



CERAMIC

Low Pass Filter

LFCN-8440+

50Ω DC¹ to 8440 MHz

FEATURES

- Excellent Power Handling, 8 W
- Small Size
- 7 Sections
- Temperature Stable
- Hermetically Sealed
- LTCC Construction
- Protected by U.S. Patent 6,943,646



Generic photo used for illustration purposes only

CASE STYLE: FV1206-4

+RoHS Compliant

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

APPLICATIONS

- Electronic Warfare (EW)
- Harmonic Rejection
- Transmitters/Receivers
- Lab Use

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 8 W 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 (0.12x0.06x0.04")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
High Power Handling, 8 W	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.

REV. B
ECO-011891
LFCN-8440+
MCL NY
250613





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Mini-Circuits

50Ω DC¹ to 8440 MHz

ELECTRICAL SPECIFICATIONS^{1,2} 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
Stopband	Rejection Loss	F3-F4	10900-11500	20	30		dB
		F4-F5	11500-21850	25	33		dB
	VSWR	F3-F6	10900-21850		30		:1

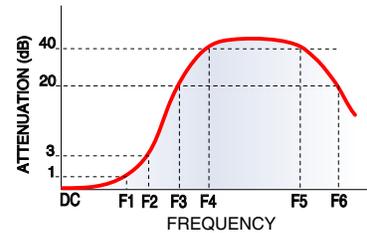
1. In Application where DC voltage is present at either input or output ports, de-coupling capacitors are required.
2. Measured on Mini-Circuits Characterization Test Board TB-LFCN-8440+.

ABSOLUTE MAXIMUM RATINGS

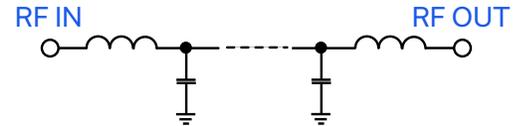
Parameter	Ratings
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input ³	8 W max. at +25°C

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





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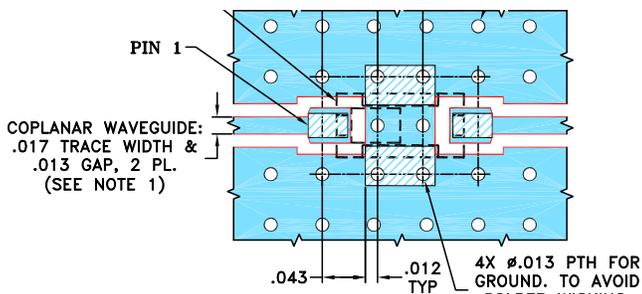
50Ω DC¹ to 8440 MHz

PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: EC

DEMO BOARD MCL P/N: TB-LFCN-8440+ SUGGESTED PCB LAYOUT (PL-487)

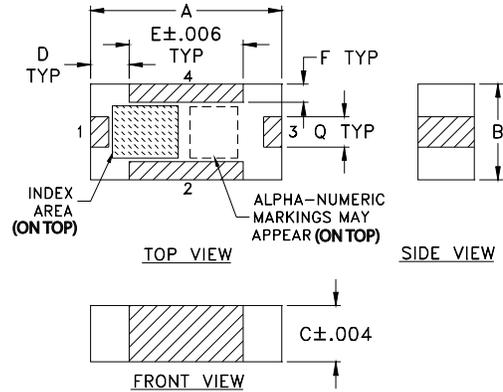


NOTES:

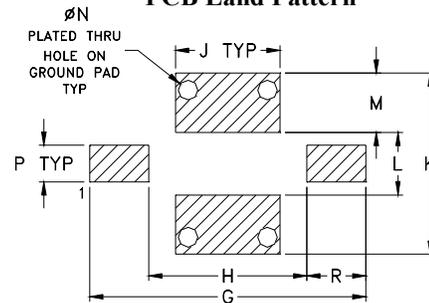
- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .010" ± .001".
COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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

