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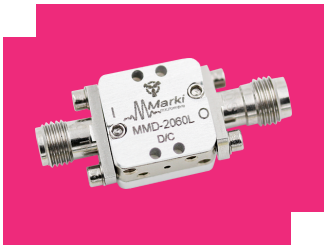
MMD-2060LU

GaAs MMIC Millimeter Wave Doubler

DEVICE OVERVIEW

General Description

The MMD-2060L is a MMIC millimeter wave doubler fabricated with GaAs Schottky diodes. This operates over a guaranteed 10 to 30 GHz input frequency range or a doubled output frequency range of 20 to 60 GHz. It features excellent conversion loss, superior isolations and harmonic suppressions across a broad bandwidth. Both the wire bondable die and connectorized units are available. For new designs, the MMD-2060LBH in our inline bullet housing package is the preferred package and offers improved performance over the MMD-2060LU.



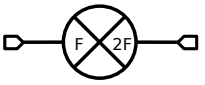
Features

- 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-2060LU	GaAs MMIC Millimeter Wave Doubler	U	Standard	REACH RoHS	Released	EAR99

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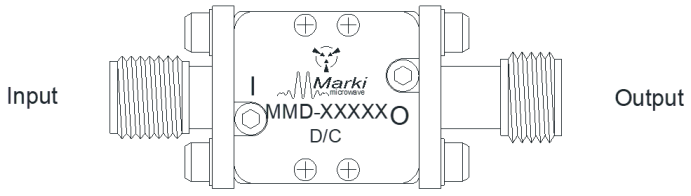
Revision History

Revision Code	Revision Date	Comment
-	2018-11-01	Datasheet Initial Release
A	2018-11-01	Correction to Performance Plots Limits

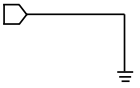
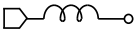
Port Configuration and Functions

Port Diagram

The MMD-2060L 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	DC Equivalent Circuit
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 coupled to the diodes for the CH and U packages. Blocking capacitor is optional.	
Port 2	Output	1.85F	2x Input Frequency output port. Port 2 is DC open for the CH and 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
Port 1 DC Current	25	mA
Power Handling, at any Port	23	dBm

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Weight	Package name: U	10g
Dimensions	-	14.22 x 13.21 mm

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	3	-	10	dBm

Electrical Specifications

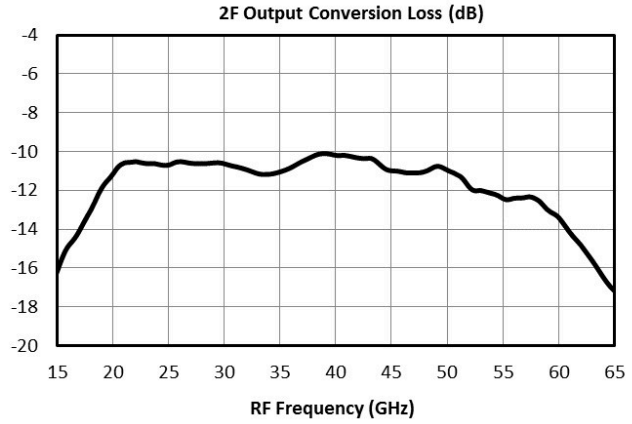
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the connectorized U package doubler used in the forward direction with a +3 dBm sine wave input. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C. RF testing of our die is performed on a sample basis to verify conformance to datasheet guaranteed specifications.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Conversion Loss	Second Harmonic Output	-	-	-	12	-	dB
Conversion Loss	Second Harmonic Output	-	-	-	11	14	dB
Input Frequency Range	-	-	-	10	-	30	GHz
Input Power	-	-	-	3	-	10	dBm
Isolation, 1F [1]	Input = 10 - 30 GHz Output = 10 - 30 GHz	-	-	-	48	-	dB
Isolation, 3F [2]	Input = 10 – 20 GHz Output = 30 - 60 GHz	-	-	-	51	-	dB
Isolation, 4F [3]	Input = 10 – 15 GHz Output = 40 - 60 GHz	-	-	-	25	-	dB
Output Frequency Range	-	-	-	20	-	60	GHz
Spurious Suppression, All Harmonics	Input = 27.5 - 30 GHz Output = 55 - 60 GHz	-	-	-	37	-	dBc
Suppression, 3F [4]	Input = 10 – 20 GHz Output = 30 - 60 GHz	-	-	-	41	-	dBc
Suppression, 4F [5]	Input = 10 – 15 GHz Output = 40 - 60 GHz	-	-	-	13.5	-	dBc

