CERAMIC

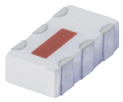
High Pass Filter

HFCN-8400D+

50Ω 9000 to 13000 MHz

THE BIG DEAL

- 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 web site for RoHS Compliance 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	5700	—	30	—	dB
		6000	20	—	—	
	Freq. Cut-Off	8400	—	3.0	—	dB
	VSWR	5700-6000	—	20	—	:1
Pass Band	Insertion Loss	9000-13000	—	—	3.0	dB
		9500-13000	—	—	2.5	dB
	VSWR	9000-13000	—	1.5	—	:1

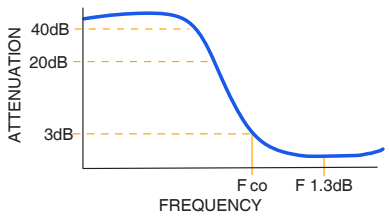
1. DC Resistance to ground is 100 Mohms min.
2. Measured on Mini-Circuits Characterization Test Board TB-285.

MAXIMUM RATINGS

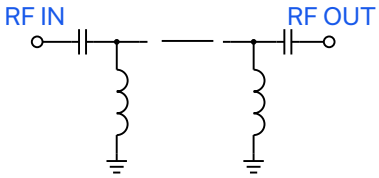
Parameter	Ratings
Operating temperature	-55°C to +100°C
Storage temperature	-55°C to +100°C
RF Power Input[3]	7W max.at 25°C
Max. DC Voltage at pins 1&3	25 VDC

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



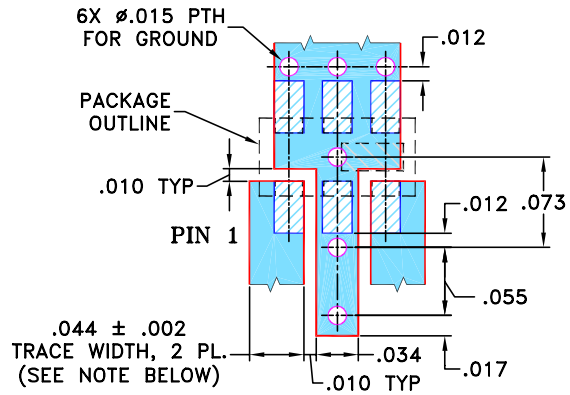
REV. D
ECO-025301
HFCN-8400D+
MCL NY
250428

PIN CONNECTIONS

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

PRODUCT MARKING: MT

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

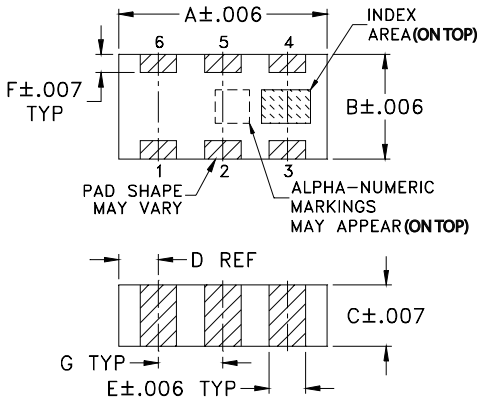


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS: .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

