Sales: 408-778-9952 | General: 408-778-4200 | Fax: 408-778-4300
Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

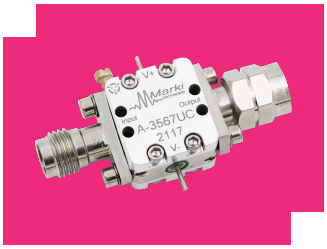
A-3567UC

30 GHz – 67 GHz LO Driver Amplifier

DEVICE OVERVIEW

General Description

The A-3567UC is a broadband MMIC LO buffer amplifier that is capable of producing at least +18 dBm up to 67 GHz. This amplifier can be used to drive L- or H-diode mixers from 35-67 GHz, or L- or H-diode IQ mixers from 35-60 GHz. It also has built-in DC blocking capacitors on the input and output.



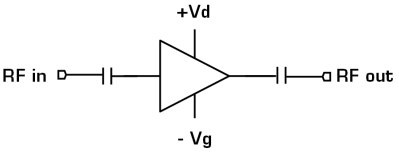
Features

- +20dBm Saturated Power
- Broadband Performance

Applications

- LO Driver amplifier for L-, H-, or S-diode mixers
- Mobile test and measurement equipment
- Radar
- SATCOM
- 5G transceivers

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
A-3567UC	30 GHz – 67 GHz LO Driver Amplifier	UC	Standard	REACH RoHS	Released	EAR99

Table Of Contents

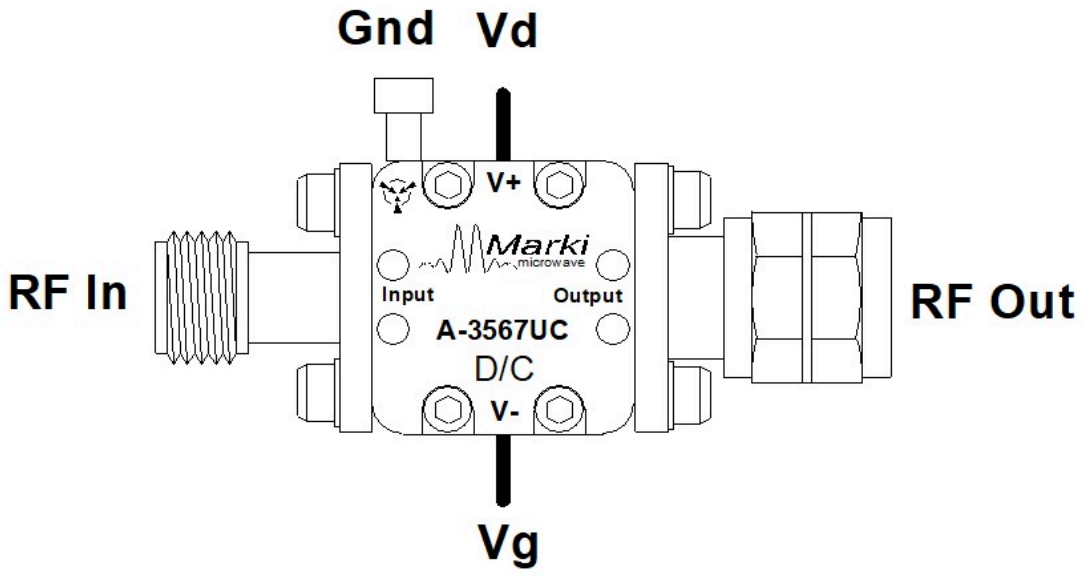
Revision History

Revision Code	Revision Date	Comment
-	2021-05-01	Datasheet Initial Release

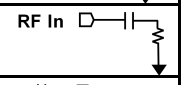
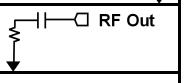
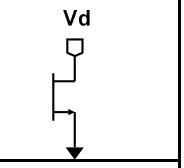
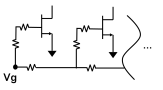
Port Configuration and Functions

Port Diagram

A port diagram of the A-3567UC is shown below.



Port Functions

Port	Function	Connector Type	Description	Equivalent Circuit for Package
GND	Ground	-	Exterior housing must be connected to a DC/RF ground potential with high thermal and electrical conductivity.	
RF In	RF Input	1.85F	This is the RF Input port of the amplifier. It is internally DC blocked and RF matched to 50 Ω.	
RF Out	RF Output	1.85M	This is the RF Output port of the amplifier. It is internally DC blocked and RF matched to 50 Ω.	
Vd	Drain Supply Pin	-	The Vd pin supplies drain voltage to the amplifier IC. Apply gate voltage Vg before applying drain voltage.	
Vg	Gate Bias Pin	-	The Vg pin supplies negative control voltage to the amplifier and controls the amplifier gain. The user should apply between 0.4V and -0.6V to Vg pad before applying positive DC voltage to Vd port. Lower (more negative) voltages on Vg pad will result in lower drain current and lower small signal gain.	

