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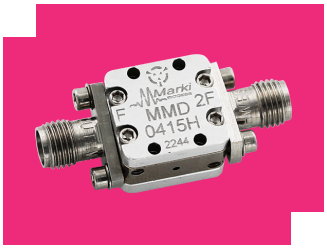
MMD-0415HS

GaAs MMIC Doubler

DEVICE OVERVIEW

General Description

The MMD-0415H is a MMIC doubler fabricated with GaAs Schottky diodes. This operates over a guaranteed 2 to 7.5 GHz input frequency range or a doubled output frequency range of 4 to 15 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.



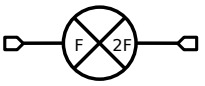
Features

- High fundamental rejection
- High fundamental suppression

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-0415HS	GaAs MMIC Doubler	S	Standard	REACH RoHS	Released	EAR99

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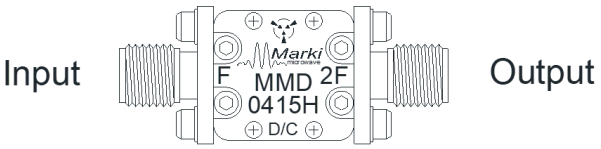
Revision History

Revision Code	Revision Date	Comment
-	2022-11-01	Datasheet Initial Release

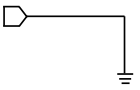
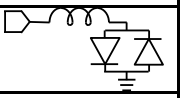
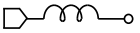
Port Configuration and Functions

Port Diagram

The MMD-0415H 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	-	S package ground provided through metal housing and outer coax conductor.	
Port 1	Input	SMAF	Input 1x Frequency Port. Port 1 is DC coupled to the diodes for the S packages. Blocking capacitor is optional.	
Port 2	Output	SMAF	2x Input Frequency output port. Port 2 is DC open for the S 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	29	dBm

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
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	7	14	20	dBm

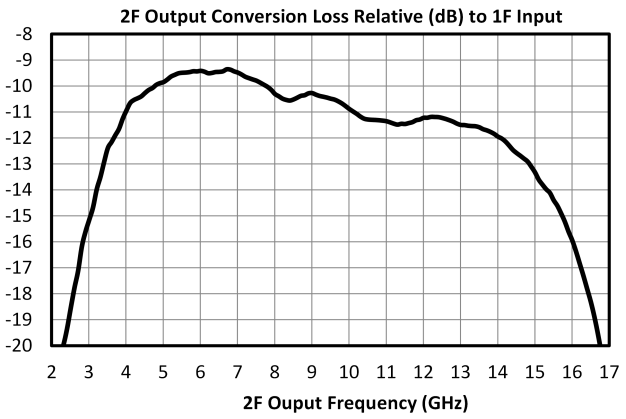
Electrical Specifications

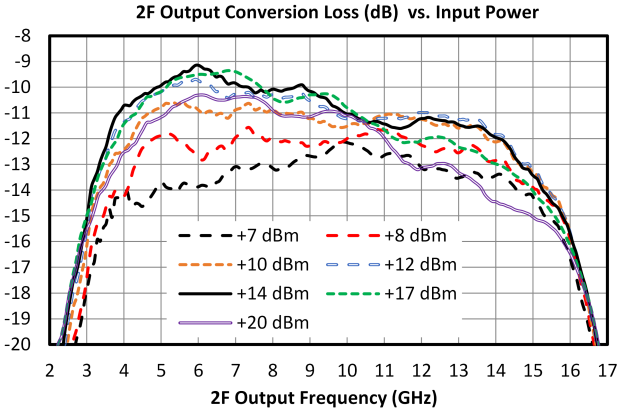
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the connectorized S package doubler used in the forward direction with a +14 dBm sine wave input. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C. RF testing of our die is performed on a sample basis to verify conformance to datasheet guaranteed specifications.

