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

ADM1-8095PC

0.09 - 10 GHz High Dynamic Range Gain Block

DEVICE OVERVIEW

General Description

The ADM1-8095PC is a high-linearity amplifier capable of providing +18 dBm output power up to 10 GHz. The ADM1-8095PC can serve either as a linear signal amplifier, or as a saturated driver amplifier for H- or S-diode mixers. The amplifier has excellent return losses and gain flatness.

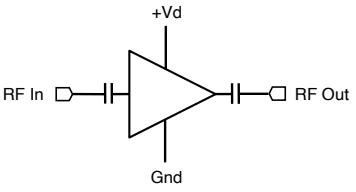
Features

- +19 dBm output power
- +18 dB gain
- Gain flatness
- Excellent Return Losses
- No external bias tee required
- Single-supply, positive only bias

Applications

- Mobile test and measurement equipment
- Driver Amplifier for H and S - Diode Mixers
- Radar
- SATCOM

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
ADM1-8095PC	0.09 - 10 GHz High Dynamic Range Gain Block	PC	Standard	REACH RoHS	Released	EAR99

Table Of Contents

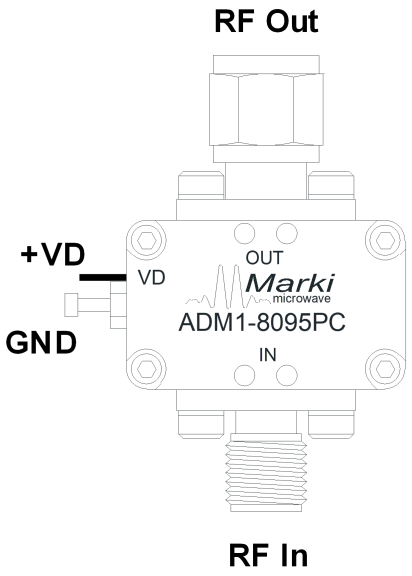
Revision History

Revision Code	Revision Date	Comment
-	2022-11-01	Initial Datasheet Release
A	2024-02-27	Updated RF Input Power Handling
B	2024-07-31	Connectors Updated to SMA

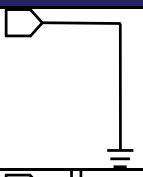
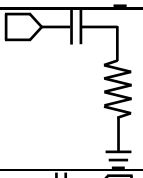
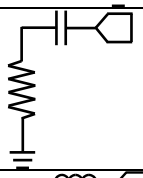
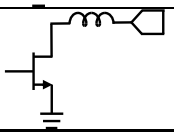
Port Configuration and Functions

Port Diagram

A port diagram of the ADM1-8095PC is shown below.



Port Functions

Port	Function	Connector Type	Description	Equivalent Circuit for Package
GND	Ground	-	The housing or outside of the coaxial cables must be connected to a DC/RF ground potential with high thermal and electrical conductivity.	
RF In	RF Input	SMAF	The amplifier's RF Input port is matched to 50 Ω and has built-in DC blocking capacitors.	
RF Out	RF Output	SMAM	The amplifier's RF Output port is matched to 50 Ω and has built-in DC blocking capacitors.	
Vd	Drain Supply Pin	-	The VD pin supplies DC voltage to the drain of the amplifier IC.	

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. 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
Drain Current (RF Applied)	90	mA
Drain Supply Voltage (Vd)	8	V
Maximum Operating Temperature for MTTF > 1E6 hours	85	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature for MTTF > 1E6 hours	-40	°C
Minimum Storage Temperature	-65	°C
RF Input Power	20	dBm

Package Information

Parameter	Details	Rating
Dimensions	-	21.85 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
Power Supply DC Current (Id) (No RF Input) [1]	31	57	72	mA
Power Supply DC Voltage (Vd)	3	5	6	V
Input Power for Saturation	2	4	6	dBm
Ambient Temperature	-40	25	85	°C

[1] Recommended operating current conditions without RF input applied.

Sequencing Requirements

There is no sequencing required to power up or power down the amplifier. An output load is recommended to be connected to the amplifier during operation.

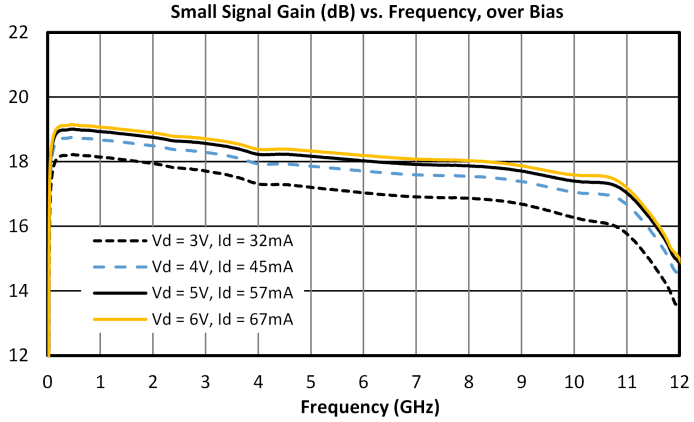
Electrical Specifications

Unless otherwise specified, electrical specifications apply at TA=+25°C, Vd = 5 V. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C

