

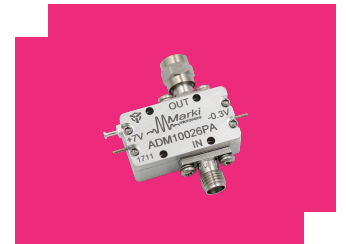
ADM1-0026PA

Broadband Distributed Amplifier

DEVICE OVERVIEW

General Description

The ADM1-0026PA is a complete LO driver solution for use with all Marki mixers up to 26.5 GHz. This single-stage packaged GaAs MMIC distributed amplifier integrates all required biasing circuitry. It offers 12 dB typical gain and 21 dBm saturated output power, which is suitable for driving all L, M, I, and H mixers. In saturation it produces a square wave that is optimal for driving a T3 with the highest linearity. The amplifier is operated with a +3V to +7 V positive bias and an optional current reducing negative voltage. While optimized as a mixer LO driver, it is suitable for many applications in test and measurement and laboratory applications.



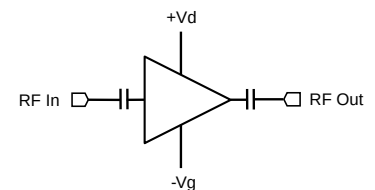
Features

- Broadband 50 Ω Matching
- Unconditionally Stable
- Optimized for use as a T3 LO buffer amplifier
- Suitable for driving L, M, I, and H diode mixers
- Optional Positive Only Bias Operation
- Integrated Blocking Capacitors and Inductors
- 3rd and 5th Harmonic Generation

Applications

- Test and Measurement Equipment
- Laboratory Applications

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Packing Size	Green Status	Product Lifecycle	Export Classification
ADM1-0026PA	Broadband Distributed Amplifier	PA	-	RoHS	Released	EAR99

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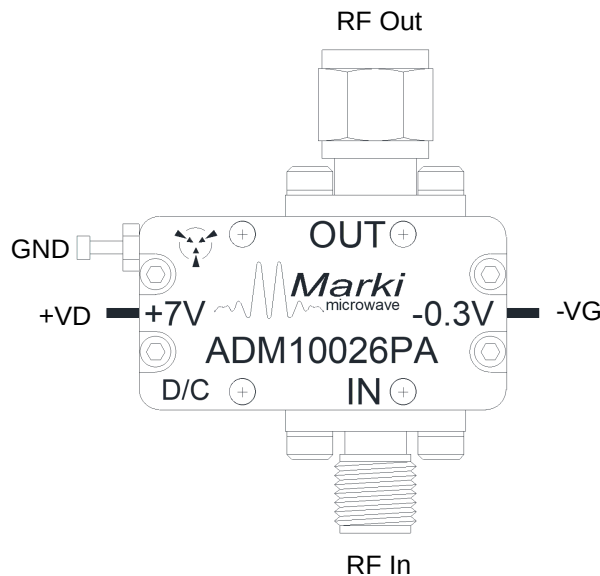
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Revision History

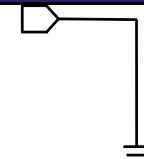
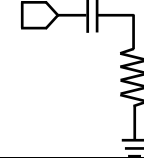
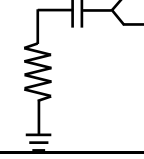
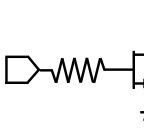
Revision Code	Revision Date	Comment
-	2020-01-07	Initial Date Release

Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	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	The amplifier's RF Input port is matched to 50 Ω and has built-in DC blocking capacitors.	
RF Out	RF Output	The amplifier's RF Output port is matched to 50 Ω and has built-in DC blocking capacitors.	
Vd	Drain Supply Pin	Bias supply on Vd should be voltage limited below 9 V and current limited below 250 mA at all times. The operational bias voltage should be between 3 V and 7 V for full gain, efficiency, and linearity. In general linearity and output power will increase marginally with increased voltage from 3 to 7 V.	
Vg	Negative bias	Bias on this pin is recommended. Application of a negative bias can reduce the current draw from the positive supply, slightly improve small signal gain at higher frequencies, significantly improve even order harmonic suppression, and improve nonlinear performance of a T3 mixer. Due to the reduced current, it may also extend the lifetime of the amplifier. The amplifier is designed to perform optimally when the negative bias voltage is adjusted so that the amplifier draws 150 mA on the positive supply.	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	85	°C
Maximum Storage Temperature	150	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
Negative Bias Current	0.5	mA
Negative Bias Voltage	-2	V
Positive Bias Current	280	mA
Positive Bias Voltage	9	V
Power Dissipation	2.25	W
RF Input Power	15	dBm

