

22 - 57 GHz GaAs Driver Amplifier

AMM-8211

1. Device Overview

1.1 General Description

The AMM-8211 is a general-purpose broadband MMIC driver amplifier that provides +21 dBm output power suitable for driving a Marki H or L diode mixers at 22-57 GHz and S diode mixer from 25-50 GHz. The UC5 module features a single-supply, positive only bias and has built in DC-blocking capacitors on the input and output.



UC5 Package

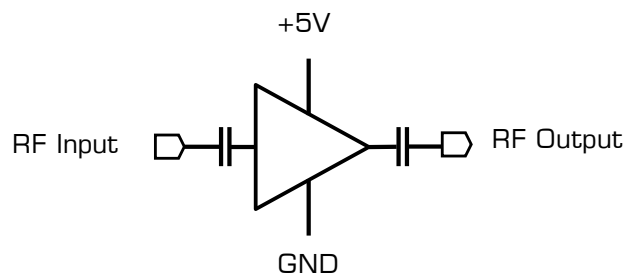
1.2 Features

- +21 dBm Output Power
- Broadband Performance
- Positive only, single supply bias
- [5V Single-Supply Voltage Module](#)
- [AMM-8211.s2p](#)

1.3 Applications

- Mobile test and measurement equipment
- Radar and satellite communications
- 5G Transceivers
- Driver amplifier L,H,S – diode mixers

1.4 Functional Block Diagram



UC5 Module

1.5 Part Ordering Options¹

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
AMM-8211UC5 ²	5V Positive Only Sequenced Connectorized Module	UC5	RoHS	Active	EAR99

¹ Refer to our [website](#) for a list of definitions for terminology presented in this table.

Table of Contents

1. Device Overview	1	2.2 AMM-8211 Port Functions	3
1.1 General Description	1	3. Specifications	4
1.2 Features	1	3.1 Absolute Maximum Ratings	4
1.3 Applications	1	3.2 Package Information	4
1.4 Functional Block Diagram	1	3.3 Recommended Operating Condition ...	5
1.5 Part Ordering Options	1	3.4 Supply Sequencing Requirements	5
2. AMM-8211 Port Configurations and Functions	3	3.5 Electrical Specifications	6
2.1 AMM-8211 Port Diagram	3	3.6 AMM-8211 Typical Performance Plots	7
		4. Mechanical Data	9
		4.1 AMM-8211 Package Outline Drawing	9

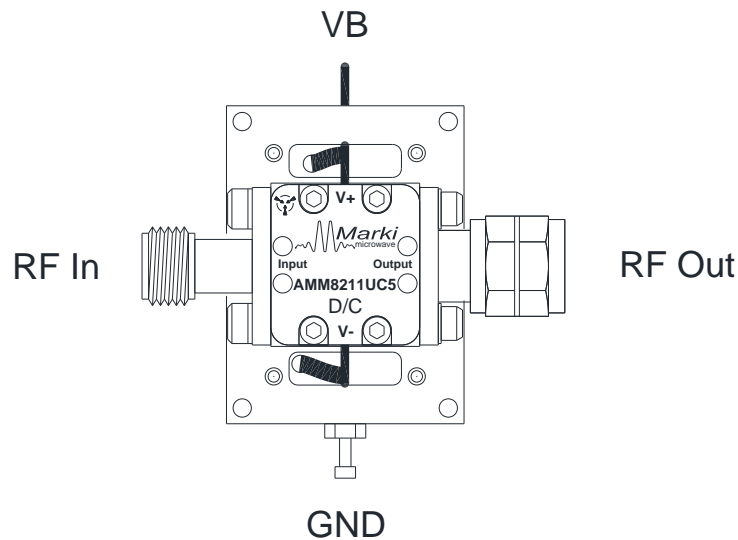
Revision History

Revision Code	Revision Date	Comment
-	March 2023	Datasheet Initial Release

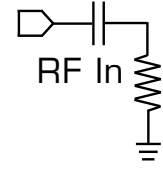
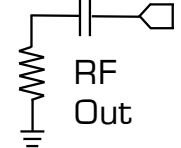
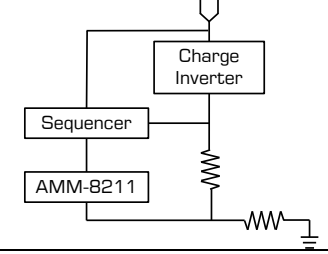
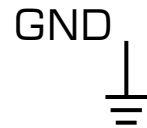
2. AMM-8211 Port Configurations and Functions

