



Mini-Circuits®

CERAMIC

High Pass Filter

50Ω 1400 to 5000 MHz

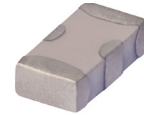
HFCN-1300+

FEATURES

- Small size
- 7 sections
- Temperature stable
- Excellent power handling, 7W
- 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 CompliantThe +Suffix identifies RoHS Compliance.
See our website for methodologies and qualificationsELECTRICAL SPECIFICATIONS^{1,2} AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Stop Band	Rejection Loss	690	40	—	dB
		930	20	—	
	Freq. Cut-Off	1300	—	3.0	dB
	VSWR	690-930	—	20	
Pass Band	Insertion Loss	1400-5000	—	2.0	dB
		1510-4000	—	1.3	
	VSWR	1400-4000	—	1.5	:1

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.

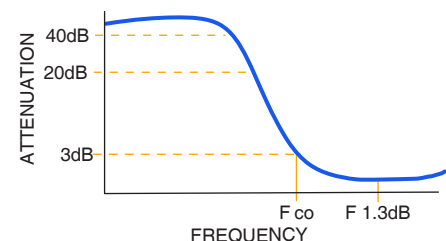
2. Measured on Mini-Circuits Characterization Test Board TB-270.

ABSOLUTE MAXIMUM RATINGS

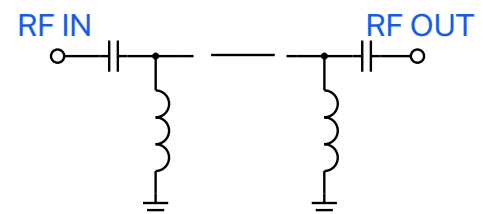
Parameter	Ratings
Operating temperature	-55°C to 100°C
Storage temperature	-55°C to 100°C
RF Power Input ³	7 W max. at 25°C

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. M
ECO-023332
HFCN-1300+
MCL NY
241016

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PAGE 1 OF 3



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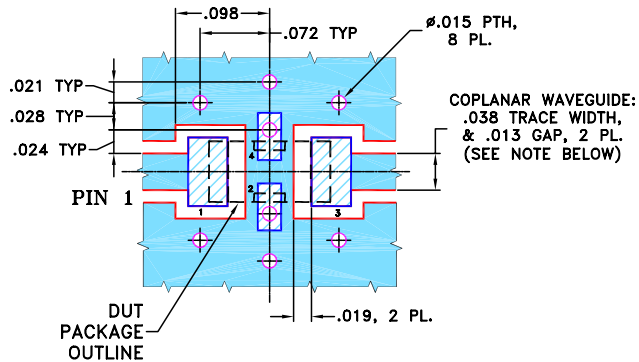
HFCN-1300+

PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: ZG

DEMO BOARD MCL P/N: TB-270
SUGGESTED PCB LAYOUT (PL-137)

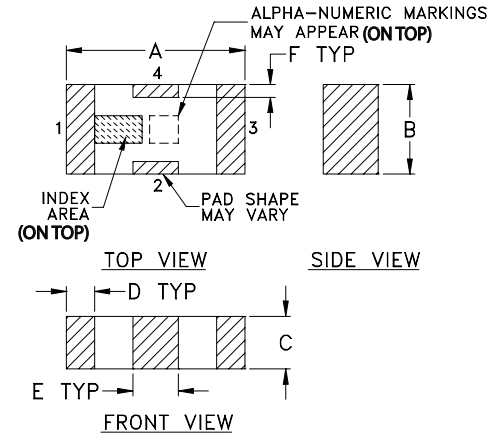


NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" $\pm$.0015".
COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

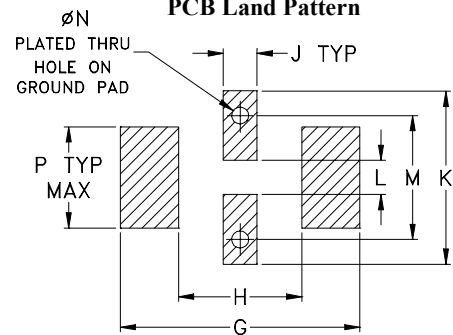
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  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 $\pm .002$

