



Mini-Circuits®

CERAMIC

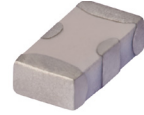
High Pass Filter

HFCN-1500D+

50Ω 1600 to 5500 MHz

THE BIG DEAL

- Small size
- 7 sections
- Temperature stable
- Excellent power handling, 7W
- Hermetically sealed
- LTCC construction
- Low cost



Generic photo used for illustration purposes only

CASE STYLE: FV1206

+RoHS Compliant

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

APPLICATIONS

- Sub-harmonic rejection
- Transmitters/receivers
- Lab use

ELECTRICAL SPECIFICATIONS^{1,2} AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Stop Band	Rejection Loss	1060	40	—	dB
		1250	20	—	
	Freq. Cut-Off	1550	—	3.0	dB
	VSWR	1060-1250	—	20	
Pass Band	Insertion Loss	1600-5500	—	2.0	dB
		1850-4400	—	1.3	
	VSWR	1620-3450	—	1.5	:1

1. DC Resistance to ground is 100 Mohms min.

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

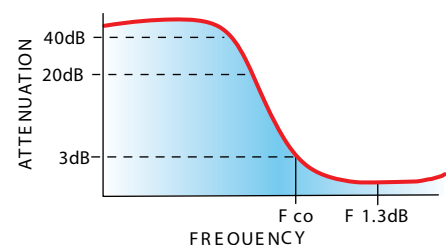
MAXIMUM RATINGS

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

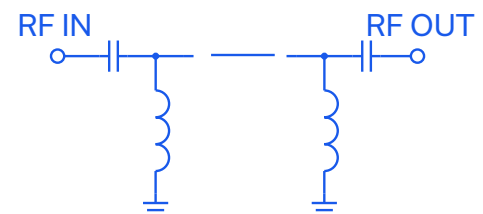
3. Derate linearly to 3W at 100°C ambient.

Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



REV. C
ECO-011980
HFCN-1500D+
AD/CP/AM
220221

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High Pass Filter

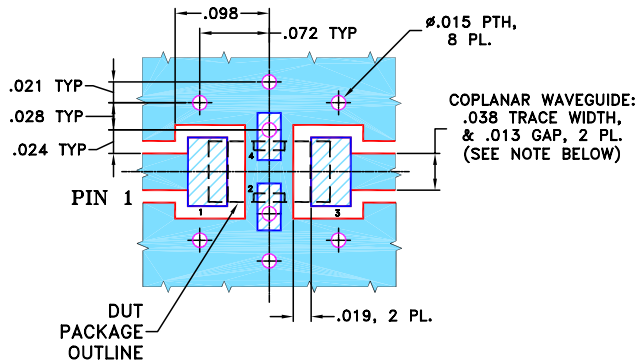
HFCN-1500D+

PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: N/A

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



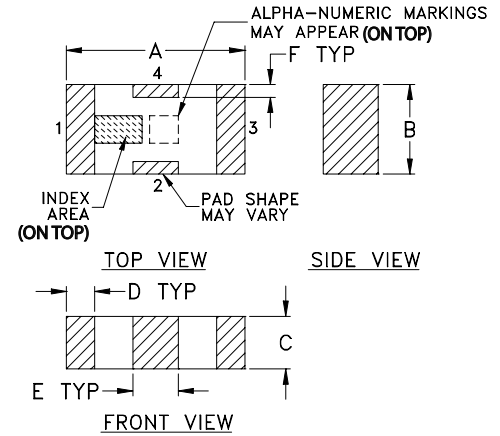
NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" $\pm$.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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

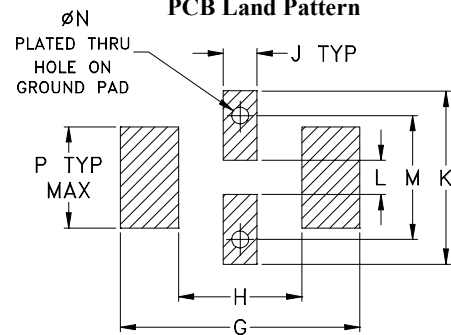
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

