CERAMIC

High Pass Filter

HFCN-1320D+

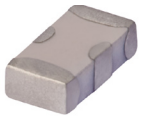
50Ω 1400 to 5000 MHz

THE BIG DEAL

- Small Size
- 7 Sections
- Temperature Stable
- Excellent Power Handling, 7 W
- Hermetically Sealed
- LTCC Construction
- Low Cost

APPLICATIONS

- Sub-Harmonic Rejection
- Transmitters/Receivers
- Lab Use



Generic photo used for illustration purposes only

CASE STYLE: FV1206

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our website for RoHS Compliance methodologies and qualifications

ELECTRICAL SPECIFICATIONS[1,2] AT +25°C

Parameter		Frequency (MHz)	Min.	Typ.	Max.	Units
Stopband	Rejection Loss	880	40			dB
		1060	20			
	Freq. Cut-Off	1320		3.0		dB
	VSWR	880-1060		20		:1
Passband	Insertion Loss	1400-5000		2.0		dB
		1700-3800			1.3	dB
	VSWR	1700-3700		1.5		:1

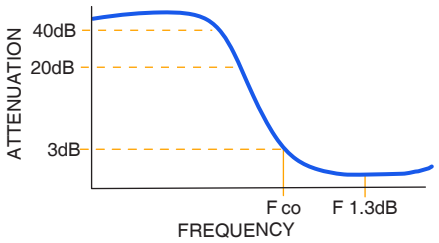
1. DC Resistance to ground is 100 Mohms min.
2. Measured on Mini-Circuits Characterization Test Board TB-HFCN-1320D+.

ABSOLUTE MAXIMUM RATINGS

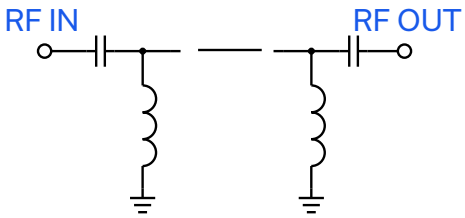
Parameter	Ratings
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input[3]	7 W max. at +25°C
Max. DC Voltage at Pins 1 & 3	+25 VDC

3. Derate linearly to 3 W at +100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



REV. D
ECO-026891
HFCN-1320D+
MCL NY
250919

CERAMIC

High Pass Filter

HFCN-1320D+

50Ω 1400 to 5000 MHz

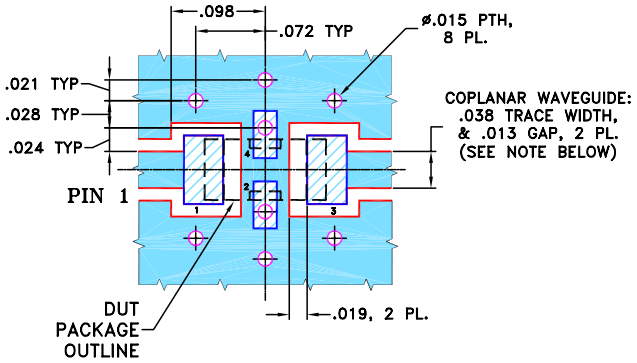
PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: ZM

DEMO BOARD MCL P/N: TB-HFCN-1320D+

SUGGESTED PCB LAYOUT (PL-137)

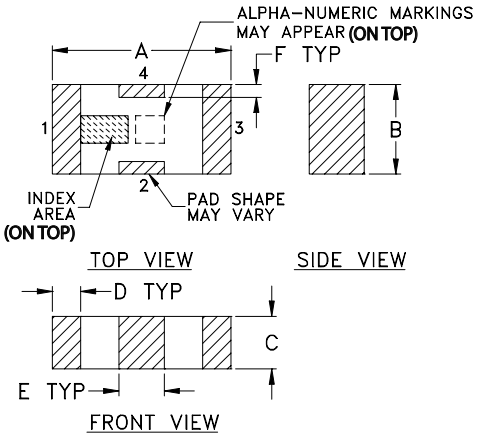


NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

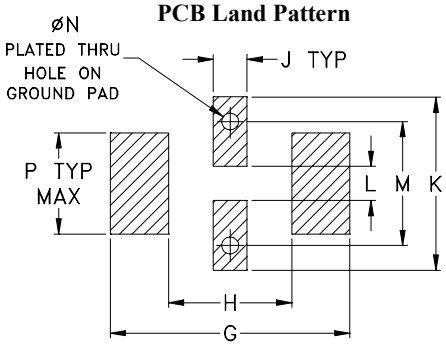
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS (Inches / 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

