



Mini-Circuits

CERAMIC

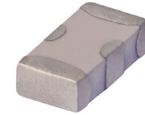
## Low Pass Filter

LFCN-2000AT+

50Ω DC<sup>1</sup> to 2000 MHz

## FEATURES

- Excellent power handling, 9W
- Small size
- 5 sections
- Temperature stable
- LTCC construction
- AEC-Q200 qualified component family



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

- Automotive

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

| Parameter | F#             | Frequency (MHz) | Min.      | Typ. | Max. | Units |
|-----------|----------------|-----------------|-----------|------|------|-------|
| Passband  | Insertion Loss | DC-F1           | DC-2000   | —    | 1.5  | dB    |
|           | Freq. Cut-Off  | F2              | 2275      | 3.0  | —    | dB    |
|           | VSWR           | DC-F1           | DC-2000   | 1.3  | —    | :1    |
| Stop Band | Rejection Loss | F3              | 3000      | 20   | —    | dB    |
|           |                | F4-F5           | 3100-3500 | 30   | —    |       |
|           |                | F6              | 4600      | 20   | —    |       |
|           | VSWR           | F3-F6           | 3000-4650 | 20   | —    | :1    |

1. In Applications where DC isolation to ground is required, coupling capacitors are recommended to avoid DC leakage. Alternatively, if DC pass IN-OUT is required, Mini-Circuits' "D" suffix version of this model will support DC IN-OUT, and provide >100 MOhm isolation to ground.

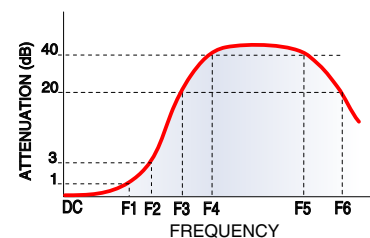
2. Electrical performance measured on TB-270 using LFCN-2000+

## ABSOLUTE MAXIMUM RATINGS

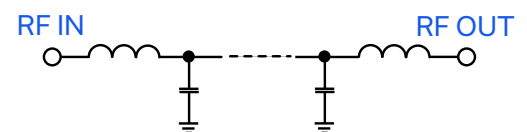
| Parameter                   | Ratings           |
|-----------------------------|-------------------|
| Operating Temperature       | -40 to +105 °C    |
| Storage Temperature         | -40 to +105 °C    |
| RF Power Input <sup>3</sup> | 9 W max. at +25°C |

3. Passband rating, derate linearly to 4W at +105°C ambient.  
Permanent damage may occur if any of these limits are exceeded.

## TYPICAL FREQUENCY RESPONSE



## FUNCTIONAL SCHEMATIC



REV. OR  
NPO-005311  
LFCN-2000AT+  
MCL NY  
250603

Mini-Circuits



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CERAMIC

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## PIN CONNECTIONS

|        |     |
|--------|-----|
| RF IN  | 1   |
| RF OUT | 3   |
| GROUND | 2,4 |

## PRODUCT MARKING: ZF

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

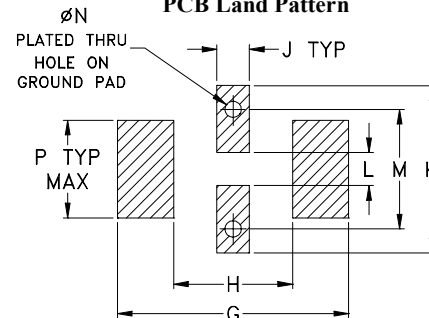
**NOTES:** 1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015".  
COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within ±.002

