

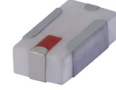


### FEATURES

- Excellent power handling, 8W
- Small size
- 7 sections
- Temperature stable
- Hermetically sealed
- LTCC construction
- Protected by U.S. Patent 6,943,646

### APPLICATIONS

- Electronic warfare (EW)
- Harmonic rejection
- Transmitters/receivers
- Lab use



Generic photo used for illustration purposes only

CASE STYLE: FV1206-4

#### +RoHS Compliant

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

### PRODUCT OVERVIEW

Mini-Circuits' LFCN-8440+ is an LTCC low pass filter with a passband from DC to 8440 MHz, supporting a variety of applications. This model provides 1.3 dB passband insertion loss and 30 dB typical stopband rejection. It handles up to 8W RF input power and provides a wide operating temperature range from -55 to +100°C. Housed in a tiny 1206 ceramic form factor with wraparound terminations, the filter is ideal for dense PCB layouts and with minimal performance variation due to parasitics.

### 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 (0.12 x 0.06 x 0.04")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
High power handling, 8W	Supports a wide range of system power requirements.
Wrap-around terminations	Provides excellent solderability and easy visual inspection
Wide operating temperature range, -55 to +100°C	Enables reliable performance in extreme environments.



CERAMIC

# Low Pass Filter

## LFCN-8440+

### ELECTRICAL SPECIFICATIONS<sup>1,2</sup> AT 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units	
Passband	Insertion Loss	DC-F1	DC-8440	—	1.3	2.5	dB
	Freq. Cut-Off	F2	9429	—	3.0	—	dB
	VSWR	DC-F1	DC-8440	—	1.7	—	:1
Stop Band	Rejection Loss	F3-F4	10900-11500	20	30	—	dB
		F4-F5	11500-21850	25	33	—	
	VSWR	F3-F6	10900-21850	—	30	—	:1

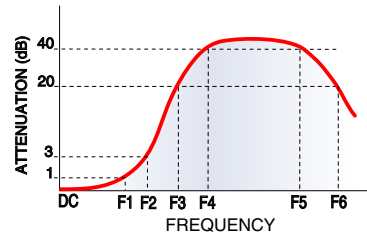
1. In Application where DC voltage is present at either input or output ports, de-coupling capacitors are required.
2. Measured on Mini-Circuits Characterization Test Board TB-860+.

### MAXIMUM RATINGS

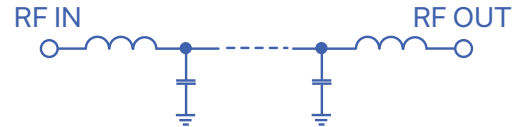
Parameter	Ratings
Operating temperature	-55°C to 100°C
Storage temperature	-55°C to 100°C
RF Power Input <sup>3</sup>	8 W max. at 25°C

3. Passband rating, 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. B  
 ECO-011891  
 LFCN-8440+  
 AVB/CP/AM  
 220209



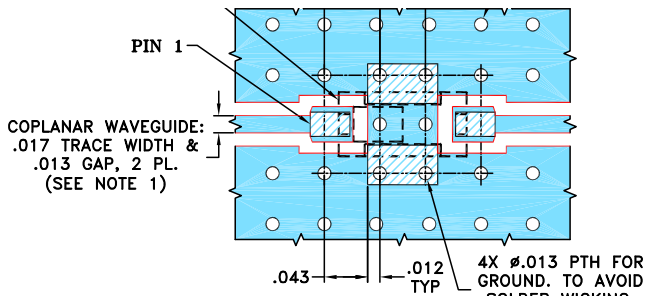


### PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: EC

DEMO BOARD MCL P/N: TB-860  
SUGGESTED PCB LAYOUT (PL-487)

