

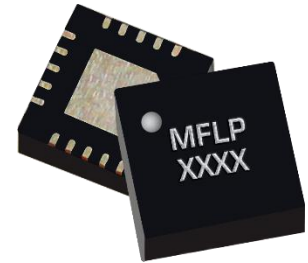
Passive GaAs MMIC Lowpass Filter Family

MFLP-000XXPSM

1 Device Overview

1.1 General Description

The MFLP-000XXPSM family of passive MMIC surface mount lowpass 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 MFLP-000XXPSM 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.

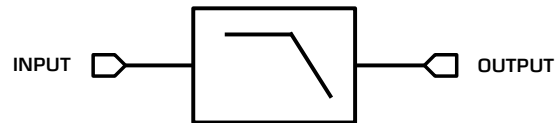


PSM

1.2 Features

- Low Passband Insertion Loss with Fast Roll-off
- Excellent Return Loss
- High Stop Band Suppression
- [S2P data available](#)

1.3 Functional Block Diagram



1.4 Part Ordering Options¹

Part Number	3dBc Cutoff Frequency (GHz)	Description	Package	Green Status	Product Lifecycle	Export Classification
MFLP-00001PSM	6.10	4 x 4 mm QFN	PSM	RoHS	Active	EAR99
MFLP-00002PSM	9.40					
MFLP-00003PSM	12.30					
MFLP-00004PSM	15.40					
MFLP-00005PSM	18.50					

¹ Refer to our [website](#) for a list of definitions for terminology presented in this table.

EVb-MFLP-00001P	6.10	Connectorized Evaluation Fixture with 2.92mm Connectors	EVb	RoHS	Active	EAR99
EVb-MFLP-00002P	9.40					
EVb-MFLP-00003P	12.30					
EVb-MFLP-00004P	15.40					
EVb-MFLP-00005P	18.50					

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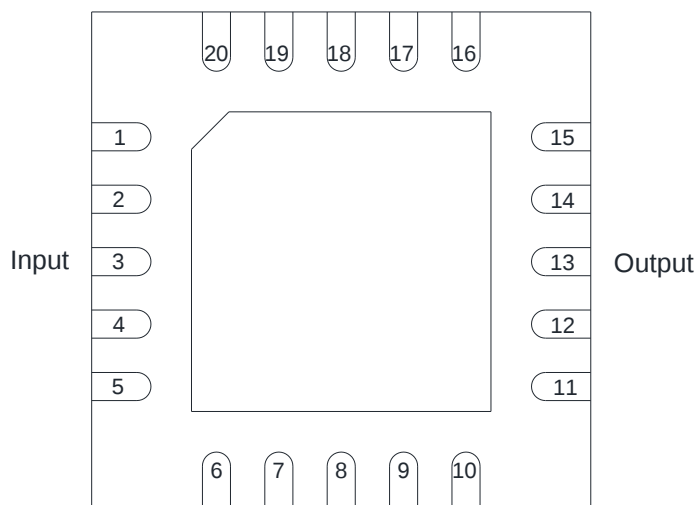
Revision History

Revision Code	Revision Date	Comment
-	April 2023	Datasheet Initial Release

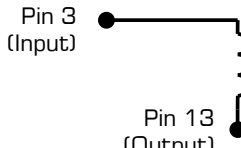
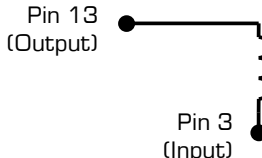
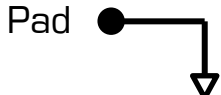
2 Port Configurations and Functions

2.1 Port Diagram

A top-down x-ray view of the MFLP-000XXPSM package outline drawing is shown below.



2.2 Port Functions

Port	Function	Description	Equivalent Circuit
Pin 3	Input	Pin 3 is DC short to Pin 13.	
Pin 13	Output	Pin 13 is DC short to Pin 3.	
Pad	Ground	PSM package ground path is provided through the substrate and ground bond pads.	

