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ADM-8556PC

6 - 20 GHz Distributed Amplifier

DEVICE OVERVIEW

General Description

The ADM-8556 is a wideband low noise amplifier capable of providing 24 dB gain and a low 1.3 dB typical noise figure from 6 to 20 GHz. The ADM-8556 is an ideal linear signal amplifier for applications requiring low power consumption and small form-factors. ADM-8556 is available in bare die and connectorized module forms. The amplifier has excellent return losses and gain flatness.

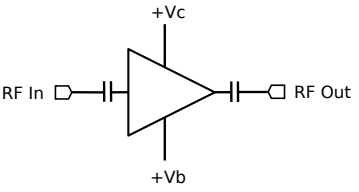
Features

- 24 dB typical gain
- 1.3 dB typical noise figure
- Single Supply, Positive Only Bias
- Low power consumption

Applications

- Test and Measurement Equipment
- Radar and satellite communications

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
ADM-8556PC	6 - 20 GHz Distributed Amplifier	PC	Standard	RoHS REACH	Released	EAR99

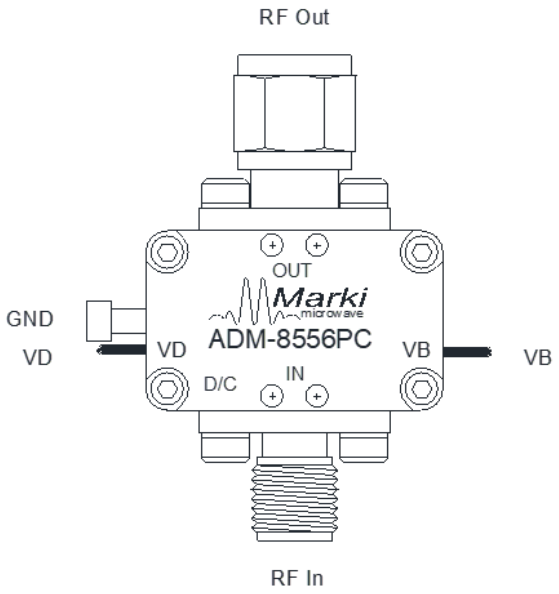
Table Of Contents

Revision History

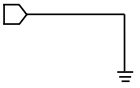
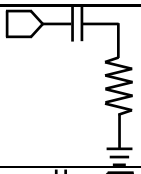
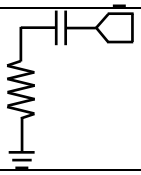
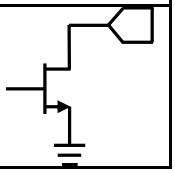
Revision Code	Revision Date	Comment
-	2023-07-01	Datasheet Initial Release
A	2023-11-02	Updated VB pin identification to be consistent throughout datasheet.

Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
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	SMAF	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	SMAM	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 +3V.	
Vd	Drain Supply Pin	-	The VD pin supplies DC voltage to the drain of the amplifier IC. This pin is nominally set at +3V.	

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
Bias Current (Ib)	10	mA
Bias Supply Voltage (Vb)	4	V
Drain Current (Id) (RF Applied)	175	mA
Drain Supply Voltage (Vd)	4	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	-55	°C
RF Power Handling	15	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
Ambient Temperature	-40	25	85	°C
Bias Supply DC Voltage (Vb)	2.5	3	3.5	V
Power Supply DC Voltage (Vd)	2.4	3	3.5	V
Power Supply DC Current (Id) (No RF Input)	50	67	86	mA

Sequencing Requirements

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

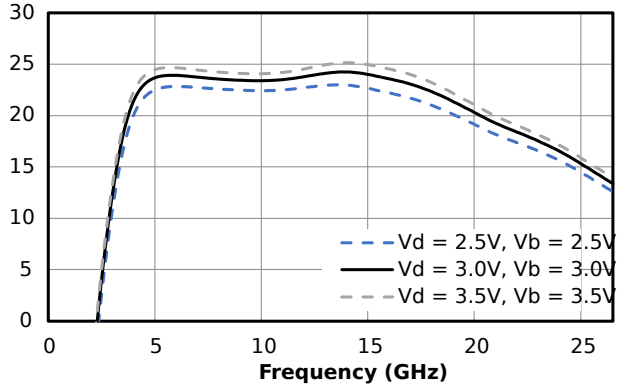
Electrical Specifications

Unless otherwise specified, electrical specifications apply at TA=+25°C, Vd = 3V, Vb = 3V.