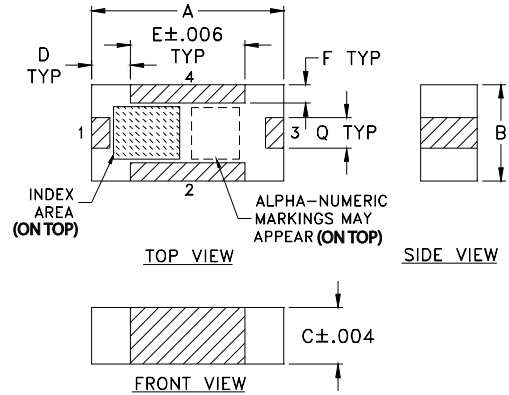


#### NOTES:

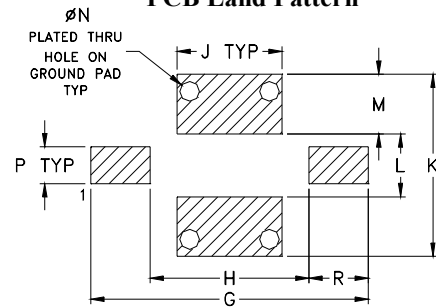
- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" ± .001".  
COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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



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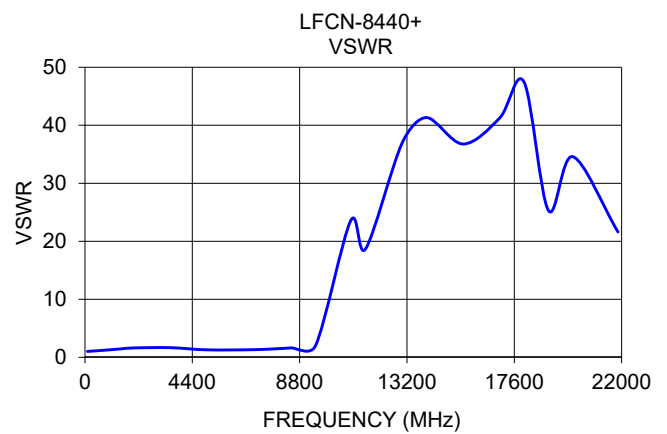
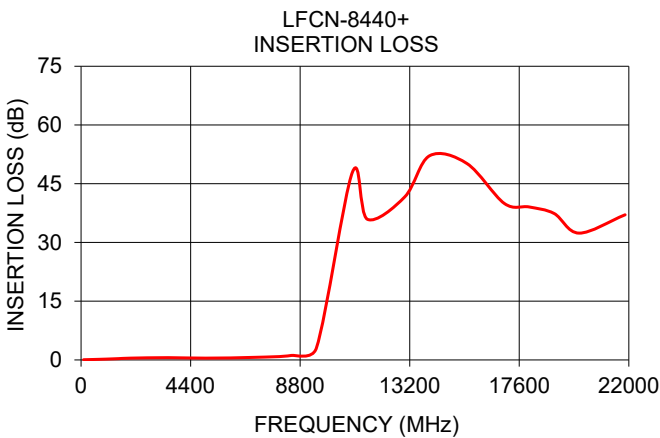
# Low Pass Filter

## LFCN-8440+

Mini-Circuits

### TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
100	0.05	1.02
500	0.11	1.13
1000	0.21	1.29
1500	0.33	1.47
2000	0.46	1.62
3500	0.58	1.67
5000	0.46	1.29
7000	0.66	1.33
8450	1.15	1.62
9450	3.00	2.00
10900	47.97	23.62
11500	35.92	18.66
13000	41.64	36.93
14000	52.15	41.33
15500	50.15	36.77
17000	39.96	41.25
18000	39.06	47.45
19000	37.40	25.30
20000	32.39	34.59
21850	37.07	21.62



