

Bandpass Filter

BFCN-4440+

50Ω 4200 to 4700 MHz



CASE STYLE: FV1206

Maximum Ratings

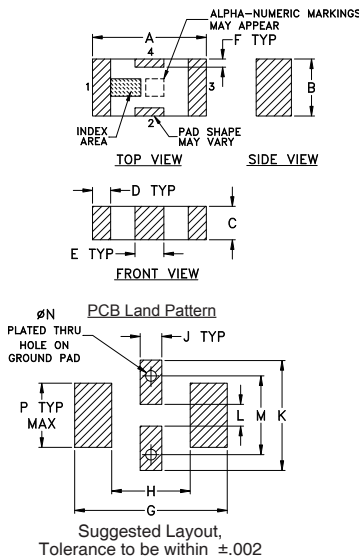
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	1.5W at 25°C

*Passband rating, derate linearly to 0.25W 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

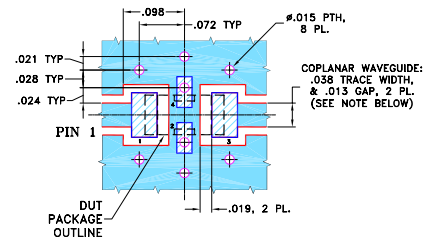
Outline Drawing



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. COPPLANAR 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

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Features

- Good VSWR, 1.2:1 Typ @ Passband
- Small size
- Temperature stable
- LTCC construction

Applications

- Harmonic Rejection
- Transmitters/Receivers

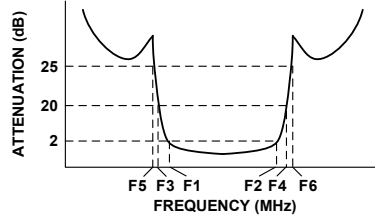
Bandpass Filter Electrical Specifications^{1,2} (T_{AMB} = 25°C)

CENTER FREQ. (MHz)	PASSBAND (MHz) (Loss < 2dB) F1 - F2	STOPBANDS (MHz)				VSWR (:1)	
		Loss > 20dB F3 F4		Loss 25dB Typ F5 F6		Passband Max.	Stopband Typ.
4440	4200 - 4700	2000	6750	2000	6650 - 12000	1.6	20

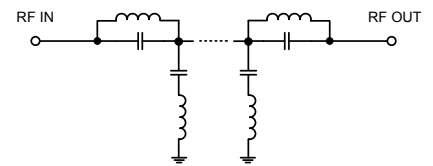
1. Measured on Mini-Circuits Characterization Test Board TB-270.

2. This filter is not intended for use as a DC Blocking circuit element. In Application where DC voltage is present at either input or output ports, blocking capacitors are required at the corresponding RF port.

Typical Frequency Response

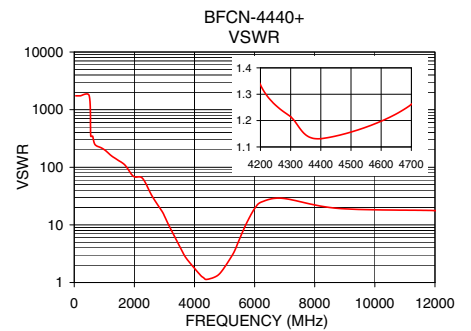
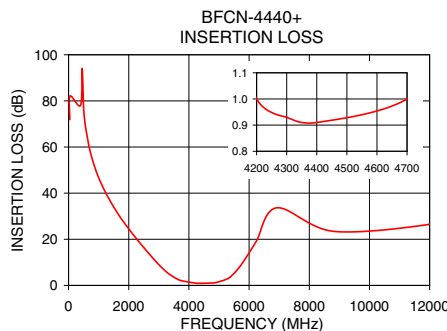


Functional Schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
50	82.05	1737.18
500	76.80	1737.18
1000	46.74	868.59
2000	24.56	91.43
2300	19.60	51.10
2900	10.36	18.30
3300	5.35	6.78
3700	2.28	2.79
4200	1.00	1.34
4440	0.91	1.12
4700	1.00	1.26
5000	1.45	1.79
5400	3.99	4.26
5650	7.48	8.60
6000	14.07	19.11
6650	29.01	31.03
6750	31.37	29.96
9000	22.79	18.30
12000	26.72	17.22



