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

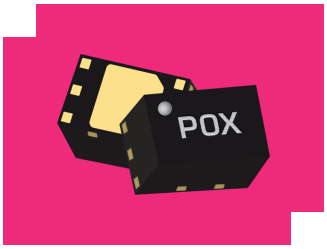
MPD2-00001PSM

0.4 - 4 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter

DEVICE OVERVIEW

General Description

The MPD2-00001PSM is a small footprint MMIC 0.4-4 GHz 2-Way Wilkinson power divider/power splitter featuring high 16 dB isolation and low 0.9 dB insertion loss in our compact DFN package. It is much smaller than a printed PCB Wilkinson Power Divider/Combiner. It can be used as an equal amplitude/phase power splitter or a power combiner with excellent isolation. Tight fabrication tolerances result in less unit-to-unit variation than traditional power divider technologies, allowing for accurate simulations using the provided S3P file taken from measured production units. The 1.3 x 2mm DFN package enables extreme miniaturization of SMT footprint making the MPD2-00001PSM ideal for applications prioritizing low SWaP.



Download s-parameters here

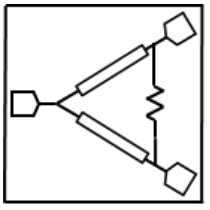
Features

- 2-way splitter or combiner in a compact 2.5mm package
- Low 0.9 dB insertion loss
- High 16 dB isolation
- Excellent equal 0.02 dB amplitude and 0.8° phase balance
- RoHS compliant
- Miniature 1.3 x 2mm DFN package

Applications

- Test Equipment
- Electronic Warfare
- Radar and satellite communications
- High Channel Count Systems

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MPD2-00001PSM	0.4 - 4 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter	DFN	REACH RoHS	Released	EAR99
EVB-MPD2-00001P	Evaluation Board, 0.4 - 4 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter	EVB	RoHS	Released	EAR99

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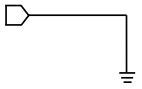
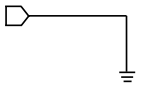
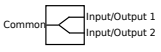
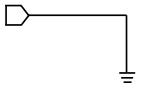
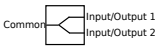
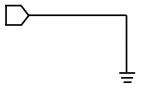
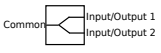
Revision History

Revision Code	Revision Date	Comment
-	2024-06-10	Datasheet Initial Release
A	2024-12-16	Power Handling Added
B	2025-12-17	Power Handling Updated

Port Configuration and Functions

Port Functions

Port	Function	Description	DC Equivalent Circuit
Ground Paddle	Gnd	Ground paddle should be connected to RF ground	
Pin 1	Non-connect (NC)	Pin 1 is not connected internally and should be tied to RF ground.	
Pin 2	Common	Pin 2 is the common input/output port. It is DC short to the other two ports and open to ground.	
Pin 3	Non-connect (NC)	Pin 3 is not connected internally and should be tied to RF ground.	
Pin 4	Input/Output 1	Pin 4 is an input/output port. It is DC short to the other two ports and open to ground.	
Pin 5	Non-connect (NC)	Pin 5 is not connected internally and should be tied to RF ground.	
Pin 6	Input/Output 2	Pin 6 is an input/output port. It is DC short to the other two ports and open to ground.	

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
DC Current	40	mA
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
RF Power Handling as a Power Combiner	1.5	W
RF Power Handling as a Power Divider	20	W

Power handling as a combiner was tested under incoherent signal condition. Under coherent signal condition, power handling at each input can be up to 10W.

