LTCC SMT

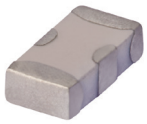
Band Pass Filter

BFCN-4440+

50Ω 4200 to 4700 MHz

THE BIG DEAL

- Good Rejection, 25 dB Typ.
- Good Return Loss, 20.8 dB Typ.
- 1206 Surface Mount Footprint
- Power Handling: 1.5 Watts



Generic photo used for illustration purposes only

CASE STYLE: FV1206

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

APPLICATIONS

- Harmonic Rejection
- Transmitters / Receivers

PRODUCT OVERVIEW

Mini-Circuits' BFCN-4440+ 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 500 MHz passband, these units offer low insertion loss and good rejection.

KEY FEATURES

Feature	Advantages
Small Size, 1206	Allows for high layout density of circuit boards, while minimizing the effects 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.
Rugged Power handling	Handles up to 1.5 Watts in a small package.

REV. C
ECO-021539
BFCN-4440+
URJ
240418

LTCC SMT

Band Pass Filter

BFCN-4440+

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	4440	—	MHz
	Insertion Loss	F1-F2	4200 - 4700	—	—	2	dB
	Return Loss	F1-F2	4200 - 4700	12.7	20.8	—	dB
Stop Band, Lower	Rejection	F3	2000	20	25	—	dB
Stop Band, Upper	Rejection	F5	6750	20	—	—	dB
		F4-F6	6650 - 12000	—	25	—	

1 This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

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

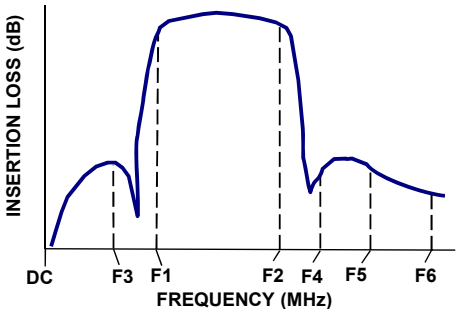
ABSOLUTE MAXIMUM RATINGS[1]

Parameter	Ratings
Operating temperature	-55°C to 100°C
Storage temperature	-55°C to 100°C
RF Power Input[2]	1.5W @25°C

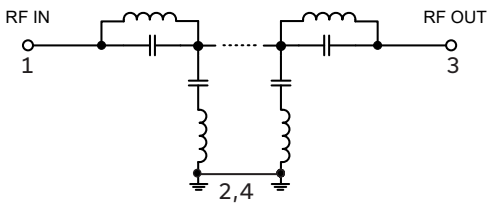
1. Permanent damage may occur if any of these limits are exceeded.

2. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.25W at +100°C.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL DIAGRAM