TAPE & REEL INFORMATION: F71

CERAMIC

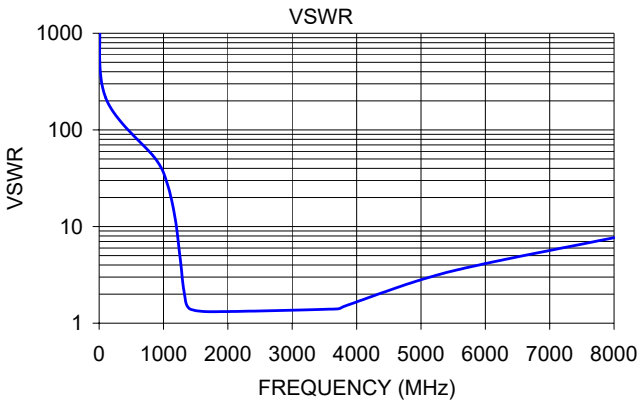
High Pass Filter

HFCN-1320D+

50Ω 1400 to 5000 MHz

TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	94.16	1737.18
100	69.34	217.15
880	55.96	49.64
1060	27.72	27.59
1180	13.92	12.18
1260	6.40	4.64
1320	2.97	2.12
1400	1.55	1.42
1700	0.75	1.31
3700	0.55	1.41
3800	0.59	1.49
5000	1.76	2.81
6000	3.08	4.13
8000	5.76	7.66