Package Information

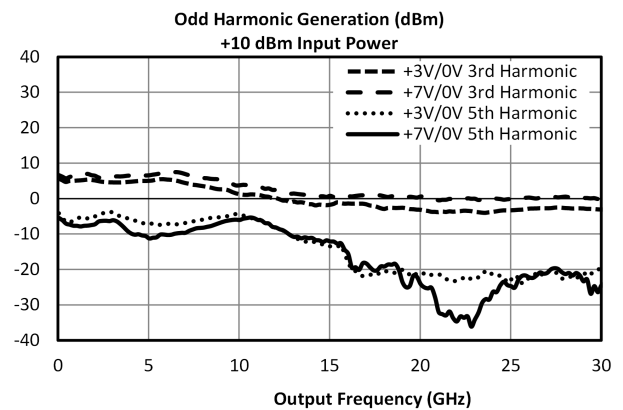
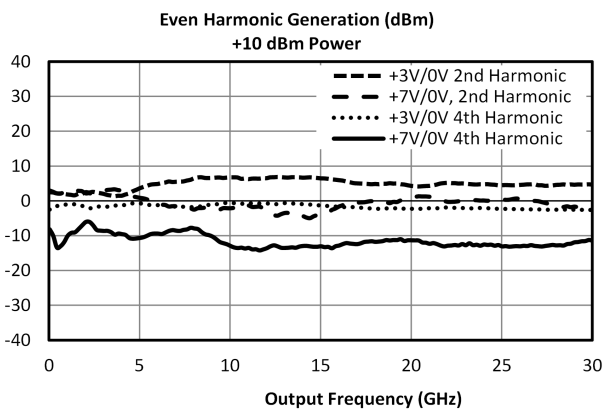
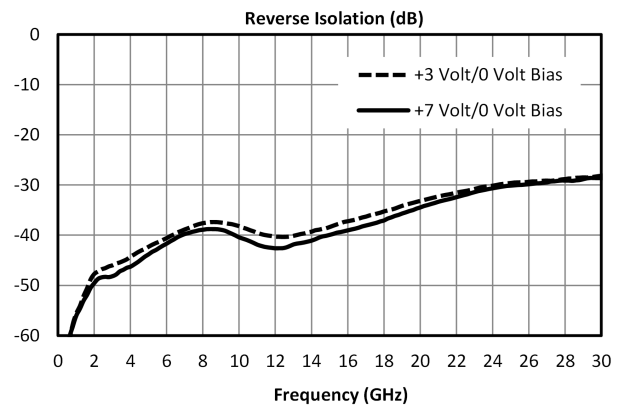
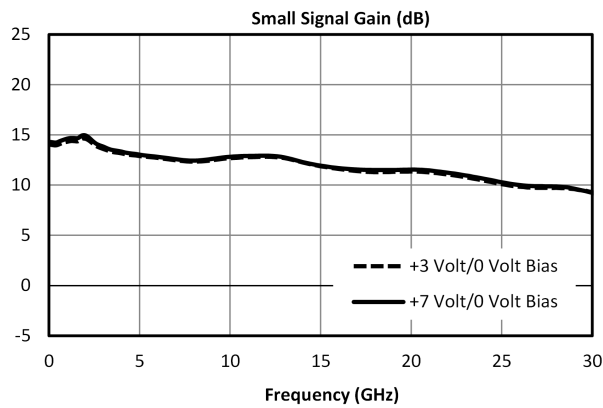
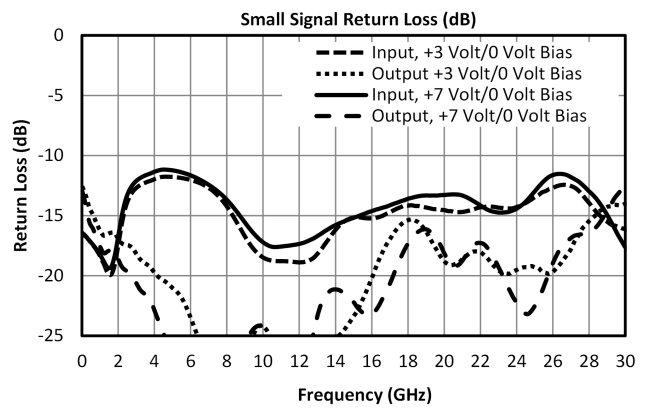
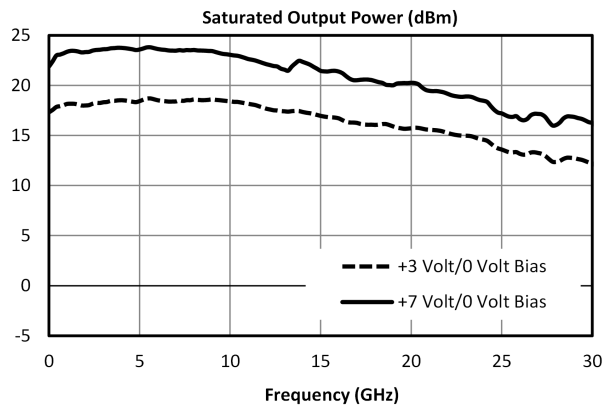
Parameter	Details	Rating
ESD	< 250 Volts	HBM Class 0
Dimensions	-	28.45x14.99 mm