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



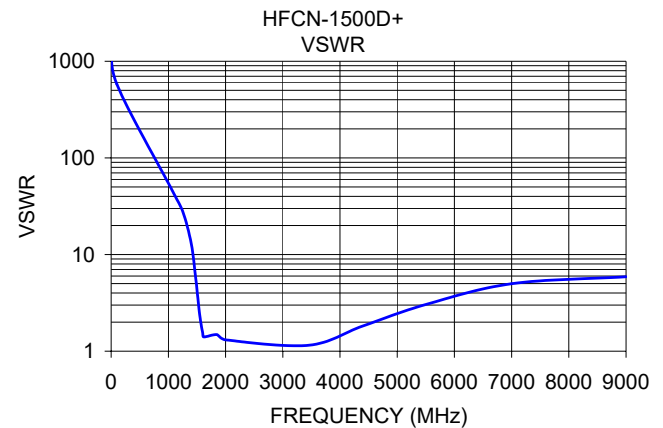
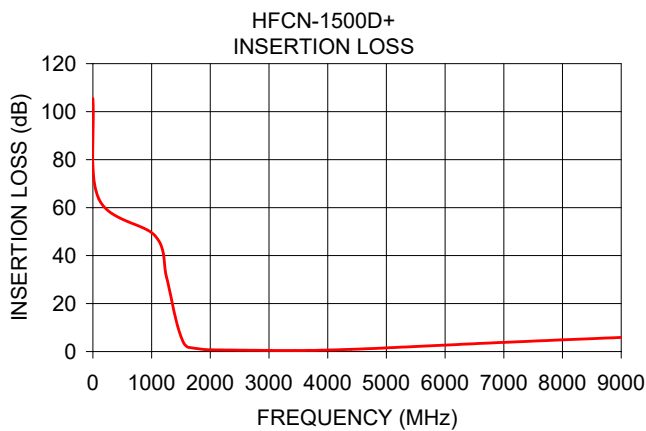
CERAMIC

High Pass Filter

HFCN-1500D+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1.00	105.45	1737.18
100.00	63.65	579.06
1060.00	48.22	46.96
1250.00	31.52	28.03
1400.00	14.81	12.89
1480.00	7.64	5.56
1550.00	3.50	2.35
1600.00	2.13	1.54
1620.00	1.83	1.41
1850.00	1.00	1.49
2000.00	0.76	1.31
3450.00	0.45	1.15
4400.00	0.94	1.82
5500.00	2.10	3.04
7000.00	3.85	4.99
9000.00	5.89	5.89



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.
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Ceramic High Pass Filter