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/terms/viewterm.html

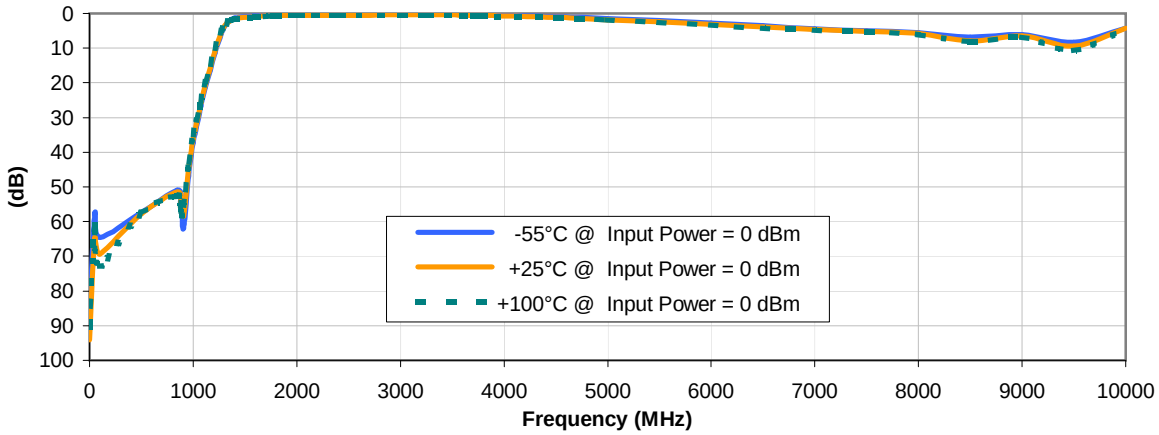
Ceramic High Pass Filter HFCN-1320D+

Typical Performance Data

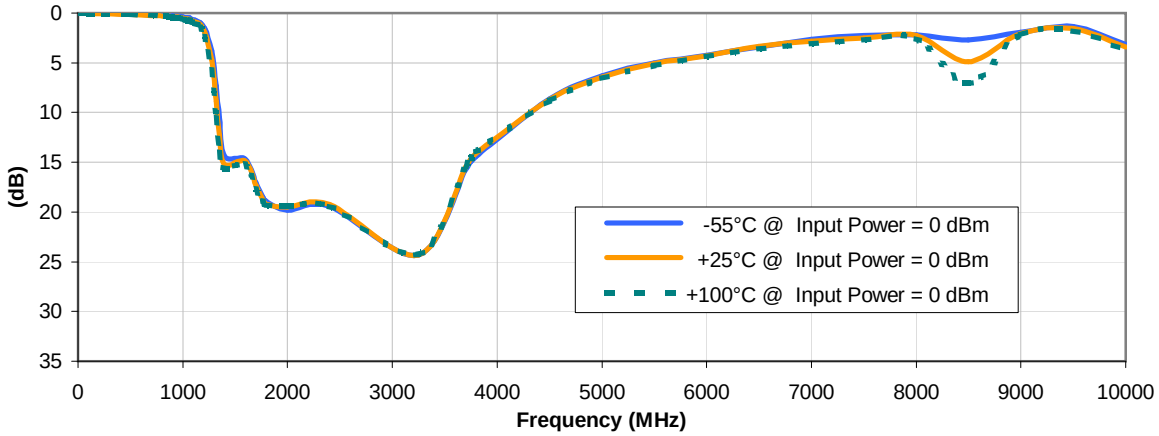
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
1	87.11	94.16	90.41	0.01	0.01	0.02	0.01	0.01	0.00
50	57.97	65.03	61.28	0.01	0.00	0.03	0.01	0.00	0.00
100	64.61	69.34	72.86	0.03	0.08	0.04	0.02	0.03	0.02
500	57.46	57.72	57.55	0.06	0.15	0.14	0.07	0.12	0.14
845	51.01	51.56	52.60	0.23	0.29	0.35	0.22	0.28	0.38
880	55.34	55.96	56.44	0.26	0.35	0.41	0.21	0.32	0.37
890	56.68	57.59	58.42	0.28	0.37	0.41	0.25	0.29	0.38
910	61.89	58.39	55.40	0.31	0.39	0.46	0.26	0.34	0.43
955	46.00	44.42	43.06	0.29	0.40	0.48	0.34	0.40	0.51
1000	37.20	36.09	35.09	0.38	0.49	0.57	0.38	0.46	0.55
1030	32.70	31.77	30.85	0.48	0.59	0.71	0.41	0.50	0.58
1060	28.56	27.72	26.89	0.47	0.63	0.76	0.42	0.52	0.64
1075	26.70	25.85	25.05	0.56	0.69	0.86	0.43	0.59	0.70
1120	21.27	20.51	19.76	0.70	0.87	1.03	0.60	0.76	0.92
1165	16.20	15.49	14.74	0.96	1.19	1.47	0.82	1.00	1.23
1210	11.49	10.86	10.20	1.54	1.93	2.40	1.25	1.57	1.90
1275	5.69	5.33	5.00	3.79	4.70	5.75	3.08	3.77	4.47
1320	3.06	2.97	2.96	7.35	8.89	10.53	5.91	6.86	7.76
1350	2.13	2.17	2.21	10.57	12.31	14.04	8.32	9.25	10.04
1400	1.38	1.55	1.65	14.44	15.25	15.64	11.45	11.89	12.23
1595	0.81	0.95	1.04	14.65	14.87	15.23	14.55	14.91	15.57
1700	0.62	0.75	0.86	17.06	17.33	17.69	17.70	18.24	19.14
1765	0.53	0.68	0.77	18.50	18.76	18.95	19.29	20.02	20.78
1800	0.50	0.64	0.74	19.01	19.25	19.29	20.20	20.88	21.46
2000	0.38	0.54	0.63	19.82	19.50	19.40	20.88	20.71	20.64
2400	0.34	0.47	0.54	19.41	19.24	19.46	19.43	19.22	19.22
3250	0.25	0.40	0.50	24.33	24.30	24.25	23.57	23.43	23.21
3700	0.42	0.55	0.69	15.70	15.45	15.35	15.78	15.33	15.31
3750	0.35	0.56	0.69	14.91	14.70	14.62	14.84	14.65	14.53
3800	0.40	0.59	0.70	14.38	14.11	13.96	14.12	13.87	13.69
4500	1.00	1.18	1.27	8.63	8.71	8.81	8.56	8.56	8.56
5000	1.47	1.76	1.88	6.29	6.46	6.58	6.24	6.35	6.36
5500	2.12	2.46	2.64	5.04	5.11	5.25	4.94	4.97	5.04
6000	2.81	3.08	3.41	4.23	4.29	4.39	4.07	4.10	4.21
6500	3.50	3.86	4.20	3.43	3.35	3.60	3.30	3.33	3.47
7000	4.37	4.57	4.80	2.62	2.82	3.07	2.57	2.79	3.05
7500	4.91	5.15	5.34	2.25	2.54	2.71	2.17	2.44	2.68
8000	5.62	5.76	6.03	2.17	2.28	2.58	1.93	2.12	2.44
8500	6.86	7.94	8.18	2.70	4.86	7.09	1.53	1.81	2.05
9000	6.14	6.48	6.78	1.95	2.04	2.16	1.92	2.06	2.20
9500	8.22	9.37	10.79	1.35	1.57	1.83	2.00	2.59	3.43
10000	4.22	4.31	4.43	3.17	3.41	3.67	6.58	5.35	4.83