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 become inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	85	°C
Maximum Storage Temperature	150	°C
Minimum Operating Temperature	-40	°C
Minimum Storage Temperature	-65	°C
Negative Bias Voltage (Vg)	-2	V
Positive Drain Supply Voltage (Vd)	4.5	V
RF Input Power	22	dBm
Total Positive Drain Supply Current (Id)	600	mA

Package Information

Parameter	Details	Rating
ESD	125 to < 250 Volts	HBM Class 0B
Weight	Package name: UC	11.8g
Dimensions	-	13.21 x 14.22 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
Power Supply DC Voltage (Vd)	3	3.5	4	V
Ambient Temperature	-40	25	85	°C
Power Supply DC Current (with RF Input)	-	-	500	mA
Power Supply DC Current (Id) (No RF Input)	200	300	400	mA
Negative Bias Voltage (Vg)	-0.6	-0.5	-0.4	V

Sequencing Requirements

Turn-on Procedure:
1. Apply negative bias to Vg
2. Apply Vd

Turn-off Procedure:
1. Turn off Vd
2. Turn off Vg f

Electrical Specifications

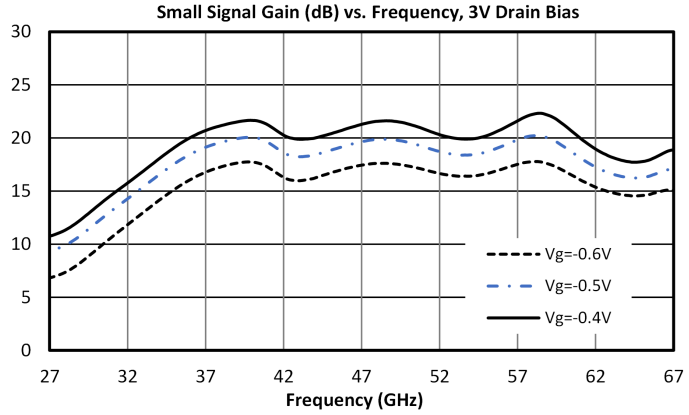
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Bias Requirements [1]	3.5V/-0.4V	-	-	-	374	-	mA
Bias Requirements [2]	3.5V/-0.5V	-	-	-	298	-	mA
Bias Requirements [3]	3.5V/-0.6V	-	-	-	222	-	mA
Input IP3	3.5V/-0.5V, -20 dBm Input Power	35	67	-	8	-	dBm
Input Power for Saturation	3.5V/-0.5V	35	67	-	5	-	dBm
Input Return Loss	3.5V/-0.5V Bias	35	67	-	-17	-	dB
Output IP3	3.5V/-0.5V, -20 dBm Input Power	35	67	-	26	-	dBm
Output Power [4]	3.5V/-0.5V Bias	35	67	15	20	-	dBm
Output Return Loss	3.5V/-0.5V Bias	35	67	-	-15	-	dB
Reverse Isolation	3.5V/-0.5V Bias	35	67	-	44	-	dB
Small Signal Gain	3.5V/-0.4V Bias	35	67	-	16	-	dB
Small Signal Gain	3.5V/-0.5V Bias	35	67	13	18	-	dB
Small Signal Gain	3.5V/-0.6V Bias	35	67	-	19	-	dB

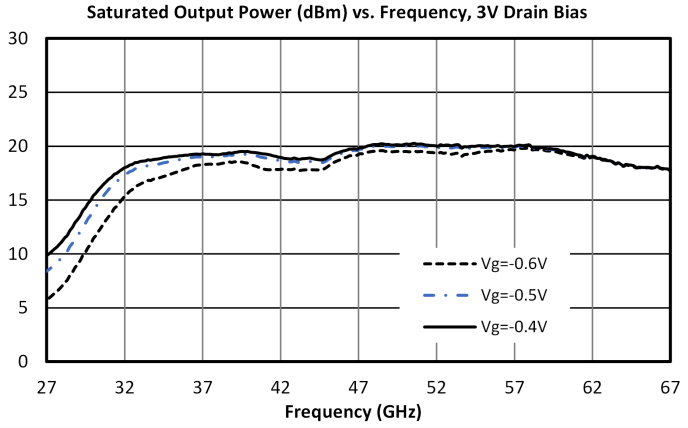
[1][2][3] Bias conditions tested with no RF input power. Bias conditions presented as Vd/Vg.
[4] Saturated Output Power measured with A-3567UC driver biased at 3.5V/-0.5V input to A-3567 DUT at specified bias condition. Input power to driver nominally 0dBm with 6dB attenuator, corresponding to +8dBm to +10dBm input power.

