NON-CATALOG

Ceramic

Low Pass Filter

LFCN-4400

50Ω DC[1] to 4400 MHz

Generic photo used for illustration purposes only

CASE STYLE: FV1206

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	8W 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

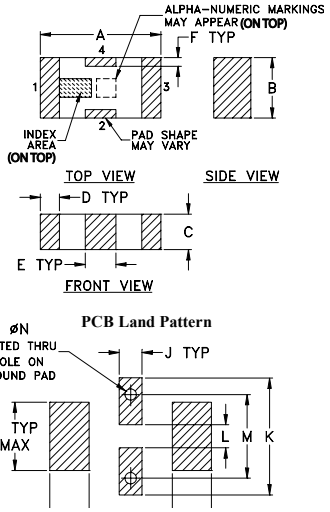
Features

- excellent power handling, 8W
- small size
- 7 sections
- temperature stable
- hermetically sealed
- LTCC construction
- protected by U.S. Patent 6,943,646

Applications

- harmonic rejection
- VHF/UHF transmitters/receivers
- lab use

Outline Drawing

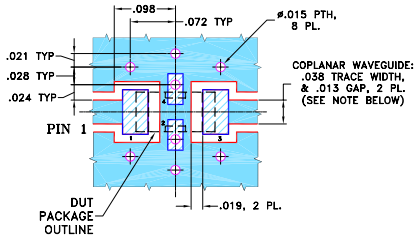


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.126	.063	.037	.020	.032	.009	.169
3.20	1.60	0.94	0.51	0.81	0.23	4.29

H	J	K	L	M	N	P	wt
.087	.024	.122	.024	.087	.012	.071	grams
2.21	0.61	3.10	0.61	2.21	0.30	1.80	.020

Demo Board MCL P/N: TB-270
Suggested PCB Layout (PL-137)



NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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

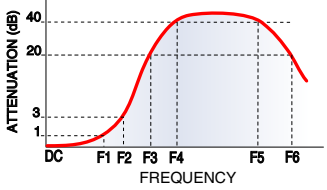
Electrical Specifications[1,2] at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-4400	—	—	1	dB
	Freq. Cut-Off	F2	5290	—	3.0	—	dB
	VSWR	DC-F1	DC-4400	—	1.2	—	:1
Stop Band	Rejection Loss	F3	6700	20	—	—	dB
		F4-F5	6280-9800	—	30	—	dB
		F5-F6	9800-13000	—	20	—	dB
	VSWR	F3-F6	6700-13000	—	17	—	:1

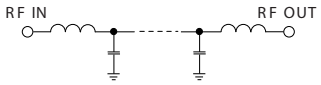
(1) In Application where DC voltage is present at either input or output ports, coupling capacitors are required. Alternatively, if DC pass IN-OUT is required, Mini-Circuits' "D" suffix version of this model will support DC IN-OUT, and provide>100 MOhm isolation to ground.

(2) Measured on Mini-Circuits Characterization Test Board TB-270.

Typical Frequency Response



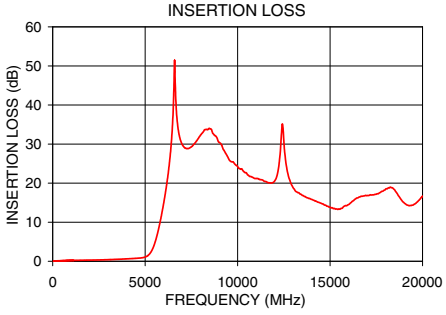
Electrical Schematic



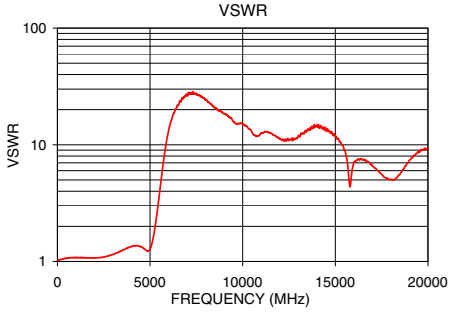
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
50	0.04	1.03
320	0.12	1.06
1340	0.24	1.08
3740	0.57	1.33
4400	0.75	1.39
5170	1.98	1.88
5290	2.99	2.62
5580	7.66	6.63
5860	14.61	13.09
6280	31.47	21.20
6700	31.52	26.33
7400	28.90	26.33
9800	24.24	14.26
13000	19.94	12.80
20000	17.61	11.53

