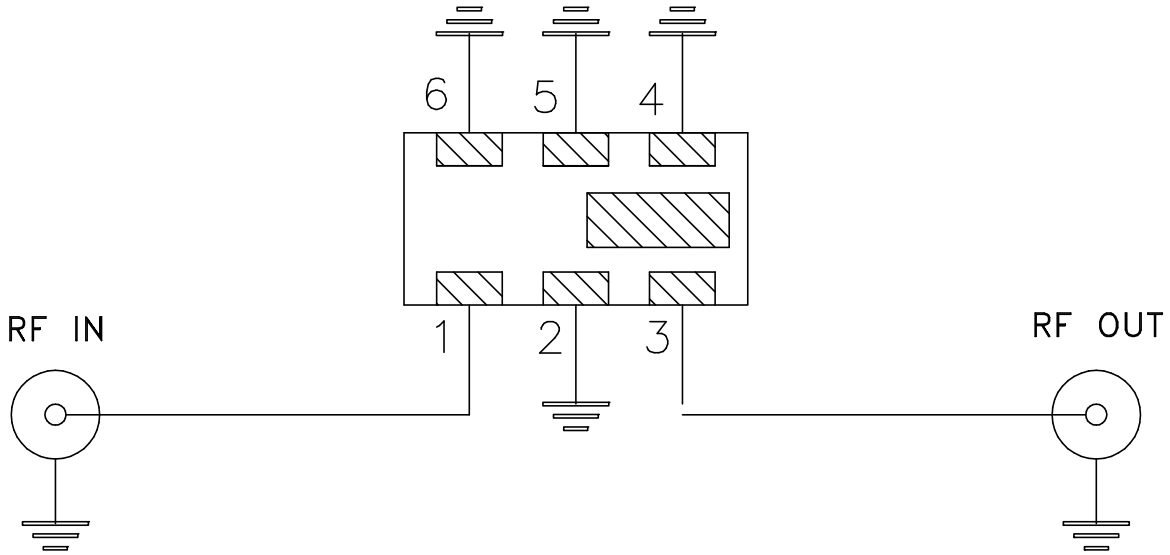
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

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 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

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