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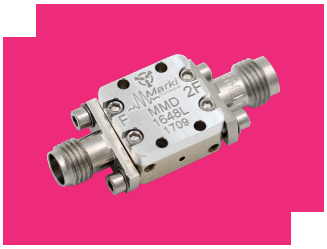
MMD-1648LS

High Isolation GaAs MMIC Doubler

DEVICE OVERVIEW

General Description

The MMD-1648L is a balanced MMIC doubler covering 16 to 48 GHz on the output. It features superior isolations and harmonic suppressions across a broad bandwidth in a highly miniaturized form factor. Accurate, nonlinear simulation models are available for Microwave Office® through the Marki Microwave PDK. The MMD-1648L is available as a wire bondable chip or a connectorized package. The MMD-1648L is a superior alternative to Marki Microwave carrier and packaged doublers.



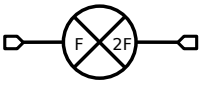
Features

- Compact Chip Style Package (0.058” x 0.096”x0.004”)
- CAD Optimized for Superior Suppressions and Efficiency
- Broadband Performance
- Excellent Unit-to-Unit Repeatability
- Fully nonlinear software models available with Marki PDK for Microwave Office®
- RoHS Compliant

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
MMD-1648LS	High Isolation GaAs MMIC Doubler	S	Standard	REACH RoHS	Released	EAR99

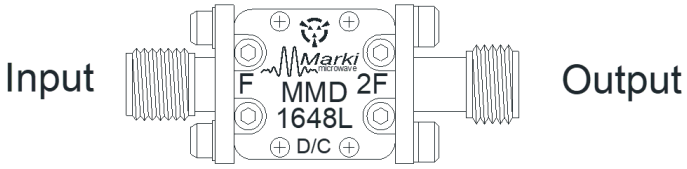
Table Of Contents

Revision History

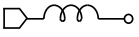
Revision Code	Revision Date	Comment
-	2016-08-01	Initial Release
A	2019-09-01	Added CH Package Dimensions
B	2020-01-01	Die Shrink

Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
2F	Output	2.4F	2x Input Frequency output port. The output port is DC open and AC matched to 50 Ohms from 16 to 48 GHz. Blocking capacitor is optional.	
F	Input	SMAF	Input 1x Frequency Port. The input port is DC open and AC matched to 50 Ohms from 8 to 24 GHz. Blocking capacitor is optional.	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
RF Power Handling (RF+LO), 100°C	20	dBm
RF Power Handling (RF+LO), 25°C	25	dBm

Package Information

Parameter	Details	Rating
Dimensions	-	14.22 x 13.21 mm

Electrical Specifications

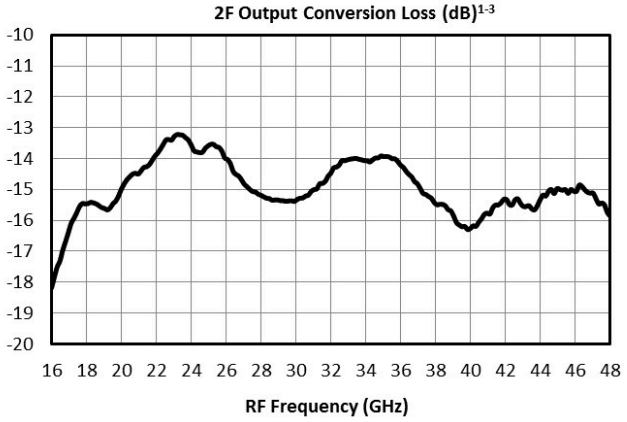
Specifications guaranteed from -55 to +100°C, measured in a 50Ω system. All bare die are 100% DC tested and 100% visually inspected. RF testing is performed on a sample basis to verify conformance to datasheet guaranteed specifications. Consult factory for more information.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Conversion Loss	Second Harmonic Output	16	48	-	15	20	dB
Isolation, 1F [1]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	8	24	-	59	-	dB
Isolation, 3F [2]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	85	-	dB
Isolation, 4F [3]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	33	-	dB
Isolation, 5F [4]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	57	-	dB
Suppression, 1F [5]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	8	24	-	44	-	dBc
Suppression, 3F [6]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	69	-	dBc
Suppression, 4F [7]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	33	-	dBc
Suppression, 5F [8]	Input = 8 - 24 GHz Output = 16 - 48 GHz Diode Option Input drive level = 10 - 15 dBm	16	48	-	58	-	dBc
Input Frequency Range	-	-	-	8	-	24	GHz
Output Frequency Range	-	-	-	16	-	48	GHz