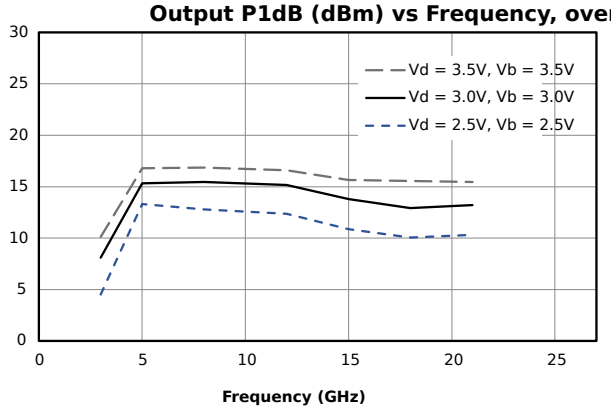
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Output Power	Vd = 3V, Vb = 3V	6	20	-	17	-	dBm
Small Signal Gain	Vd = 3V, Vb = 3V, Pin = -20dBm	15	20	18	21	-	dB
DC Supply Quiescent Current (Idq)	Vd = 3V, Vb = 3V, no RF input	6	20	-	67	-	mA
Input Return Loss	Vd = 3V, Vb = 3V, Pin = -20dBm	6	20	-	10	-	dB
Noise Figure	Vd = 3V, Vb = 3V, Pin = -20dBm	6	20	-	1.7	-	dB
Output IP3	Vd = 3V, Vb = 3V, Pin = -20dBm	6	20	-	26	-	dBm
Output P1dB	Vd = 3V, Vb = 3V	6	20	-	15	-	dBm
Output Return Loss	Vd = 3V, Vb = 3V, Pin = -20dBm	6	20	-	15	-	dB
Reverse Isolation	Vd = 3V, Vb = 3V, Pin = -20dBm	6	20	-	45	-	dB
Small Signal Gain	Vd = 3V, Vb = 3V, Pin = -20dBm	6	15	20	23	-	dB

Typical Performance Plots

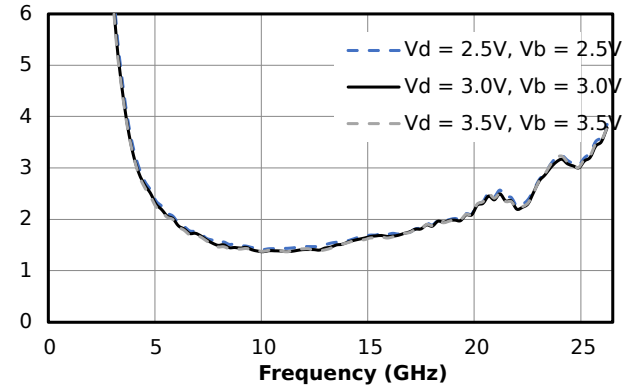
Small Signal Gain (dB) vs Frequency, over Bias



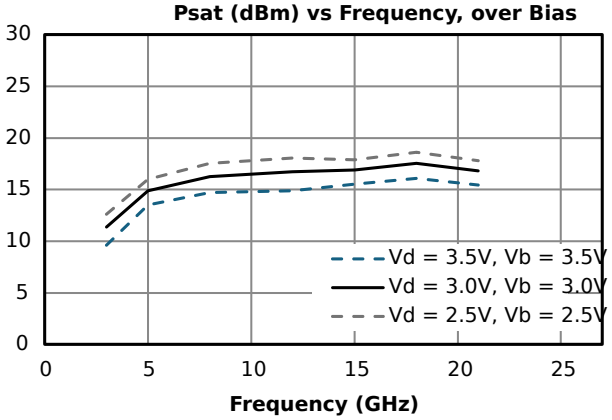
Output P1dB (dBm) vs Frequency, over Bias



