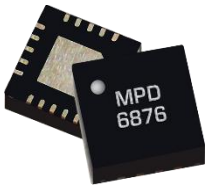
2-26.5 GHz MMIC 2-way Power Divider/Combiner MPD-0226SM

1 Device Overview



QFN

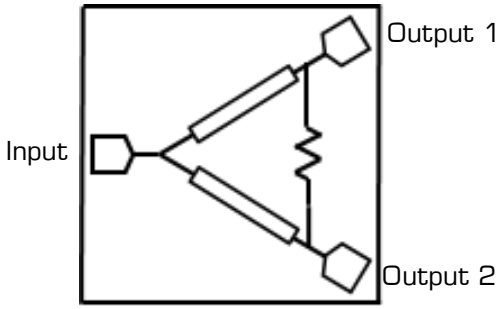
1.1 General Description

MPD-0226SM is a MMIC 2-way Wilkinson power divider. 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 power divider technologies, allowing for accurate simulations using the provided S3P file taken from measured production units. Power dividers are passive reciprocal devices that can be used either as power combiners or as power dividers. Applications include Radar, Satcom, EW and test equipment. The MPD-0226SM is available as a 4 X 4 mm QFN package. Evaluation boards are also available.

1.2 Features

- 2 GHz to 26.5 GHz In-phase Power splitting
- 20 dB Typical Output to Output Isolation
- Outstanding phase and amplitude balance
- RoHS Compliant
- S3P data MPD-0226SM.zip

1.3 Functional Block Diagram



1.4 Part Ordering Options[1]

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MPD-0226SM	4 X 4 mm QFN	SM	RoHS	Active	EAR99
EVAL-MPD-0226	Connectorized Evaluation Fixture	Eval	RoHS	Active	EAR99

[1] Refer to our website for a list of definitions for terminology presented in this table.

Table of Contents

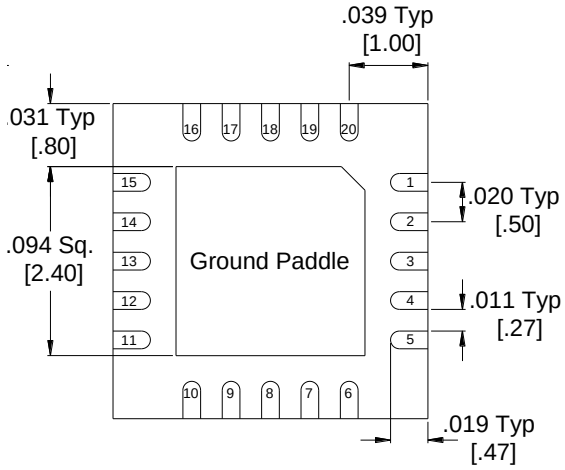
Revision History

Revision Code	Revision Date	Comment
-	June 2020	Initial Datasheet Release

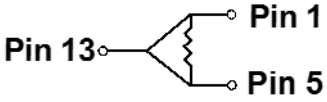
2 Port Configurations and Functions

2.1 Port Diagram

A bottom-up view of the MPD-0226SM's SM package outline drawing is shown below. The MMIC Power dividers are passive reciprocal devices allowing either power splitting or power combining.



2.2 Port Functions

Port	Function	Description	Equivalent Circuit
Pin 1	Output 1	The output 1 port is DC short to the other two ports and open to ground.	
Pin 5	Output 2	The output 2 port is DC short to the other two ports and open to ground.	
Pin 13	Input/common	The common port is DC short to the other two ports and open to ground.	
Pad	Ground	SM package ground path is provided through the ground paddle.	

3 Specifications

3.1 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	Units
DC Current	60	mA
Power Handling, at any Port	TBD	dBm
Operating Temperature	-55 to +100	°C
Storage Temperature	-65 to +125	°C

3.2 Package Information

Parameter	Details	Rating
ESD	Human Body Model (HBM), per MIL-STD-750, Method 1020	N/A

3.3 Electrical Specifications[1]

The electrical specifications apply at T_A=+25°C in a 50Ω system.

Min and Max limits are guaranteed at T_A=+25°C.

Parameter	Frequency (GHz)	Min	Typ.	Max	Units
Nominal Power Splitting	2-26.5		3		dB
Nominal Phase Shift			0		Degrees
Amplitude Balance			0.2	0.8	dB
Phase Balance			2	8.5	Degrees
Excess Insertion Loss[2]			3	6	dB
VSWR			1.25		
Isolation			20		dB
Impedance			50		Ω

[1] All measured data is taken from the eval board without de-embedding of the connectors and traces.
[2]Excess Insertion Loss = (Common Port to Output Port Insertion Loss) – 3 dB.

