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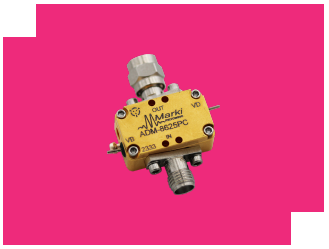
ADM-8625PC

0.75 - 8 GHz Low Noise Amplifier

DEVICE OVERVIEW

General Description

The ADM-8625PC is a high-linearity low noise amplifier capable of providing 18 dB gain, 1.4 dB noise figure and +29 dBm OIP3 from 750 MHz to 8 GHz. The ADM-8625PC can serve either as a linear signal amplifier, or as a saturated driver amplifier for H- or S-diode mixers. The amplifier features excellent return losses, gain flatness and high dynamic range making it suitable for RF front-end applications. The size and low power consumption of the ADM-8625PC make it ideal for low SWaP applications.



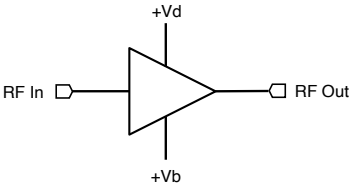
Features

- 18 dB typical gain
- 1.4 dB typical noise figure
- Single Supply, Positive Only Bias
- Low power consumption

Applications

- Test and Measurement Equipment
- Radar and satellite communications
- 5G transceivers
- Driver Amplifier for H and S - Diode Mixers

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
ADM-8625PC	0.75 - 8 GHz Low Noise Amplifier	PC	Standard	RoHS REACH	Released	EAR99

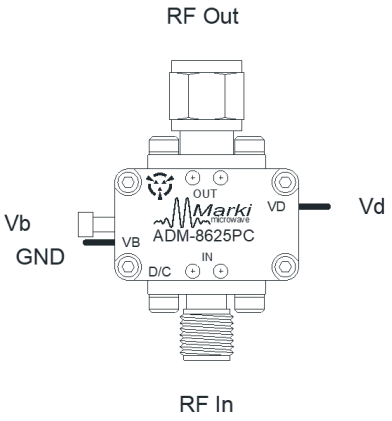
Table Of Contents

Revision History

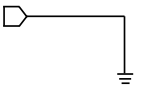
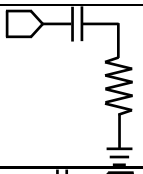
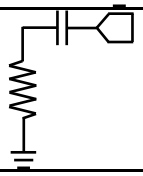
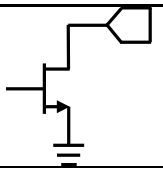
Revision Code	Revision Date	Comment
-	2023-08-30	Datasheet Initial Release

Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Connector Type	Description	Equivalent Circuit for Package
GND	Ground	-	Housing or ground lug must be connected to a DC/RF ground potential with high thermal and electrical conductivity.	
RF In	RF Input	-	This is the amplifier's RF Input port. It is RF matched to 50 Ω and has built-in DC blocking capacitors.	
RF Out	RF Output	-	This is the amplifier's RF Output port. It is RF matched to 50 Ω and has built-in DC blocking capacitors.	
Vb	Positive Bias Pin	-	The Vb pin provides a required positive bias which supplies the current mirror. A higher voltage results in a higher current draw through the RF Out port. This pin is nominally set at +5V.	
Vd	Drain Supply Pin	-	The VD pin supplies DC voltage to the drain of the amplifier IC. This pin is nominally set at +5V.	