Typical Performance Plots

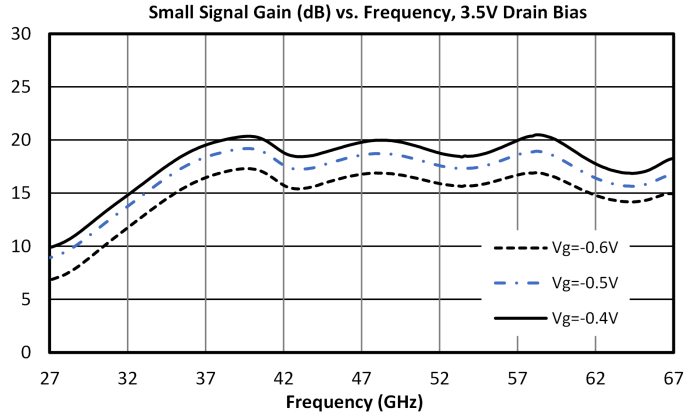
Small Signal Gain (dB) vs. Frequency, 3V Drain Bias



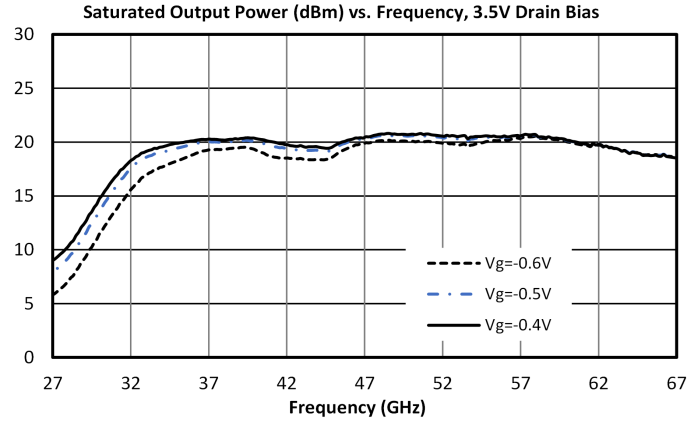
Saturated Output Power (dBm) vs. Frequency, 3V Drain Bias



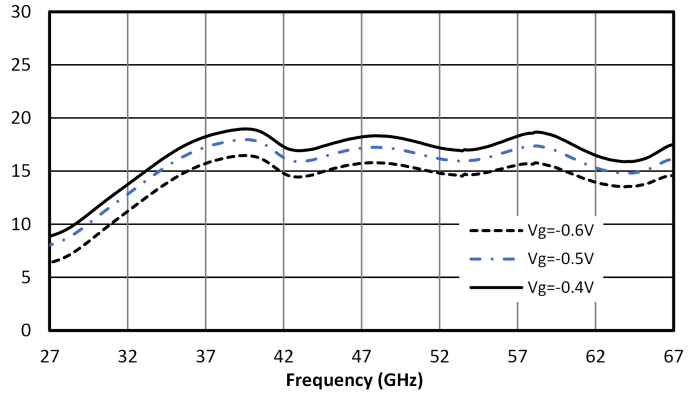
Small Signal Gain (dB) vs. Frequency, 3.5V Drain Bias



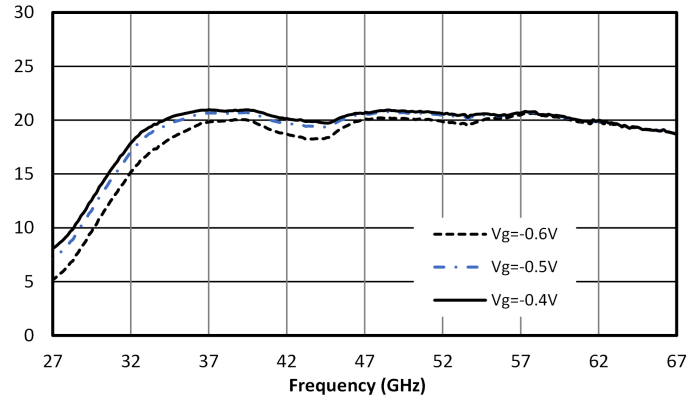
Saturated Output Power (dBm) vs. Frequency, 3.5V Drain Bias



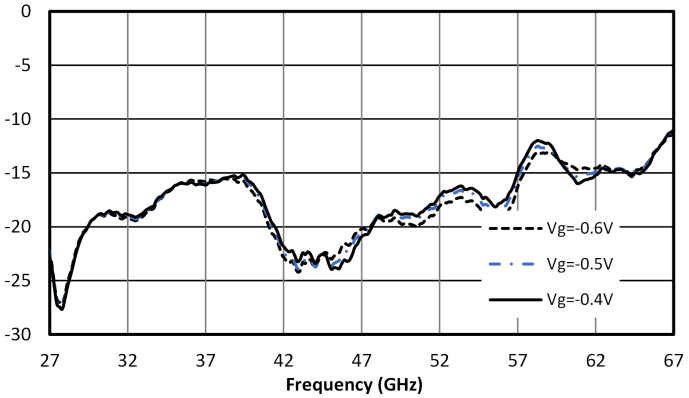
Small Signal Gain (dB) vs. Frequency, 4V Drain Bias



