

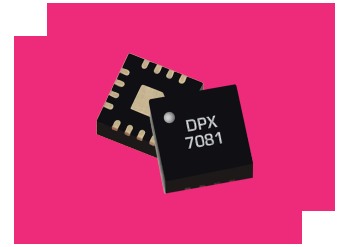
MDPXN-0407PSM01

Passive MMIC 0 - 26.5 GHz Diplexer/Reflectionless Filter

DEVICE OVERVIEW

General Description

The MDPXN-0407PSM01 is a MMIC surface mount diplexer capable of multiplexing low frequency DC to 4 GHz and high frequency 7 to 26.5 GHz signals. 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 MDPXN-0407PSM01 is available as a 3x3mm QFN. Low unit to unit variation allows for accurate simulations using the provided S3P file taken from measured production units.



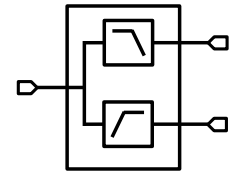
Features

- Excellent Return Loss
- 5.5 GHz Crossover Point
- High Stop Band Suppression
- Reflectionless Filter

Applications

- Satellite Communications
- Reflectionless Filter Applications
- Electronic Warfare

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MDPXN-0407PSM01	Passive MMIC 0 - 26.5 GHz Diplexer/Reflectionless Filter	QFN	RoHS REACH	Released	EAR99

MDPXN-0407PSM01

Passive MMIC 0 - 26.5 GHz

Diplexer/Reflectionless Filter

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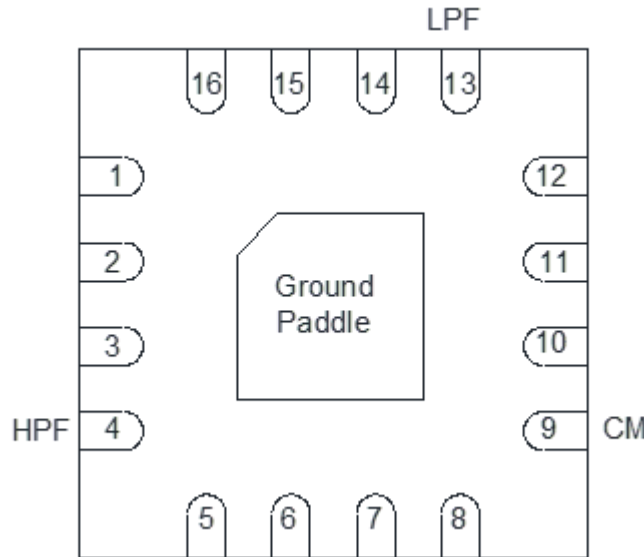
Revision History

Revision Code	Revision Date	Comment
PRE	2023-12-04	Datasheet Pre-Release

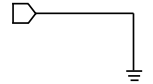

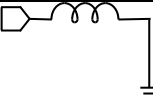
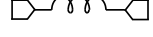
Port Configuration and Functions

Port Diagram

A top-down x-ray view of the MDPXN-0407PSM01 package outline drawing is shown below. Input to the diplexer is on Pin 9, Pin 4 will be the output after passing through the HPF and Pin 13 will be the output after passing through the LPF.



Port Functions

Port	Function	Description	Equivalent Circuit for Package
Pad	Ground	PSM package ground path is provided through the substrate and ground bond pads.	
Pin 13	Low Pass Filter	Pin 13 is DC short to Pin 9 and open to GND and Pin 4.	
Pin 4	High Pass Filter	Pin 4 is DC short to GND and open to the other ports.	
Pin 9	Common/Input	Pin 9 is DC short to Pin 13 and open to GND and Pin 4.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. All Absolute Maximum Ratings are individual and should not be met in parallel. 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	100	°C
Minimum Operating Temperature	-65	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	30	dBm

Package Information

Parameter	Details	Rating
ESD	< 50 Volts	HBM 0Z
Dimensions	-	3 x 3 mm
Moisture Sensitivity Level	-	MSL 1

