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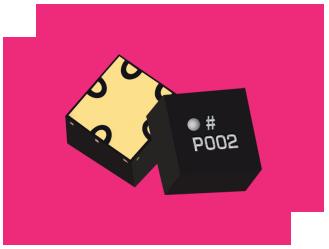
MPDW-0670CSP2

6 - 70 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter, Side Ports

DEVICE OVERVIEW

General Description

The MPDW-0670CSP2 is a small footprint MMIC 6-70 GHz 2-Way power divider/power splitter featuring high 24 dB isolation and low 1 dB insertion loss in our compact CSP2 chip scale 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 MPDW-0670CSP2 features side port outputs. The 2.5 mm CSP2 package enables extreme miniaturization of SMT footprint making the MPDW-0670CSP2 ideal for applications prioritizing low SWaP.



Download s-parameters here

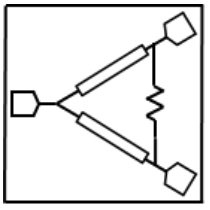
Features

- 2-way splitter or combiner in a compact 2.5mm package
- Side ports
- Low 1 dB insertion loss
- High 24 dB isolation
- Excellent 0.1 dB amplitude and 1° phase balance
- This product embodies Marki Microwave's U.S. Pat. 11,869,858

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
MPDW-0670CSP2	6 - 70 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter, Side Ports	CSP2	REACH RoHS	Released	EAR99
EVB-MPDW-0670	Evaluation Board, 6 - 70 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter, Side Ports	EVB	RoHS	Released	EAR99

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Table Of Contents

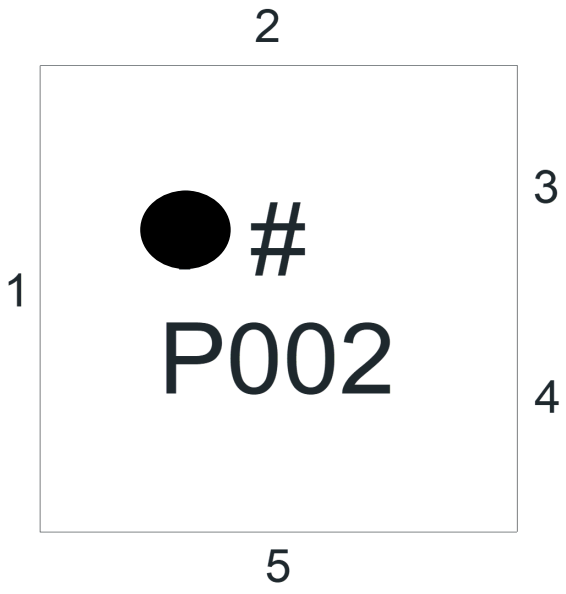
Revision History

Revision Code	Revision Date	Comment
-	2024-02-14	Datasheet Initial Release
A	2025-04-28	Updated Moisture Sensitivity from MSL3 to MSL1
B	2025-12-17	Power Handling Updated

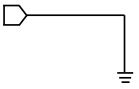
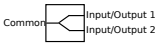
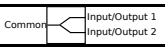
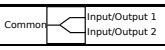
Port Configuration and Functions

Port Diagram

A top-down view of the MPDW-0670CSP2 package outline drawing is shown below. The MMIC Power dividers are passive reciprocal devices allowing either power splitting or power combining.



Port Functions

Port	Function	Description	DC Equivalent Circuit
Paddle	Ground	Ground paddle should be connected to RF ground	
Pin 1	Common	Pin 1 is the common input/output port. It is DC short to the other two ports and open to ground.	
Pin 2	Input/Output 1	Pin 2 is an 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	Non-connect (NC)	Pin 4 is not connected internally and should be tied to RF ground	-
Pin 5	Input/Output 2	Pin 5 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
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 Divider	10	W

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	2.50 x 2.50 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	-	50	70	-	0.5	2	dB
Amplitude Balance	-	6	50	-	0.1	0.8	dB
Excess Insertion Loss [1]	-	6	65	-	1	4	dB
Excess Insertion Loss [2]	-	65	70	-	3	8	dB
Impedance	-	6	70	-	50	-	Ω
Isolation	-	10	50	15	24	-	dB
Isolation	-	50	70	10	20	-	dB
Nominal Phase Shift	-	6	70	-	0	-	°
Nominal Power Splitting	-	6	70	-	3	-	dB
Phase Balance	-	40	-	-	2	8	°
Phase Balance	-	6	40	-	1	5	°
Return Loss	-	6	40	10	17	-	dB
Return Loss	-	40	70	4	14	-	dB

