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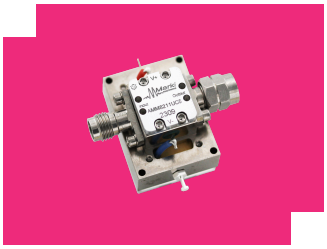
AMM-8211UC5

22 - 57 GHz GaAs Driver Amplifier

DEVICE OVERVIEW

General Description

The AMM-8211UC5 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.



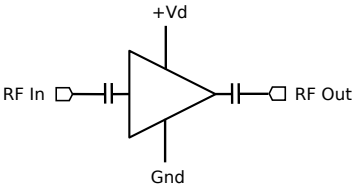
Features

- +21 dBm Output Power
- Broadband Performance
- Positive only, single supply bias
- 5V Single-Supply VoltageModule

Applications

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

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
AMM-8211UC5	22 - 57 GHz GaAs Driver Amplifier	UC5	Standard	REACH RoHS	Released	EAR99

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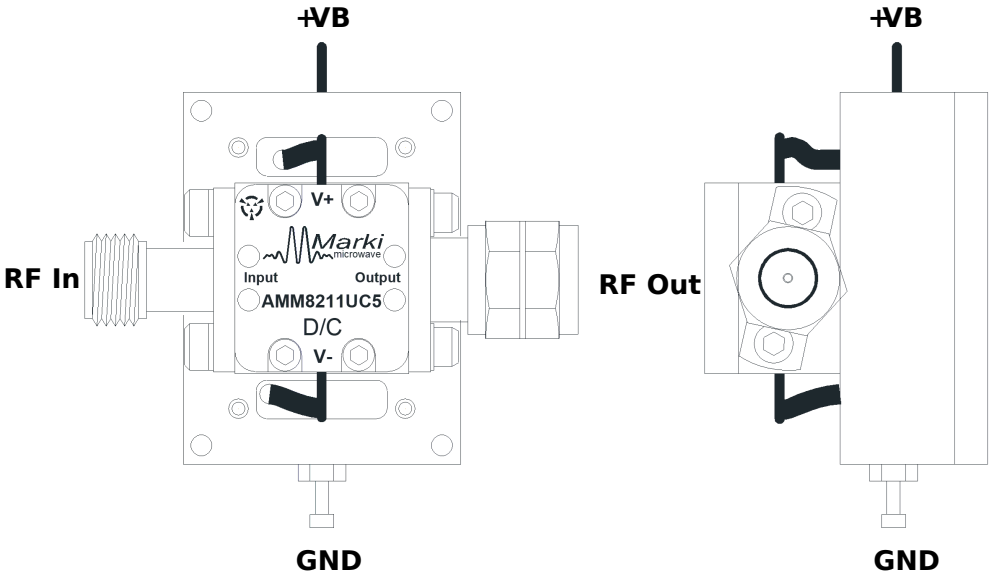
Revision History

Revision Code	Revision Date	Comment
-	2023-03-01	Datasheet Initial Release
A	2026-02-13	MTTF Table Added.

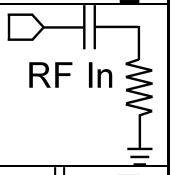
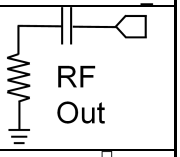
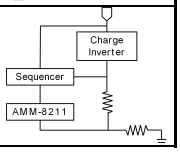
Port Configuration and Functions

Port Diagram



A port diagram of the AMM-8211UC5 is shown below.

Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
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.	
RF In	RF Input	1.85F	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	1.85M	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.	

Specifications

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

FIT and MTTF Table

T (°C)	λ (TIF)	MTTF (hr)	MTTF (yr)
105	2,441.45	4.10E+05	47
85	310.48	3.22E+06	368
55	8.79	1.14E+08	12,992
25	0.12	8.24E+09	941,063

Package Information

Parameter	Details	Rating
Weight	Package name: UC5	23g
Dimensions	-	13.21 x 14.48 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	85	°C
Positive DC Bias Voltage (VB)	3.5	5	5.5	V
Positive DC Current (Id) (No RF Input)	155	175	230	mA
Input Power for Saturation	8	11	13	dBm

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.