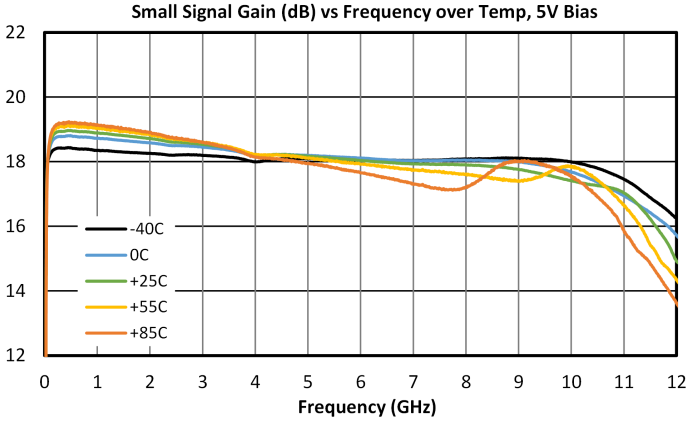
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
DC Supply Quiescent Current (Idq)	Vd = 5 V, no RF input	-	-	-	57	-	mA
Input IP3	Vd = 5 V, Pin = -15 dBm per tone, 10 MHz tone spacing	0.09	10	-	15	-	dBm
Input Power for Saturation	Vd = 5V	0.09	10	2	4	-	dBm
Input Return Loss	Vd = 5 V, Pin = -20 dBm	0.09	10	-	17	-	dB
Noise Figure	Vd = 5 V, Pin = -20 dBm	0.09	5	-	1.6	-	dB
Noise Figure	Vd = 5 V, Pin = -20 dBm	5	10	-	2.2	-	dB
Output IP3	Vd = 5 V, Pin = -15 dBm per tone, 10 MHz tone spacing	0.09	10	-	32	-	dBm
Output P1dB	Vd = 5V	0.09	10	-	18.5	-	dBm
Output Power	Vd = 5 V	0.09	10	18	19	-	dBm
Output Return Loss	Vd = 5 V, Pin = -20 dBm	0.09	10	-	21	-	dB
Reverse Isolation	Vd = 5 V, Pin = -20 dBm	0.09	10	-	24	-	dB
Small Signal Gain	Vd = 5 V, Pin = -20 dBm	0.09	8	17	18	-	dB
Small Signal Gain	Vd = 5 V, Pin = -20 dBm	8	10	-	17	-	dB

ADM1-8095PC Typical Performance Plots

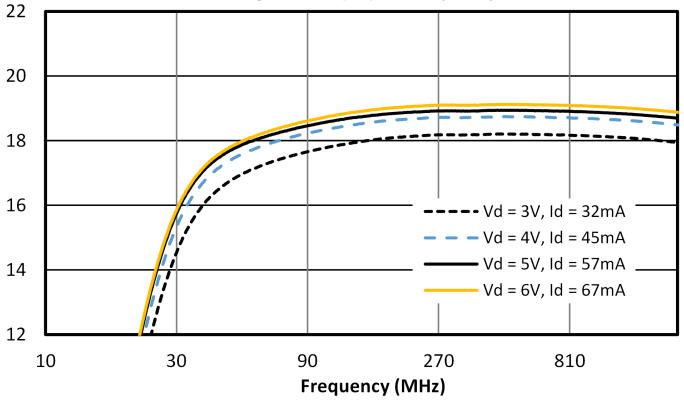
Small Signal Gain (dB) vs. Frequency, over Bias



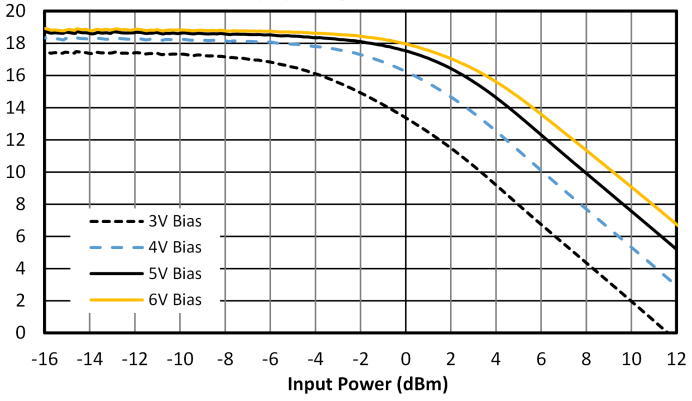
Small Signal Gain (dB) vs Frequency over Temp, 5V Bias