Typical Performance Curves

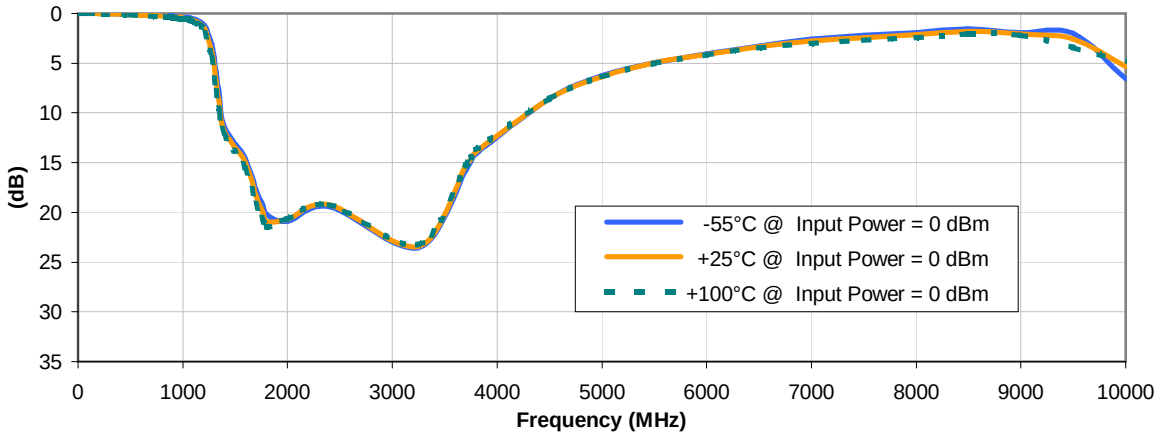
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



