1. Device Overview

Module

1.1 General Description

The MMD-3567L is a MMIC millimeter wave doubler fabricated with GaAs Schottky diodes. This operates over a guaranteed 17.5 to 33.5 GHz input frequency range or a doubled output frequency range of 35 to 67 GHz. This doubler is a bandlimited version of the MMD-3580L. The sister die version, MMD-3580LCH, is capable of operating beyond 80GHz. Both the wire bondable die and connectorized units are available.

1.2 Features

- High fundamental rejection
- Millimeter wave output frequencies
- Low +7 dBm minimum input drive

1.3 Applications

- High frequency synthesis
- LO signal chain

1.4 Functional Block Diagram

1.5 Part Ordering Options[1]

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MMD-3567LU	Connectorized module, 1.85 mm connector output	U	**RoHS**	Active	EAR99

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

Table of Contents

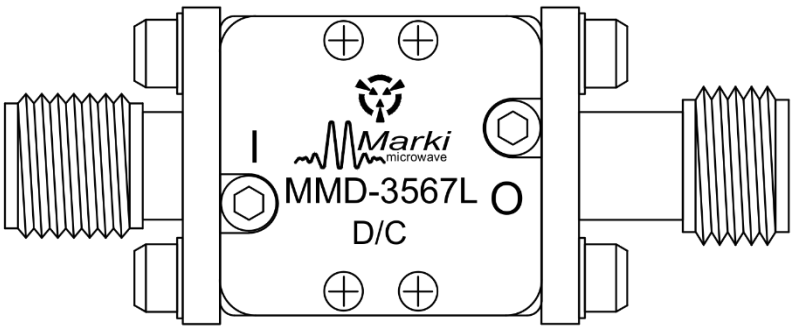
Revision History

Revision Code	Revision Date	Comment
-	February 2018	Datasheet Initial Release
A	February 2019	Updated output return loss

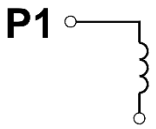
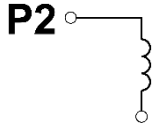
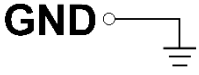
2. Port Configurations and Functions

2.1 Port Diagram

A top-down view of the MMD-3567L's S package outline drawing is shown below. The MMD-3567L should only be used in the forward direction, with the input and output ports given in Port Functions.



2.2 Port Functions

Port	Function	Description	Equivalent Circuit for Package
Port 1	Input	Port 1 is DC open for the U package.	
Port 2	Output	Port 2 is DC open for the U package.	
GND	Ground	U package ground provided through metal housing and outer coax conductor.	

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
Port 1 DC Current	TBD	mA
Port 2 DC Current	TBD	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	TBD
Weight	U Package	10 g

3.3 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.

	Min	Nominal	Max	Units
T_A, Ambient Temperature	-55	+25	+100	°C
Input Power	+7		+11	dBm

3.4 Sequencing Requirements

There is no requirement to apply power to the ports in a specific order. However, it is recommended to provide a 50Ω termination to each port before applying power. This is a passive diode doubler that requires no DC bias.

3.5 Electrical Specifications

The electrical specifications apply at T_A=+25°C in a 50Ω system. Typical data shown is for the connectorized U package doubler used in the forward direction with a +8 dBm sine wave input.

Min and Max limits apply only to our connectorized units and are guaranteed at T_A=+25°C. RF testing of our die is performed on a sample basis to verify conformance to datasheet guaranteed specifications.

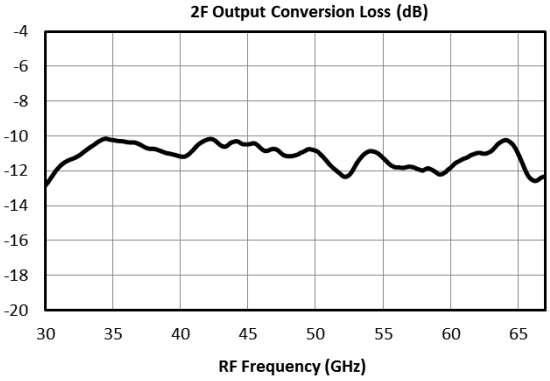
Parameter	Test Conditions		Min	Typical	Max	Units
Input (Port 1) Frequency Range			17.5		33.5	GHz
Output (Port 2) Frequency Range			35		67	
Input Power			+7		+11	dBm
2F Conversion Loss (CL)	Input = 17.5 - 33.5 GHz Output = 35 - 67 GHz			11	15	dB
Suppression[2,3]	1F	Input = 17.5 - 40 GHz Output = 17.5 - 40 GHz		38		dBc
	3F	Input = 17.5 – 22.3 GHz Output = 52.5 - 67 GHz		44		
	4F	Input = 15 – 16.8 GHz Output = 60 - 67 GHz		21		
Isolations[4]	1F	Input = 17.5 - 40 GHz Output = 17.5 - 40 GHz		47.7		dB
	3F	Input = 17.5 – 22.3 GHz Output = 52.5 - 67 GHz		54.4		
	4F	Input = 15 – 16.8 GHz Output = 60 - 67 GHz		31		

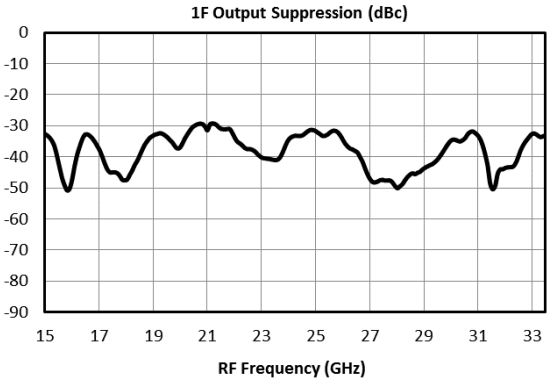
[2] Suppressions and isolations measured with an input source with >70dBc (relative to fundamental input) harmonic suppression