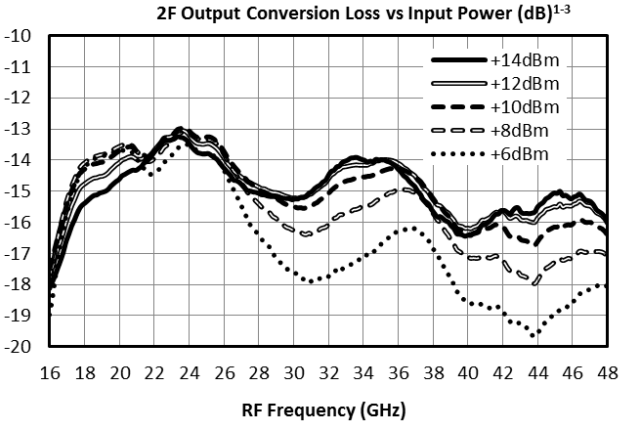
[1][2][3][4] Isolation is defined as relative to the 1F fundamental input power.
[5][6][7][8] Suppression is relative to 2F doubled output power.

Typical Performance Plots

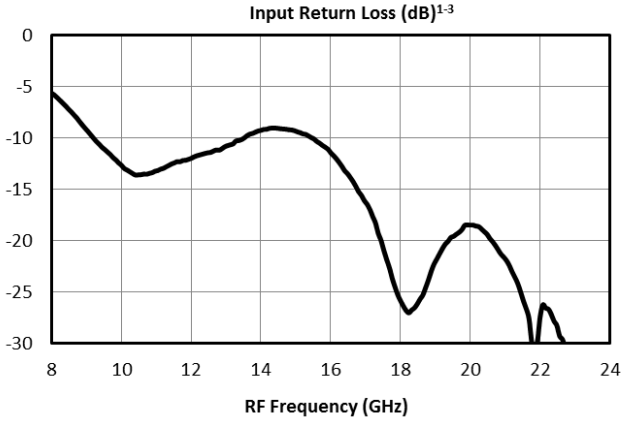
2F Output Conversion Loss (dB)[1-3]



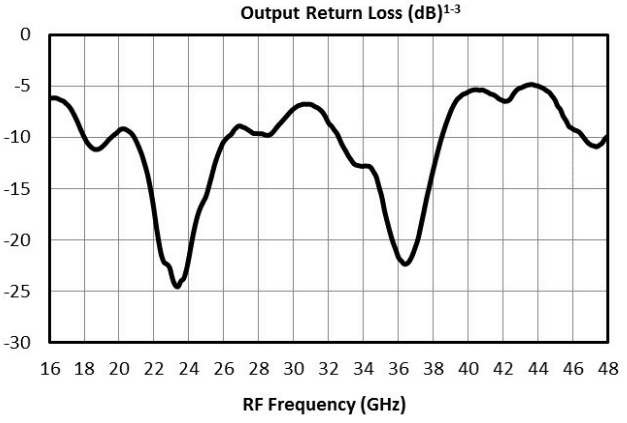
2F Output Conversion Loss vs Input Power (dB)[1-3]