2.1 AMM-8211UC5 Port Diagram

A port diagram of the AMM-8211 is shown below.



2.2 AMM-8211UC5 Port Functions

Port	Function	Description	Equivalent Circuit for Package
RF In	RF Input	This is the RF Input port of the amplifier module. It is internally DC blocked and RF matched to 50 Ω .	
RF Out	RF Output	This is the RF Output port of the amplifier module. It is internally DC blocked and RF matched to 50 Ω .	
VB	Positive Bias Pin	The positive bias pin activates an internal negative voltage generator and a voltage sequencer when a 5V bias is applied externally. Nominally applies 3.5V to Vd and -0.5V to Vg at the amplifier level. See our tech note for details.	
GND	Ground	Exterior housing and ground lug must be connected to a DC/RF ground potential with high thermal and electrical conductivity. Ensure that the ground voltage is a common reference potential to all DC power supplies.	

3. Specifications

3.1 Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If any one of these limits are exceeded, the device may become inoperable or have a reduced lifetime.

Reliability limits are individual, instantaneous catastrophic limits only. Functional operation limits are indicated below. Operation of the device at multiple absolute maximum limits or for extended periods at a single limit can cause degradation and damage to the device.

Parameter	Maximum Rating	Units
Positive Bias Voltage (VB)	5.5	V
Positive Bias Current (Id)	450	mA
RF Input Power	+20	dBm
Operating Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C
θ_{JC} , Junction to Case Thermal Resistance	85	°C/W
Max Junction Temperature for MTTF of > 1E6 hours	175	°C
Max Power Dissipation for MTTF of > 1E6 hours	1	W

3.2 Package Information

Parameter	Details	Rating
Weight	AMM-8211UC5	23g

3.3 Recommended Operating Condition

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.

Recommended Operating Conditions	Min	Nominal	Max	Units
T _A , Ambient Temperature	-55	+25	+85	°C
Positive DC Bias Voltage (V _B)	+3.5	+5	+5.5	V
Positive DC Current (I _d) (No RF Input)	155	175	230	mA
Input Power for Saturation	+8	+11	+13	dBm

3.4 Supply Sequencing Requirements

There is no sequencing required to power up or power down the amplifier. The amplifier must have an output load connected during operation.