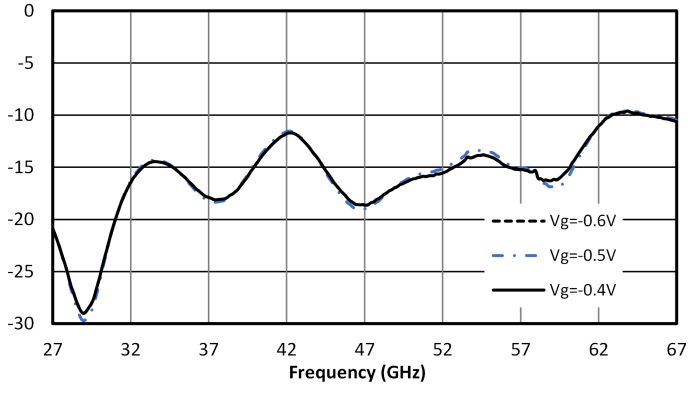
Saturated Output Power (dBm) vs. Frequency, 4V Drain Bias



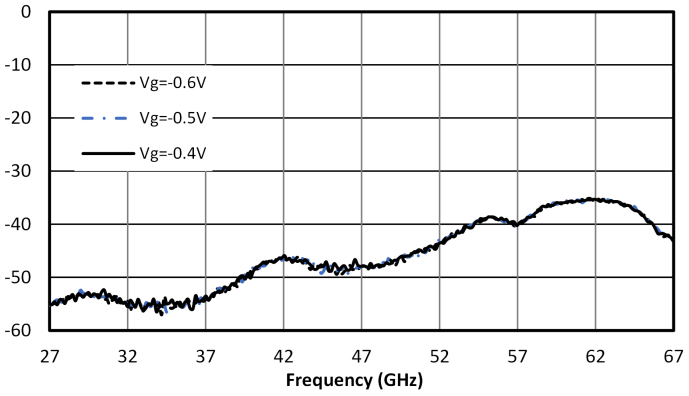
Input Return Loss (dB) vs. Frequency, 3.5V Drain Bias



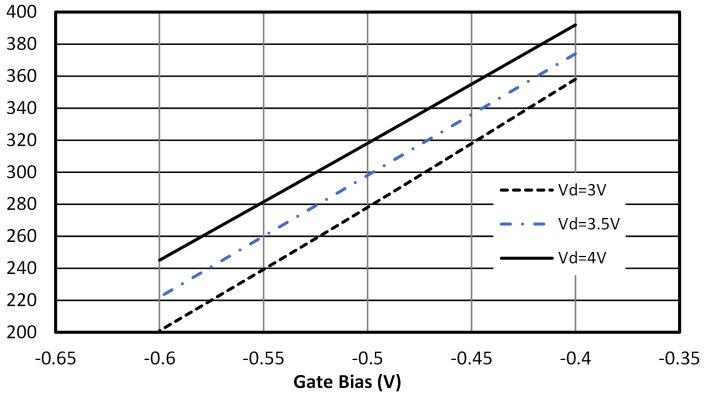
Output Return Loss (dB) vs. Frequency, 3.5V Drain Bias



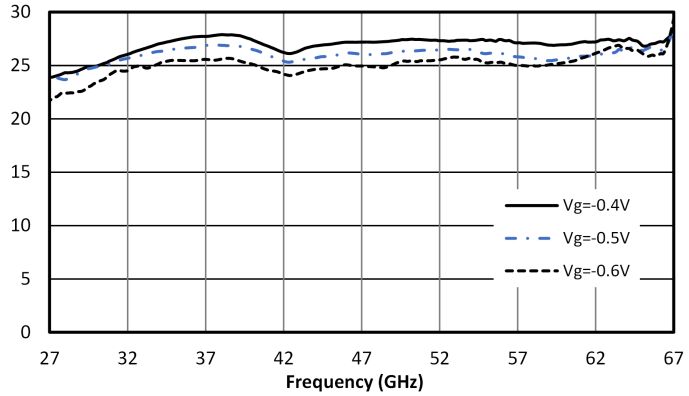
Reverse Isolation (dB) vs. Frequency, 3.5V Drain Bias