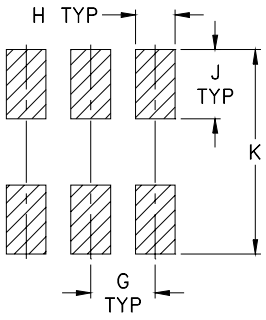
DENOTES PCB COPPER LAYOUT

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

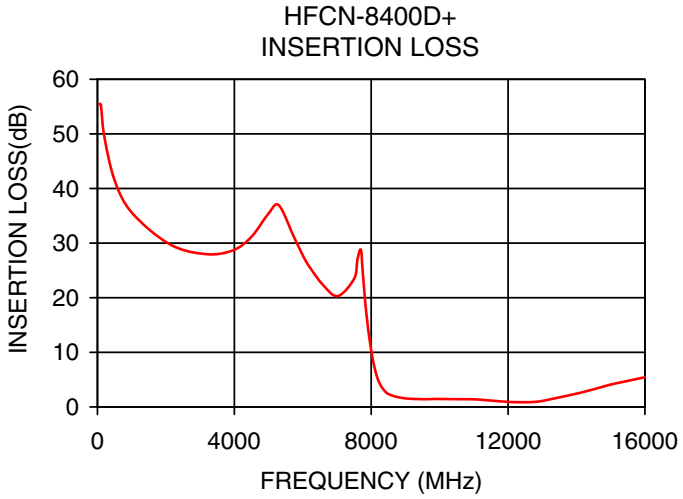
CERAMIC

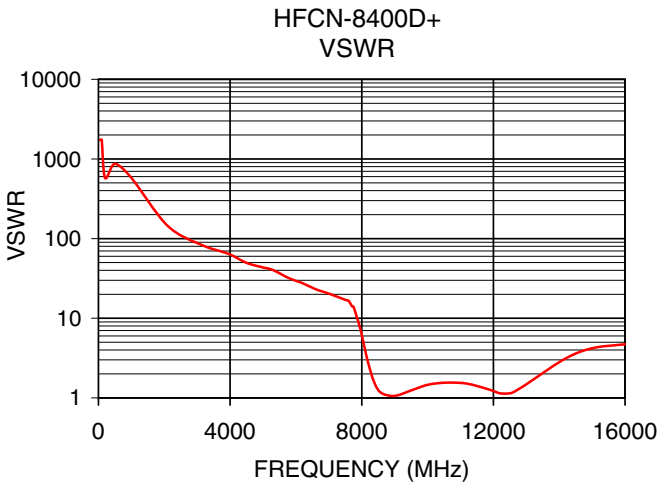
High Pass Filter

HFCN-8400D+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
50	55.48	1737.18
500	41.57	868.59
4500	31.17	49.64
5700	36.69	31.60
6000	27.78	29.46
7500	23.46	17.05
8020	9.65	5.68
8400	2.88	1.50
8600	2.11	1.15
9000	1.57	1.06
9500	1.43	1.24
10000	1.47	1.46
12000	0.92	1.22
13000	1.10	1.48
16000	5.43	4.72