LFCN-4400
INSERTION LOSS



LFCN-4400
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 Low Pass Filter LFCN-4400

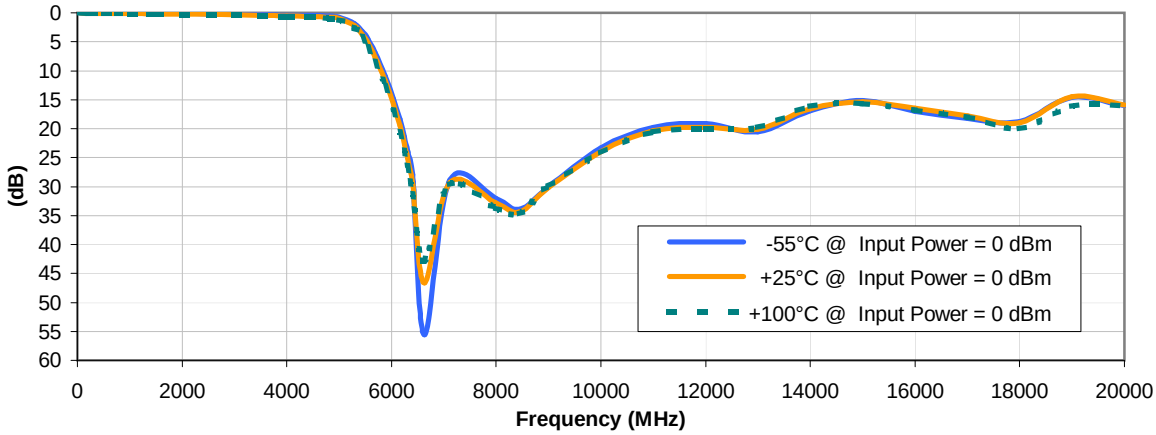
Typical Performance Data

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	0.02	0.04	0.05	38.06	33.69	31.00	37.93	33.57	30.87
250	0.06	0.08	0.09	28.39	32.96	36.06	28.23	33.34	39.79
500	0.06	0.10	0.13	29.22	30.42	32.94	29.31	30.86	36.83
750	0.08	0.13	0.16	27.97	28.34	29.75	28.30	28.86	32.33
1000	0.10	0.15	0.19	26.60	27.08	27.62	27.73	28.08	29.37
1500	0.14	0.21	0.26	25.47	25.72	25.48	26.76	27.22	26.58
2000	0.15	0.23	0.29	26.32	26.70	26.58	26.63	28.06	28.13
2500	0.17	0.25	0.34	27.95	28.62	26.66	28.34	30.73	30.35
3000	0.20	0.31	0.41	26.53	25.03	23.42	27.71	26.53	25.41
3500	0.27	0.40	0.51	18.99	18.92	18.82	19.62	19.72	19.72
4000	0.39	0.53	0.66	15.99	15.82	15.69	16.19	16.21	16.20
4400	0.46	0.61	0.78	16.26	15.96	15.36	16.25	15.98	15.47
4830	0.57	0.76	0.94	22.57	23.31	23.24	19.53	19.57	19.62
5000	0.76	0.98	1.17	18.00	18.34	19.02	15.68	15.93	16.46
5290	1.89	2.26	2.62	8.53	8.20	8.04	7.74	7.61	7.58
5440	3.19	3.71	4.23	5.44	5.17	5.04	4.90	4.79	4.73
5550	4.57	5.21	5.83	3.80	3.66	3.60	3.43	3.37	3.35
5690	6.87	7.60	8.38	2.40	2.43	2.47	2.18	2.22	2.24
5880	10.89	11.70	12.57	1.40	1.48	1.57	1.17	1.35	1.43