[1][2] Excess Insertion Loss = (Input Port to Common Port Insertion Loss) - 3dB

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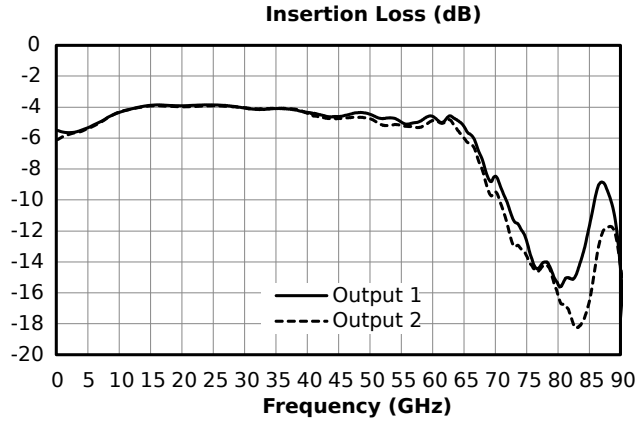
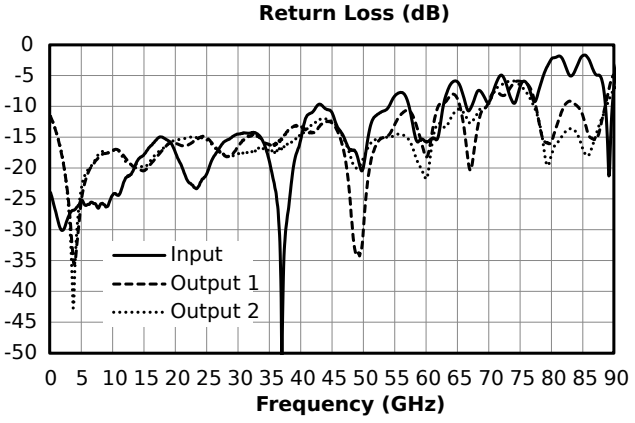
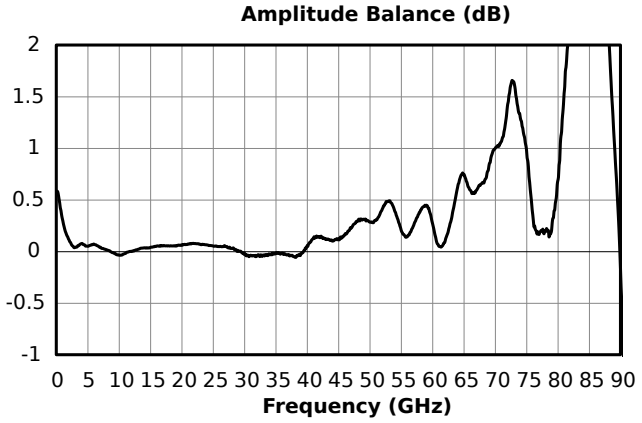
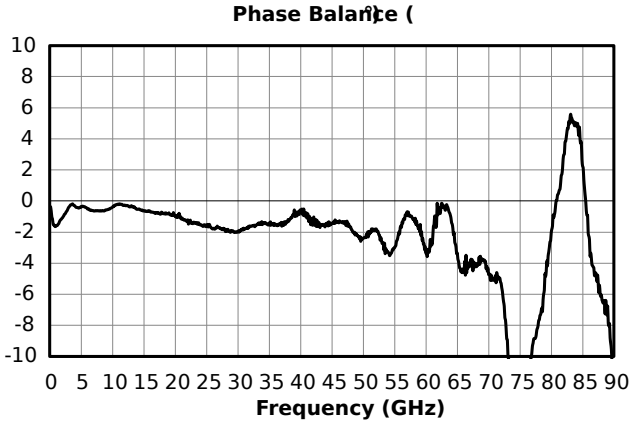
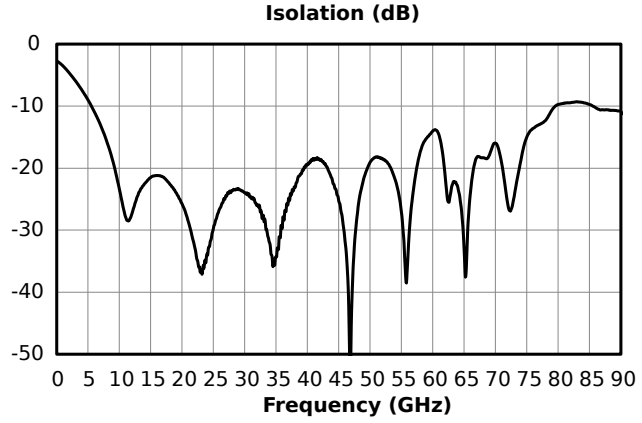
Typical Performance Plots











Measured data is de-embedded from fixture using AFR.