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-8400D+

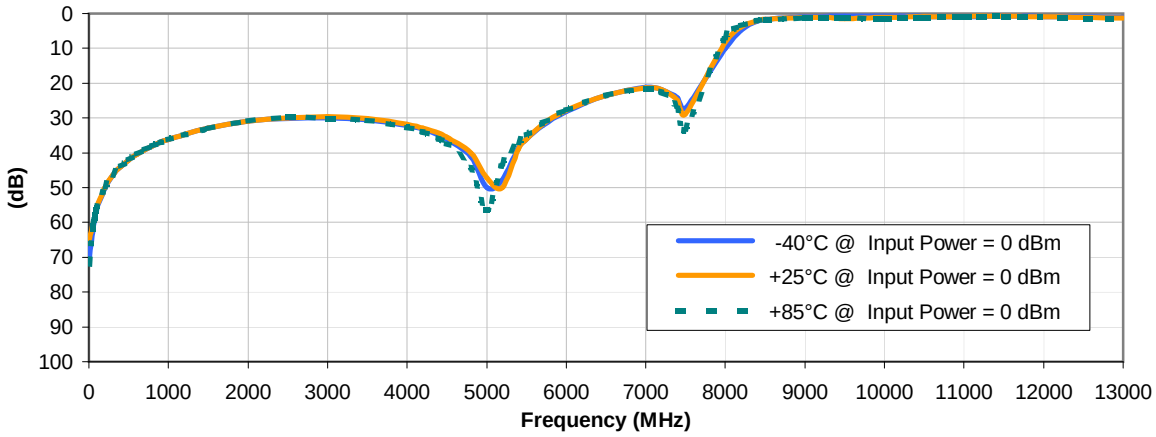
Typical Performance Data

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
10	69.84	64.76	72.03	0.03	0.01	0.01	0.00	0.00	0.00
50	62.39	60.58	61.01	0.02	0.00	0.00	0.01	0.00	0.00
60	61.11	60.38	60.01	0.02	0.00	0.00	0.00	0.00	0.00
70	59.10	58.85	58.81	0.01	0.00	0.00	0.00	0.00	0.00
80	57.81	57.88	58.22	0.01	0.00	0.00	0.00	0.01	0.01
90	57.25	56.64	56.53	0.01	0.00	0.00	0.00	0.00	0.01
100	56.09	55.68	55.95	0.00	0.00	0.00	0.00	0.00	0.01
200	50.16	50.02	49.77	0.00	0.00	0.01	0.01	0.01	0.01
300	46.55	46.48	46.25	0.00	0.00	0.01	0.01	0.01	0.02
400	44.01	43.99	43.89	0.00	0.01	0.02	0.01	0.01	0.03
500	42.06	42.05	42.04	0.00	0.01	0.03	0.01	0.01	0.04
600	40.48	40.49	40.49	0.00	0.02	0.04	0.01	0.02	0.04
700	39.15	39.18	39.20	0.00	0.02	0.04	0.02	0.02	0.05
800	38.02	38.05	38.09	0.00	0.03	0.05	0.02	0.02	0.05
900	37.02	37.04	37.11	0.01	0.04	0.06	0.02	0.02	0.05
1000	36.17	36.16	36.25	0.01	0.03	0.06	0.03	0.01	0.06
1500	32.91	32.92	33.00	0.02	0.07	0.11	0.06	0.01	0.06
2000	30.82	30.97	30.94	0.07	0.12	0.16	0.05	0.02	0.08
2500	30.14	29.90	29.78	0.12	0.16	0.21	0.01	0.04	0.12
3000	29.96	29.65	30.17	0.16	0.21	0.25	0.04	0.09	0.17
3500	30.52	30.21	30.79	0.18	0.25	0.30	0.10	0.13	0.20
4000	32.14	31.86	32.67	0.22	0.30	0.36	0.17	0.18	0.26
4200	33.29	32.92	34.02	0.20	0.29	0.36	0.21	0.22	0.28
4400	34.89	34.44	35.99	0.22	0.33	0.41	0.24	0.25	0.31
4500	35.97	35.42	37.29	0.24	0.35	0.44	0.25	0.26	0.34
4800	41.14	40.06	44.35	0.25	0.39	0.49	0.33	0.34	0.42
5000	49.96	47.25	56.48	0.26	0.43	0.53	0.41	0.42	0.48
5200	47.77	50.03	43.26	0.25	0.45	0.56	0.48	0.50	0.57
5400	38.69	38.97	36.91	0.23	0.47	0.58	0.50	0.56	0.65
5500	36.08	36.03	34.84	0.25	0.52	0.64	0.54	0.61	0.70
5700	32.18	31.77	31.40	0.23	0.51	0.68	0.61	0.69	0.80
6000	28.19	27.77	27.68	0.22	0.53	0.75	0.60	0.76	0.91
6500	23.55	23.45	23.47	0.19	0.52	0.81	0.73	0.96	1.18
7000	21.23	21.33	21.69	0.32	0.53	0.81	0.86	1.03	1.38
7200	21.79	21.91	22.67	0.44	0.60	0.85	0.81	1.04	1.46
7400	24.22	25.01	27.28	0.60	0.72	0.95	0.71	1.03	1.52
7500	27.25	28.94	33.14	0.66	0.74	1.00	0.66	1.04	1.59
8000	10.03	8.23	6.73	2.32	3.14	4.39	1.65	2.39	3.66
8200	4.77	3.91	3.41	4.95	6.77	8.80	4.17	5.43	7.25
8400	2.25	2.09	2.10	9.45	11.74	13.71	8.57	10.10	11.68
8500	1.68	1.67	1.80	11.87	13.96	15.50	10.87	12.42	13.59
9000	0.92	1.09	1.31	13.21	15.59	15.53	14.00	17.46	16.36
9200	0.87	1.12	1.30	12.69	14.15	13.83	13.76	16.72	15.11
9400	0.82	1.25	1.27	12.42	12.20	12.10	13.36	15.99	13.62
9500	0.80	1.42	1.32	12.21	11.16	11.53	13.14	15.40	12.97
10000	0.74	1.14	1.39	11.94	9.89	9.45	12.30	11.15	10.56
10200	0.72	1.05	1.34	11.70	9.91	9.27	11.62	10.54	10.15
10400	0.75	0.97	1.25	11.10	9.97	9.41	10.91	10.21	10.07
10500	0.84	0.98	1.26	10.82	9.95	9.53	10.53	10.20	10.13
11000	0.96	0.84	0.98	9.36	11.03	12.05	9.94	10.88	11.88
11200	0.89	0.78	0.90	9.65	11.73	13.49	10.44	11.79	13.32
11400	0.77	0.67	0.81	10.21	12.58	15.18	11.57	13.66	15.82
11500	0.72	0.71	0.84	10.78	13.47	16.35	12.32	15.07	17.79
13000	1.08	1.28	1.61	8.47	8.44	8.02	10.66	9.39	8.73

