

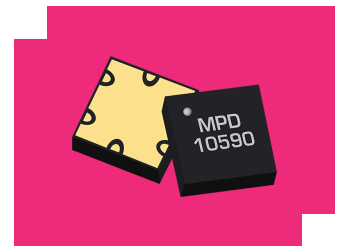
MPBR-0122CSP3

1 - 22 GHz MMIC 2-Way High Isolation Power Divider/Power Splitter

DEVICE OVERVIEW

General Description

The MPBR-0122CSP3 is a small footprint MMIC 1-22 GHz 2-Way high isolation power divider/power splitter featuring high 31 dB isolation and low 2 dB insertion loss in our compact CSP3 chip scale package. It is much smaller than a printed PCB Power Divider/Combiner. It can be used as an equal amplitude/phase power splitter or a power combiner with higher isolation compared to standard Wilkinson power dividers, making it ideal for applications that demand the highest 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 3.5 mm CSP3 package enables extreme miniaturization of SMT footprint making the MPBR-0122CSP3 ideal for applications prioritizing low SWaP. If higher isolation is required, refer to our MPBR-0022CSP3.



[Download s-parameters here](#)

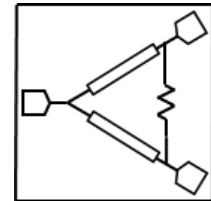
Features

- High 31 dB isolation
- 2-way splitter or combiner in a compact 3.5mm package
- Low 2 dB typical insertion loss
- Excellent 0.1 dB amplitude and 0.7° 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
MPBR-0122CSP3	1 - 22 GHz MMIC 2-Way High Isolation Power Divider/Power Splitter	CSP3	REACH RoHS	Released	EAR99
<u>EVB-MPBR-0122</u>	Evaluation Board, 1 - 22 GHz MMIC 2-Way High Isolation Power Divider/Power Splitter	EVB	RoHS REACH	Released	EAR99

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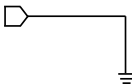



<ul style="list-style-type: none"> ■ Device Overview <ul style="list-style-type: none"> General Description Features Applications Functional Block Diagram ■ Port Configuration and Functions <ul style="list-style-type: none"> Port Functions ■ Revision History 	<ul style="list-style-type: none"> ■ Specifications <ul style="list-style-type: none"> Absolute Maximum Ratings Package Information Electrical Specifications Typical Performance Plots ■ Mechanical Data <ul style="list-style-type: none"> Outline Drawing ■ Footprint Image ■ Evaluation Board <ul style="list-style-type: none"> Evaluation Board Outline Drawing
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Revision History

Revision Code	Revision Date	Comment
-	2025-08-18	Initial Release
A	2025-08-25	Updated Max Current Rating
B	2025-12-08	Updated Max Power Handling
B	2026-01-09	Updated Max Power Handling

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	Common	Pin 1 is the common input/output pin. It is DC short to Pin 3 and Pin 4 and open to ground.	
Pin 3	Input/Output 1	Pin 3 is an input/output pin. It is DC short to the common and Pin 5 and open to ground.	
Pin 5	Input/Output 2	Pin 5 is an input/output pin. It is DC short to the common and Pin 3 and open to ground.	

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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	80	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 Divider	20	W
RF Power Handling as a Power Combiner	5	W

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	3.50 x 3.50 mm
Moisture Sensitivity Level	-	MSL 1