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	2.0 x 1.3 mm
Moisture Sensitivity Level	-	MSL 1

Electrical Specifications

The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Amplitude Balance	-	0	4	-	0.02	-	dB
Common Return Loss	-	0	4	-	21	-	dB
Excess Insertion Loss [1]	-	0	4	-	0.9	-	dB
Impedance	-	0	4	-	50	-	Ω
Isolation	-	0.4	4	-	16	-	dB
Nominal Phase Shift	-	0	4	-	0	-	°
Nominal Power Splitting (dB)	-	0	4	-	3	-	dB
Output Return Loss	-	0	4	-	18	-	dB
Phase Balance	-	0	4	-	0.8	-	°

[1] Excess Insertion Loss is loss in addition to power splitting loss, calculated as (Common Port to Output Port Insertion Loss) – (Power splitting loss of 3 dB)

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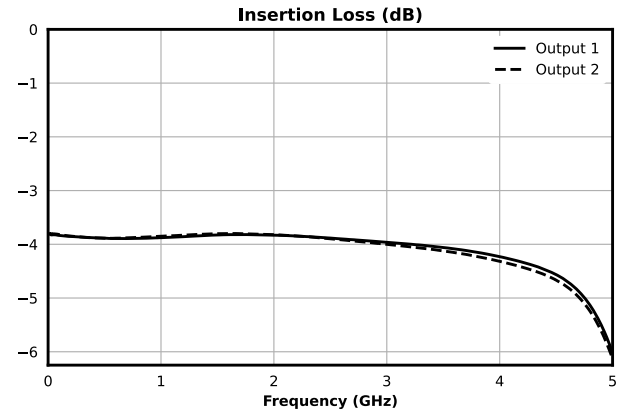
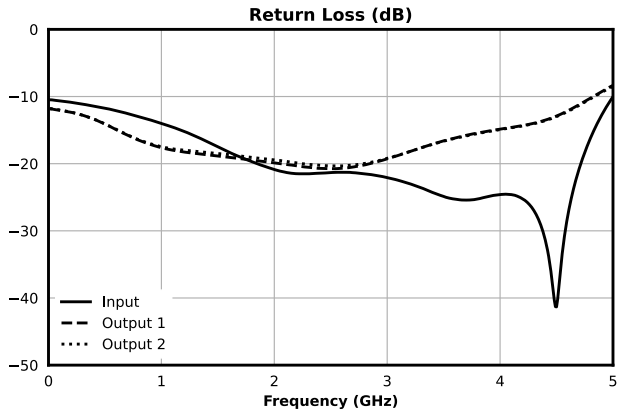
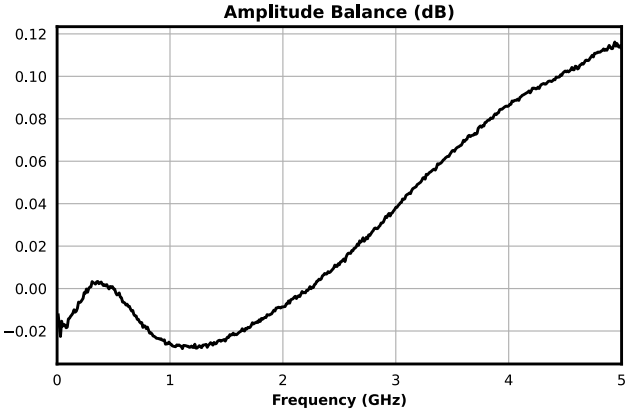
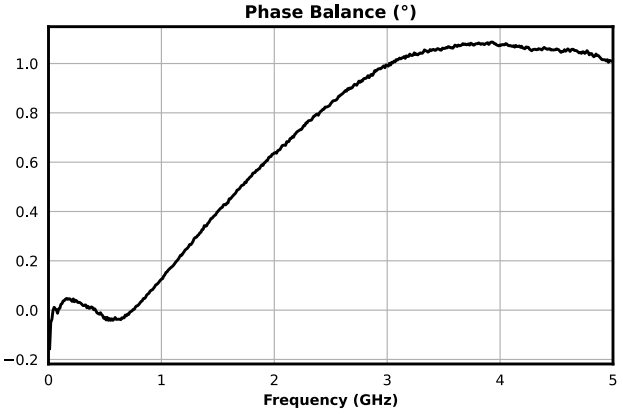
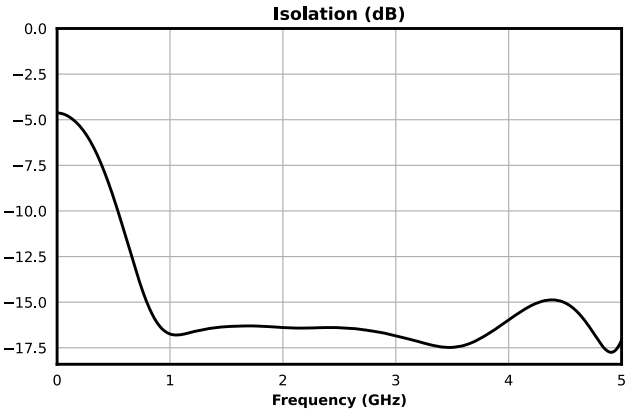
Typical Performance Plots











Measured data is de-embedded from fixture using AFR.