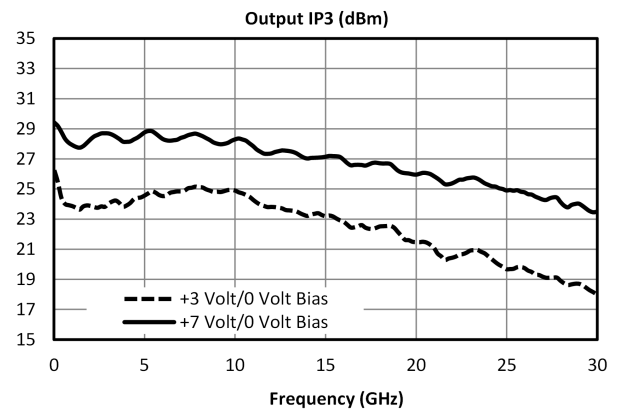
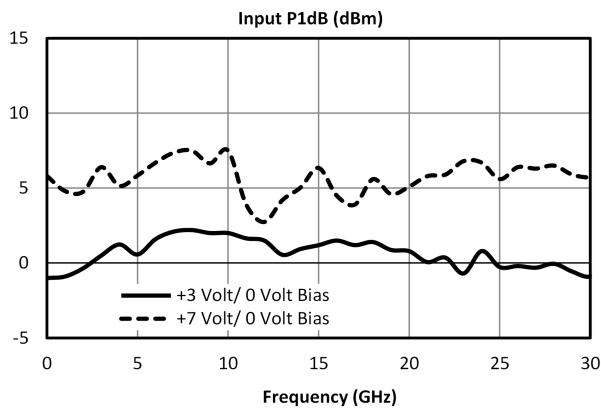
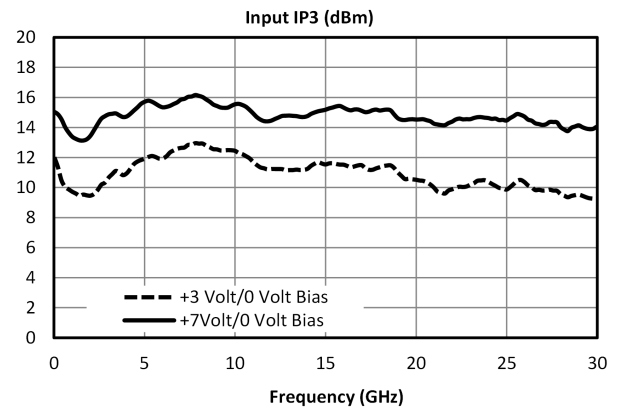
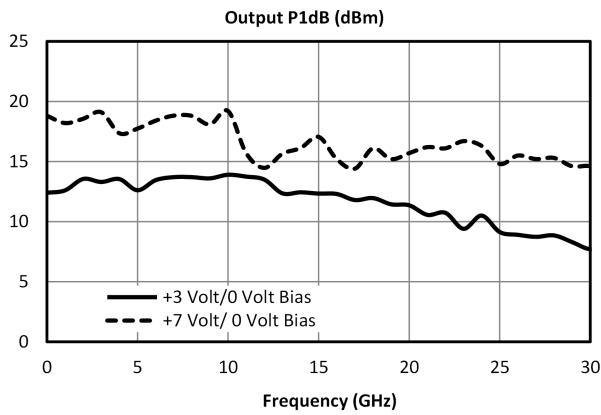
Electrical Specifications

