LTCC Bandpass Filter BFCN-3085A+

50Ω 2800 to 3400 MHz

The Big Deal

- Small size 3.2mm x 1.6mm
- Pass band (2800-3400 MHz)
- Low Insertion Loss (1.5 dB typical)
- Over 50 dB rejection up to 500 MHz

CASE STYLE: FV1206

Product Overview

The BFCN-3085A+ LTCC Band Pass Filter is constructed with multiple layers in order to achieve a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 600 MHz passband, these units offer low insertion loss and good rejection.

Key Features

Feature	Advantages
Small Size (3.20mm x1.6 mm)	Allows for high layout density of circuit boards, while minimizing affects of parasitics.
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.

Ceramic

Bandpass Filter

BFCN-3085A+

50Ω 2800 to 3400 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 max. 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.

Pad Connections

RF IN	1
RF OUT	3
GROUND	2,4

Features

- Small size (0.126"x0.063"x0.037")
- Temperature stable
- Hermetically sealed
- LTCC construction

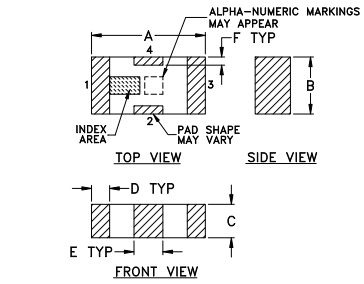
Applications

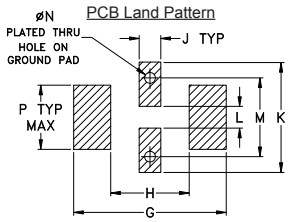
- Harmonic Rejection
- Transmitters / Receivers
- Military and Avionics

+RoHS Compliant

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

Outline Drawing





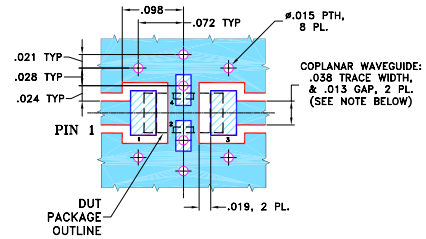
Suggested Layout,
Tolerance to be within ±.002

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)

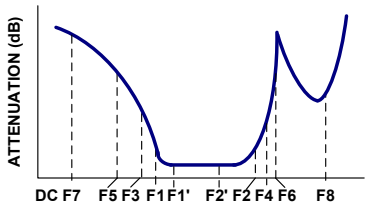
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Specifications[1,2] at 25°C

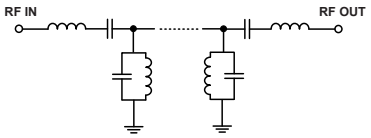
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	3085	—	MHz
	Insertion Loss	F1-F2	2800-3400	—	1.5	2.5	dB
	VSWR	F1'-F2'	3050-3350	—	1.85	3.0	:1
		F1-F2	2800-3400	—	1.8	3.0	
Stop Band, Lower	Insertion Loss	DC-F7	DC-500	50	68	—	dB
		DC-F5	DC-1750	20	49	—	
		DC-F3	DC-2000	12	—	—	
	VSWR	DC-F5	DC-1750	—	40	—	:1
Stop Band, Upper	Insertion Loss	F6-F8	4210-7800	20	34	—	dB
		F4-F8	4000-7800	12	—	—	
	VSWR	F6-F8	4210-7800	—	24	—	:1

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



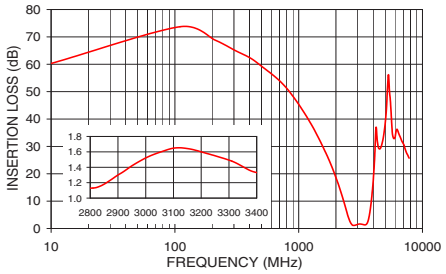
Functional Schematic



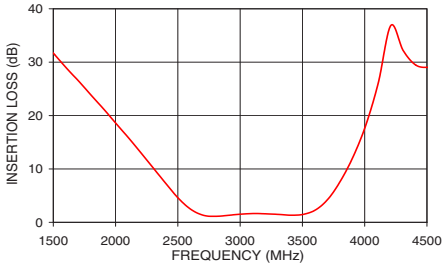
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10.00	60.29	347.44
100.00	74.29	434.30
500.00	59.20	579.06
1750.00	25.22	43.44
2000.00	18.63	35.46
2350.00	8.81	11.85
2550.00	3.46	3.73
2800.00	1.11	1.19
2900.00	1.31	1.65
3050.00	1.60	2.13
3085.00	1.63	2.15
3350.00	1.40	1.63
3400.00	1.35	1.44
3650.00	3.06	2.69
4000.00	17.57	17.93
4210.00	36.88	22.87
5300.00	56.71	30.49
7800.00	25.70	16.56

