Sales: 408-778-9952 | General: 408-778-4200 | Fax: 408-778-4300
Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

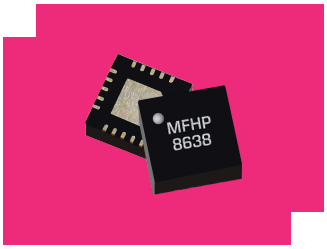
MFHP-00001PSM

Passive GaAs MMIC 2 GHz Highpass Filter

DEVICE OVERVIEW

General Description

The MFHP-00001PSM family of passive MMIC surface mount highpass filters are 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 MFHP-00001PSM is available as a 4x4mm plastic QFN. Low unit to unit variation allows for accurate simulations using the provided S2P file taken from measured production units.



Download s-parameters here

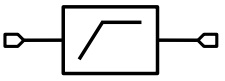
Features

- Low Passband Insertion Loss with Fast Roll-off
- Excellent Return Loss
- High Stop Band Suppression

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MFHP-00001PSM	Passive GaAs MMIC 2 GHz Highpass Filter	QFN	RoHS REACH	Released	EAR99
EVB-MFHP-00001P	Evaluation Board, Passive GaAs MMIC 2GHz Highpass Filter	EVB	RoHS REACH	Released	EAR99

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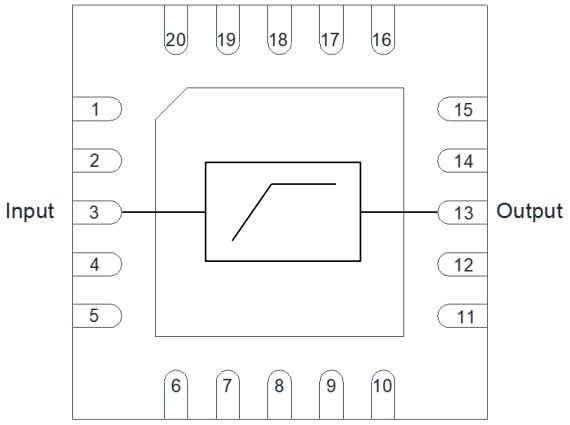
Revision History

Revision Code	Revision Date	Comment
-	2023-04-01	Datasheet Initial Release
A	2025-03-03	Power Handling Update

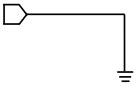
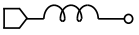
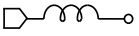
Port Configuration and Functions

Port Diagram

A top-down x-ray view of the MFHP-00001PSM package outline drawing is shown below.



Port Functions

Port	Function	Description	Equivalent Circuit for Package
Ground Paddle	Ground	PSM package ground path is provided through the ground paddle and should be connected to RF ground.	
Pin 13	Output	Pin 13 is DC open to ground for the PSM package.	
Pin 3	Input	Pin 3 is DC open to ground for the PSM 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
RF Power Handling	14	W

Package Information

Parameter	Details	Rating
Dimensions	-	4 x 4 mm
Moisture Sensitivity Level	-	MSL 1