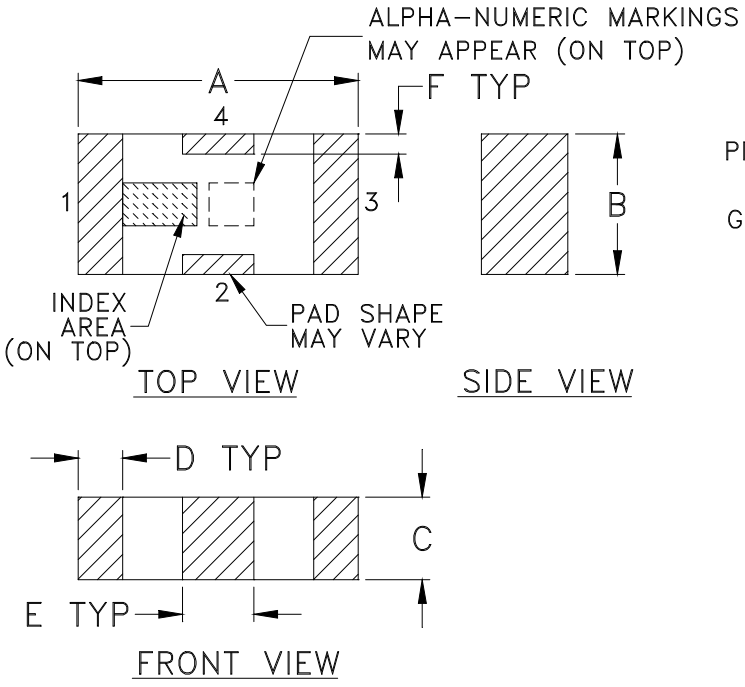
OUTPUT RETURN LOSS vs. TEMPERATURE



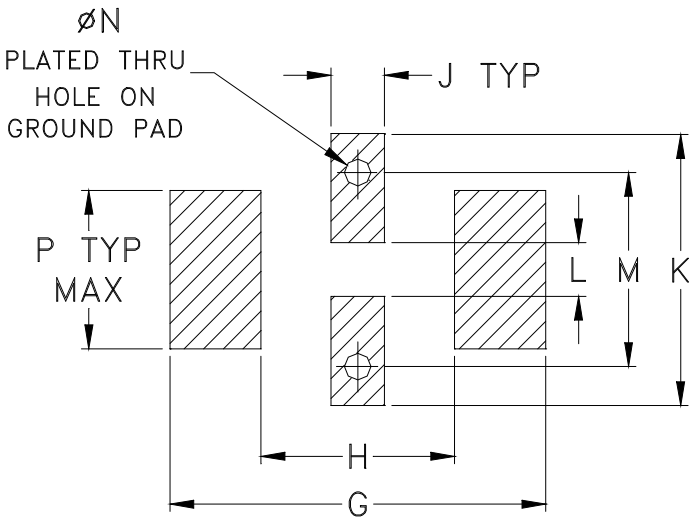
Case Style FV

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.