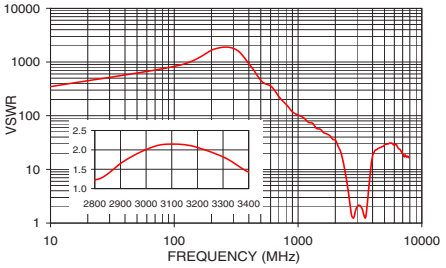
BFCN-3085A+
INSERTION LOSS



BFCN-3085A+
INSERTION LOSS



BFCN-3085A+
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 Band Pass Filter BFCN-3085A+

Typical Performance Data

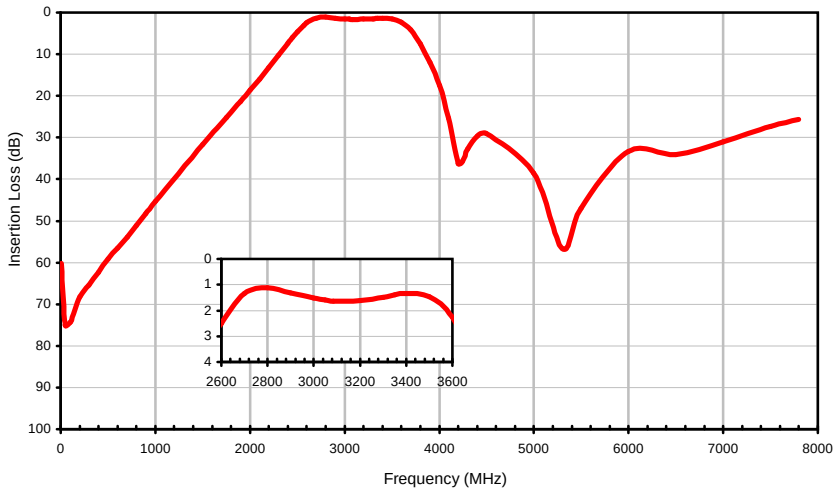
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
10	60.29	0.05
50	75.03	0.05
100	74.29	0.04
200	68.17	0.02
300	65.42	0.00
400	62.43	0.02
500	59.20	0.03
600	56.55	0.05
700	53.99	0.08
800	51.12	0.11
900	48.25	0.14
1000	45.39	0.17
1500	31.70	0.32
1750	25.22	0.40
1900	21.31	0.46
2000	18.63	0.49
2100	15.92	0.62
2200	13.16	0.82
2300	10.22	1.16
2400	7.40	1.95
2450	5.95	2.50
2500	4.62	3.37
2570	3.02	5.42
2600	2.50	6.74
2700	1.33	14.67
2800	1.11	21.03
2900	1.31	12.20
3000	1.51	9.47
3050	1.60	8.86
3085	1.63	8.76
3200	1.61	9.13
3300	1.48	10.78
3350	1.40	12.43
3400	1.35	14.88
3500	1.47	19.79
3600	2.25	9.92
3700	4.22	4.74
3800	7.48	2.44
3900	11.94	1.43
4000	17.57	0.97
4100	25.29	0.83
4200	36.25	0.76
4250	35.69	0.76
4300	32.67	0.74
4400	29.58	0.72
4500	29.01	0.70
5000	38.48	0.62
5300	56.71	0.57
5500	46.94	0.57
6000	33.27	0.61
6500	34.15	0.70
7000	30.98	0.89
7500	27.29	1.00
7800	25.70	1.05