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Electrical Specifications

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

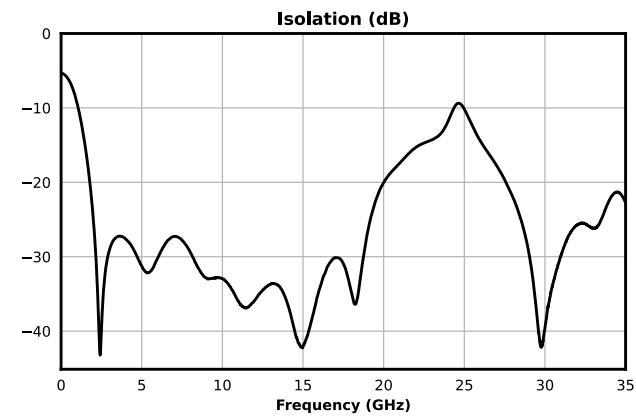
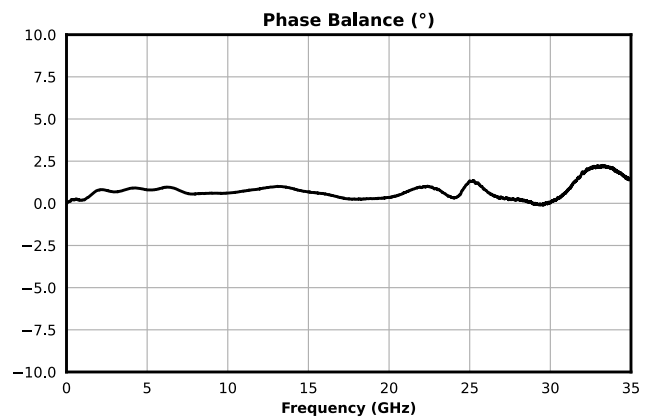
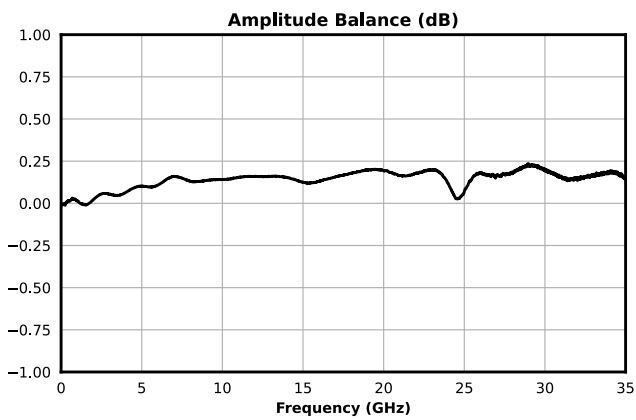
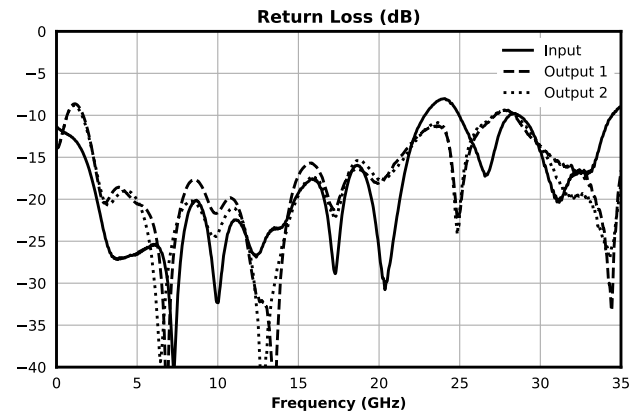
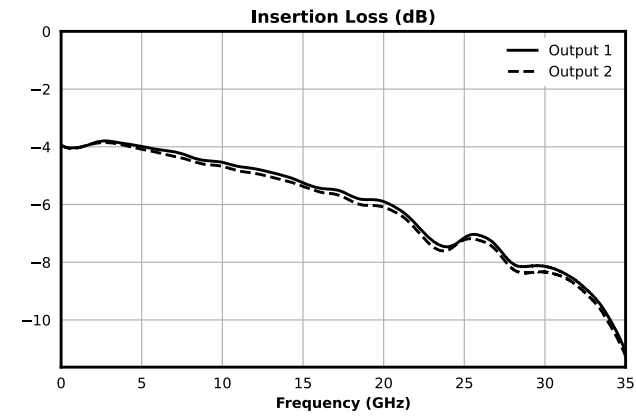
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Amplitude Balance	-	2	22	-	0.1	-	dB
Common Port Return Loss	-	2	22	-	23	-	dB
Excess Insertion Loss ¹	-	2	22	-	2	-	dB
Impedance	-	2	22	-	50	-	Ω
Isolation	-	2	22	-	31	-	dB
Nominal Phase Shift	-	2	22	-	0	-	°
Nominal Power Splitting	-	2	22	-	3	-	dB
Output Return Loss	-	2	22	-	20	-	dB
Phase Balance	-	2	22	-	0.7	-	°

^[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 automatic fixture removal (AFR).