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
Bias Current (Ib)	10	mA
Bias Voltage (Vb)	6	V
Drain Current (RF Applied)	75	mA
Drain Supply Voltage (Vd)	6	V
Maximum Operating Temperature for MTTF > 1E6 hours	85	°C
Maximum Storage Temperature	125	°C
Max Junction Temperature for MTTF of 1E6 hours	175	°C
Max Power Dissipation for MTTF of 1E6 hours	0.34	W
Minimum Operating Temperature for MTTF > 1E6 hours	-40	°C
Minimum Storage Temperature	-55	°C
RF Power Handling	15	dBm
θ_Jc, Junction to Case Thermal Resistance	62	°C/W

Package Information

Parameter	Details	Rating
Weight	Package name: PC	10.27g
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 Bias (Vb)	3	5	6	V
Power Supply DC Voltage (Vd)	3	5	6	V
Ambient Temperature	-40	25	85	°C
Input Power for Saturation	4	6	-	-
Power Supply DC Current (Id) (No RF Input)	25	48	67	mA
Power Supply DC Current (Ib)	2	4	5	mA

Sequencing Requirements

There is no sequencing required to power up or power down the amplifier.

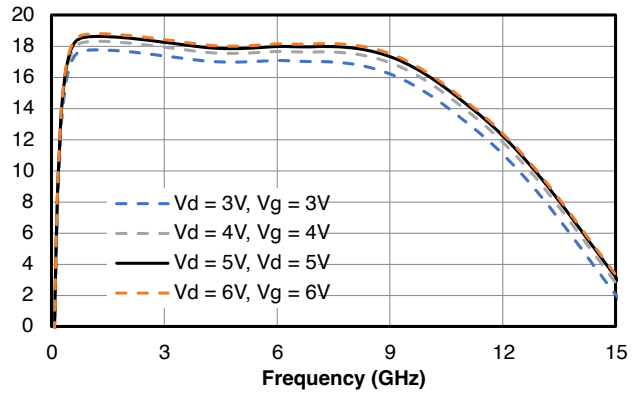
Electrical Specifications

Unless otherwise specified, electrical specifications apply at TA=+25°C, Vd = Vb = 5V.

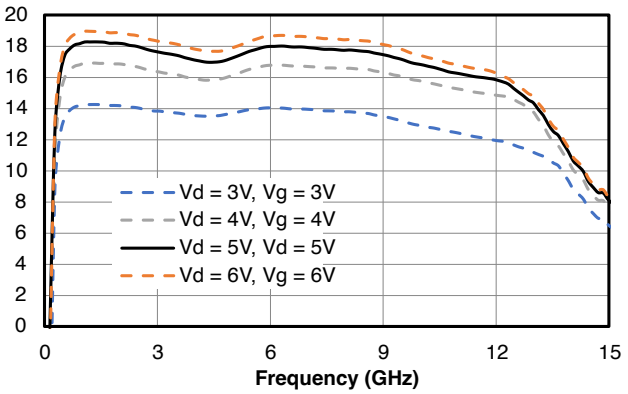
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
DC Supply Quiescent Current (Idq)	Vd = 5V, Vb = 5V, no RF input	-	-	-	48	-	mA
Input IP2	Vd = 5V, Vb = 5V, Pin = -15dBm per tone, 10MHz tone spacing	0.75	8	-	16	-	dBm
Input IP3	Vd = 5V, Vb = 5V, Pin = -15dBm per tone, 10MHz tone spacing	0.75	8	-	11	-	dBm
Input Power for Saturation	Vd = 5V, Vb = 5V,	0.75	8	-	6	-	dBm
Input Return Loss	Vd = 5V, Vb = 5V, Pin = -20dBm	0.75	8	-	15	-	dB
Noise Figure	Vd = 5V, Vb = 5V, Pin = -20dBm	0.75	8	-	1.4	-	dB
Output IP2	Vd = 5V, Vb = 5V, Pin = -15dBm per tone, 10MHz tone spacing	0.75	8	-	34	-	dBm
Output IP3	Vd = 5V, Vb = 5V, Pin = -15dBm per tone, 10MHz tone spacing	0.75	8	-	29	-	dBm
Output P1dB	Vd = 5V, Vb = 5V	0.75	8	-	18	-	dBm
Output Power	Vd = 5V, Vb = 5V	0.75	8	-	19	-	dBm
Output Return Loss	Vd = 5V, Vb = 5V, Pin = -20dBm	0.75	8	-	16	-	dB
Reverse Isolation	Vd = 5V, Vb = 5V, Pin = -20dBm	0.75	8	-	24	-	dB
Small Signal Gain	Vd = 5V, Vb = 5V, Pin = -20dBm	0.75	8	16	18	-	dB