Electrical Specifications

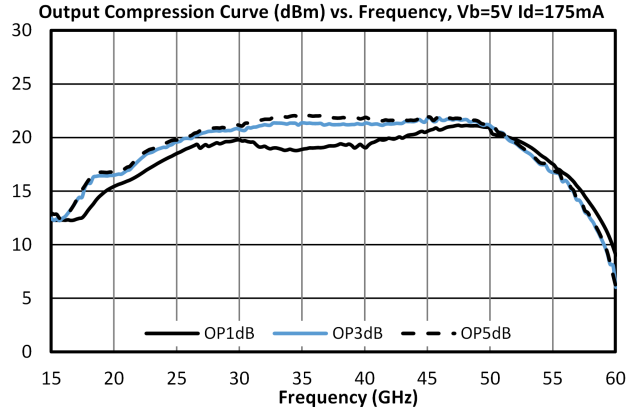
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Current Consumption [1]	+5V	-	-	-	175	-	mA
Input IP3	+5V Bias, -12dBm Input Power, 10MHz tone spacing	22	57	-	15	-	dBm
Input Power for Saturation	+5V Bias	22	57	-	11	-	dBm
Input Return Loss	+5V Bias, -25dBm Input Power	22	57	-	14	-	dB
Noise Figure	+5V Bias	22	57	-	6.3	-	dB
Output IP3	+5V Bias, -12dBm Input Power, 10MHz tone spacing	22	57	-	27	-	dBm
Output P1dB	+5V Bias	22	57	-	19	-	dBm
Output Return Loss	+5V Bias, -25dBm Input Power	22	57	-	16	-	dB
Reverse Isolation	+5V Bias, -25dBm Input Power	22	57	-	48	-	dB
Saturated Output Power	+5V Bias	48	57	-	18	-	dBm
Saturated Output Power	+5V Bias	22	30	-	20	-	dBm
Saturated Output Power	+5V Bias	30	48	19	21	-	dBm
Small Signal Gain	+5V Bias, -25dBm Input Power	22	30	-	11	-	dB
Small Signal Gain	+5V Bias, -25dBm Input Power	45	57	-	10	-	dB
Small Signal Gain	+5V Bias, -25dBm Input Power	30	48	11	13	-	dB

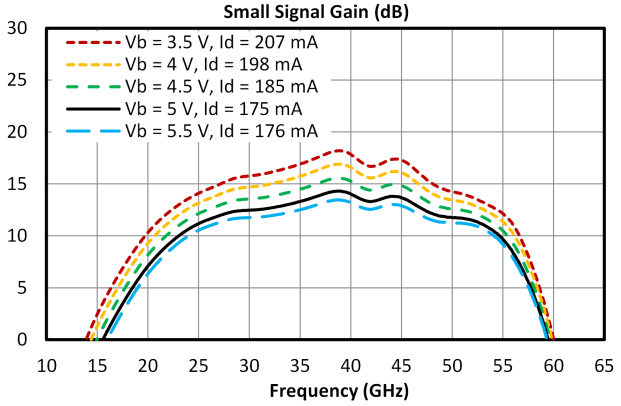
[1] Bias conditions tested with no RF input power.

Typical Performance Plots

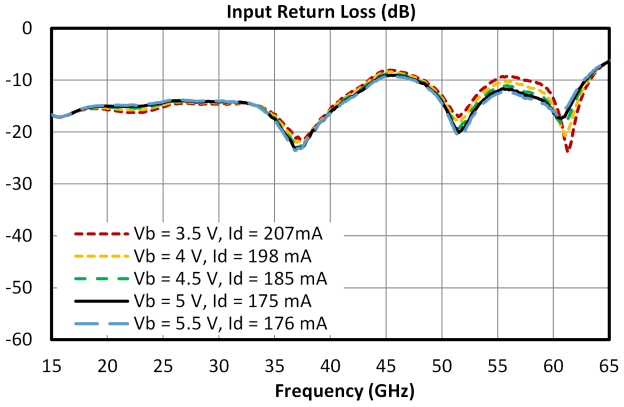
Output Compression Curve (dBm) vs. Frequency, Vb=5V Id=175mA