3 Specifications

3.1 Absolute Maximum Ratings

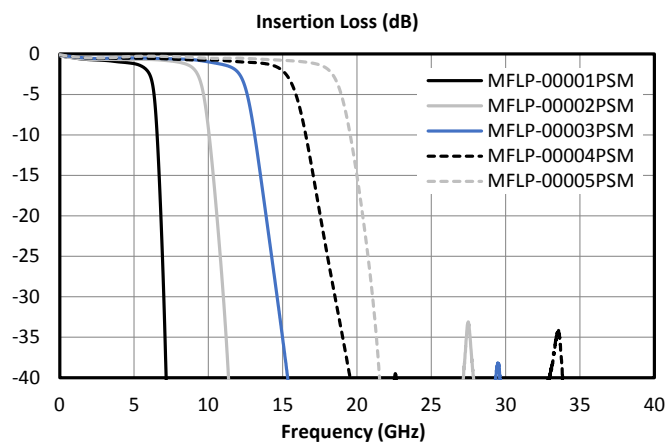
The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

Device	Parameter	Maximum Rating	Units
MFLP-00001PSM	DC Current: Port 1 / Port 2	240	mA
MFLP-00002PSM	DC Current: Port 1 / Port 2	240	mA
MFLP-00003PSM	DC Current: Port 1 / Port 2	320	mA
MFLP-00004PSM	DC Current: Port 1 / Port 2	320	mA
MFLP-00005PSM	DC Current: Port 1 / Port 2	320	mA
MFLP-000XXPSM	Operating Temperature	-55 to +100	°C
	Storage Temperature	-65 to +125	°C

3.2 Package Information

Parameter	Details	Rating
ESD	Human Body Model (HBM), per MIL-STD-750, Method 1020	N/A

3.3 Passband Comparison



Part Number	3dBc Cutoff Frequency (GHz)
MFLP-00001PSM	6.10
MFLP-00002PSM	9.40
MFLP-00003PSM	12.30
MFLP-00004PSM	15.40
MFLP-00005PSM	18.50

3.4 Electrical Specifications

The electrical specifications apply at $T_A=+25^{\circ}\text{C}$ 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 $T_A=+25^{\circ}\text{C}$.

MFLP-00001PSM	Frequency Range (GHz)	Min	Typ.	Max
3dBc Cutoff Frequency (GHz)			6.10	
Passband Insertion Loss (dB)	DC – 6.00		0.80	
Passband Return Loss (dB)	DC – 6.00	13	21	
Stop Band Suppression (dB)	7.50 – 40.00	30	57	
Group Delay (ps)	DC – 6.00		150	

MFLP-00002PSM	Frequency Range (GHz)	Min	Typ.	Max
3dBc Cutoff Frequency (GHz)			9.40	
Passband Insertion Loss (dB)	DC – 9.00		0.70	
Passband Return Loss (dB)	DC – 9.00	13	23	
Stop Band Suppression (dB)	12.00 – 40.00	30	52	
Group Delay (ps)	DC – 9.00		100	

