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Tech Support: support@markimicrowave.com

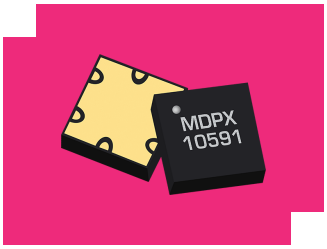
MDPX-00010CSP3

Passive MMIC 20.3 GHz Diplexer/Reflectionless Filter

DEVICE OVERVIEW

General Description

The MDPX-00010CSP3 is a MMIC surface mount balanced diplexer featuring a 20.3 GHz crossover frequency. 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 MDPX-00010CSP3 is available as a 3.5x3.5mm CSP3. Low unit to unit variation allows for accurate simulations using the provided S3P file taken from measured production units.



Download s-parameters here

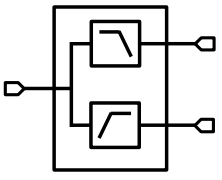
Features

- Low Insertion Loss, ≤ 1 dB Typical
- Crossover Point, 20.3 GHz
- Excellent Return Losses, 17 dB Typical
- Highpass-Lowpass Isolation, 33 dB Typical

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MDPX-00010CSP3	Passive MMIC 20.3 GHz Diplexer/Reflectionless Filter	CSP3	RoHS REACH	Released	EAR99
EVB-MDPX-00010	Evaluation Board, Passive MMIC 20.3GHz Diplexer/Reflectionless Filter	EVB	RoHS REACH	Released	EAR99

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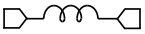
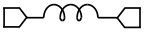
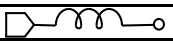
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
-	2025-10-21	Initial Release

Port Configuration and Functions

Port Functions

Port	Function	Description	DC Equivalent Circuit
Pin 1	Common/Input	Pin 1 is DC short to Pin 3 and open to GND and Pin 5.	
Pin 3	Low Pass Filter	Pin 3 is DC short to Pin 1 and open to GND and Pin 5	
Pin 5	High Pass Filter	Pin 5 is DC open to Pin 1, Pin3, and Pin 5	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
DC Current	72	mA

Package Information

Parameter	Details	Rating
ESD	< 250 Volts	HBM Class 0
Dimensions	-	3.50 x 3.50 mm
Moisture Sensitivity Level	-	MSL 1

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Electrical Specifications

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
High Pass Center Freq	Configuration A, Temp = 25°C	-	-	-	34.46	-	GHz
1 dBc High Passband	Configuration A, Temp = 25°C	22.65	-	-	-	-	GHz
3 dBc High Passband	Configuration A, Temp = 25°C	20.6	-	-	-	-	GHz
30 dBc High Pass Rejection Point	Configuration A, Temp = 25°C	18.19	18.19	-	-	-	GHz
High Pass Filter, Pass Band Insertion Loss	Configuration A, Temp = 25°C	-	-	-	1.0	-	dB
High Pass Filter, Pass Band Return Loss	Configuration A, Temp = 25°C	-	-	-	16	-	dB
High Pass Isolation	Configuration A, Temp = 25°C	-	-	-	33	-	dB
High Pass Group Delay	Configuration A, Temp = 25°C	-	-	-	73	-	ps
Low Pass Center Freq	Configuration A, Temp = 25°C	-	-	-	8.65	-	GHz
1 dBc Low Passband	Configuration A, Temp = 25°C	-	17.29	-	-	-	GHz
3 dBc Low Passband	Configuration A, Temp = 25°C	-	19.78	-	-	-	GHz
30 dBc Low Pass Rejection Point	Configuration A, Temp = 25°C	24.02	24.02	-	-	-	GHz
Low Pass Filter, Pass Band Insertion Loss	Configuration A, Temp = 25°C	-	-	-	0.5	-	dB
Low Pass Filter, Pass Band Return Loss	Configuration A, Temp = 25°C	-	-	-	23	-	dB
Low Pass Isolation	Configuration A, Temp = 25°C	-	-	-	48	-	dB
Crossover Isolation	Configuration A, Temp = 25°C	-	-	-	14	-	dB
Cross Over Frequency	Configuration A, Temp = 25°C	-	-	-	20.28	-	GHz
Common Port Return Loss	Configuration A, Temp = 25°C	-	-	-	17	-	dB
Impedance	Configuration A, Temp = 25°C	-	-	-	50	-	Ω
Low Pass Group Delay	Configuration A, Temp = 25°C	-	-	-	80	-	ps