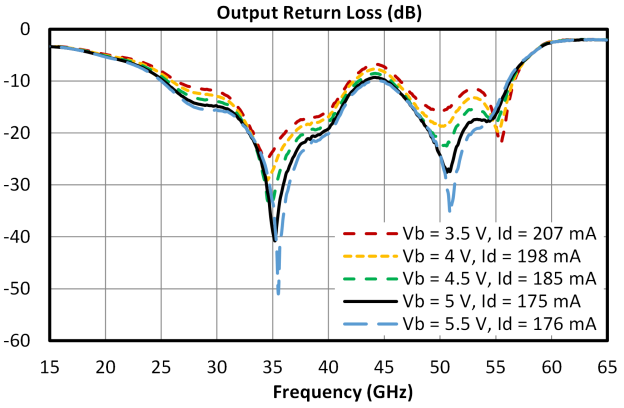
Small Signal Gain (dB)



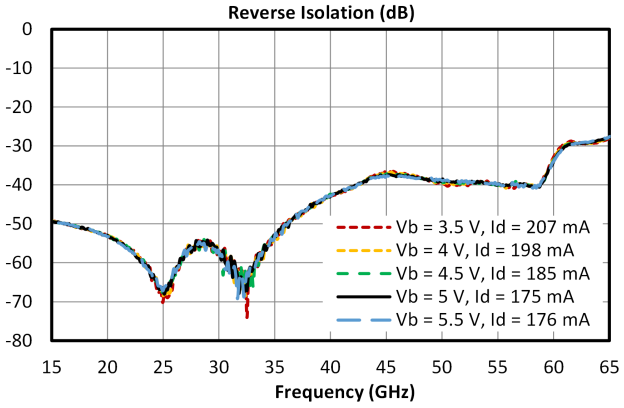
Input Return Loss (dB)



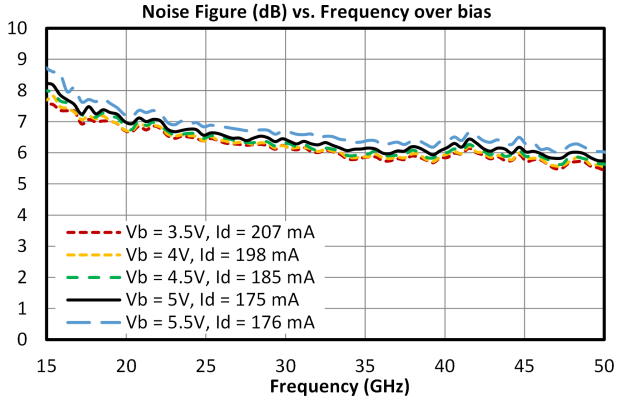
Output Return Loss (dB)



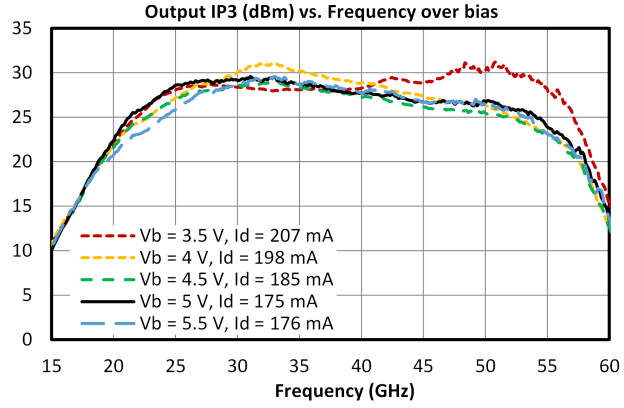
Reverse Isolation (dB)