#### NOTES

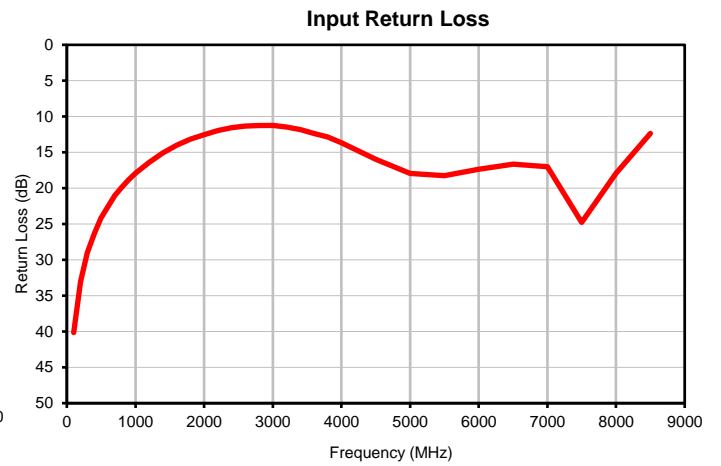
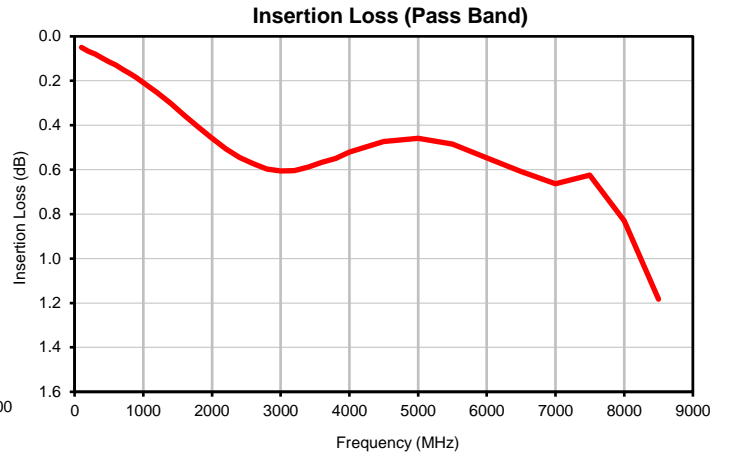
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
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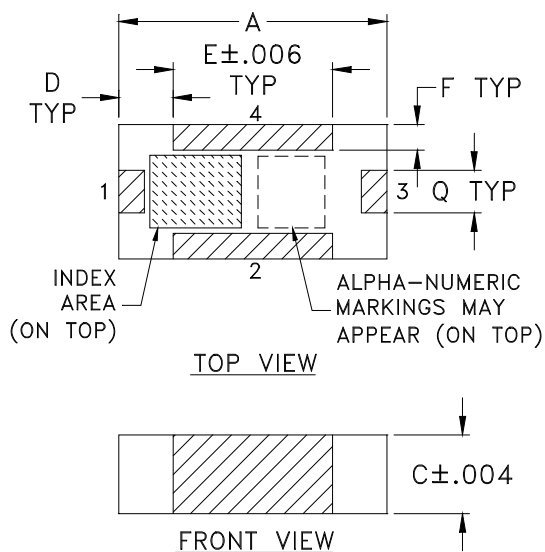
## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)
100	0.05	40.15
200	0.07	33.06
300	0.08	29.01
400	0.10	26.32
500	0.11	24.14
600	0.13	22.55
700	0.15	21.01
800	0.17	19.86
900	0.19	18.84
1000	0.21	17.92
1200	0.25	16.36
1400	0.30	15.07
1600	0.36	14.01
1800	0.41	13.17
2000	0.46	12.52
2200	0.51	11.95
2400	0.55	11.57
2600	0.57	11.35
2800	0.60	11.26
3000	0.61	11.27
3200	0.60	11.46
3400	0.59	11.83
3600	0.57	12.37
3800	0.55	12.85
4000	0.52	13.67
4500	0.47	16.00
5000	0.46	17.94
5500	0.49	18.27
6000	0.55	17.37
6500	0.61	16.66
7000	0.66	17.01
7500	0.62	24.80
8000	0.83	17.96
8500	1.18	12.35
9000	1.52	13.29
9500	3.53	7.82
10000	13.31	1.40
10500	27.11	0.71
11000	44.89	0.62
11500	35.92	0.93
12000	36.04	0.59
12500	38.31	0.56
13000	41.64	0.47
13500	46.21	0.43
14000	52.15	0.42
14500	57.57	0.41
15000	60.44	0.41
15500	50.15	0.47
16000	44.02	0.40
16500	40.75	0.37
17000	39.96	0.42
17500	39.56	0.41
18000	39.06	0.37
18500	38.39	0.49
19000	37.40	0.69
19500	35.66	0.52
20000	32.39	0.50