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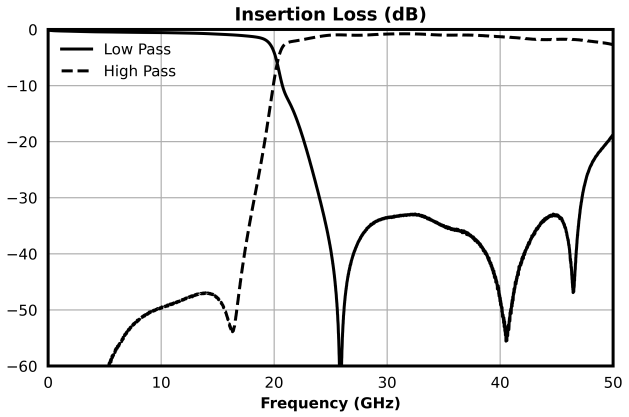
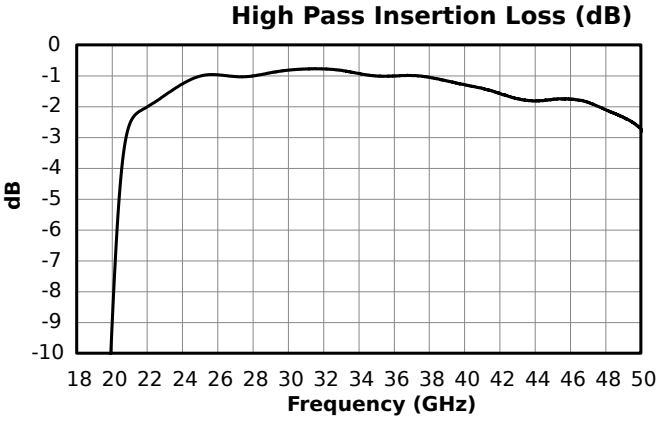
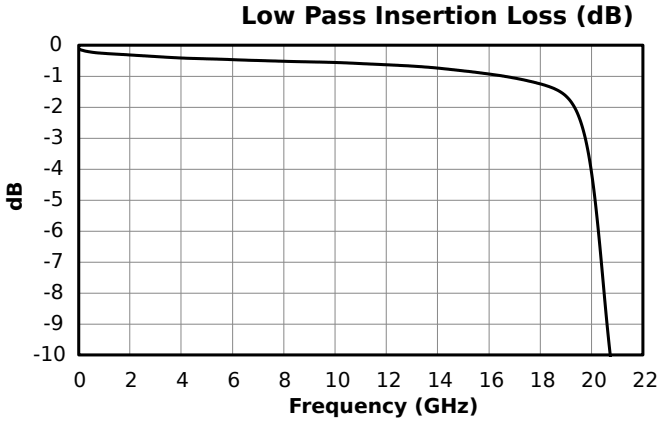
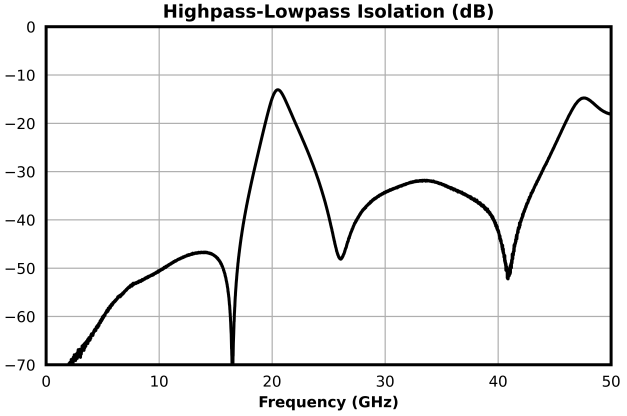
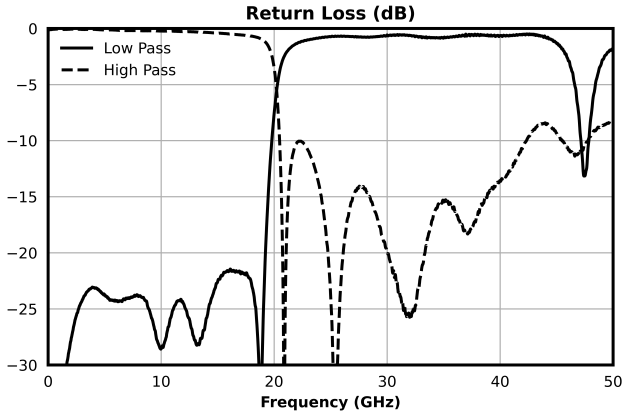
Typical Performance Plot