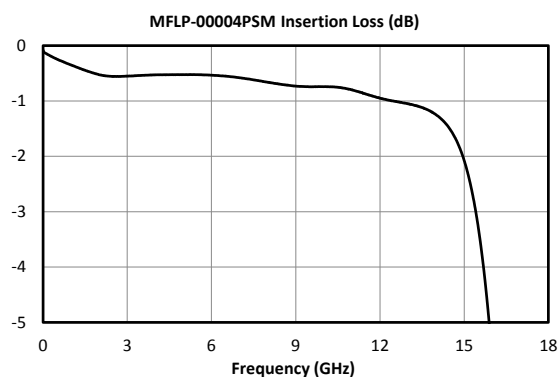
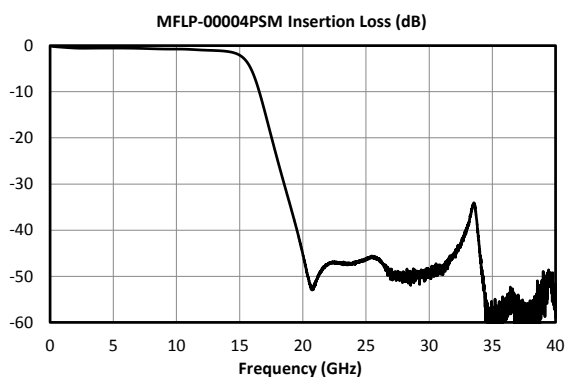
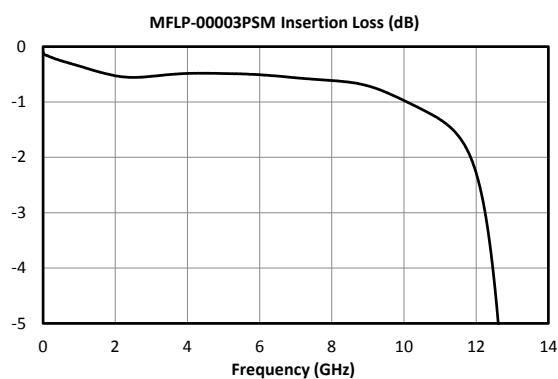
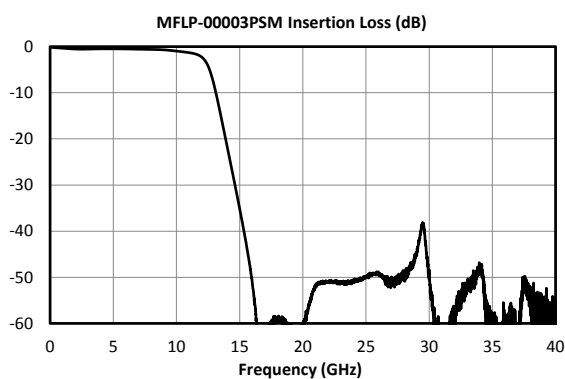
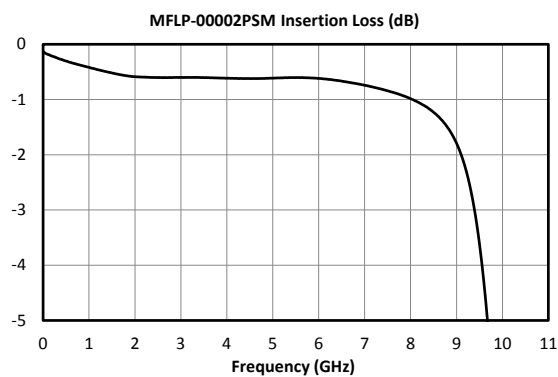
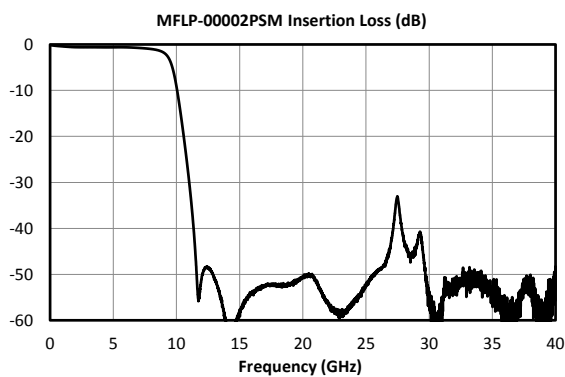
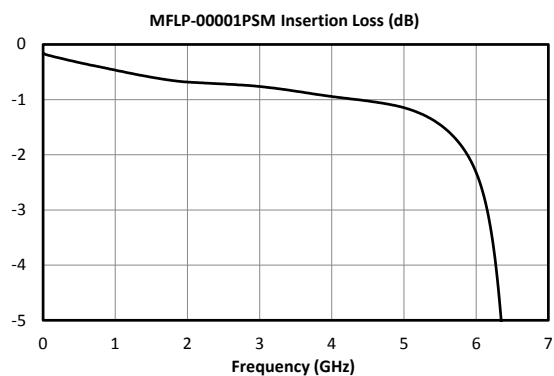
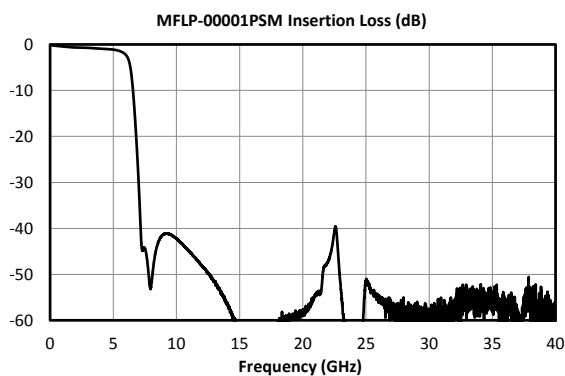
MFLP-00003PSM	Frequency Range (GHz)	Min	Typ.	Max
3dBc Cutoff Frequency (GHz)			12.30	
Passband Insertion Loss (dB)	DC – 12.00		0.50	
Passband Return Loss (dB)	DC – 12.00	10	21	
Stop Band Suppression (dB)	16.00 – 40.00	35	52	
Group Delay (ps)	DC – 12.00		100	

