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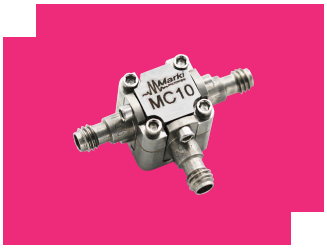
MC10-25110M2

MMIC 25-110 GHz Directional Coupler

DEVICE OVERVIEW

General Description

The MC10-25110M2 is a mmWave 25-110 GHz, 10dB directional coupler in our connectorized miniature M2-package enabling operation up to 110 GHz. The coupler features excellent directivity, return loss and coupling accuracy. Passive GaAs MMIC technology allows production of smaller constructions that replace larger form factor circuit board constructions. Tight fabrication tolerances result in less unit-to-unit variation than traditional coupler technologies, allowing for accurate simulations using the provided S3P file taken from measured production units. The MC10-25110M2 is available as a 1.0mm connectorized module.



Download s-parameters here

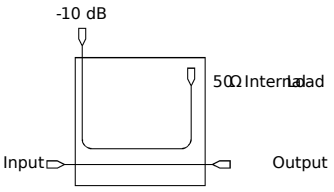
Features

- Broadband Performance
- Excellent Return Loss
- High Directivity

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
MC10-25110M2	MMIC 25-110 GHz Directional Coupler	M2	Standard	REACH RoHS	Released	EAR99

Table Of Contents

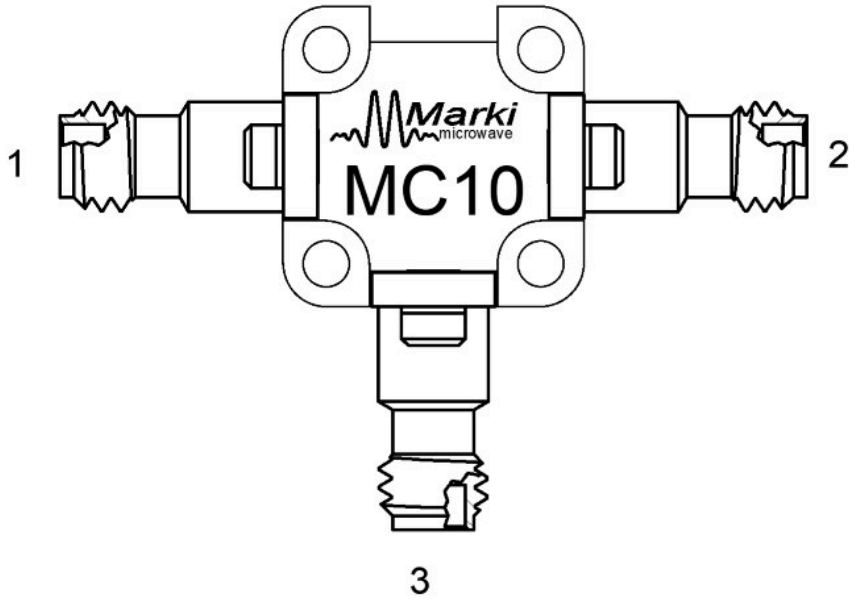
Revision History

Revision Code	Revision Date	Comment
-	2023-06-01	Initial Datasheet Release
A	2025-05-19	Return / Insertion Loss, Coupling Ratio plots and s-parameters updated.

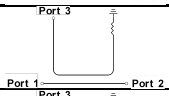
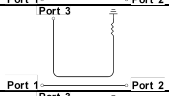
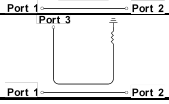
Port Configuration and Functions

Port Diagram

A top down view of the MC10-25110M2's M2 package outline drawing is shown below.



Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
GND	Ground	-	M2 package ground path is provided through the metal housing.	
Port 1	Input	1.0F	The input port is DC short to the output port and open to ground.	
Port 2	Output	1.0F	The output port is DC short to the input port and open to ground.	
Port 3	Coupled	1.0F	The coupled port is DC connected to a 50 Ω load.	

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, Port 1 and 2	160	mA
DC Current, Port 3	32	mA
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	3	W