Typical Performance Plots

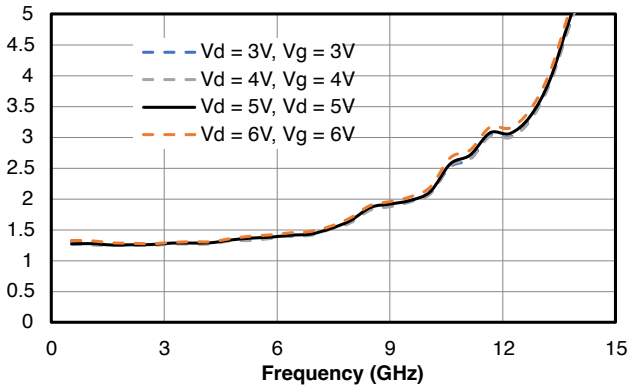
Small Signal Gain (dB) vs Frequency, over Bias



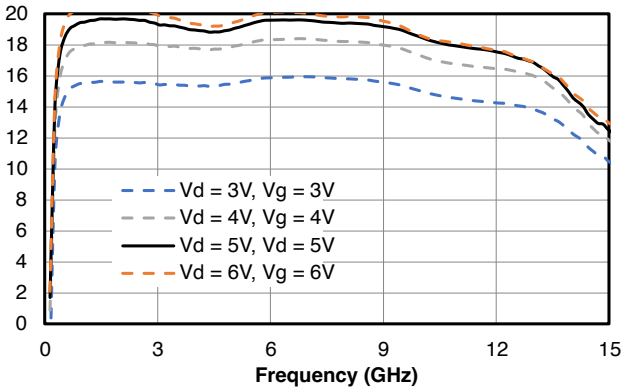
Output P1dB (dBm) vs Frequency, over Bias



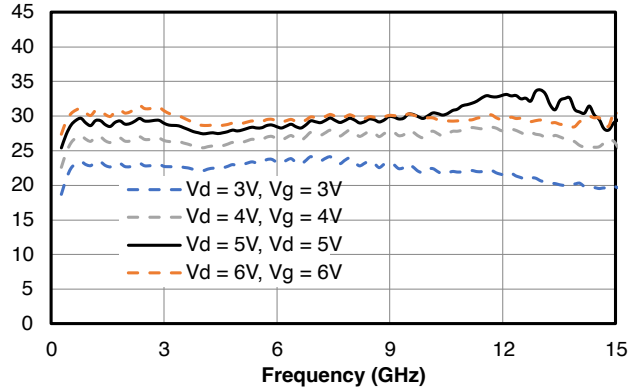
Noise Figure (dB) vs Frequency, over Bias



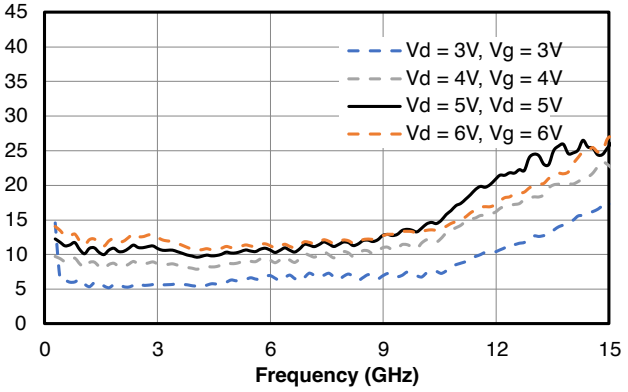
Saturated Output Power (dBm) vs Frequency, over Bias