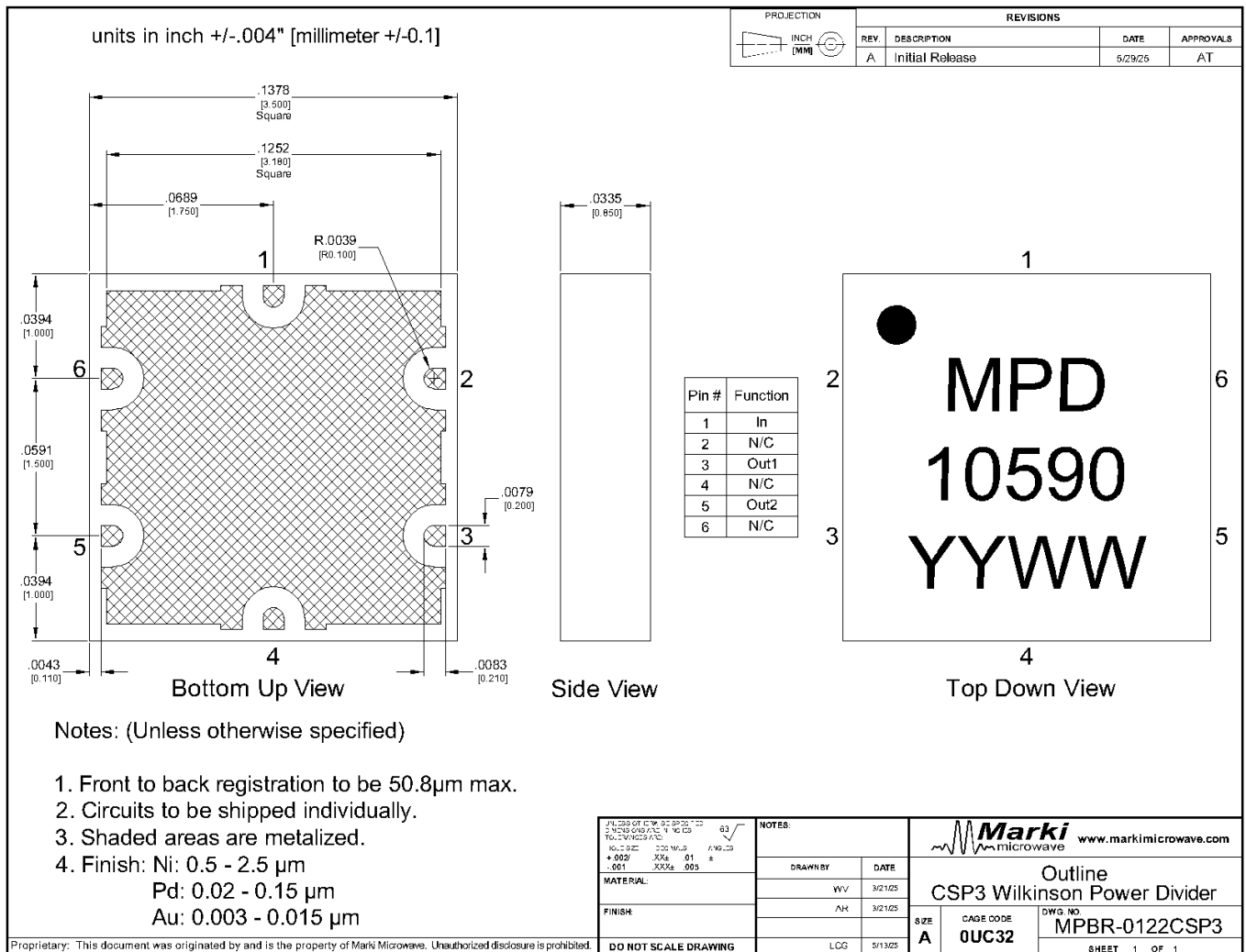
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Mechanical Data

