Sales: 408-778-9952 | General: 408-778-4200 | Fax: 408-778-4300
Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

MMD-0416LPSM

GaAs MMIC Doubler

DEVICE OVERVIEW

General Description

The MMD-0416LPSM is a GaAs Schottky-diode MMIC frequency doubler operating with an input range of 2 to 8 GHz and a doubled output of 4 to 16 GHz. It delivers low conversion loss, high fundamental and LO isolation, and strong harmonic suppression across a wide bandwidth. The MMD-0416LPSM is available in a compact 2.29 x 3.86mm DFN package for easy SMT integration, as well as a connectorized evaluation board.

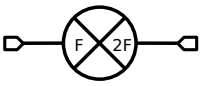
Features

- High Fundamental Rejection
- Low 2F Conversion Loss
- Compact DFN Package (2.29 x 3.8 mm)
- Low Input Drive Power, +10 dBm Nominal

Applications

- Test and Measurement Equipment
- High frequency synthesis
- LO signal chain

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MMD-0416LPSM	GaAs MMIC Doubler	DFN	REACH RoHS	Released	EAR99
EVB-MMD-0416L	Evaluation Board, GaAs MMIC 4 - 16 GHz Doubler	EVB	REACH RoHS	Released	EAR99

Table Of Contents

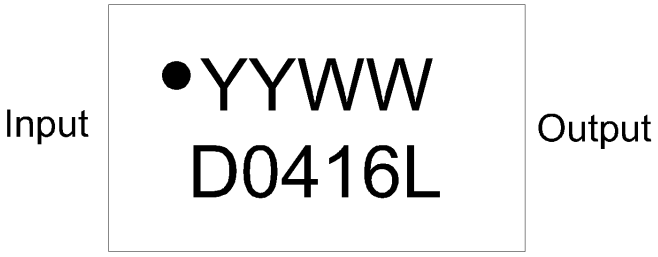
Revision History

Revision Code	Revision Date	Comment
-	2025-12-10	Initial Release
A	2025-12-17	3D Models Updated.

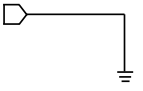
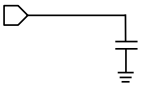
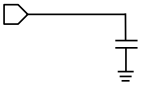
Port Configuration and Functions

Port Diagram

A top-down x-ray view of the MMD-0416LPSM's PSM package outline drawing is shown below. The MMD-0416LPSM should only be used in the forward direction, with the input and output ports given in Port Functions.



Port Functions

Port	Function	Description	DC Equivalent Circuit
GND	Ground	PSM package ground path is provided through the ground paddle.	
Input	1F Input	Input 1x Frequency input port. This pin is DC open for the PSM package.	
Output	2F Output	Output 2x Frequency output port. This pin is DC open for the PSM package.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. All Absolute Maximum Ratings are individual and should not be met in parallel. If these limits are exceeded or multiple are met in parallel the device may be inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
Power Handling, at any Port (25°C)	27	dBm

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	2.29 x 3.86 mm
Moisture Sensitivity Level	-	MSL 1

Recommended Operating Conditions

The Recommended Operating Conditions indicate the limits, inside which the device should be operated, to guarantee the performance given in Electrical Specifications Operating outside these limits may not necessarily cause damage to the device, but the performance may degrade outside the limits of the electrical specifications. For limits, above which damage may occur, see Absolute Maximum Ratings.

Parameter	Min	Nominal	Max	Unit
Ambient Temperature	-55	25	100	°C
Input Power	6	10	14	dBm

Electrical Specifications

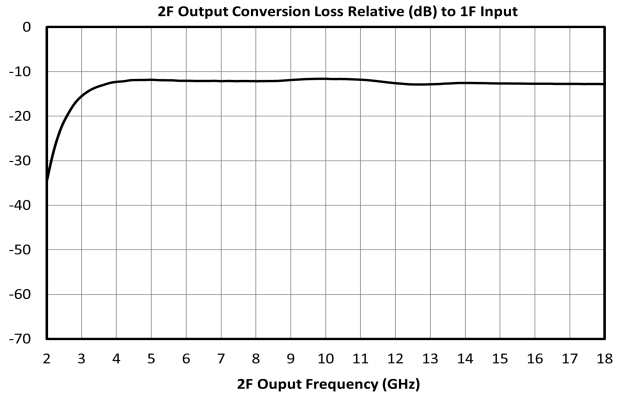
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the connectorized EVB package doubler used in the forward direction with a +10 dBm sine wave input. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C.