MFLP-00004PSM	Frequency Range (GHz)	Min	Typ.	Max
3dBc Cutoff Frequency (GHz)			15.40	
Passband Insertion Loss (dB)	DC – 15.00		0.60	
Passband Return Loss (dB)	DC – 15.00	10	21	
Stop Band Suppression (dB)	20.00 – 40.00	30	49	
Group Delay (ps)	DC – 15.00		73	

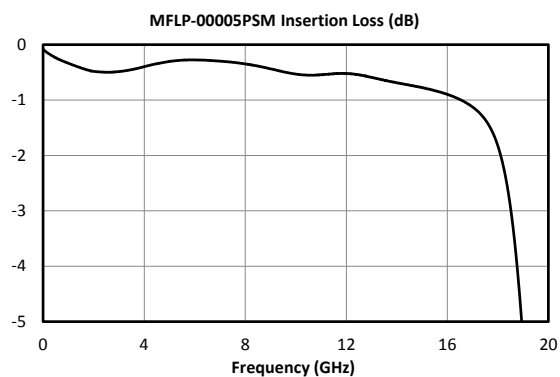
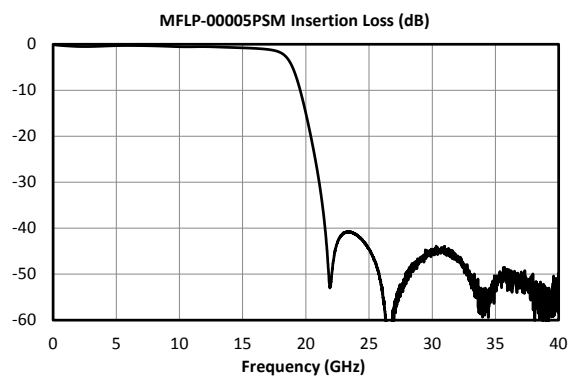
MFLP-00005PSM	Frequency Range (GHz)	Min	Typ.	Max
3dBc Cutoff Frequency (GHz)			18.50	
Passband Insertion Loss (dB)	DC – 17.00		0.50	
Passband Return Loss (dB)	DC – 17.00	12	21	
Stop Band Suppression (dB)	22.00 – 40.00	30	49	
Group Delay (ps)	DC – 17.00		73	