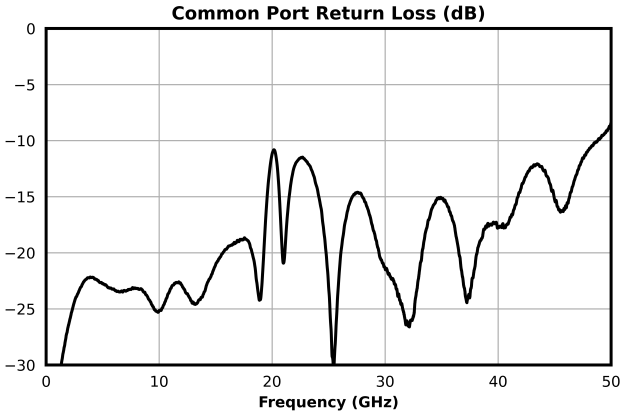


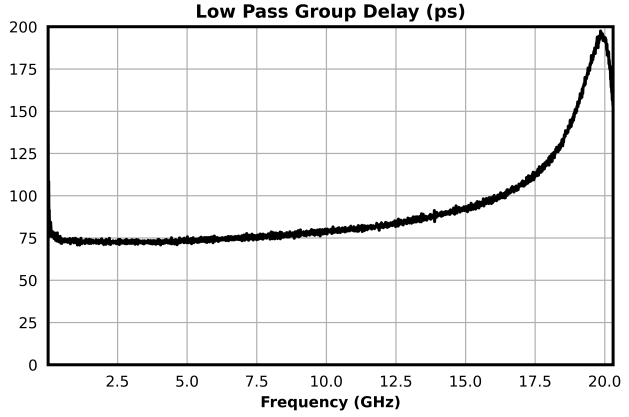


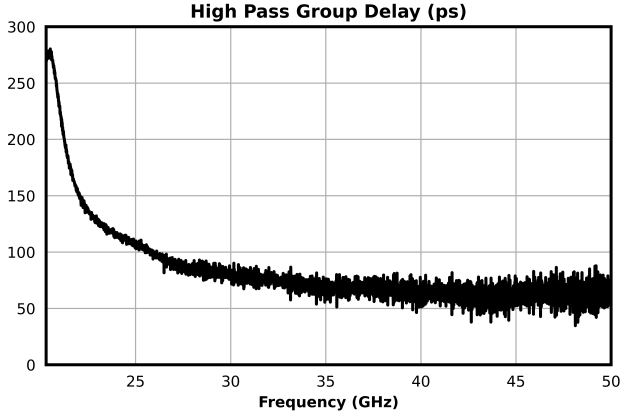






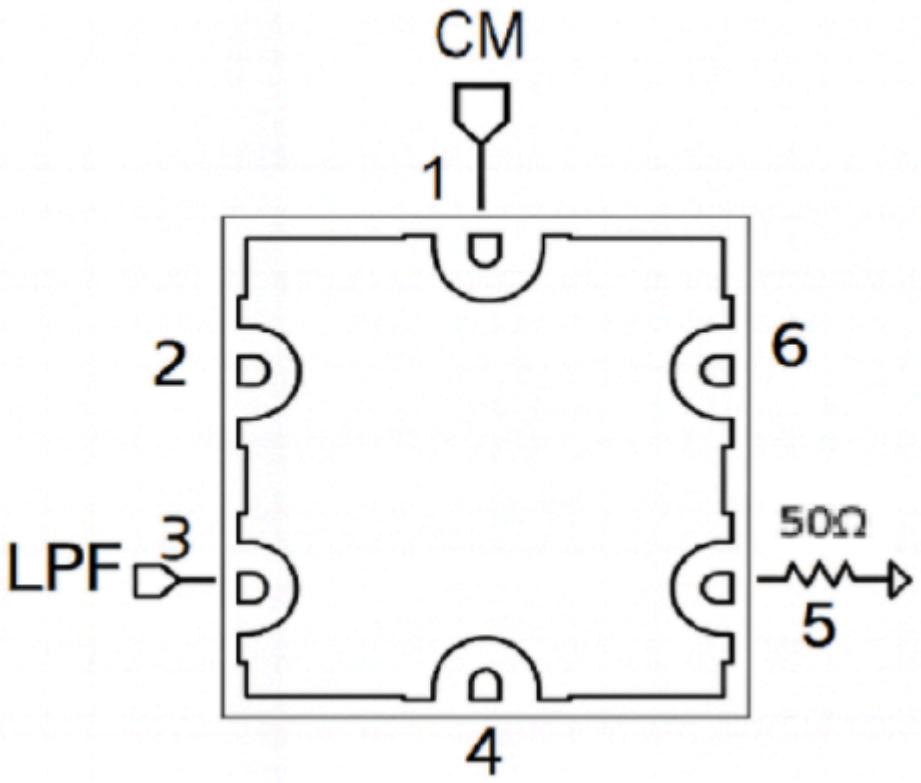






All measurements are de-embedded from the fixture with Automatic Fixture Removal (AFR).

