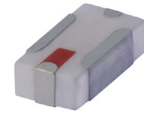


**THE BIG DEAL**

- Small Size (0.12x0.06x0.04")
- Temperature Stable
- Excellent Power Handling, 7 W
- Hermetically Sealed
- Low Cost

*Generic photo used for illustration purposes only*

CASE STYLE: FV1206-4

+RoHS Compliant

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

APPLICATIONS

- Electronic Warfare Exciters and Receivers
- Sub-Harmonic Rejection
- Transmitters/Receivers
- Lab Use

PRODUCT OVERVIEW

The HFCN-1322+ LTCC high pass filter covers the 14300 to 18500 MHz passband with 1.5 dB passband insertion loss and 28 dB stopband rejection. This model handles up to 7 W RF input power and provides a wide operating temperature range from -55 to +100°C. Utilizing LTCC multi-layer construction, the filter achieves excellent repeatability of performance and comes in a tiny 1206 ceramic package with wraparound terminations, minimizing performance variations due to parasitics and saving space in dense PCB layouts.

KEY FEATURES

Feature	Advantages
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Tiny Size (0.12x0.06x0.04")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Wrap-Around Terminations	Provides excellent solderability and easy visual inspection.
Wide Operating Temperature Range, -55 to +100°C	Enables reliable performance in extreme environments.



Mini-Circuits®

CERAMIC

High Pass Filter

HFCN-1322+

50Ω

14300 to 18500 MHz

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

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Stopband	DC-F1	DC-11300	20	28		dB
	F1-F2	DC-11700	15	28		
	Freq. Cut-Off	F3		3.0		dB
	VSWR	DC-F2		20		:1
Passband	Insertion Loss	F4-F7		1.75	2.8	dB
		F5-F6		1.5	2.5	dB
	VSWR	F4-F7		1.7		:1

1. In Application where DC voltage is present at either input or output ports, coupling capacitors are required.

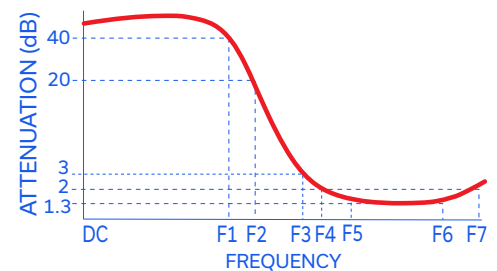
2. Measured on Mini-Circuits Characterization Test Board TB-HFCN-1322+.

ABSOLUTE MAXIMUM RATINGS

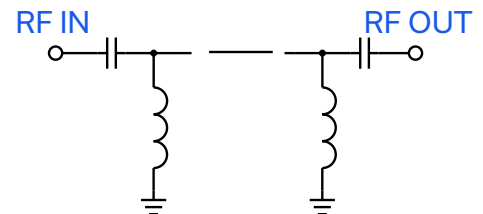
Parameter	Ratings
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input ³	7 W max. at +25°C

3. Passband rating, derate linearly to 3 W at +100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC





Mini-Circuits®

CERAMIC

High Pass Filter

HFCN-1322+

50Ω

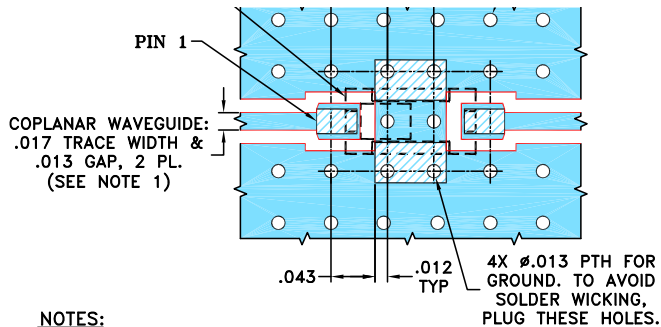
14300 to 18500 MHz

PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: FB

DEMO BOARD MCL P/N: TB-HFCN-1322+
SUGGESTED PCB LAYOUT (PL-487)

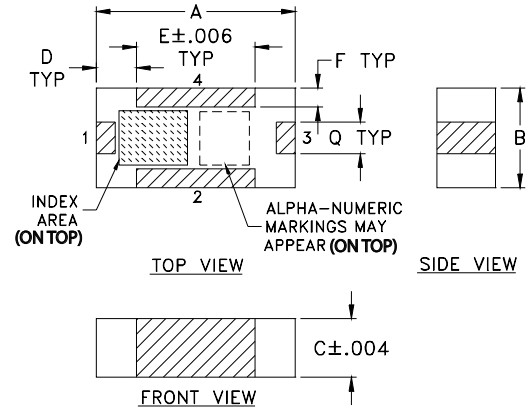


NOTES:

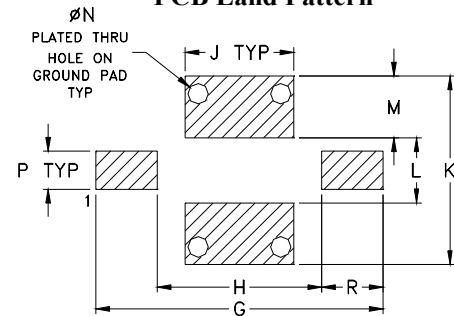
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001".
COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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 ±.002

OUTLINE DIMENSIONS (Inches)
mm

A	B	C	D	E	F	G	H	J
.126	.063	.037	.026	.075	.012	.182	.104	.069
3.20	1.60	0.94	0.66	1.91	0.30	4.62	2.64	1.75
K	L	M	N	P	Q	R	wt	
.119	.041	.039	.013	.024	.020	.039	grams	
3.02	1.04	0.99	0.33	0.61	0.51	0.99	.020	

TAPE & REEL INFORMATION: F75



CERAMIC

High Pass Filter

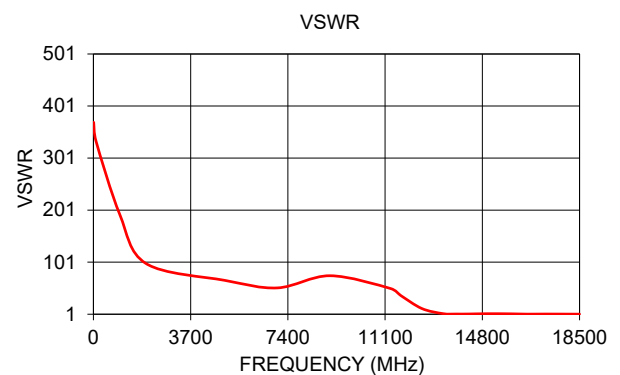
HFCN-1322+

Mini-Circuits

50Ω 14300 to 18500 MHz

TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR :1
10	80.30	369.73
100	52.19	333.37
1000	32.67	193.05
2000	28.29	98.48
5000	26.56	66.05
7000	27.18	51.59
9000	31.24	74.98
11300	34.00	50.49
11700	29.04	36.80
12500	14.10	11.91
13300	3.03	2.12
13800	1.73	1.40
14300	1.56	1.47
15000	1.75	2.02
15900	1.47	1.78
16500	1.08	1.21
17200	1.17	1.38
18500	1.19	1.15



NOTES

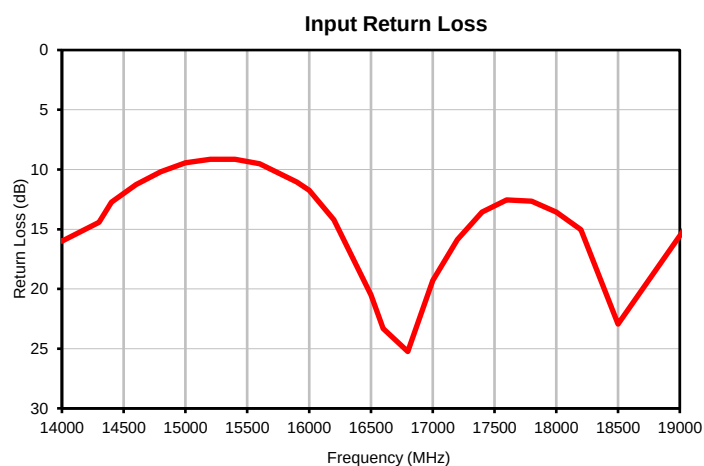
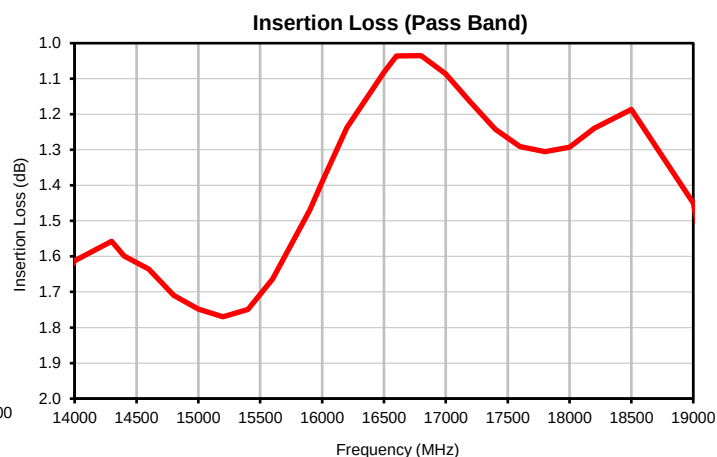
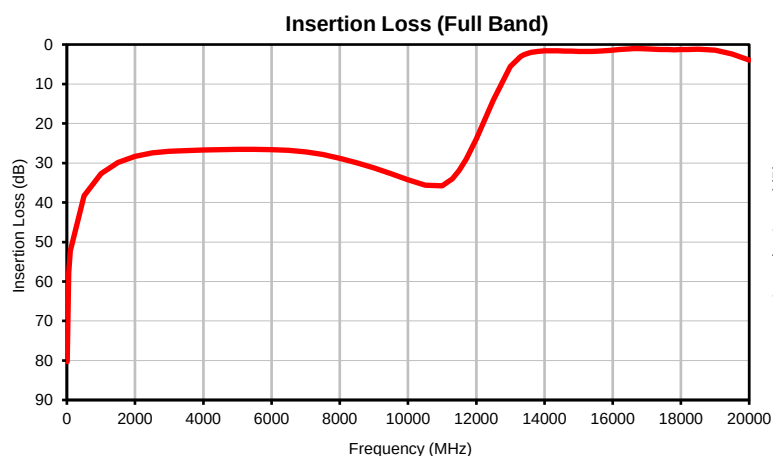
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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