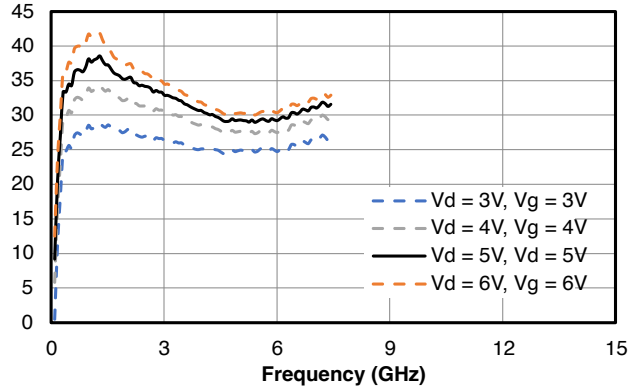
Output IP3 (dBm) vs Frequency, over Bias



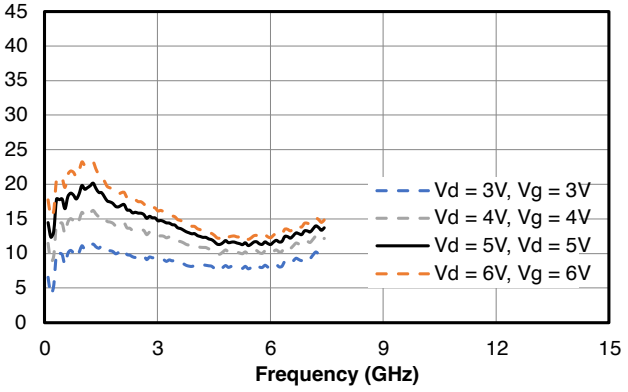
Input IP3 (dBm) vs Frequency, over Bias



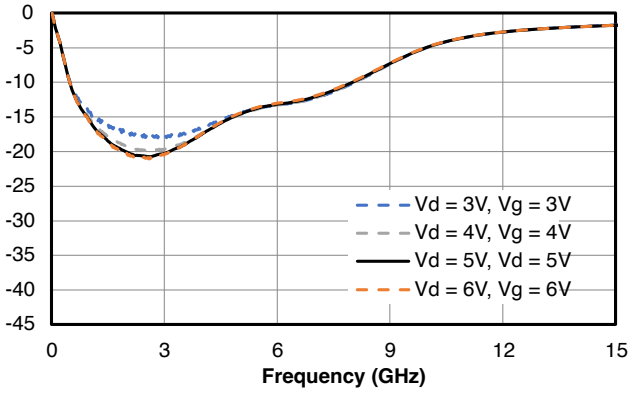
Output IP2 (dBm) vs Frequency, over Bias



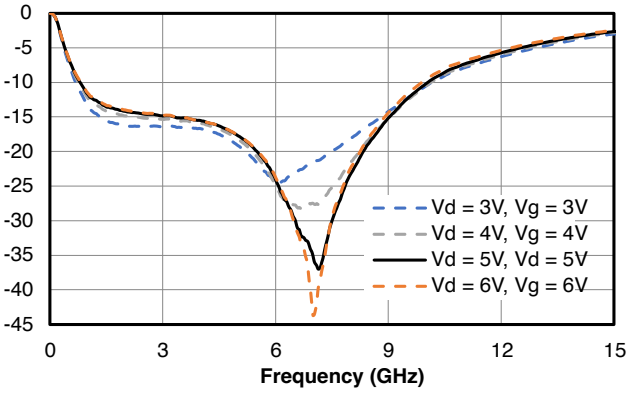
Input IP2 (dBm) vs Frequency, over Bias



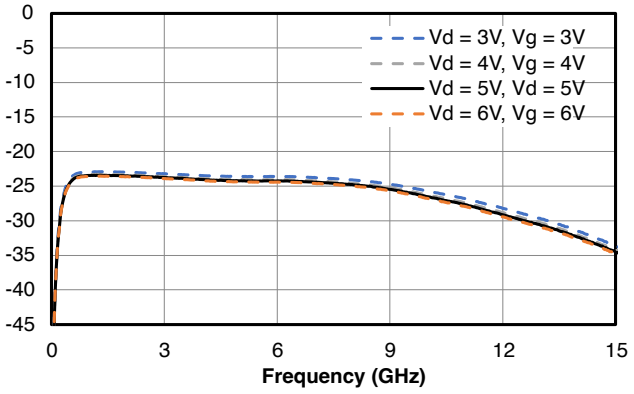
Input Return Loss (dB) vs Frequency, over Bias