Application Circuit



Application Circuit Description

Terminating the High-Pass port (Pin 5) with 50 Ω enables one-way reflectionless low-pass filtering from the Common port (Pin 1) to the Low-Pass port (Pin 3).

Terminating the Low-Pass port (Pin 3) with 50 Ω enables one-way reflectionless high-pass filtering from the Common port (Pin 1) to the High-Pass port (Pin 5).

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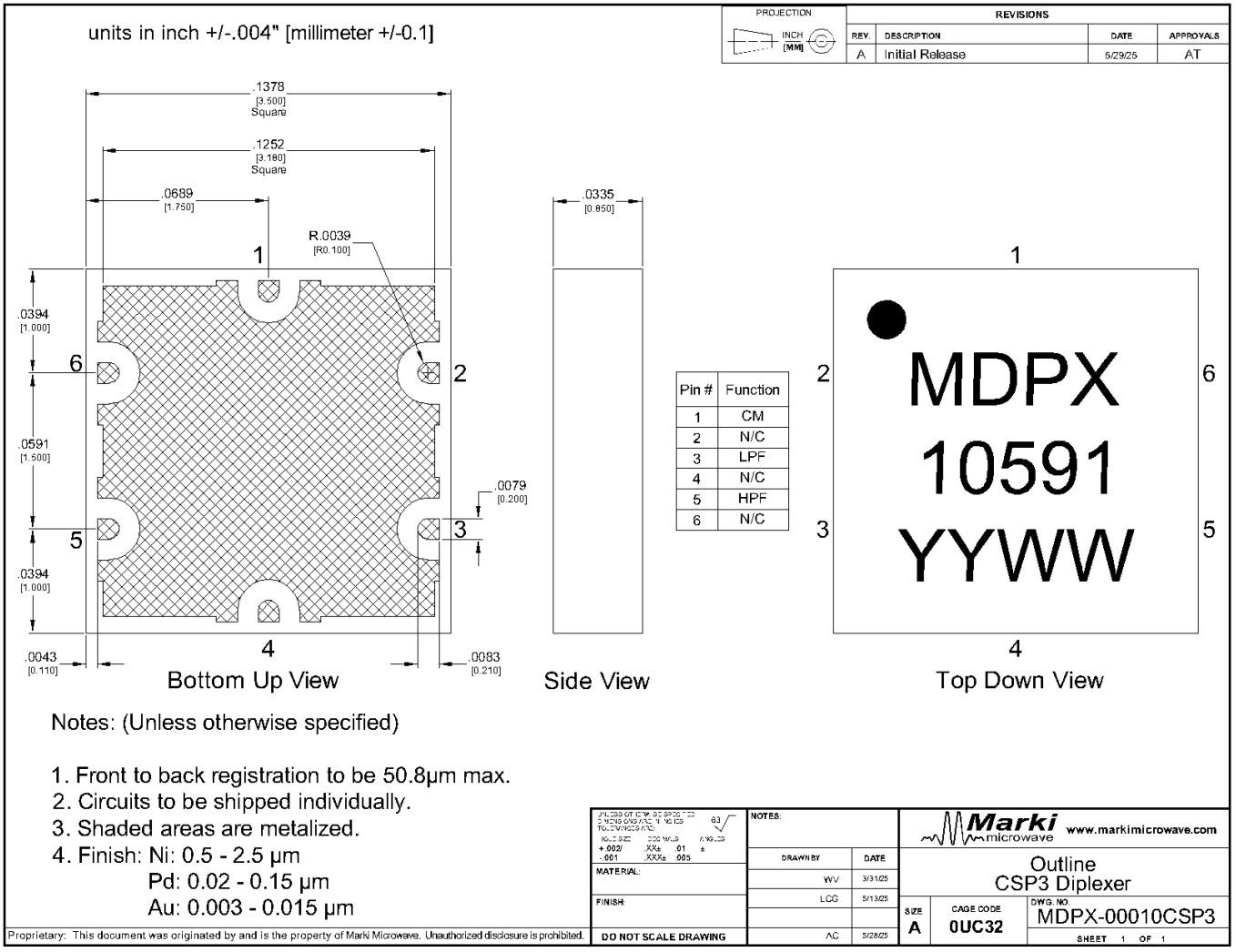
Mechanical Data