Band Pass Filter

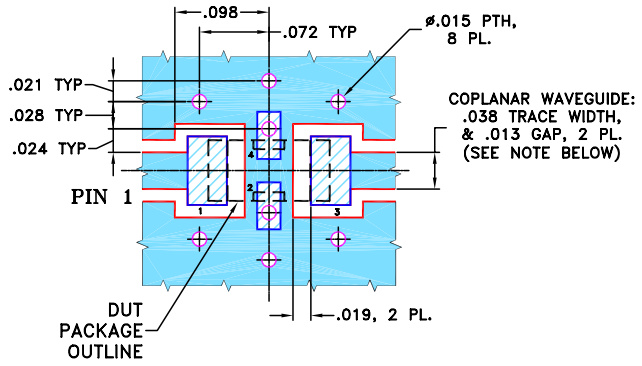
BFCN-4440+

PAD CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: RG

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

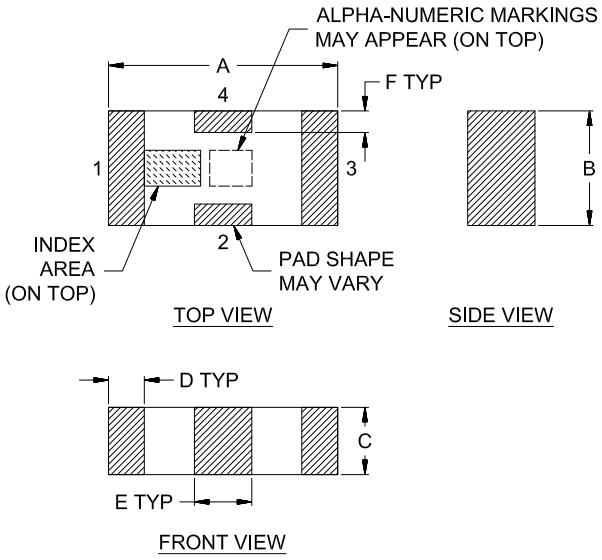


NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

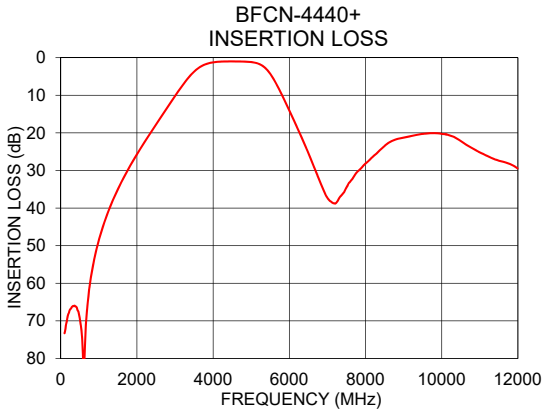
A	B	C	D	E	F	Wt.
.126	**.063**	**.037**	**.020**	**.032**	**.009**	grams
3.20	1.60	0.94	0.51	0.81	0.23	.020

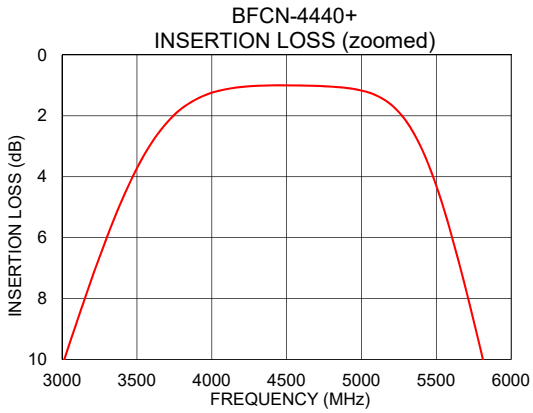
Band Pass Filter

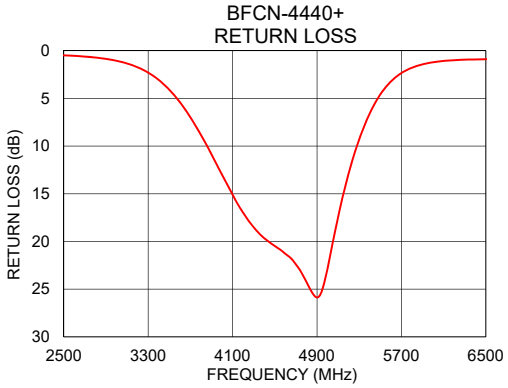
BFCN-4440+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
100	73.28	0.00
1012	48.11	0.13
1715	30.74	0.28
2000	25.69	0.33
2330	20.43	0.41
3540	3.35	4.57
4200	1.05	16.99
4300	1.01	18.52
4440	1.00	20.01
4600	1.00	21.29
4700	1.02	22.41
5402	3.08	6.51
6299	20.67	0.94
6650	29.12	0.87
6750	31.63	0.87
12000	29.55	0.97







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-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
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-Circuits 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