FREQUENCY (MHz)	GROUP DELAY (nsec)
2800	0.86
2820	0.85
2830	0.84
2840	0.83
2850	0.82
2860	0.82
2870	0.81
2880	0.80
2890	0.79
2900	0.79
2920	0.76
2930	0.75
2940	0.74
2950	0.73
2960	0.73
2970	0.72
2980	0.71
2990	0.71
3000	0.70
3010	0.70
3020	0.70
3030	0.69
3040	0.69
3050	0.69
3060	0.69
3070	0.68
3080	0.68
3090	0.68
3100	0.68
3120	0.68
3130	0.68
3140	0.68
3150	0.68
3160	0.69
3180	0.69
3190	0.70
3200	0.70
3220	0.71
3230	0.71
3240	0.72
3250	0.72
3260	0.73
3280	0.74
3290	0.74
3300	0.75
3320	0.76
3330	0.77
3340	0.78
3350	0.79
3360	0.80
3370	0.81
3380	0.82
3390	0.83
3400	0.83

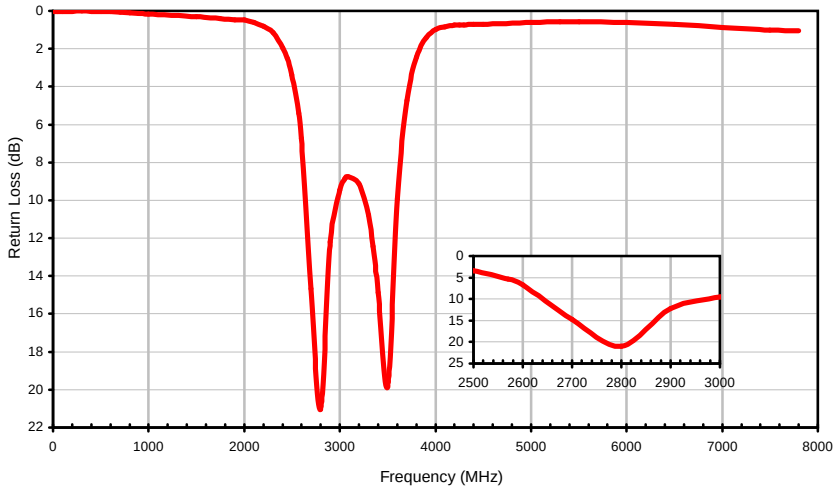
Ceramic Band Pass Filter BFCN-3085A+

Typical Performance Curves

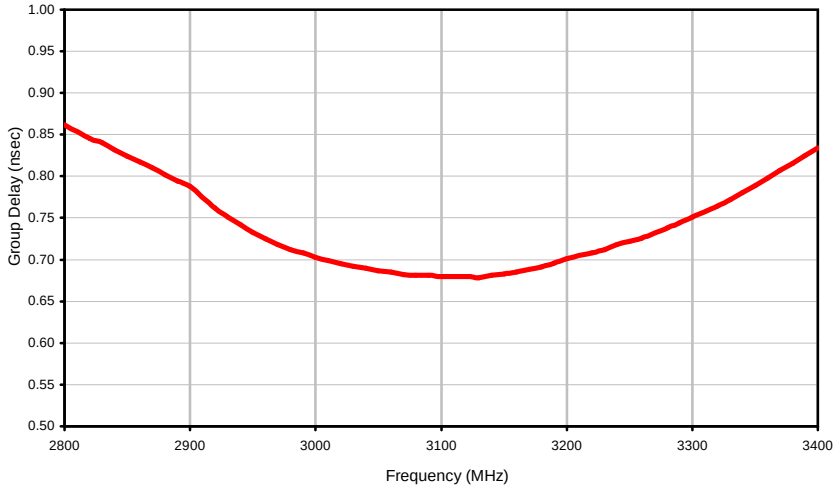
Insertion Loss



Return Loss



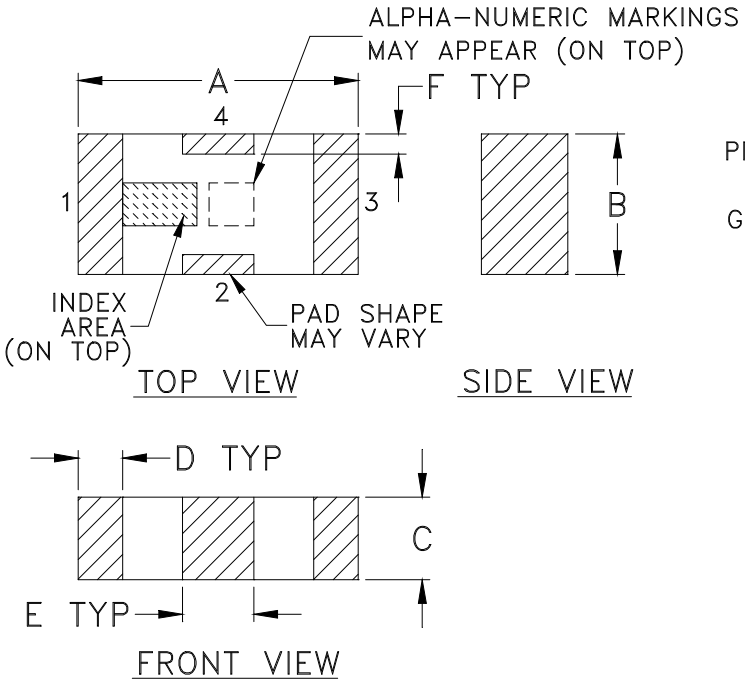
Group Delay