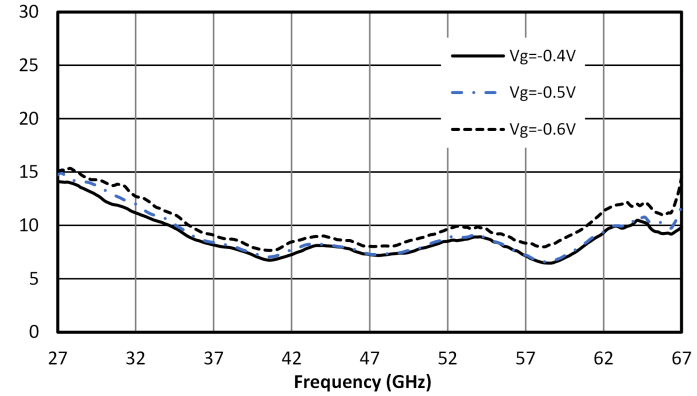
Drain Current (mA) vs. Gate Bias



Output IP3 (dBm) vs. Frequency, 3.5V Drain Bias

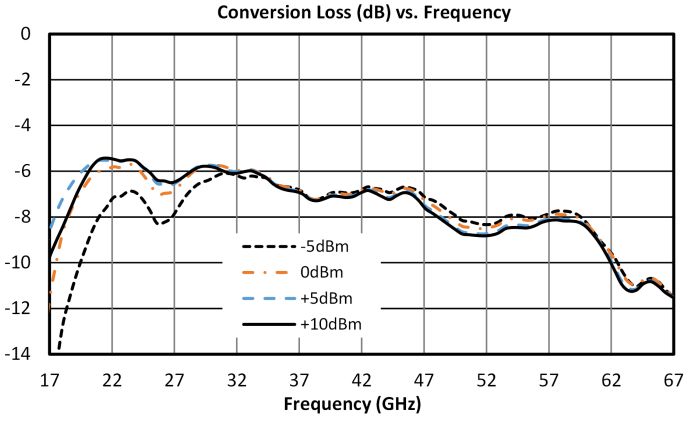


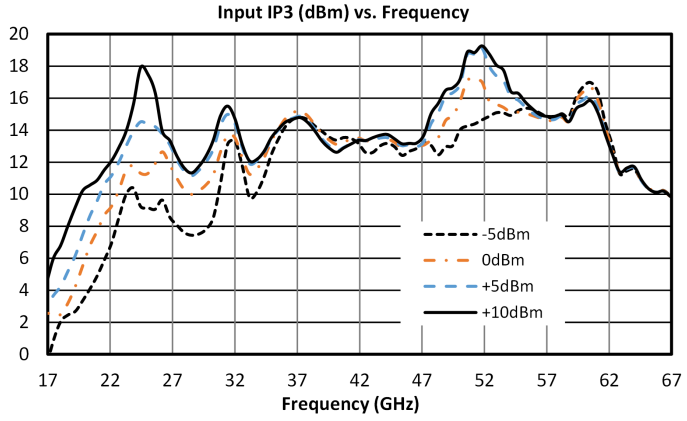
Input IP3 (dBm) vs. Frequency, 3.5V Drain Bias

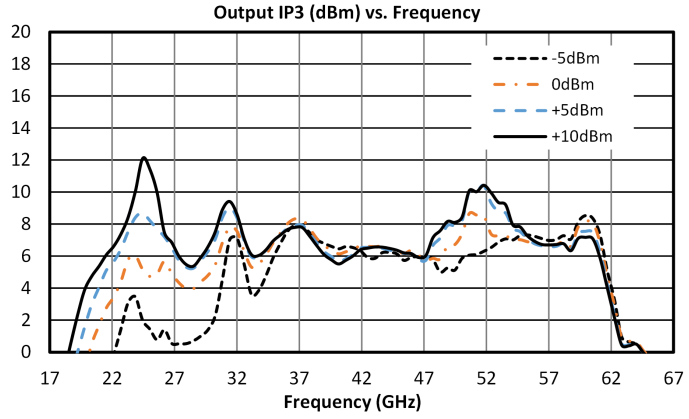


MM1-1467LUB Mixer Performance with A-3567UC LO Driver

Data taken by driving MM1-1467LUB module LO port with A-3567UC module in Config A biased at 3.5V_d and -0.5V_g. Specified power is at input to A-3567UC driver. IF frequency 91MHz.

