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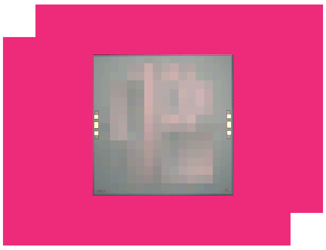
MFBP-00079CH

Passive GaAs MMIC 8 - 10 GHz Bandpass Filter

DEVICE OVERVIEW

General Description

The MFBP-00079CH 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-00079CH 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

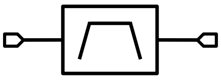
Features

- 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-00079CH	Passive GaAs MMIC 8 - 10 GHz Bandpass Filter	CH	RoHS REACH	Released	EAR99

Table Of Contents

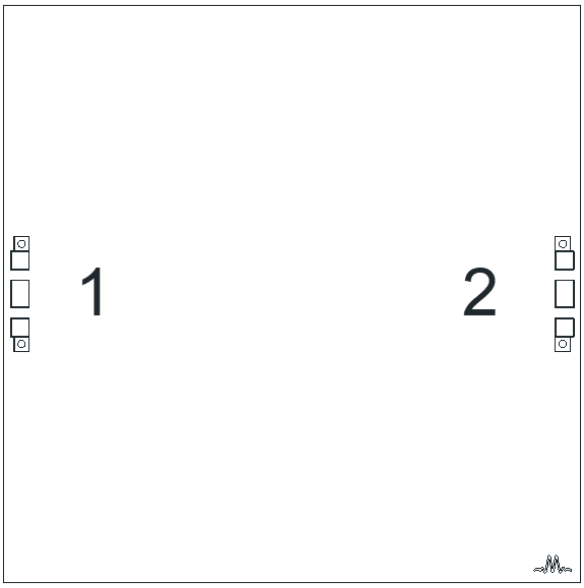
Revision History

Revision Code	Revision Date	Comment
-	2024-08-27	Initial Release
A	2025-03-06	Port Function Description correction

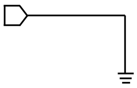
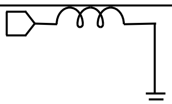
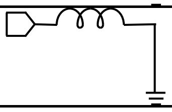
Port Configuration and Functions

Port Diagram

A top-down view of the MFBP-00079CH 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

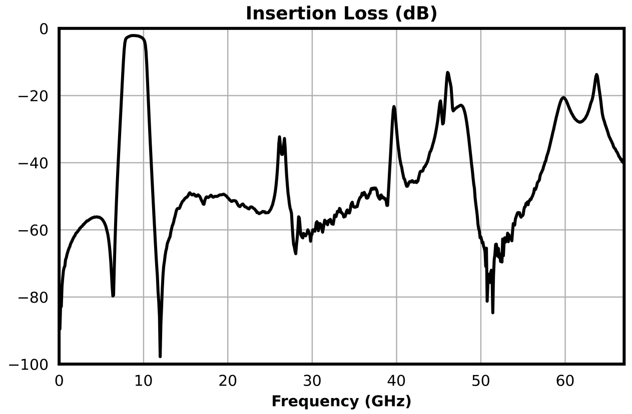
Parameter	Details	Rating
Dimensions	-	3.10 x 3.10 mm

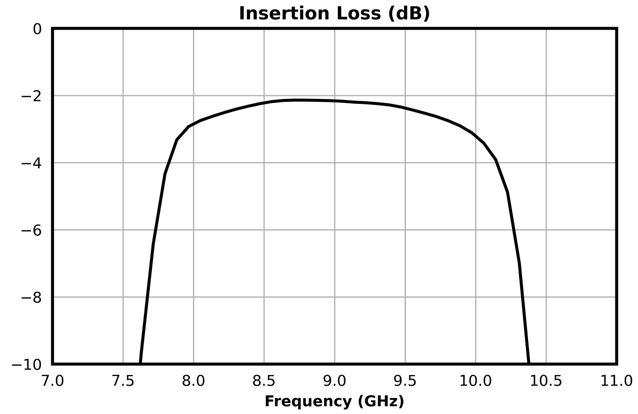
Electrical Specifications

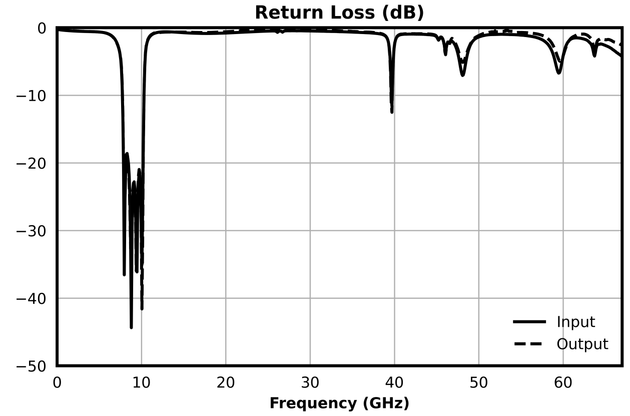
The electrical specifications apply at TA=+25°C in a 50Ω system. Data is measured with 3 wirebonds with approximately 25 µm diameter, 50 µm height and 280 µm length. Min and Max limits are guaranteed at TA=+25°C. All bare die are 100% visually inspected and RF performance is guaranteed by sample testing.