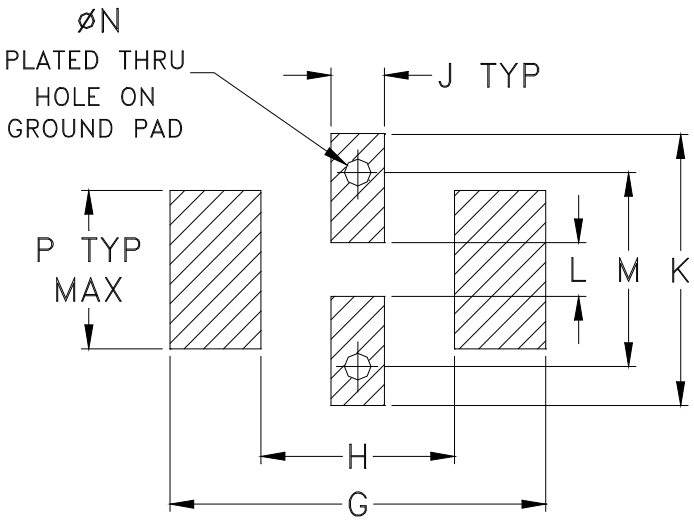
Case Style FV

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

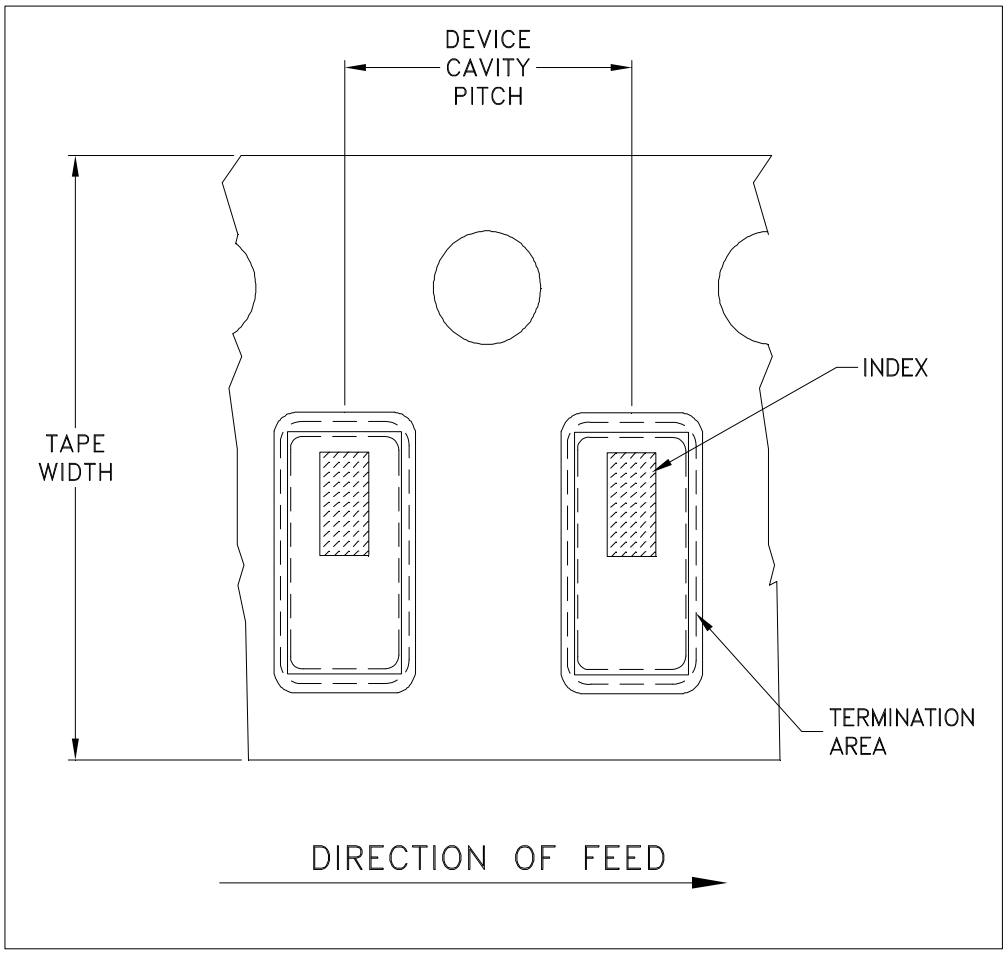


ILLUSTRATION 1

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.

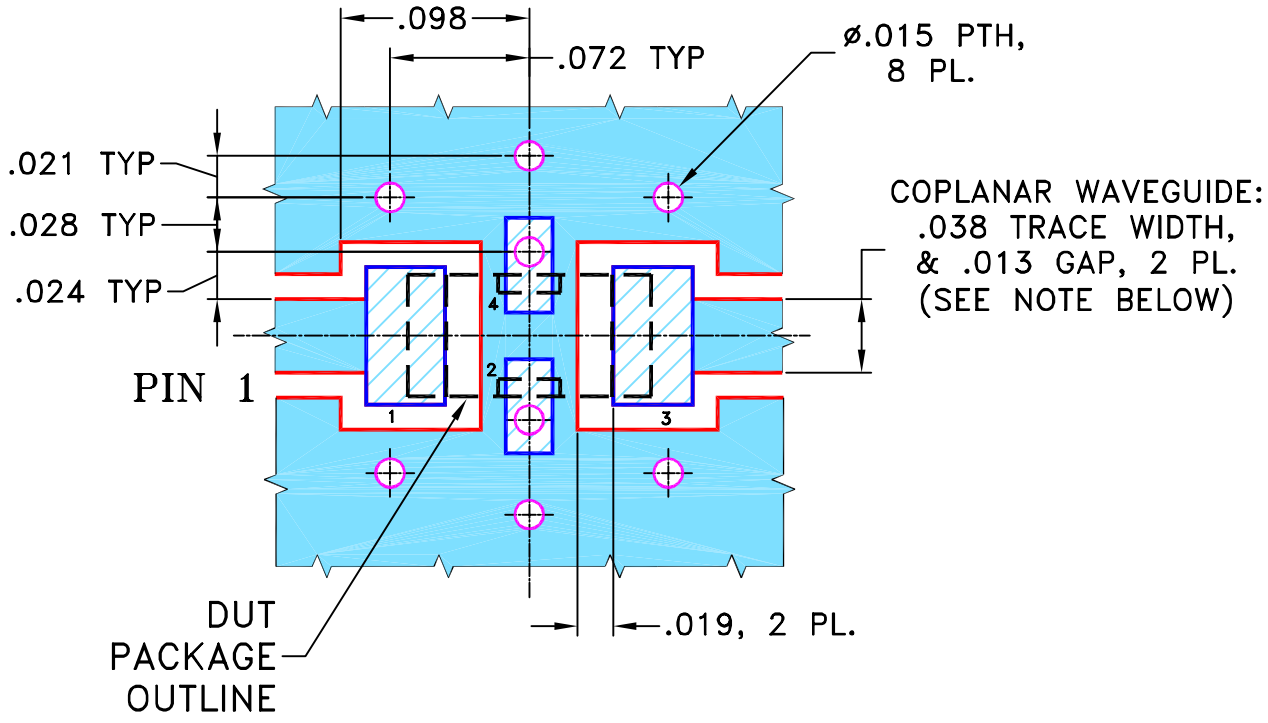
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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:
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 ±			