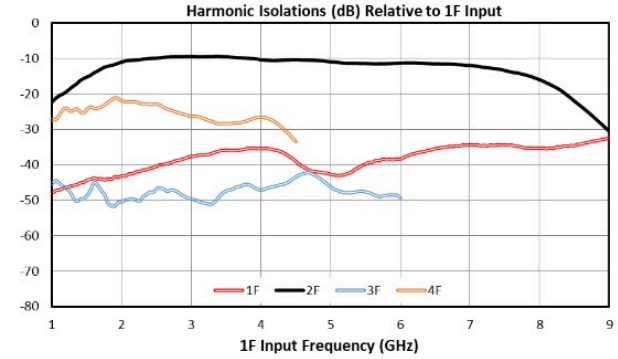
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Input Frequency Range	-	-	-	2	-	7.5	GHz
Input Power	-	-	-	7	14	20	dBm
Isolation, 1F [1]	Input=2–7.5 GHz Output=2–7.5 GHz	2	7.5	-	38	-	dB
Isolation, 3F [2]	Input=2–5 GHz Output=6-15 GHz	6	15	-	47	-	dB
Isolation, 4F [3]	Input=2–3.75 GHz Output=8-15 GHz	8	15	-	25	-	dB
Output Frequency Range [4]	-	-	-	4	-	15	GHz
Suppression, 1F [5]	Input=2–7.5 GHz Output=2–7.5 GHz	2	7.5	-	27	-	dBc
Suppression, 3F [6]	Input=2–5 GHz Output=6-15 GHz	6	15	-	36	-	dBc
Suppression, 4F [7]	Input=2–3.75 GHz Output=8-15 GHz	8	15	-	15	-	dBc
Conversion Loss	Input = 2 - 7.5 GHz Output = 4 - 15 GHz	-	-	-	11	15	dB

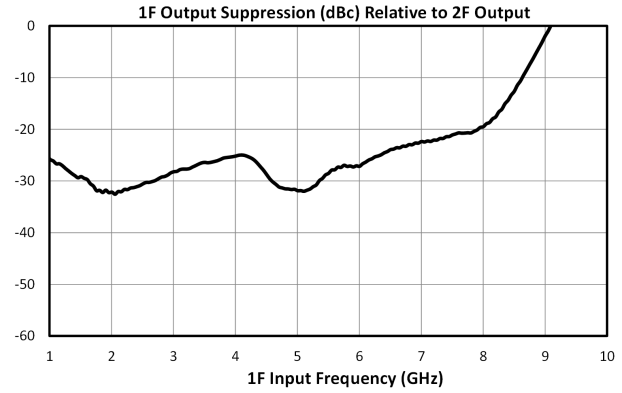
[1][2][3] Isolation is defined as the harmonic power relative to the 1F fundamental input power.
[4] Output return loss measured with a fixed frequency large signal 4 GHz input.
[5][6][7] Suppressions and isolations measured with an input source with >60dBc (relative to fundamental input) harmonic suppression. Suppression is defined as the harmonic power relative to the 2F doubled output power.