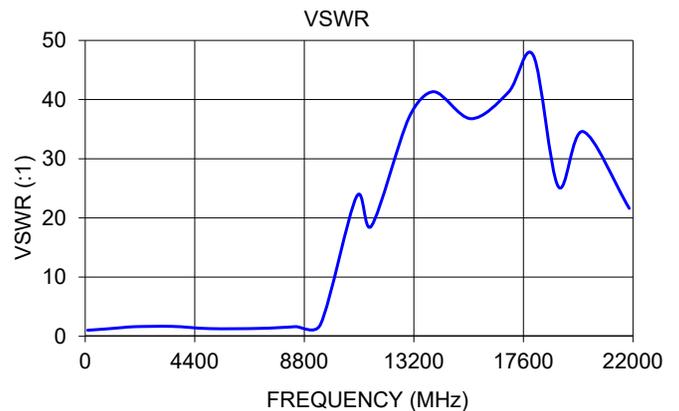
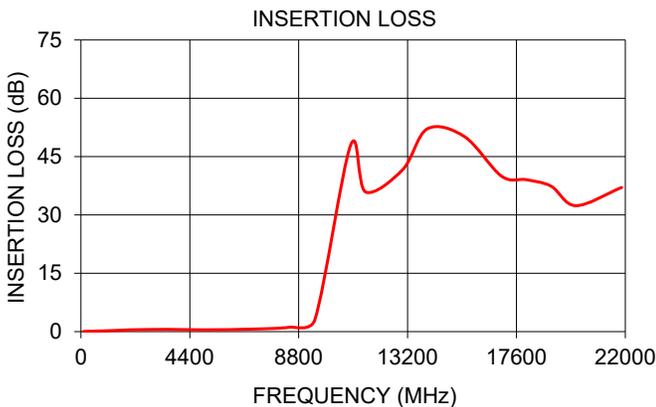
LFCN-8440+

Mini-Circuits

50Ω DC¹ to 8440 MHz

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

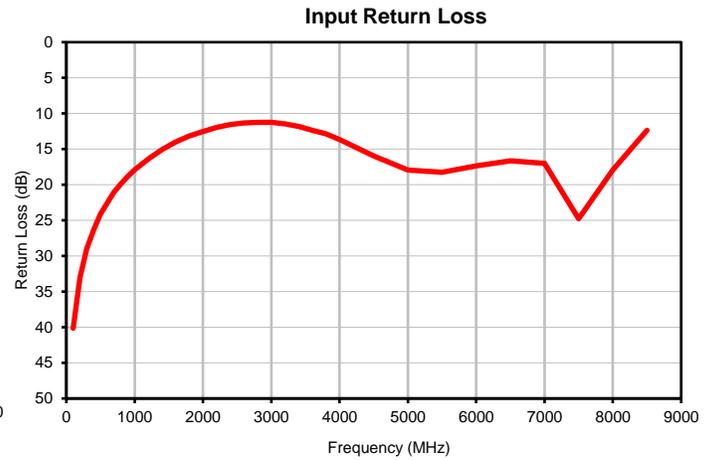