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



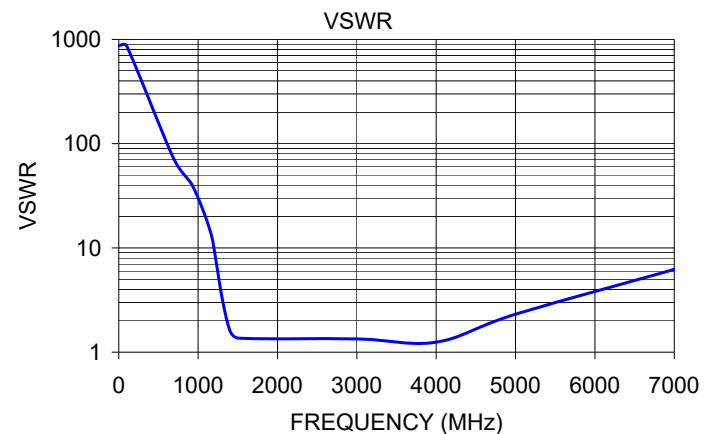
CERAMIC

High Pass Filter

HFCN-1300+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1.00	89.20	868.59
100.00	68.18	868.59
690.00	49.67	72.39
930.00	28.30	39.49
1150.00	12.20	14.74
1230.00	6.92	7.11
1300.00	3.49	3.39
1400.00	1.44	1.61
1510.00	1.01	1.36
3000.00	0.51	1.34
4000.00	0.53	1.25
5000.00	1.39	2.32
7000.00	4.70	6.24



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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-1300+