3.5 Typical Performance Plots²

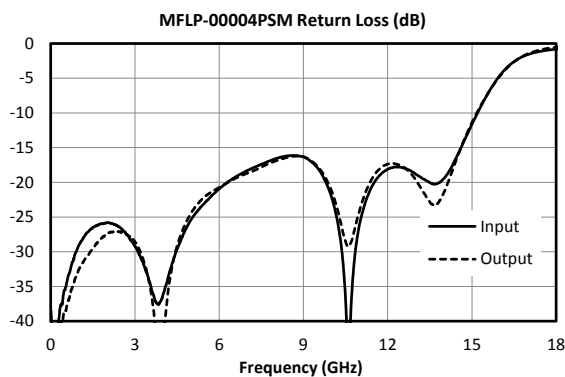
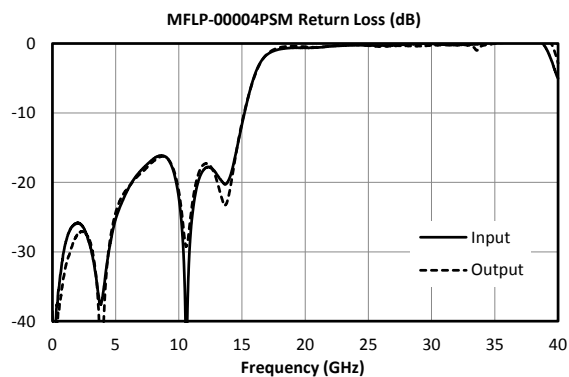
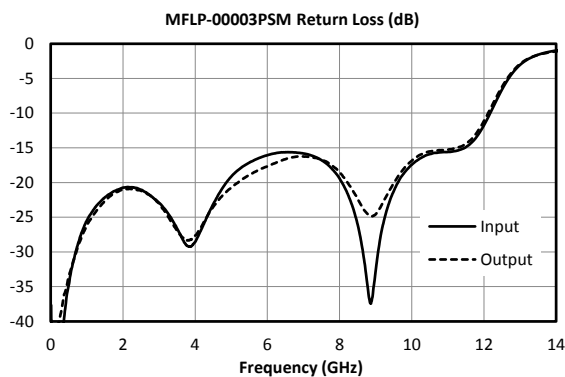
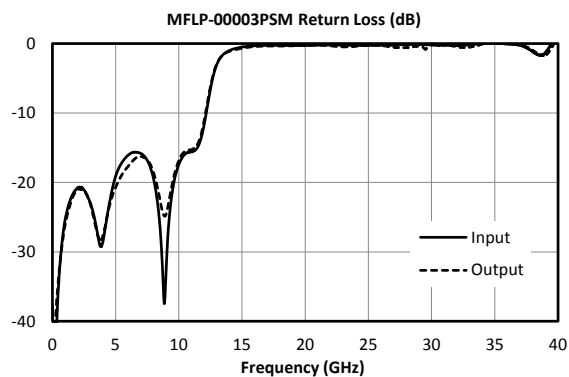
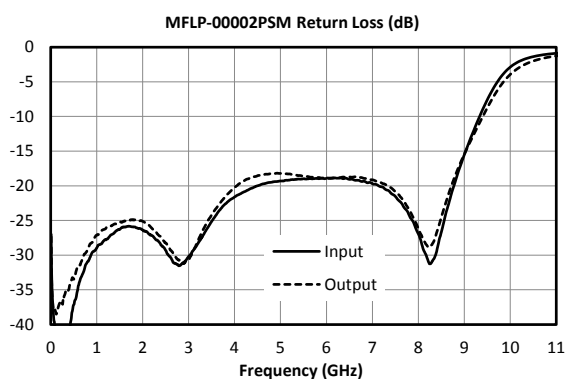
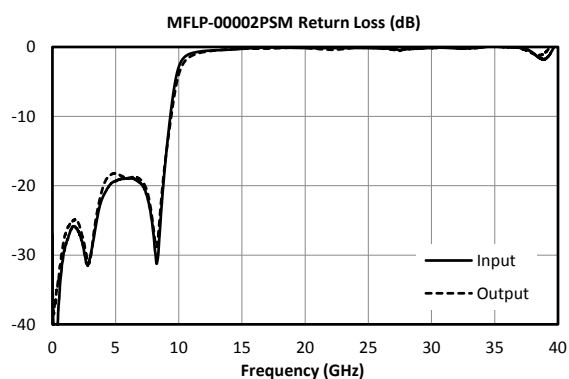
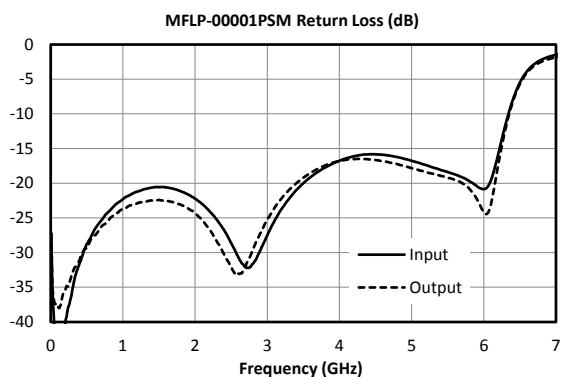
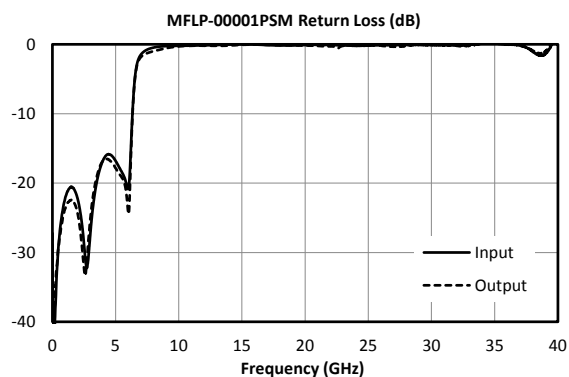
3.5.1 Insertion Loss