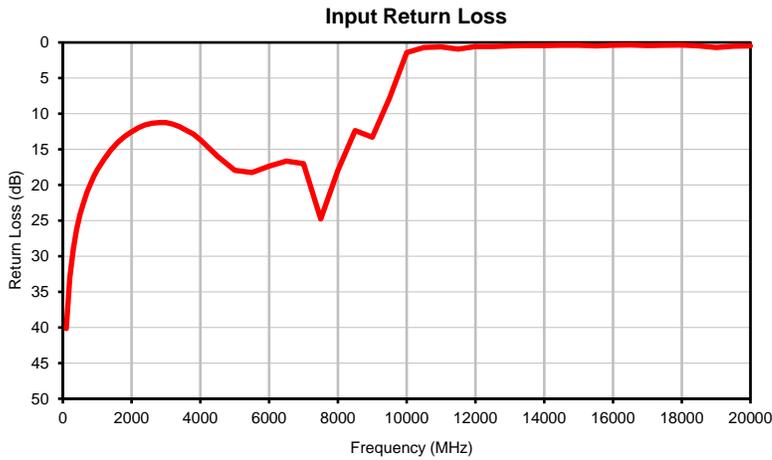
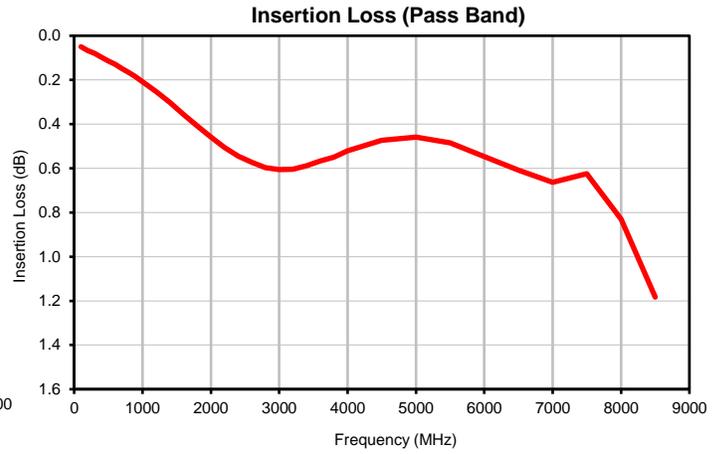
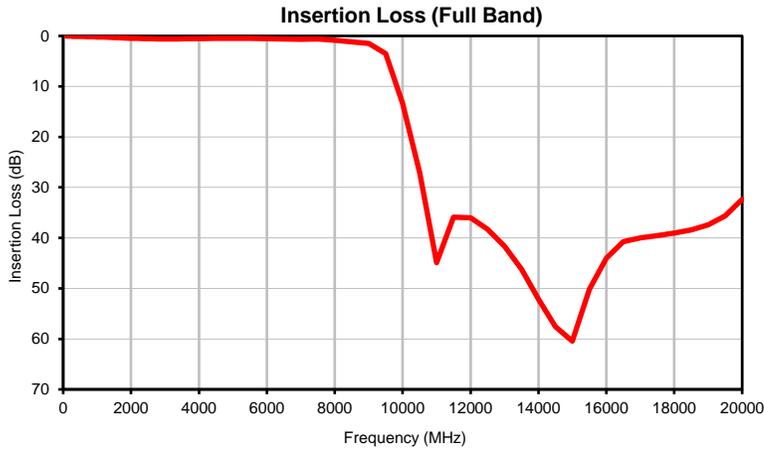
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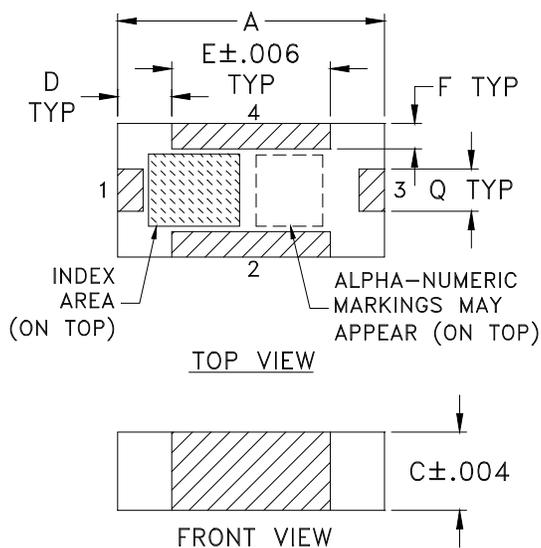
Typical Performance Data