Specifications guaranteed from -55 to +85°C, measured in a 50-Ohm system.

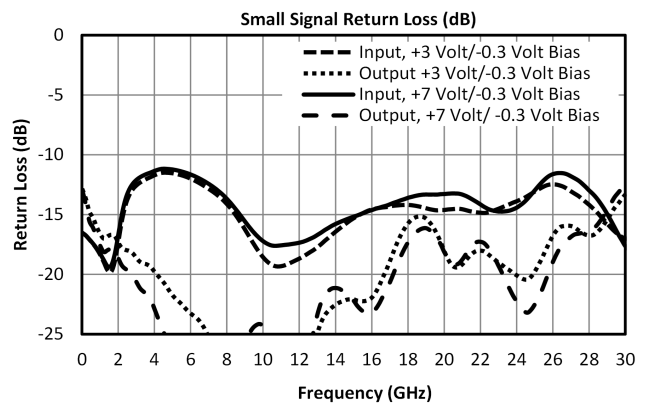
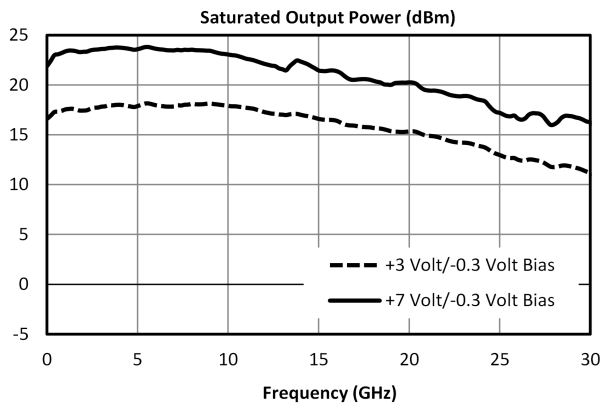
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Small Signal Gain	-	0.005	26.5	-	12	-	dB
Noise Figure	-	0.005	26.5	-	4	-	dB
Saturated Output Power	With Negative Bias	0.005	26.5	-	20	-	dBm
Output IP3	-	0.005	26.5	-	25	-	dBm
Input Return Loss	-	0.005	26.5	-	13	-	dB
Output Return Loss	-	0.005	26.5	-	17	-	dB
Bias Requirements	Vd: +3.0 to +7.0 / Vg: -0.2 to -0.3 Volts	0.005	26.5	-	165	250	mA
Bias Requirements	Vd: +3.0 to +7.0 / Vg: 0 Volts	0.005	26.5	-	250	280	mA
Input for Saturated Output	-	0.005	26.5	5	10	15	dBm
Output 1 dB Compression	-	0.005	26.5	-	17	-	dBm