Typical Performance Data

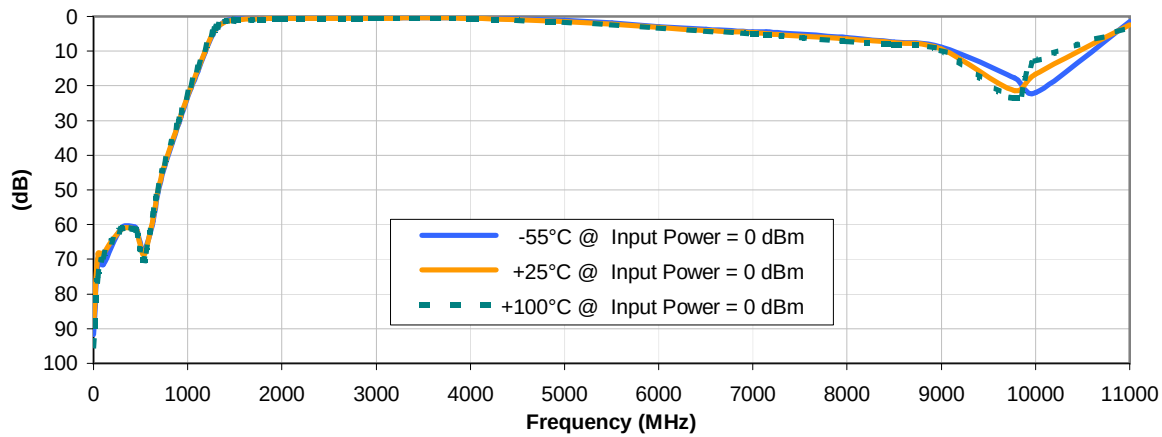
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
1	91.75	89.20	95.02	0.00	0.02	0.03	0.01	0.02	0.00
50	71.10	68.53	74.51	0.00	0.00	0.01	0.01	0.02	0.00
100	71.57	68.18	69.20	0.00	0.02	0.02	0.01	0.01	0.02
290	61.02	61.43	61.39	0.02	0.05	0.07	0.02	0.05	0.07
440	60.62	61.20	61.43	0.06	0.11	0.14	0.06	0.11	0.13
465	61.55	61.90	62.59	0.06	0.11	0.15	0.06	0.11	0.14
535	67.60	68.68	70.23	0.09	0.15	0.19	0.08	0.14	0.17
630	59.06	58.07	57.02	0.12	0.20	0.25	0.13	0.19	0.23
680	51.40	50.80	50.29	0.15	0.23	0.29	0.14	0.21	0.25
755	43.30	42.85	42.40	0.20	0.28	0.34	0.18	0.26	0.31
895	31.41	30.97	30.53	0.29	0.41	0.48	0.28	0.38	0.45
930	28.71	28.30	27.81	0.34	0.44	0.53	0.33	0.44	0.51
1035	20.89	20.49	19.93	0.48	0.62	0.74	0.50	0.63	0.75
1105	15.82	15.39	14.81	0.69	0.87	1.04	0.73	0.90	1.08
1180	10.53	10.11	9.58	1.23	1.51	1.80	1.31	1.61	1.94
1265	5.29	5.00	4.72	3.00	3.59	4.20	3.26	3.94	4.69
1300	3.66	3.49	3.36	4.49	5.28	6.05	4.91	5.86	6.87
1315	3.11	3.00	2.91	5.30	6.19	7.00	5.83	6.91	8.02
1400	1.31	1.44	1.55	11.63	12.62	13.18	13.48	15.26	16.62
1485	0.87	1.05	1.20	16.04	16.10	15.99	18.72	18.72	18.42
1500	0.84	1.03	1.17	16.26	16.23	16.13	18.45	18.27	17.97
1510	0.83	1.01	1.14	16.30	16.24	16.17	18.19	17.96	17.71
1760	0.58	0.74	0.85	17.91	18.34	19.06	17.61	17.57	17.78
2000	0.47	0.63	0.72	17.96	17.87	18.37	17.31	17.03	17.31
2800	0.40	0.56	0.66	15.02	15.35	15.60	14.89	15.16	15.44
3000	0.33	0.51	0.58	16.36	16.74	17.33	16.48	16.79	17.46
3600	0.29	0.44	0.58	28.28	28.80	28.45	28.76	31.99	32.12
4000	0.32	0.53	0.66	18.70	19.17	19.10	18.88	18.80	18.56
4500	0.69	0.87	1.02	12.49	11.65	11.83	12.13	11.41	11.31
5000	1.08	1.39	1.58	8.41	8.03	7.99	8.10	7.77	7.66
5500	1.83	2.21	2.45	5.78	5.87	6.02	5.55	5.56	5.62
6000	2.88	3.12	3.35	4.22	4.46	4.50	3.98	4.20	4.26
6500	3.75	4.04	4.21	3.39	3.53	3.70	3.19	3.34	3.58
7000	4.43	4.70	5.07	2.83	2.81	2.86	2.61	2.75	2.93
7140	4.43	4.92	5.30	2.66	2.70	2.70	2.59	2.67	2.87
8000	6.09	6.47	7.11	2.01	2.01	1.90	1.92	2.06	2.17
8500	7.44	7.54	8.05	1.26	1.59	1.69	1.51	1.76	1.92
9000	8.85	9.32	9.73	1.06	1.33	1.56	1.39	1.67	1.90
9780	17.62	21.34	23.63	0.84	1.14	1.54	1.21	1.51	1.69
10000	21.94	16.52	12.91	1.11	1.64	2.42	1.07	1.79	2.49
11000	1.56	2.35	3.23	9.25	7.56	6.44	8.42	7.17	6.42

