

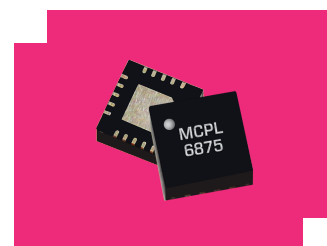
MC16-0222SM

MMIC 2-22 GHz Directional Coupler

DEVICE OVERVIEW

General Description

MC16-0222SM is a MMIC 2-22 GHz Directional Coupler. 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 MC16-0222SM is available as a 4 X 4 mm QFN package. Evaluation boards are also available.



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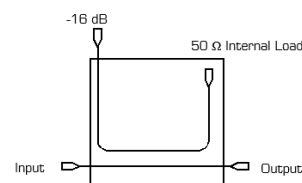
Features

- Broadband Performance
- Low VSWR
- High Directivity
- RoHS Compliant

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Packing Size	Green Status	Product Lifecycle	Export Classification
EVAL-MC16-0222	Evaluation Board, MMIC 2-22 GHz Directional Coupler	-	-	RoHS	Released	EAR99
MC16-0222SM	MMIC 2-22 GHz Directional Coupler	QFN	-	RoHS	Released	EAR99

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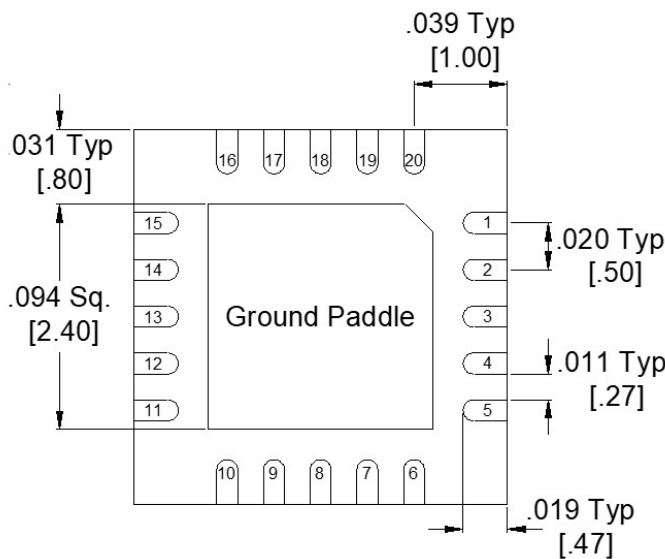
Revision History

Revision Code	Revision Date	Comment
-	2020-07-01	Initial Datasheet Release
A	2020-08-01	Updated Return Loss Plots

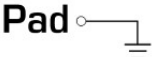
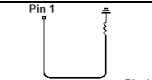
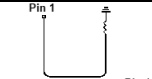
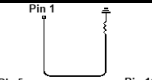
Port Configuration and Functions

Port Diagram

A bottom-up view of the MC16-0222SM's SM package outline drawing is shown below.



Port Functions

Port	Function	Description	Equivalent Circuit for Package
Pad	Ground	SM package ground path is provided through the ground paddle.	
Pin 1	Coupled	The coupled port is DC connected to a 50 Ω load.	
Pin 11	Output	The output port is DC short to the input port and open to ground.	
Pin 5	Input	The input port is DC short to the output port 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 at any Port	60	mA
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C

Package Information

Parameter	Details	Rating
Dimensions	-	4x4 mm

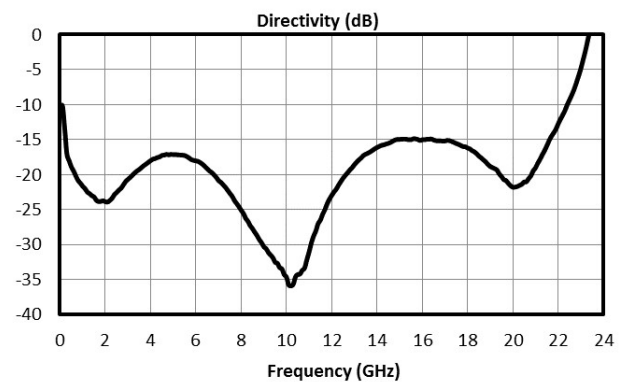
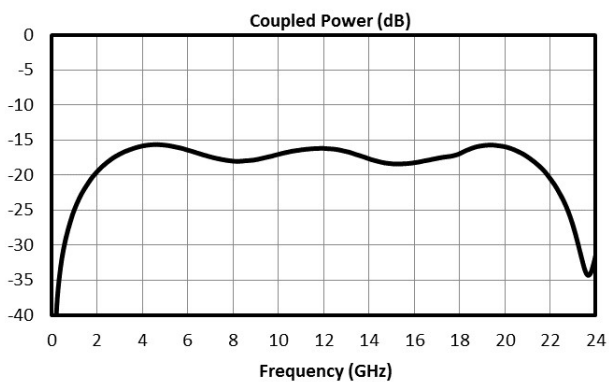
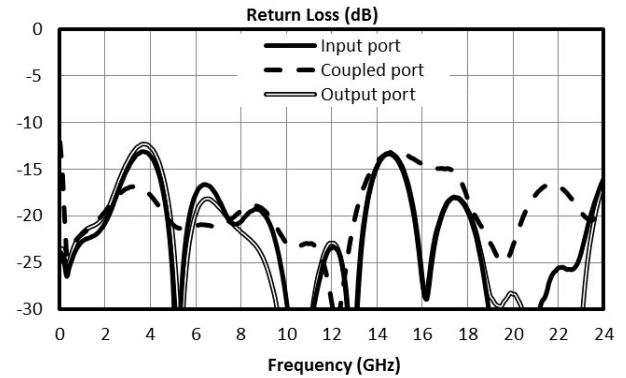
Electrical Specifications