Typical Performance Data

FREQUENCY	INSERTION LOSS	INPUT RETURN LOSS
(MHz)	(dB)	(dB)
10	80.30	0.05
50	57.81	0.05
100	52.19	0.05
500	38.30	0.06
1000	32.67	0.09
1500	29.86	0.14
2000	28.29	0.18
2500	27.46	0.20
3000	27.03	0.23
3500	26.85	0.23
4000	26.74	0.22
4500	26.65	0.25
5000	26.56	0.26
5500	26.55	0.30
6000	26.62	0.32
6500	26.80	0.37
7000	27.18	0.34
7500	27.83	0.32
8000	28.77	0.29
8500	29.93	0.28
9000	31.24	0.23
9500	32.67	0.19
10000	34.21	0.19
10500	35.65	0.23
11000	35.76	0.34
11300	34.00	0.34
11500	31.90	0.42
11700	29.04	0.47
12000	23.90	0.80
12500	14.10	1.46
13000	5.55	4.57
13300	3.03	8.88
13400	2.55	10.67
13600	2.01	13.47
13800	1.73	15.52
14000	1.61	16.00
14300	1.56	14.41
14400	1.60	12.73
14600	1.64	11.27
14800	1.71	10.19
15000	1.75	9.45
15200	1.77	9.14
15400	1.75	9.14
15600	1.66	9.53
15900	1.47	11.05
16000	1.39	11.74
16200	1.24	14.20
16500	1.08	20.52
16600	1.04	23.32
16800	1.03	25.24
17000	1.09	19.31
17200	1.17	15.86
17400	1.24	13.56
17600	1.29	12.54
17800	1.31	12.65
18000	1.29	13.57
18200	1.24	15.05
18500	1.19	22.93
19000	1.45	15.55
19500	2.38	7.93
20000	3.90	5.40

Typical Performance Curves



DEVICE ORIENTATION IN T&R

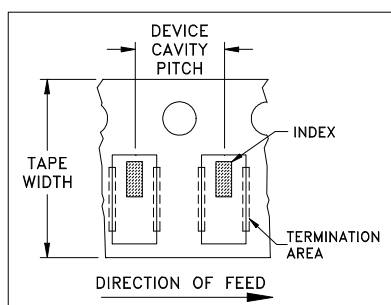


ILLUSTRATION 1

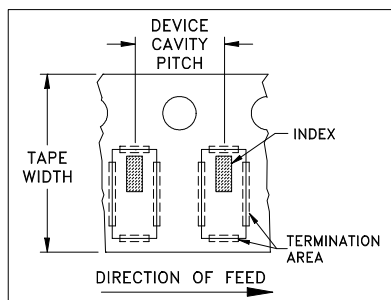


ILLUSTRATION 2

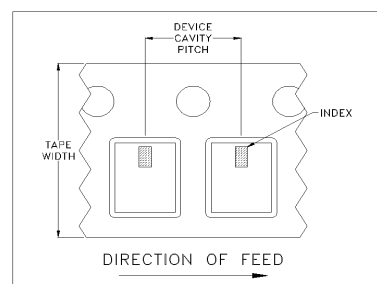


ILLUSTRATION 3

Applicable Case Styles

FV1206-1
FV1206-3

Applicable Case Styles

FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

Applicable Case Styles

FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10
NL1008C-12

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.