Mini-Circuits®
www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

Ceramic Band Pass Filter BFCN-4440+

Typical Performance Data

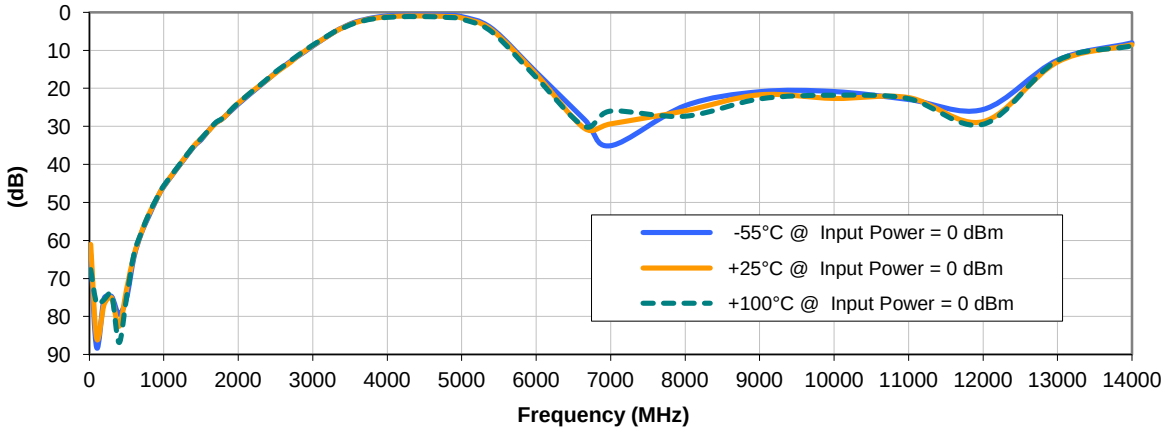
FREQ. (MHz)	GROUP DELAY (psec)		
	@ -55° C	@ +25° C	@ +100° C
4200	471.74	466.03	460.17
4205	530.13	481.17	501.08
4210	512.19	443.42	508.60
4215	530.26	480.38	425.57
4220	496.08	488.50	409.27
4230	493.52	472.31	442.63
4240	514.79	477.30	469.46
4250	505.39	481.43	529.18
4260	530.63	469.47	433.81
4270	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

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-Circuits 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

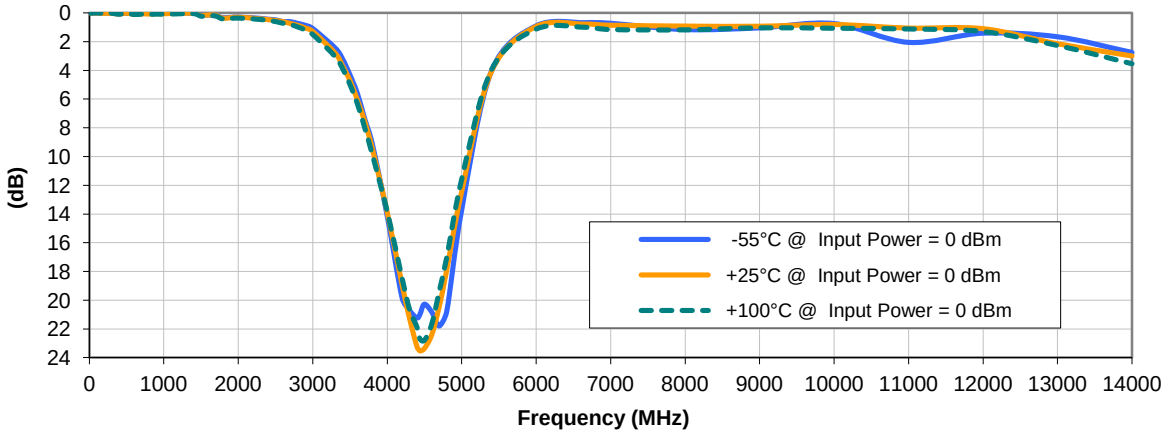
Mini-Circuits®
www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

