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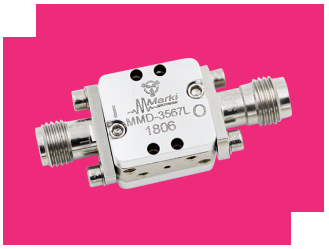
MMD-3567LU

GaAs MMIC Millimeter Wave Doubler

DEVICE OVERVIEW

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.



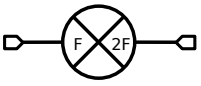
Features

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

Applications

- High frequency sysnthesis
- LO signal chain

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
MMD-3567LU	GaAs MMIC Millimeter Wave Doubler	U	Standard	RoHS REACH REACH	Released	EAR99

Table Of Contents

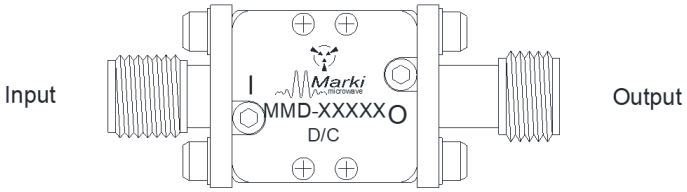
Revision History

Revision Code	Revision Date	Comment
-	2018-02-01	Datasheet Initial Release
A	2019-02-01	Updated output return loss

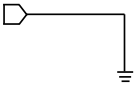
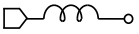
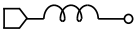
Port Configuration and Functions

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.



Port Functions

Port	Function	Connector Type	Description	Equivalent Circuit for Package
GND	Ground	-	U package ground provided through metal housing and outer coax conductor.	
Port 1	Input	2.92F	Input 1x Frequency Port. Port 1 is DC open for the U package.	
Port 2	Output	1.85F	2x Input Frequency output port. Port 2 is DC open for the U package.	

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
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
Weight	Package name: U	10g
Dimensions	-	14.22x13.21mm

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
Input Power	7	-	11	dBm
Ambient Temperature	-55	25	100	°C

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.

Electrical Specifications

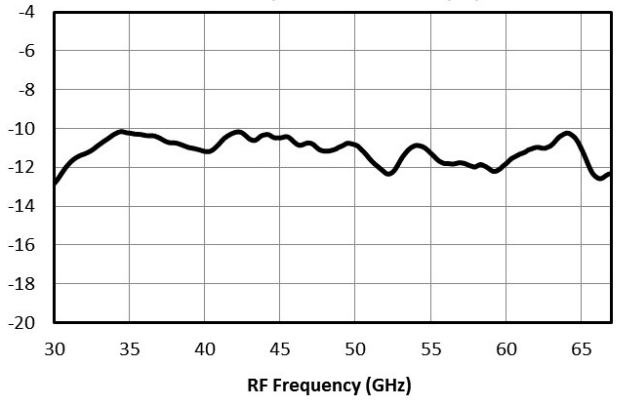
The Recommended Operating Conditions indicate the limits, inside which the device should be operated, to guarantee the performance given in Electrical Specifications Operating outside these limits may not necessarily cause damage to the device, but the performance may degrade outside the limits of the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

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Conversion Loss	Second Harmonic Output	-	-	-	11	15	dB
Input Frequency Range	-	-	-	17.5	-	33.5	GHz
Input Power	-	-	-	7	-	11	dBm
Isolation, 1F [1]	Input = 17.5 - 40 GHz Output = 17.5 - 40 GHz	-	-	-	47.7	-	dB
Isolation, 3F [2]	Input = 17.5 – 22.3 GHz Output = 52.5 - 67 GHz	-	-	-	54.4	-	dB
Isolation, 4F [3]	Input = 15 – 16.8 GHz Output = 60 - 67 GHz	-	-	-	31	-	dB
Output Frequency Range	-	-	-	35	-	67	GHz
Suppression, 1F [4]	Input = 17.5 - 40 GHz Output = 17.5 - 40 GHz	-	-	-	38	-	dBc
Suppression, 3F [5]	Input = 17.5 – 22.3 GHz Output = 52.5 - 67 GHz	-	-	-	44	-	dBc
Suppression, 4F [6]	Input = 15 – 16.8 GHz Output = 60 - 67 GHz	-	-	-	21	-	dBc

