

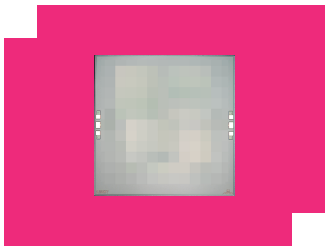
# MFBP-00114CH

## Passive GaAs MMIC 10 - 13.5 GHz Bandpass Filter

### DEVICE OVERVIEW

#### General Description

The MFBP-00114CH passive MMIC bandpass filter die is an ideal solution for small form factor, high rejection filtering. Passive GaAs MMIC technology allows production of smaller filter constructions that replace larger form factor circuit board constructions. Tight fabrication tolerances allow for less unit to unit variation than traditional filter technologies. The MFBP-00114CH is available as a wire bondable chip. Low unit to unit variation allows for accurate simulations using the provided S2P file taken from measured production units.



[Download s-parameters here](#)

#### Features

- Excellent Return Loss
- High Stop Band Suppression
- Wide Stop Band with Fast Roll-Off

#### Applications

N/A

#### Functional Block Diagram



#### Part Ordering Options

| Part Number  | Description                                     | Package | Green Status  | Product Lifecycle | Export Classification |
|--------------|-------------------------------------------------|---------|---------------|-------------------|-----------------------|
| MFBP-00114CH | Passive GaAs MMIC 10 - 13.5 GHz Bandpass Filter | CH      | RoHS<br>REACH | Released          | EAR99                 |

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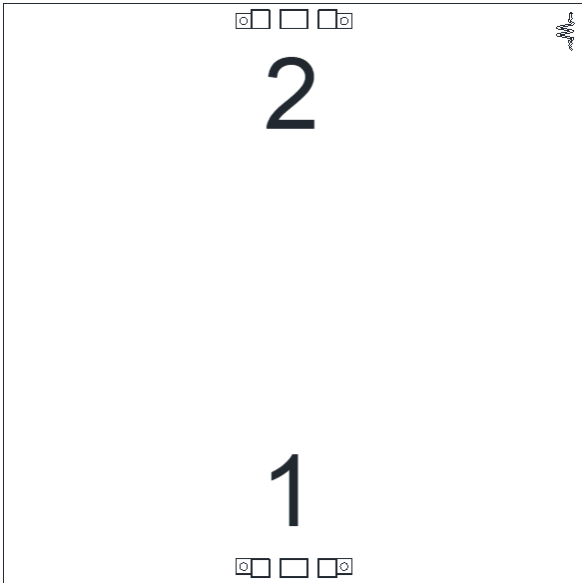
Revision History

| Revision Code | Revision Date | Comment                              |
|---------------|---------------|--------------------------------------|
| -             | 2024-12-18    | Initial Release                      |
| A             | 2025-03-06    | Port Function Description correction |

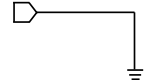
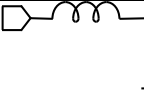
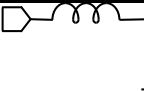
## Port Configuration and Functions

### Port Diagram

A top-down view of the MFBP-00114CH package outline drawing is shown below. The MMIC bandpass filters are symmetrical allowing Port 1 or Port 2 to be used as the input.



### Port Functions

| Port   | Function     | Description                                                                    | Equivalent Circuit for Package                                                        |
|--------|--------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Pad    | Ground       | CH package ground path is provided through the substrate and ground bond pads. |  |
| Port 1 | Input/Output | Port 1 is DC short for the CH package.                                         |  |
| Port 2 | Input/Output | Port 2 is DC short for the CH package.                                         |  |

**Specifications**

**Absolute Maximum Ratings**

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

| Parameter                     | Maximum Rating | Unit |
|-------------------------------|----------------|------|
| Maximum Operating Temperature | 100            | °C   |
| Maximum Storage Temperature   | 125            | °C   |
| Minimum Operating Temperature | -55            | °C   |
| Minimum Storage Temperature   | -65            | °C   |