Typical Performance Curves

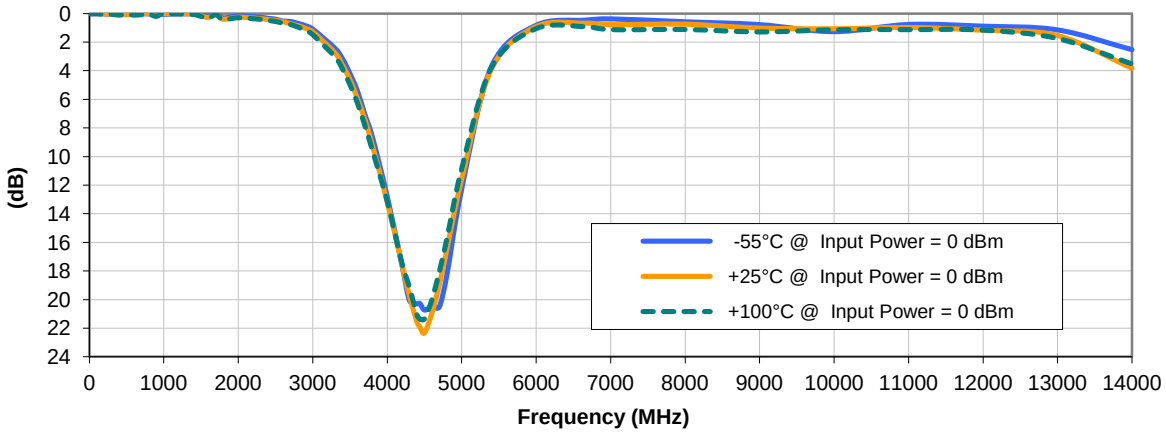
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE

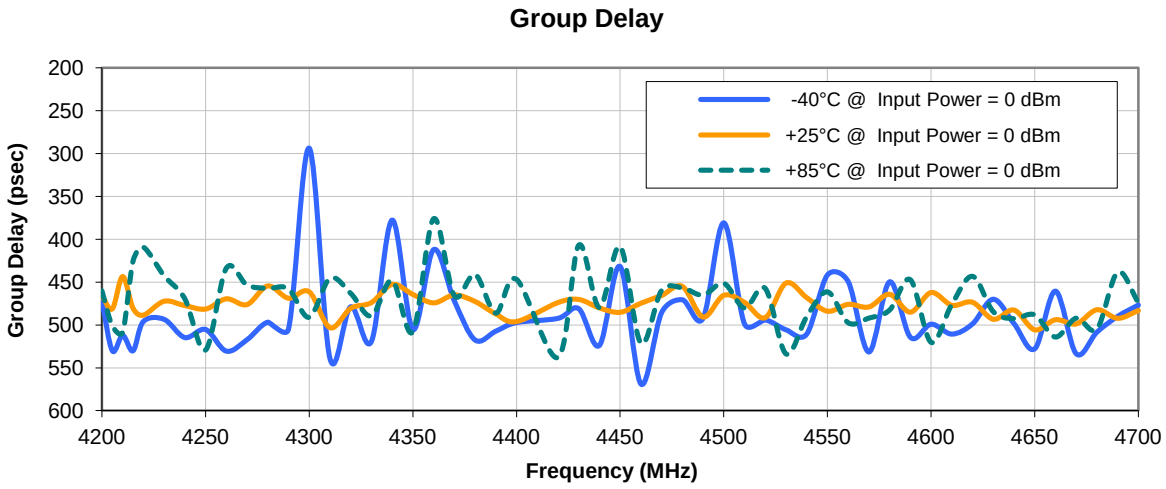


OUTPUT RETURN LOSS vs. TEMPERATURE



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-Circuits 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

Typical Performance Curves

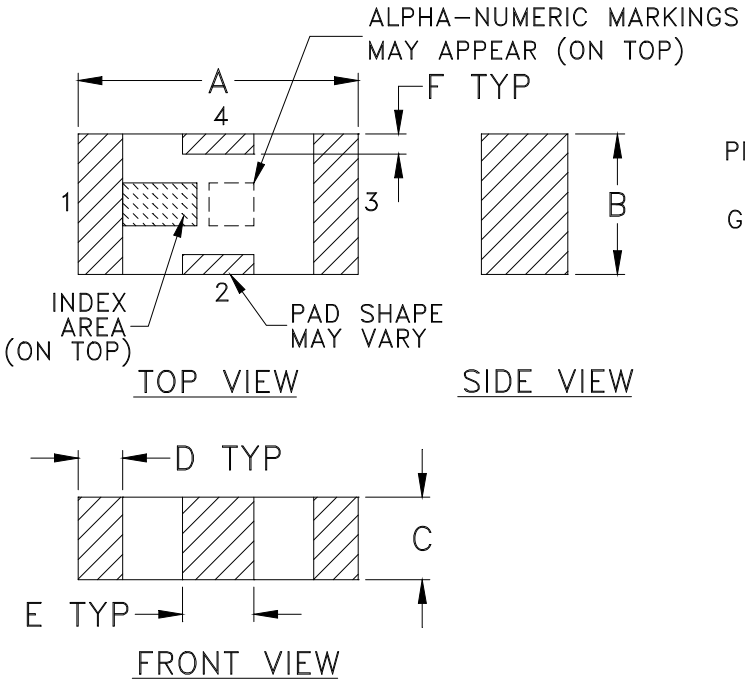


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits 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