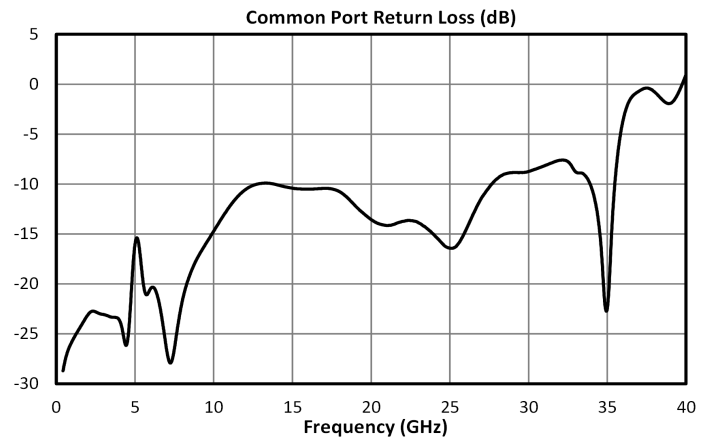
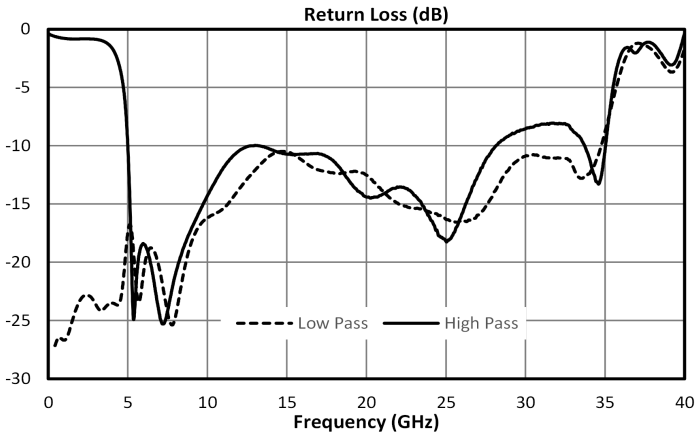
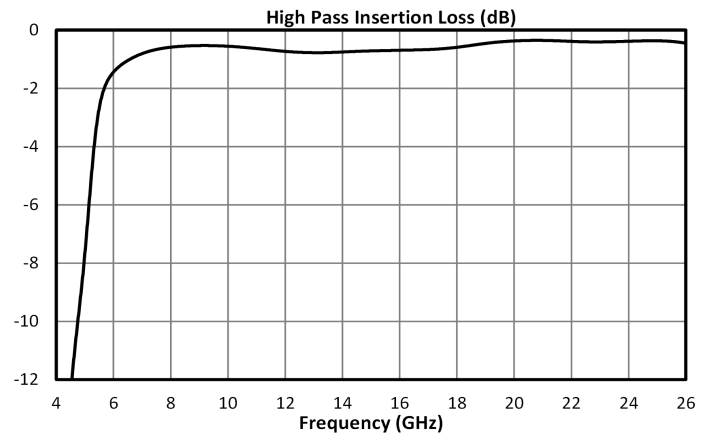
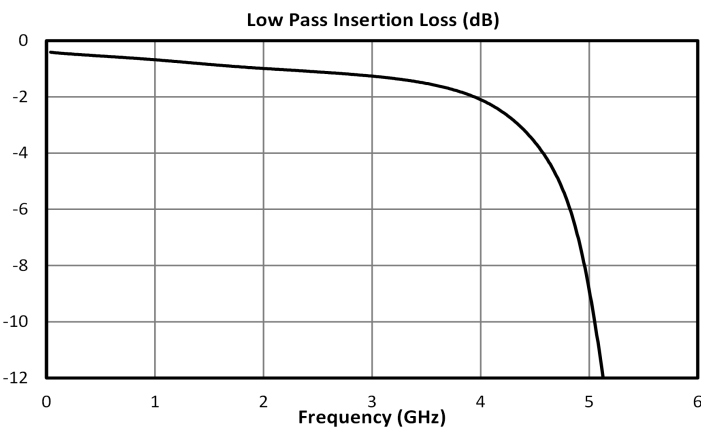
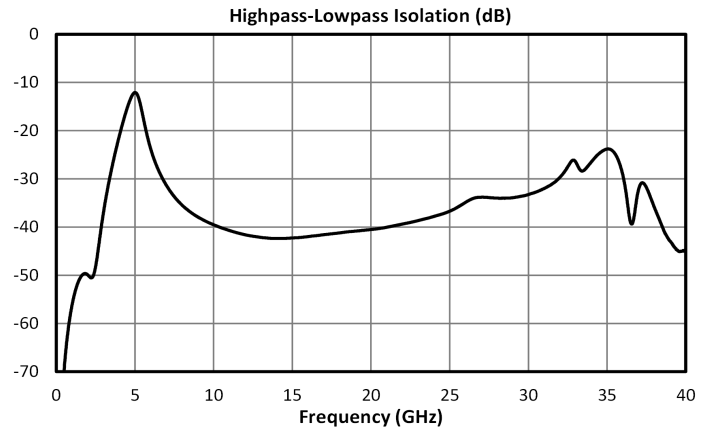
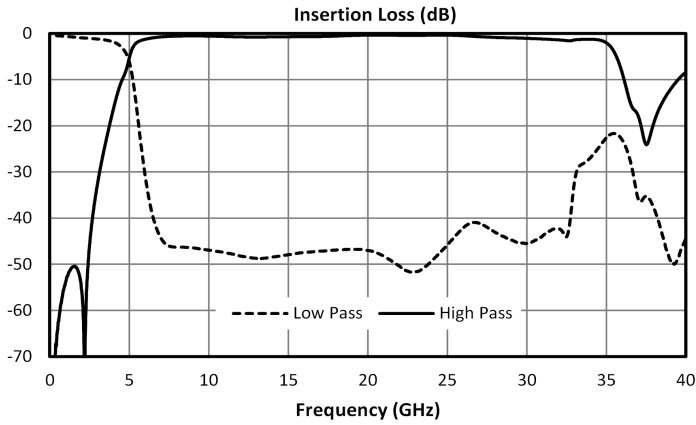
Electrical Specifications