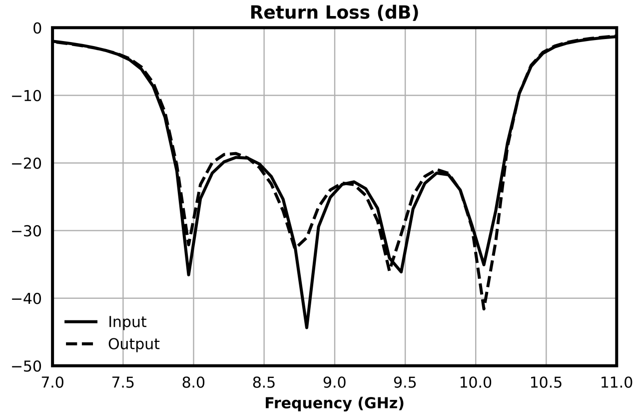
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
1 dBc Passband	Configuration A, Temp = 25°C	7.97	9.97	-	-	-	GHz
3 dBc Passband	Configuration A, Temp = 25°C	7.8	10.23	-	-	-	GHz
30 dBc Rejection Point	Configuration A, Temp = 25°C	7.21	10.73	-	-	-	GHz
Center Freq	Configuration A, Temp = 25°C	-	-	-	8.91	-	GHz
Insertion Loss @ fc	Configuration A, Temp = 25°C	-	-	-	2.2	-	dB
Passband Return Loss	Configuration A, Temp = 25°C	-	-	-	24	-	dB
Group Delay	Configuration A, Temp = 25°C	-	-	-	701	-	ps
Impedance	Configuration A, Temp = 25°C	-	-	-	50	-	Ω

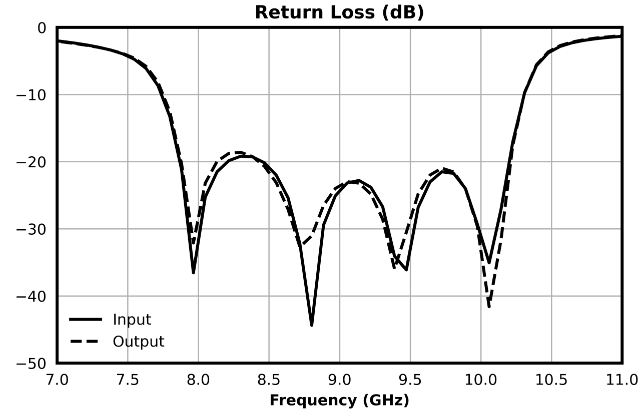
Typical Performance Plot

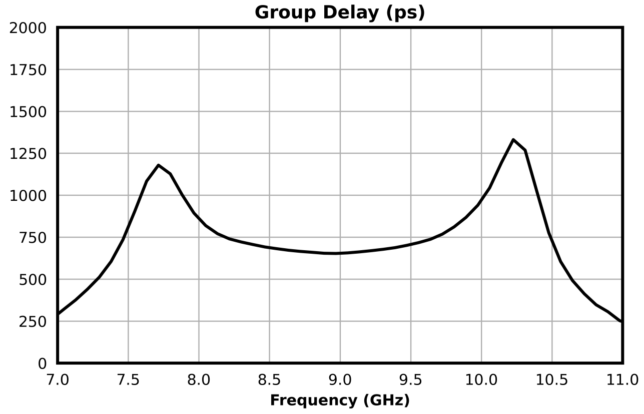












Die Mounting Recommendations

Mounting and Bonding Recommendations

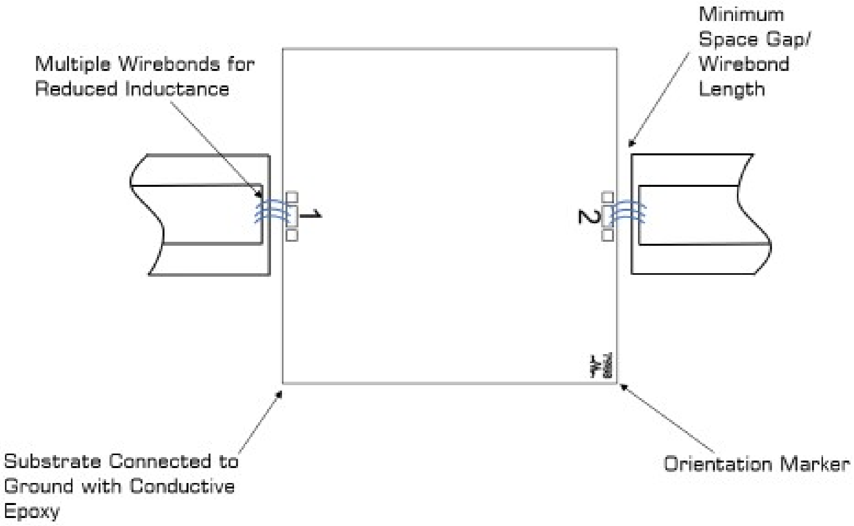
Marki MMICs should be attached directly to a ground plane with conductive epoxy. The ground plane electrical impedance should be as low as practically possible. This will prevent resonances and permit the best possible electrical performance. Datasheet performance is only guaranteed in an environment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