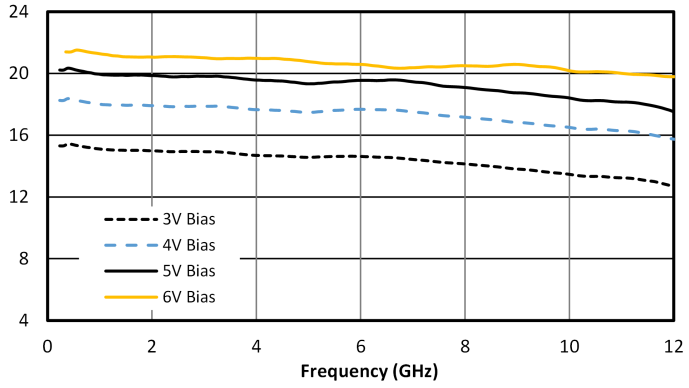
Small Signal Gain (dB) vs. Frequency, over Bias



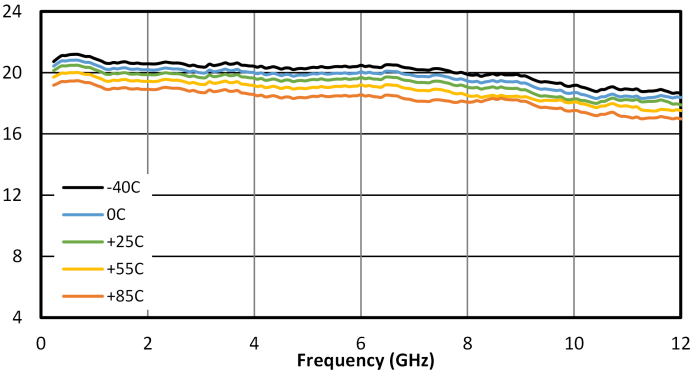
Gain (dB) vs. Input Power, F = 5GHz



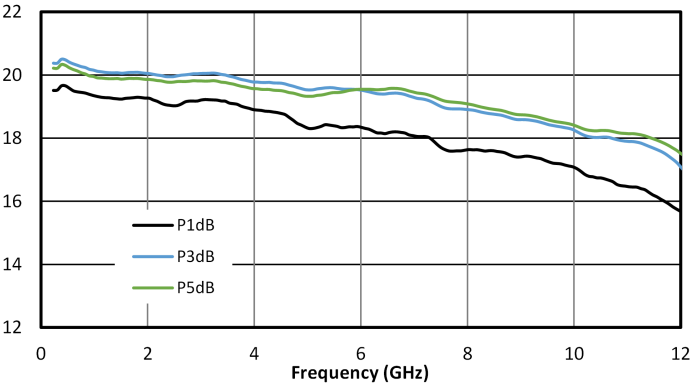
Psat (dBm) vs. Frequency, over Bias



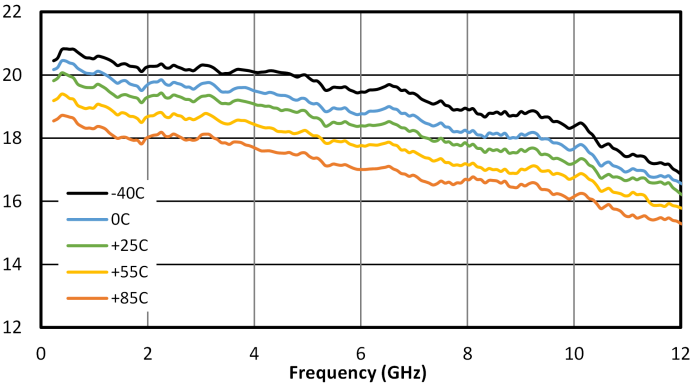
Psat (dBm) vs Frequency over Temp, 5V Bias



Output Compression Curves (dBm) vs. Frequency, 5V Bias



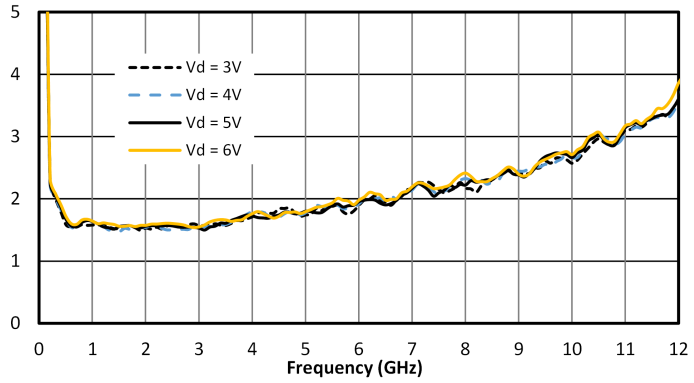
P1dB (dBm) vs Frequency over Temp, 5V Bias