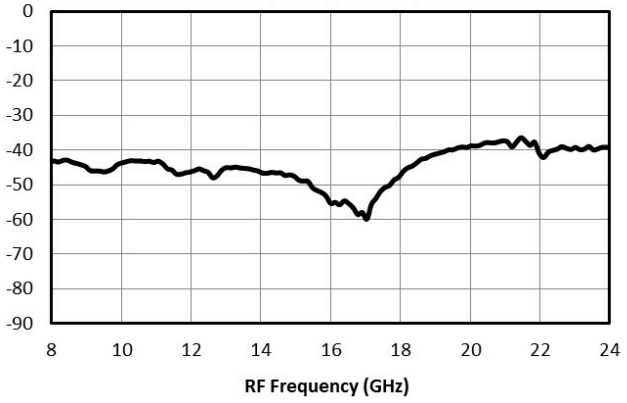
Input Return Loss (dB)[1-3]



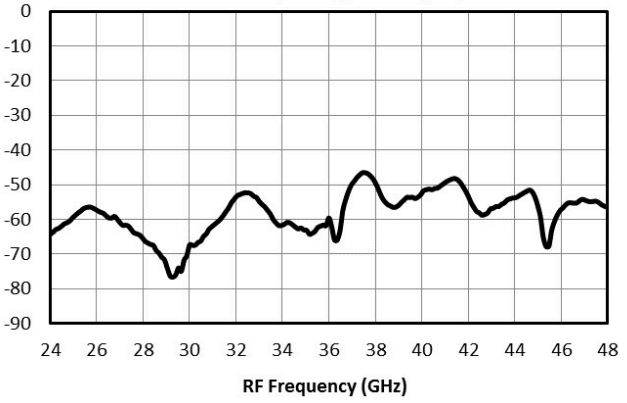
Output Return Loss (dB)[1-3]



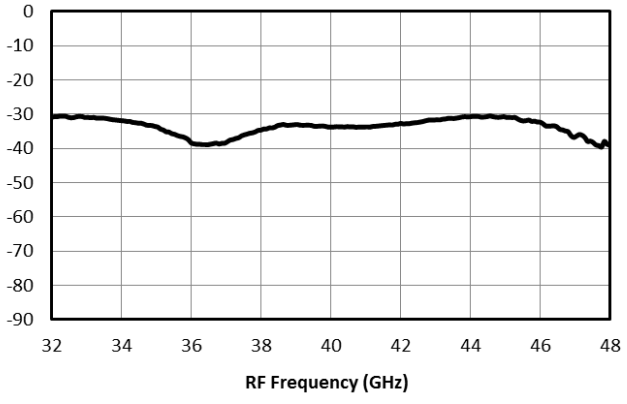
1F Output Suppression (dBc)[1-3]



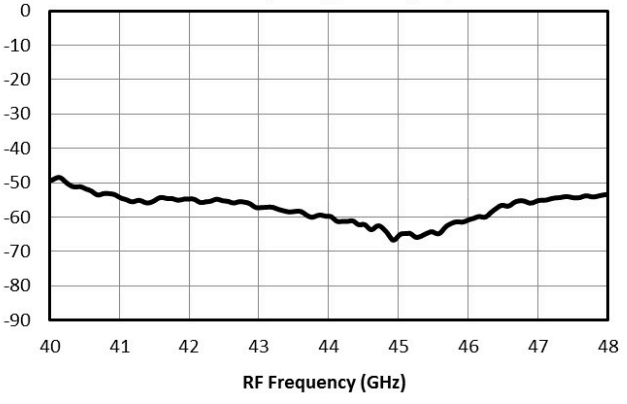
3F Output Suppression (dBc)[1-3]



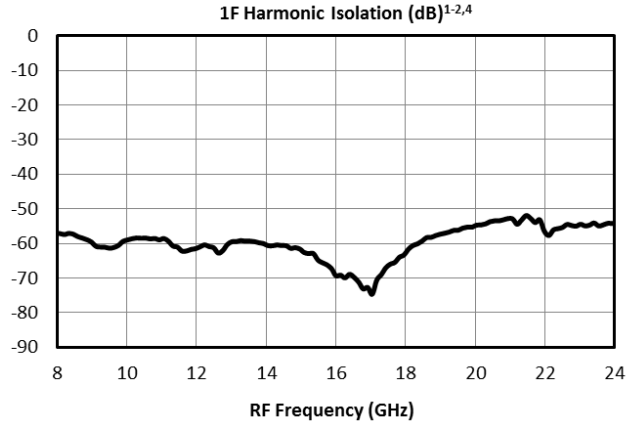
4F Output Suppression (dBc)[1-3]