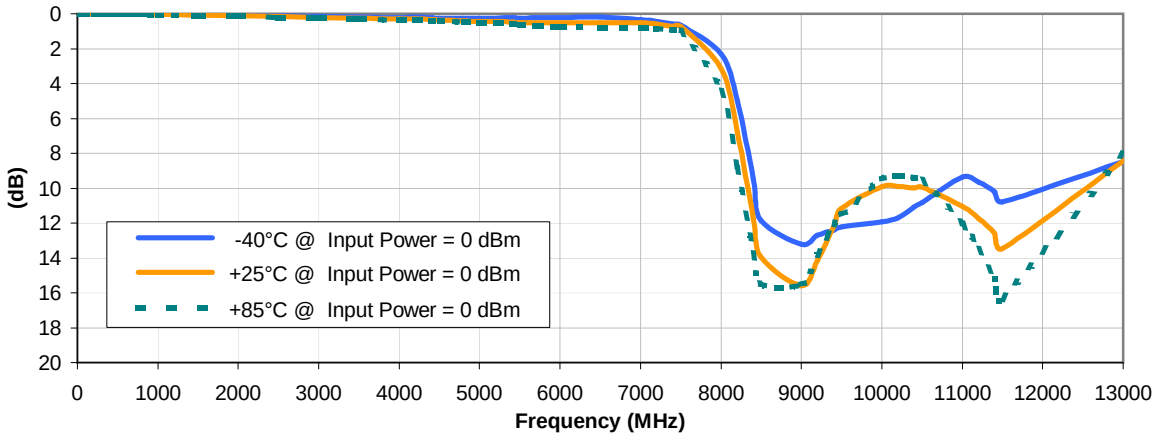
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The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