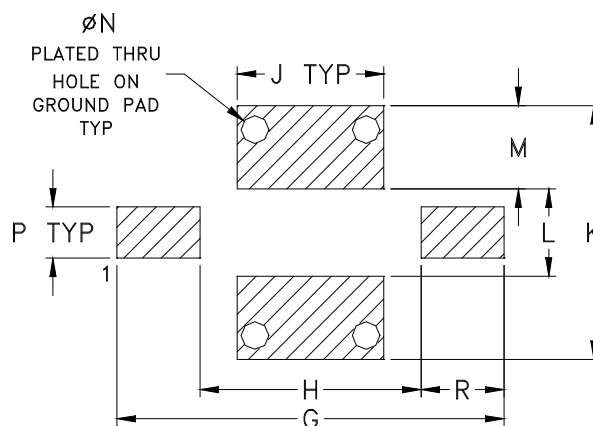
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



CASE #	A	B	C	D	E	F	G	H	J	K	L	M
FV1206-4	.126 (3.20)	.063 (1.60)	.037 (0.94)	.026 (0.66)	.075 (1.91)	.012 (0.30)	.182 (4.62)	.104 (2.64)	.069 (1.75)	.119 (3.02)	.041 (1.04)	.039 (0.99)

CASE #	N	P	Q	R	WT. GRAM
FV1206-4	.013 (0.33)	.024 (0.61)	.020 (0.51)	.039 (0.99)	.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.