Ceramic Band Pass Filter

BFCN-4440+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
20	63.91	61.04	67.66	0.02	0.02	0.02	0.03	0.01	0.01
100	88.20	85.75	76.51	0.01	0.01	0.00	0.01	0.01	0.01
200	75.28	76.82	75.54	0.02	0.03	0.03	0.03	0.03	0.05
300	74.76	75.11	74.08	0.03	0.03	0.02	0.06	0.05	0.04
400	79.44	82.59	86.86	0.06	0.08	0.09	0.07	0.09	0.10
500	75.32	73.03	75.14	0.03	0.02	0.01	0.08	0.06	0.05
600	64.50	63.94	63.67	0.06	0.09	0.11	0.04	0.08	0.10
700	58.13	57.92	57.92	0.03	0.06	0.09	0.02	0.05	0.07
800	53.65	53.12	53.07	0.05	0.08	0.11	0.03	0.01	0.03
900	49.42	49.27	49.14	0.02	0.06	0.08	0.10	0.17	0.19
1000	45.91	45.75	45.60	0.03	0.06	0.09	0.06	0.01	0.00
1400	35.46	35.27	35.24	0.03	0.02	0.05	0.02	0.04	0.06
1500	33.61	33.26	33.25	0.17	0.18	0.23	0.09	0.16	0.19
1600	31.22	31.22	31.05	0.15	0.14	0.19	0.19	0.28	0.31
1700	29.12	29.12	28.95	0.18	0.17	0.22	0.01	0.06	0.07
1800	27.84	27.77	27.68	0.34	0.37	0.42	0.31	0.40	0.42
2000	24.19	23.86	23.81	0.30	0.30	0.36	0.17	0.26	0.29
2300	19.24	19.04	19.00	0.39	0.42	0.46	0.27	0.36	0.40
2400	17.65	17.56	17.35	0.45	0.47	0.53	0.34	0.43	0.47
2500	15.93	15.98	15.66	0.49	0.53	0.60	0.40	0.49	0.55
2600	14.43	14.53	14.23	0.61	0.61	0.72	0.53	0.57	0.66
2700	12.98	13.15	12.77	0.62	0.74	0.81	0.56	0.72	0.76
2800	11.63	11.48	11.33	0.74	0.87	0.98	0.69	0.85	0.94
2900	10.32	10.10	9.94	0.87	1.05	1.19	0.85	1.03	1.16
3000	8.94	8.73	8.61	1.09	1.29	1.50	1.09	1.28	1.47
3300	5.08	5.06	4.98	2.44	2.79	3.03	2.44	2.75	3.03
3400	4.08	4.06	4.17	3.20	3.68	3.86	3.16	3.61	3.87
3500	3.13	3.17	3.29	4.32	4.71	4.98	4.20	4.62	4.96
3600	2.42	2.53	2.61	5.61	6.07	6.32	5.41	5.94	6.24
3700	1.94	2.00	2.12	7.41	7.58	8.02	7.05	7.40	7.81
3800	1.51	1.62	1.73	9.11	9.44	9.84	8.60	9.18	9.52
4000	0.98	1.14	1.29	14.12	13.86	13.81	12.77	13.15	13.11
4200	0.79	0.95	1.14	19.83	18.92	18.47	17.62	17.57	17.49
4300	0.84	0.93	1.08	20.71	21.27	20.64	20.07	19.77	19.14
4400	0.76	0.92	1.12	21.24	23.24	21.88	20.29	21.57	21.06
4440	0.75	0.92	1.10	20.99	23.54	22.70	20.27	21.93	21.36
4500	0.80	0.95	1.10	20.28	23.37	22.80	20.73	22.33	21.35
4600	0.78	0.95	1.13	20.84	22.40	21.65	20.49	20.95	20.01
4700	0.80	1.00	1.20	21.80	20.43	19.37	20.51	18.96	18.05
4800	0.84	1.08	1.31	20.78	17.91	17.02	18.33	16.55	15.79
5000	1.18	1.46	1.78	13.74	12.46	11.60	12.29	11.60	10.86
5400	4.20	4.54	5.05	4.06	4.09	3.97	3.71	3.88	3.77
6000	15.77	16.26	17.09	0.91	0.95	1.13	0.83	0.92	1.05
6650	28.26	30.49	29.98	0.69	0.78	1.00	0.47	0.68	0.91
7000	35.12	29.32	25.96	0.73	0.86	1.16	0.38	0.78	1.12
8000	24.60	25.89	27.31	1.17	0.92	1.18	0.58	0.75	1.11
9000	20.92	21.67	22.76	1.05	0.93	1.04	0.78	1.02	1.28
10000	20.88	22.63	21.79	0.75	0.81	1.07	1.27	1.07	1.13
11000	22.96	22.40	22.69	2.06	1.06	1.12	0.77	0.98	1.12
12000	25.60	28.74	29.44	1.42	1.10	1.30	0.89	1.17	1.15
13000	12.62	13.04	12.67	1.67	2.15	2.27	1.15	1.54	1.74
14000	8.06	8.48	8.80	2.76	3.00	3.54	2.53	3.82	3.52