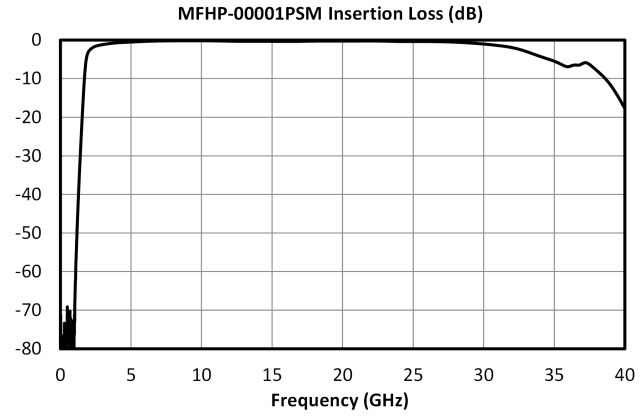
Electrical Specifications

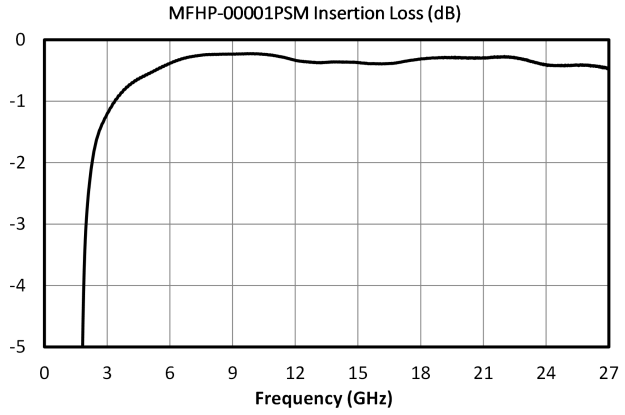
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the filter in a PSM package with a sine wave input applied to Pin 3. Min and Max limits are guaranteed at TA=+25°C.

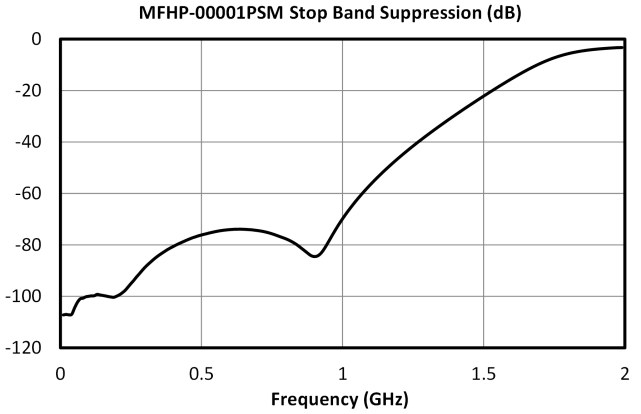
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
1 dBc Passband	Configuration A, 25°C, Input Power = -5.00 dBm Input	2.98	30.45	-	-	-	GHz
30 dBc Rejection Point	Configuration A, 25°C, Input Power = -5.00 dBm Input	1.4	1.4	-	-	-	GHz
3 dBc Passband	Configuration A, 25°C, Input Power = -5.00 dBm Input	1.96	33.18	-	-	-	GHz
Group Delay	Configuration A, 25°C, Input Power = -5.00 dBm Input	-	-	-	46	-	ps
Insertion Loss @ fc	Configuration A, 25°C, Input Power = -5.00 dBm Input	-	-	-	0.2	-	dB
Passband Return Loss	Configuration A, 25°C, Input Power = -5.00 dBm Input	-	-	-	19	-	dB