3.5 Electrical Specifications

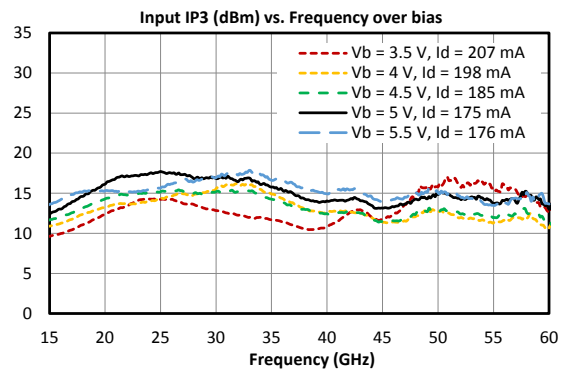
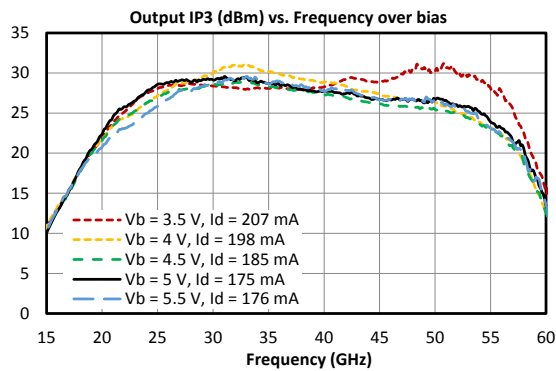
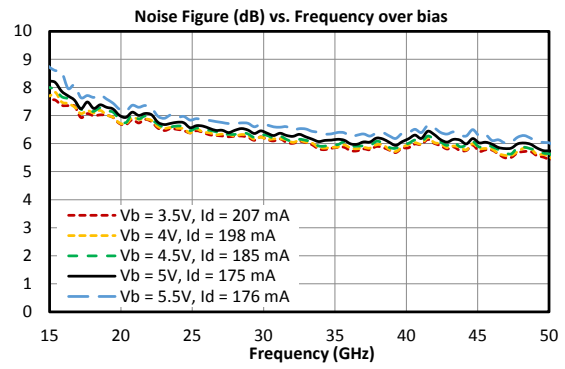
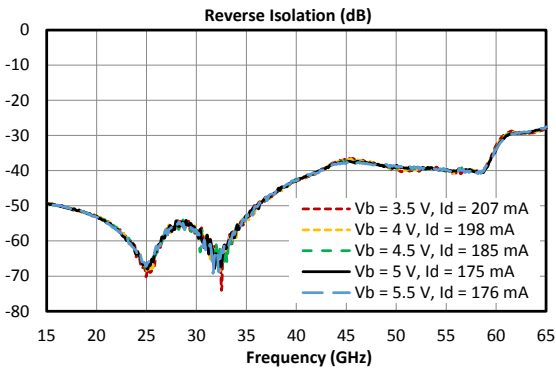
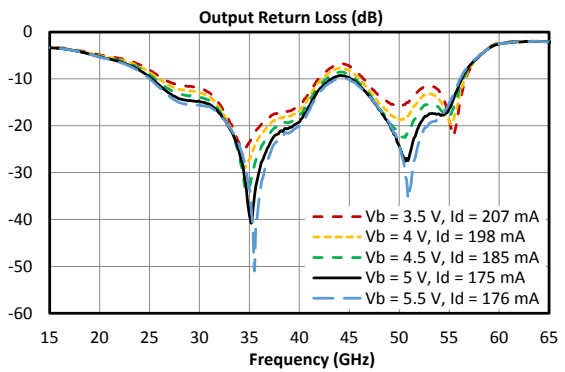
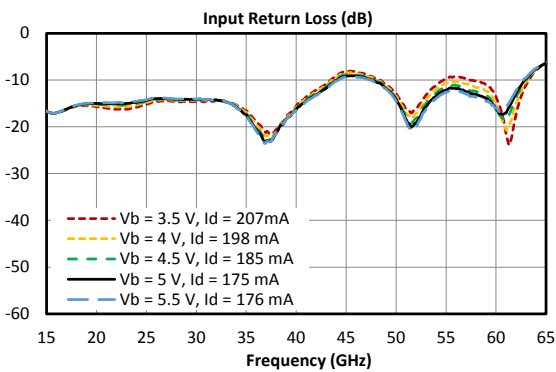
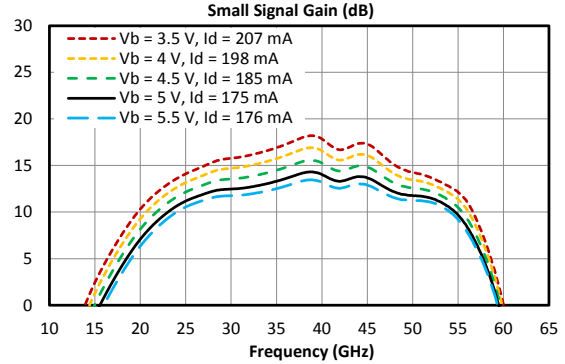
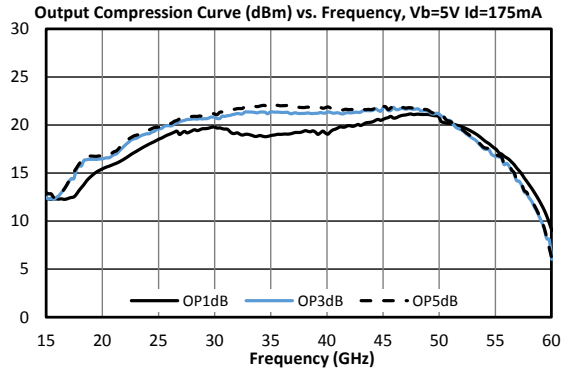
The electrical specifications apply at $T_A=+25^{\circ}\text{C}$ in a 50Ω system.