HFCN-1500D+

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	96.15	105.45	107.90	0.02	0.01	0.02	0.01	0.01	0.02
50	61.07	72.31	74.03	0.06	0.02	0.05	0.01	0.01	0.03
100	66.09	63.65	69.00	0.04	0.03	0.09	0.03	0.00	0.00
500	59.66	59.75	59.91	0.04	0.07	0.16	0.05	0.10	0.13
870	48.63	48.51	48.45	0.15	0.20	0.27	0.17	0.23	0.28
1060	47.35	48.22	48.69	0.27	0.37	0.44	0.23	0.33	0.41
1100	50.33	51.58	52.59	0.27	0.37	0.47	0.28	0.40	0.46
1140	56.91	53.96	50.27	0.33	0.41	0.53	0.33	0.44	0.50
1165	50.32	46.53	44.13	0.37	0.46	0.59	0.34	0.44	0.55
1245	33.69	32.22	30.86	0.43	0.59	0.71	0.43	0.55	0.65
1250	33.02	31.52	30.18	0.47	0.62	0.76	0.43	0.55	0.66
1280	29.05	27.76	26.53	0.54	0.69	0.85	0.45	0.58	0.73
1340	21.98	20.94	19.85	0.70	0.91	1.12	0.57	0.75	0.94
1390	16.84	15.86	14.81	0.93	1.21	1.54	0.81	1.03	1.30
1445	11.48	10.57	9.73	1.58	2.06	2.69	1.32	1.71	2.16
1500	6.82	6.21	5.65	3.14	4.10	5.22	2.53	3.26	4.07
1510	6.12	5.55	5.04	3.58	4.69	5.96	2.93	3.71	4.59
1530	4.80	4.40	4.06	4.73	6.10	7.67	3.86	4.79	5.84
1540	4.23	3.93	3.67	5.43	6.95	8.64	4.39	5.45	6.51
1550	3.78	3.50	3.31	6.22	7.90	9.83	4.98	6.14	7.25
1560	3.34	3.10	2.99	7.14	8.95	11.07	5.73	6.84	8.02
1600	2.09	2.13	2.16	11.17	13.39	15.61	8.58	9.68	10.57
1620	1.75	1.83	1.95	13.38	15.45	16.97	9.98	10.83	11.55
1650	1.48	1.62	1.72	15.21	16.13	16.49	11.38	11.82	12.23
1700	1.23	1.38	1.53	14.72	14.71	14.73	12.38	12.50	12.79
1850	0.87	1.00	1.13	13.82	14.16	14.59	13.37	13.80	14.42
1870	0.86	1.01	1.10	14.09	14.42	14.91	13.72	14.19	14.84
2045	0.57	0.69	0.84	18.36	18.68	19.11	18.63	19.19	19.98
2500	0.35	0.47	0.60	23.45	23.09	23.17	24.35	23.80	23.51
3000	0.28	0.43	0.55	26.40	27.95	30.03	27.51	28.14	27.88
3440	0.32	0.50	0.61	23.31	23.27	23.33	22.85	22.88	22.46
3450	0.27	0.45	0.55	23.01	22.96	23.13	22.63	22.65	22.26
4000	0.45	0.65	0.78	14.66	14.48	14.53	14.44	14.16	14.17
4400	0.74	0.94	1.07	10.69	10.72	11.02	10.56	10.52	10.68
4500	0.78	0.99	1.11	9.86	10.06	10.12	9.79	9.85	9.84
5000	1.32	1.54	1.70	7.14	7.52	7.56	7.02	7.25	7.16
5500	1.86	2.10	2.27	5.72	5.93	6.03	5.53	5.68	5.72
6000	2.34	2.64	2.99	4.77	4.86	4.85	4.55	4.62	4.59
6300	2.66	3.06	3.32	4.35	4.27	4.48	4.16	4.15	4.35
7000	3.59	3.85	4.16	3.31	3.53	3.71	3.18	3.43	3.67
7500	4.08	4.30	4.57	2.89	3.14	3.34	2.77	3.02	3.23
8000	4.55	4.68	4.92	2.74	2.95	3.05	2.47	2.81	2.99
8500	4.69	4.99	5.33	2.48	2.72	2.83	2.42	2.69	2.80
9000	5.37	5.89	6.70	2.53	2.98	3.83	2.26	2.37	2.56
9500	3.99	4.19	4.37	3.58	3.64	3.76	3.15	3.23	3.44
10000	3.81	3.81	3.93	3.05	3.52	3.97	3.16	3.63	4.07