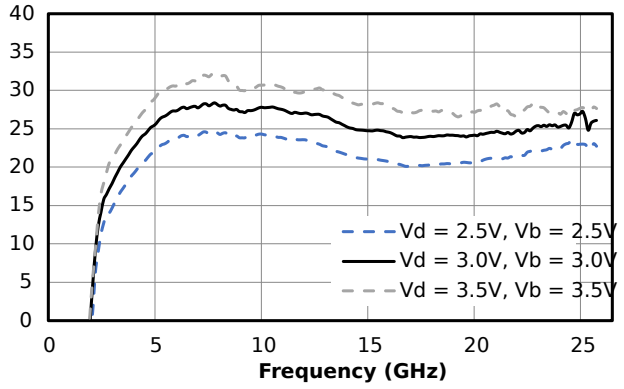
Noise Figure (dB) vs Frequency, over Bias



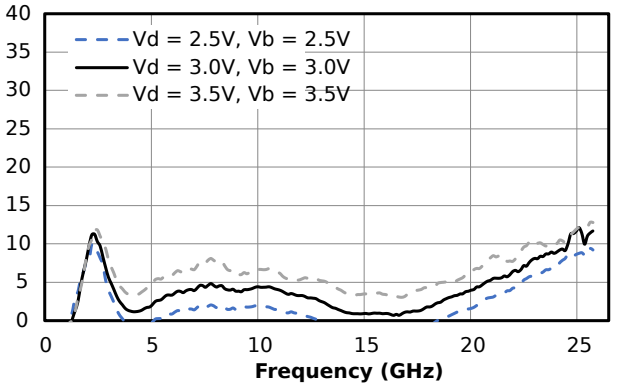
Psat (dBm) vs Frequency, over Bias



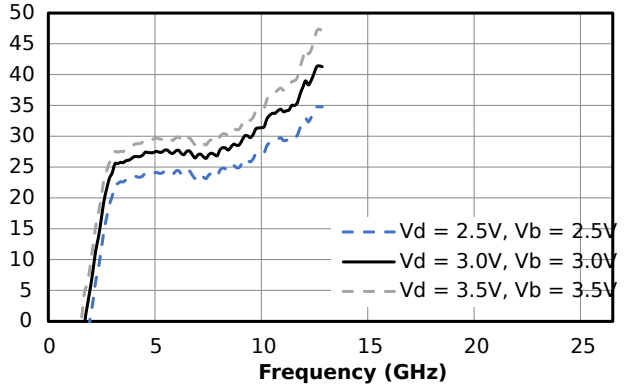
Output IP3 (dBm) vs Frequency, over Bias



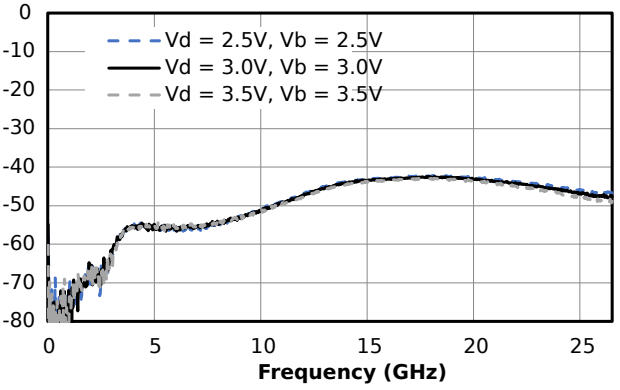
Input IP3 (dBm) vs Frequency, over Bias



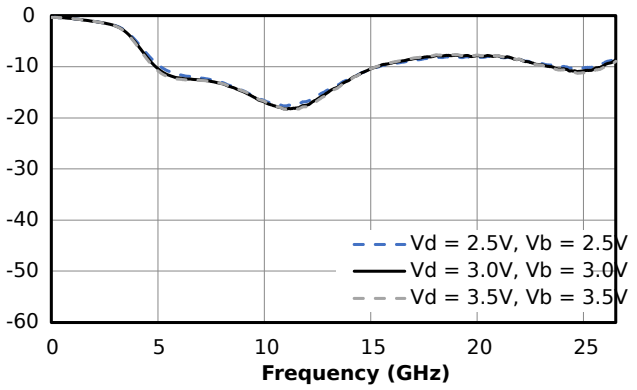
Output IP2 (dBm) vs Frequency, over Bias