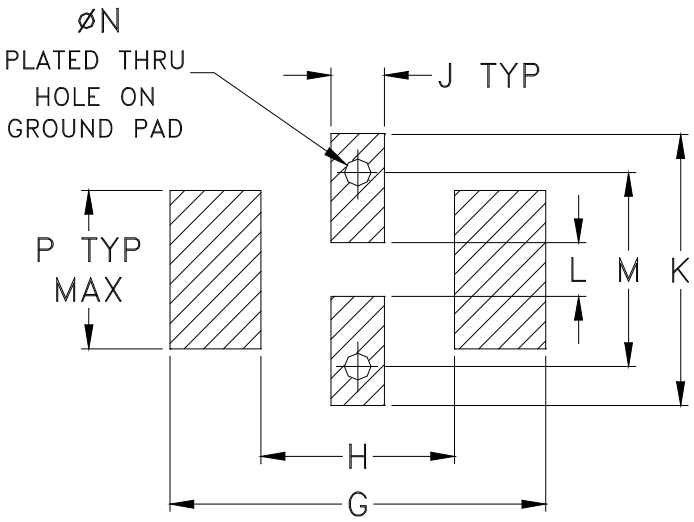
Case Style FV

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.

This document and its contents are the property of Mini-Circuits.

Tape & Reel Packaging TR-F71

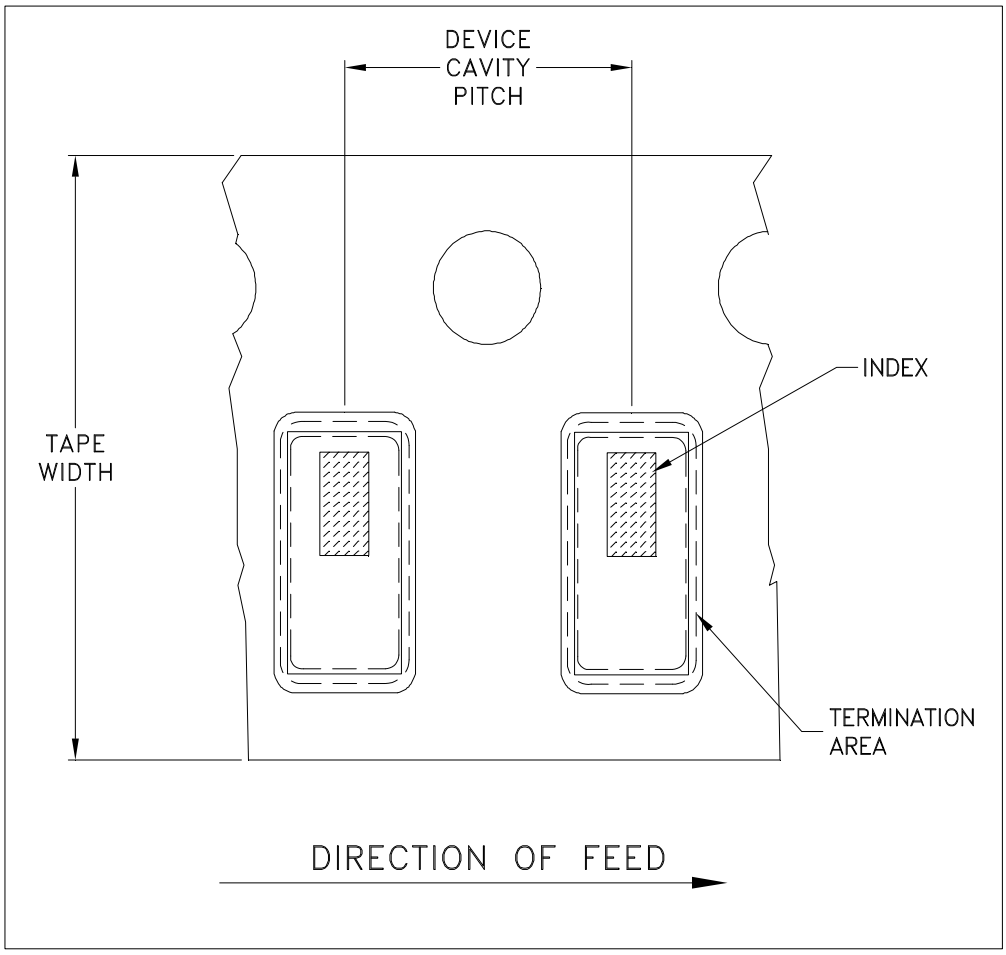