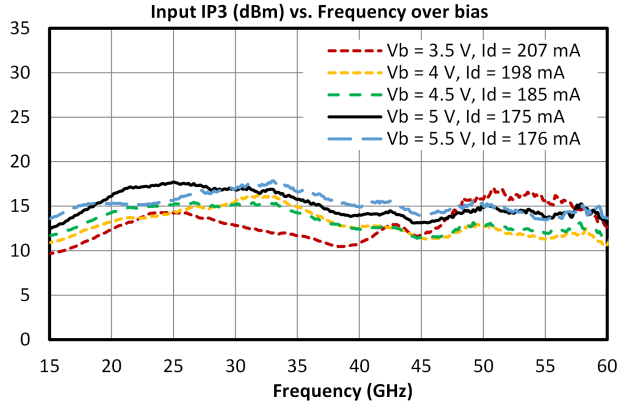
Noise Figure (dB) vs. Frequency over bias



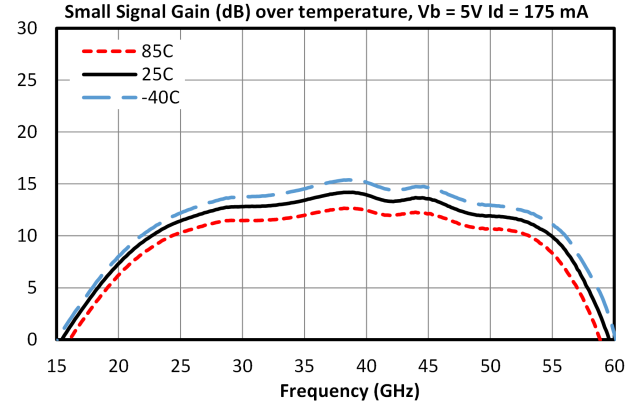
Output IP3 (dBm) vs. Frequency over bias



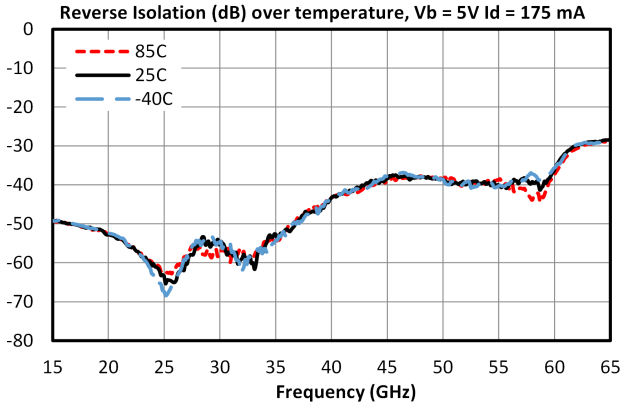
Input IP3 (dBm) vs. Frequency over bias



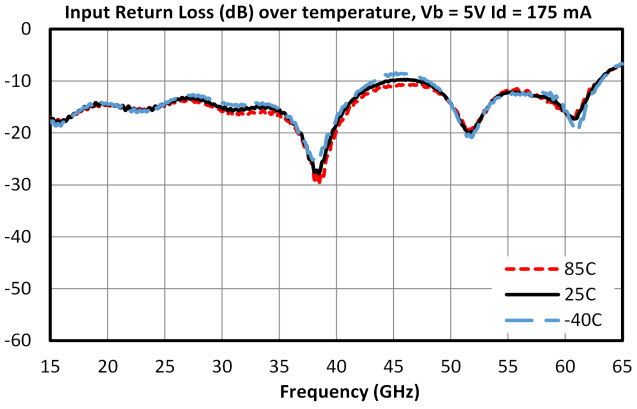
Small Signal Gain (dB) over temperature, Vb = 5V Id = 175 mA



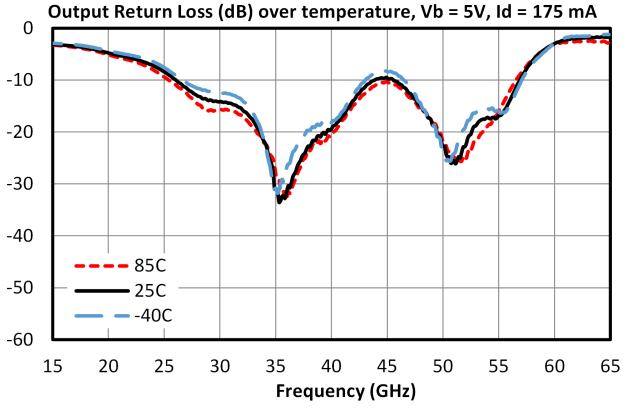
Reverse Isolation (dB) over temperature, Vb = 5V Id = 175 mA