Notes

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Ceramic Band Pass Filter

BFCN-4440+

Typical Performance Data

FREQ. (MHz)	GROUP DELAY (psec)		
	@ -55° C	@ +25° C	@ +100° C
4200	471.74	466.03	460.17
4205	530.13	481.17	501.08
4210	512.19	443.42	508.60
4215	530.26	480.38	425.57
4220	496.08	488.50	409.27
4230	493.52	472.31	442.63
4240	514.79	477.30	469.46
4250	505.39	481.43	529.18
4260	530.63	469.47	433.81
4270	517.32	476.14	453.48
4280	496.87	454.41	457.30
4290	504.94	468.75	457.88
4300	293.69	461.24	491.01
4310	539.14	503.18	445.48
4320	478.91	480.59	463.08
4330	519.39	473.83	489.46
4340	377.63	452.61	448.04
4350	505.42	464.27	507.95
4360	412.12	474.20	376.13
4370	471.89	464.97	465.91
4380	517.64	472.59	440.92
4390	507.38	487.13	486.08
4400	497.30	496.03	446.76
4420	492.38	473.83	537.87
4430	481.09	470.20	407.04
4440	523.98	480.09	479.71
4450	431.87	485.21	408.51
4460	568.98	474.58	521.31
4470	485.63	465.53	459.66
4480	470.69	454.93	456.74
4490	492.23	490.70	465.22
4500	380.87	465.37	451.40
4510	498.94	473.67	480.19
4520	494.27	491.43	457.35
4530	505.73	451.06	533.66
4540	510.77	468.07	490.36
4550	441.70	483.93	461.37
4560	449.50	475.91	497.33
4570	531.65	478.94	491.95
4580	449.69	464.17	482.53
4590	514.41	485.03	447.26
4600	499.24	462.12	520.19
4610	510.75	476.96	475.91
4620	498.81	473.49	443.28
4630	470.07	493.33	484.45
4640	498.53	482.56	492.58
4650	527.90	505.71	488.21
4660	460.61	493.89	514.02
4670	533.69	498.70	492.03
4680	508.44	482.22	504.69
4690	490.07	492.22	438.45
4700	476.81	483.22	473.94