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	27.62 x 19.37 mm

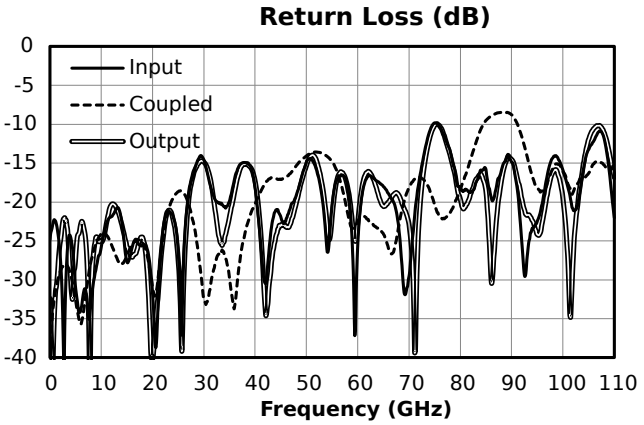
Electrical Specifications

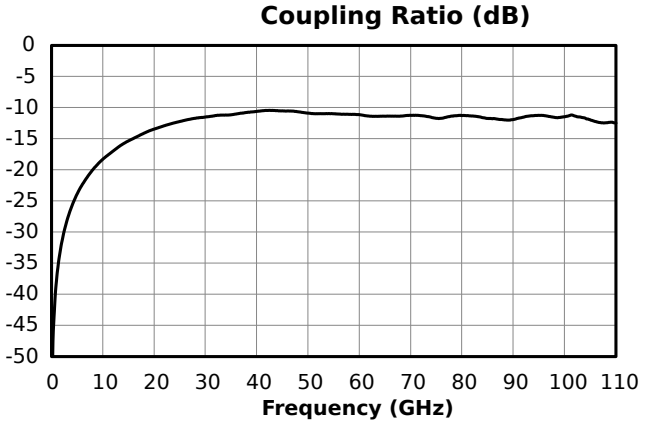
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C.

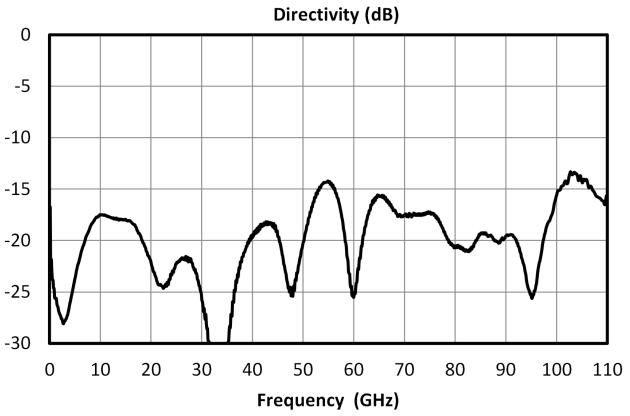
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Amplitude Flatness [1]	-	25	110	-	20	0.5	dB
Coupling Loss [2]	-	25	110	0.75	0.46	0.22	dB
Directivity	-	25	110	12	19.5	-	dB
Direct Line Insertion Loss	-	0	110	-	2.75	5	dB
Excess Insertion Loss (dB) [3]	-	0	110	-	2.2	4.25	dB
IL Corrected Directivity [4]	-	25	110	15	22.5	-	dB
Impedance	-	-	-	-	50	-	Ω
Maximum Coupling Deviation	-	25	110	-	70	2.5	dB
Mean Coupling	-	25	110	8	10	13	dB
Pass Band Return Loss	-	0	110	-	15	-	dB

[1] Amplitude Flatness = Median value of ABS(Measured Coupling Power – Average Coupling Factor).
[2] Coupling loss based on average coupling factor.
[3] Excess Insertion Loss = (Input Port to Output Port Insertion Loss) – Coupling Loss.
[4] IL Corrected Directivity = Directivity + Insertion Loss.

Typical Performance Plots



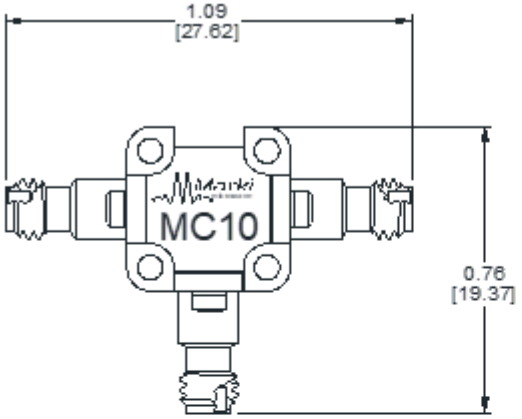




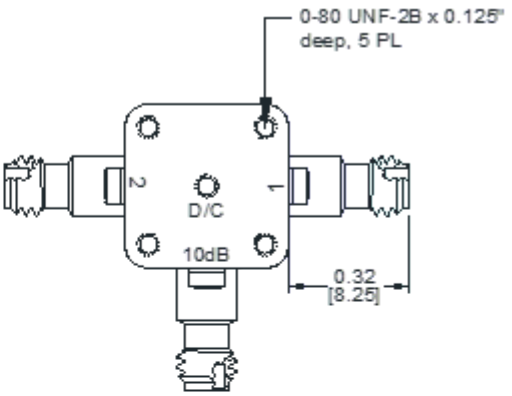
Mechanical Data

Outline Drawing

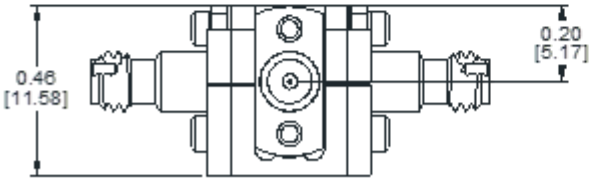
Download : Outline 3D Drawing | Outline 3D STP



Topside View



Bottomside View



1.00 mm Connector View

All measurements are typical

Note: Connectors are not removeable. Do not attempt replacing.

Port	Connector Type
1,2,3	1.00 mm Female

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