6040	14.91	15.82	16.79	0.90	1.06	1.20	0.81	1.00	1.09
6160	18.37	19.46	20.51	0.69	0.87	1.03	0.72	0.87	0.95
6250	21.41	22.62	23.78	0.58	0.76	0.93	0.66	0.81	0.89
6310	23.82	25.12	26.39	0.56	0.73	0.88	0.58	0.74	0.84
6400	27.99	29.61	31.26	0.48	0.65	0.80	0.54	0.72	0.83
6620	55.54	46.63	42.80	0.44	0.58	0.70	0.47	0.68	0.81
7120	28.82	29.32	29.60	0.31	0.47	0.58	0.46	0.68	0.85
8000	31.99	32.78	33.72	0.26	0.47	0.68	0.53	0.80	1.03
8450	33.90	34.39	34.74	0.29	0.55	0.85	0.63	0.86	1.12
9000	30.11	30.12	29.93	0.40	0.67	0.99	0.69	0.95	1.23
10000	23.26	23.98	24.20	0.60	0.79	1.01	0.87	1.05	1.27
11000	19.80	20.30	20.59	0.66	0.83	0.98	1.25	1.43	1.57
12000	19.13	19.79	20.12	0.80	0.93	1.06	2.88	3.99	5.20
13000	20.51	20.15	19.73	0.63	0.81	1.10	1.72	2.07	2.19
14000	16.87	16.61	16.10	0.92	1.09	1.47	1.45	1.81	2.11
15000	15.17	15.35	15.68	1.47	1.65	2.03	2.37	2.51	2.84
16000	16.97	16.41	16.81	1.84	2.51	3.01	2.59	2.58	2.60
17000	18.27	17.83	17.97	1.88	2.17	3.14	1.49	1.98	2.12
18000	18.82	18.98	19.95	3.19	2.46	2.11	0.92	1.49	2.20
19000	14.59	14.42	16.15	1.43	1.78	1.49	3.06	3.04	3.37
20000	16.06	15.90	16.07	1.09	1.15	1.77	2.43	3.43	3.66

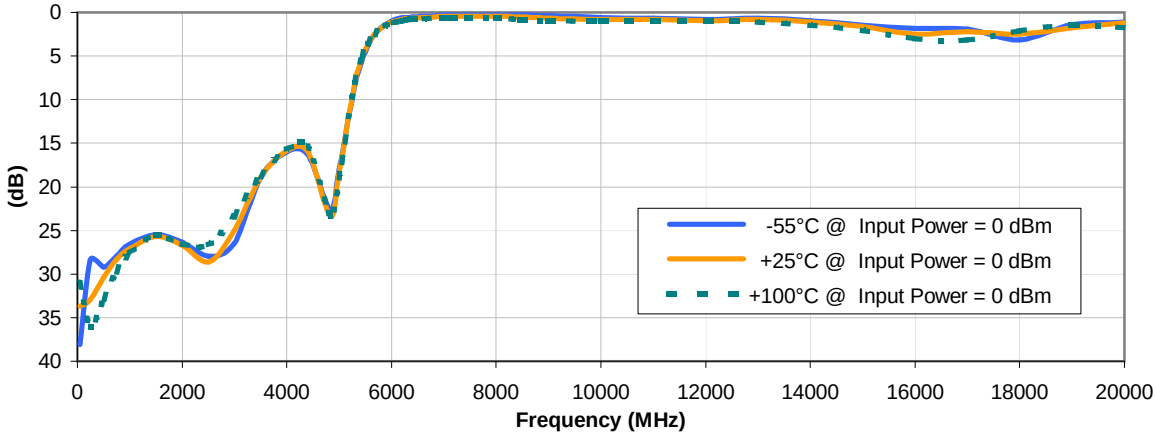
Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