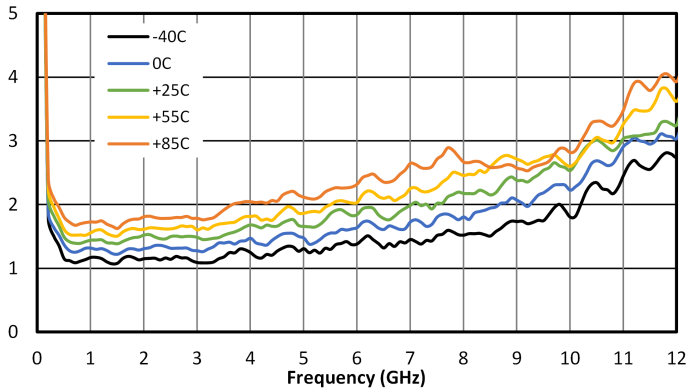
ADM1-8095PC

0.09 - 10 GHz High Dynamic Range Gain Block

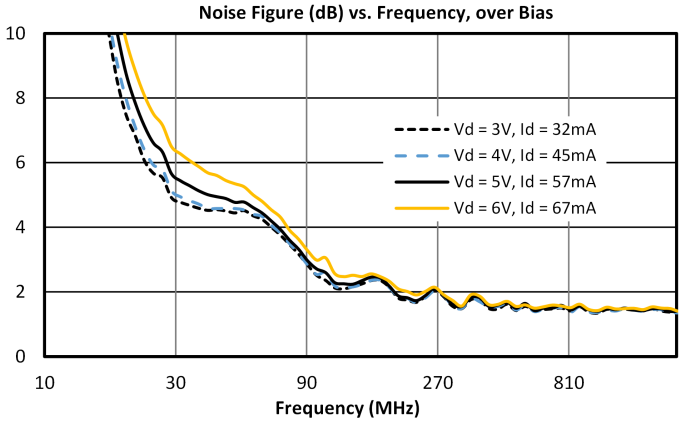
Noise Figure (dB) vs. Frequency, over Bias



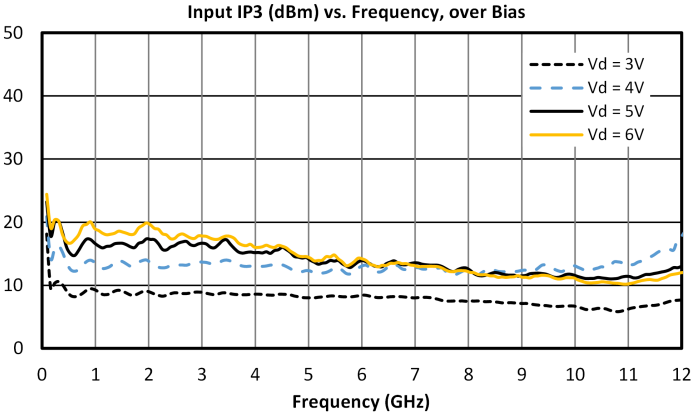
Noise Figure (dB) vs Frequency over Temp, 5V Bias



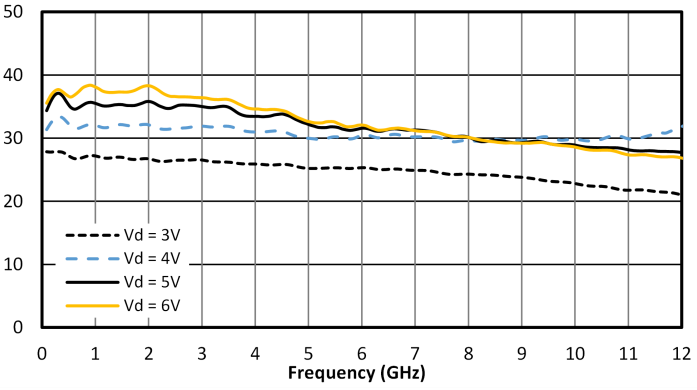
Noise Figure (dB) vs. Frequency, over Bias



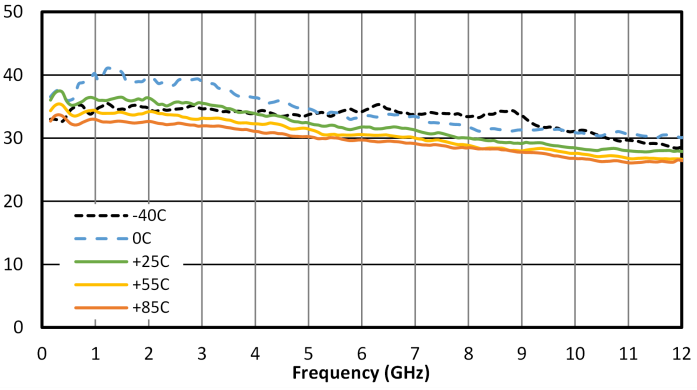
Input IP3 (dBm) vs. Frequency, over Bias