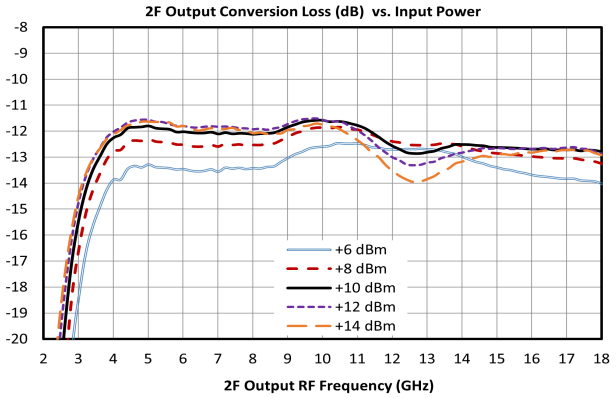
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Input Frequency Range	-	-	-	2	-	8	GHz
Output Frequency Range	-	-	-	4	-	16	GHz
Input Power	-	-	-	6	10	14	dBm
Conversion Loss [1]	Second Harmonic Output	4	16	-	12	-	dB
Isolation, 3F [2]	Input = 2 – 5.33 GHz Output = 6 - 16 GHz	6	16	-	62	-	dB
Isolation, 4F. [3]	Input = 2 – 4 GHz Output = 8 - 16 GHz	8	16	-	27	-	dB
Isolation, 1F [4]	Input = 2 – 8 GHz Output = 2 – 8 GHz	2	8	-	50	-	dB
Suppression, 1F [5]	Input = 2 – 8 GHz Output = 2 – 8 GHz	2	8	-	37	-	dBc
Suppression, 3F [6]	Input = 2 – 5.33 GHz Output = 6 - 16 GHz	6	16	-	50	-	dBc
Suppression, 4F [7]	Input = 2 – 4 GHz Output = 8 - 16 GHz	8	16	-	14	-	dBc

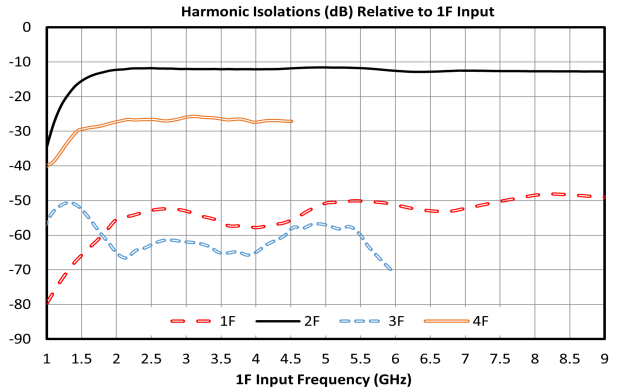
[1] with +10 dBm RF Input
[2][3][4] Isolation is defined as the harmonic power relative to the 1F fundamental input power.
[5][6][7] Suppressions and isolations measured with an input source with >60dBc (relative to fundamental input) harmonic suppression. Suppression is defined as the harmonic power relative to the 2F doubled output power.

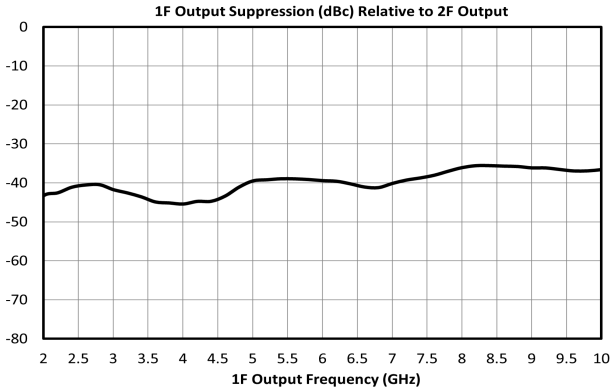
Typical Performance Plots

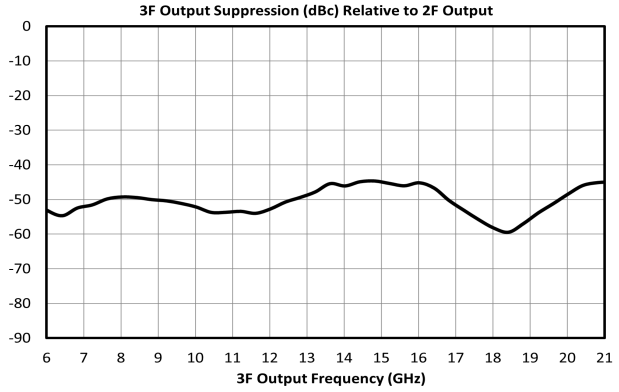
The EVB trace losses are de-embedded for the metrics has shown here.