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

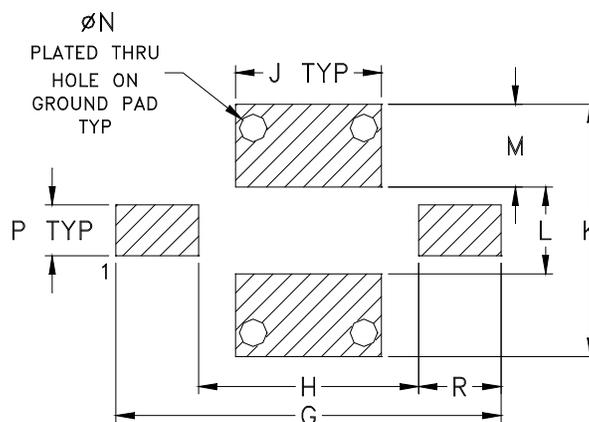
Typical Performance Curves



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.



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

DEVICE ORIENTATION IN T&R

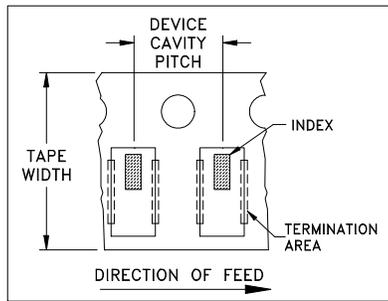


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

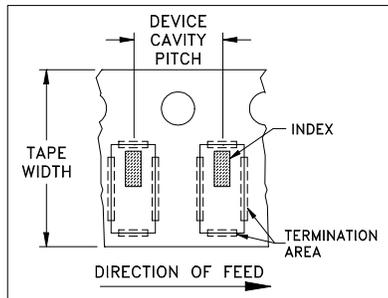


ILLUSTRATION 2

Applicable Case Styles
FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

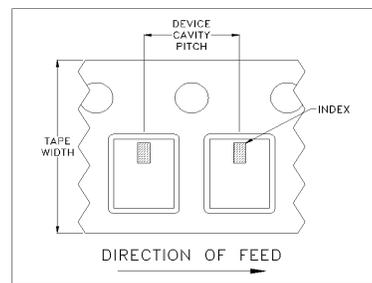


ILLUSTRATION 3

Applicable Case Styles
FV1206-11
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

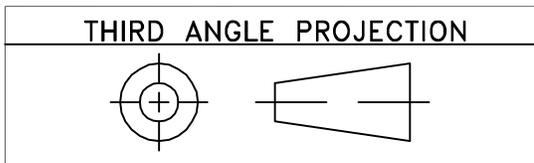
Note: Please consult individual model data sheet to determine device per reel availability.