3.4 Typical Performance Plots

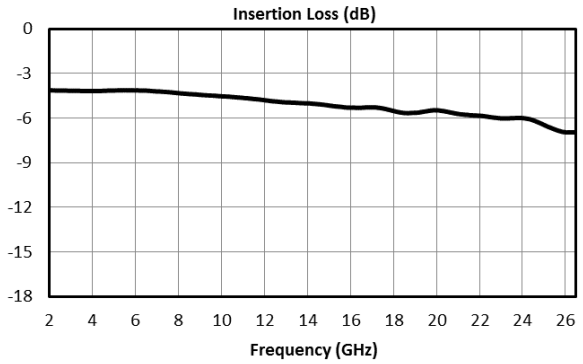


Fig. 1. Common to output port insertion loss

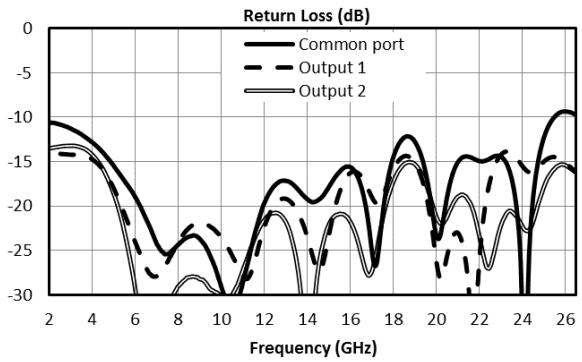


Fig. 2. Return loss for common port and output ports.

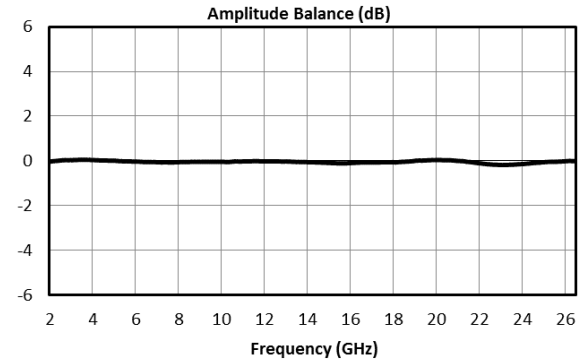


Fig. 3. Amplitude balance between output ports.

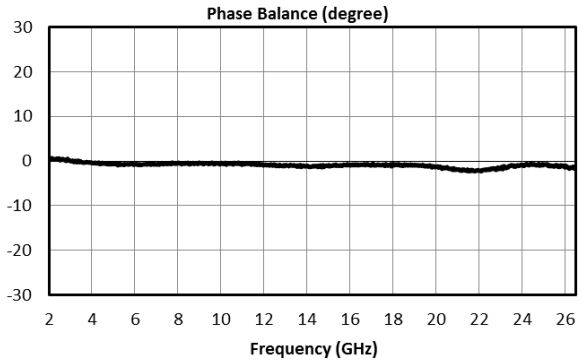


Fig. 4. Phase balance between output ports.