## DEVICE ORIENTATION IN T&R

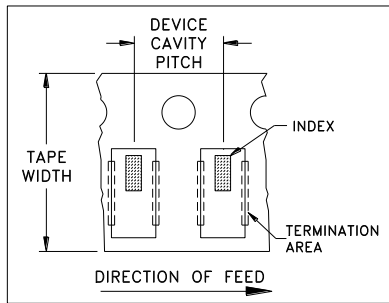


ILLUSTRATION 1

### Applicable Case Styles

FV1206-1  
FV1206-3

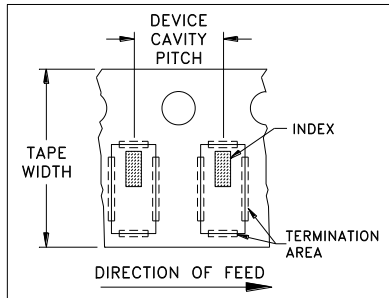


ILLUSTRATION 2

### Applicable Case Styles

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

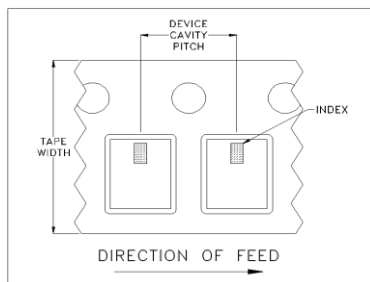


ILLUSTRATION 3

### Applicable Case Styles

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

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

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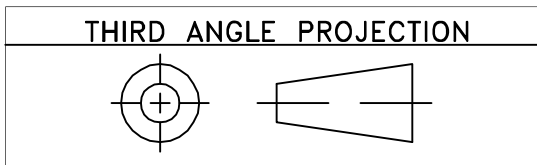
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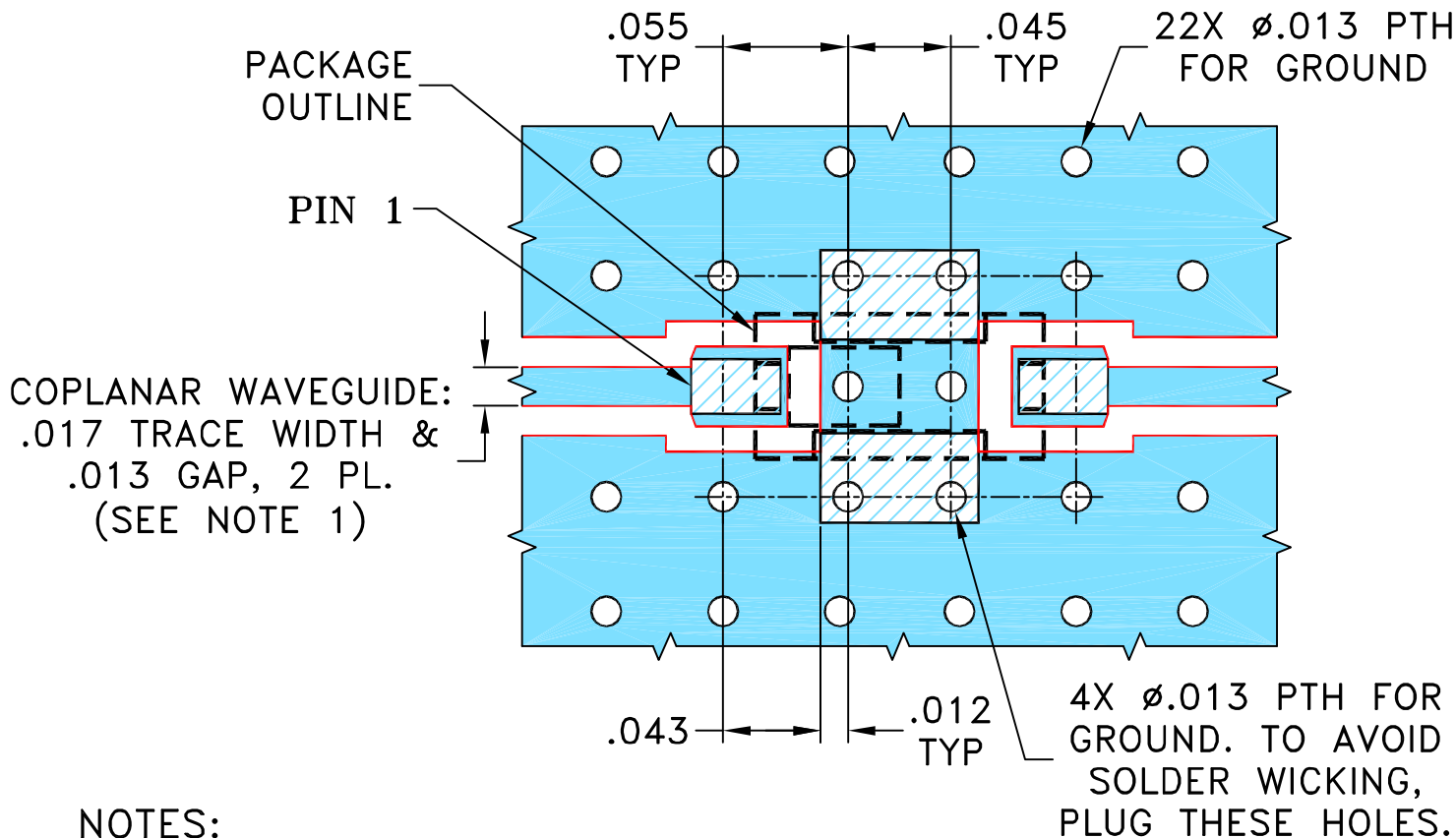
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REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M158043	NEW RELEASE	09/28/16	CA	ZL