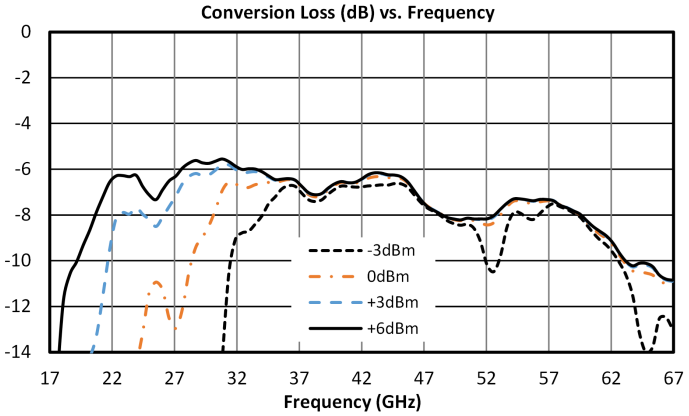


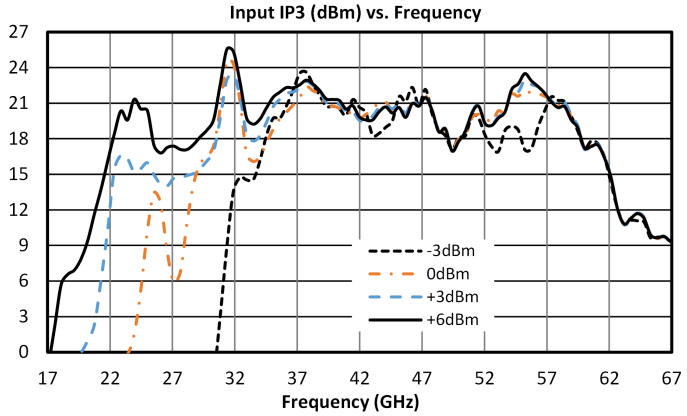


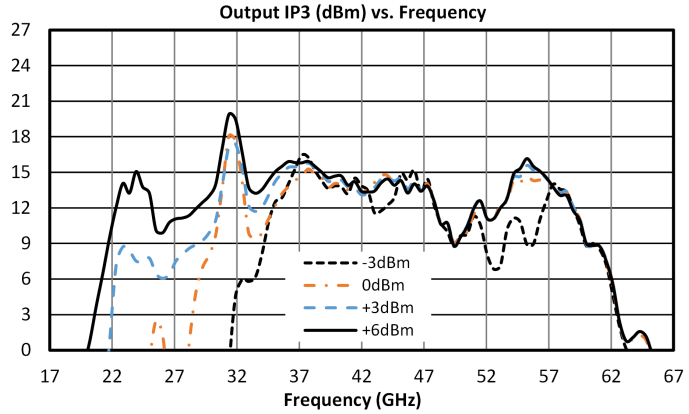


MM1-1467HUB Mixer Performance with A-3567UC LO Driver

Data taken by driving MM1-1467HUB module LO port with A-3567UC module in Config A biased at 3.5V$_d$ and -0.5V$_g$. Specified power is at input to A-3567UC driver. IF frequency 91MHz.

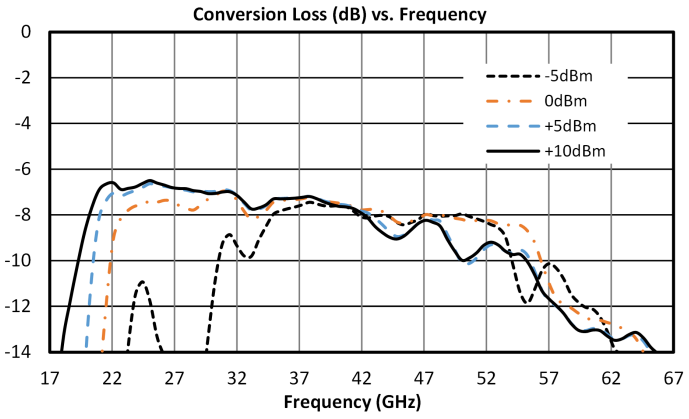


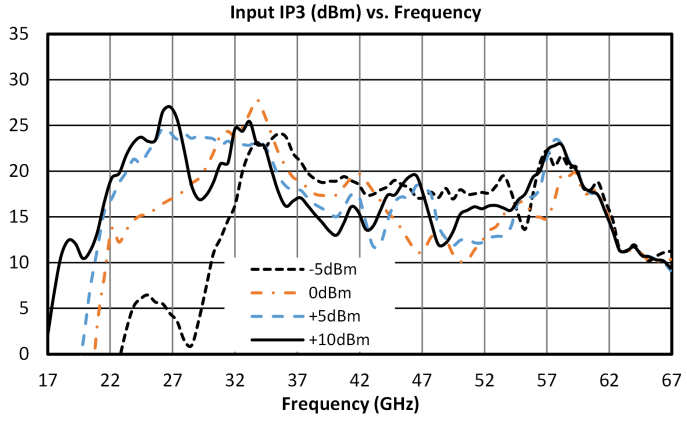


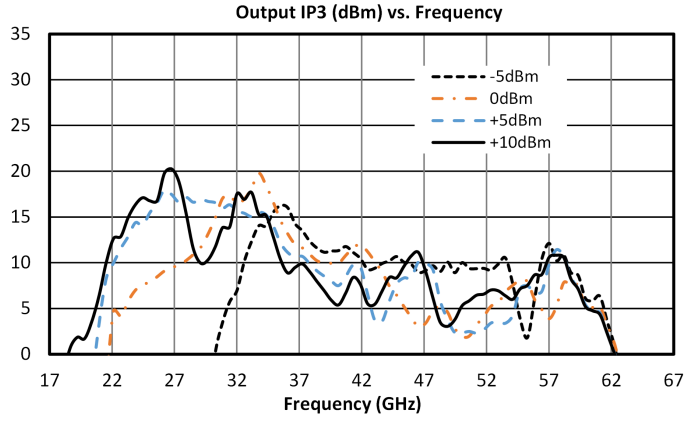


MM1-1857HS Mixer Performance with A-3567UC LO Driver

Data taken by driving MM1-1857HS module LO port with A-3567UC module with a biased at 3.5V_d and -0.5V_g. Specified power is at input to A-3567UC driver. IF frequency 91MHz.