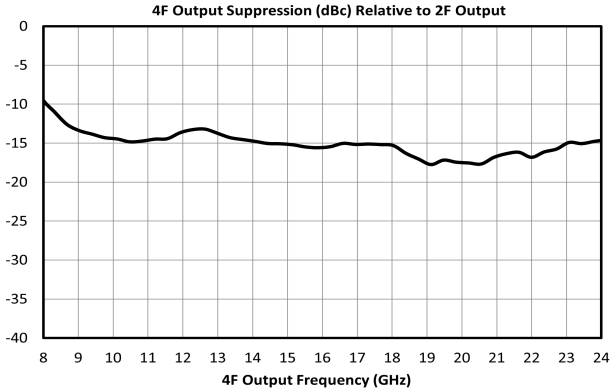


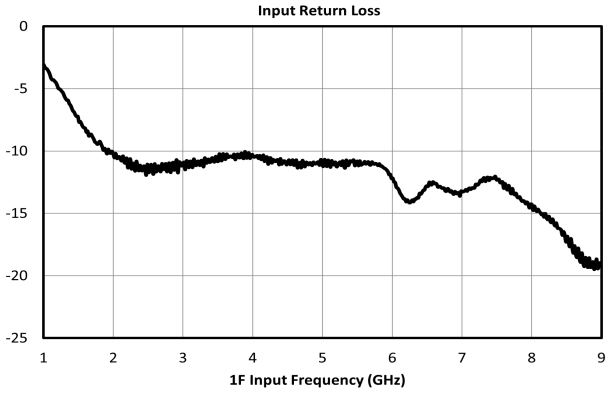


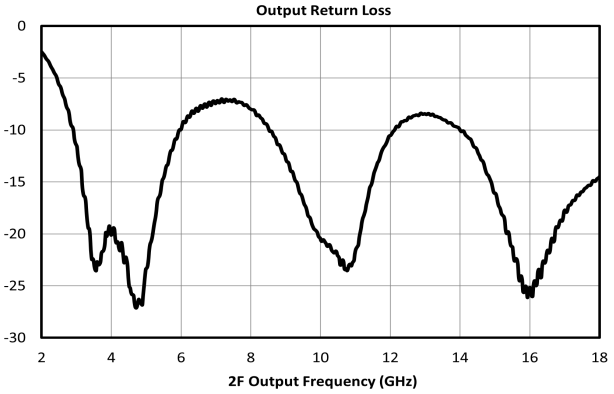












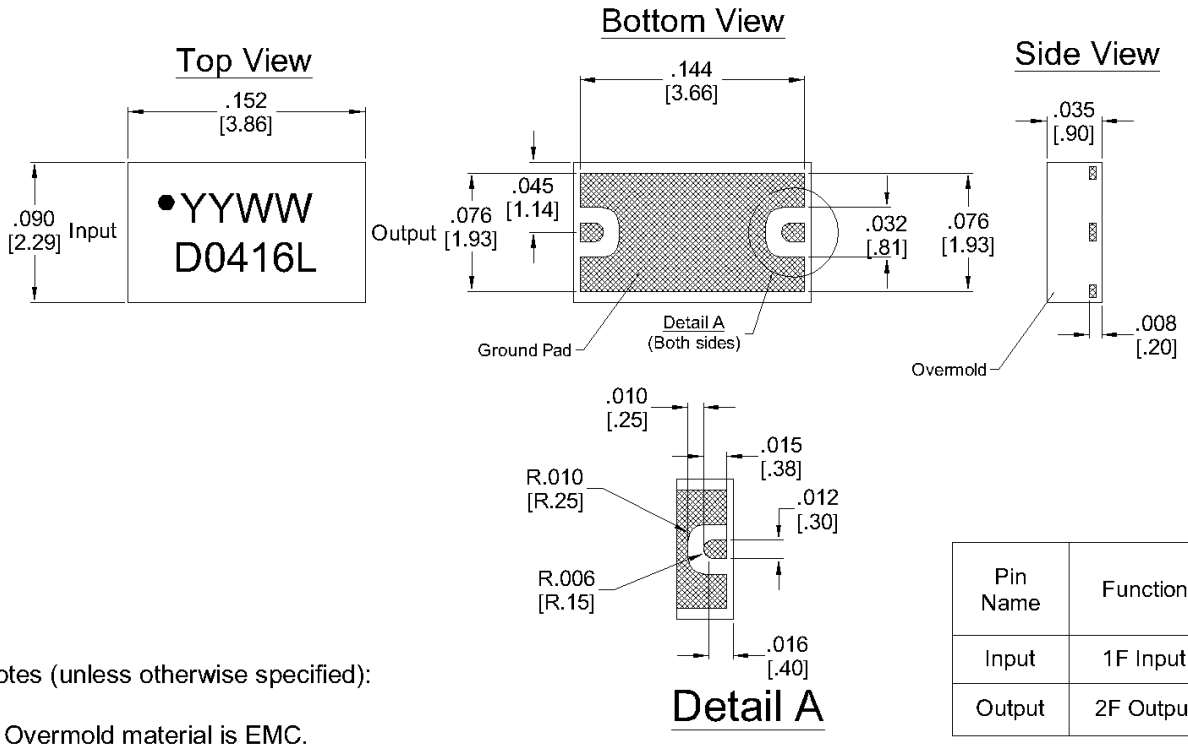
Mechanical Data

Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP

All measurements are typical!

PROJECTION	REVISIONS			
INCH (MM)	REV.	DESCRIPTION	DATE	APPROVALS
	A	Initial Release	11/12/25	AT