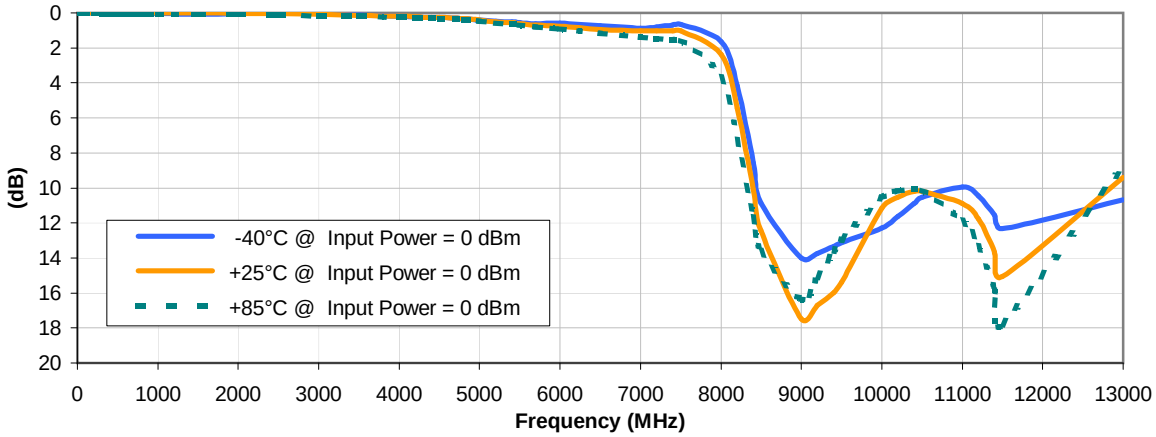
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

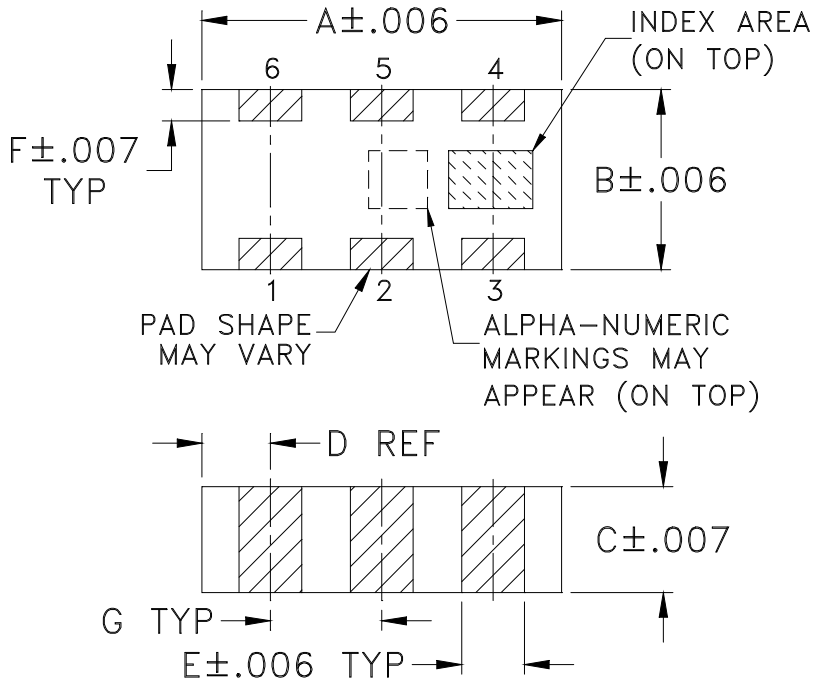


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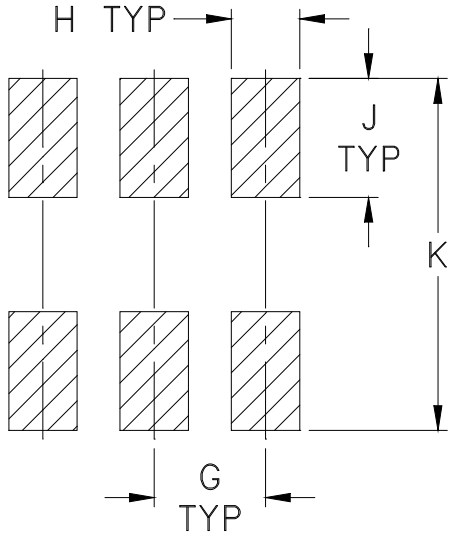
Case Style FV