REV. X1

HFCN-1500D+

080723

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

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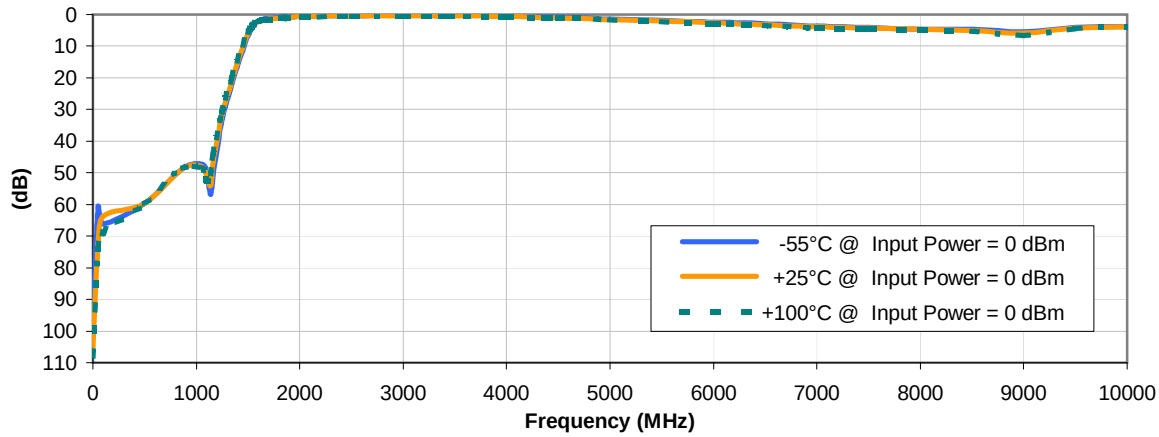