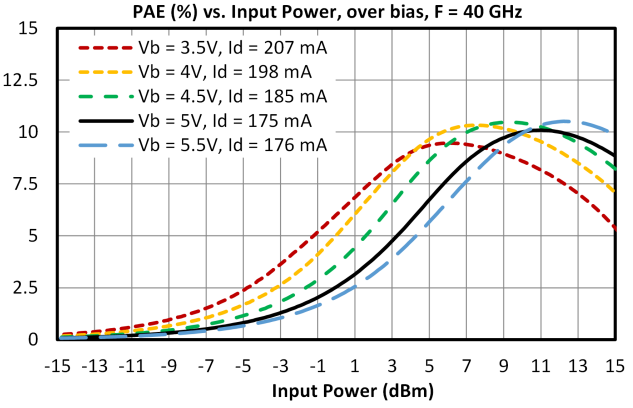
Input Return Loss (dB) over temperature, Vb = 5V Id = 175 mA



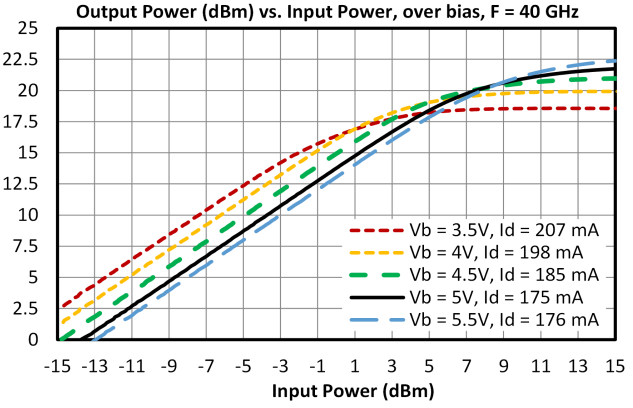
Output Return Loss (dB) over temperature, Vb = 5V, Id = 175 mA



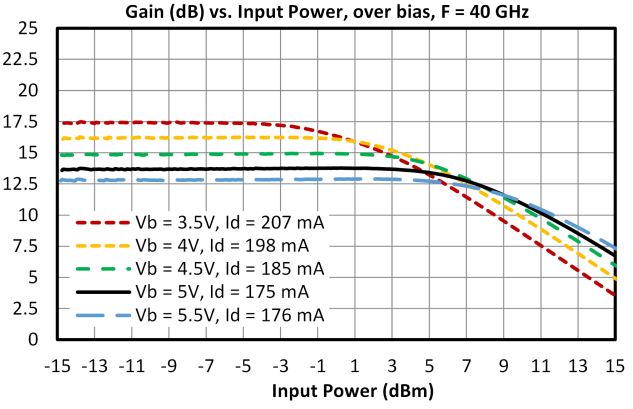
PAE (%) vs. Input Power, over bias, F = 40 GHz



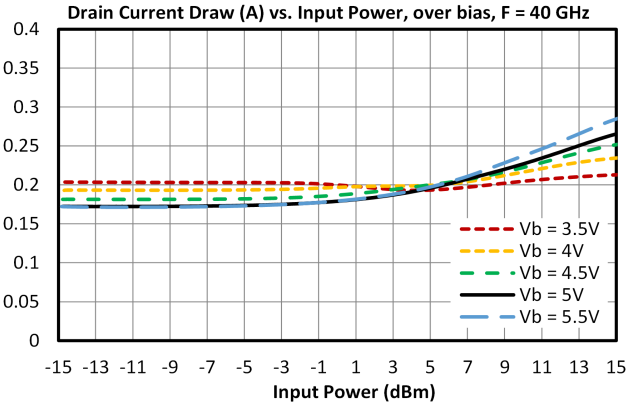
Output Power (dBm) vs. Input Power, over bias, F = 40 GHz