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0.4 - 4 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter

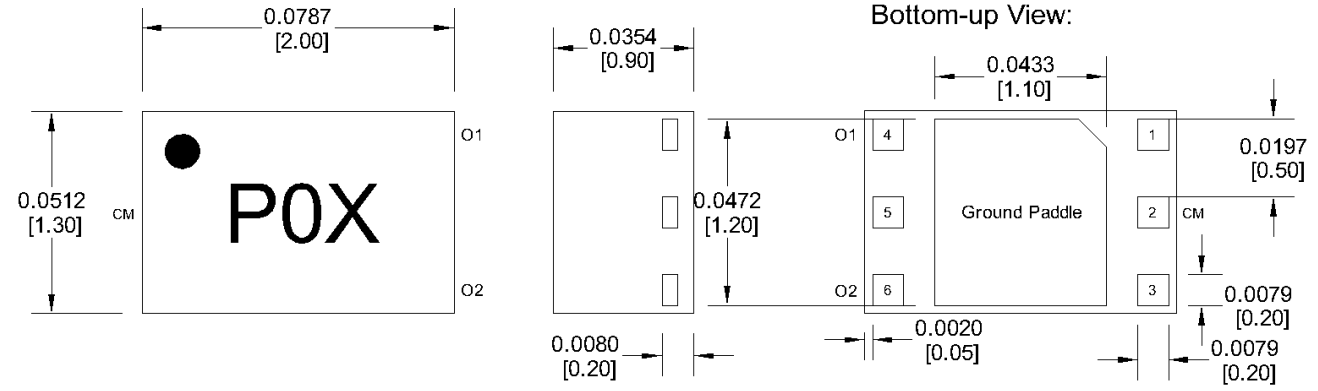
Mechanical Data

Outline Drawing

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

PROJECTION	REVISIONS			
INCH [MM]	REV.	DESCRIPTION	DATE	APPROVALS
	A	Initial Release	10/14/24	AT

All dimensions are typical



Pin #	Port
1	GND
2	CM
3	GND
4	O1
5	GND
6	O2

Notes (unless otherwise specified):

1. Substrate material is LCP.
2. I/O Leads and Die Paddle are 0.05 micron Au over 0.02 microns Pd over 0.5 microns Ni.
3. All unconnected pins should be connected to PCB RF ground.