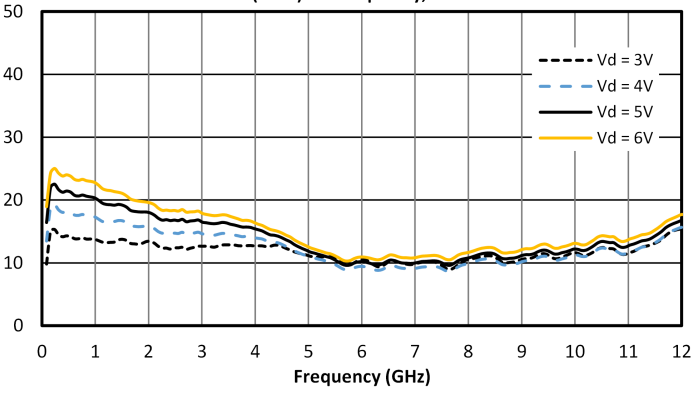
Output IP3 (dBm) vs. Frequency, over Bias



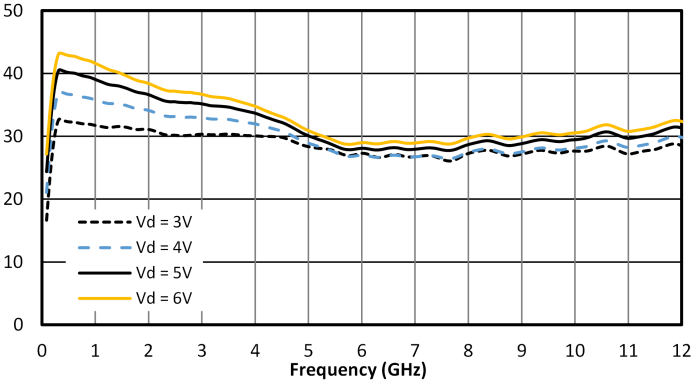
Output IP3 (dBm) vs Frequency over Temp, 5V Bias



IIP2 (dBm) vs. Frequency, over Bias



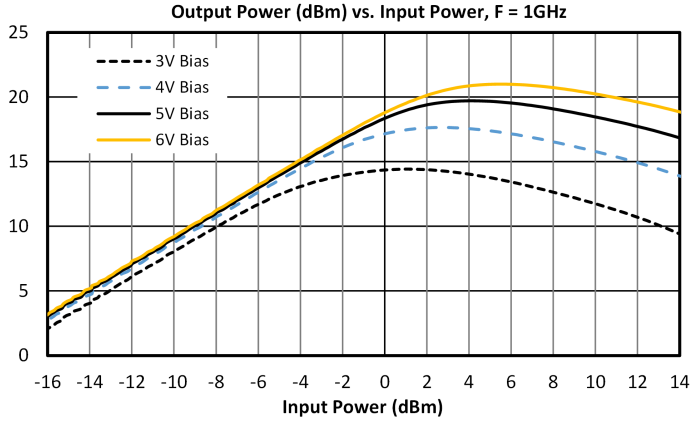
OIP2 (dBm) vs. Frequency, over Bias



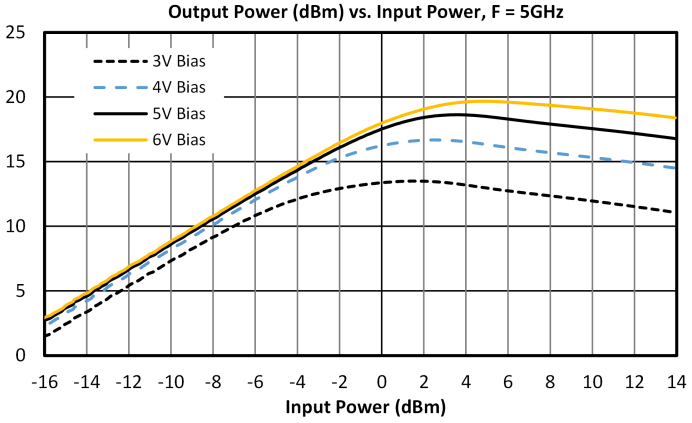
ADM1-8095PC

0.09 - 10 GHz High Dynamic Range Gain Block

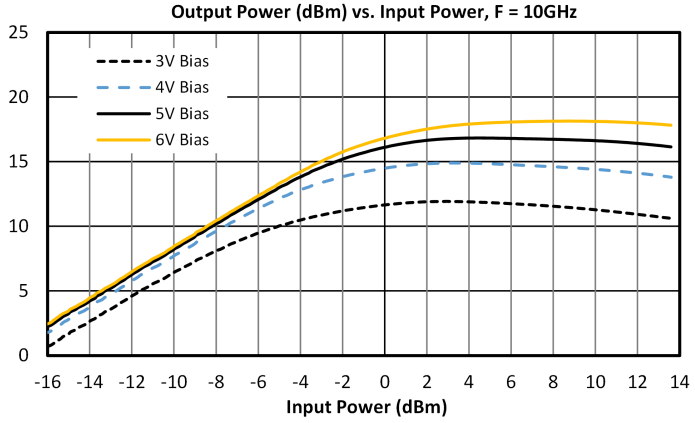
Output Power (dBm) vs. Input Power, F = 1GHz