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 9 . Min and Max limits are guaranteed between TA=-50°C and TA=+100°C.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
30 dBc Low Pass Rejection Point	DC to 3	0	3	-	53	-	dB
Common Port Return Loss	7 to 26.5 GHz	7	26	9	14	-	dB
Common Port Return Loss	DC to 4 GHz	0	4	-	23	-	dB
High Frequency Passband	-	-	-	7	-	26.5	GHz
High Pass Filter, Pass Band Insertion Loss	7 to 26.5 GHz	7	26.5	-	0.9	4.2	dB
High Pass Filter, Pass Band Return Loss	7 to 26.5 GHz	7	26.5	-	14	-	dB
Impedance	-	-	-	-	50	-	Ω
Isolation	3 to 4 GHz	3	4	-	20	-	dB
Isolation	4 to 7 GHz	4	7	10	-	-	dB
Isolation	7 to 26.5 GHz	7	26.5	-	38	-	dB
Isolation	DC to 3 GHz	0	3	-	38	-	dB
Low Frequency Passband	-	-	-	0	-	4	GHz
Low Pass Filter, Pass Band Insertion Loss	DC to 4 GHz	0	4	-	0.9	3.9	dB
Low Pass Filter, Pass Band Return Loss	DC to 4 GHz	0	4	-	24	-	dB
Low Pass Filter, Stop Band Rejection	7 to 26.5	7	26.5	-	42	-	dB

Typical Performance Plots

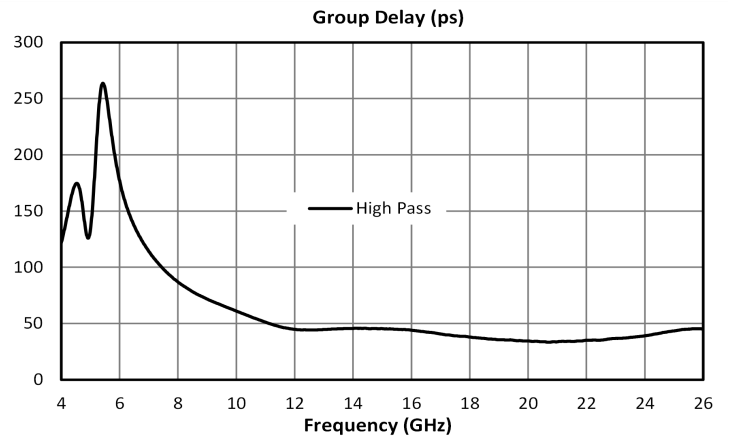
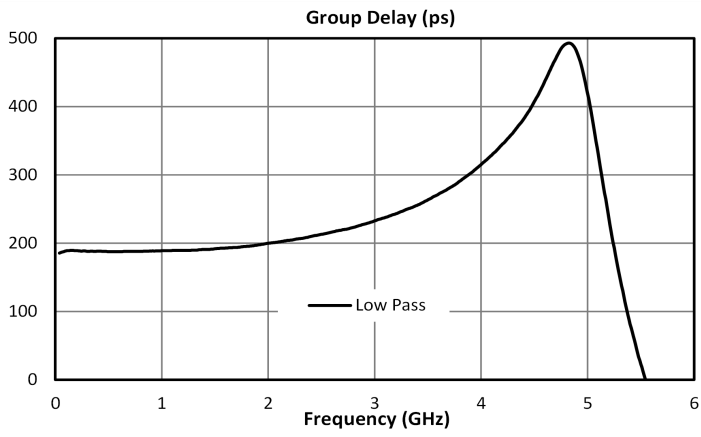
Typical performance plots are evaluation board measurements with fixturing to the device pads de-embedded.