Tape & Reel Packaging TR-F71

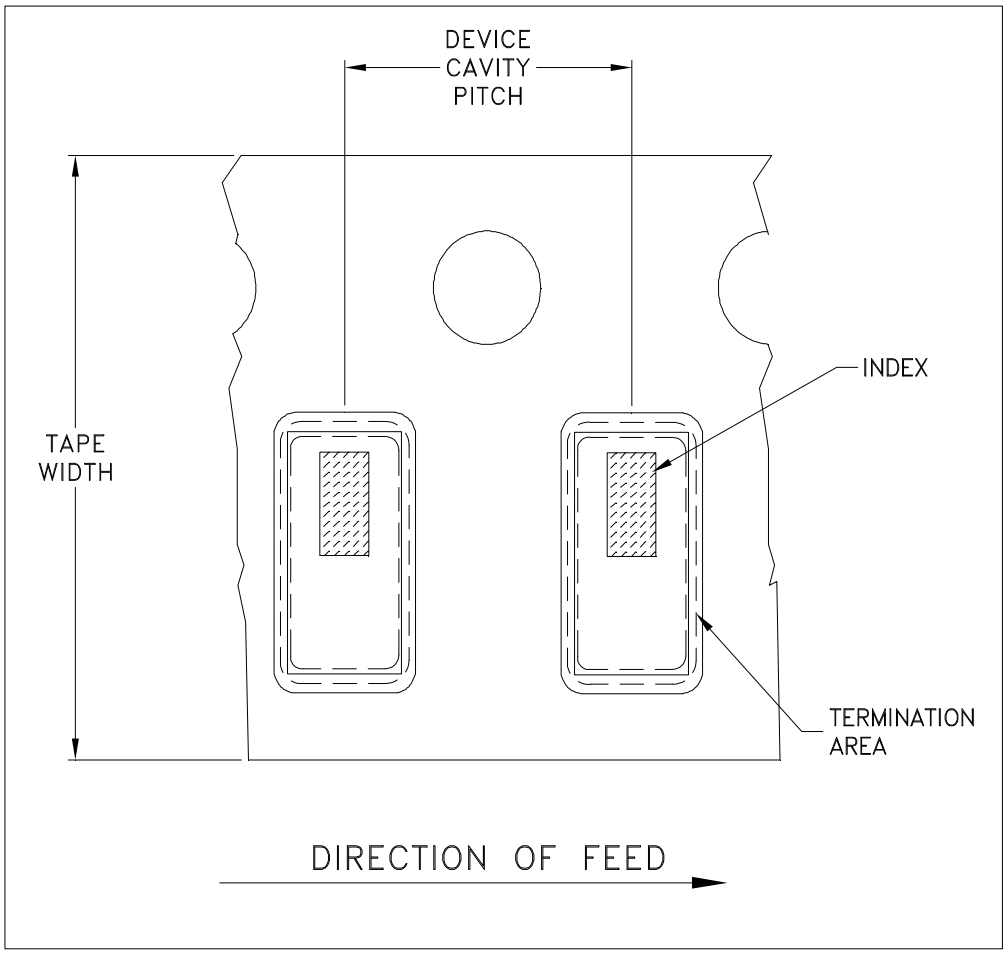


ILLUSTRATION 1

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.

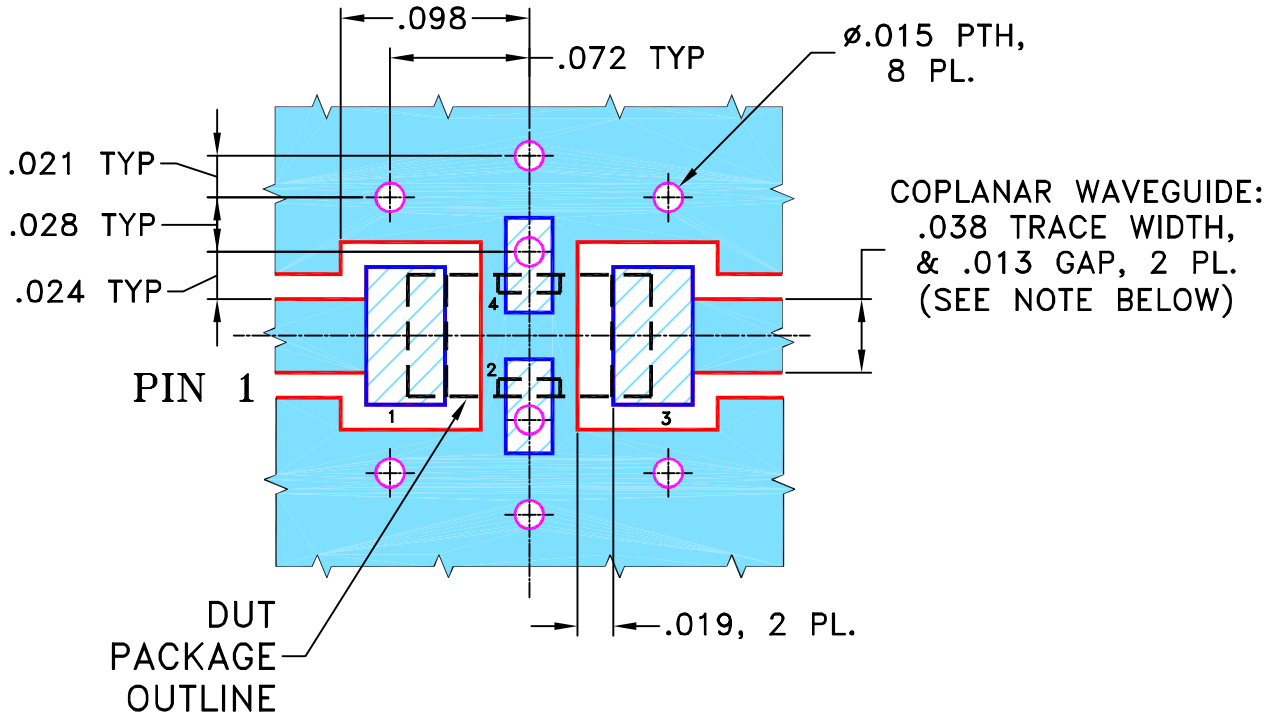
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

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:
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   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 ±			