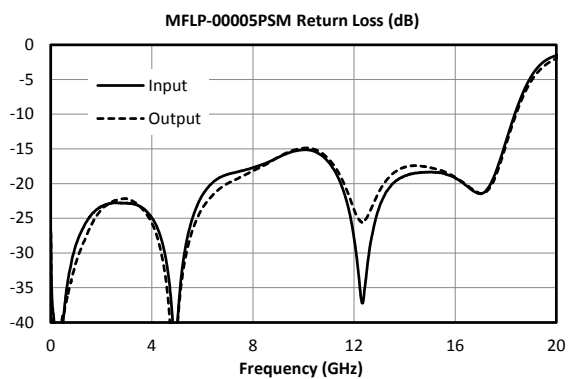
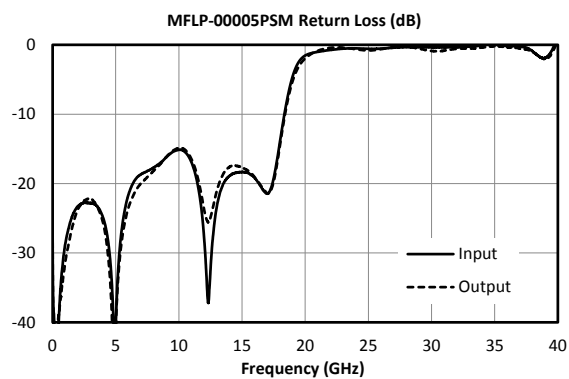


² Typical performance is de-embedded from EVB using AFR.

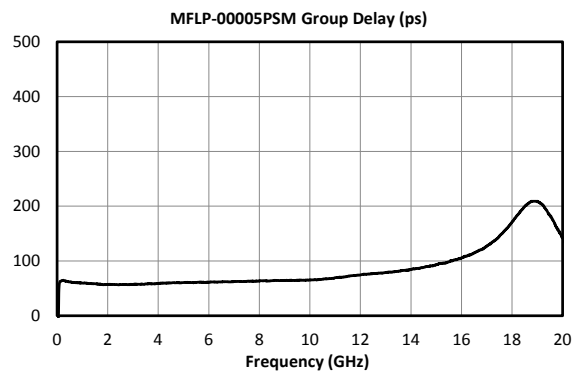
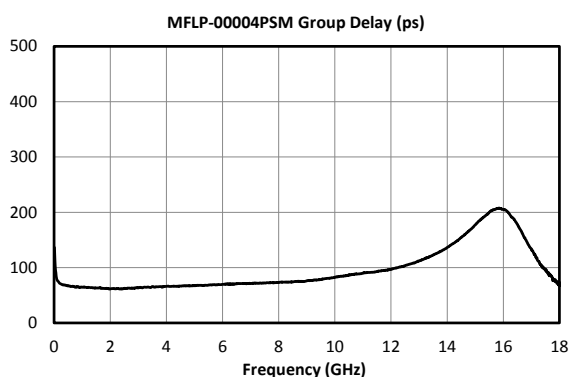
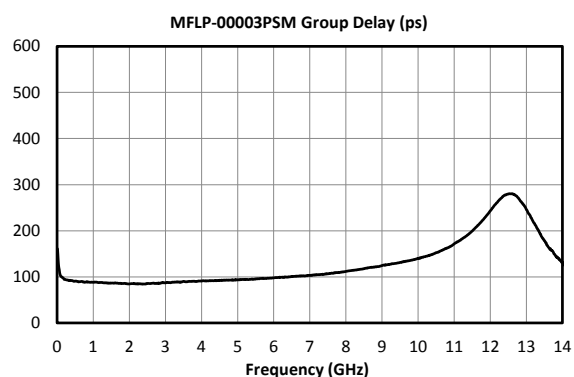
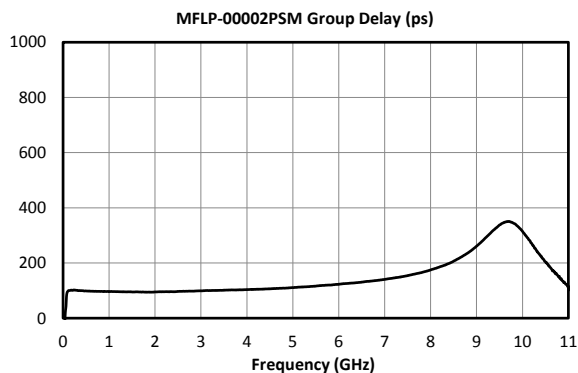
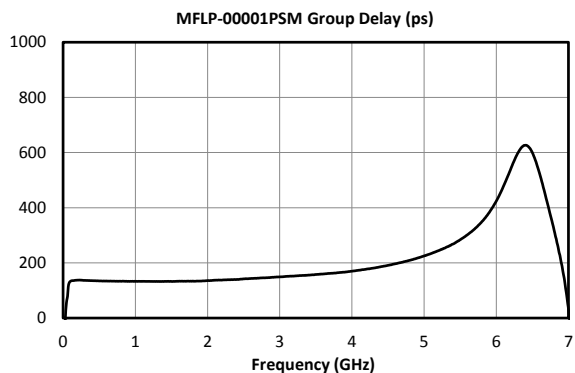