Ceramic High Pass Filter

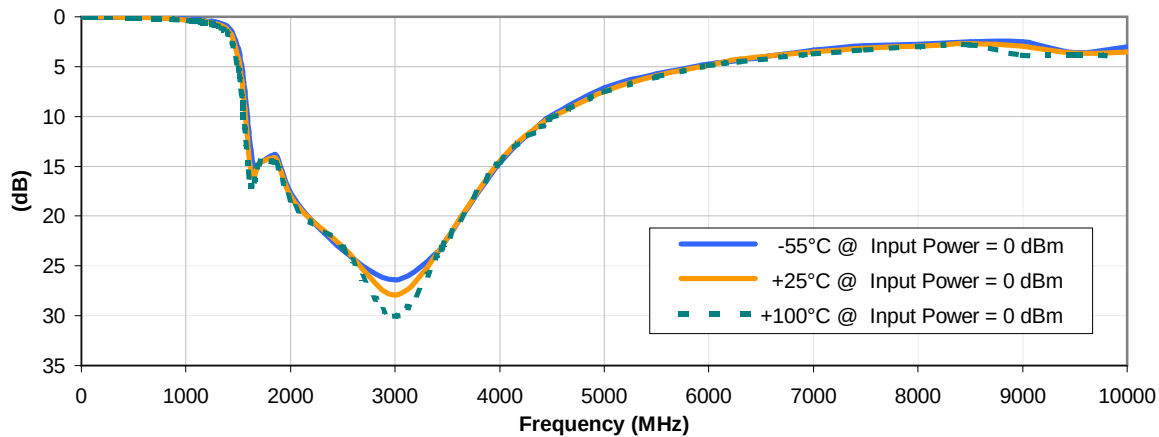
Typical Performance Curves

HFCN-1500D+

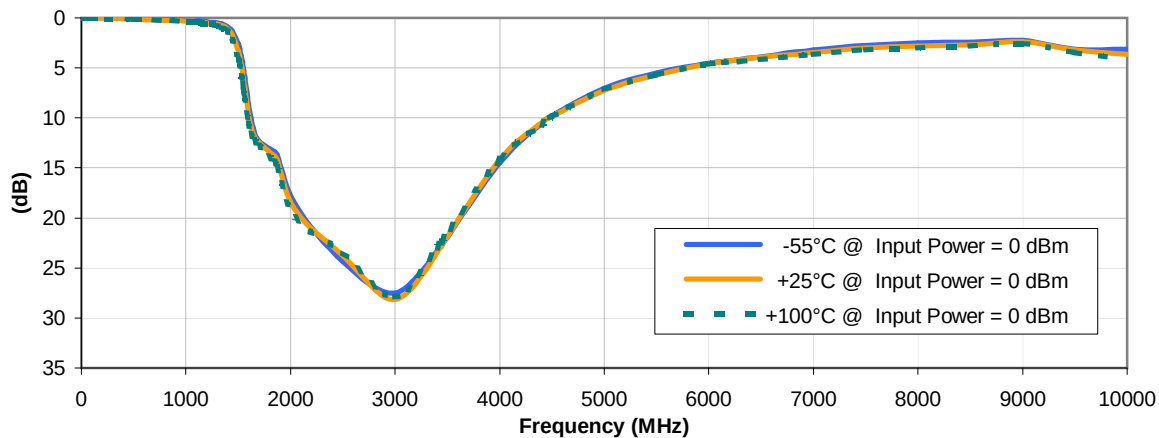
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE



REV. X1
HFCN-1500D+
080723
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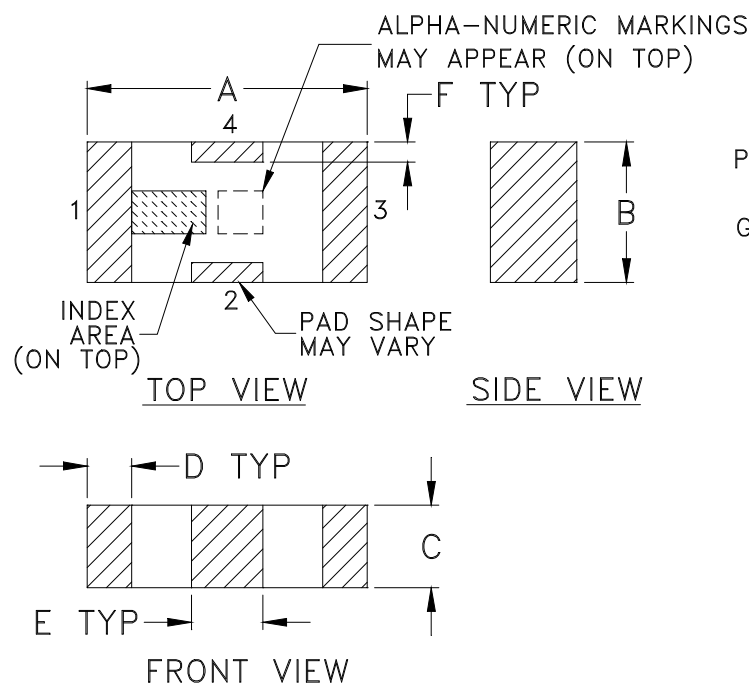


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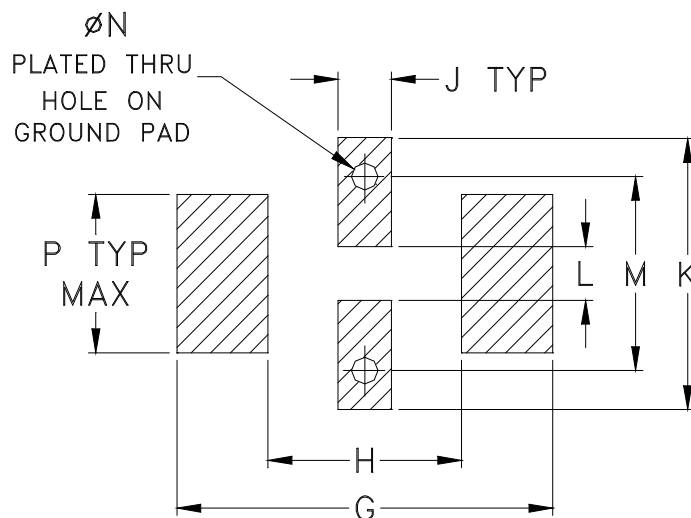
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Outline Dimensions



PCB Land Pattern



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.