The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C. All measured data is taken from the eval board with de-embedding of the connectors and traces, but group delay may vary.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Mean Coupling	-	2	22	-	16	-	dB
Direct Line Insertion Loss	DC-12	-	-	-	1.2	2.5	dB
Direct Line Insertion Loss	-	12	22	-	2	3.5	dB
Directivity	-	2	12	14	23	-	dB
Directivity	-	12	22	-	15	-	dB
VSWR	-	2	22	-	1.22	-	-
Impedance	-	-	-	-	50	-	Ω

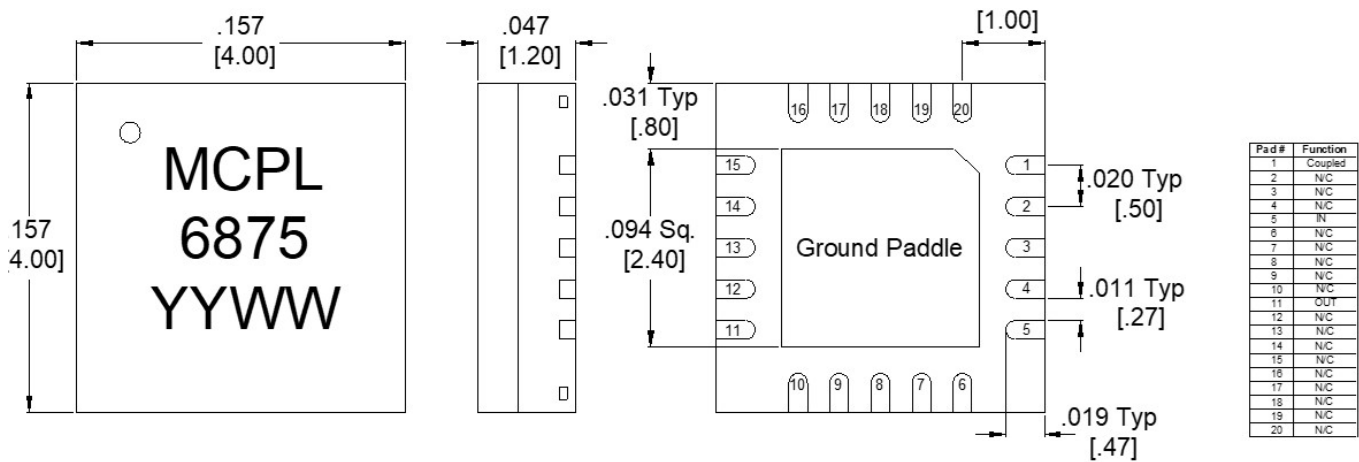
Typical Performance Plots

All measured data is taken from the eval board with de-embedding of the connectors and traces, but group delay may vary.