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

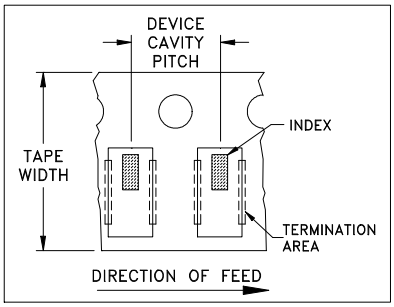


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

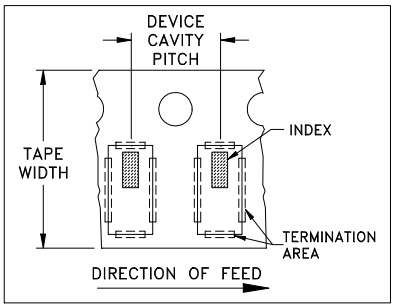


ILLUSTRATION 2

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

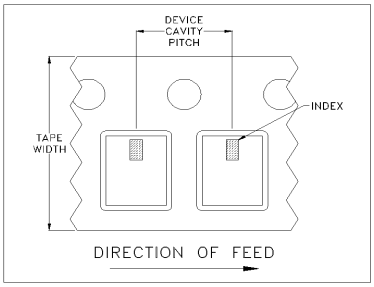


ILLUSTRATION 3

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.

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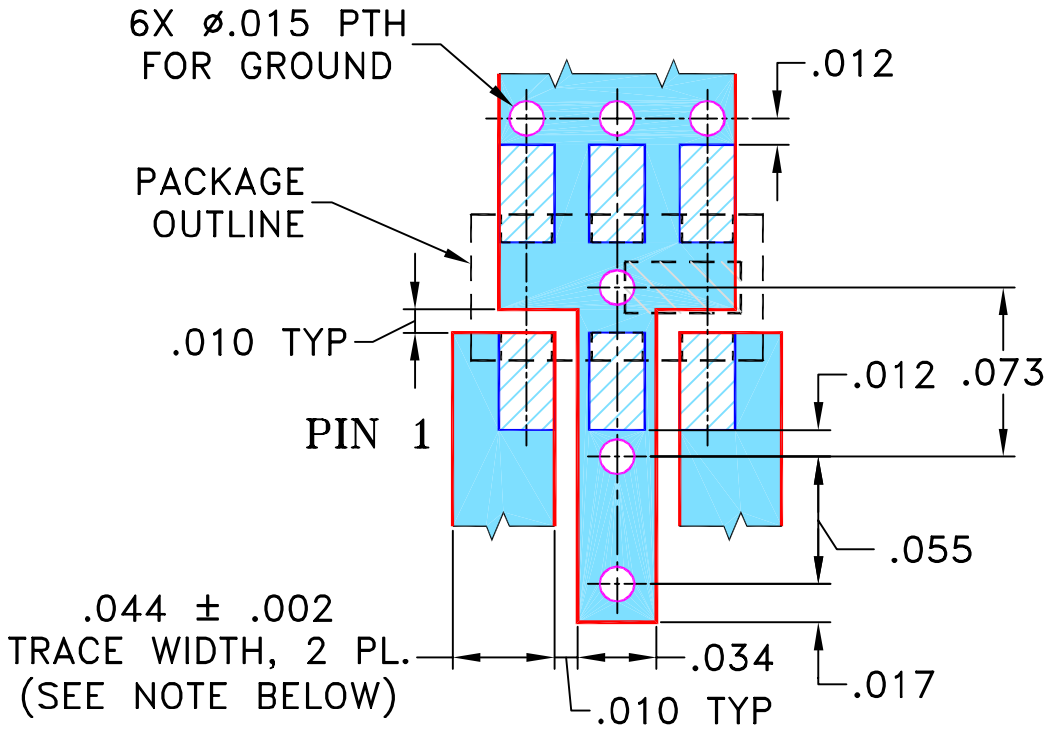
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THIRD ANGLE PROJECTION