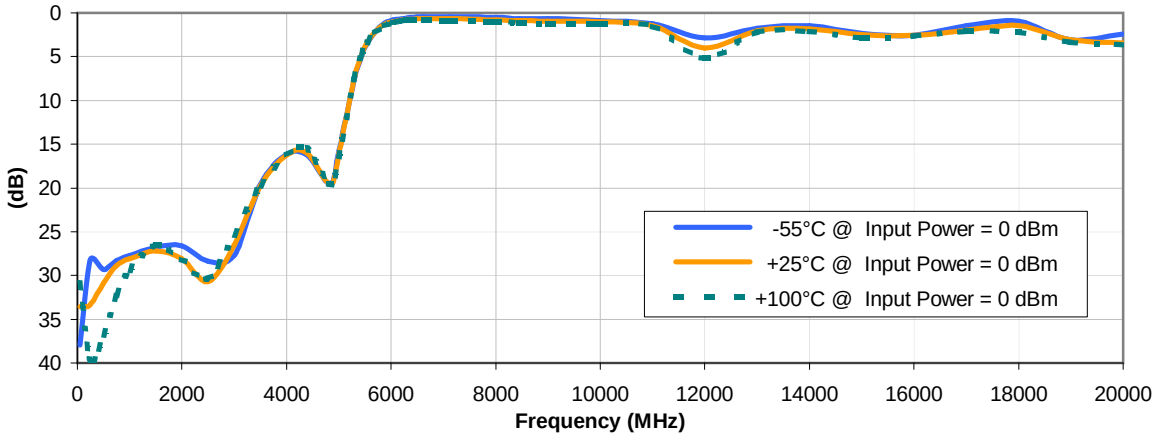
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