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

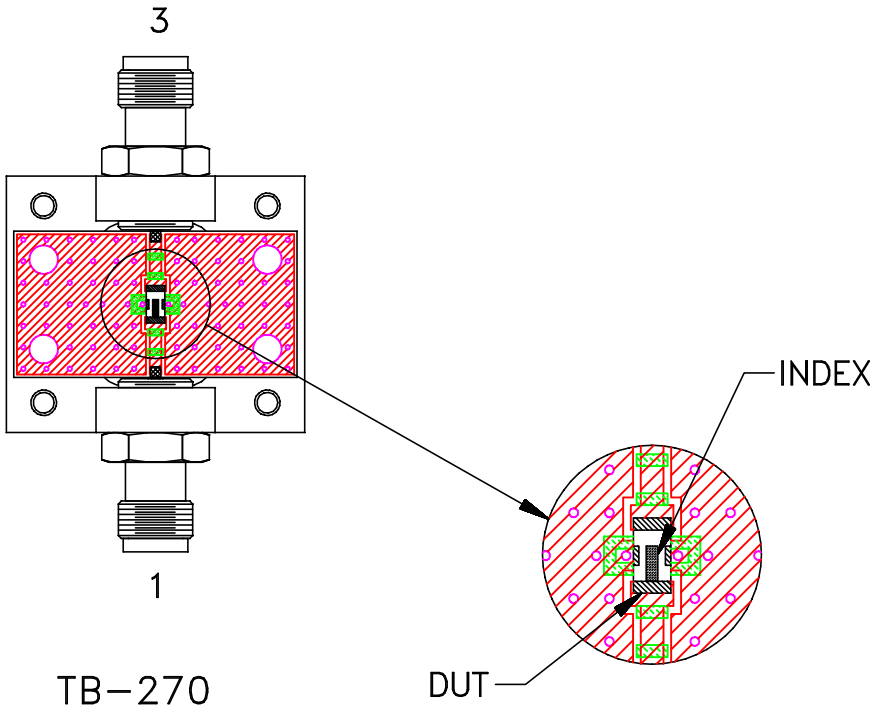
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

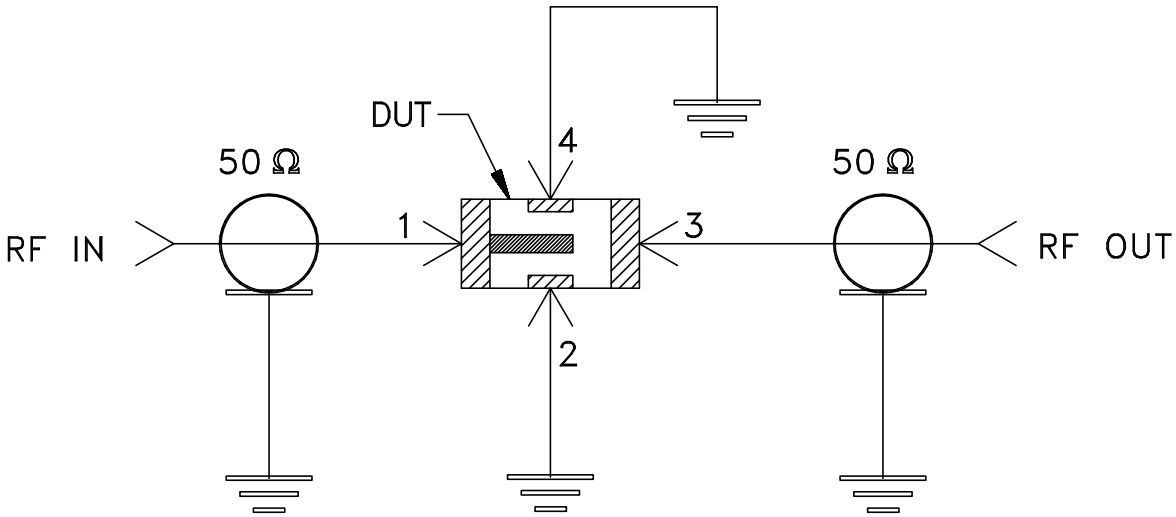
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-137	A

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®

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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