## OUTLINE DIMENSIONS (Inches 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  |

## TAPE &amp; REEL INFORMATION: F71



CERAMIC

## Low Pass Filter

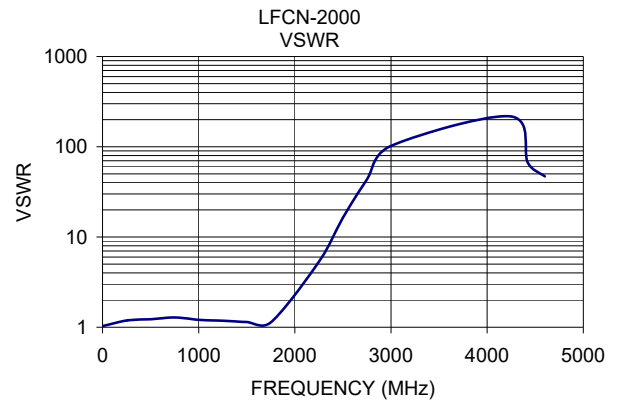
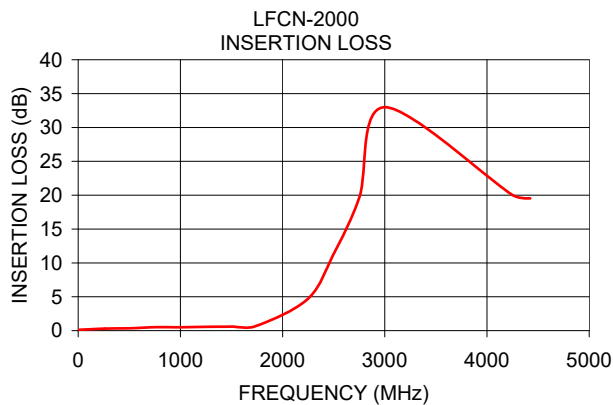
LFCN-2000AT+

Mini-Circuits

50Ω DC<sup>1</sup> to 2000 MHz

## TYPICAL PERFORMANCE DATA AT 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|-----------------|---------------------|-----------|
| 10.00           | 0.14                | 1.04      |
| 258.75          | 0.30                | 1.19      |
| 507.50          | 0.35                | 1.23      |
| 756.25          | 0.51                | 1.28      |
| 1005.00         | 0.49                | 1.21      |
| 1253.75         | 0.56                | 1.18      |
| 1502.50         | 0.60                | 1.14      |
| 1751.25         | 0.74                | 1.13      |
| 2250.00         | 4.73                | 5.33      |
| 2500.00         | 11.34               | 16.41     |
| 2750.00         | 19.65               | 43.44     |
| 3000.00         | 32.99               | 102.19    |
| 4244.00         | 20.09               | 217.15    |
| 4422.00         | 19.52               | 66.82     |
| 4600.00         | 20.32               | 46.96     |



## NOTES

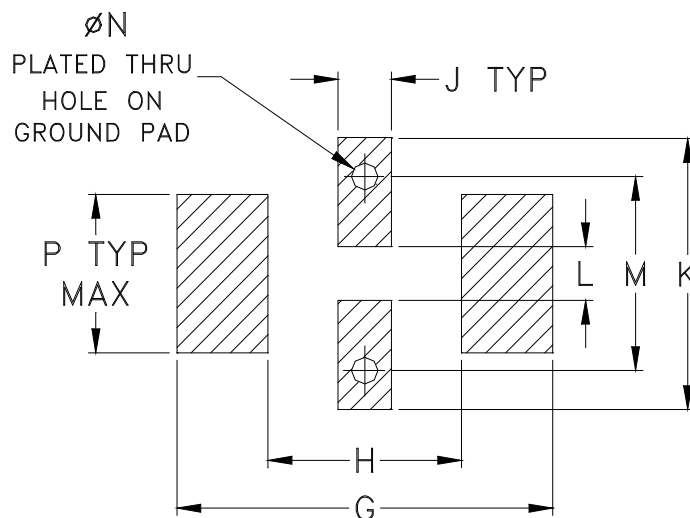
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### Outline Dimensions



### PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| CASE # | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | M              | N              | P              | WT. GRAM |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| FV1206 | .126<br>(3.20) | .063<br>(1.60) | .037<br>(0.94) | .020<br>(0.51) | .032<br>(0.81) | .009<br>(0.23) | .169<br>(4.29) | .087<br>(2.21) | .024<br>(0.61) | .122<br>(3.10) | .024<br>(0.61) | .087<br>(2.21) | .012<br>(0.30) | .071<br>(1.80) | .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](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

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



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



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RF/IF MICROWAVE COMPONENTS

## 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**



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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

TOLERANCES ON:

2 PL DECIMALS  $\pm$ 3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

DRAWN

GF

08/27/03

CHECKED

AV

08/28/03

APPROVED

ABD

08/28/03



**Mini-Circuits®**

13 Neptune Avenue  
Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-137

REV:

A

FILE:

98PL137

SCALE:

10:1

SHEET:

1 OF 1

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