

Ceramic

# Low Pass Filter

LFCW-8000+

50Ω

DC to 8 GHz



Generic photo used for illustration purposes only

CASE STYLE: JC0603C-1

## The Big Deal

- Very good rejection, 42 dB typical
- Rugged, ceramic construction
- Tiny size, 0.063" x 0.032" x 0.024" (0603)
- Good power handling, 2.5W

## Product Overview

Mini-Circuits' LFCW-8000+ is an LTCC low pass filter with a passband from DC to 8 GHz, supporting a variety of applications. This model provides 1.5 dB typical passband insertion loss and provides a very good stopband rejection due to strategically constructed layout with minimal interaction between components. It handles up to 2.5W RF input power and provides a wide operating temperature range from -55 to +125°C. Housed in a tiny 0603 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                                                                                                                                      |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Ultra-wide stopband                   | The LTCC lowpass filter provides a very good stopband rejection until 26.5 GHz suitable for high end applications.                              |
| LTCC Construction                     | Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes. |
| Tiny size ( 0.063" x 0.032" x 0.024") | Saves space in dense circuit board layouts and minimizes the effects of parasitics.                                                             |
| Good power handling, 2.5W             | Supports a wide range of system power requirements.                                                                                             |
| Wrap-around terminations              | Provides excellent solderability and easy visual inspection.                                                                                    |

### 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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**+RoHS Compliant**

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

## Features

- Low loss, 1.5 dB typical
- Good rejection 42 dB typical
- Extremely small size 0603" (0.063" X 0.032" X 0.024")
- Temperature stable
- LTCC construction

## Applications

- Military radios
- Point-Point communication
- 5G Sub 6 GHz
- WiFi
- ISM band

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

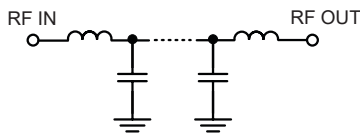
| Parameter | F#             | Frequency (MHz) | Min.          | Typ. | Max. | Unit   |
|-----------|----------------|-----------------|---------------|------|------|--------|
| Pass Band | Insertion Loss | DC-F1           | DC - 8000     | —    | 1.5  | 2.3 dB |
|           | Freq. Cut-Off  | F2*             | 8900          | —    | 3.0  | dB     |
|           | Return Loss    | DC-F1           | DC - 8000     | —    | 13   | dB     |
| Stop Band | Rejection Loss | F3-F4           | 11000 - 12000 | 20   | 42   | dB     |
|           |                | F4-F5           | 12000 - 15500 | 30   | 42   | dB     |
|           |                | F5-F6           | 15500 - 21000 | 25   | 35   | dB     |
|           |                | F6-F7           | 21000 - 26500 | —    | 20   | dB     |

1 DC de-coupling capacitors are required in Applications where DC voltage and/or current is present at either input or output ports. Please contact Mini-Circuits for alternatives if DC pass from IN-OUT is required.

2 Measured on Mini-Circuits Characterization Test Board TB-LFCW-8000+

\* Typically, a ±5% frequency deviation from the stated value may occur on a unit-to-unit basis.

## Functional Schematic



## Maximum Ratings

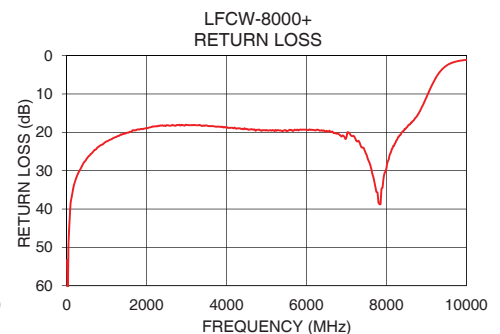
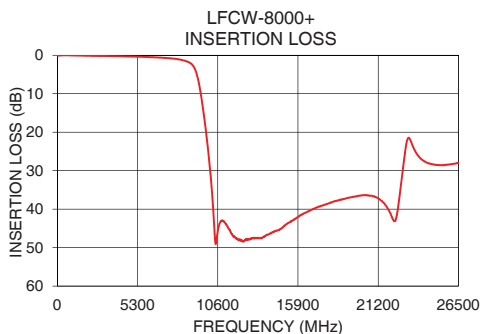
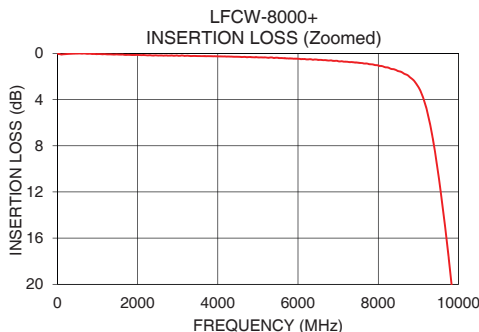
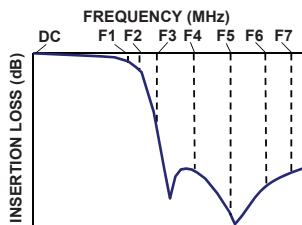
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 125°C |
| Storage Temperature   | -55°C to 125°C |
| RF Power Input*       | 2.5W @25°C     |