ILLUSTRATION 1

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.

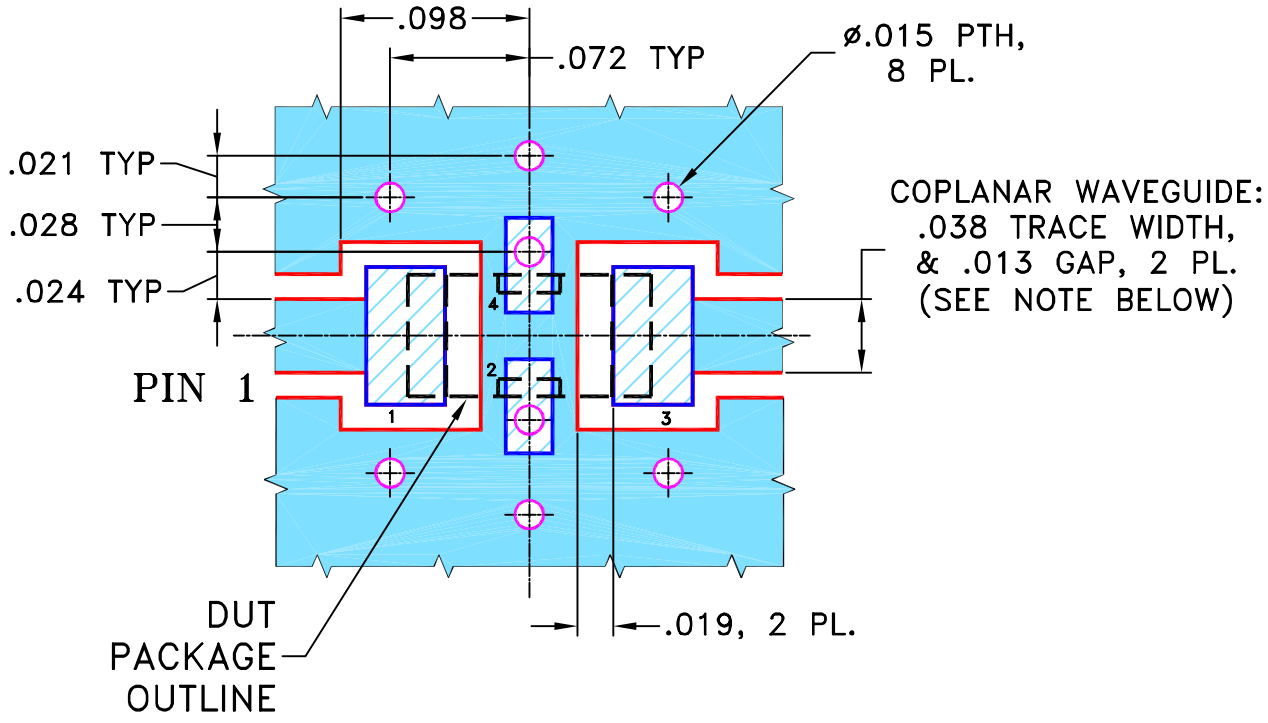
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

This document and its contents are the property of Mini-Circuits.