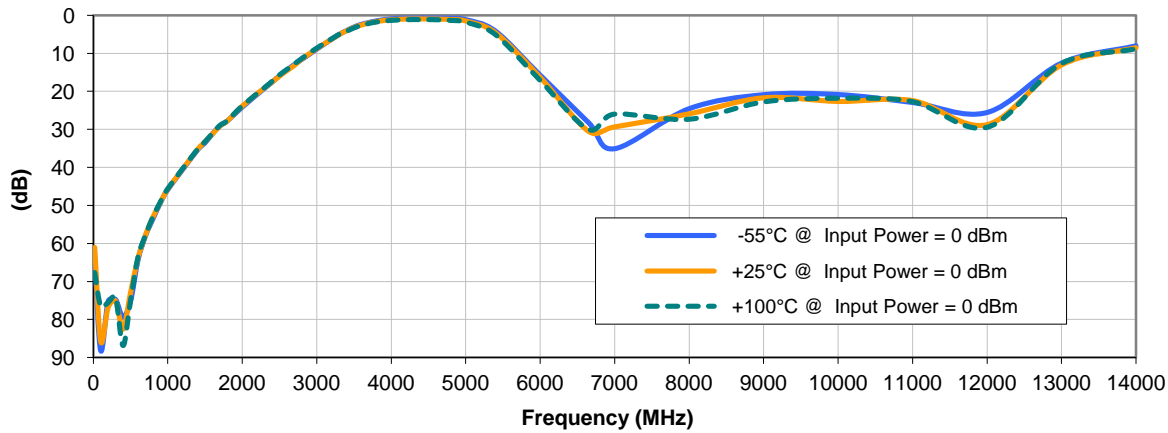
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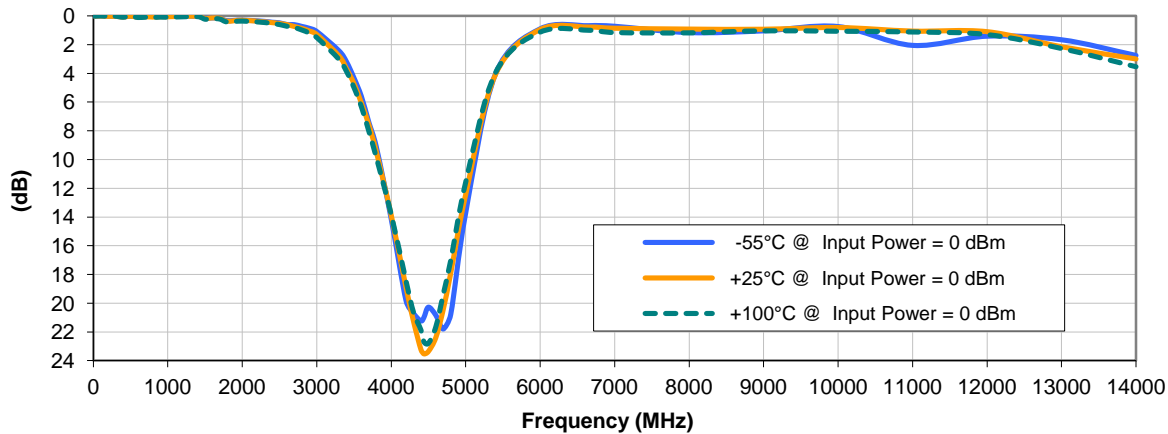


Typical Performance Curves

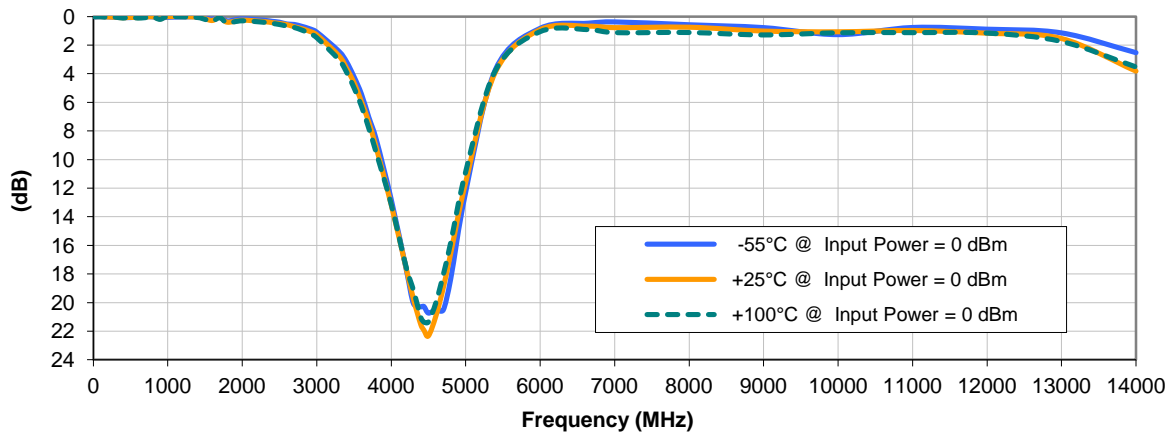
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