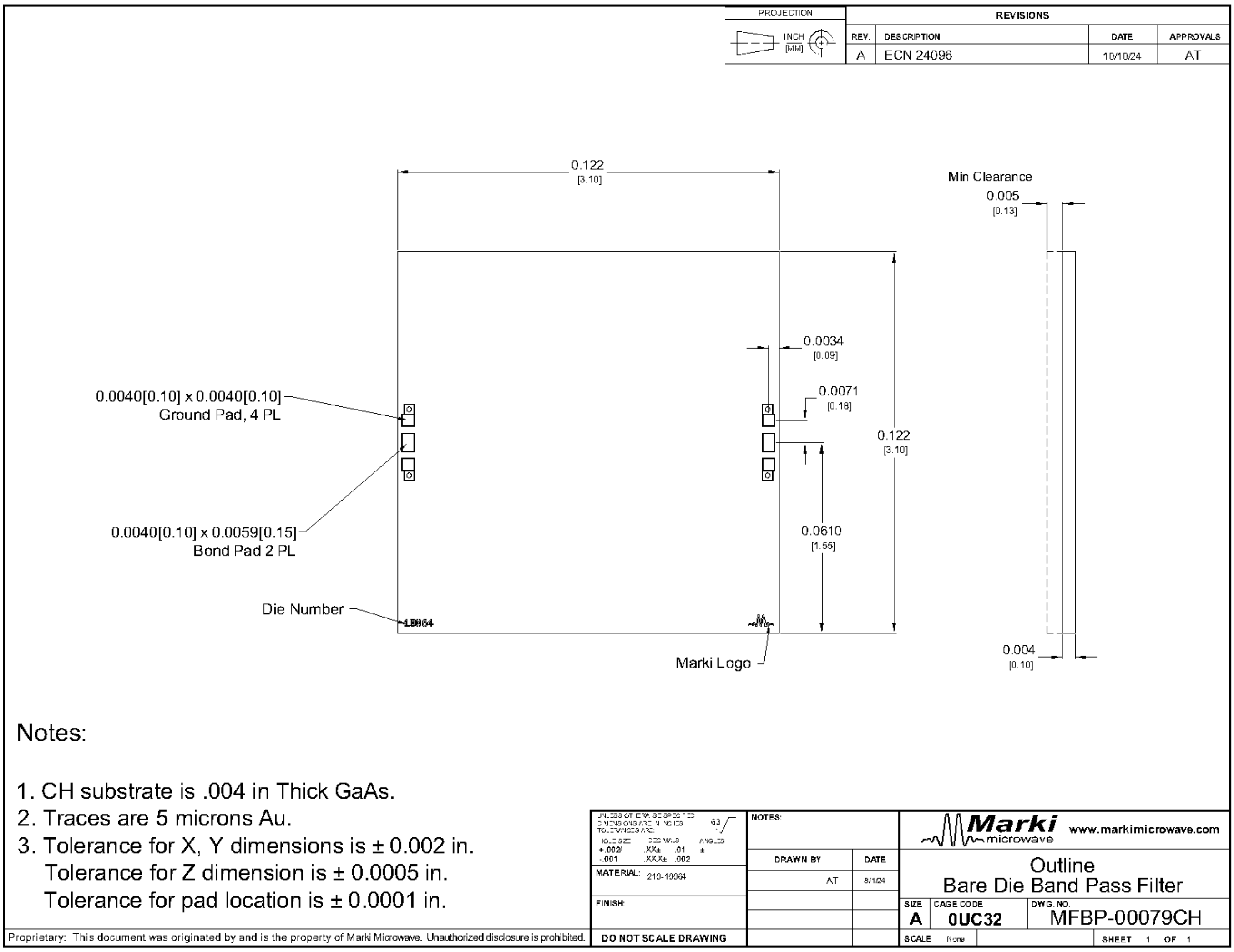
GaAs MMIC devices are sensitive to ESD and should be handled, assembled, tested, and transported only in static protected environments.

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.

Mechanical Data

Outline Drawing

Download : Outline 2D Drawing



Notes:

1. CH substrate is .004 in Thick GaAs.
2. Traces are 5 microns Au.
3. Tolerance for X, Y dimensions is ± 0.002 in.
   Tolerance for Z dimension is ± 0.0005 in.
   Tolerance for pad location is ± 0.0001 in.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
HOLE SIZE +.002/ -.001
DECIMALS .XX± .01 .XXX± .002
ANGLES ±
63

MATERIAL: 210-10064

FINISH:

DO NOT SCALE DRAWING

NOTES:

DRAWN BY	DATE
AT	8/1/24

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Outline
Bare Die Band Pass Filter

SIZE A
CAGE CODE 0UC32
DWG. NO. MFBP-00079CH
SCALE None
SHEET 1 OF 1

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