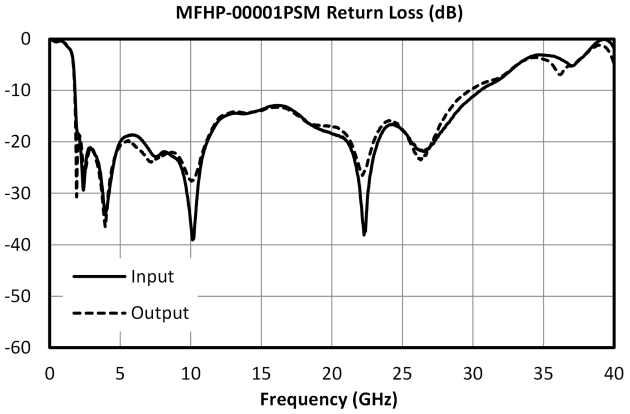
Typical Performance Plots

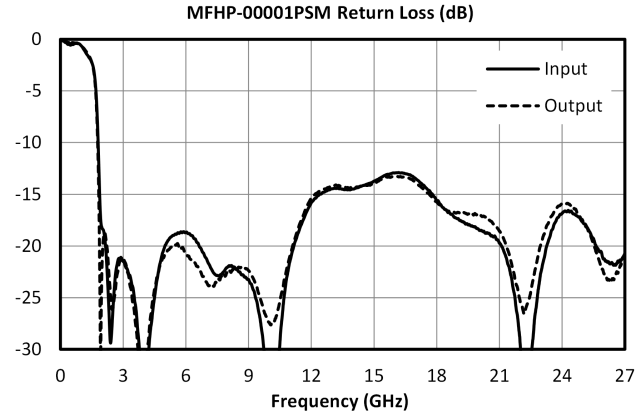
Typical performance is de-embedded from EVB using AFR.