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

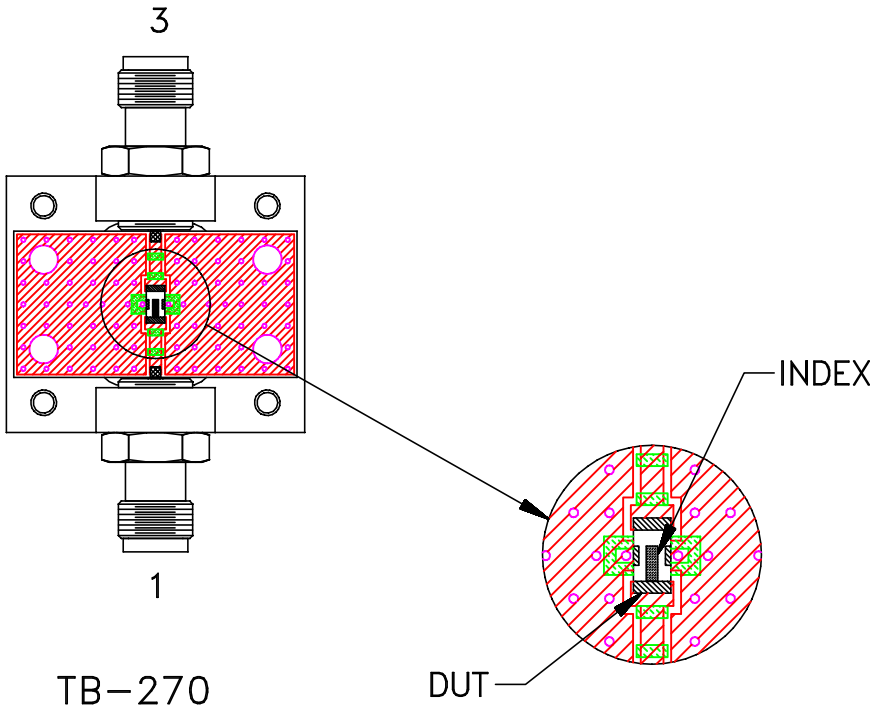
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

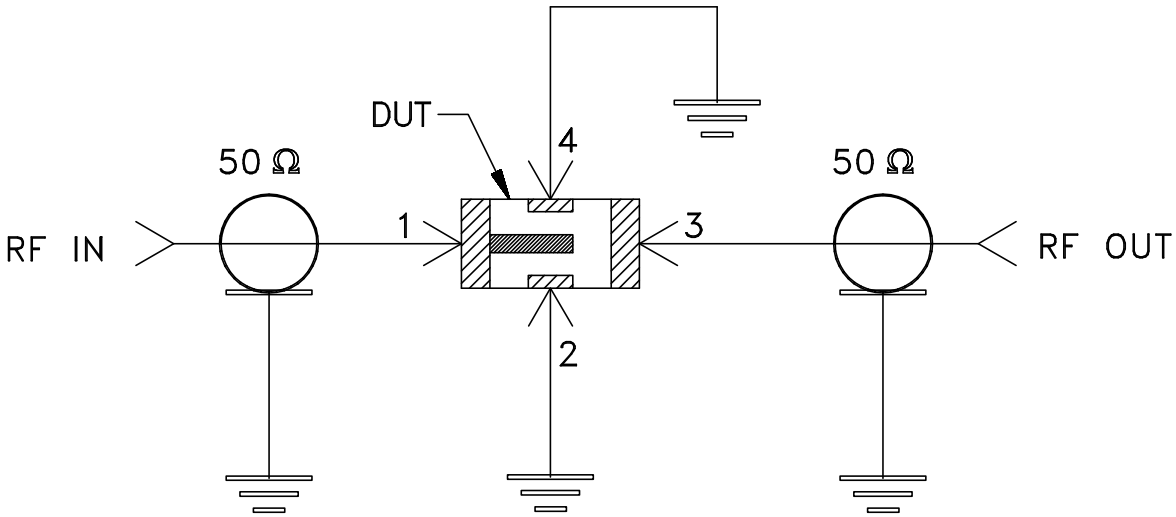
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-137	A

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®

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