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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F71

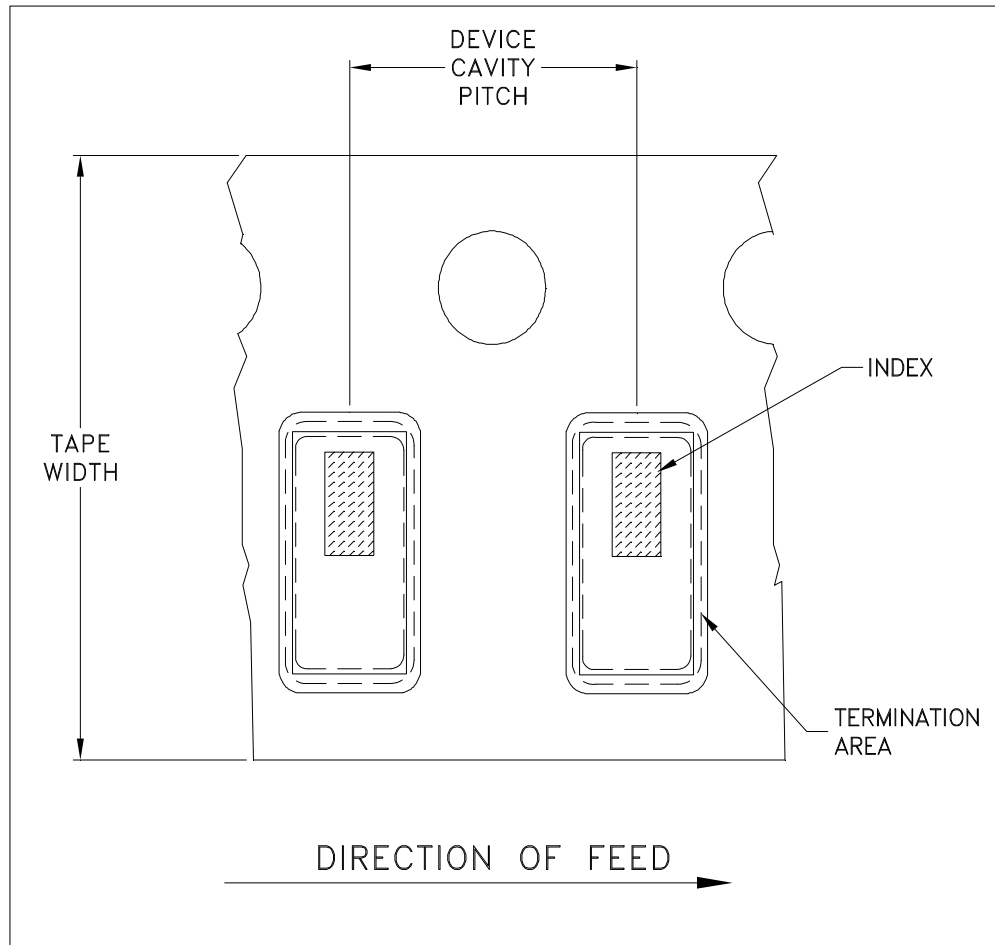


ILLUSTRATION 1

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



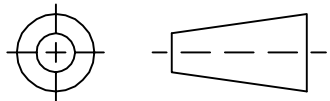
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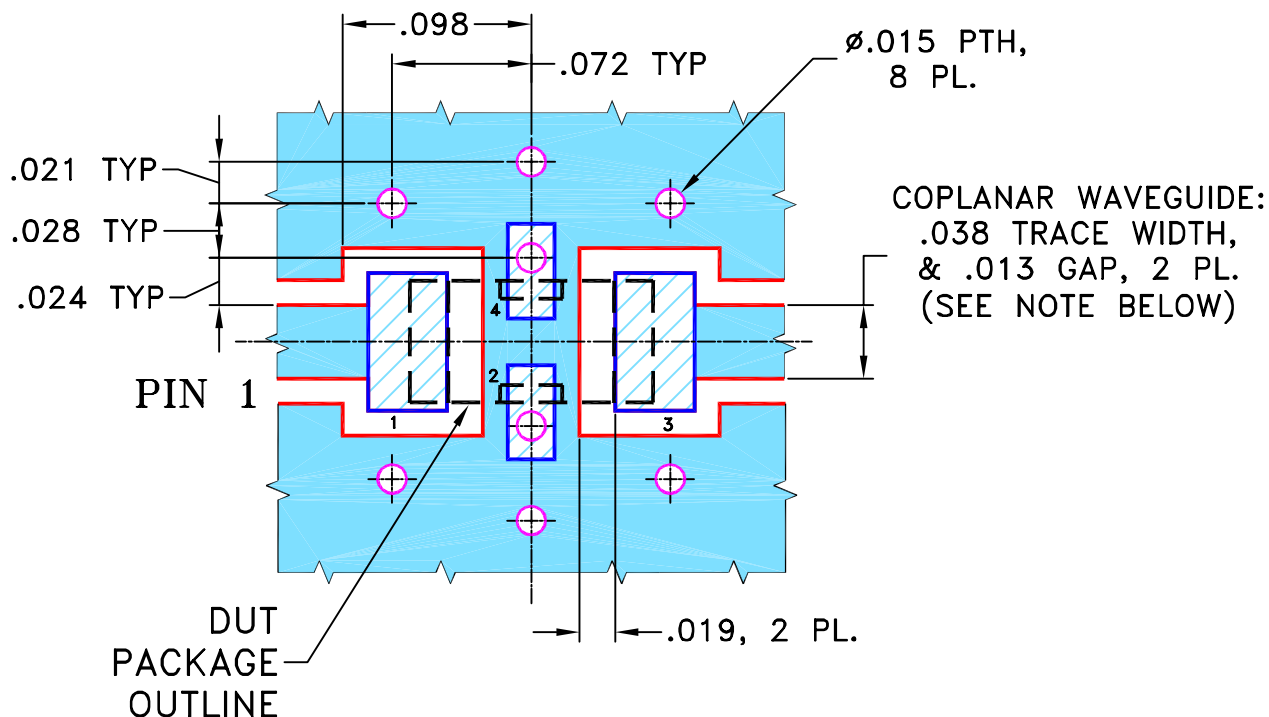
THIRD ANGLE PROJECTION



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

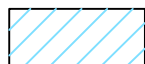


NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH THICKNESS .020" $\pm$.0015".
 COPPER: 1/2 OZ. EACH SIDE.
 FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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 $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

GF

08/27/03

CHECKED

AV

08/28/03

APPROVED

ABD

08/28/03



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:

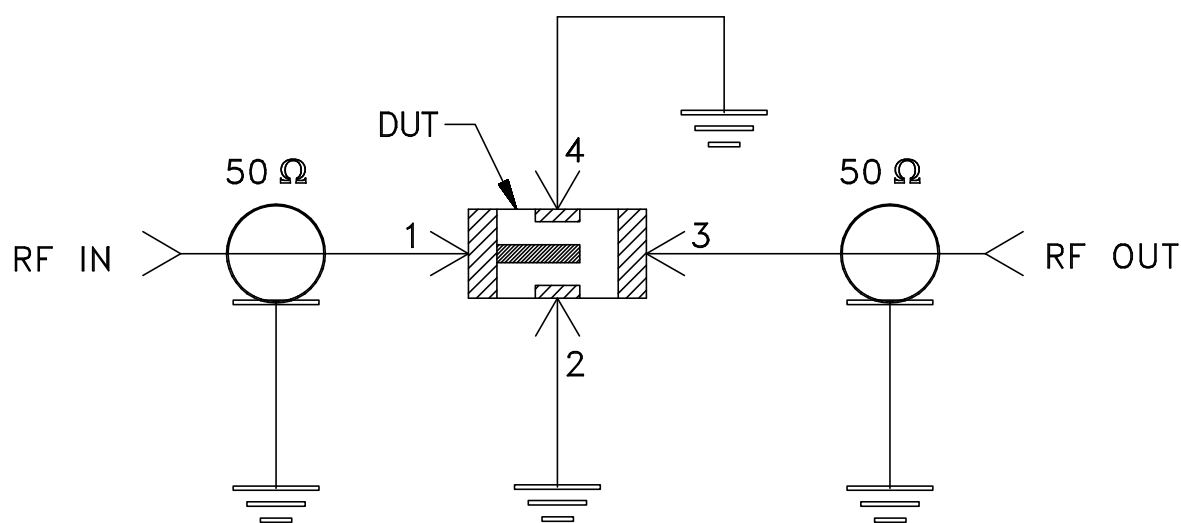
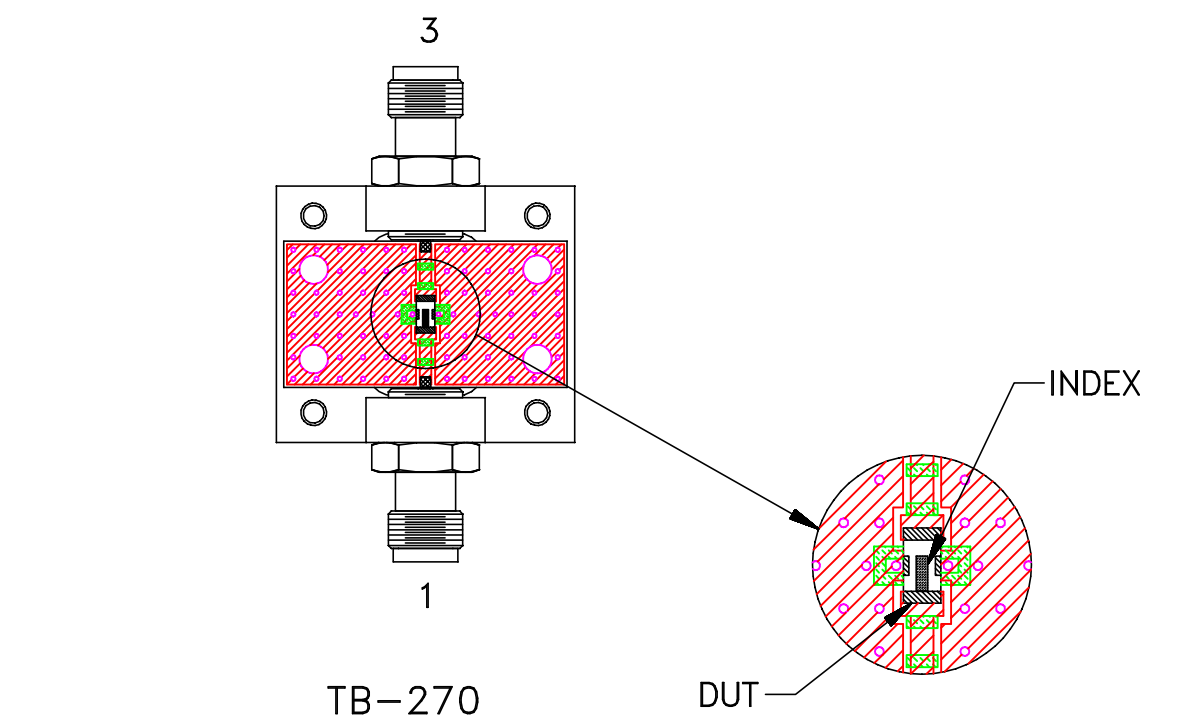
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ASHEETA1.DWG REV:A DATE:01/12/95

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