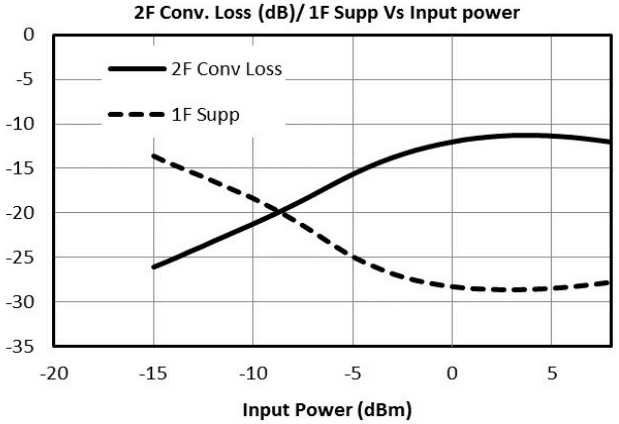
[1] Isolation is defined as the harmonic power relative to the 1F fundamental input power
[2][3] Isolation is defined as the harmonic power relative to the 1F fundamental input power.
[4] Suppressions and isolations measured with an input source with >60dBc (relative to fundamental input) harmonic suppression.Suppression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

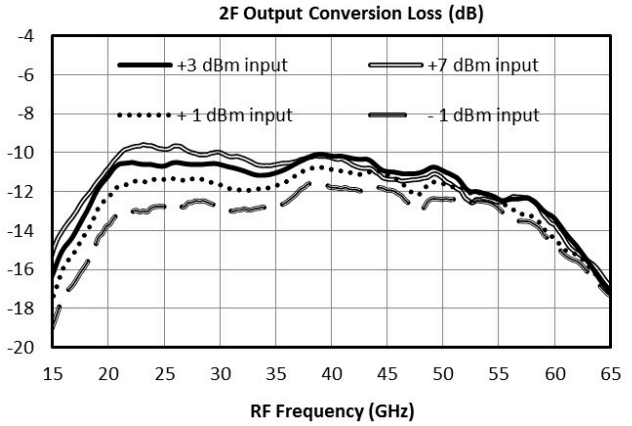
2F Output Conversion Loss (dB)



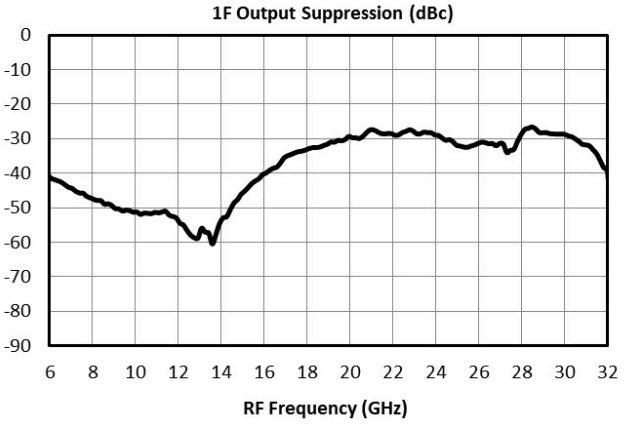
2F Conv. Loss (dB)/ 1F Supp Vs Input power



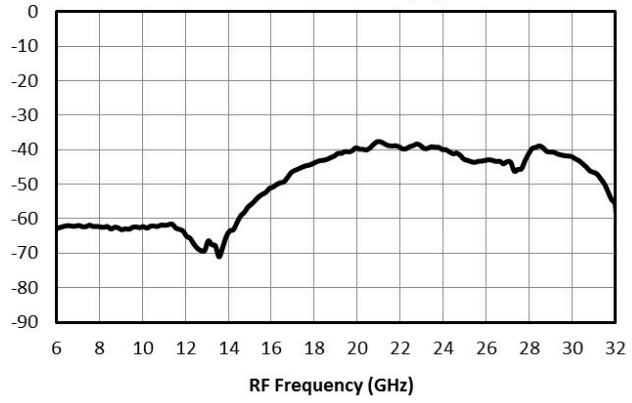
2F Output Conversion Loss (dB)