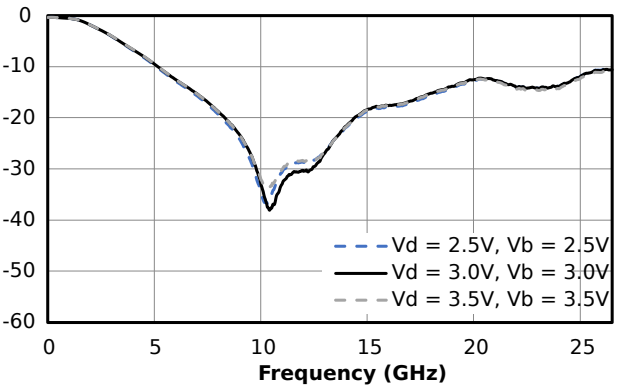
Reverse Isolation (dB) vs Frequency, over Bias



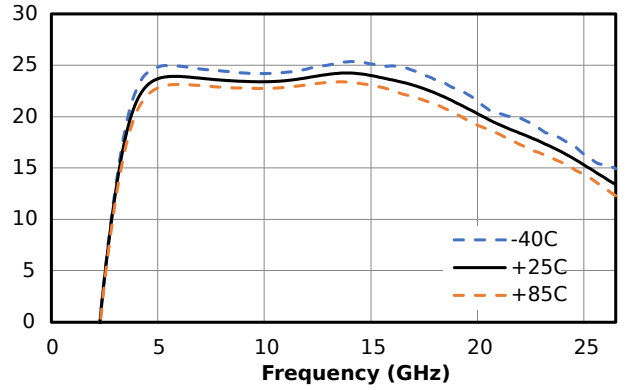
Input Return Loss (dB) vs Frequency, over Bias



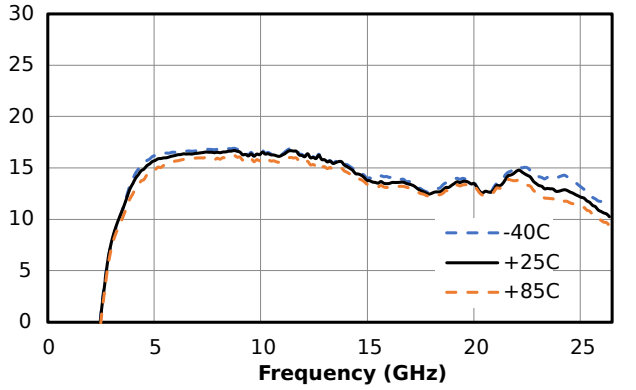
Output Return Loss (dB) vs Frequency, over Bias



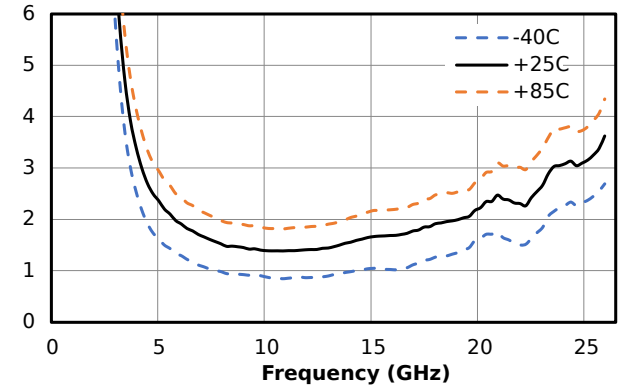
Small Signal Gain (dB) vs Frequency over Temperature,



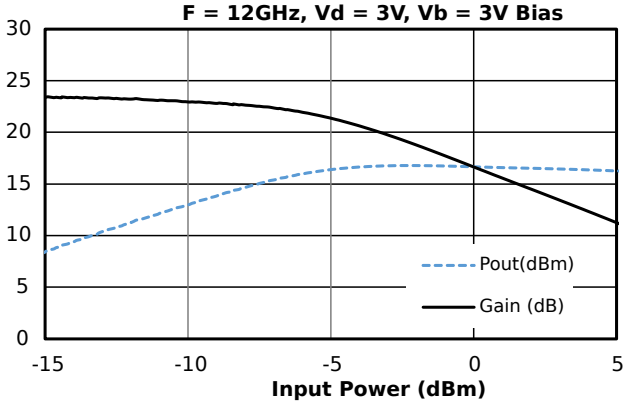
Output P1dB (dBm) vs Frequency over Temperature, Nc