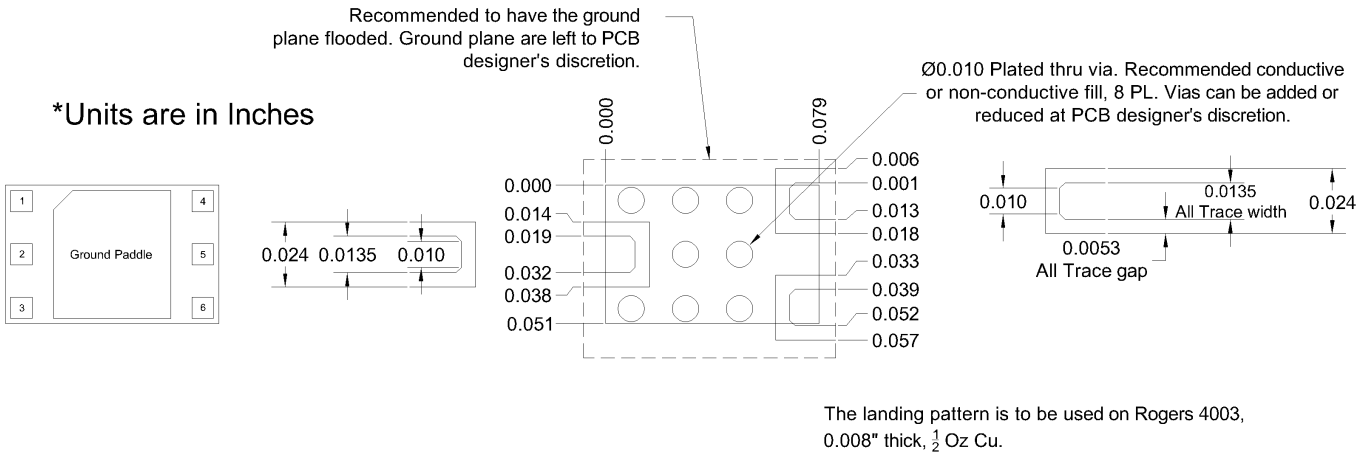
MATERIAL:	NOTES:	Marki microwave www.markimicrowave.com	
FINISH:	DRAWN BY: AR	DATE: 1/25/24	Outline 1.3mm by 2mm DFN PD
DO NOT SCALE DRAWING		SIZE: A	CAGE CODE: 0UC32
		SCALE: 1/30	DWG. NO.: MPD2-00001PSM
			SHEET 1 OF 1

MPD2-00001PSM

0.4 - 4 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter

Footprint Image

Download : Footprint Drawing



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

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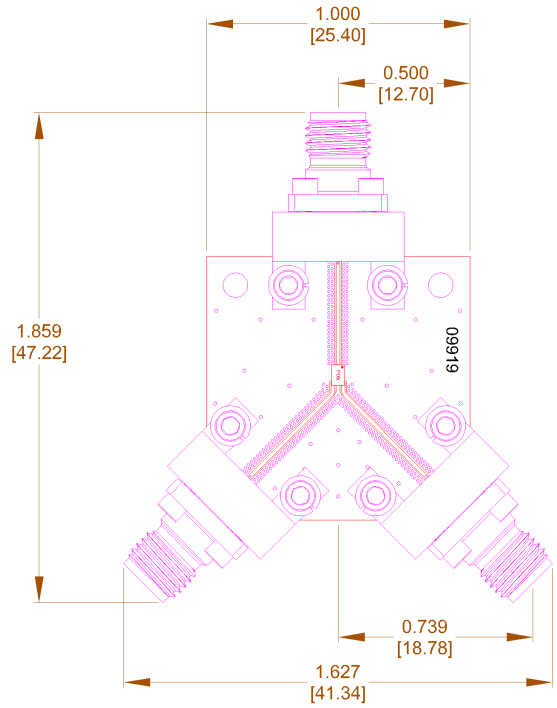
Evaluation Board - Outline Drawing

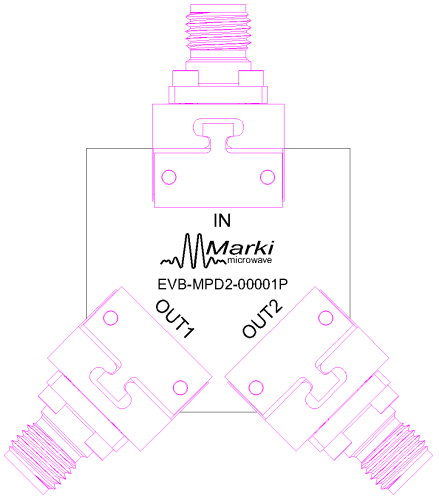
*All dimensions are typical

PROJECTION: INCH [MM]

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVALS
1	As Drawn	5/20/24	AR



Bottom-up view:



Port	Connector Type
1, 2, 3	2.92mm Female
Note: Connectors are not removeable.	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: HOLE SIZE .002/-.001 DECIMALS .XX± .02 .XXX± .010 ANGLES ± 63

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

NOTES:

DRAWN BY	DATE
AR	12/14/23

Marki microwave www.markimicrowave.com

Outline
DFN Power Divider Eval Board

SIZE	CAGE CODE	DWG. NO.
A	0UC32	EVB-MPD2-00001P

SHEET 1 OF 1

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