3.5.3 Return Loss





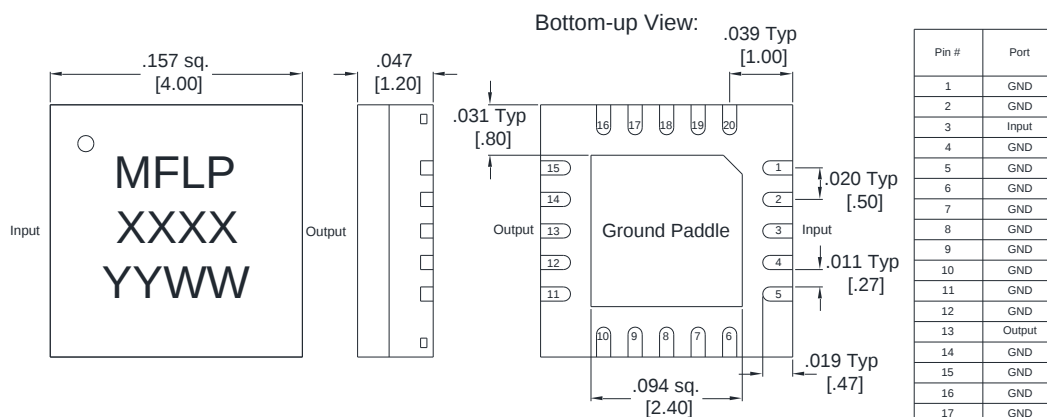
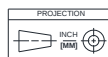
3.5.4 Group Delay