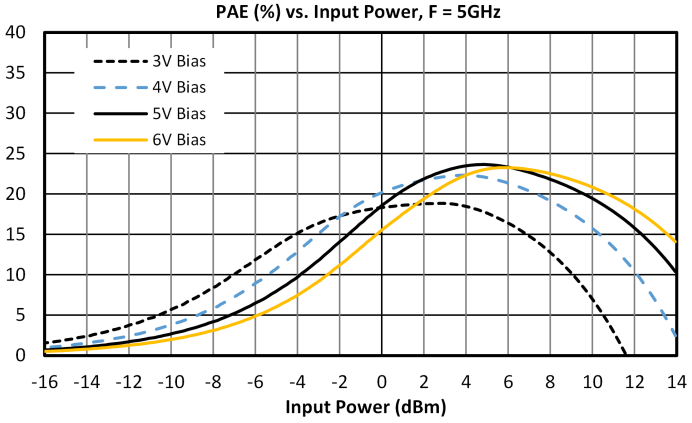
Output Power (dBm) vs. Input Power, F = 5GHz



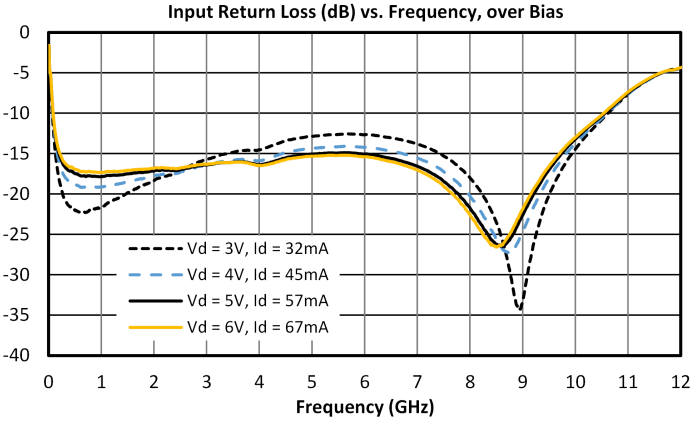
Output Power (dBm) vs. Input Power, F = 10GHz



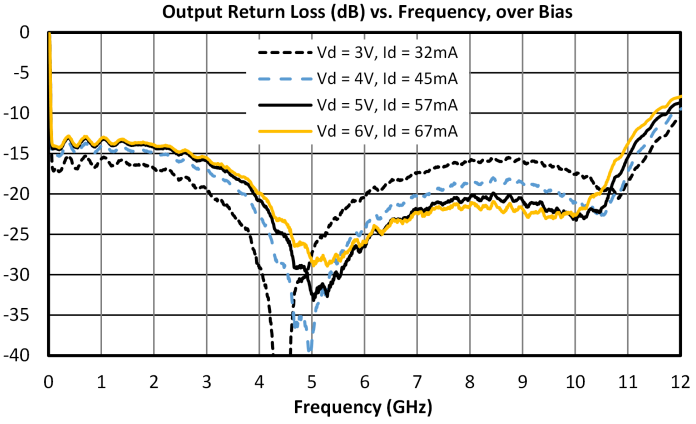
PAE (%) vs. Input Power, F = 5GHz



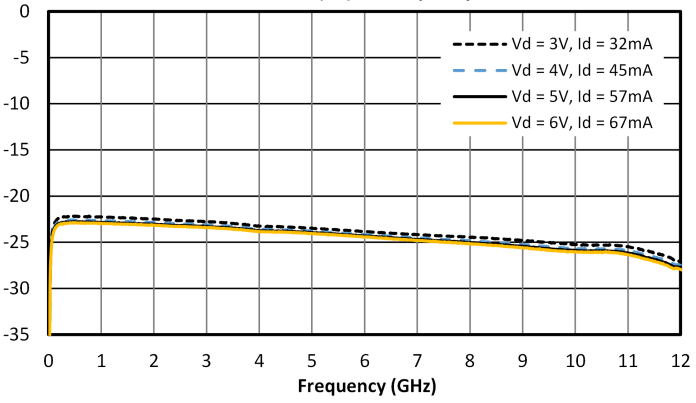
Input Return Loss (dB) vs. Frequency, over Bias