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

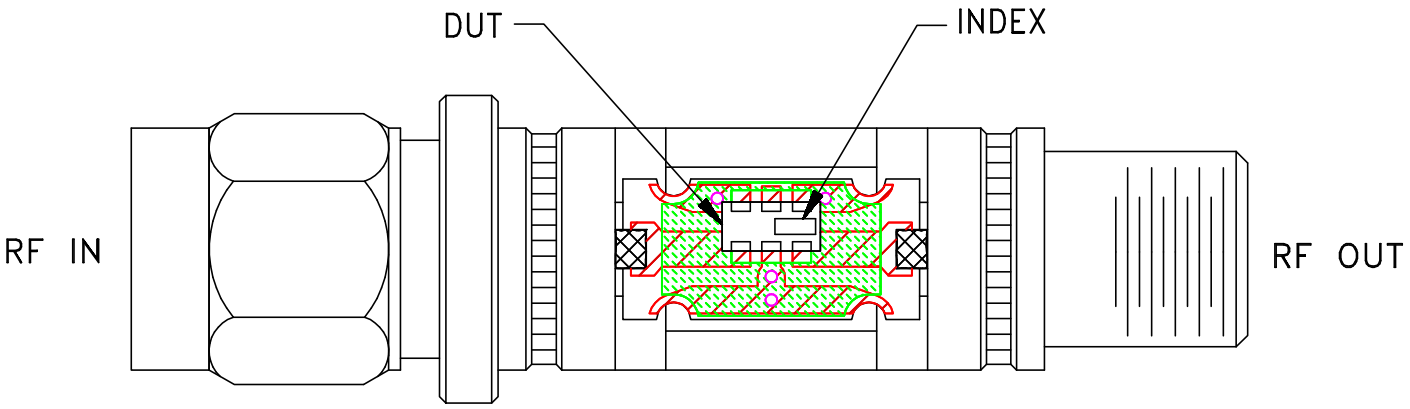
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PL, pr, FV1206-1, HFCN, TB-285

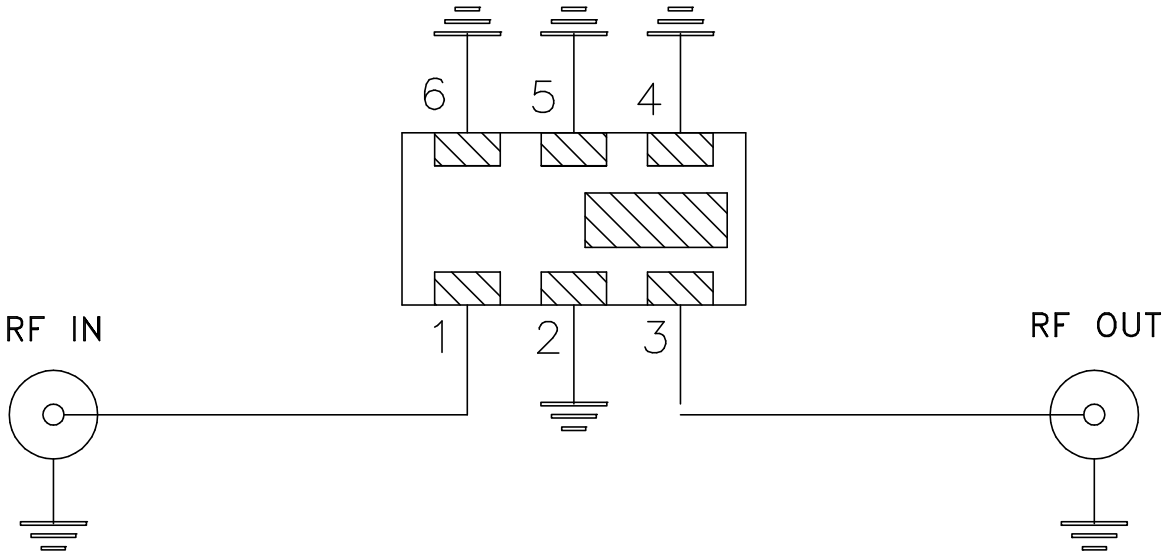
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-158	B

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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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

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