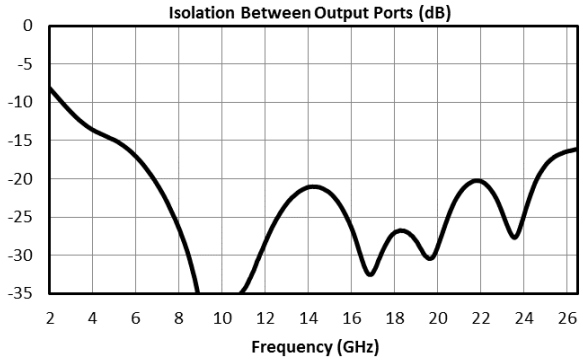
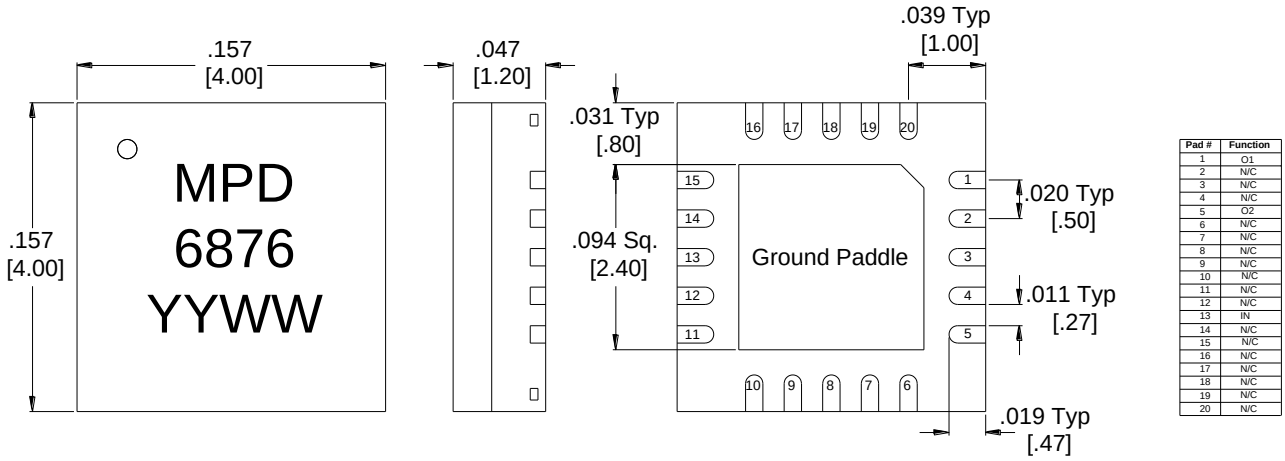


Fig. 5. Isolation between differential ports

4 Mechanical Data

4.1 SM Package Outline Drawing

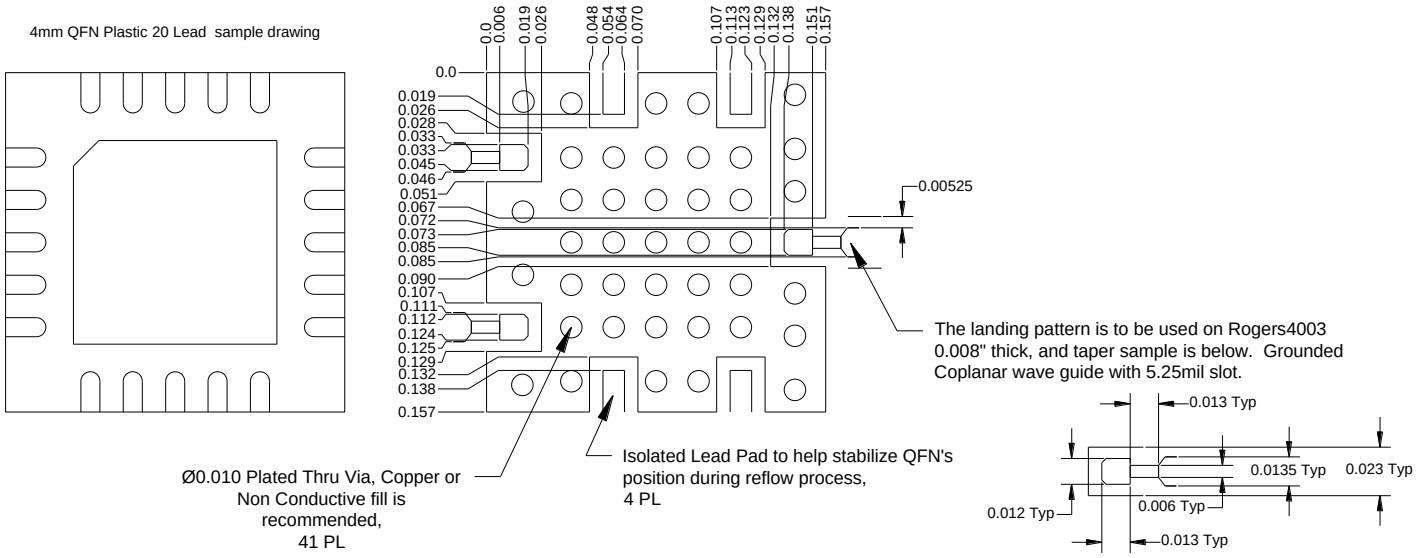


Pad #	Function
1	O1
2	N/C
3	N/C
4	N/C
5	O2
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	IN
14	N/C
15	N/C
16	N/C
17	N/C
18	N/C
19	N/C
20	N/C

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.

4.2 SM Package Footprint



QFN-Package Surface-Mount Landing Pattern

Click here for a DXF of the above layout.

Click here for leaded solder reflow. Click here for lead-free solder reflow.

4.3 Evaluation Board outline