4 Mechanical Data

4.1 PSM Package Outline Drawing

All measurements are typical



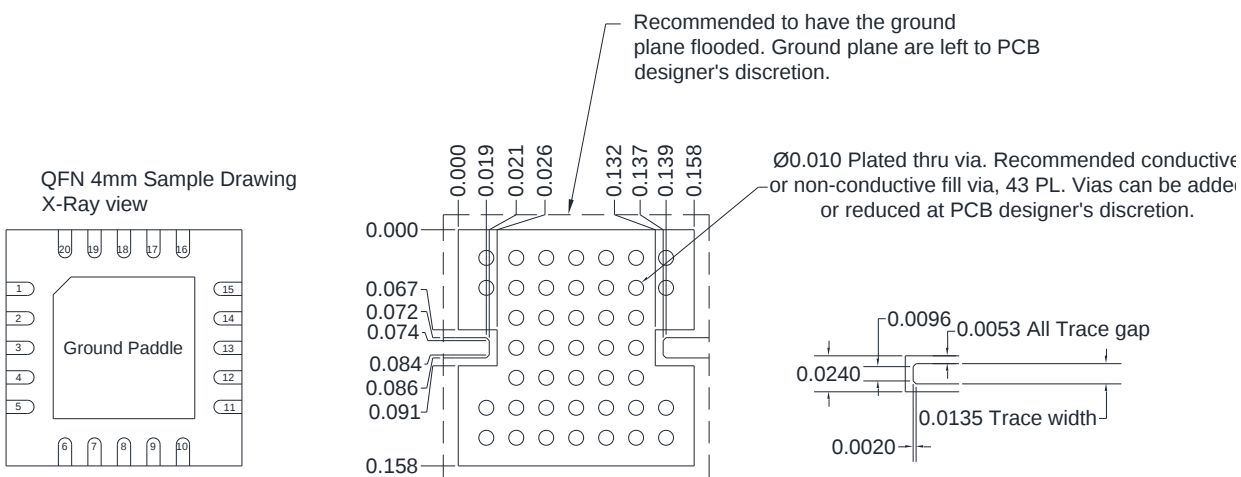
Notes (unless otherwise specified):

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

Part Number	Lid Label
MFLP-00001PSM	8641
MFLP-00002PSM	8642
MFLP-00003PSM	8643
MFLP-00004PSM	8644
MFLP-00005PSM	8646

4.2 PSM Package Footprint

MFLP-00001PSM - MFLP-00005PSM



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

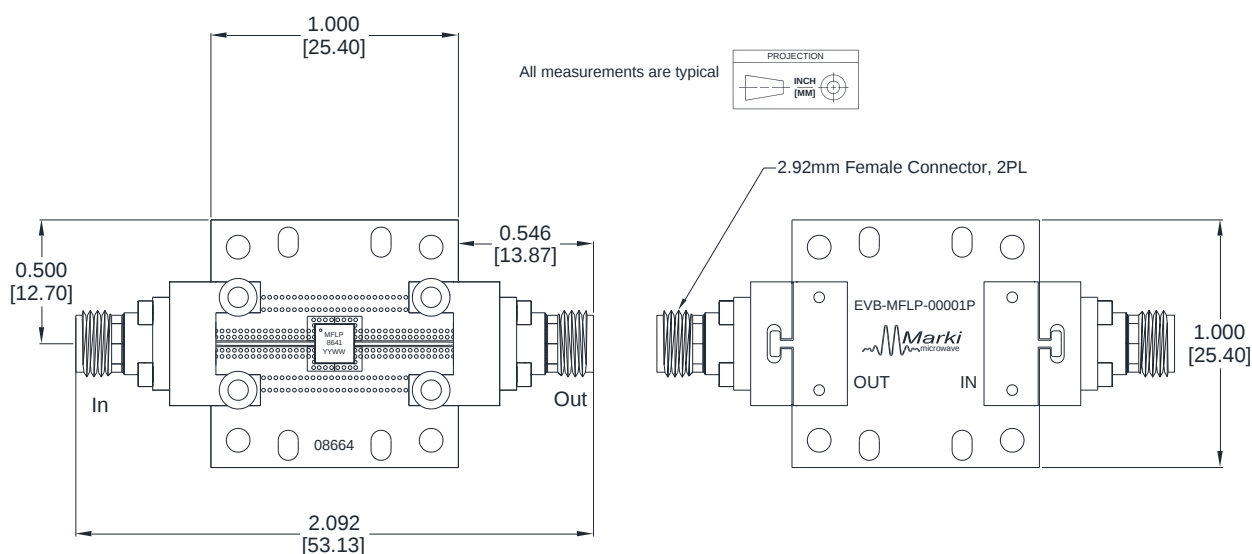
QFN-Package Surface-Mount Landing Pattern

[Click here for a DXF of the above layouts.](#)

[Click here for leaded solder reflow.](#) [Click here for lead-free solder reflow](#)

4.3 EVB Package Outline

EVB-MFLP-00001P – EVB-MFLP-0005P



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