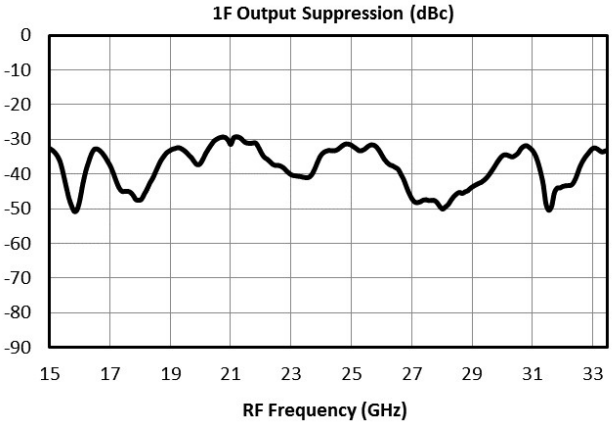
[1][2][3] Isolation is defined as the harmonic power relative to the 1F fundamental input power.
[4][5][6] Suppressions and isolations measured with an input source with >70dBc (relative to fundamental input) harmonic suppression. Suppression is defined as the harmonic power relative to the 2F doubled output power

Typical Performance Plots

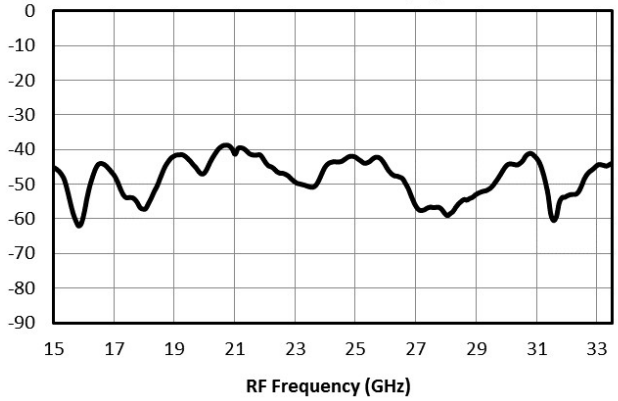
2F Output Conversion Loss (dB)



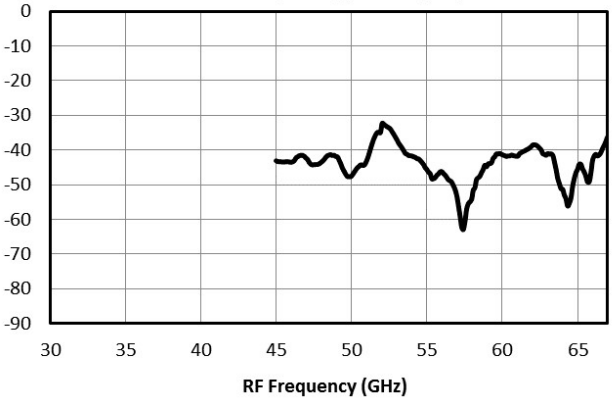
1F Output Suppression (dBc)



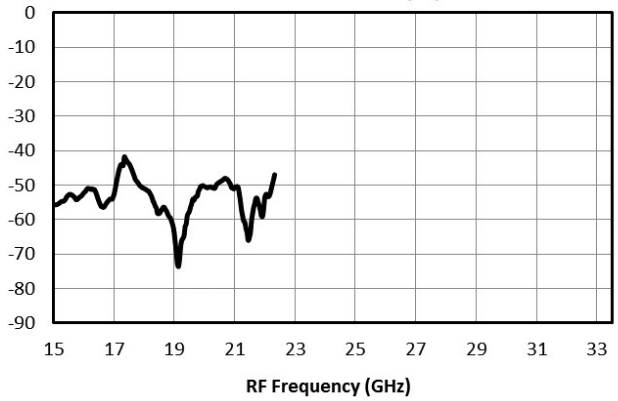
1F Harmonic Isolation (dB)



