

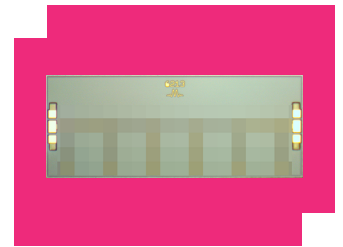
# MFB-5350CH

## Passive MMIC 40-67GHz Bandpass Filter

### DEVICE OVERVIEW

#### General Description

The MFB-5350 is a passive MMIC bandpass filter. It is a low loss integrated filter that passes most V band frequencies (40-67GHz). 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.



[Download s-parameters here](#)

#### Features

- Insertion Loss Typically 1.5dB at Center Frequency
- Excellent Return Loss
- High Stop Band Suppression
- Wide Stop Band

#### Applications

- Designed for V Band

#### Functional Block Diagram



#### Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MFB-5350CH	Passive MMIC 40-67GHz Bandpass Filter	CH	REACH RoHS	Released	EAR99

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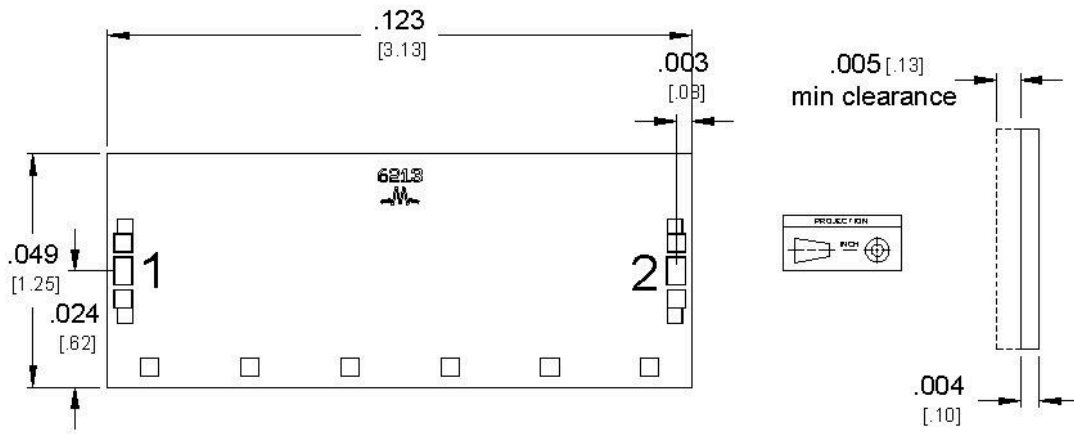
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## Revision History

Revision Code	Revision Date	Comment
-	2023-05-21	Datasheet Initial Release

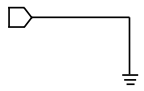
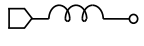
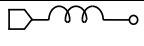
## Port Configuration and Functions

### Port Diagram



1. CH Substrate material is .004" thick GaAs.
2. I/O traces finish is 5 microns Au. Ground plane finish is 4 microns Au.
3. 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. All bonds should be as short as possible <0.31 mm (12 mils).

### 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 open to ground for the CH package.	
Port 2	Input/Output	Port 2 is DC open to ground for the CH package.	

## Specifications

### Absolute Maximum Ratings

Note: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

Parameter	Maximum Rating	Unit
Maximum Storage Temperature	125	°C
Maximum Survivable Operating Temperature	125	°C
Minimum Storage Temperature	-65	°C
Minimum Survivable Operating Temperature	-65	°C
RF Power Handling	27	dBm
Spec Guaranteed Operating Temperature	25	°C