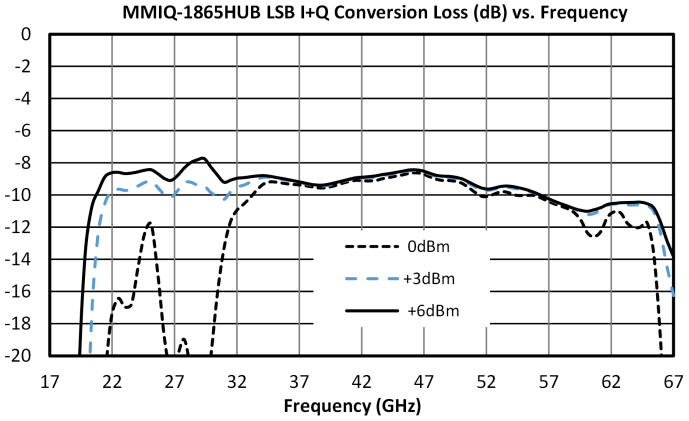


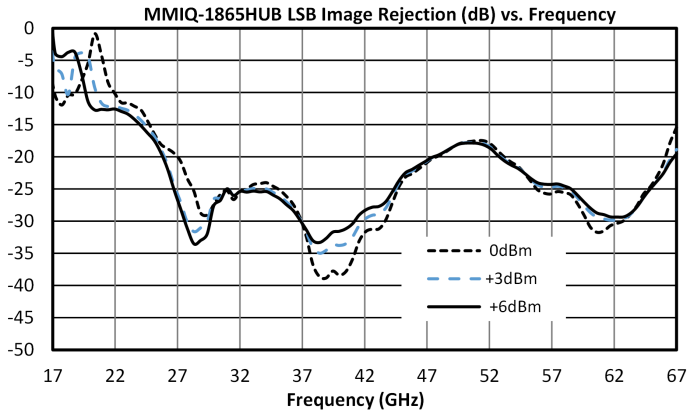


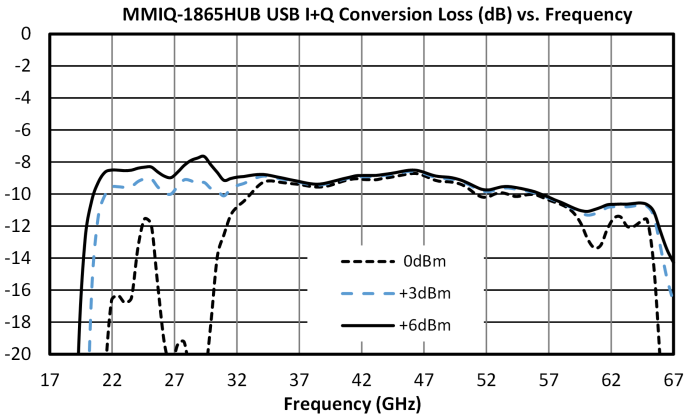


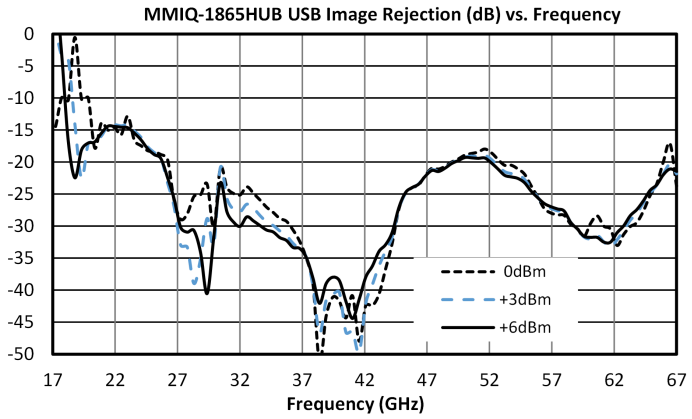
MMIQ-1865HUB IQ Mixer Performance with A-3567UC LO Driver

Data taken by driving MMIQ-1465HUB module LO port with A-3567UC module biased at 3.5V_d and -0.5V_g. Specified power is at input to A-3567UC driver. Combined I+Q frequency 91MHz.