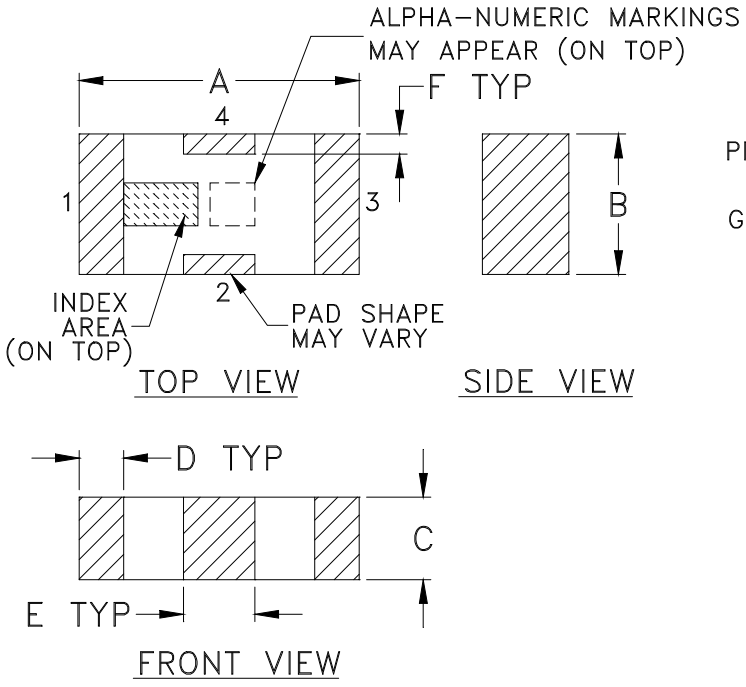


Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

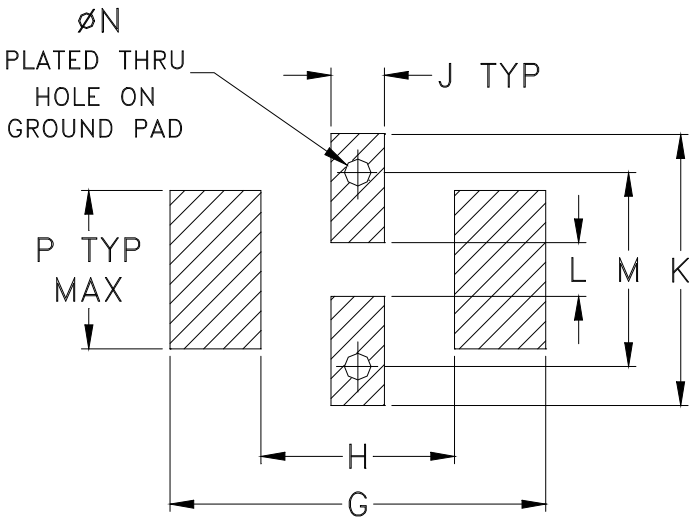
Case Style FV

FV1206

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	.126 (3.20)	.063 (1.60)	.037 (0.94)	.020 (0.51)	.032 (0.81)	.009 (0.23)	.169 (4.29)	.087 (2.21)	.024 (0.61)	.122 (3.10)	.024 (0.61)	.087 (2.21)	.012 (0.30)	.071 (1.80)	.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.

This document and its contents are the property of Mini-Circuits.

Tape & Reel Packaging TR-F71

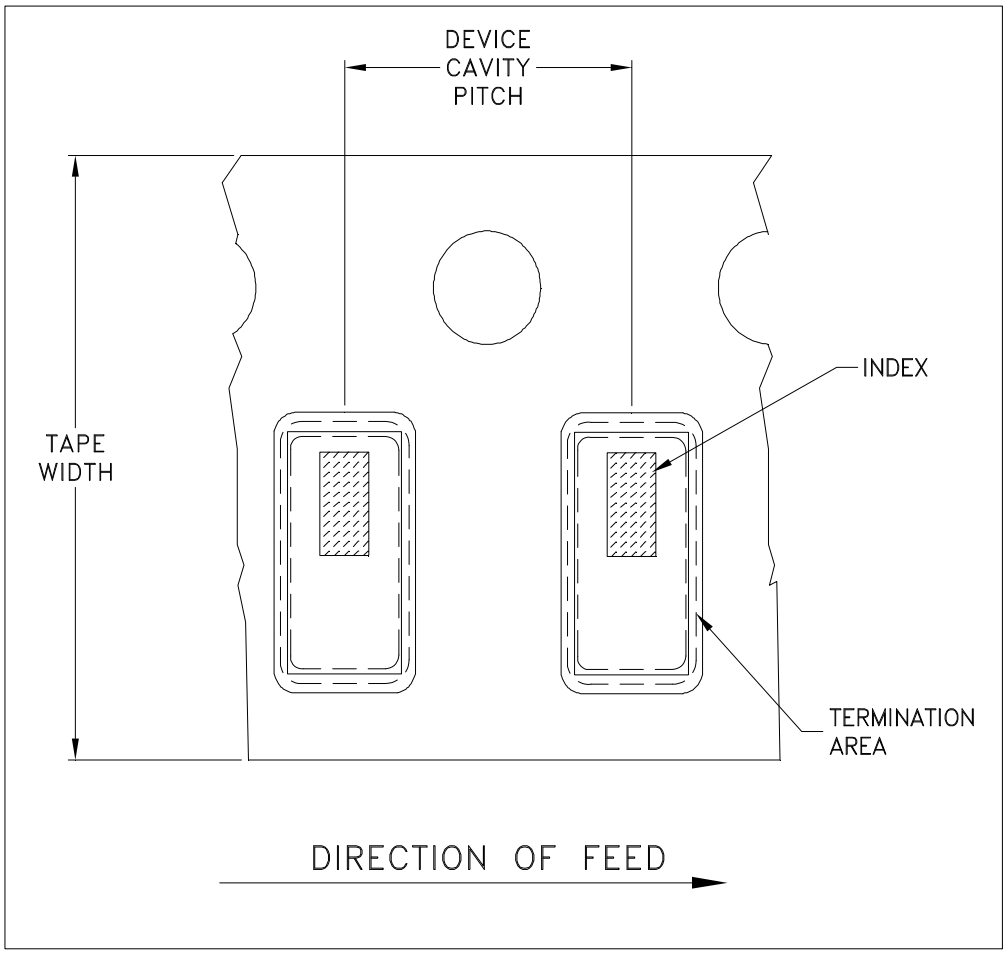


ILLUSTRATION 1

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.