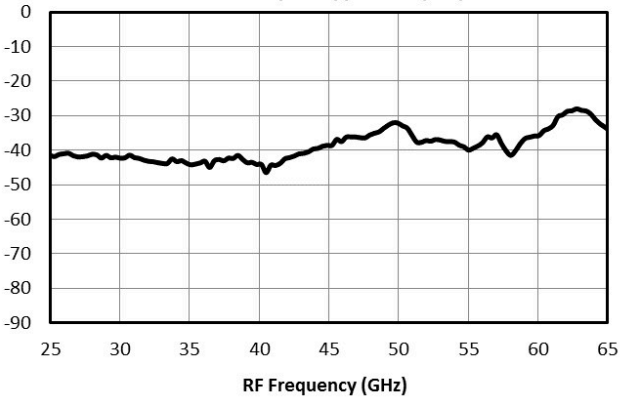
1F Output Suppression (dBc)



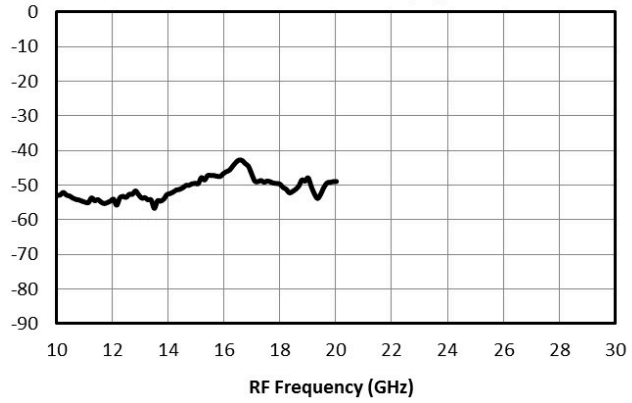
1F Harmonic Isolation (dB)



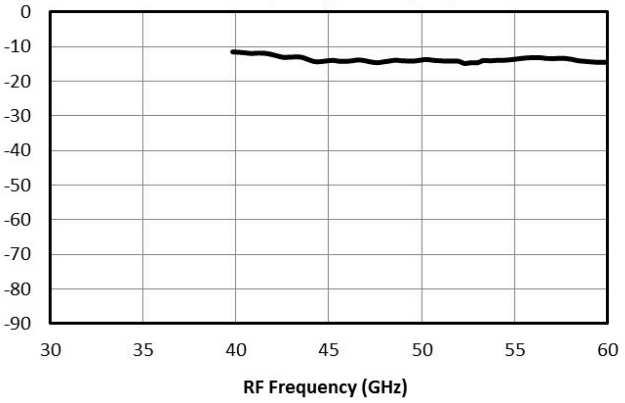
3F Output Suppression (dBc)

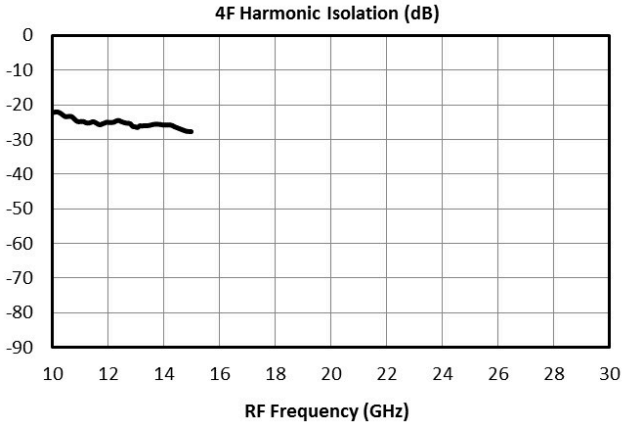


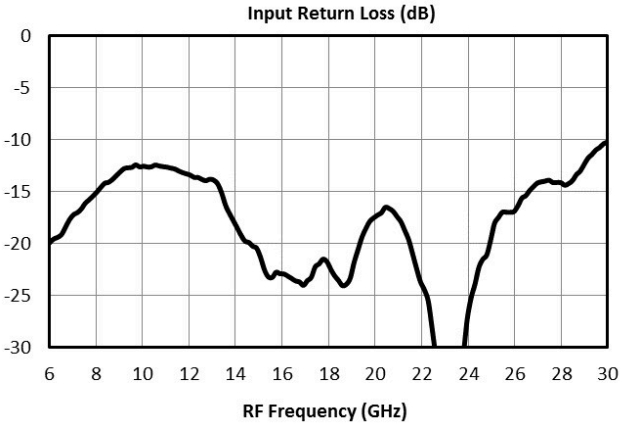
3F Harmonic Isolation (dB)