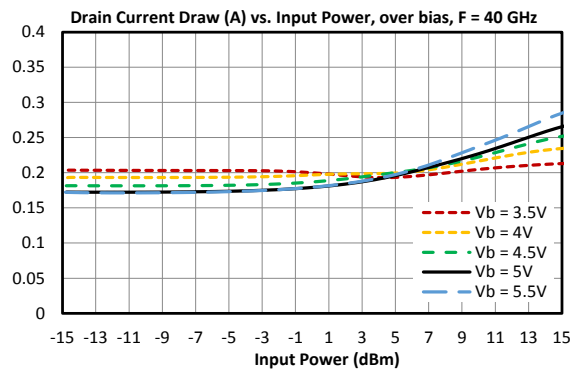
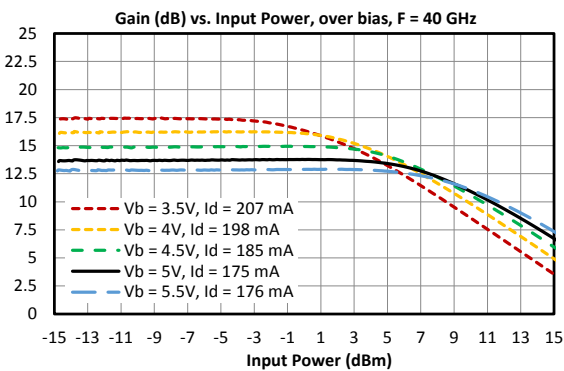
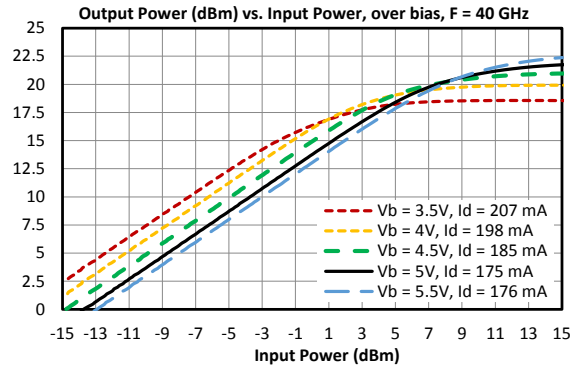
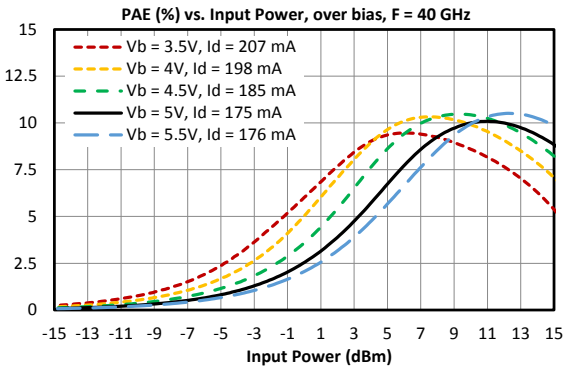
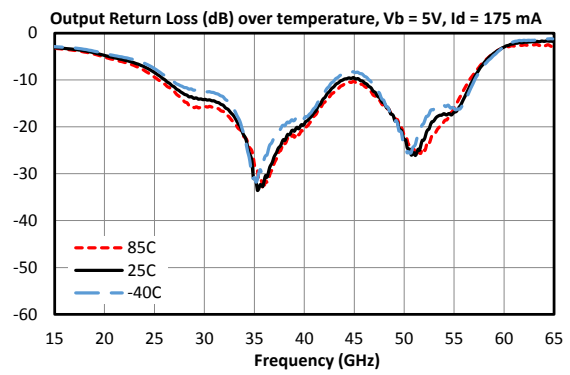