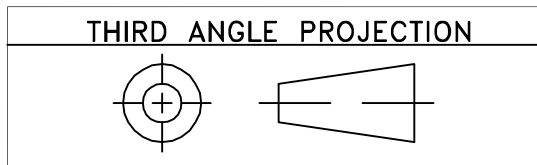
Go to: www.minicircuits.com/pages/pdfs/tape.pdf



Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • **EUROPE** 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

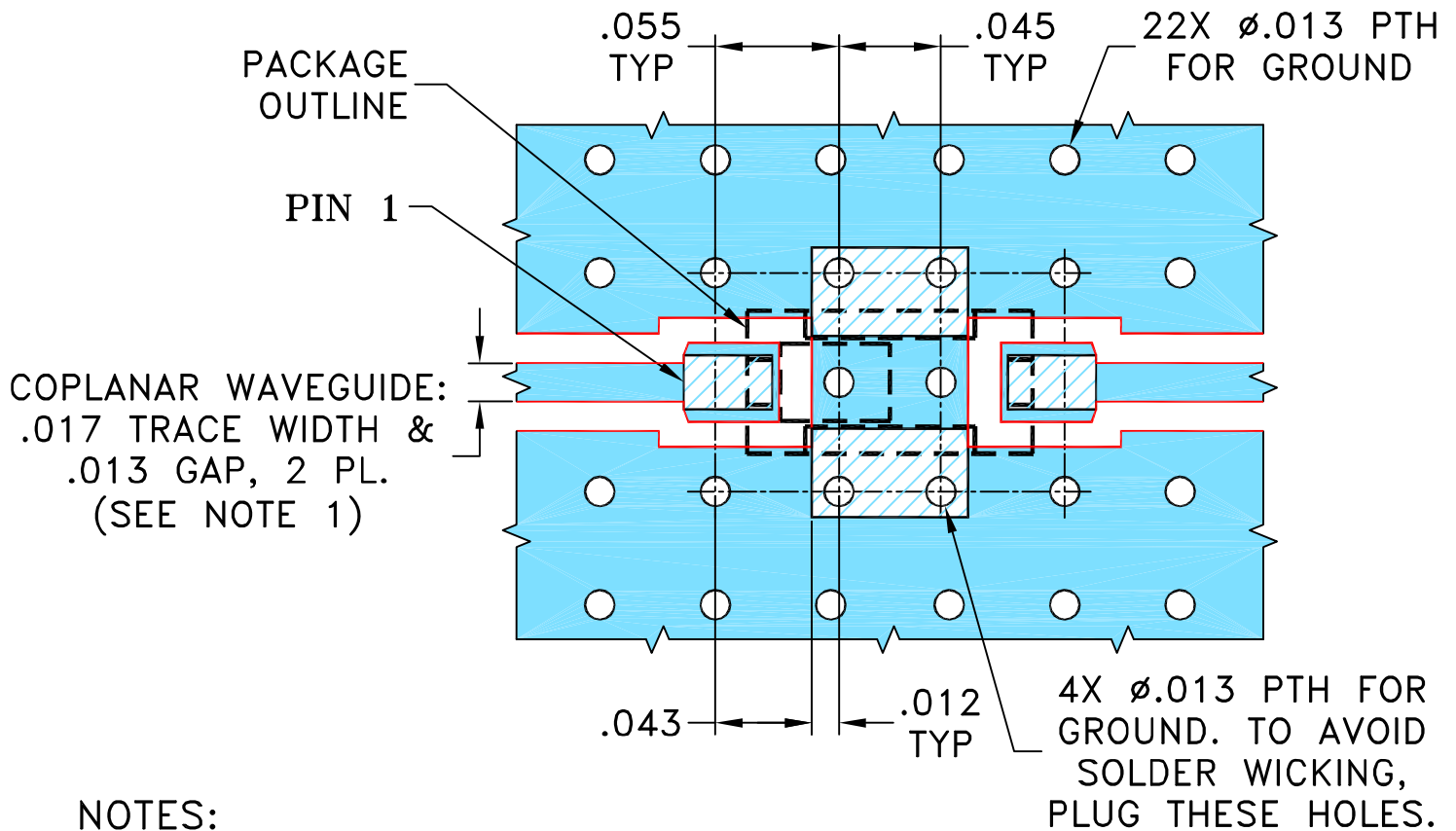
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M158043	NEW RELEASE	09/28/16	CA	ZL

**SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-4 CASE STYLE, "04FL01" PIN CODE**

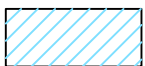


NOTES:

1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" $\pm$.001".
COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND 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 CA	09/23/16
TOLERANCES ON:	CHECKED IL	09/27/16
2 PL DECIMALS $\pm$	APPROVED ZL	09/28/16
3 PL DECIMALS $\pm$.005		
ANGLES $\pm$		
FRACTIONS $\pm$		



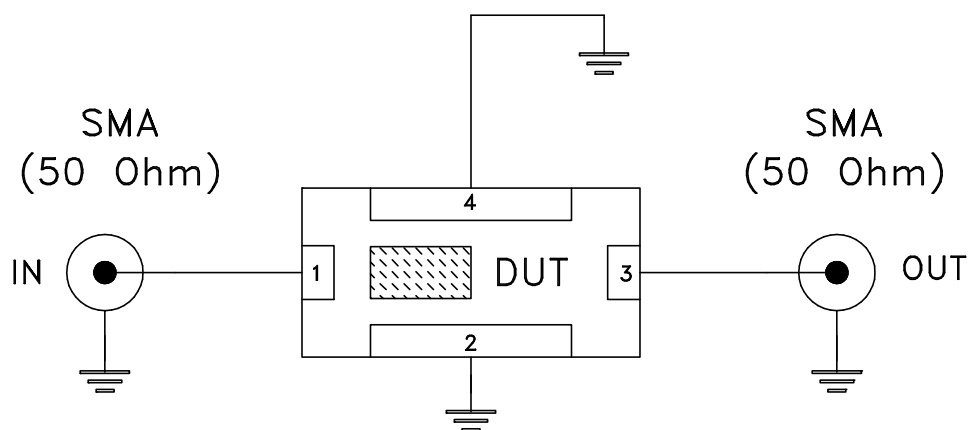
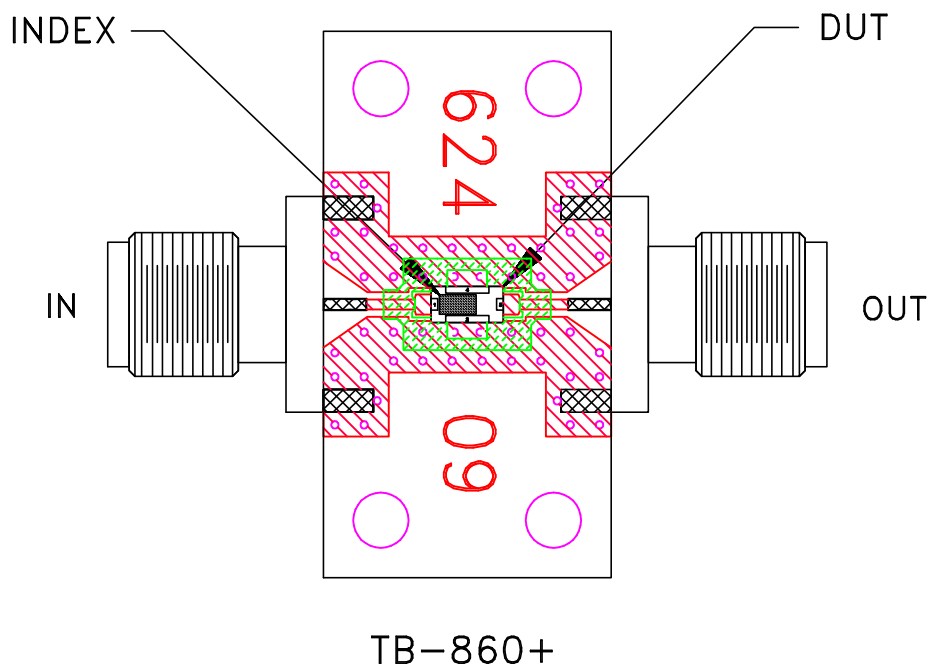
Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, 04FL01, FV1206-4, TB-860+

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.

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-487	OR
FILE:	98PL487	SCALE:	12:1
		SHEET:	1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.010 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	-40° to 85°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
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
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, 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
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215