Noise Figure (dB) vs Frequency over Temperature, Noi



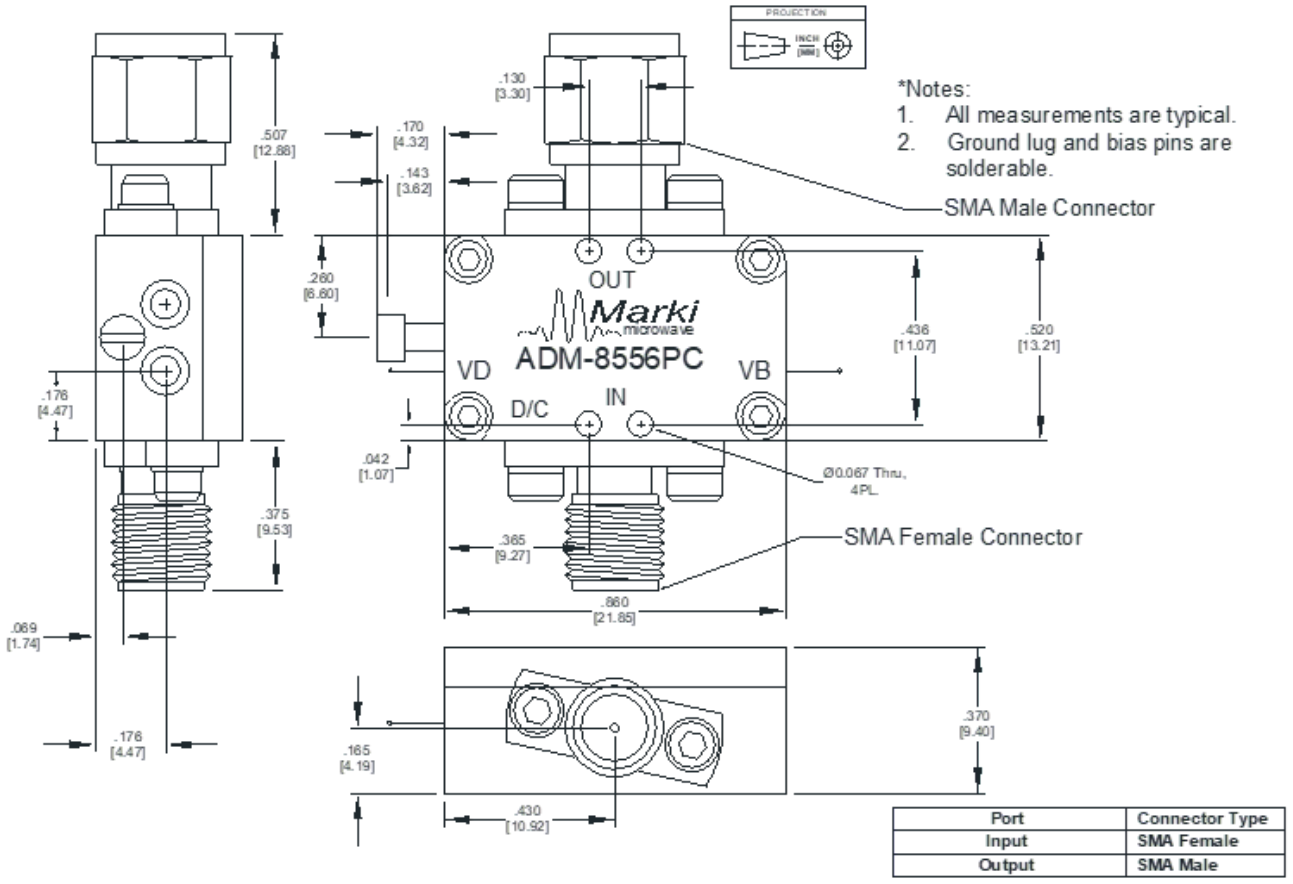
Output Power (dBm), Gain (dB), and PAE (%) vs. Input
F = 12GHz, Vd = 3V, Vb = 3V Bias



Mechanical Data

Outline Drawing

Download : 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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