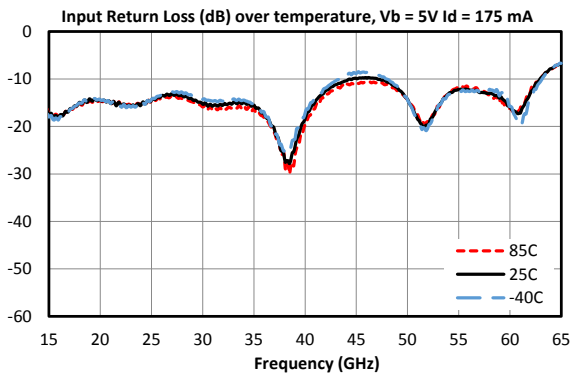
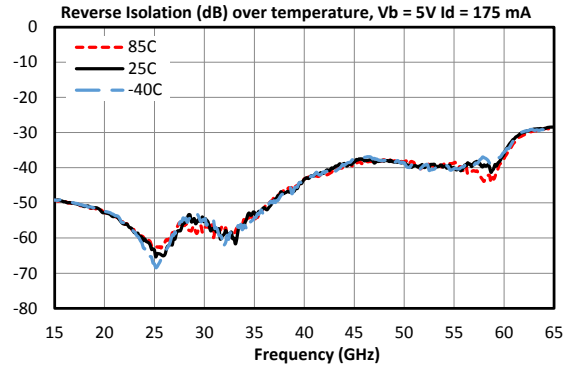
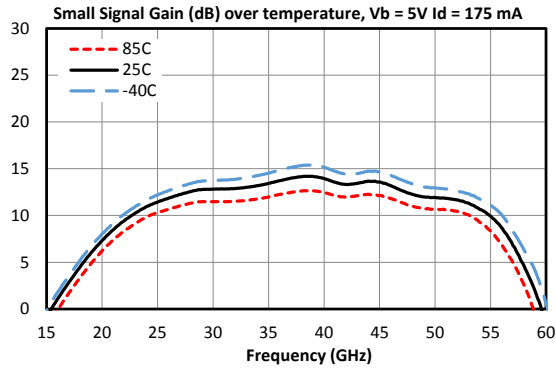
Min and Max limits apply only to our connectorized units and are guaranteed at $T_A=+25^{\circ}\text{C}$.