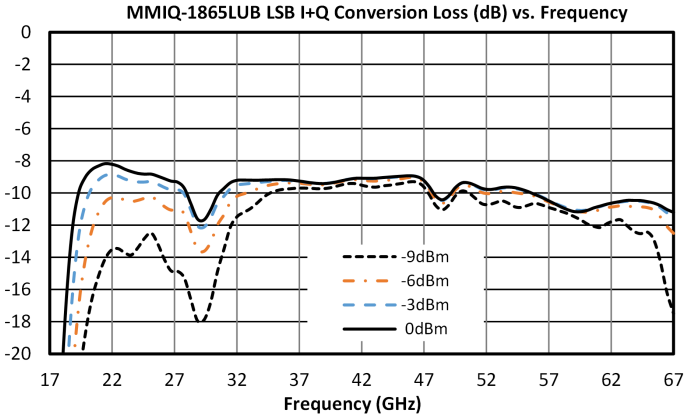


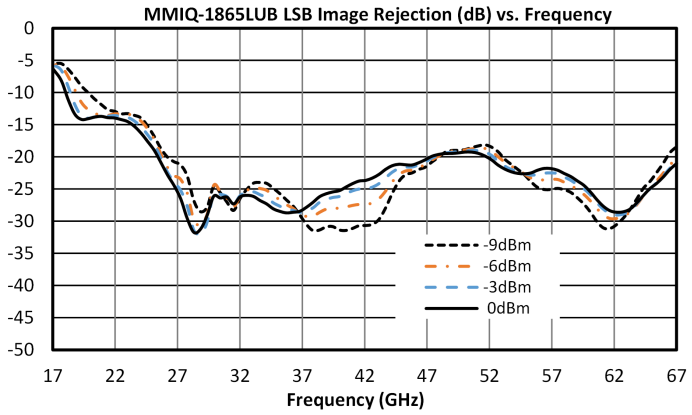


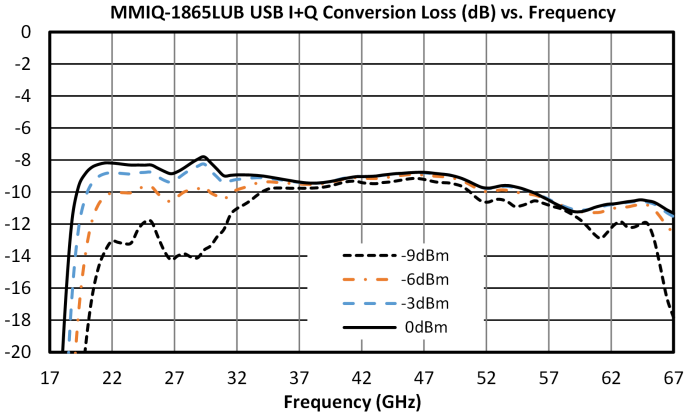


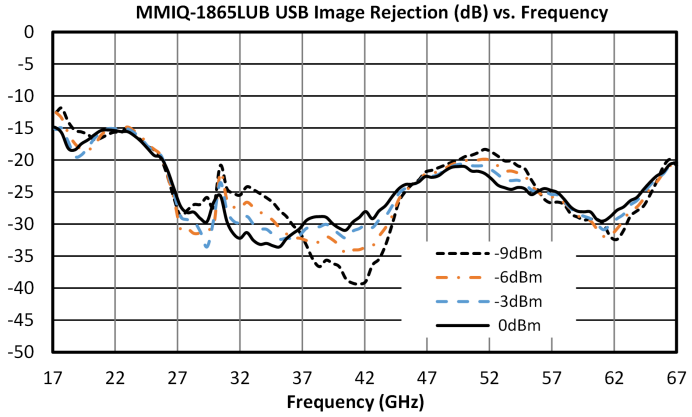
MMIQ-1865LUB IQ Mixer Performance with A-3567UC LO Driver

Data taken by driving MMIQ-1465HUB module LO port with A-3567UC module biased at 3.5V_d and -0.5V_g. Specified power is at input to A-3567UC driver. Combined I+Q frequency 91MHz.





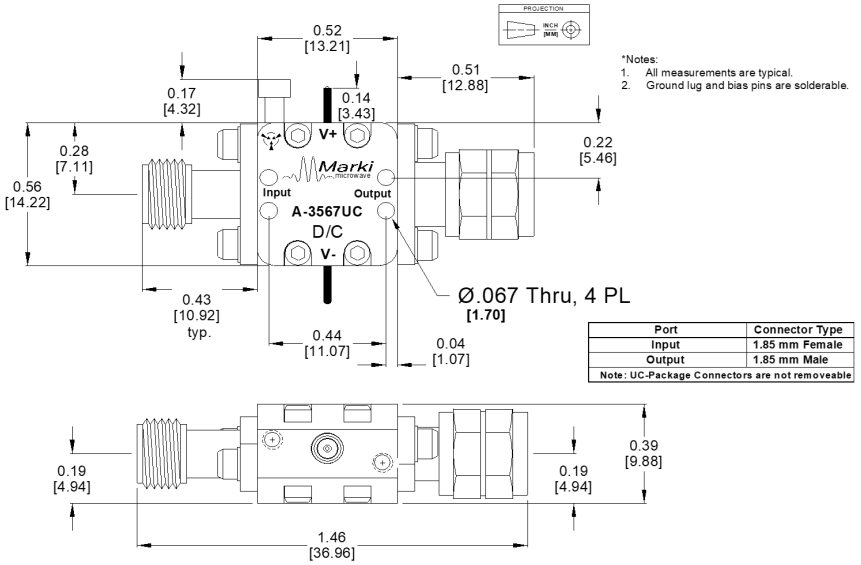




Mechanical Data

Outline Drawing

Download : Outline 3D Drawing | Outline 3D STP



Port	Connector Type
Input	1.85 mm Female
Output	1.85 mm Male
Note: UC-Package Connectors are not removeable	

DISCLAIMER

MARKI MICROWAVE, INC., (“MARKI”) PROVIDES TECHNICAL SPECIFICATIONS AND DATA (INCLUDING DATASHEETS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, AND OTHER INFORMATION AND RESOURCES “AS IS” AND WITH ALL FAULTS. MARKI DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

These resources are intended for developers skilled in the art designing with Marki products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards and other requirements. Marki makes no guarantee regarding the suitability of its products for any particular purpose, nor does Marki assume any liability whatsoever arising out of your use or application of any Marki product.

Marki grants you permission to use these resources only for development of an application that uses Marki products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Marki intellectual property or to any third-party intellectual property. Marki reserves the right to make changes to the product(s) or information contained herein without notice.

MARKI MICROWAVE and T3 MIXER are trademarks or registered trademarks of Marki Microwave, Inc. All other trademarks used are the property of their respective owners.