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6 - 70 GHz MMIC 2-Way Wilkinson Power Divider/Power Splitter, Side Ports

Mechanical Data

Outline Drawing

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

Units in inch +/-.004" [millimeter +/-0.1]

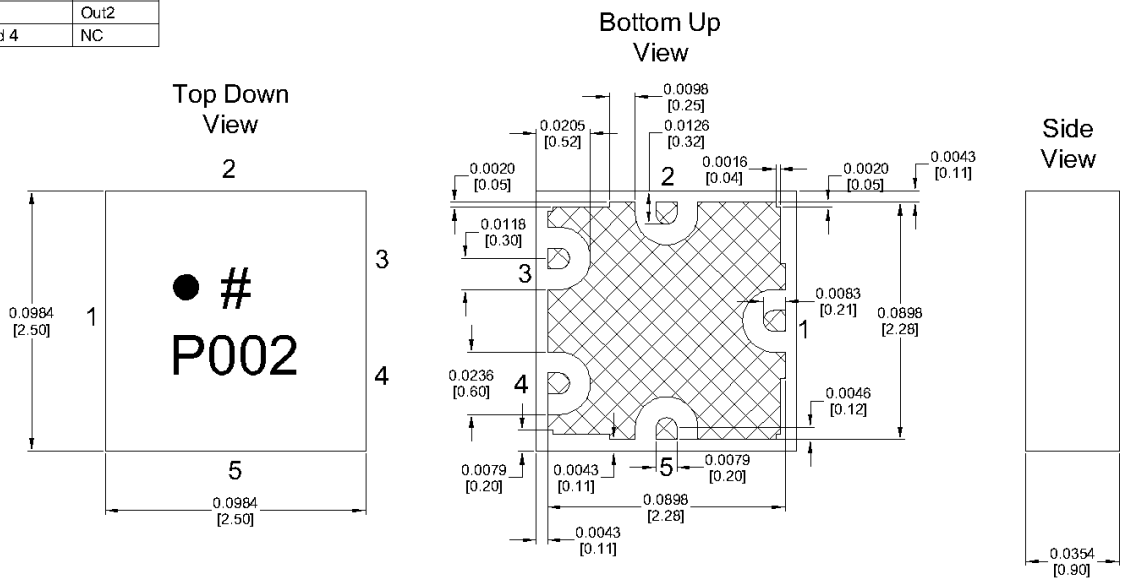
Port Number	Function
1	In
2	Out1
5	Out2
3 and 4	NC

PROJECTION INCH [MM]

REVISIONS

REV.	DESCRIPTION	DATE	APPROVALS
A	Initial Release	6/24/24	AR

*All measurements are typical



Notes: (Unless otherwise specified)

1. Front to back registration to be 50.8µm max.
2. Circuits to be shipped individually.
3. Shaded areas are metalized.
4. Finish: Ni: 0.5 - 2.0 µm
   Pd: 0.08 - 0.15 µm
   Au: 0.008 - 0.05 µm

NOTES:

DRAWN BY	DATE
AR	11/2/23
MB	11/9/23

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

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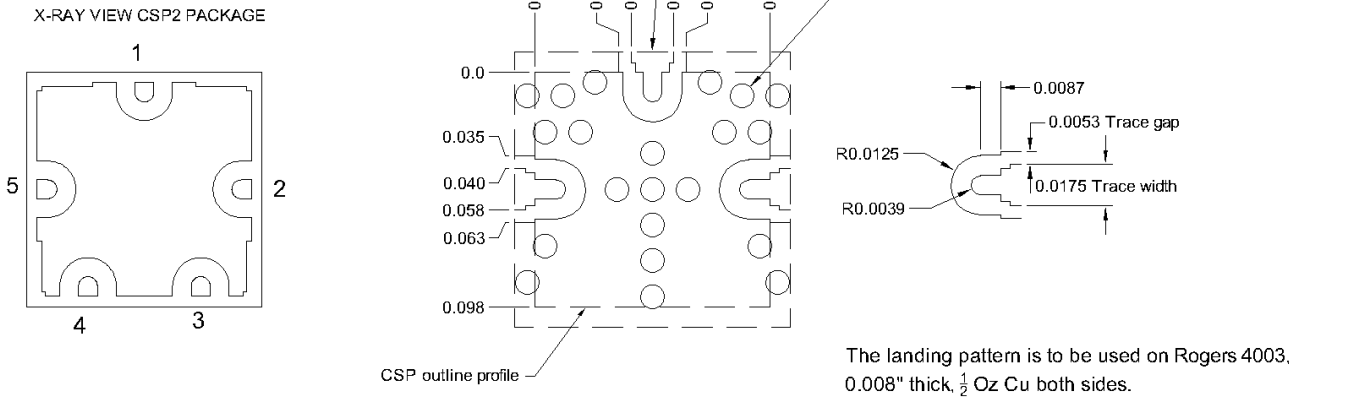
Outline
Hot Via MMIC Wilkinson PD

SIZE A | CAGE CODE 0UC32 | DWG. NO. MPDW-0670CSP2 | SHEET 1 OF 1

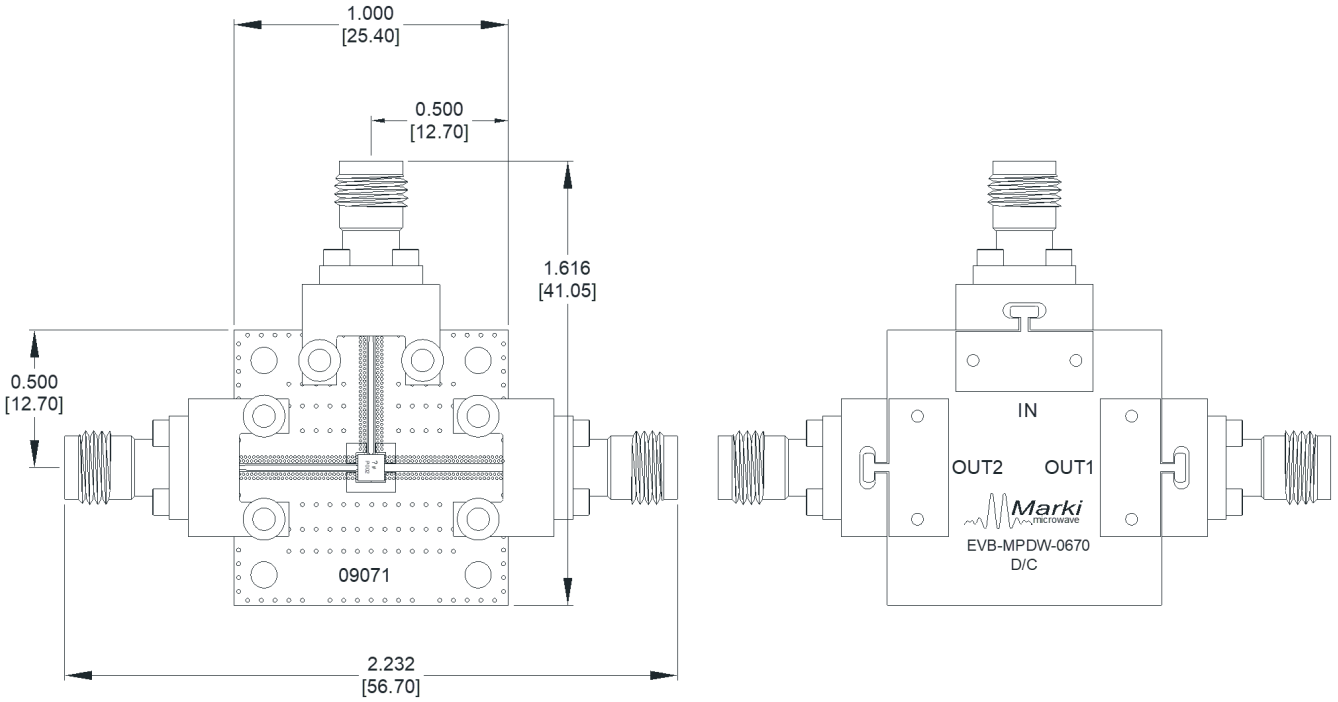
Footprint Image

Download : Footprint Drawing



Evaluation Board - Outline Drawing

*All dimensions are typical



Port	Connector Type
1, 2, 3	1.85mm Female
Note: Connectors are not removeable.	

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