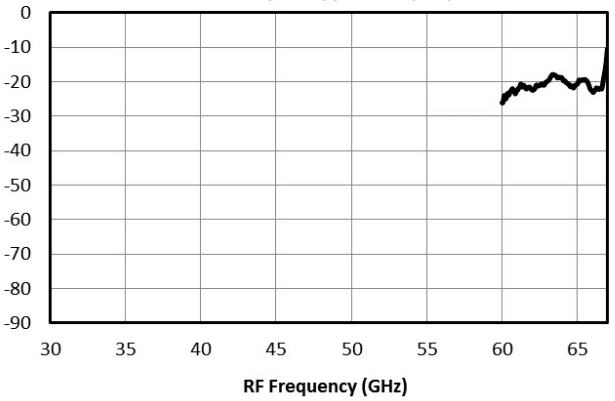
3F Output Suppression (dBc)



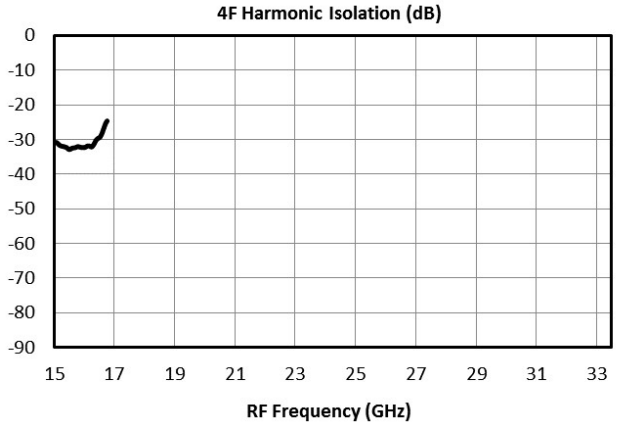
3F Harmonic Isolation (dB)



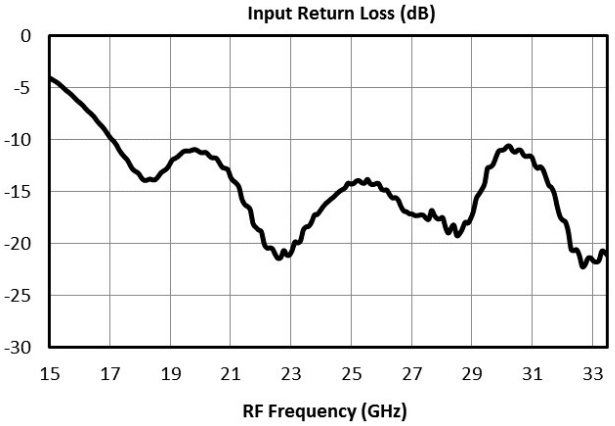
4F Output Suppression (dBc)

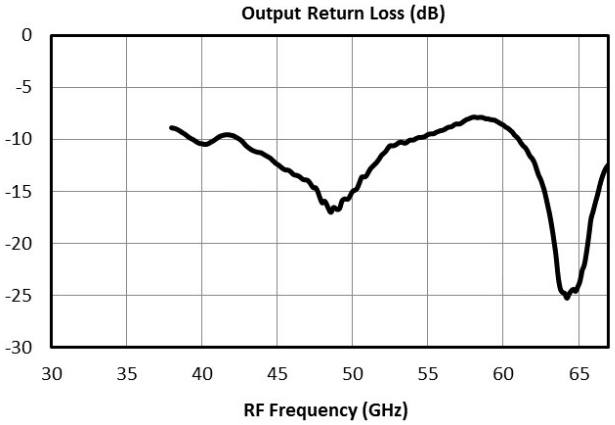


4F Harmonic Isolation (dB)



Input Return Loss (dB)