MDPXN-0407PSM01

Passive MMIC 0 - 26.5 GHz

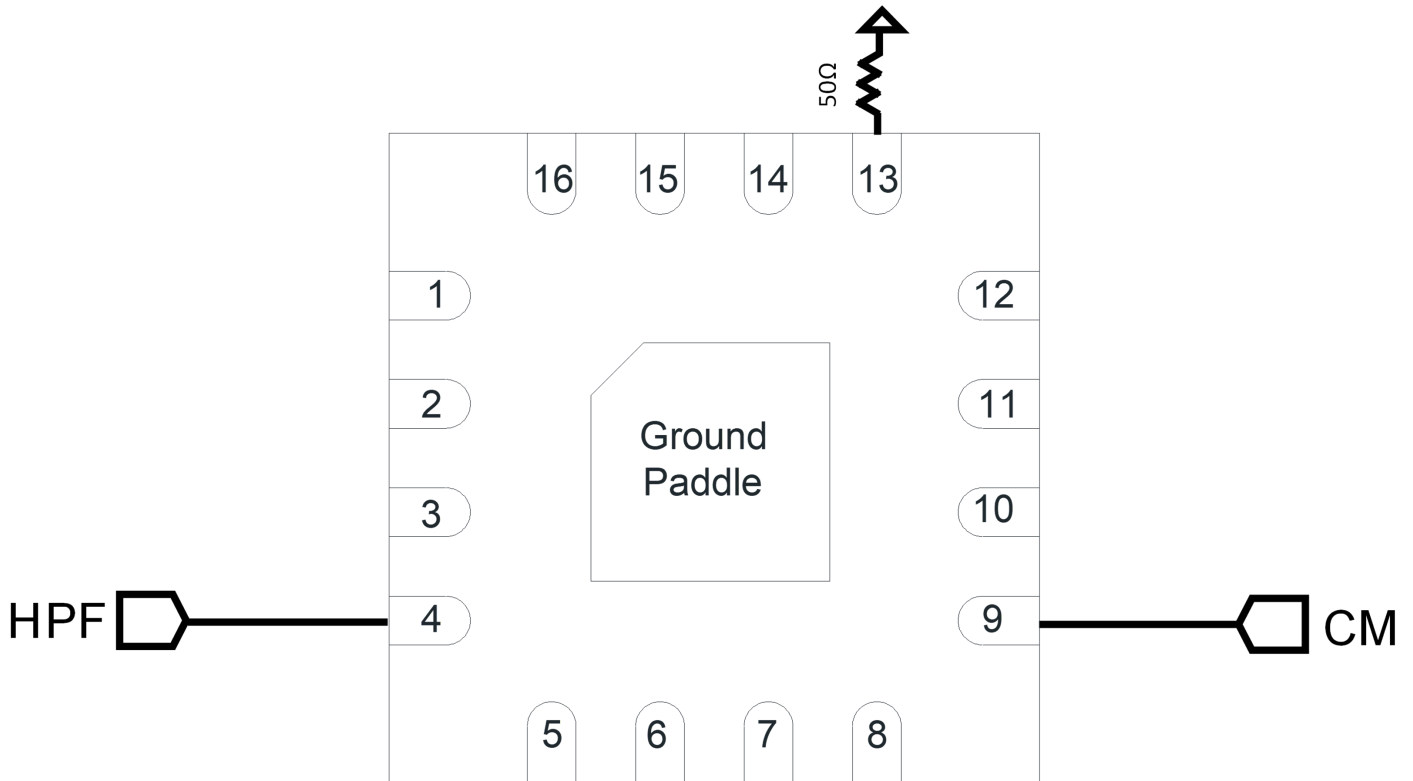
Diplexer/Reflectionless Filter



Application Circuit Description

Example Reflectionless Filter

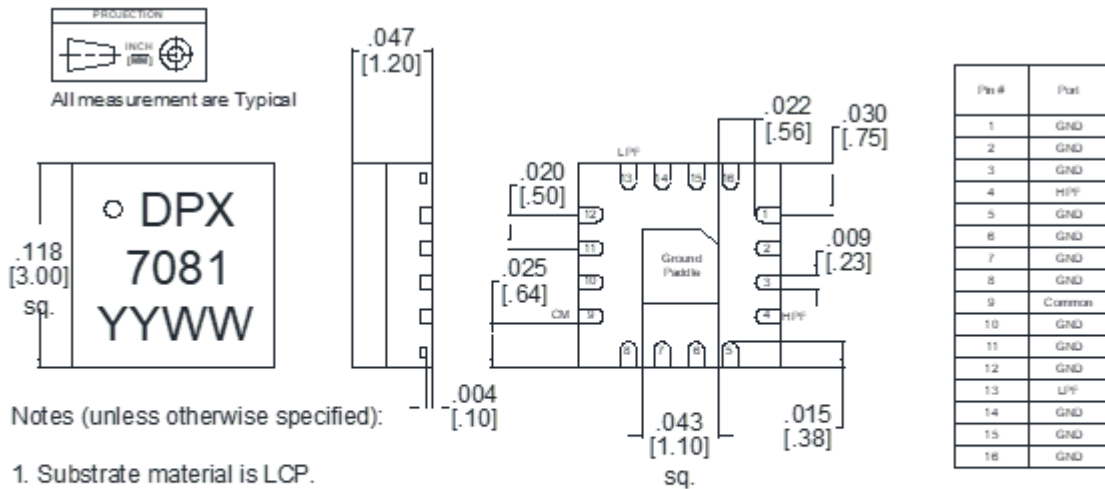
A top-down view of the MDPXN-0407PSM01's PSM package outline drawing is shown below as a high pass reflectionless filter. A low pass reflectionless filter can be achieved by terminating Pin 4 and taking the output at Pin 13 instead.



Mechanical Data

Outline Drawing