Outline Drawing

Download : Outline 2D Drawing

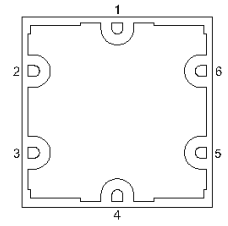


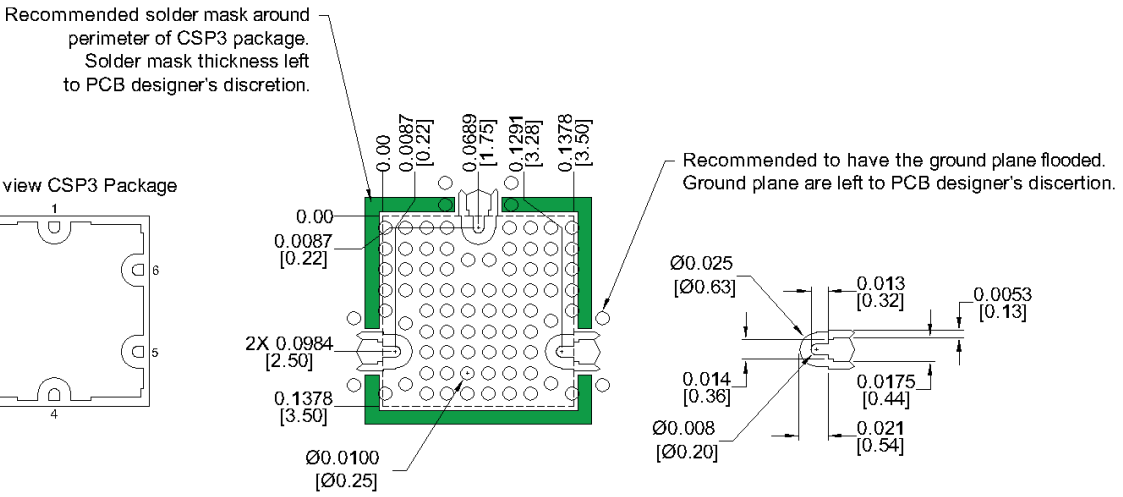
MDPX-00010CSP3

Passive MMIC 20.3 GHz Diplexer/Reflectionless Filter

Footprint Image

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





MDPX-00010CSP3

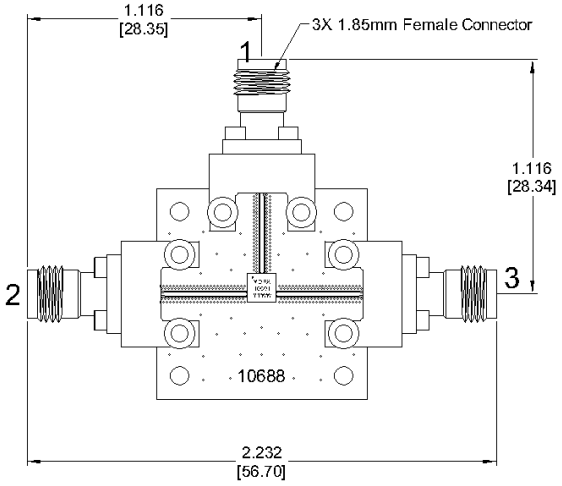
Passive MMIC 20.3 GHz Diplexer/Reflectionless Filter

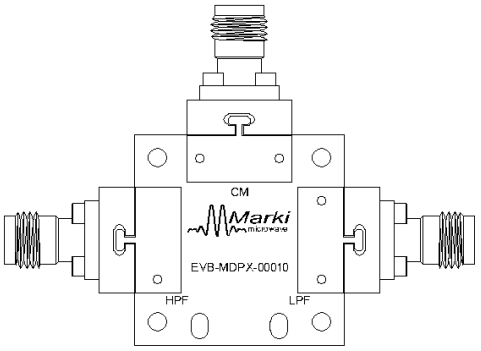
Evaluation Board - Outline Drawing

*All Dimensions are Typical

PROJECTION INCH [MM]

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVALS
A	Initial Release	5/29/25	AT





Back Side Marking

Port #	Function	Connector Type
1	CM	1.85mm
2	LPF	1.85mm
3	HPF	1.85mm

Note: RoHS Compliant Assembly

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±.002 .XX± .02 .XXX± .010 ANGLES ± 63

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

NOTES:

DRAWN BY	DATE
WV	5/2/25
LCG	5/13/25
AC	5/28/25

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Outline
Eval Board CSP3 3 Port

SIZE	CAGE CODE	DWG. NO.
A	0UC32	EVB-MDPX-00010

SHEET 1 OF 1

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