Ceramic High Pass Filter

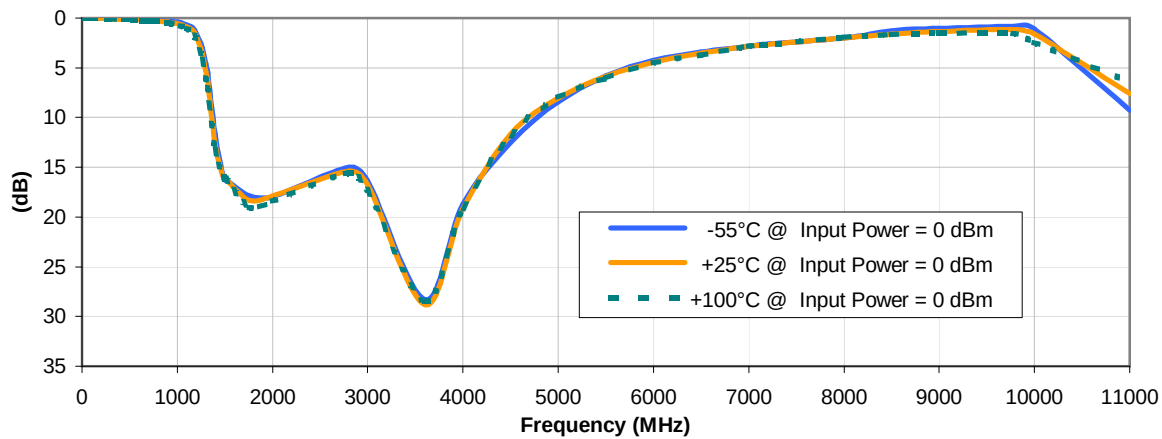
Typical Performance Curves

HFCN-1300+

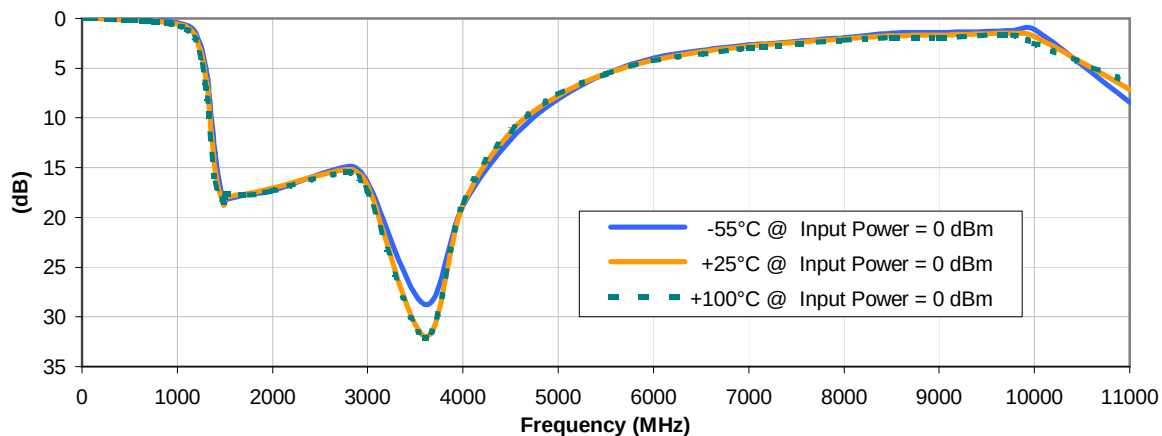
INSERTION LOSS vs. TEMPERATURE



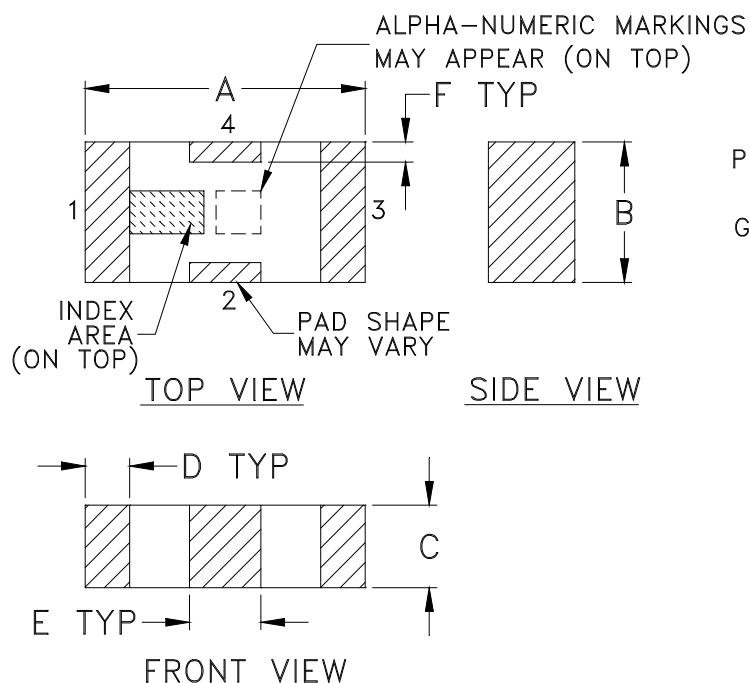
INPUT RETURN LOSS vs. TEMPERATURE



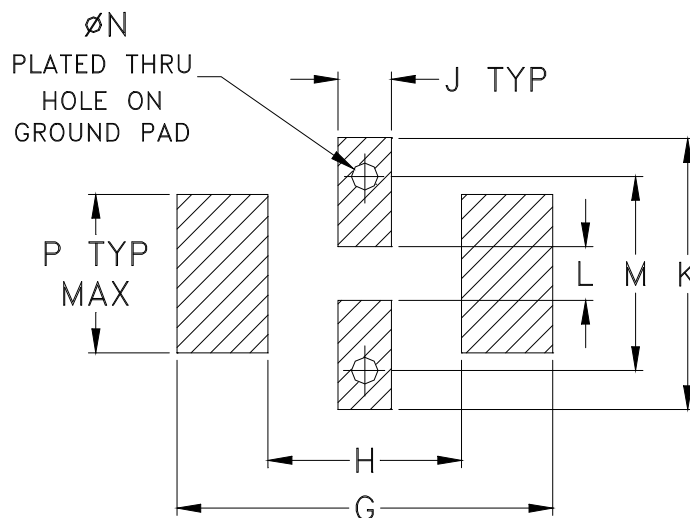
OUTPUT RETURN LOSS vs. TEMPERATURE



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

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. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Open style, ceramic base.
- 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.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F71