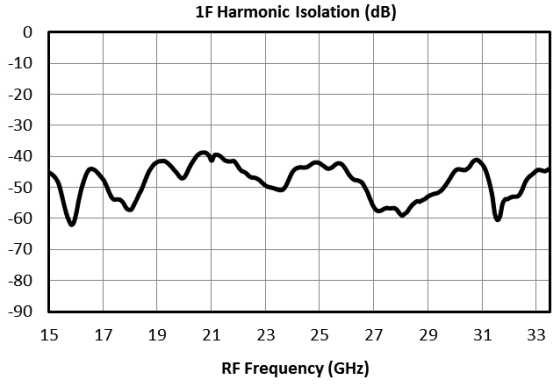
[3] Suppression is defined as the harmonic power relative to the 2F doubled output power

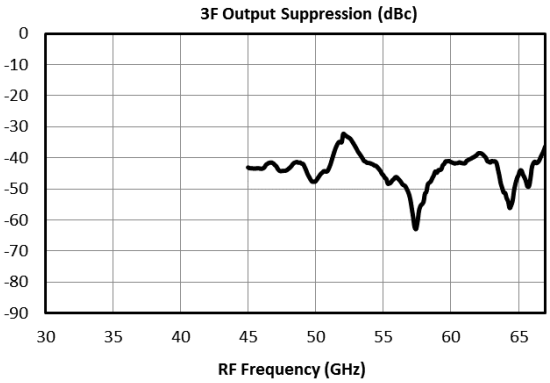
[4] Isolation is defined as the harmonic power relative to the 1F fundamental input power.

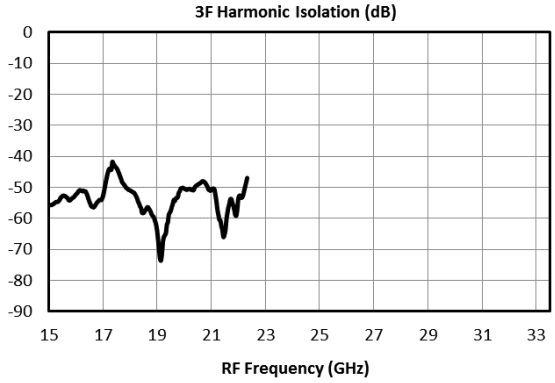
3.6 Typical Performance Plots

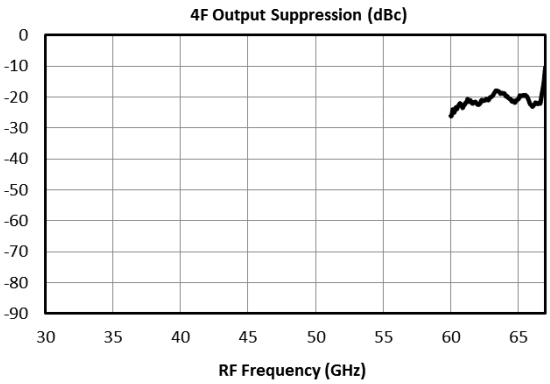


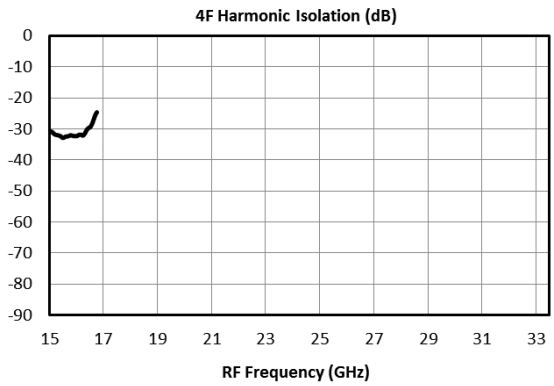


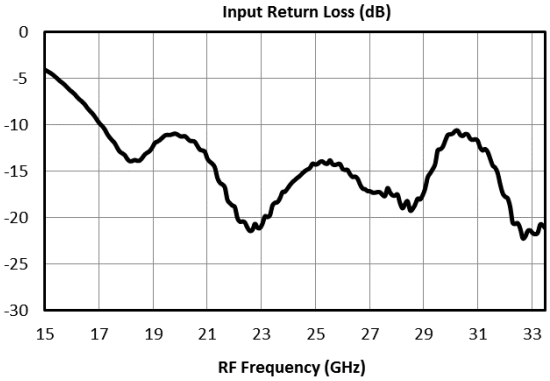


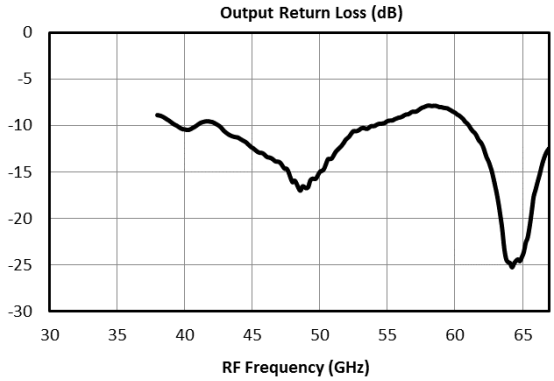












4. Mechanical Data

4.1 U Package Outline Drawing

Port	Connector Type
I	2.92mm Female
O	1.85mm Female
Note: S-Package Connectors are not removeable.