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

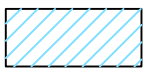


NOTES:

- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" ± .001".  
COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- 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 ±	APPROVED ZL	09/28/16
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		



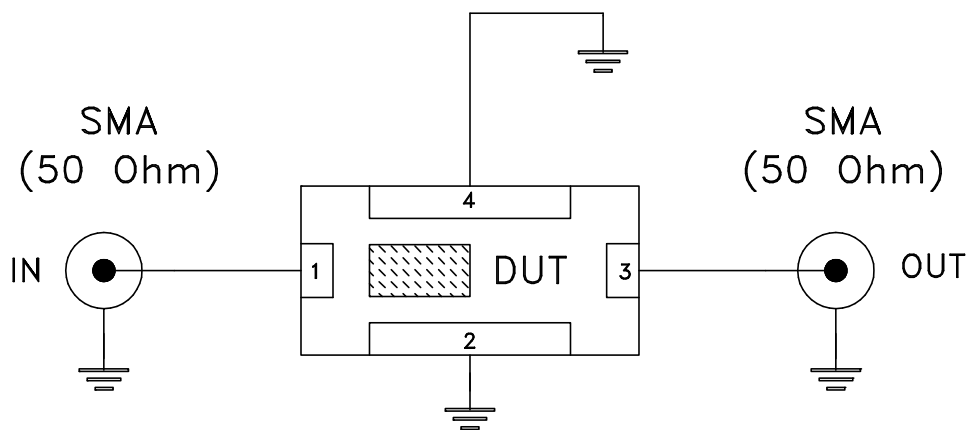
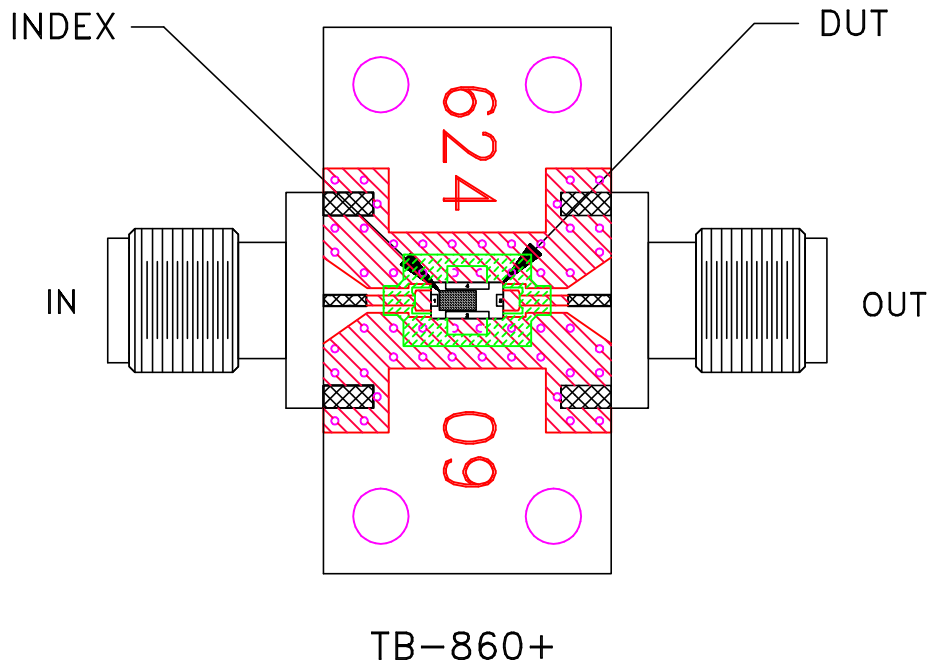
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PL, 04FL01, FV1206-4, TB-860+

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

# Evaluation Board and Circuit



## 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	-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