OUTPUT RETURN LOSS vs. TEMPERATURE

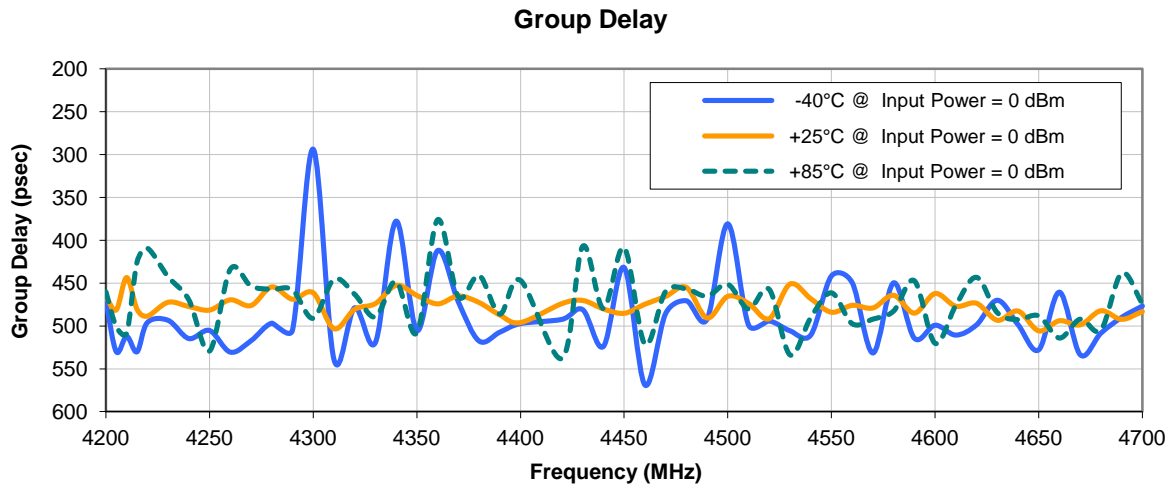


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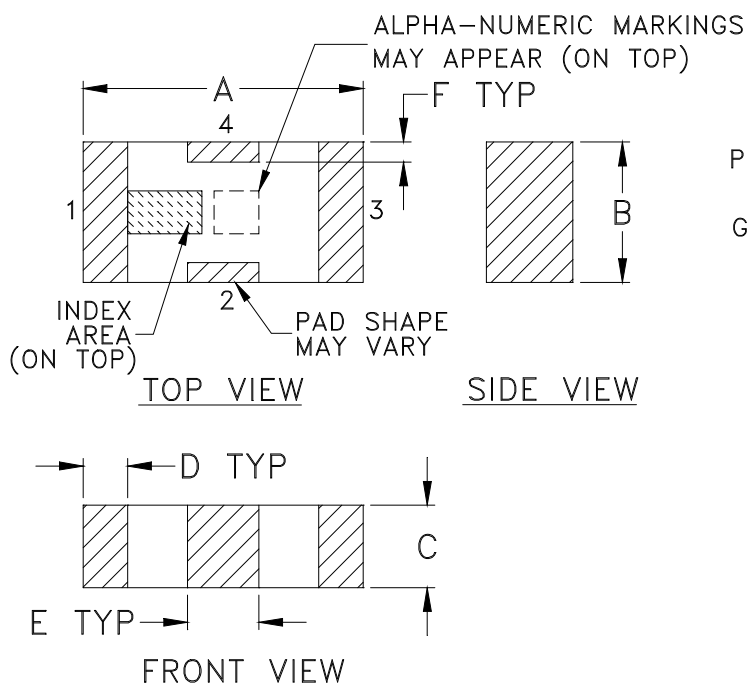
Typical Performance Curves