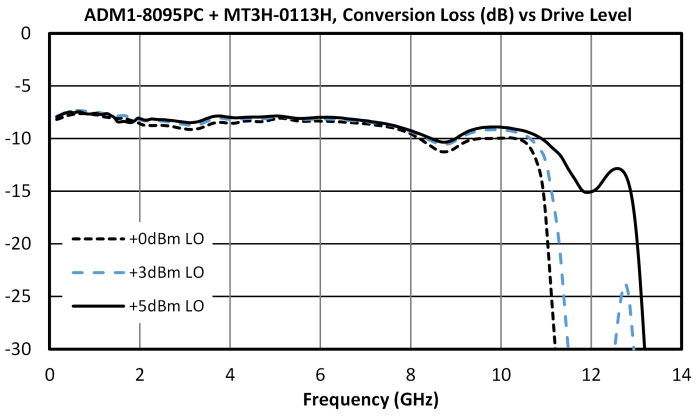
Output Return Loss (dB) vs. Frequency, over Bias

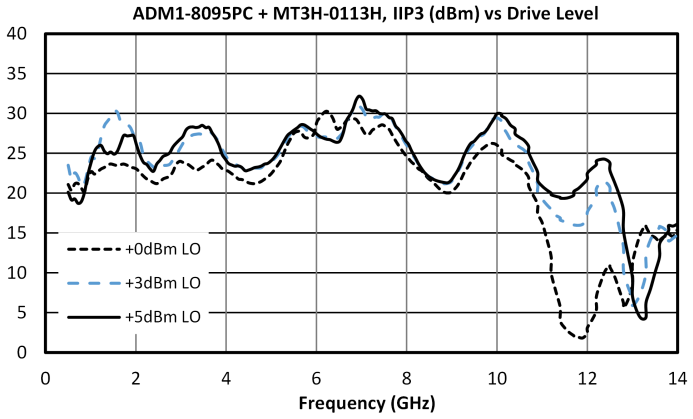


Reverse Isolation (dB) vs. Frequency, over Bias

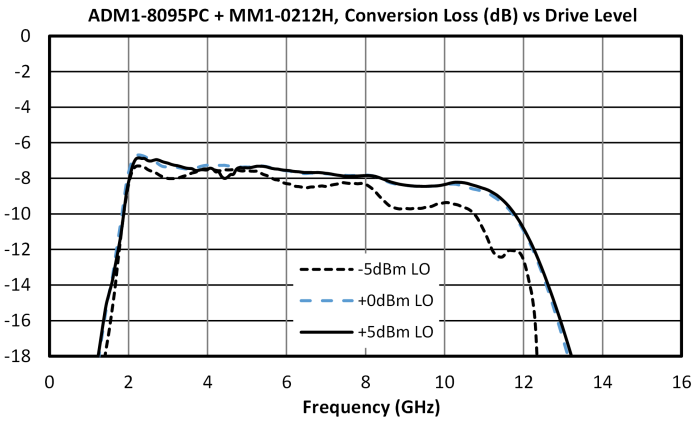


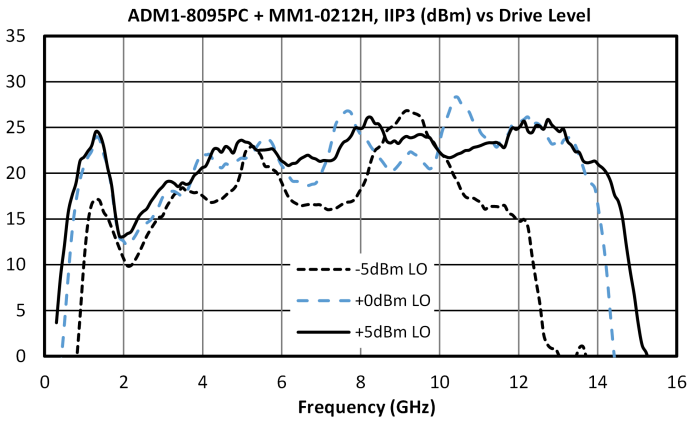
Typical Performance Plots of MT3H-0113H with ADM1-8095PC LO Driver