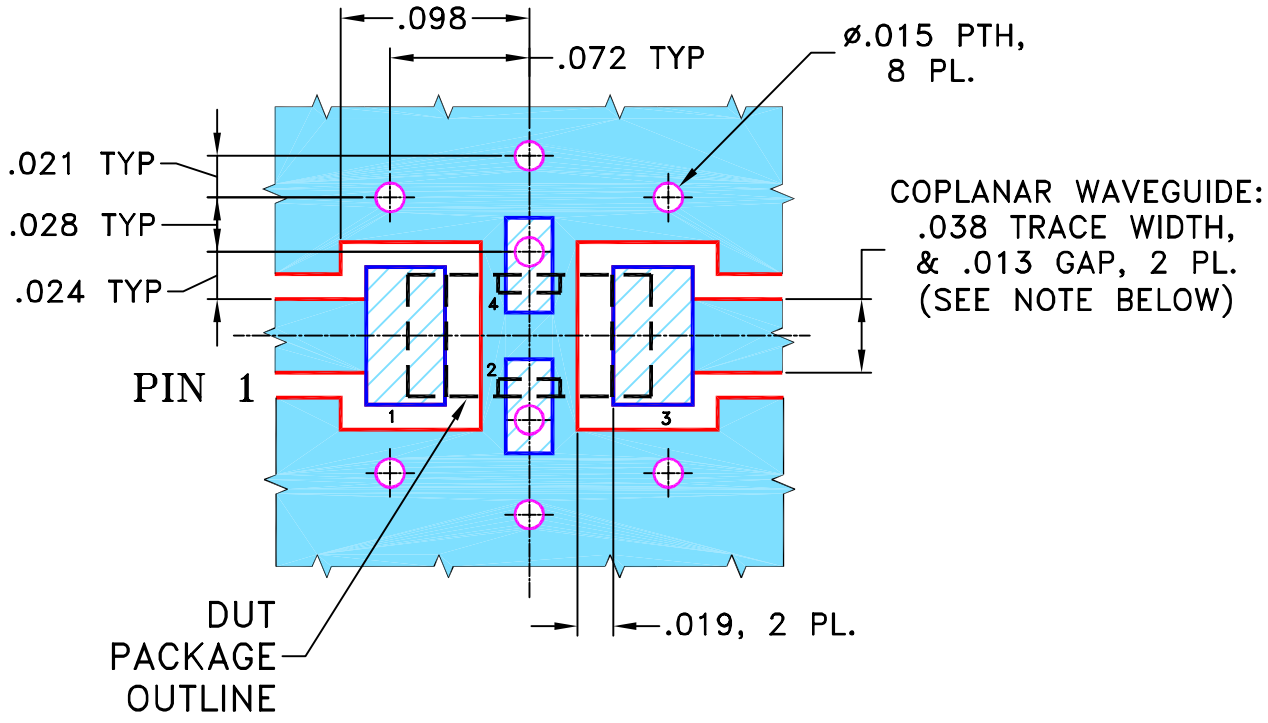
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

This document and its contents are the property of Mini-Circuits.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M88634	NEW RELEASE	08/28/03	GF	ABD
A	M102713	ADDED "...WITH SMOBC"	01/17/06	MMG	IL

SUGGESTED MOUNTING CONFIGURATION FOR FV1206 CASE STYLE, "nx" PIN CONNECTION



NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015".
   COPPER: 1/2 OZ. EACH SIDE.
   FOR OTHER MATERIALS TRACE WIDTH & GAP 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	GF	08/27/03
TOLERANCES ON:	CHECKED	AV	08/28/03
2 PL DECIMALS ±	APPROVED	ABD	08/28/03
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE , MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