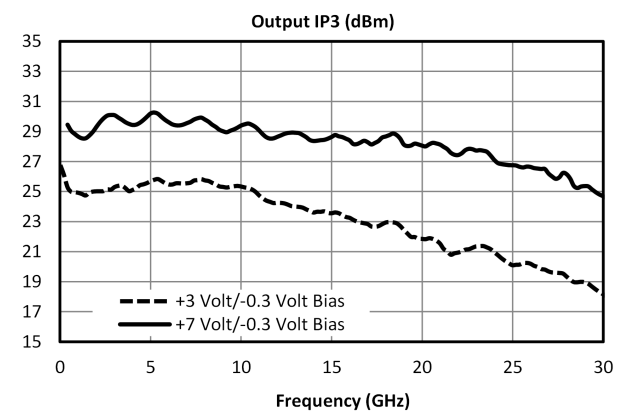
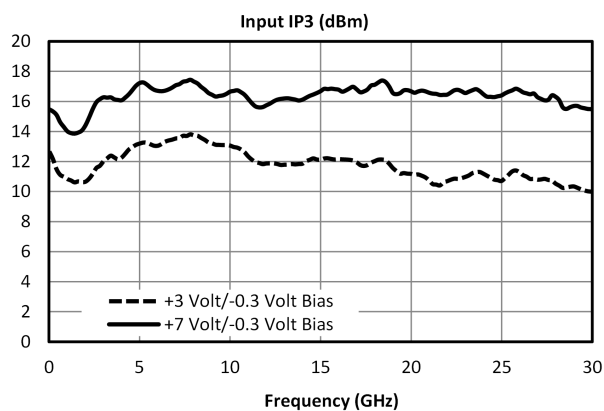
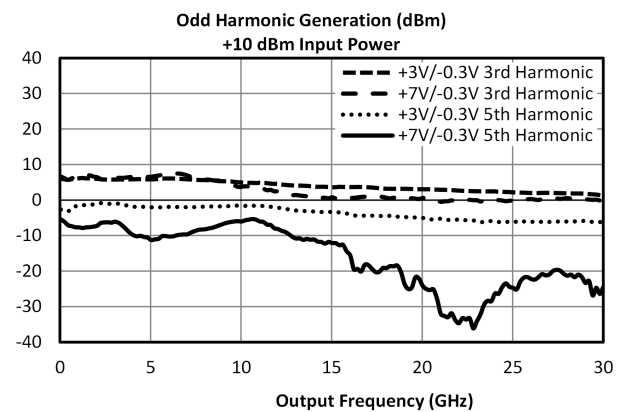
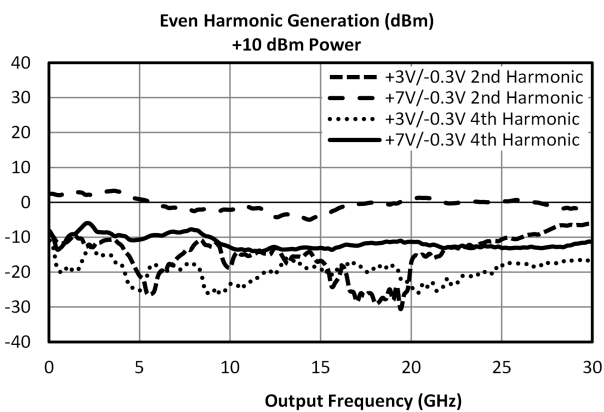
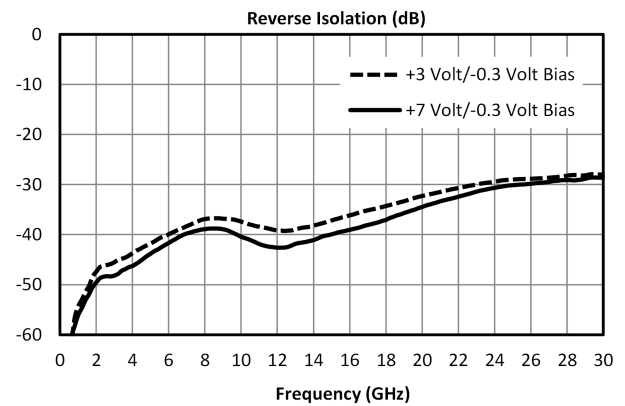
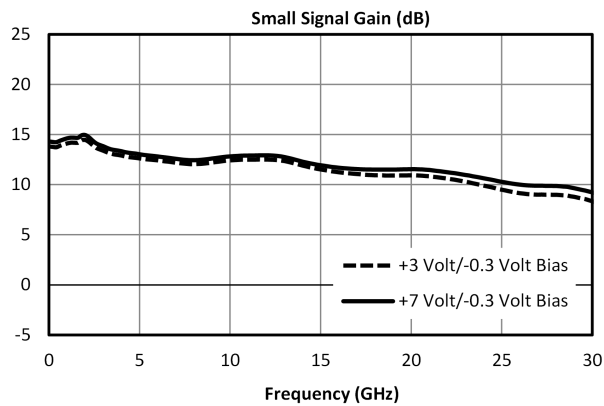
Typical Performance Plots – Positive Bias Only