Download : [Outline 2D Drawing](#) | [Outline 3D Drawing](#) | [Outline 3D STP](#)



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.

MDPXN-0407PSM01

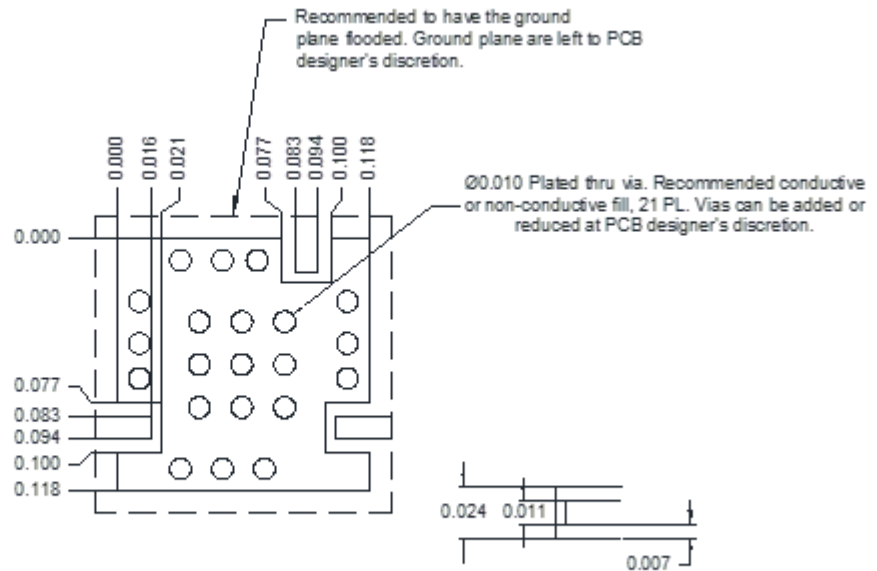
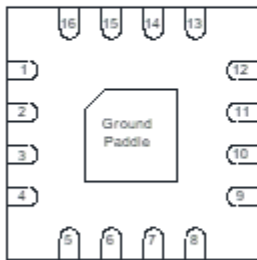
Passive MMIC 0 - 26.5 GHz

Diplexer/Reflectionless Filter

Footprint Image

Download : [Footprint Drawing](#)

QFN 3mm Sample Drawing
X-Ray view



Material Rogers 4003 008" $\frac{1}{2}$ Oz Cu.

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