Output Return Loss (dB) vs Frequency, over Bias

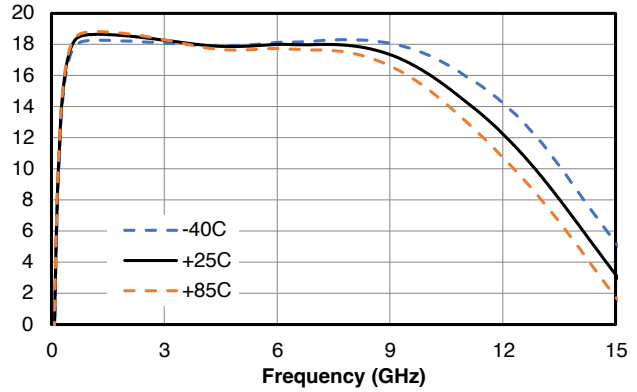


Reverse Isolation (dB) vs Frequency, over Bias

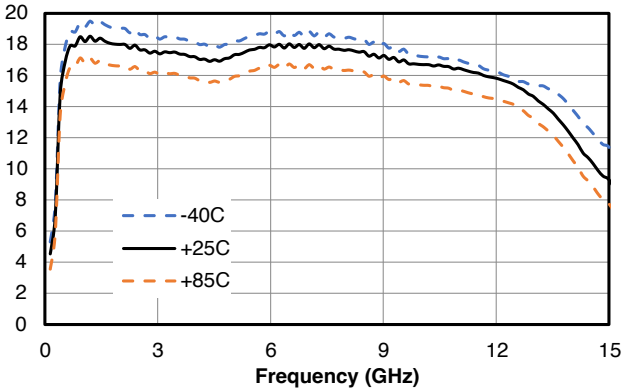


Typical Performance over Temperature Plots

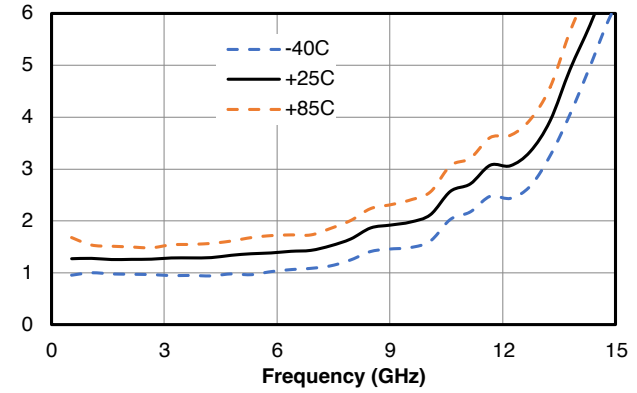
Small Signal Gain (dB) vs Frequency, over Temperature, Nom. Bias



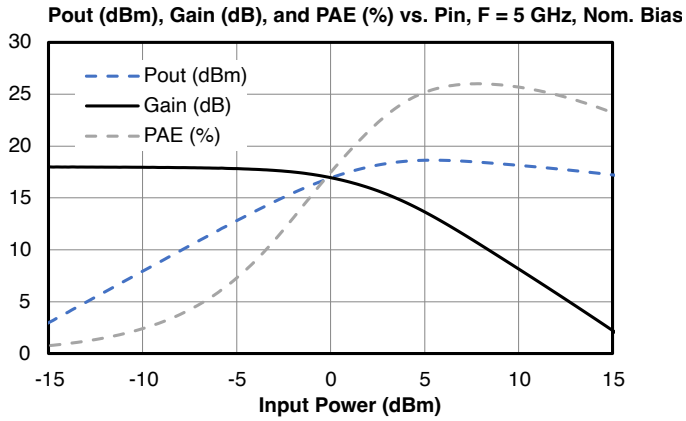
Output P1dB (dBm) vs Frequency, over Temperature, Nom. Bias