Parameter	Test Conditions	Frequency	Min	Typical	Units
Saturated Output Power	+5V Bias	22 GHz – 30 GHz		+20	dBm
		30 GHz – 48 GHz	+19	+21	
		48 GHz – 57 GHz		+18	
Small Signal Gain	+5V Bias, -25dBm Input Power	22 GHz – 30 GHz		11	dB
		30 GHz – 48 GHz	11	13	
		45 GHz – 57 GHz		10	
Input Return Loss	+5V Bias, -25dBm Input Power	22 GHz – 57 GHz		14	dB
Output Return Loss		22 GHz – 57 GHz		16	
Reverse Isolation		22 GHz – 57 GHz		48	
Noise Figure	+5V Bias	22 GHz – 57 GHz		6.3	
Bias Requirements ²	+5V			175	mA
Input IP3 (IIP3)	+5V Bias, -12dBm Input Power, 10MHz tone spacing	22 GHz – 57 GHz		+15	dBm
Output IP3 (OIP3)		22 GHz – 57 GHz		+27	
Output $P_{1\text{dB}}$	+5V Bias	22 GHz – 57 GHz		+19	
Input Power for Saturation		22 GHz – 57 GHz		+11	dBm

² Bias conditions tested with no RF input power.

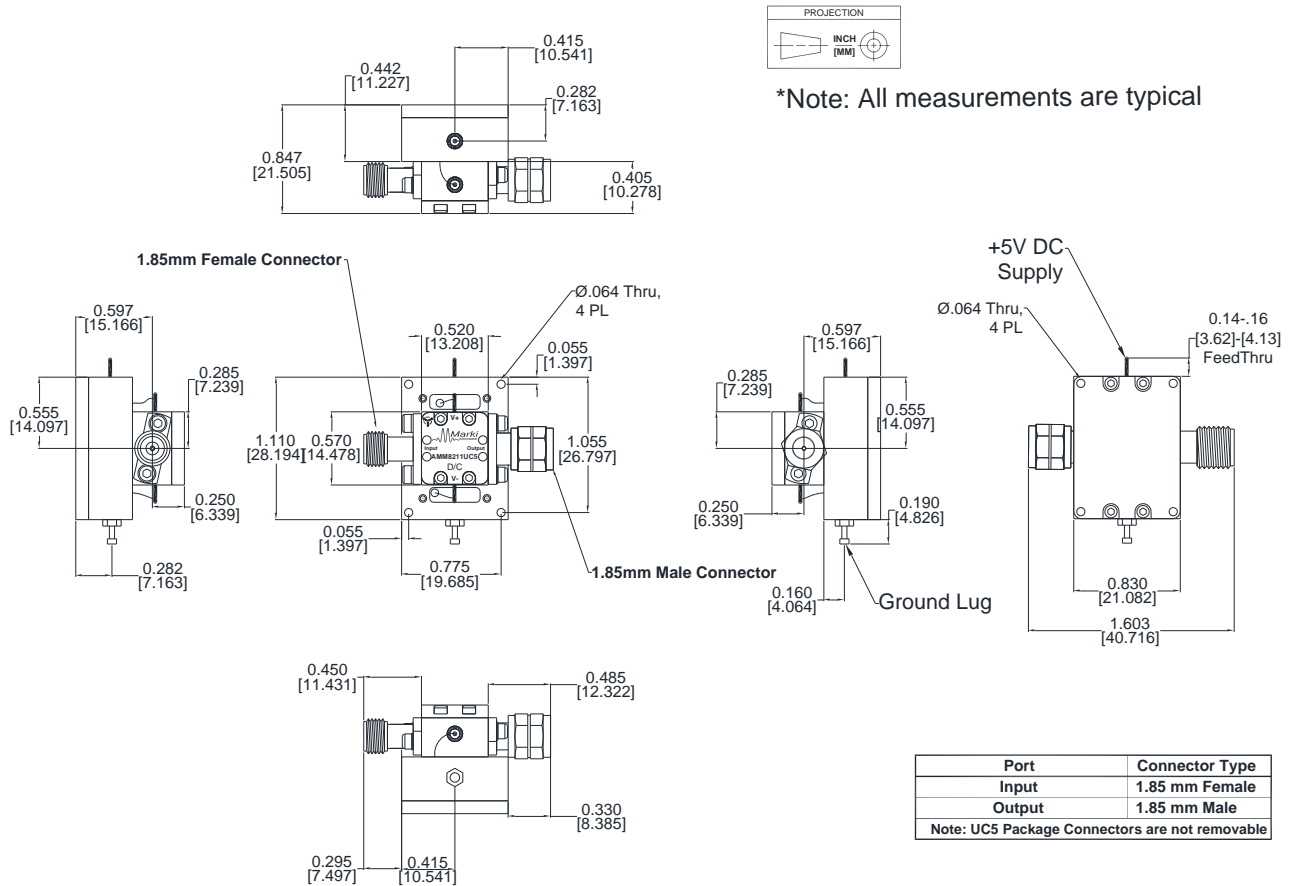
3.6 AMM-8211UC5 Typical Performance Plots





4. Mechanical Data

4.1 AMM-8211UC5 Package Outline Drawing



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