



**THE DATASHEET OF  
LFCW-133+**



# Ceramic Low Pass Filter

## LFCW-133+

50Ω DC to 13.25 GHz

### The Big Deal

- Small size 0603 (1.6 x 0.8 mm)
- Low insertion Loss, 2.2 dB typical
- Rejection 20 dB typical from 14.76 to 17 GHz
- Good power handling, 12.6W



CASE STYLE: JC0603C-1

### Product Overview

Mini-Circuits' LFCW-133+ is a Low Temperature Co-fired Ceramic (LTCC) low pass filter, designed in a very small, 0603 package. The multilayer construction provides high repeatability of performance. Small, wrap-around terminations minimize variations in performance due to parasitics. Covering DC – 13.25 GHz, these units offer low insertion loss, good rejection, and excellent power handling capability.

### Key Features

Feature	Advantages
Small size 0603 (1.6 x 0.8 mm)	Allows for high layout density of circuit boards while minimizing the effects of parasitics.
Stop band rejection 20dB typical over 14.76 - 17 GHz	Provides good rejection in a tiny package, saving PCB space for customers.
Wrap-around terminations	Provides excellent solderability and easy visual inspection.
LTCC construction	Rugged package, well-suited for tough environments including high humidity and high temperature extremes.

#### 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.  
C. 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



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50Ω DC<sup>1</sup> to 13.25 GHz

## LFCW-133+



Generic photo used for illustration purposes only

CASE STYLE: JC0603C-1

**+RoHS Compliant**

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

### Features

- Good power handling, 12.6W
- Small size 0603 (1.6 x 0.8 mm)
- 7 sections
- Temperature stable
- LTCC construction

### Applications

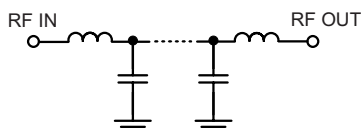
- Harmonic Rejection
- VHF/UHF transmitters / receivers
- lab use

### Electrical Specifications<sup>1,2</sup> at 25°C

Parameter	F#	Frequency (GHz)	Min.	Typ.	Max.	Unit
<b>Pass Band</b>	Insertion Loss	DC - F1	DC - 13.25	—	2.5	dB
	Freq. Cut-Off	F2	13.65	—	3.0	dB
	VSWR	DC - F1	DC - 13.25	—	2.7	:1
<b>Stop Band</b>	Rejection Loss	F3	14.76	—	20	dB
		F4 - F5	14.91 - 15.41	19	24	:1
		F6	17	—	20	dB

1. In Application where DC voltage is present at either input or output port, coupling capacitors are required.
2. Measured on Mini-Circuits Characterization Test Board TB-720+

### Functional Schematic

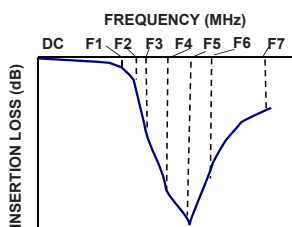


### Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input <sup>3</sup>	12.6W at 25°C

3. Passband rating, derate linearly to 6.3W at 100°C ambient ([Reference AN-75-005](#))  
Permanent damage may occur if any of these limits are exceeded.

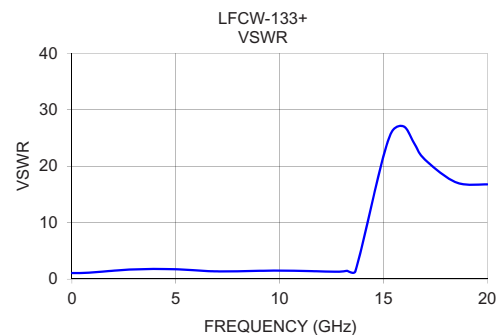
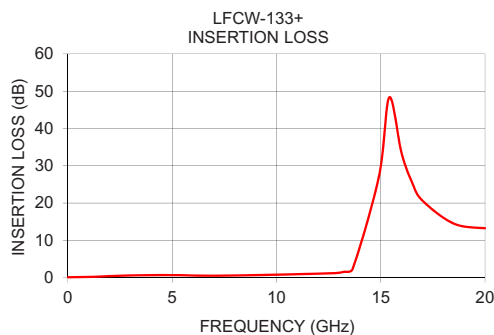
### Typical Frequency Response



### Typical Performance Data<sup>4</sup> at 25°C

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)
0.01	0.08	1.07
0.50	0.12	1.08
1.00	0.17	1.18
3.00	0.57	1.72
5.00	0.66	1.74
7.00	0.50	1.37
10.00	0.78	1.50
12.82	1.20	1.30
13.25	1.57	1.46
13.65	2.29	1.40
14.91	26.98	20.50
15.41	48.34	26.13
16.00	33.38	26.98
16.50	25.56	23.93
17.00	20.65	21.16
18.50	14.50	17.10
20.00	13.20	16.80

4. Measured with Agilent E5071B network analyzer using port extension.



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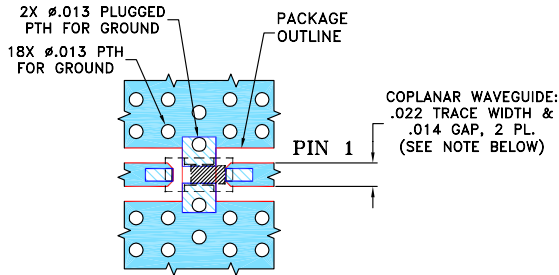
REV. B  
M151107  
ED-15030/1  
LFCW-133+  
MY/CP/AM  
20513

## Pad Connections

INPUT	1
OUTPUT	3
GROUND	2,4

## Product Marking: N/A

### Evaluation Board MCL P/N: TB-720+ Suggested PCB Layout (PL-412)



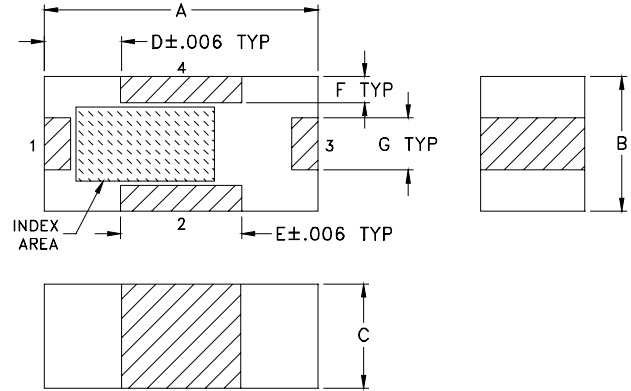
#### NOTES:

- TRACE WIDTH IS 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



### Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

A	B	C	D	E	F	G	wt
.063	.031	.024	.018	.028	.006	.012	grams
1.60	0.79	0.61	0.46	0.71	0.15	0.30	0.005

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