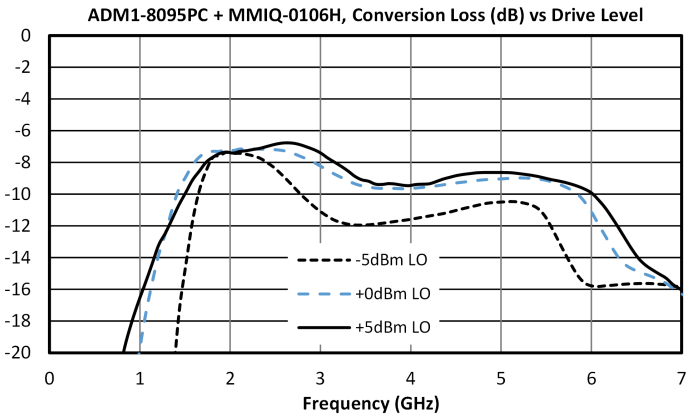


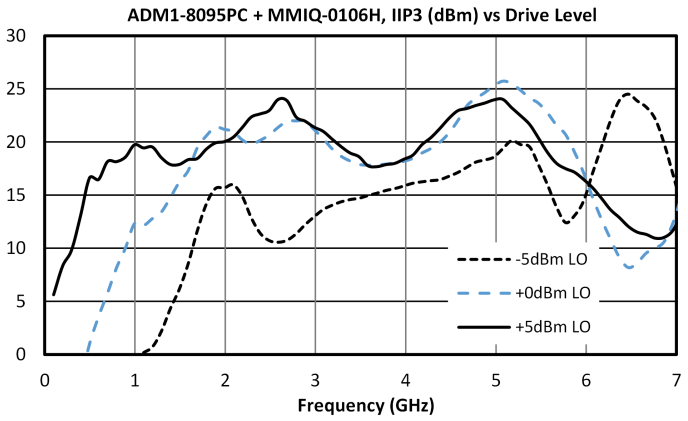
Typical Performance Plots of MM1-0212H with ADM1-8095PC LO Driver





Typical Performance Plots of MMIQ-0106H with ADM1-8095PC LO Driver

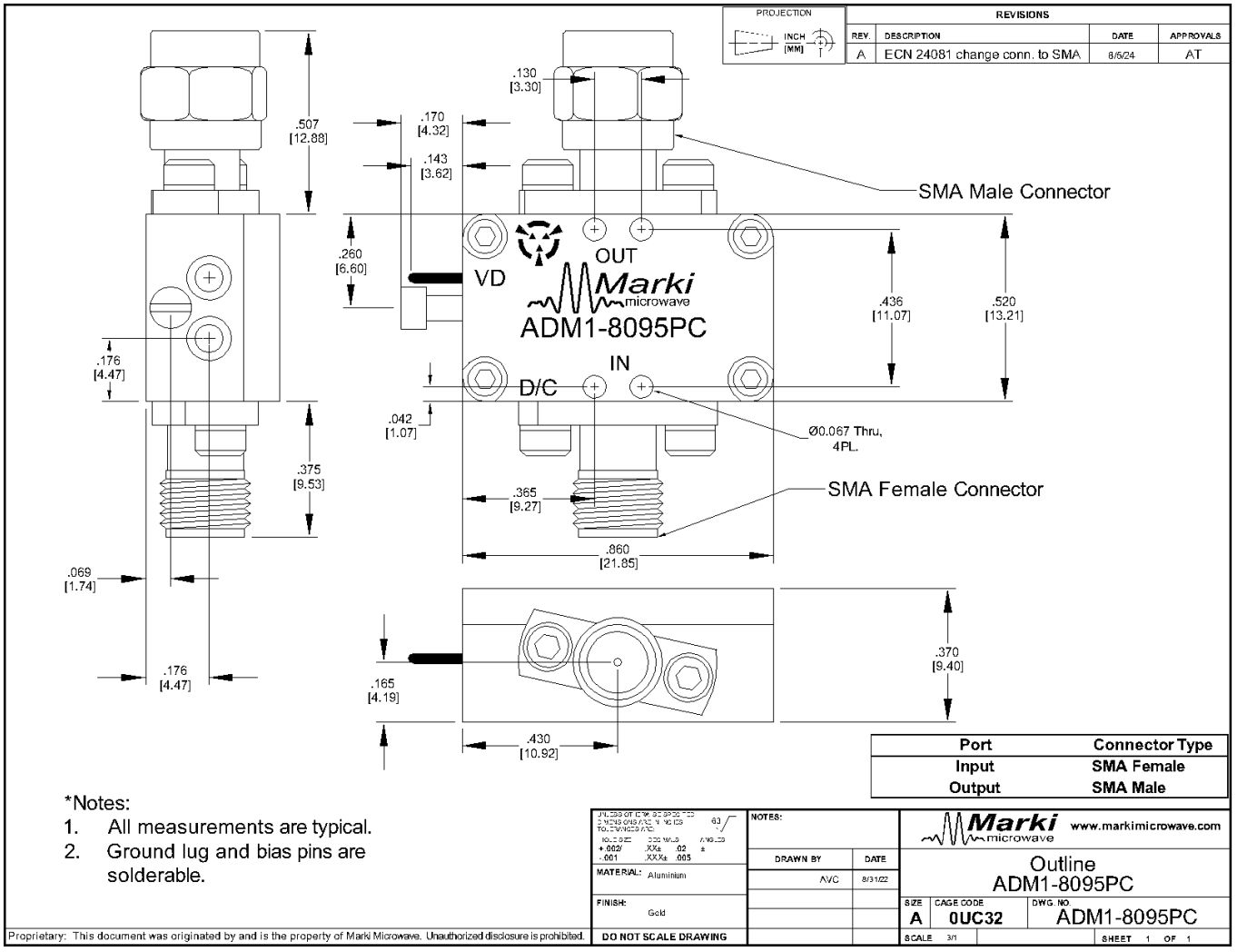




Mechanical Data

Outline Drawing

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



Package Notes:

1) All measurements are typical.

2) Ground lug and bias pins are solderable.

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.