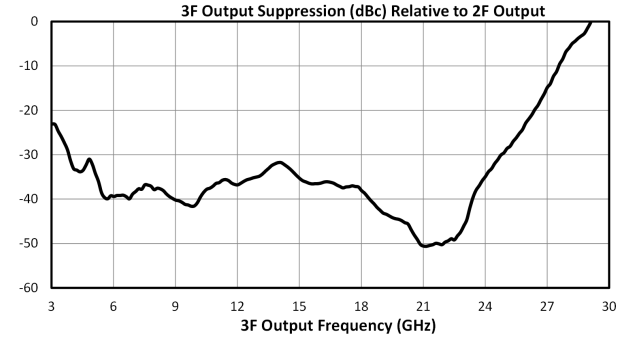
Typical Performance Plots

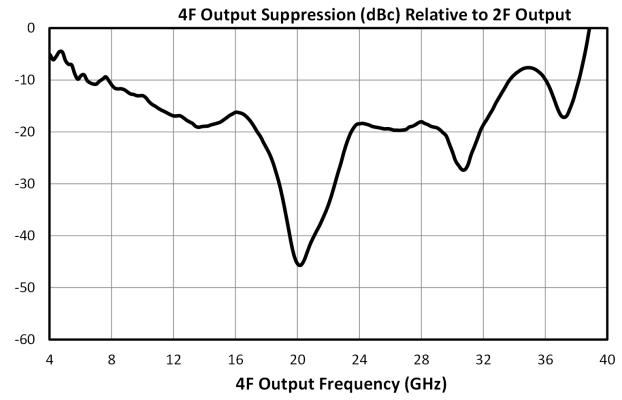


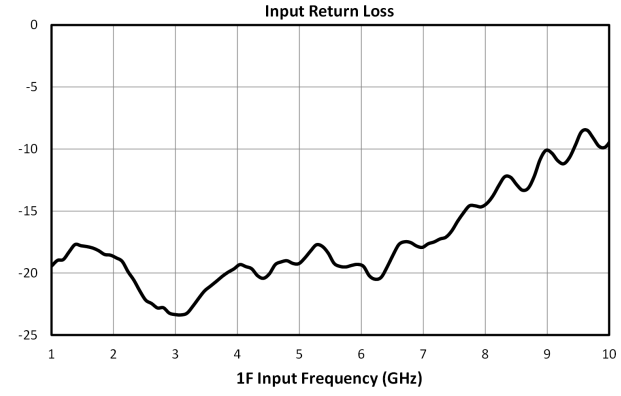


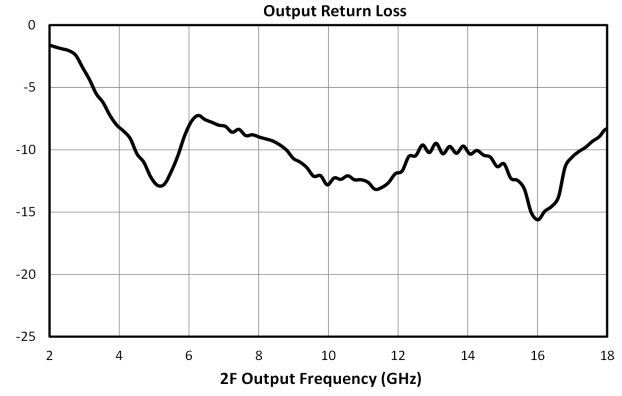








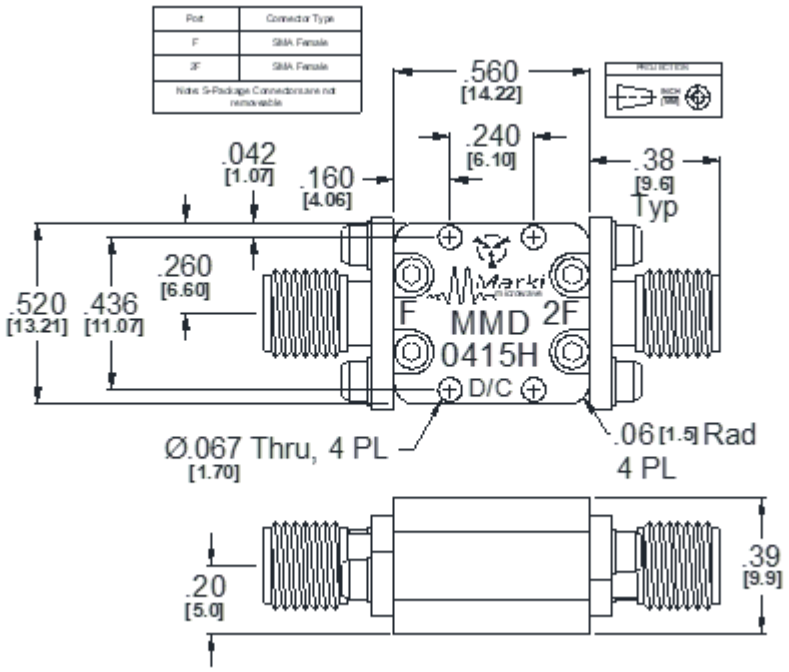




Mechanical Data

Outline Drawing

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



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