

## Surface Mount

# Coaxial-Ceramic Resonator Filters and Multiplexers

50Ω DC to 6 GHz

## The Big Deal

- Low insertion loss with excellent power handling
- Passbands up to 6 GHz
- Fractional bandwidth from <1 to 25%
- Low profile designs with min. height of 0.120"
- Excellent temperature stability
- Rugged construction to handle demanding environmental conditions



## Product Overview

Mini-Circuits' *Coaxial-Ceramic Resonator filters* offer low insertion loss in very small form factors, using ceramic material with high dielectric constant and superior Q factor. Bandpass and bandstop filters, diplexer and multiplexer designs can be constructed using this technology. Low insertion loss combined with excellent power handling makes these filters well suited for transmitter and receiver signal chains. Advanced filter design and construction can achieve stopband width greater than 3x the center frequency as high as 20 GHz.

All our coaxial-ceramic resonator filters are built with rugged construction, qualified to withstand multiple demanding reflow cycles. Custom integrated assembly with LNA in greatly simplifying system integration. They can be realized in small form factors with high-quality, precise machining for applications where size is critical. Excellent repeatability across units is achieved through precise tuning and process control.

## Key Features

| Feature                  | Advantages  |
|--------------------------|---|
| Low insertion loss       | Low signal loss results in better SNR in signal chain   |
| Fast roll-off            | Higher selectivity results in better adjacent channel rejection and dynamic range   |
| Wide stop band           | Wide spur-free stopband results in better receiver sensitivity  |
| Excellent power handling | Well suited for transmitter applications  |
| Rugged Construction      | These filter assemblies have been qualified over a wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles |
| Small Size               | Very well suited for high performance applications where size is a constraint.  |
| Temperature stability    | Very minimal change in electrical performance across temperature makes these filters suitable for a wide range of operating conditions.   |

### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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)



# Surface Mount Bandpass Filter

50Ω 1395 to 1427 MHz

## CBP12-1411AK+



### Features

- Low insertion loss, 0.65 dB typ.
- High selectivity
- High performance
- Shielded package

### Applications

- Radio Astronomy
- Earth exploration Satellite(passive)

Generic photo used for illustration purposes only  
CASE STYLE: UR2632

### Electrical Specifications <sup>(1)</sup> at 25°C

| Parameter        | F#               | Frequency (MHz) | Min.        | Typ. | Max. | Unit |    |
|------------------|------------------|-----------------|-------------|------|------|------|----|
| Pass Band        | Center Frequency | -               | -           | 1411 | -    | MHz  |    |
|                  | Insertion Loss   | F1-F2           | 1395 - 1427 | 0.65 | 1.0  | dB   |    |
|                  | VSWR             | F1-F2           | 1395 - 1427 | -    | 1.4  | 1.92 | :1 |
| Stop Band, Lower | Insertion Loss   | DC-F3           | DC - 800    | 60   | 83   | -    | dB |
|                  |                  | F3-F4           | 800 - 1150  | 40   | 54   | -    | dB |
|                  |                  | F4-F5           | 1150 - 1255 | 20   | 34   | -    | dB |
| Stop Band, Upper | Insertion Loss   | F6-F7           | 1650 - 1850 | 20   | 34   | -    | dB |
|                  |                  | F7-F8           | 1850 - 2200 | 40   | 47   | -    | dB |
|                  |                  | F8-F9           | 2200 - 2400 | -    | 30   | -    | dB |

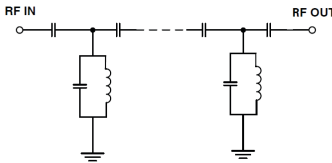
(1) Measured on Mini-Circuits Characterization Test Board TB-1065+.

### Maximum Ratings

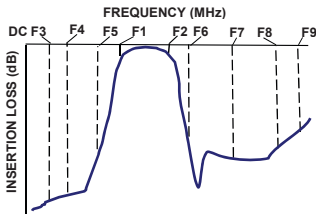
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power Input        | 15W at 25°C    |

Permanent damage may occur if any of these limits are exceeded.

### Functional Schematic



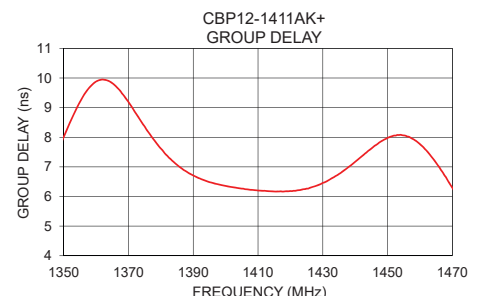
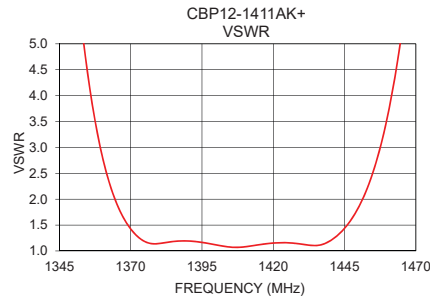
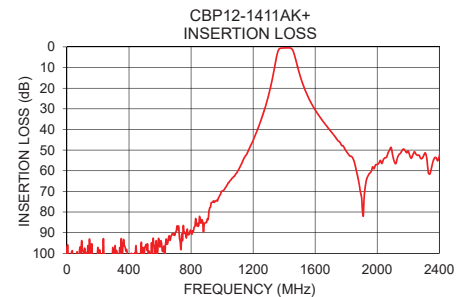
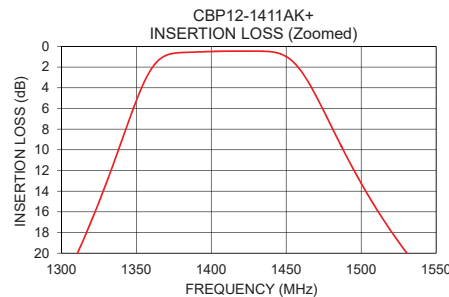
### Typical Frequency Response



### Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (ns) |
|-----------------|---------------------|-----------|-----------------|------------------|
| 1               | 112.85              | 116.70    | 1395            | 6.48             |
| 10              | 102.01              | 69.57     | 1396            | 6.46             |
| 100             | 98.59               | 101.77    | 1397            | 6.43             |
| 800             | 89.34               | 176.49    | 1398            | 6.40             |
| 1150            | 52.87               | 143.48    | 1399            | 6.38             |
| 1255            | 34.61               | 102.11    | 1400            | 6.36             |
| 1310            | 20.26               | 53.68     | 1401            | 6.33             |
| 1356            | 3.23                | 4.01      | 1402            | 6.32             |
| 1395            | 0.52                | 1.17      | 1403            | 6.30             |
| 1400            | 0.49                | 1.12      | 1404            | 6.28             |
| 1411            | 0.46                | 1.09      | 1411            | 6.19             |
| 1420            | 0.46                | 1.15      | 1412            | 6.19             |
| 1427            | 0.46                | 1.15      | 1413            | 6.18             |
| 1465            | 3.50                | 5.19      | 1414            | 6.18             |
| 1500            | 13.24               | 46.37     | 1415            | 6.17             |
| 1550            | 23.49               | 169.09    | 1416            | 6.17             |
| 1650            | 36.01               | 239.47    | 1417            | 6.17             |
| 1850            | 55.14               | 214.65    | 1418            | 6.17             |
| 2200            | 50.45               | 110.35    | 1420            | 6.18             |
| 2400            | 53.00               | 50.12     | 1427            | 6.33             |

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



#### Notes

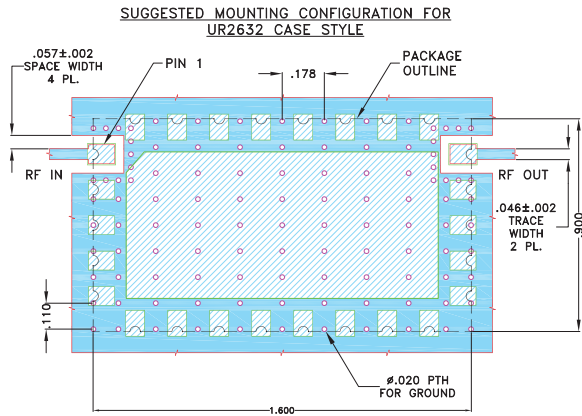
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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



## Pad Connections

|        |             |
|--------|-------------|
| INPUT  | 1           |
| OUTPUT | 18          |
| GROUND | 2-17, 19-26 |

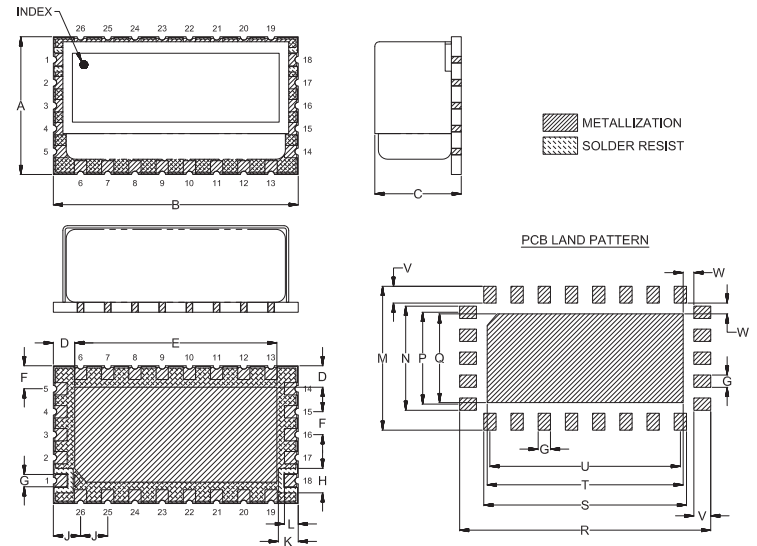
## Demo Board MCL P/N: TB-1065+ Suggested PCB Layout (PL-687)



### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS  $.020 \pm .015"$ , COPPER: 1/2 OZ, EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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 SOLDERMASK

## Outline Drawing



## Outline Dimensions ( inch / mm)

| A     | B     | C     | D     | E     | F     | G    | H    | J     | K    | L    | M     | N     |
|-------|-------|-------|-------|-------|-------|------|------|-------|------|------|-------|-------|
| .900  | 1.600 | .580  | .140  | 1.320 | .150  | .080 | .160 | .178  | .130 | .090 | .940  | .680  |
| 22.86 | 40.64 | 14.73 | 3.56  | 33.53 | 3.81  | 2.03 | 4.06 | 4.52  | 3.30 | 2.29 | 23.88 | 17.27 |
| P     | Q     | R     | S     | T     | U     | V    | W    | Wt.   |      |      |       |       |
| .600  | .580  | 1.640 | 1.324 | 1.280 | 1.244 | .110 | .070 | grams |      |      |       |       |
| 15.24 | 14.73 | 41.66 | 33.64 | 32.51 | 31.61 | 2.79 | 1.78 | 22.2  |      |      |       |       |

Note: Please refer to case style drawing for details

### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- 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)