



CERAMIC

Low Pass Filter

LFCN-2290+

Mini-Circuits

50Ω DC¹ to 2290 MHz

FEATURES

- Excellent Power Handling, 10 W
- Small Size
- 7 Sections
- Temperature Stable
- LTCC Construction
- Protected by U.S. Patent 6,943,646



Generic photo used for illustration purposes only

CASE STYLE: FV1206

APPLICATIONS

- Harmonic Rejection
- VHF/UHF Transmitters/Receivers
- Lab Use

+RoHS Compliant

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

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

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	DC-2290	0.9	1.5	dB
	Freq. Cut-Off	F2	2590	3.0		dB
	VSWR	DC-F1	DC-2290	1.3		:1
Stopband	Rejection Loss	F3-F5	3110-8000	20	29	dB
		F4-F5	3500-8000	26	40	
	VSWR	F3-F5	3110-8000		25	:1

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

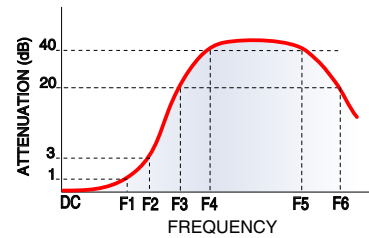
2. Measured on Mini-Circuits Characterization Test Board TB-LFCN-2290+.

ABSOLUTE MAXIMUM RATINGS

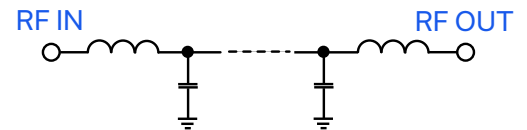
Parameter	Ratings
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C
RF Power Input ³	10 W max. at +25°C

3. Passband rating, derate linearly to 3.5 W at +100°C ambient. Permanent damage may occur if any of these limits are exceeded.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC



REV. A
ECO-011696
LFCN-2290+
MCL NY
250729



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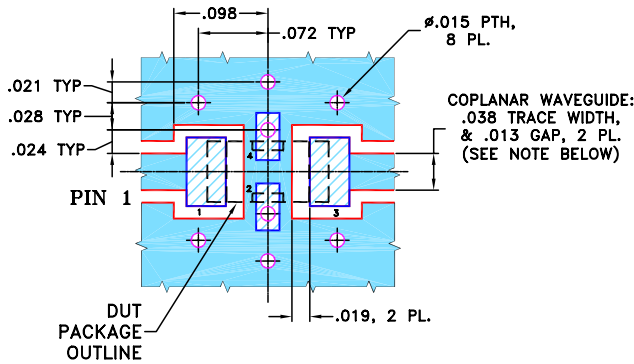
50Ω DC¹ to 2290 MHz

PIN CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: GU

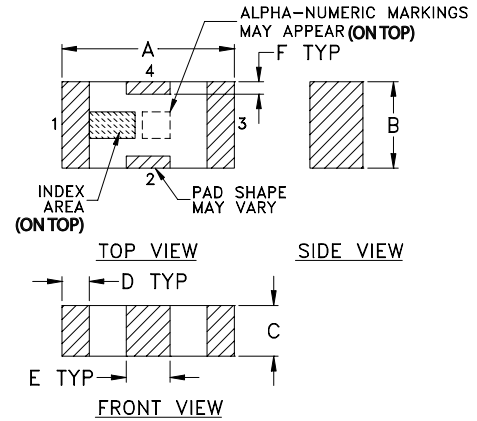
DEMO BOARD MCL P/N: TB-LFCN-2290+ SUGGESTED PCB LAYOUT (PL-137)



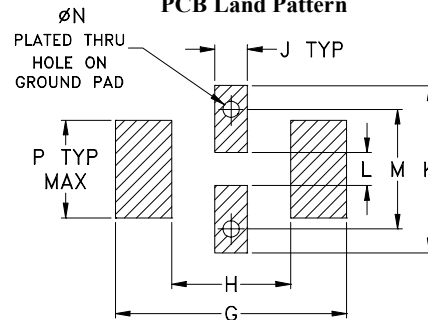
- NOTES:**
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- 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 & REEL INFORMATION: F71



CERAMIC

Low Pass Filter

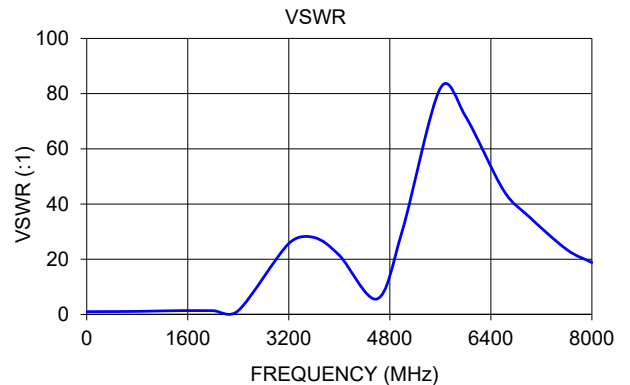
LFCN-2290+

Mini-Circuits

50Ω DC¹ to 2290 MHz

TYPICAL PERFORMANCE DATA AT +25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	0.10	1.02
10	0.14	1.01
100	0.22	1.03
500	0.31	1.06
900	0.39	1.15
2000	0.82	1.37
2400	1.30	1.38
2600	3.56	2.74
3200	28.72	25.70
3600	55.21	27.88
4600	52.08	5.64
5000	49.40	30.52
6000	40.18	71.73
6600	36.50	45.00
7000	33.88	35.53
7600	33.99	23.55
8000	33.69	18.81