\*Passband rating, derate linearly to 0.7W at 125°C ambient  
Permanent damage may occur if any of these limits are exceeded.

## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) |
|-----------------|---------------------|------------------|
| 10              | 0.01                | 53.30            |
| 100             | 0.09                | 38.36            |
| 500             | 0.01                | 26.89            |
| 1000            | 0.05                | 22.39            |
| 2000            | 0.13                | 18.86            |
| 3000            | 0.19                | 18.06            |
| 6000            | 0.47                | 19.32            |
| 8000            | 1.04                | 29.32            |
| 8900            | 2.40                | 13.12            |
| 9100            | 3.66                | 8.51             |
| 9900            | 22.44               | 1.23             |
| 10150           | 32.16               | 0.98             |
| 10800           | 43.15               | 0.76             |
| 11000           | 43.20               | 0.73             |
| 12000           | 47.99               | 0.57             |
| 13000           | 47.64               | 0.46             |
| 15500           | 43.02               | 0.34             |
| 18000           | 38.41               | 0.40             |
| 21000           | 36.83               | 0.45             |
| 26500           | 27.99               | 0.36             |

## Typical Frequency Response



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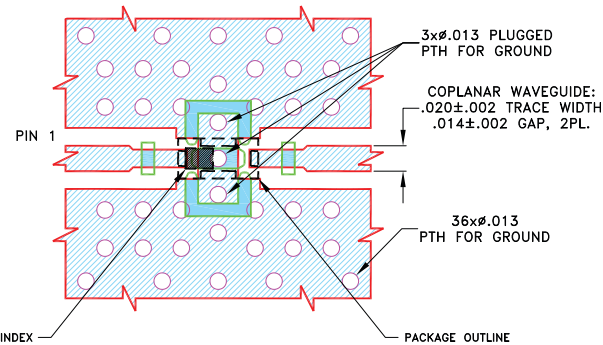


Pad Connections

|        |      |
|--------|------|
| INPUT  | 1    |
| OUTPUT | 3    |
| GROUND | 2, 4 |

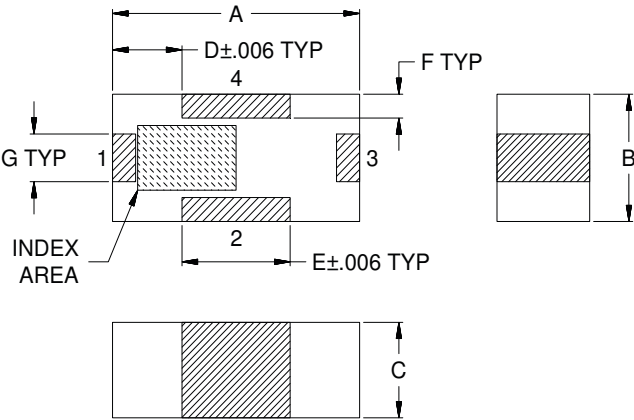
Product Marking: X

Demo Board MCL P/N: TB-LFCW-8000+  
Suggested PCB Layout (PL-650)



- NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS (R04835 Lo Pro) WITH DIELECTRIC THICKNESS .0107±.0010. COPPER: 1/2 Oz. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND 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 SOLDERMASK

Outline Drawing



Outline Dimensions (inch mm)

| A    | B    | C    | D    | E    | F    | G    | Wt.   |
|------|------|------|------|------|------|------|-------|
| .063 | .032 | .024 | .018 | .028 | .006 | .012 | grams |
| 1.60 | 0.80 | 0.60 | 0.45 | 0.70 | 0.15 | 0.30 | .005  |

Note: Please refer to case style drawing for details

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