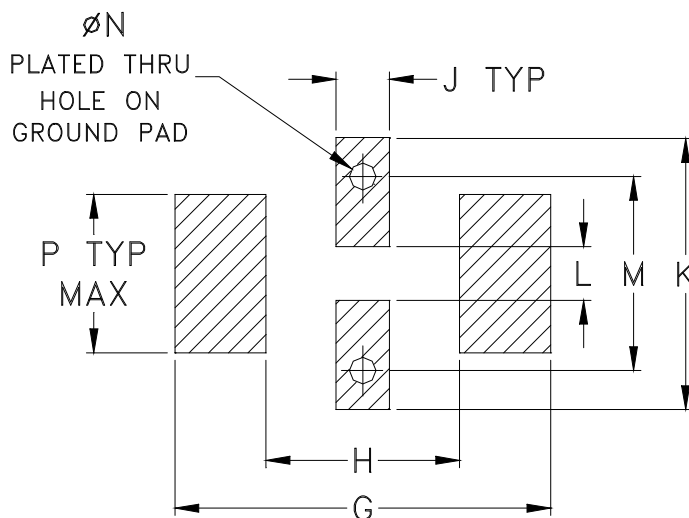
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Outline Dimensions



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



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

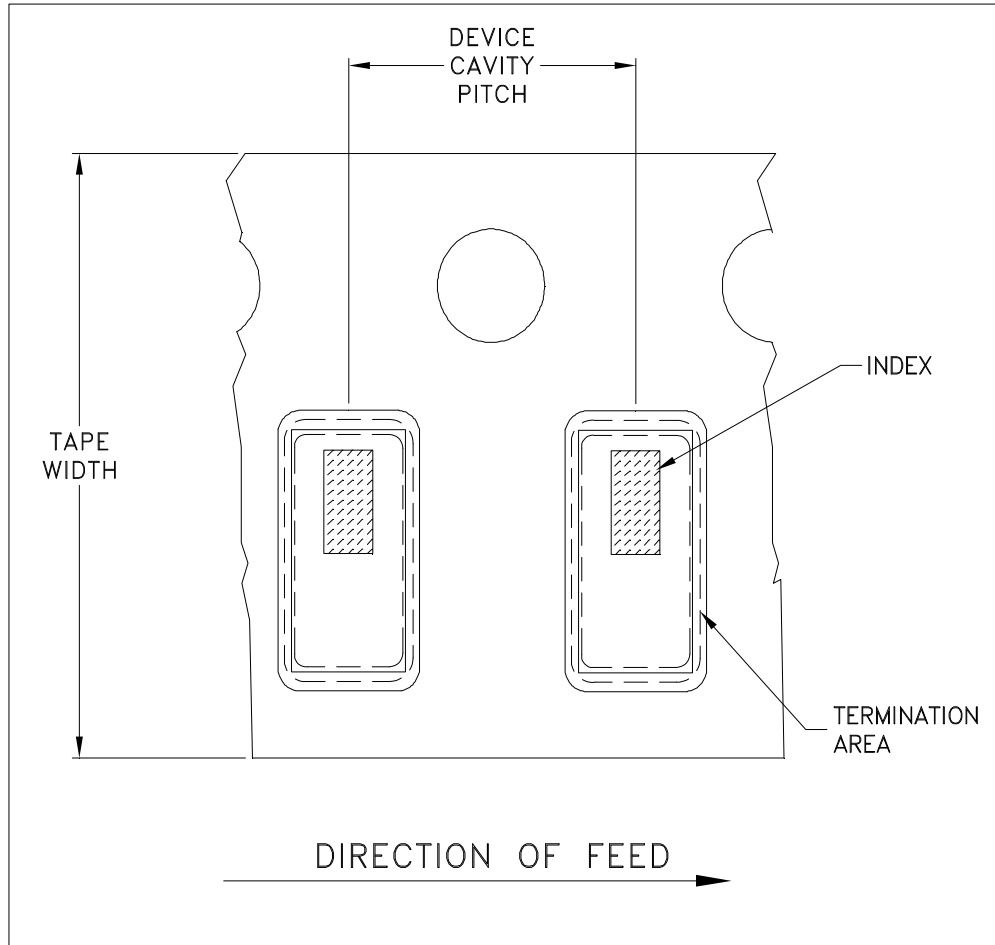


ILLUSTRATION 1

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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RF/IF MICROWAVE COMPONENTS