### Package Information

Parameter	Details	Rating
Dimensions	-	3.13 x 1.25 mm

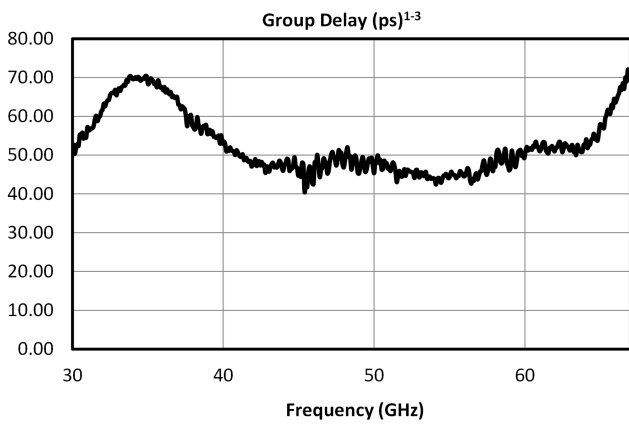
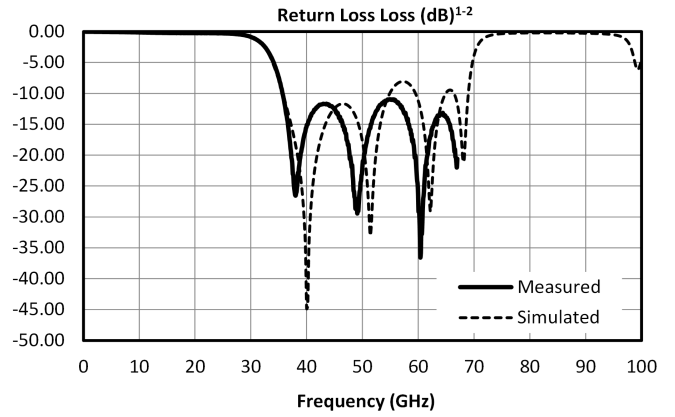
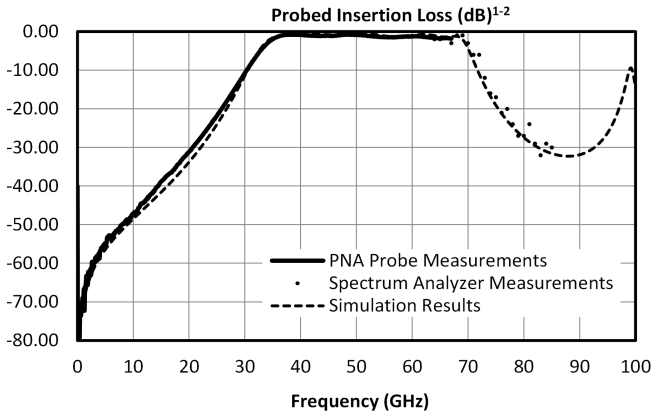
**Electrical Specifications**

Specifications guaranteed +25°C for chip (CH) package, measured in a 50Ω system.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
1 dBc Passband <sup>1</sup>	Configuration A, Temp = 25°C	35.26	67	-	-	-	GHz
3 dBc Passband <sup>2</sup>	Configuration A, Temp = 25°C	33.51	48.58	-	-	-	GHz
30 dBc Rejection Point <sup>3</sup>	Configuration A, Temp = 25°C	20.27	48.58	-	-	-	GHz
Center Freq <sup>4</sup>	Configuration A, Temp = 25°C	-	-	-	48.61	-	GHz
Insertion Loss @ fc <sup>5</sup>	Configuration A, Temp = 25°C	-	-	-	0.8	3.0	dB
Passband Return Loss <sup>6</sup>	Configuration A, Temp = 25°C	-	-	-	14	-	dB
Group Delay <sup>7</sup>	Configuration A, Temp = 25°C	-	-	-	50	-	ps
Impedance <sup>8</sup>	Configuration A, Temp = 25°C	-	-	-	50	-	Ω
Stopband Suppression	-	8	8	40	50	-	dB
Stopband Suppression	-	20.7	85	25	30	-	dB

[1][2][3][4][5][6][7][8] No

**Typical Performance Plots**



## **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. All bonds should be as short as possible <0.31 mm (12 mils).

**Circuit Considerations** – 50  $\Omega$  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.

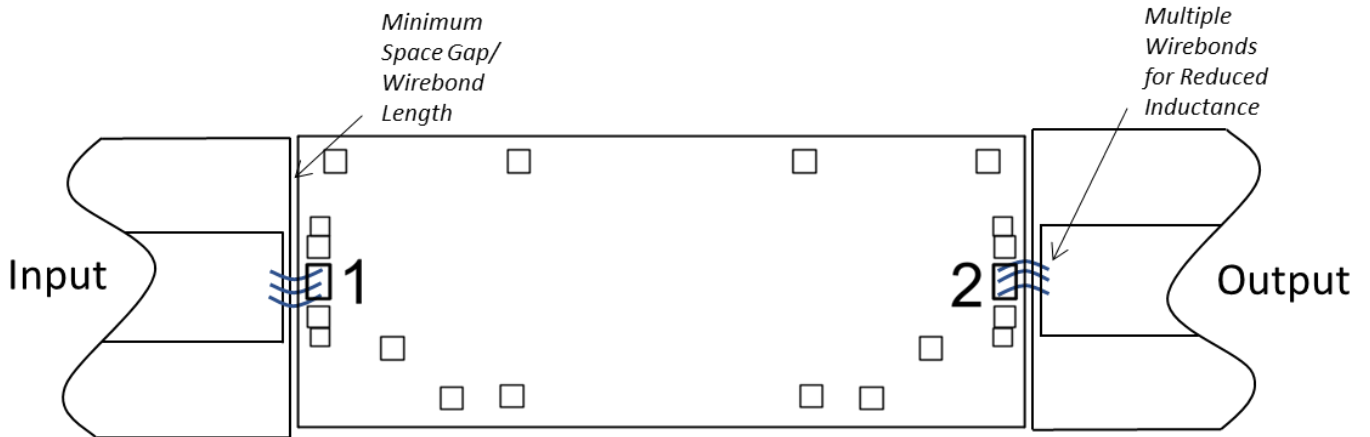
## Handling Precautions

**General Handling:** Chips should be handled with a vacuum collet when possible, or with sharp tweezers using well trained personnel. The surface of the chip is fragile and should not be contacted if possible.