NOTES

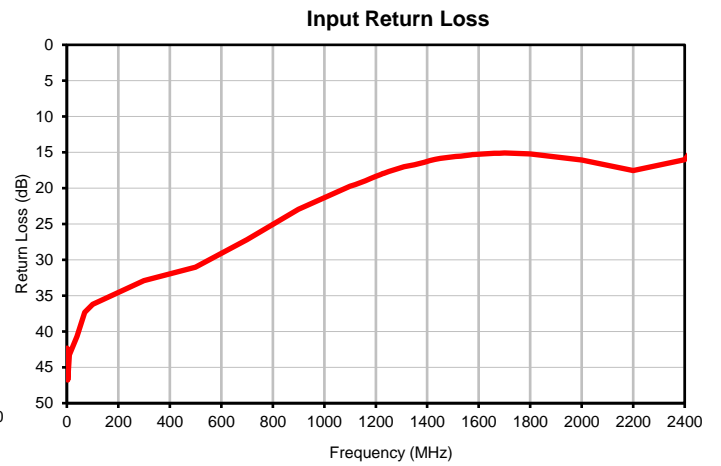
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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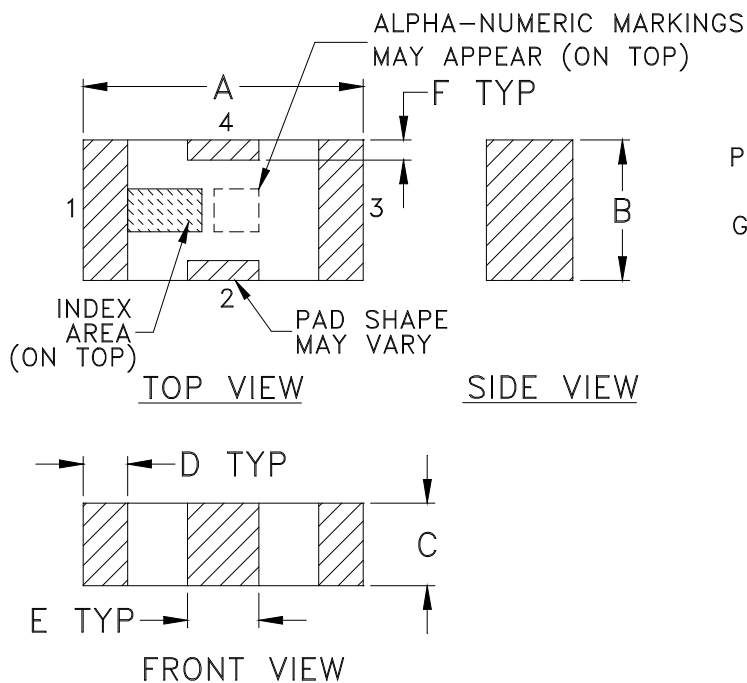
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)
1	0.10	42.33
4	0.13	46.78
7	0.13	44.73
10	0.14	43.26
40	0.18	40.66
70	0.20	37.31
100	0.22	36.21
300	0.27	32.89
500	0.31	31.02
700	0.35	27.17
900	0.39	22.96
1100	0.45	19.71
1120	0.46	19.49
1140	0.47	19.25
1160	0.48	18.96
1180	0.49	18.64
1200	0.49	18.33
1220	0.50	18.06
1228	0.50	17.96
1230	0.50	17.93
1250	0.51	17.70
1270	0.52	17.45
1290	0.53	17.23
1310	0.54	17.02
1330	0.54	16.86
1350	0.55	16.74
1370	0.56	16.57
1390	0.57	16.36
1410	0.58	16.18
1430	0.59	15.99
1450	0.59	15.85
1470	0.60	15.75
1490	0.61	15.67
1510	0.62	15.58
1530	0.63	15.53
1550	0.63	15.45
1570	0.64	15.35
1575	0.64	15.33
1580	0.65	15.31
1600	0.65	15.25
1620	0.66	15.21
1640	0.67	15.18
1660	0.67	15.14
1680	0.68	15.11
1700	0.69	15.08
1800	0.72	15.24
2000	0.82	16.07
2200	0.96	17.52
2400	1.30	16.02
2600	3.56	6.66
2800	21.47	1.15
3000	26.27	0.76
3200	28.72	0.68
3400	36.10	0.64
3600	55.21	0.62
3800	44.05	0.69
4000	40.11	0.81
4200	39.21	1.28
4400	40.87	3.14
4600	52.08	3.11
4800	52.33	1.15
5000	49.40	0.57
5200	45.91	0.38
5400	43.29	0.29
5600	41.35	0.21
5800	40.13	0.26
6000	40.18	0.24
6200	39.48	0.14
6400	37.98	0.13
6600	36.50	0.39
6800	35.06	0.49
7000	33.88	0.49
7200	33.00	0.58
7400	33.55	0.59
7600	33.99	0.74
7800	33.97	0.90
8000	33.69	0.92

Typical Performance Curves



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 (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. $\pm .01$; 3 Pl. $\pm .005$

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.



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

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



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

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 R04350B 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®

13 Neptune Avenue
 Brooklyn NY 11235

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

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SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-137

A

FILE: 98PL137

SCALE:

10:1

SHEET:

1 OF 1

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

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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