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 ±			

Mini-Circuits®
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE , MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

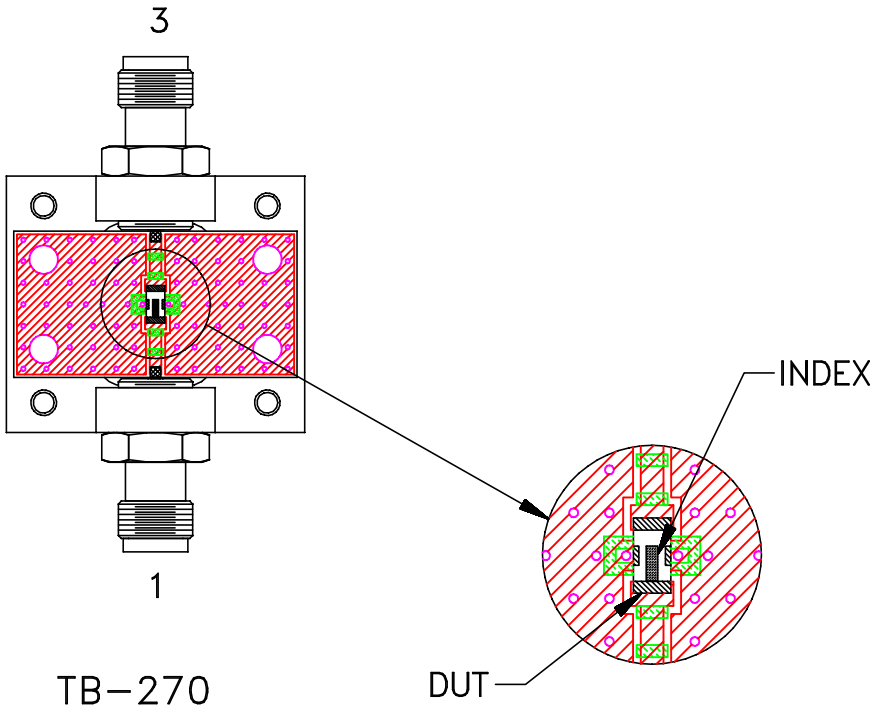
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

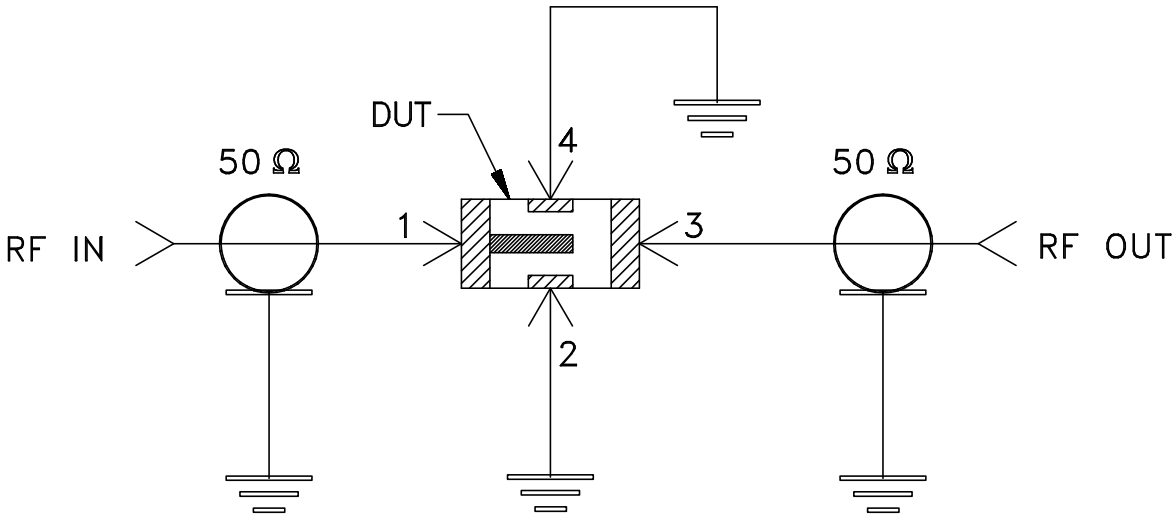
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-137	A

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®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF 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

This document and its contents are the property of Mini-Circuits.