Outline Drawing

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



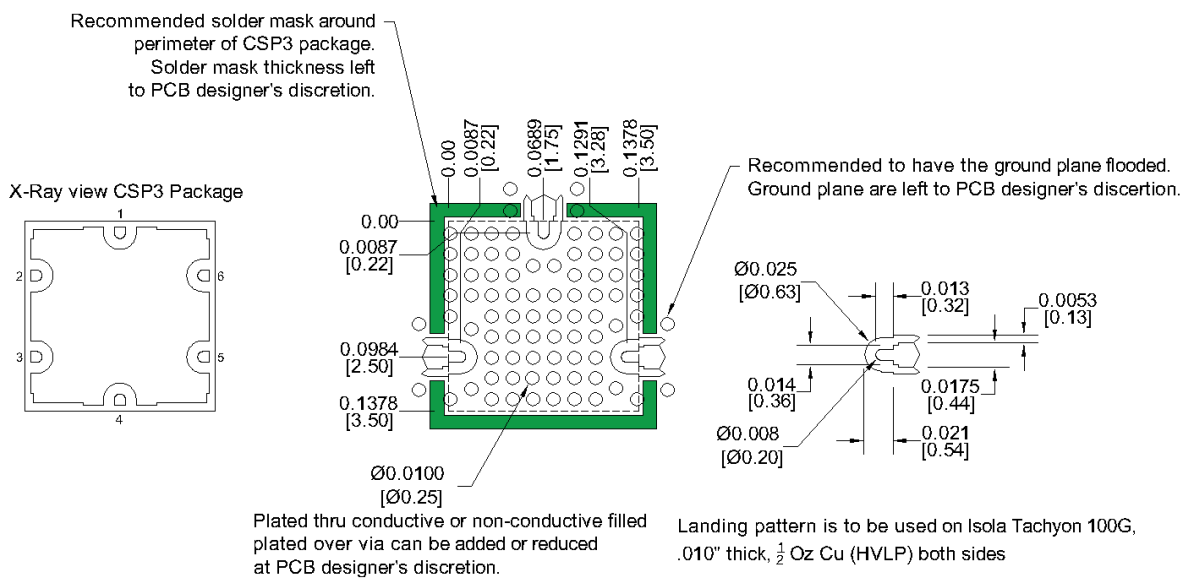
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Footprint Image

Download : [Footprint Drawing](#)

Pin #	Function
1	CM
2	N/C
3	LPF
4	N/C
5	HPF
6	N/C

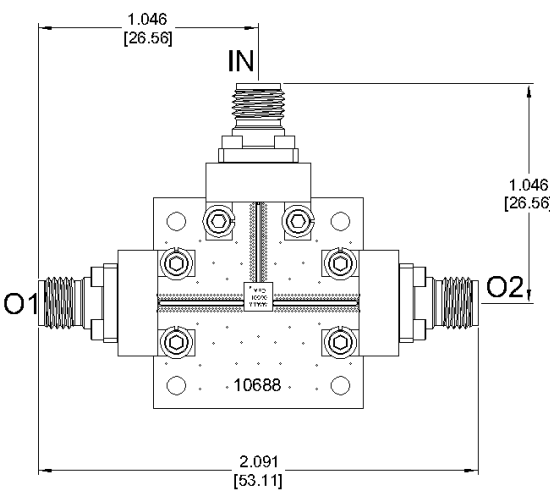


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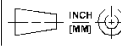
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Evaluation Board - Outline Drawing

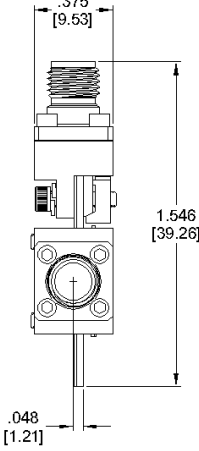
*All Dimensions are Typical

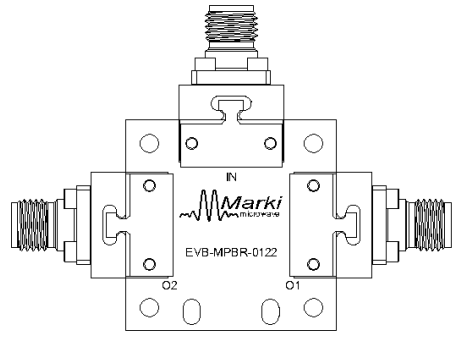


PROJECTION



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVALS
A	Initial Release	8/8/25	AT





Back Side Marking

Port	Connector Type
IN	2.92mm Female
O1	2.92mm Female
O2	2.92mm Female

Note: RoHS Compliant Assembly

JPL-228 0122CSP3 CSP3

3.14159 26.56 1.046 26.56

TOLERANCES (FRACTIONS)

FRACTIONS DECIMALS


1/16 0.0625 3/32 0.09375 1/8 0.125 3/16 0.1875 1/4 0.25 5/16 0.3125 3/8 0.375 7/16 0.4375 1/2 0.5 9/16 0.5625 5/8 0.625 11/16 0.6875 3/4 0.75 7/8 0.875 1 1.0

MATERIAL:

FINISH:

NOTES:

DRAWN BY	DATE
WV	8/5/25
AR	8/7/25
LCG	8/7/25



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Outline
CSP3 Power Divider EVB

SIZE	CAGE CODE	DWG. NO.
A	0UC32	EVB-MPBR-0122

SHEET 1 OF 1

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