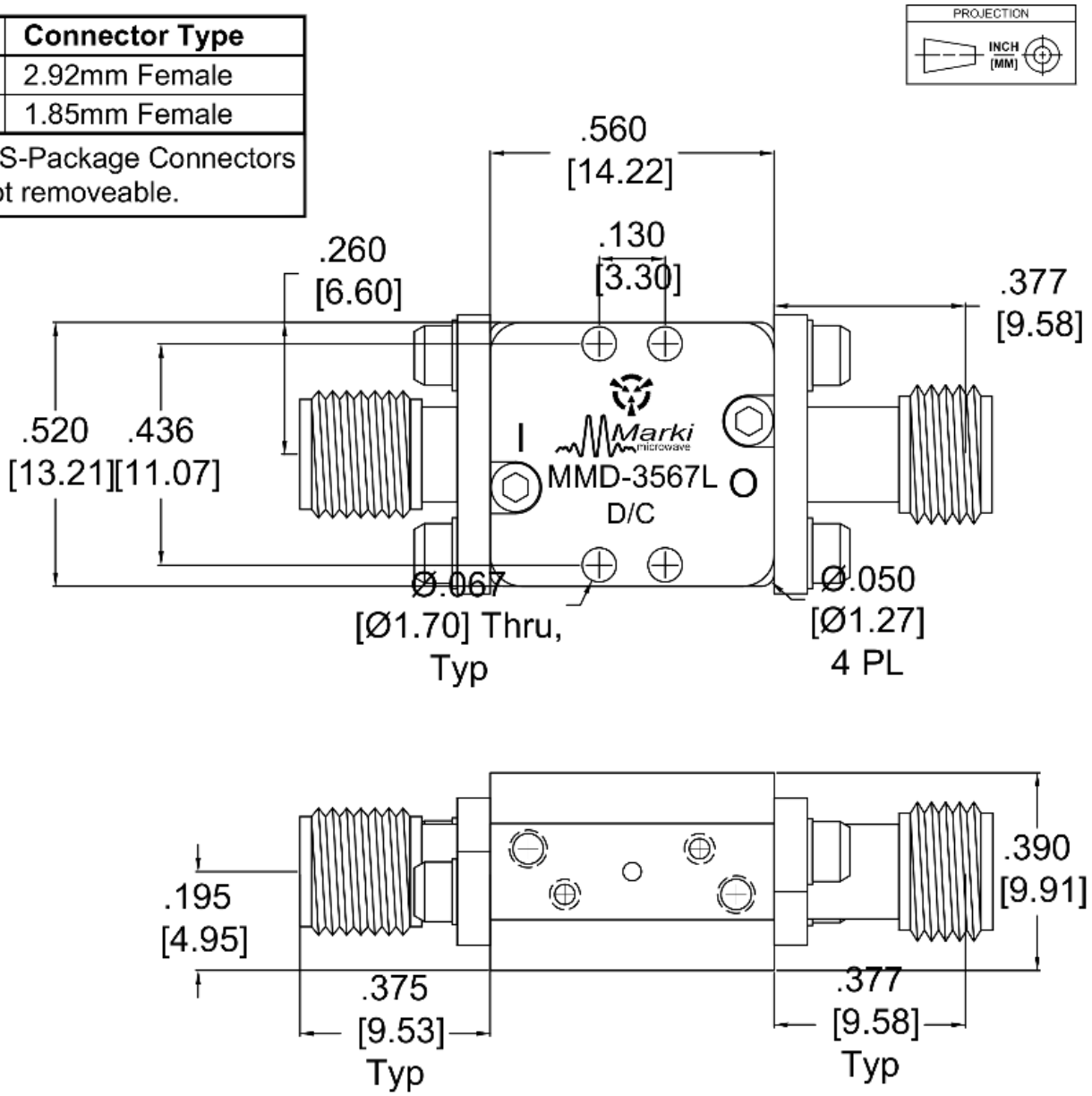




Mechanical Data

Outline Drawing

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



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