**Package Information**

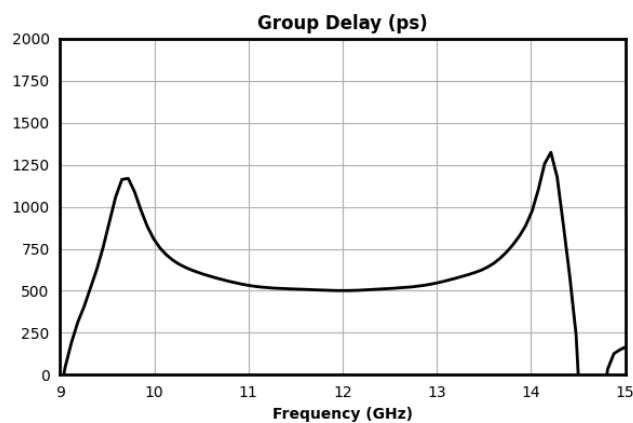
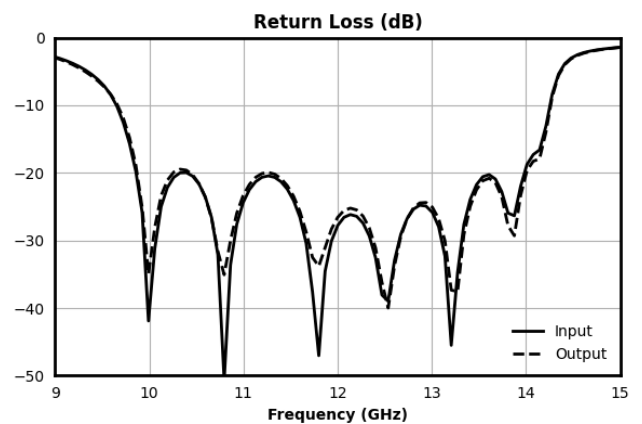
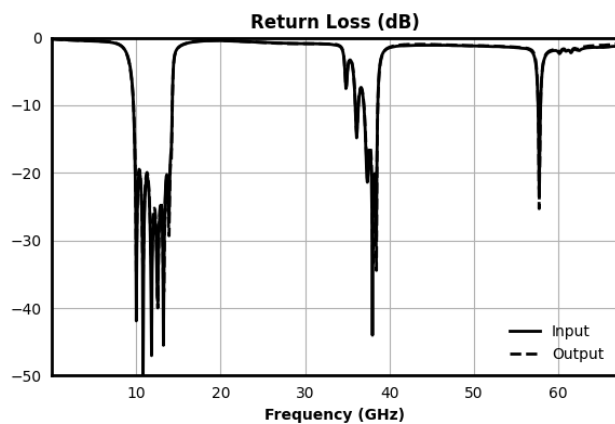
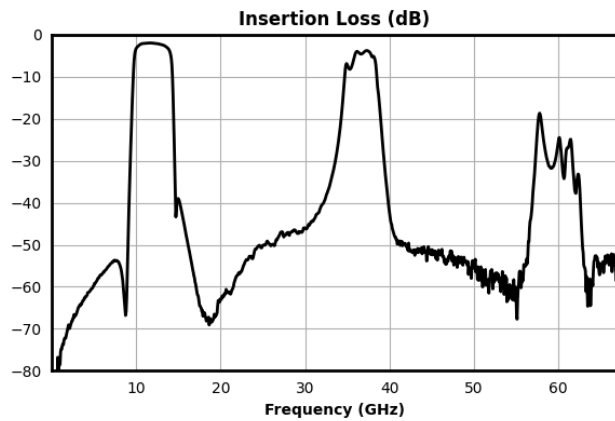
| Parameter  | Details | Rating         |
|------------|---------|----------------|
| Dimensions | -       | 3.10 x 3.10 mm |

## Electrical Specifications

The electrical specifications apply at TA=+25°C in a 50Ω system. Data is measured with 3 wirebonds with approximately 25 μm diameter, 50 μm height and 280 μm length. Min and Max limits are guaranteed at TA=+25°C. All bare die are 100% visually inspected and RF performance is guaranteed by sample testing.