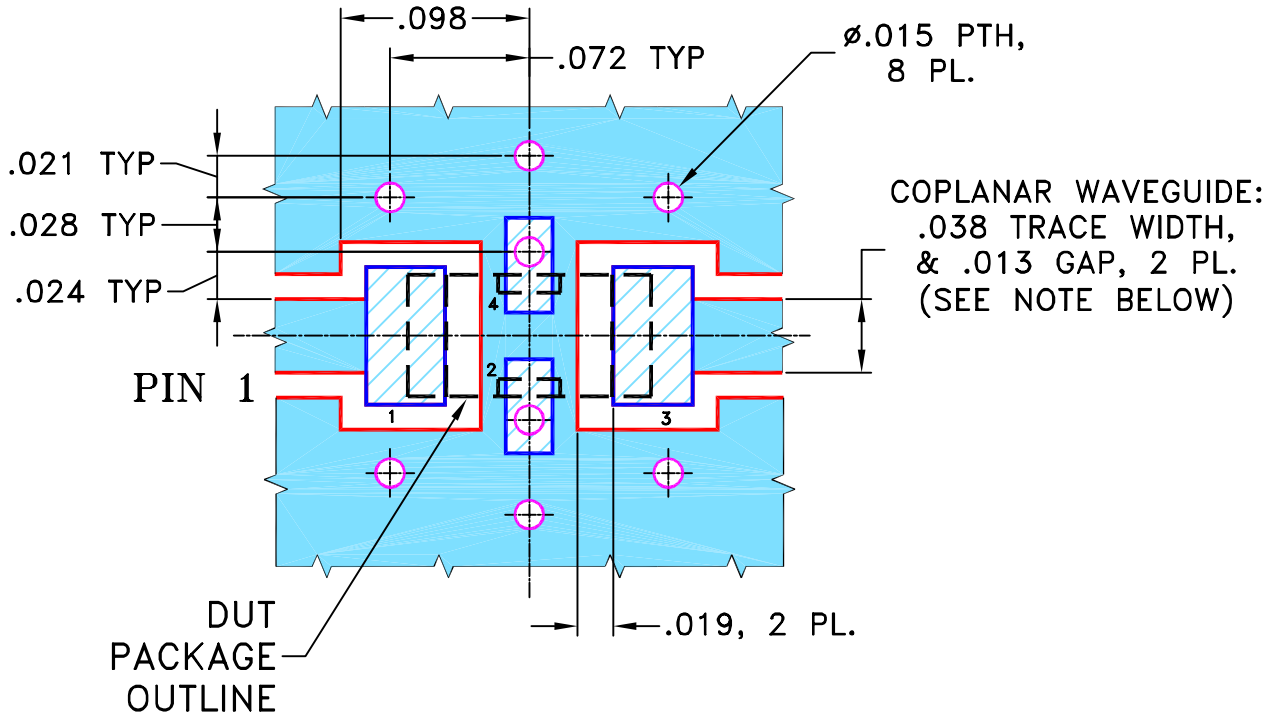
THIRD ANGLE PROJECTION



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

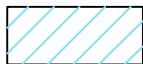


- NOTES:**
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH THICKNESS .020" ± .0015".
 COPPER: 1/2 OZ. EACH SIDE.
 FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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

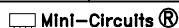
ABD

08/28/03

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±



Mini-Circuits®

13 Neptune Avenue
 Brooklyn NY 11235

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

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SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-137

A

FILE: 98PL137

SCALE:

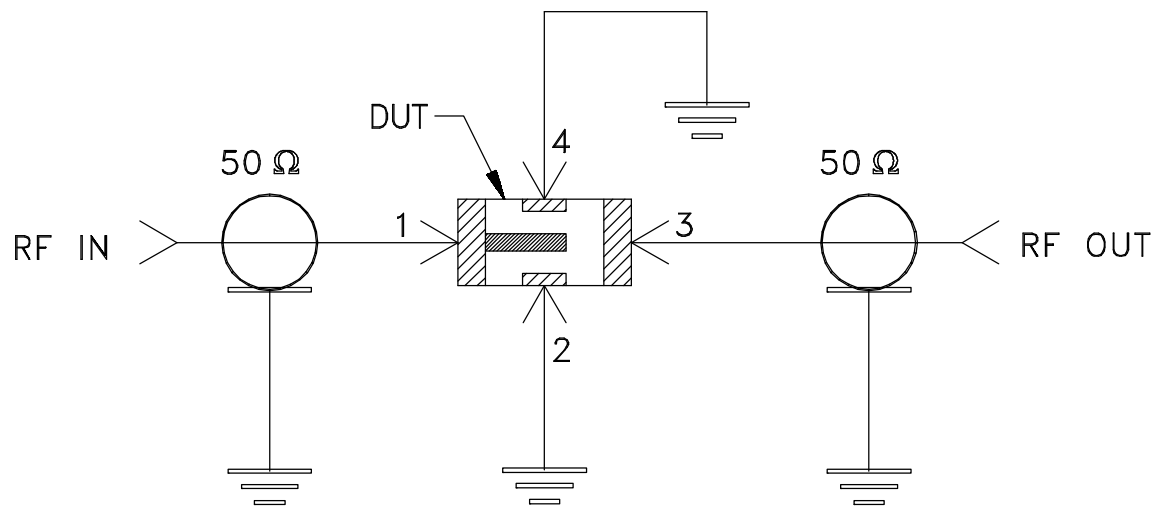
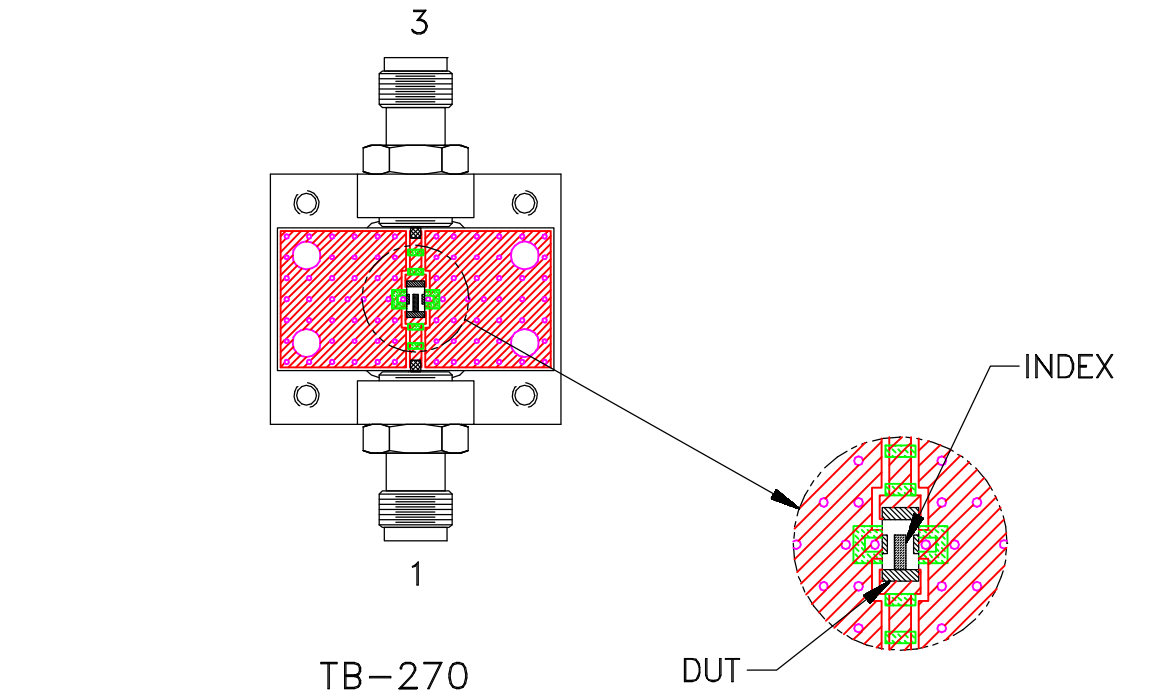
10:1

SHEET:

1 OF 1

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


Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS R04350 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