**Static Sensitivity:** GaAs MMIC devices are subject to static discharge, 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.

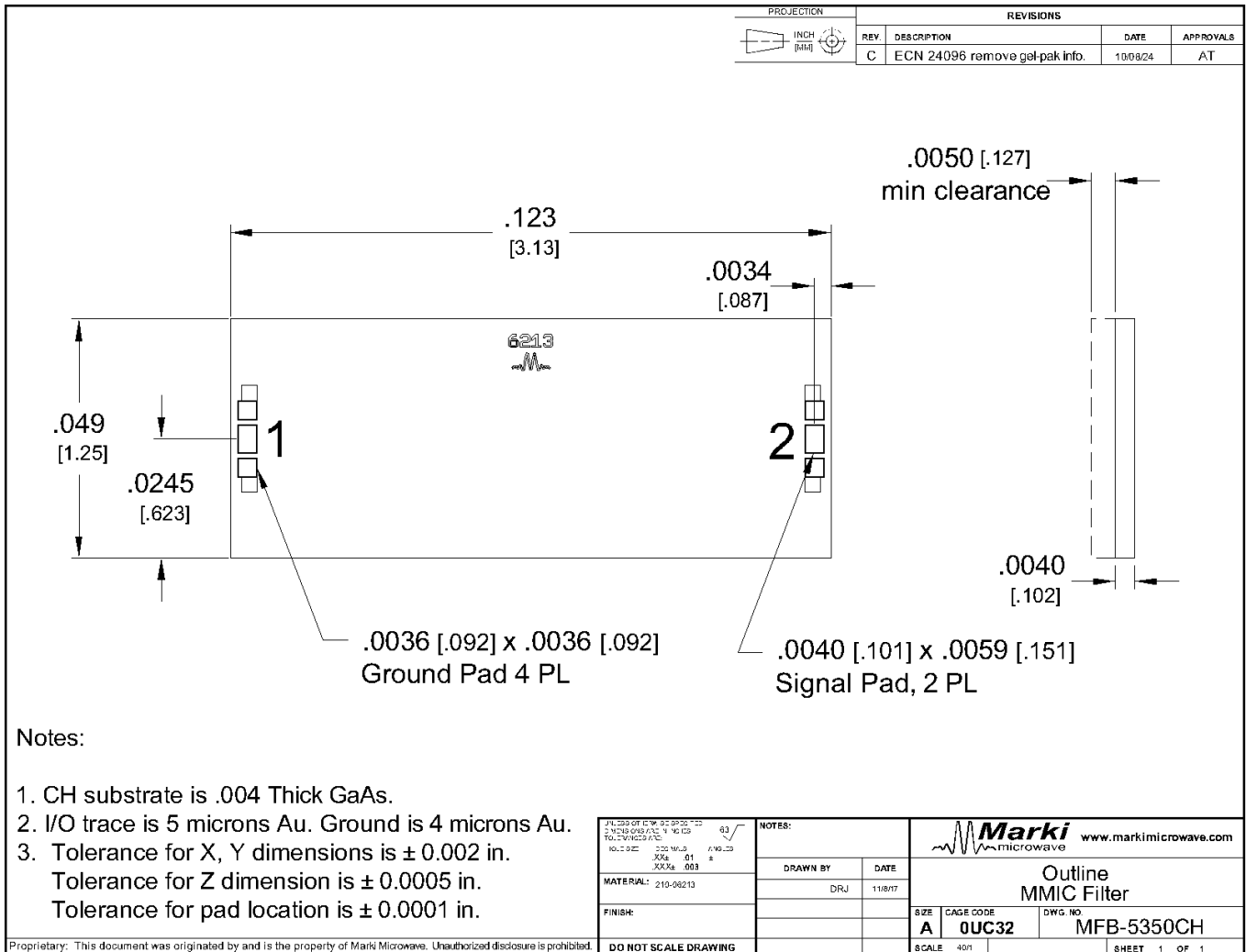
**Bonding Diagram**



### Mechanical Data

### Outline Drawing

Download : [Outline 2D Drawing](#)



## Notes

### DATA SHEET NOTES:

1. Filter is symmetrical. Reverse measurement is equivalent to forward measurement.
2. Data is taken three ways: calibrated network analyzer below 67 GHz, spectrum analyzer for insertion loss above 67 GHz, and simulations for insertion loss and return loss above 67 GHz. All measured data is taken and simulations assume 50  $\Omega$  probes on chip.
3. Group delay calculated using wrapped phase response.
4. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
5. Catalog circuits are continually improved. Configuration control requires custom model numbers and specifications.

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