4F Output Suppression (dBc)





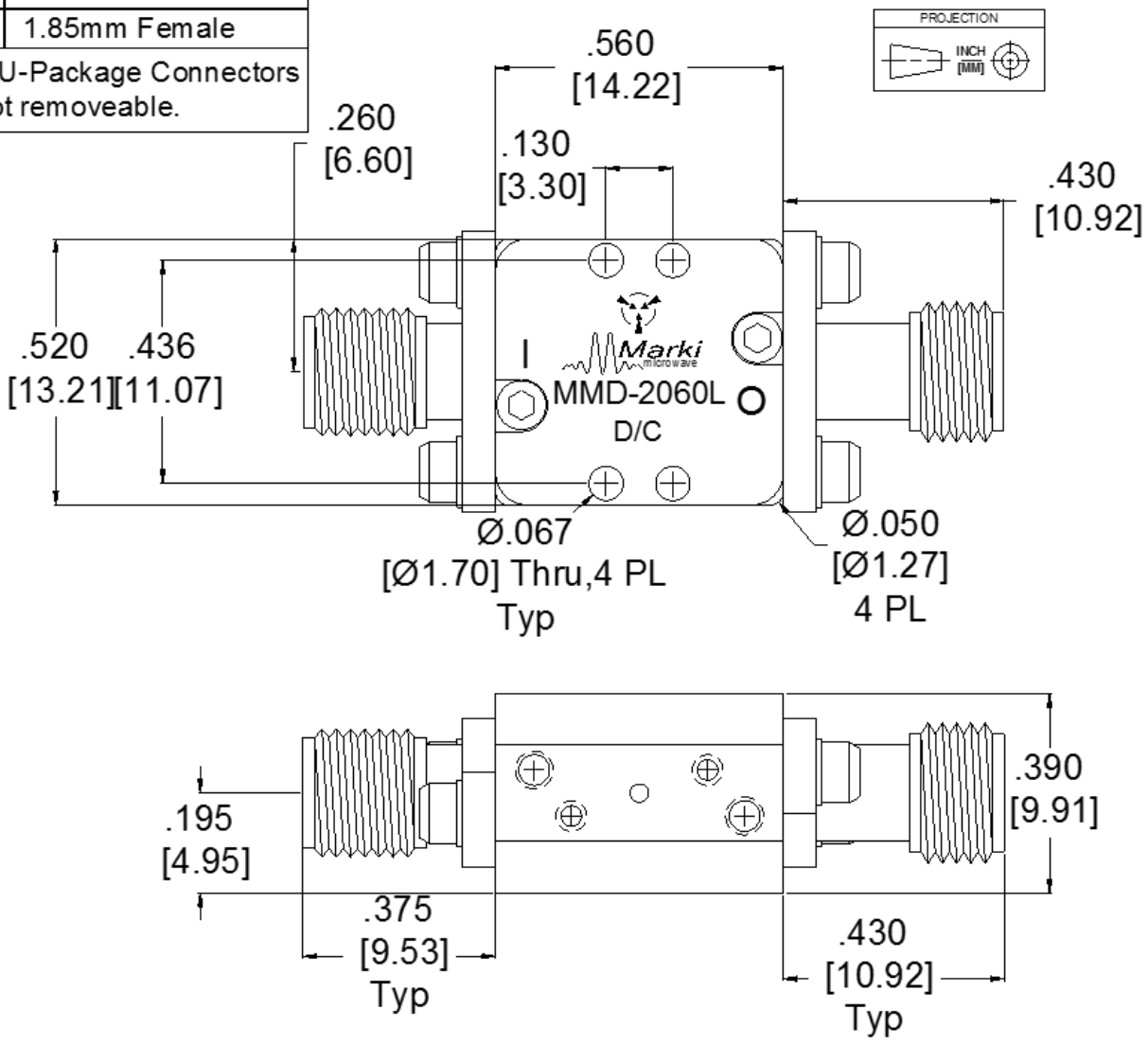


Mechanical Data

Outline Drawing

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

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



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