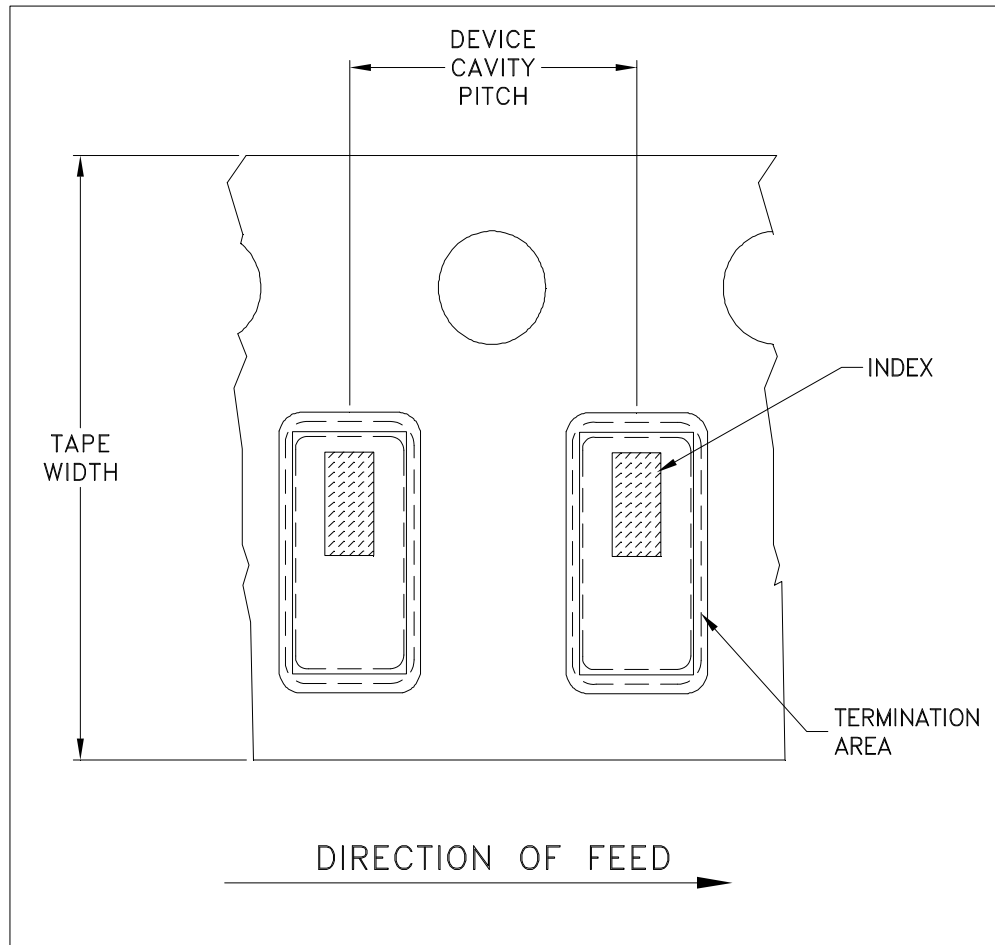


ILLUSTRATION 1

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



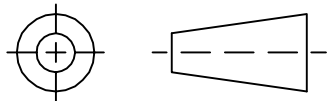
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

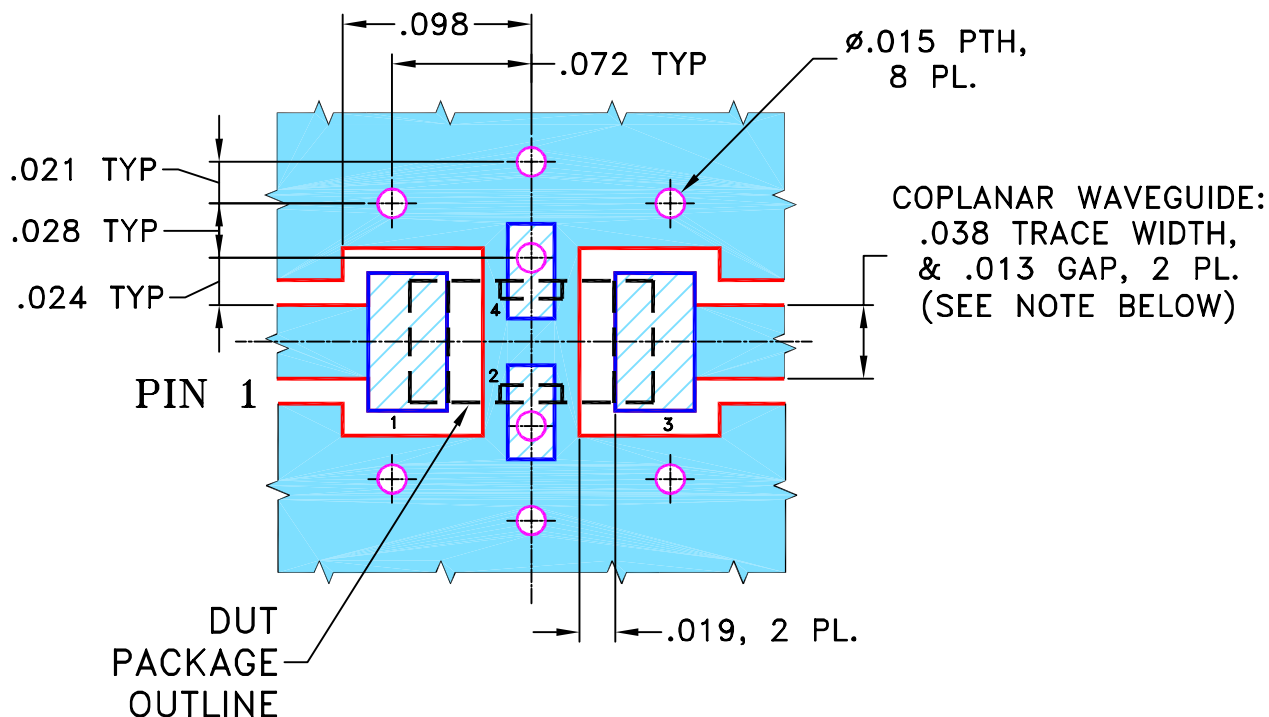
THIRD ANGLE PROJECTION



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

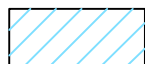


NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH THICKNESS .020" $\pm$.0015".
COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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

TOLERANCES ON:

2 PL DECIMALS $\pm$

3 PL DECIMALS $\pm$.005

ANGLES $\pm$

FRACTIONS $\pm$

DRAWN

GF

08/27/03

CHECKED

AV

08/28/03

APPROVED

ABD

08/28/03

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



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-137

REV:

A

FILE:

98PL137

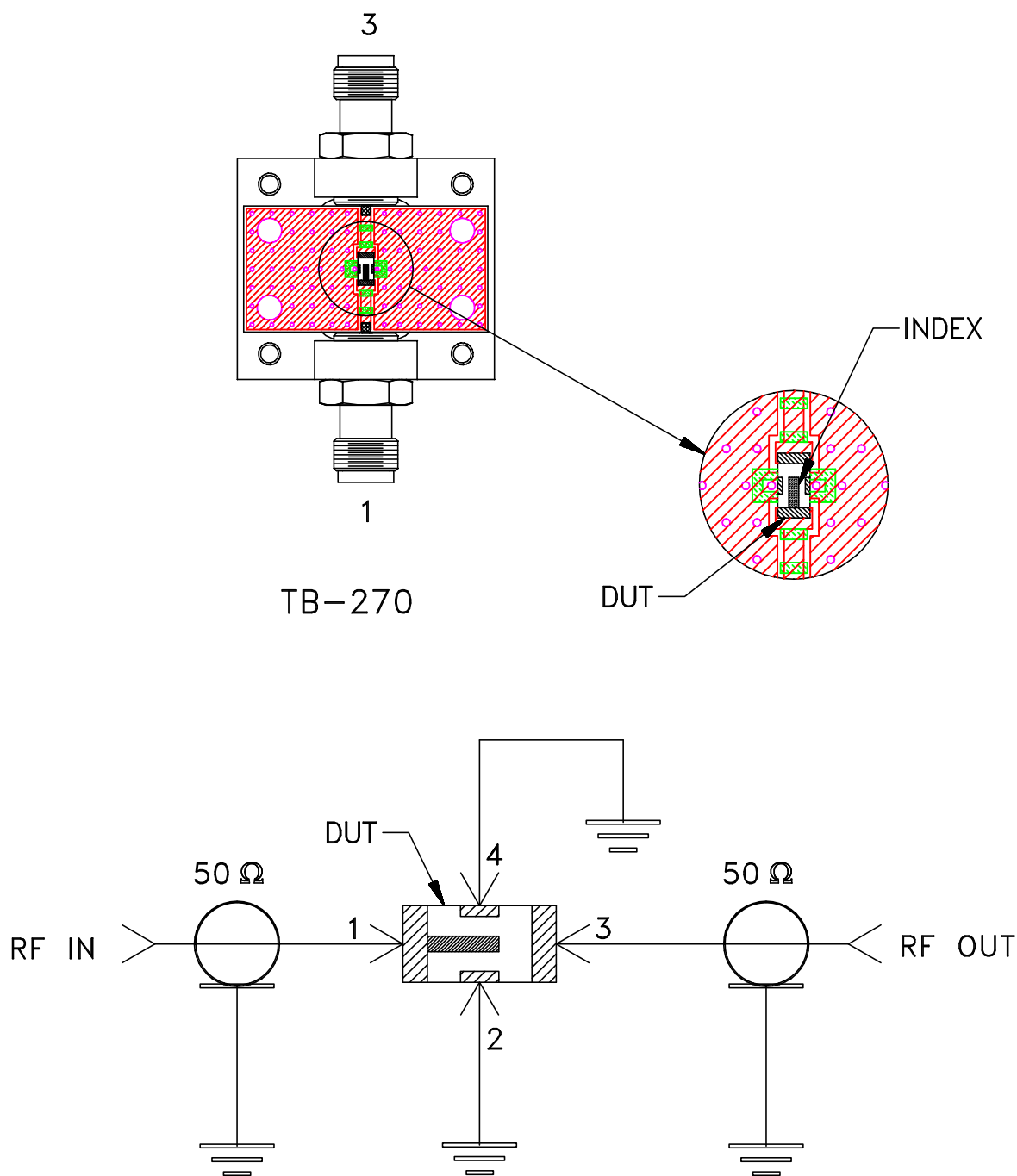
SCALE:

10:1

SHEET:

1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

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

 **Mini-Circuits®**



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