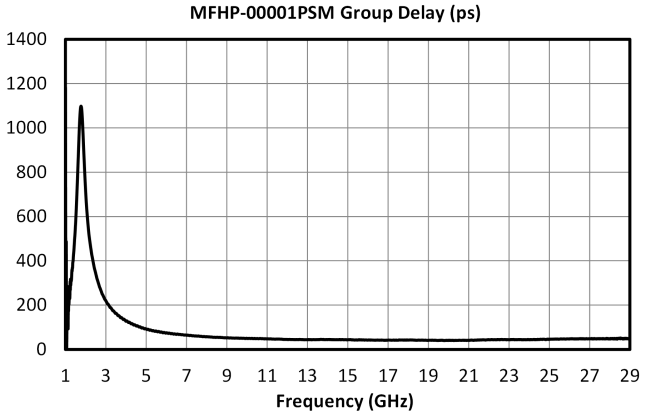






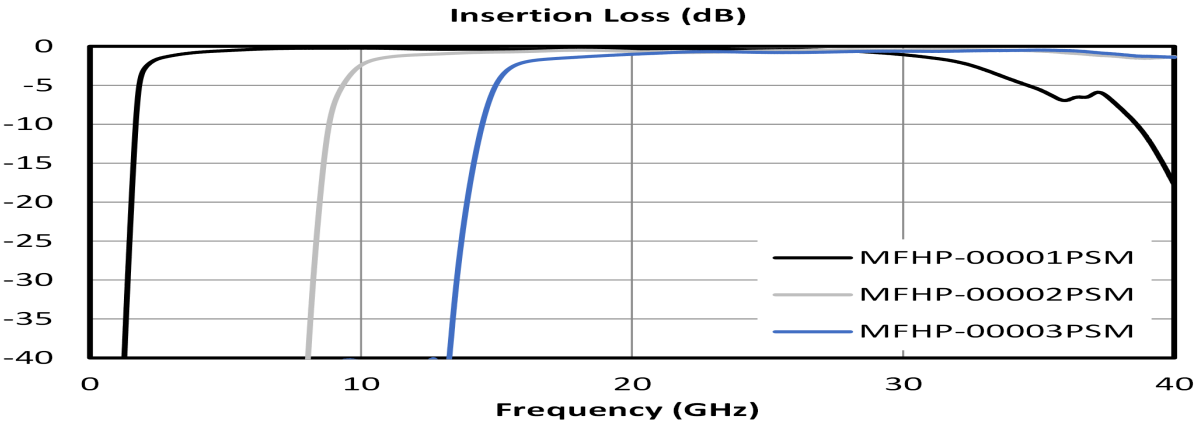






MFHP Highpass Family Passband Comparison

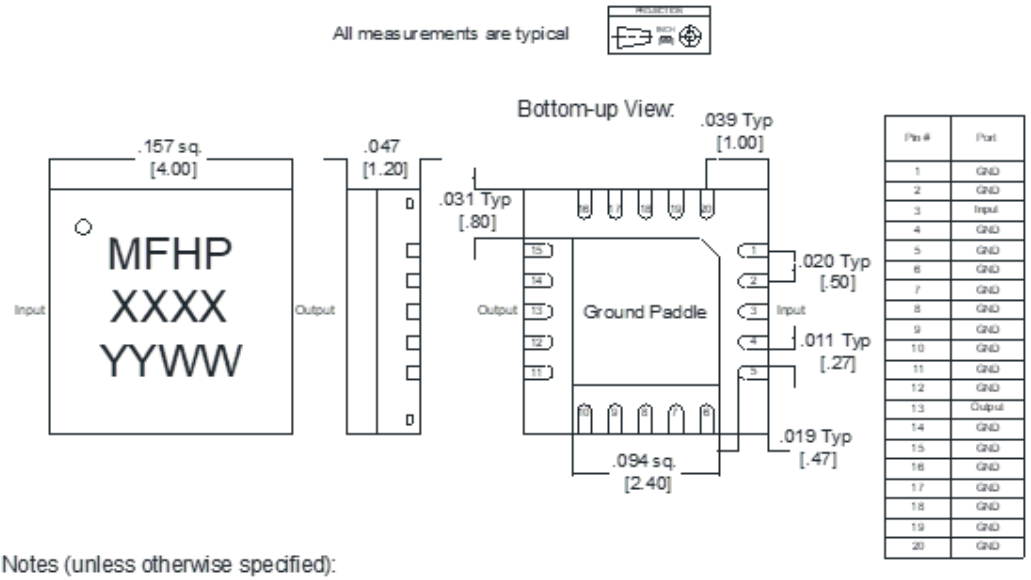
Part Number	3dBc Cutoff Frequency (GHz)
MFHP-00001PSM	2.00
MFHP-00002PSM	9.80
MFHP-00003PSM	15.40



Mechanical Data

Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



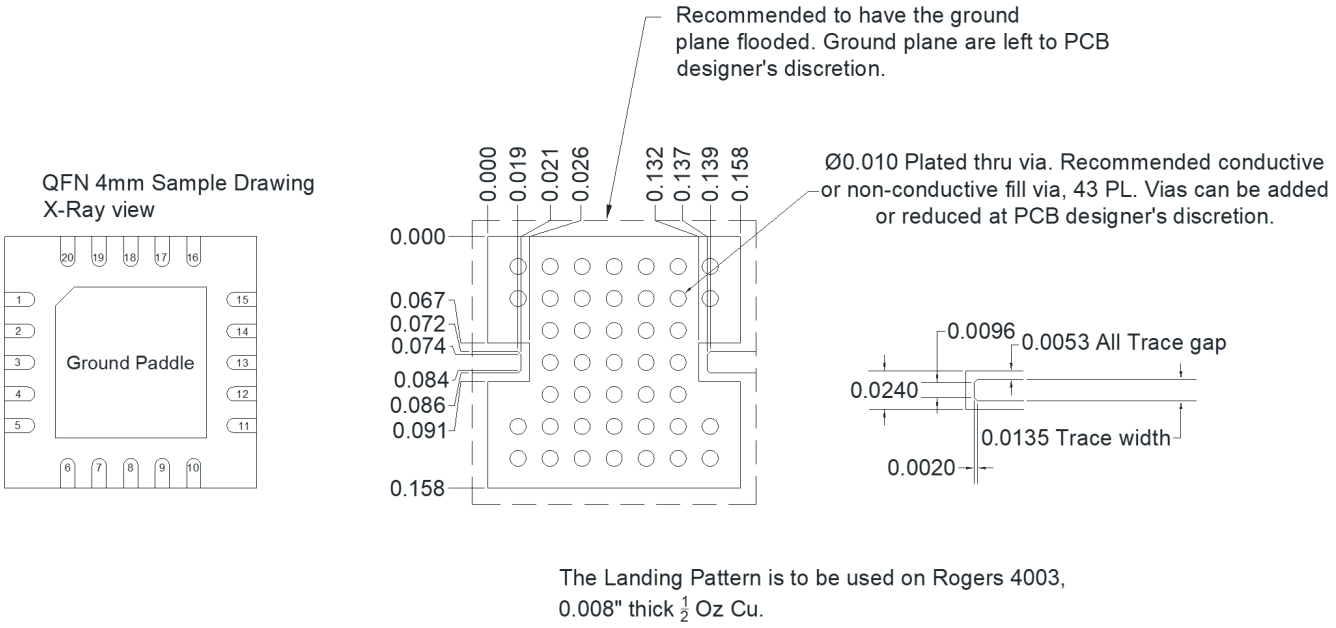
Pin #	Port
1	GND
2	GND
3	Input
4	GND
5	GND
6	GND
7	GND
8	GND
9	GND
10	GND
11	GND
12	GND
13	Output
14	GND
15	GND
16	GND
17	GND
18	GND
19	GND
20	GND