Pin Name	Function
Input	1F Input
Output	2F Output

Notes (unless otherwise specified):

1. Overmold material is EMC.
2. Shaded areas are metalized.
3. I/O Leads and Ground Paddle is (from base to finish):
   - **Ni: 0.5 - 2.0 µm**
   - **Pd: 0.08 - 0.15 µm**
   - **Au: 0.008 - 0.050 µm**

MATERIAL: MMD-0416LPSM
FINISH:
DO NOT SCALE DRAWING

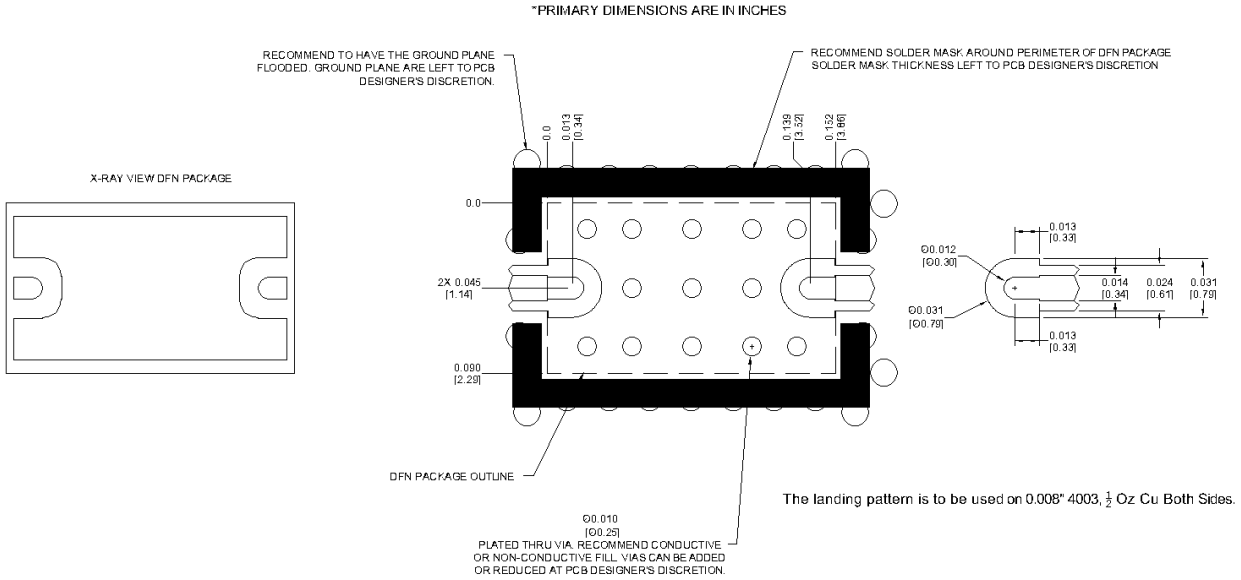
NOTES:

DRAWN BY	DATE
OG	9/17/2025
AJN	9/23/2025
AR	9/23/2025

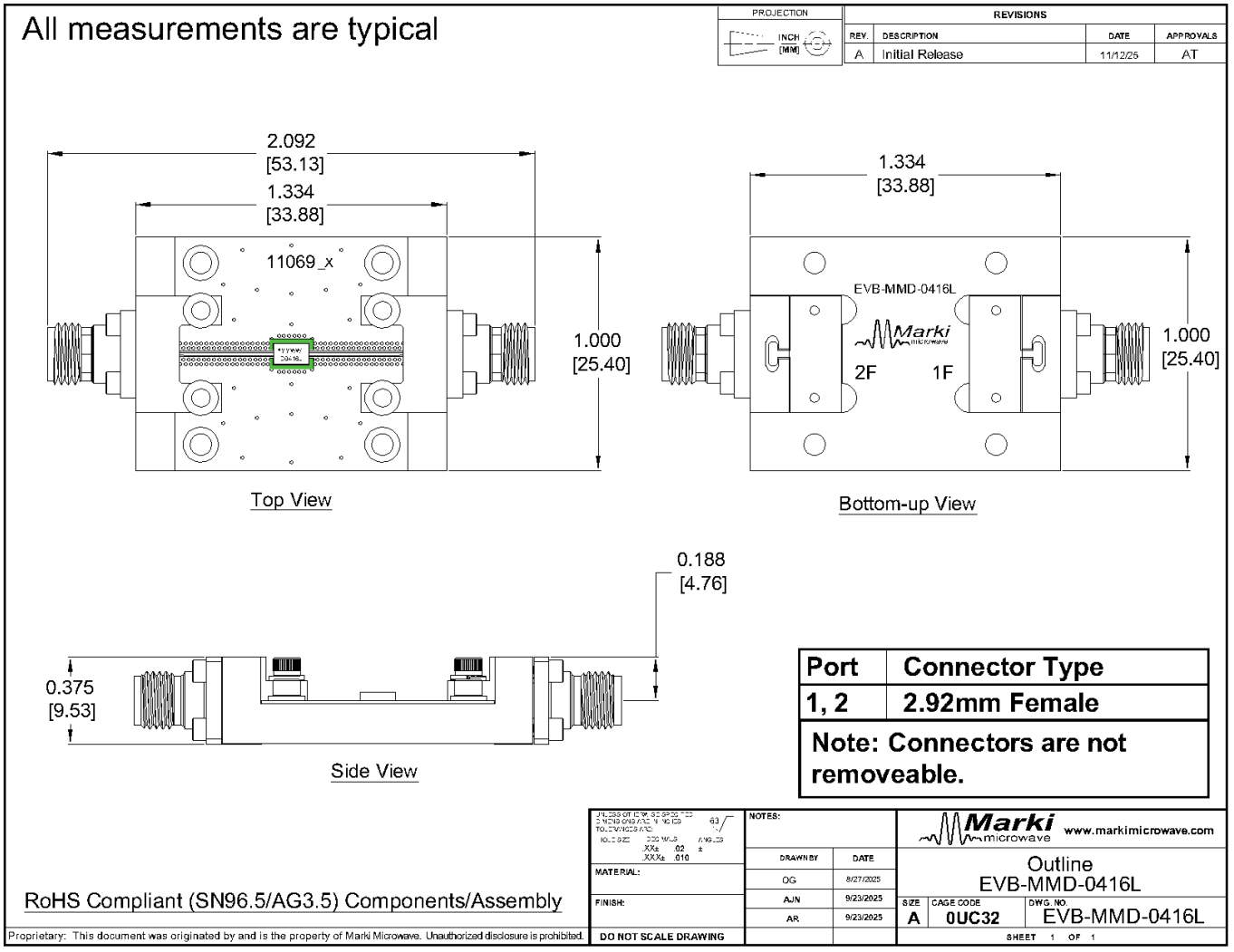
Marki microwave www.markimicrowave.com
Outline
MMD-0416LPSM
SIZE A | CAGE CODE 0UC32 | DWG. NO. MMD-0416LPSM
SHEET 1 OF 1

Footprint Image

Download : Footprint Drawing



Evaluation Board - Outline Drawing



DISCLAIMER

MARKI MICROWAVE, LLC., ("MARKI") PROVIDES TECHNICAL SPECIFICATIONS AND DATA (INCLUDING DATASHEETS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, AND OTHER INFORMATION AND RESOURCES "AS IS" AND WITH ALL FAULTS. MARKI DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

These resources are intended for developers skilled in the art designing with Marki products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards and other requirements. Marki makes no guarantee regarding the suitability of its products for any particular purpose, nor does Marki assume any liability whatsoever arising out of your use or application of any Marki product.

Marki grants you permission to use these resources only for development of an application that uses Marki products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Marki intellectual property or to any third-party intellectual property. Marki reserves the right to make changes to the product(s) or information contained herein without notice.

MARKI MICROWAVE and T3 MIXER are trademarks or registered trademarks of Marki Microwave, LLC. All other trademarks used are the property of their respective owners.