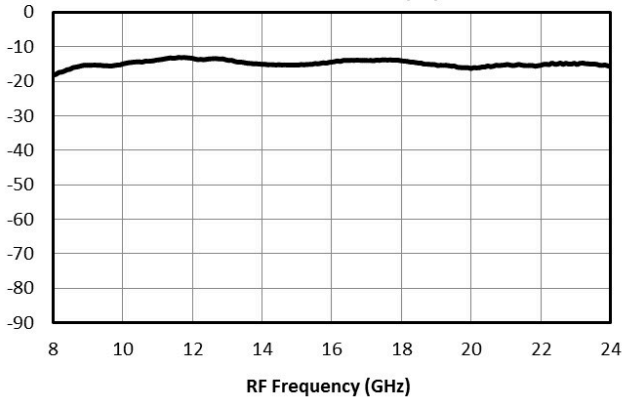
5F Output Suppression (dBc)[1-3]



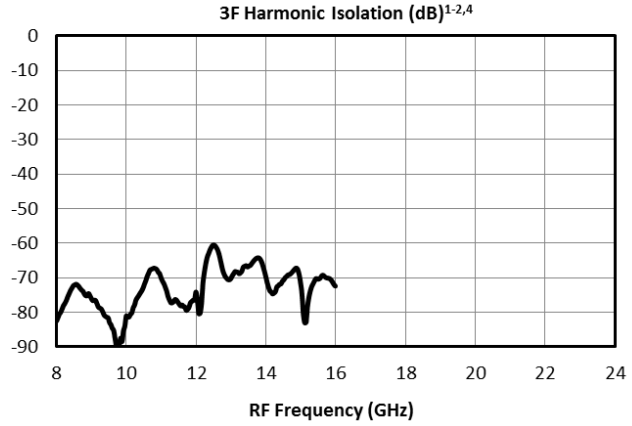
1F Harmonic Isolation (dB)[1-2,4]



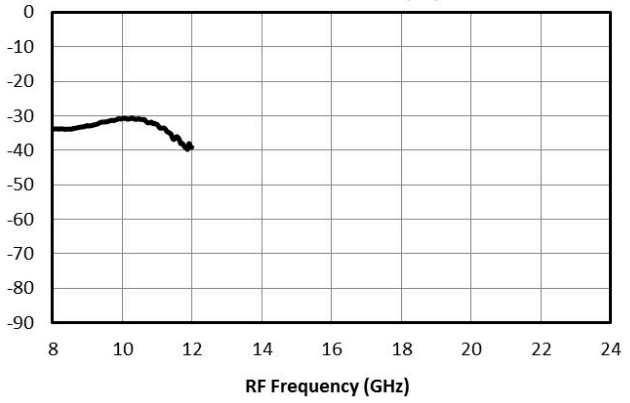
2F Harmonic Isolation (dB)[1-2,4]



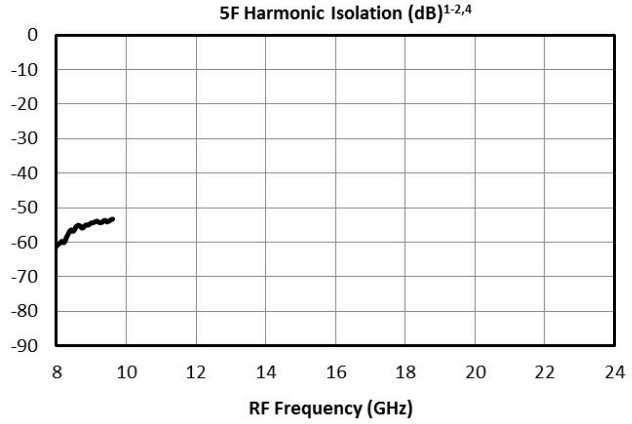
3F Harmonic Isolation (dB)[1-2,4]



4F Harmonic Isolation (dB)[1-2,4]