Gain (dB) vs. Input Power, over bias, F = 40 GHz



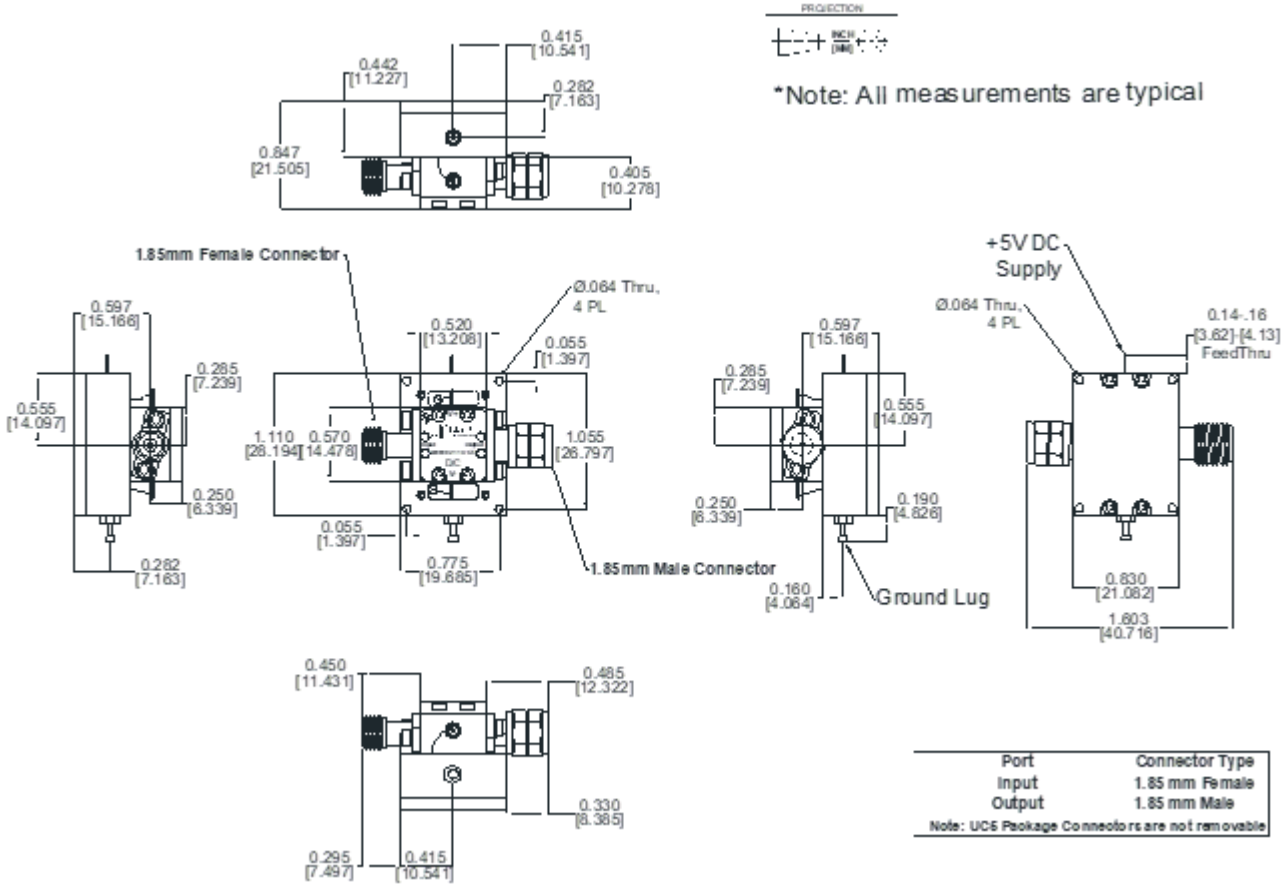
Drain Current Draw (A) vs. Input Power, over bias, F = 40 GHz



Mechanical Data

Outline Drawing

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



Port	Connector Type
Input	1.85 mm Female
Output	1.85 mm Male

Note: UC5 Package Connectors are not removable

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