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

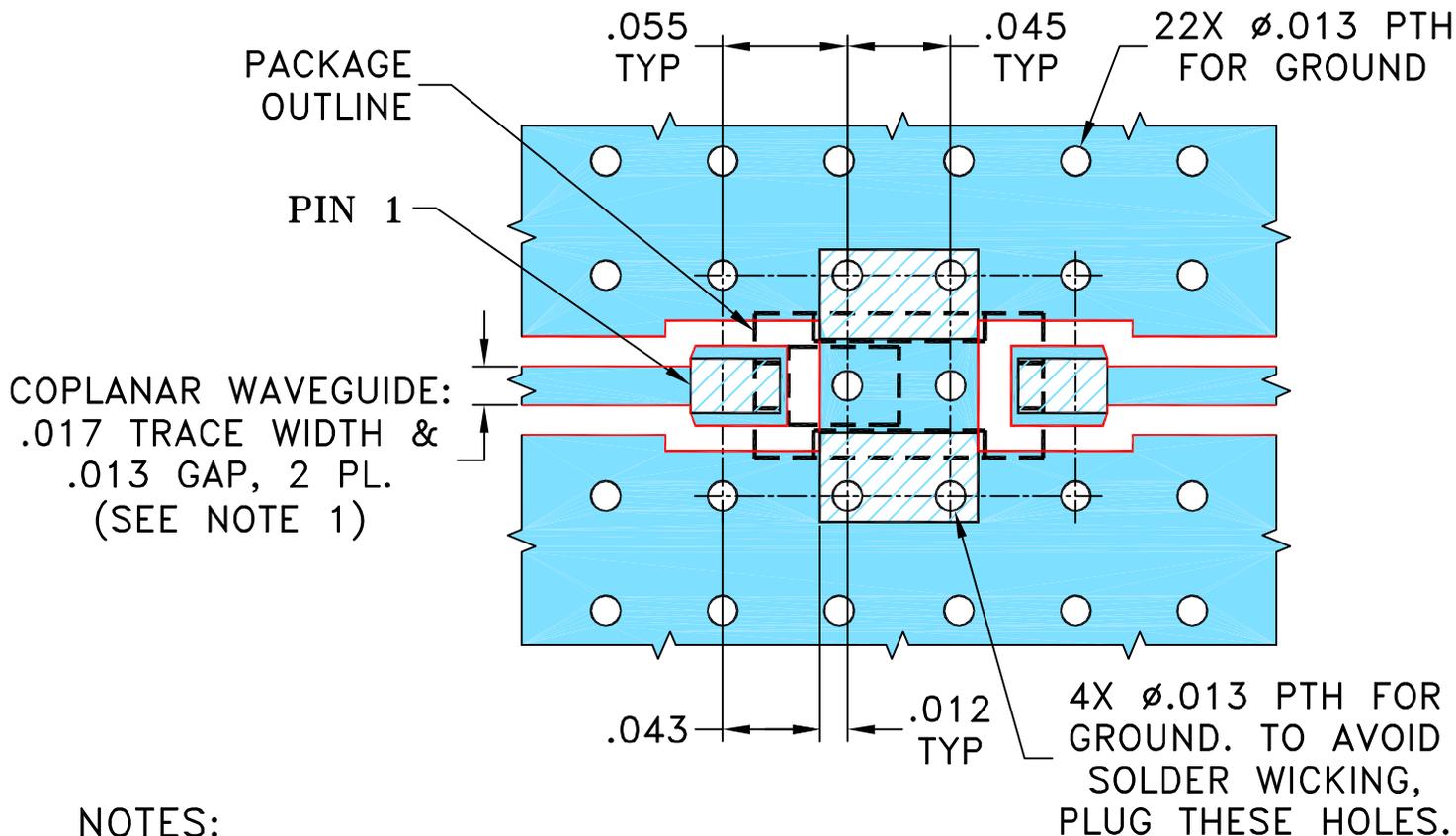


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REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M158043	NEW RELEASE	09/28/16	CA	ZL

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 ±		



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

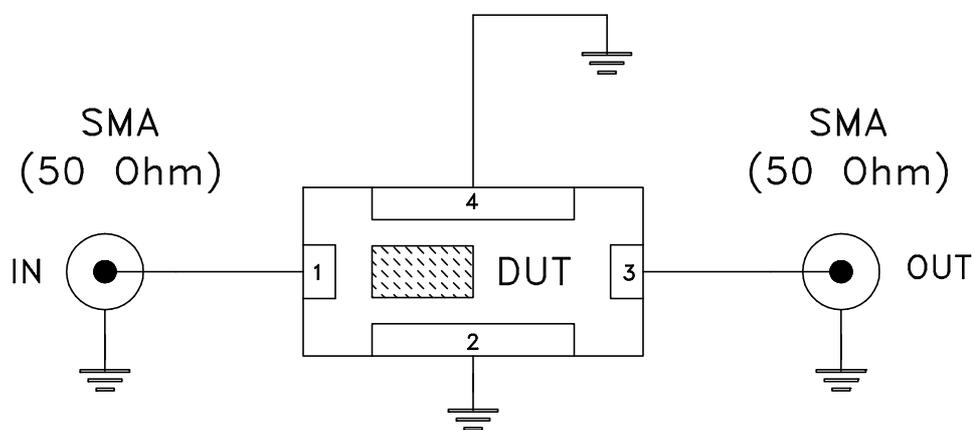
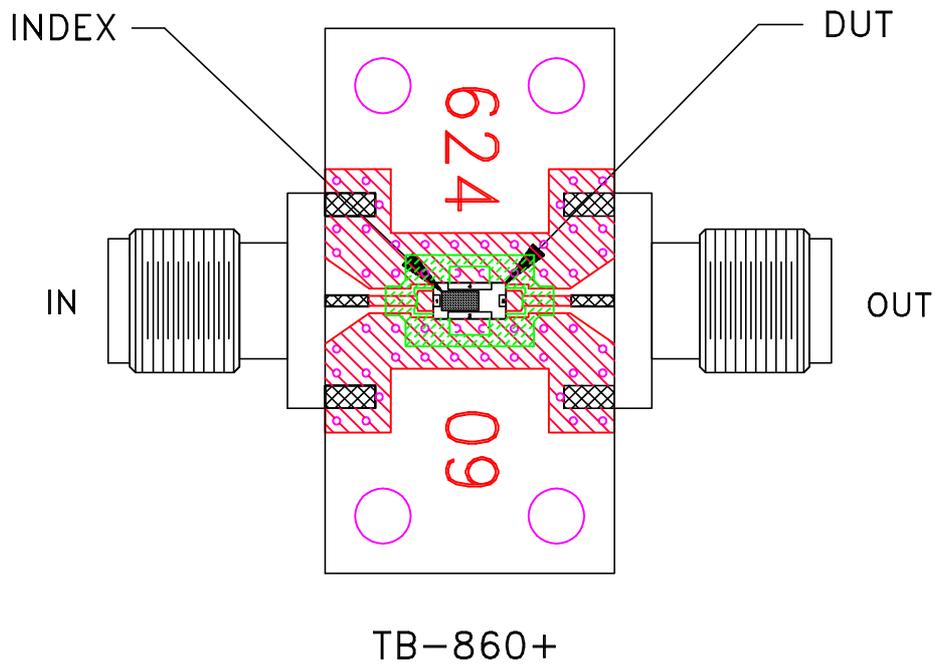
PL, 04FL01, FV1206-4, TB-860+

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

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	-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