| Parameter              | Test Conditions       | Minimum Frequency (GHz) | Maximum Frequency (GHz) | Min | Typ   | Max | Unit |
|------------------------|-----------------------|-------------------------|-------------------------|-----|-------|-----|------|
| 1 dBc Passband         | Configuration A, 25°C | 10.13                   | 13.54                   | -   | -     | -   | GHz  |
| 30 dBc Rejection Point | Configuration A, 25°C | 9.25                    | 14.55                   | -   | -     | -   | GHz  |
| 3 dBc Passband         | Configuration A, 25°C | 9.79                    | 14.08                   | -   | -     | -   | GHz  |
| Center Freq            | Configuration A, 25°C | -                       | -                       | -   | 11.71 | -   | GHz  |
| Group Delay            | Configuration A, 25°C | -                       | -                       | -   | 527   | -   | ps   |
| Impedance              | Configuration A, 25°C | -                       | -                       | -   | 50    | -   | Ω    |
| Insertion Loss @ fc    | Configuration A, 25°C | -                       | -                       | -   | 2.0   | -   | dB   |
| Passband Return Loss   | Configuration A, 25°C | -                       | -                       | -   | 26    | -   | dB   |

### Typical Performance Plot



## Die Mounting Recommendations

### Mounting and Bonding Recommendations

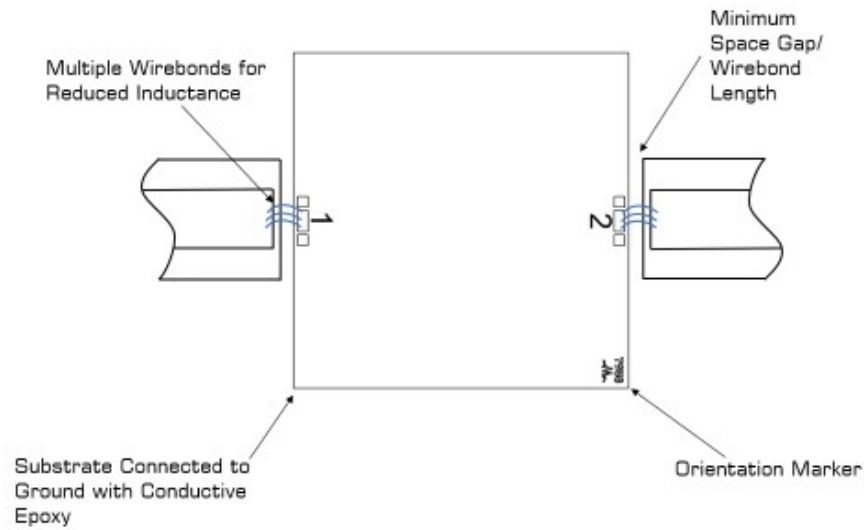
Marki MMICs should be attached directly to a ground plane with conductive epoxy. The ground plane electrical impedance should be as low as practically possible. This will prevent resonances and permit the best possible electrical performance. Datasheet performance is only guaranteed in an environment with a low electrical impedance ground.

**Mounting** - To epoxy the chip, apply a minimum amount of conductive epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip. Cure epoxy according to manufacturer instructions.

**Wire Bonding** - Ball or wedge bond with 0.025 mm (1 mil) diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 °C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package or substrate. Recommended bondwire configuration for datasheet performance is 3 wirebonds with approximately 25 µm diameter, 50 µm height and 280 µm length

**Circuit Considerations**– 50 Ω transmission lines should be used for all high frequency connections in and out of the chip. Wirebonds should be kept as short as possible, with multiple wirebonds recommended for higher frequency connections to reduce parasitic inductance. In circumstances where the chip more than .001" thinner than the substrate, a heat spreading spacer tab is optional to further reduce bondwire length and parasitic inductance.

**Bonding Diagram**



## Handling Precautions

### General Handling

Chips should be handled with care using tweezers or a vacuum collet. Users should take precautions to protect chips from direct human contact that can deposit contaminants, like perspiration and skin oils on any of the chip's surfaces.

### Static Sensitivity

GaAs MMIC devices are sensitive to ESD and should be handled, assembled, tested, and transported only in static protected environments.

**Cleaning and Storage:** Do not attempt to clean the chip with a liquid cleaning system or expose the bare chips to liquid. Once the ESD sensitive bags the chips are stored in are opened, chips should be stored in a dry nitrogen atmosphere.