5F Harmonic Isolation (dB)[1-2,4]

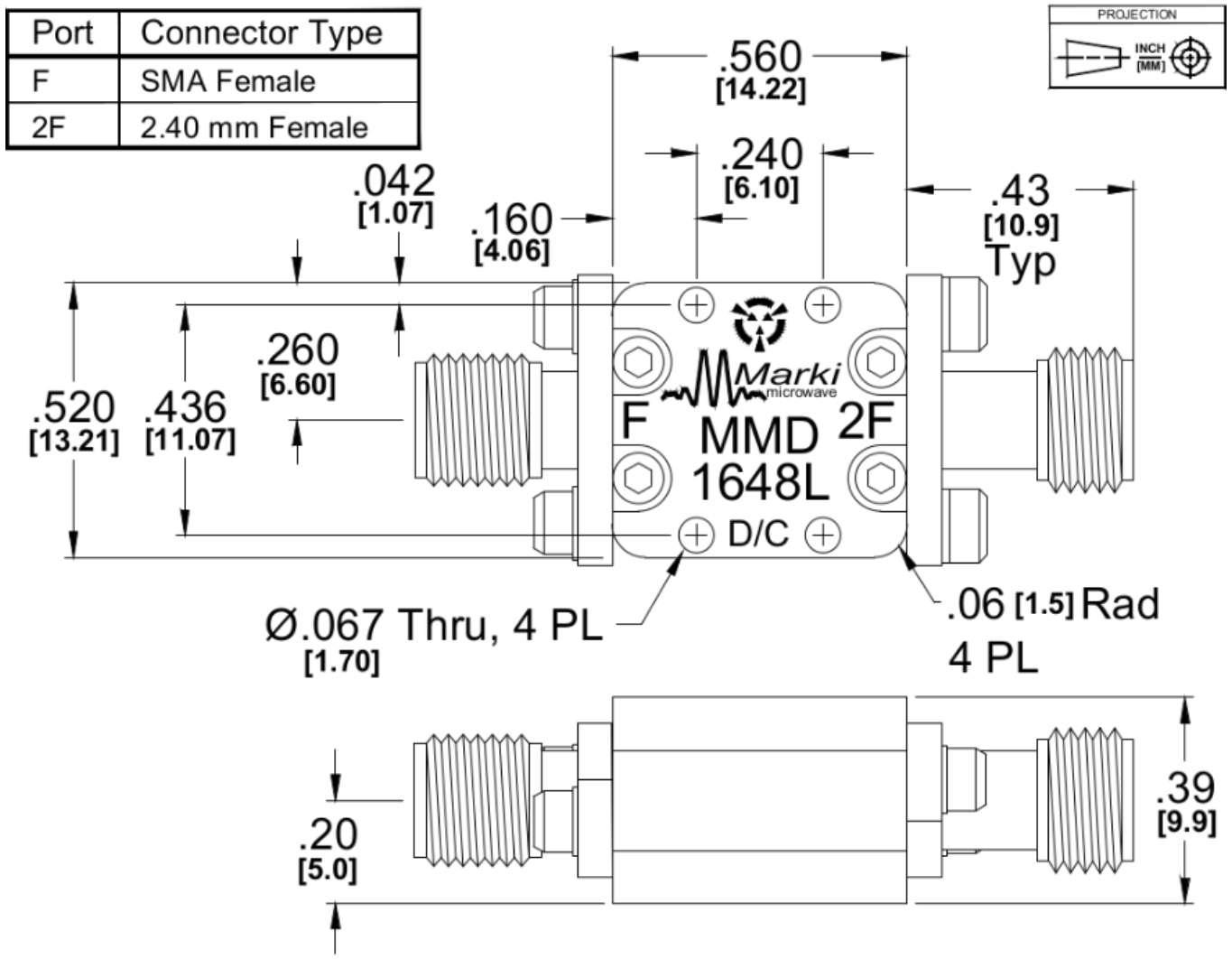


Mechanical Data

Outline Drawing

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

Port	Connector Type
F	SMA Female
2F	2.40 mm Female



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