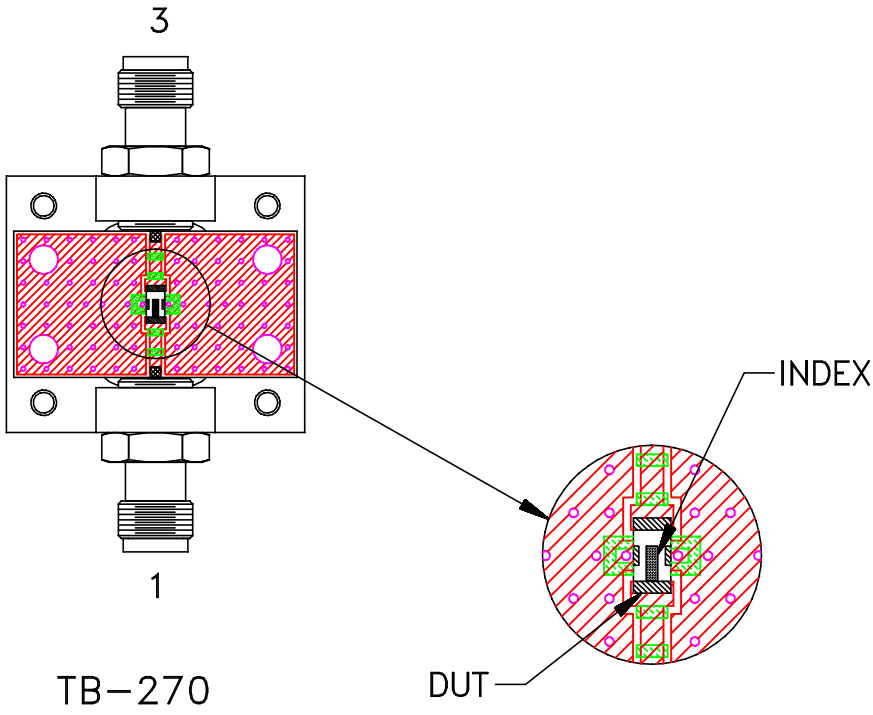
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, nx, FV1206, LFCN/HFCN, TB-270

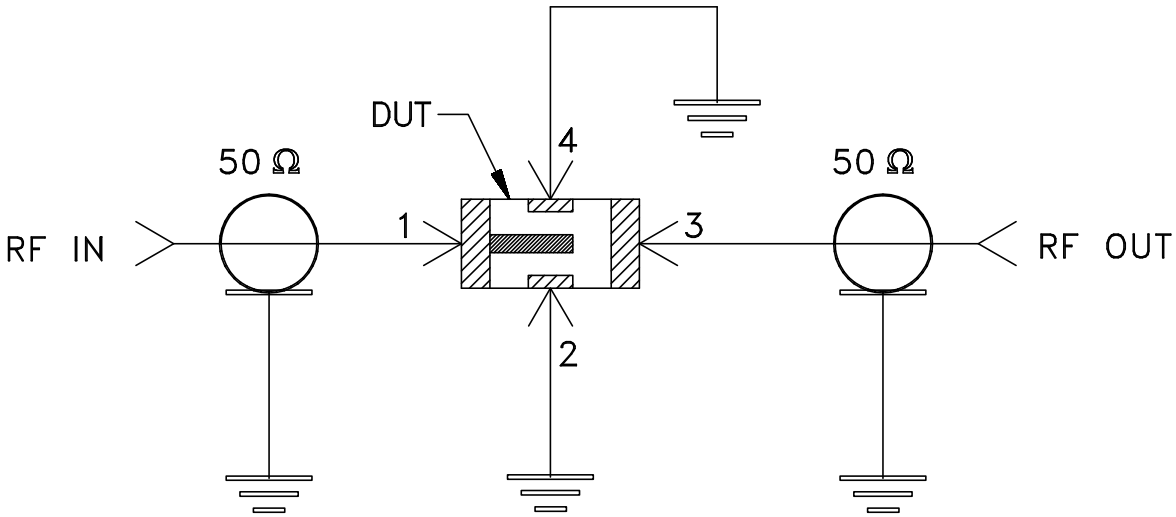
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-137	A

FILE:	SCALE:	SHEET:
98PL137	10:1	1 OF 1

Evaluation Board and Circuit



TB-270



Schematic Diagram

Notes:

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

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF 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

This document and its contents are the property of Mini-Circuits.