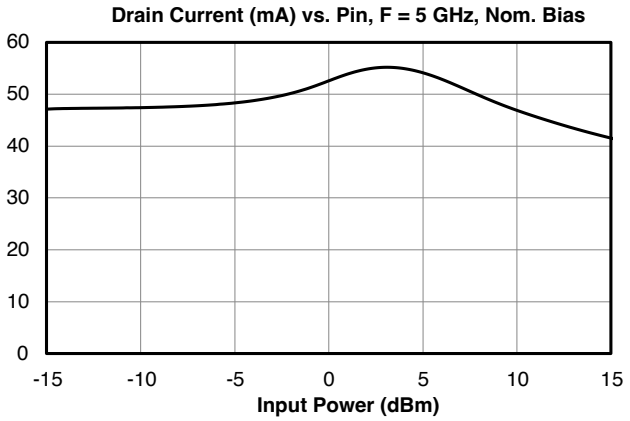


Noise Figure (dB) vs Frequency, over Temperature, Nom. Bias



Typical Performance over Input Power Plots

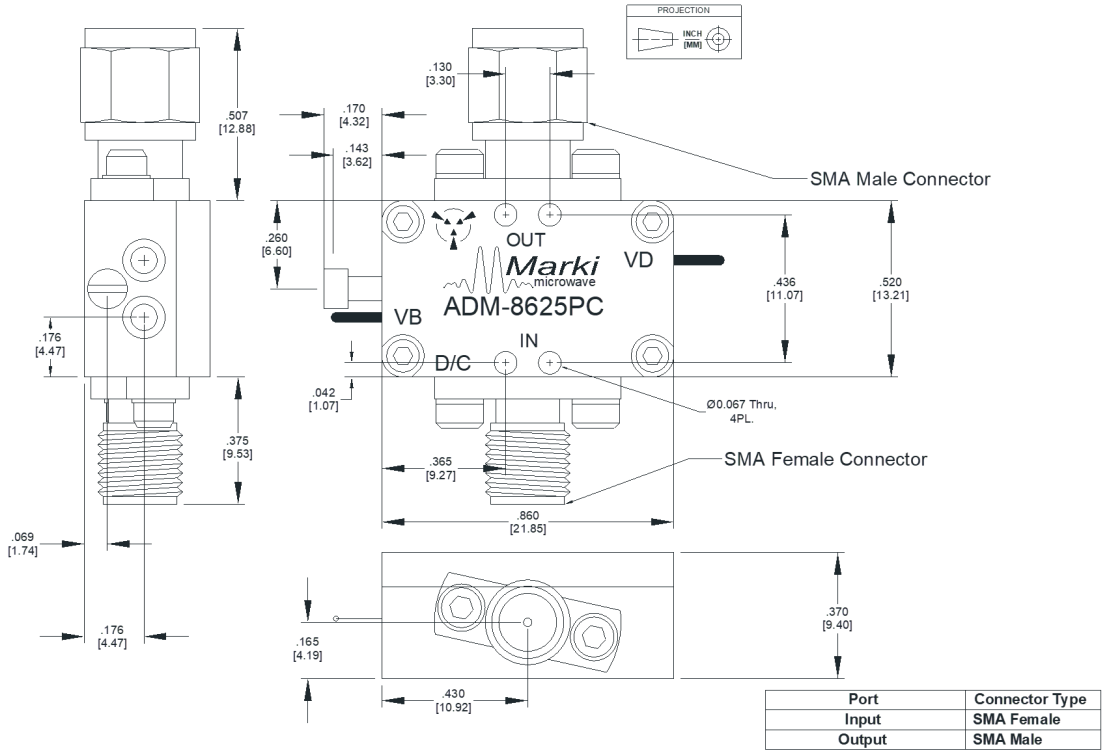




Mechanical Data

Outline Drawing

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



Port	Connector Type
Input	SMA Female
Output	SMA Male

Notes:

1. All measurements are typical.
2. Ground lug and bias pins are solderable.

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