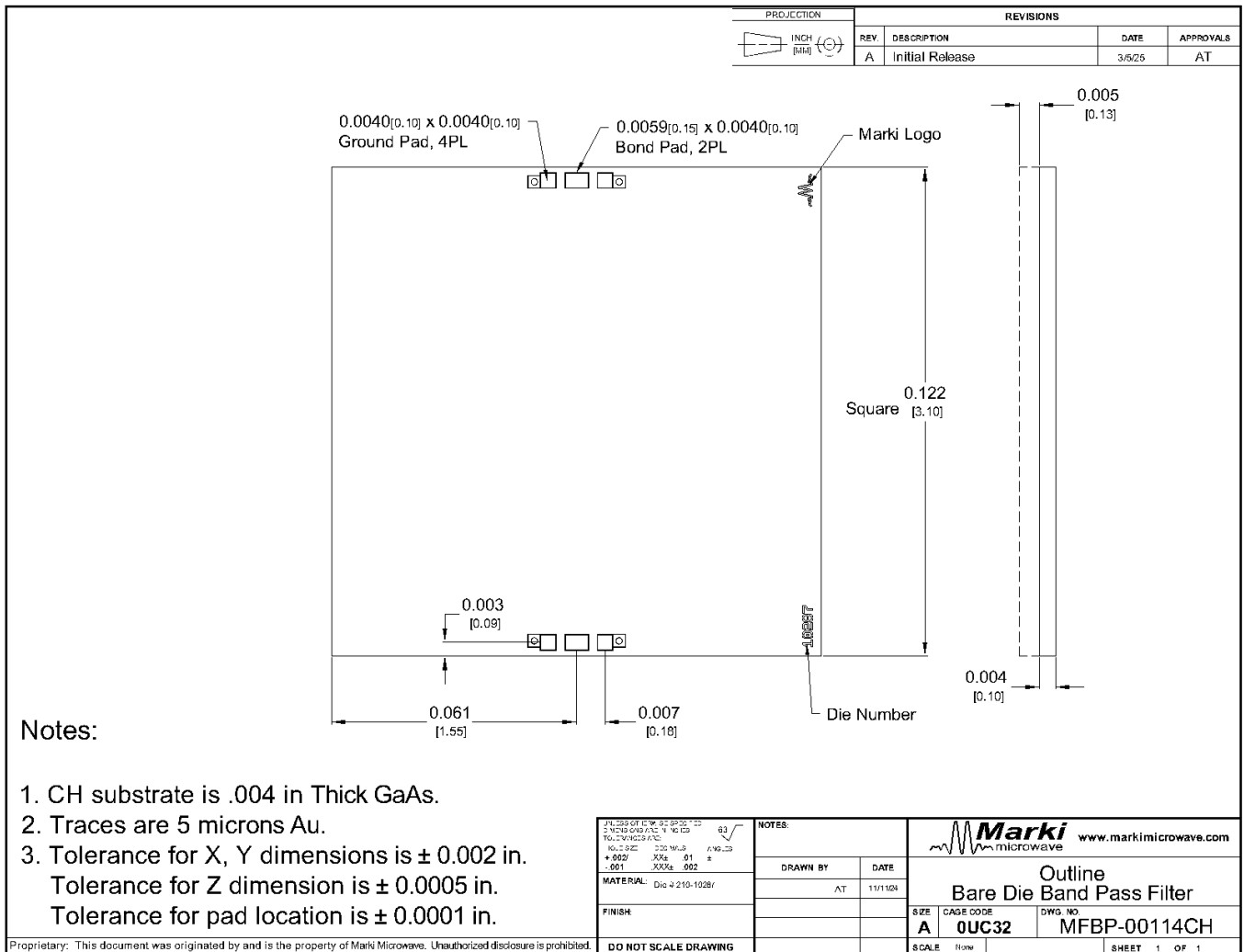
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## Passive GaAs MMIC 10 - 13.5 GHz Bandpass Filter

### Mechanical Data

### Outline Drawing

Download : [Outline 2D Drawing](#)



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