Notes (unless otherwise specified):

1. Substrate material is LCP.
2. I/O Leads and Die Paddle is (from base to finish):
   Ni: 0.5um MIN
   Pd: 0.02um MIN
   Au: 0.05um MAX
3. All unconnected pins should be connected to PCB RF ground.

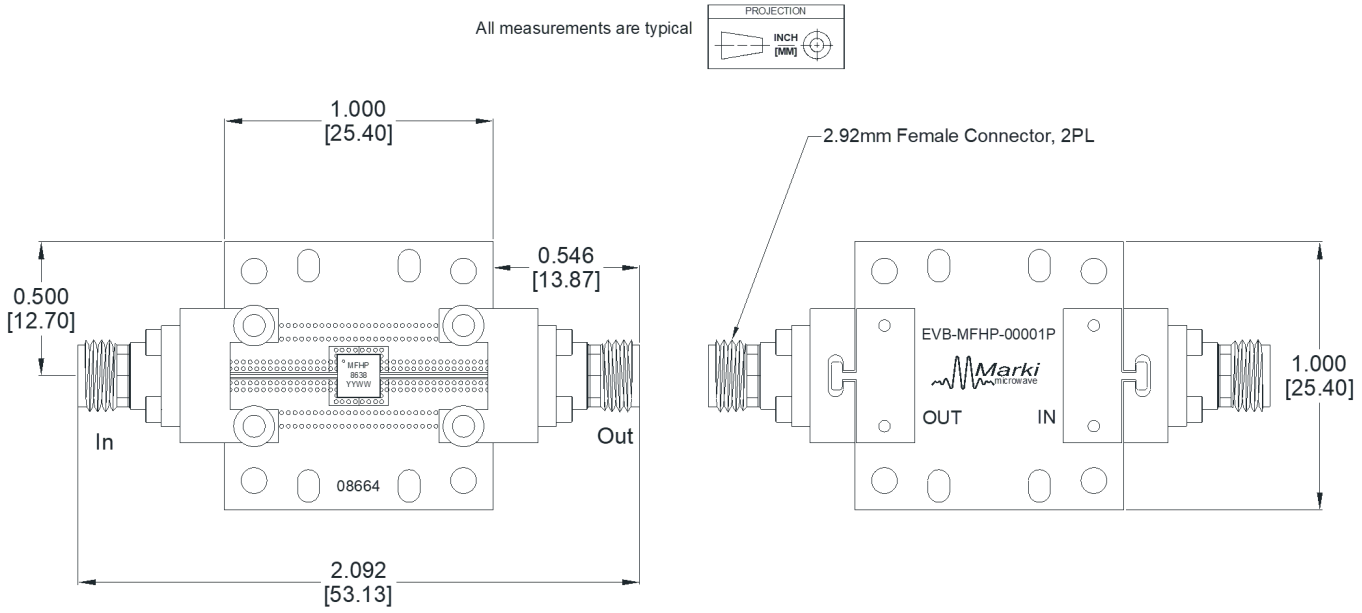
Footprint Image

Download : Footprint Drawing



The Landing Pattern is to be used on Rogers 4003, 0.008" thick $\frac{1}{2}$ Oz Cu.

Evaluation Board - Outline Drawing



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