Mechanical Data

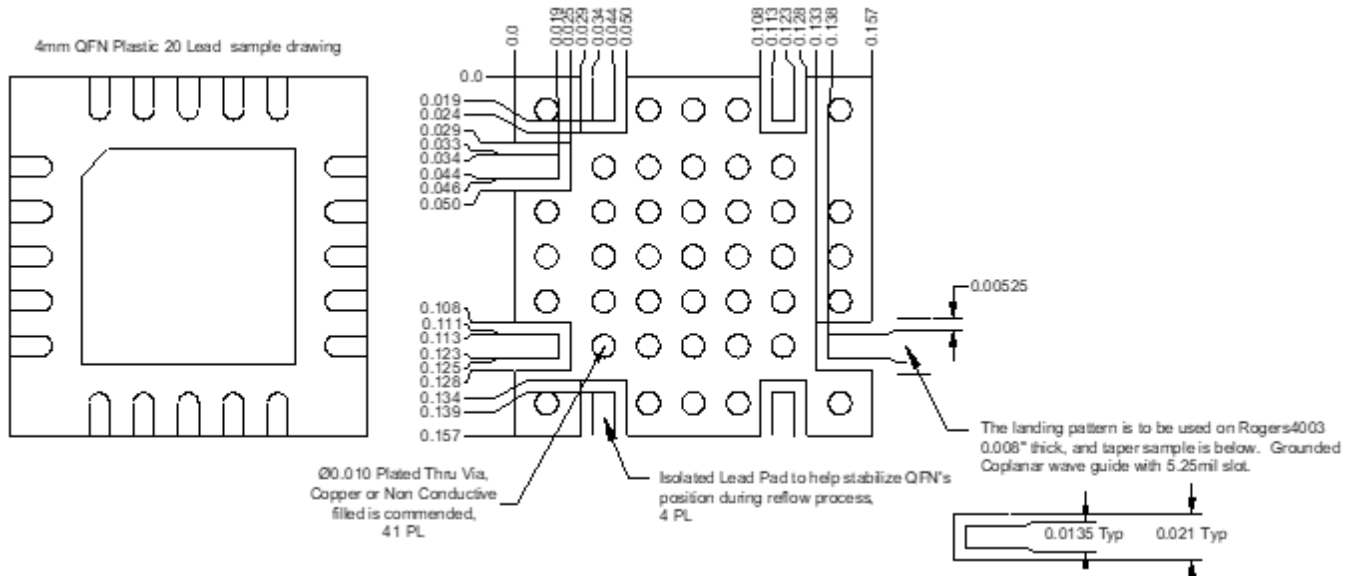
Outline Drawing



Notes:

1. Substrate material is LCP.
2. I/O Leads and Ground Paddle plating is (from base to finish):
Ni: 0.5um MIN
Pd: 0.02um MIN
Au: 0.05um MAX
3. All unconnected pins should be connected to PCB RF ground.

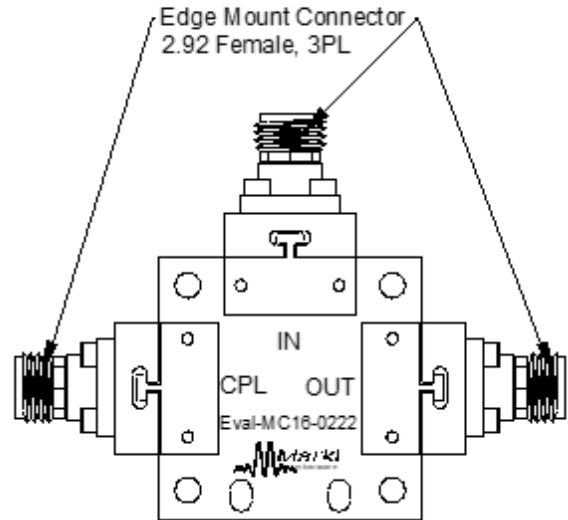
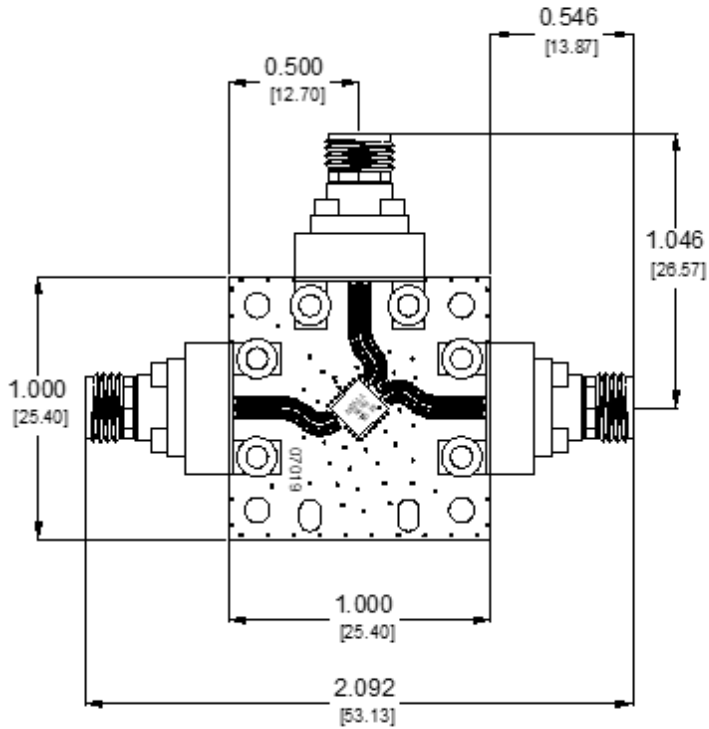
Footprint Image



MC16-0222SM

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All measurements are typical



Backside Label

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