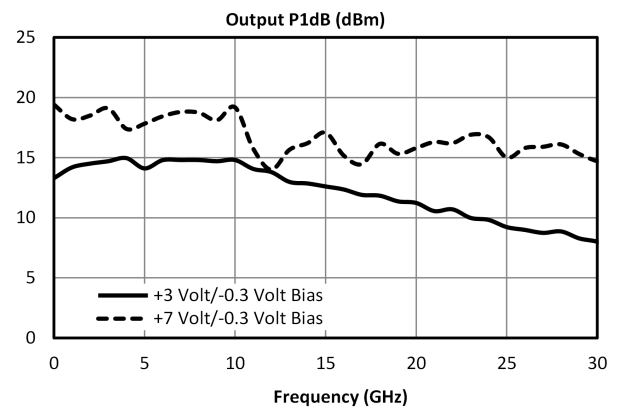
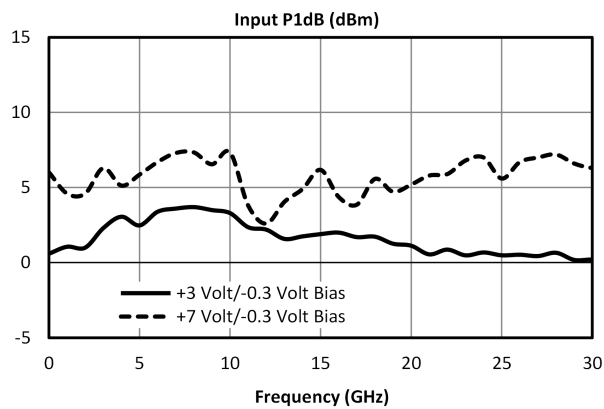




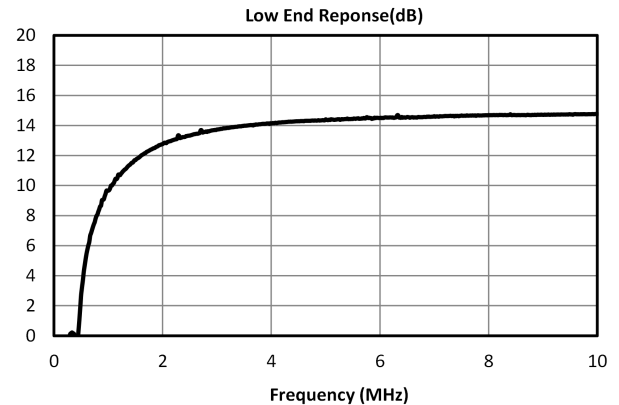
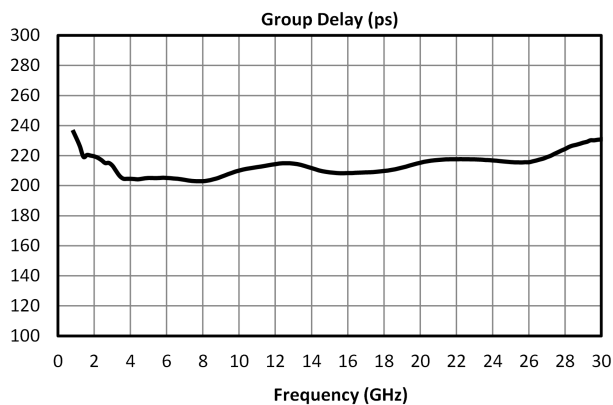
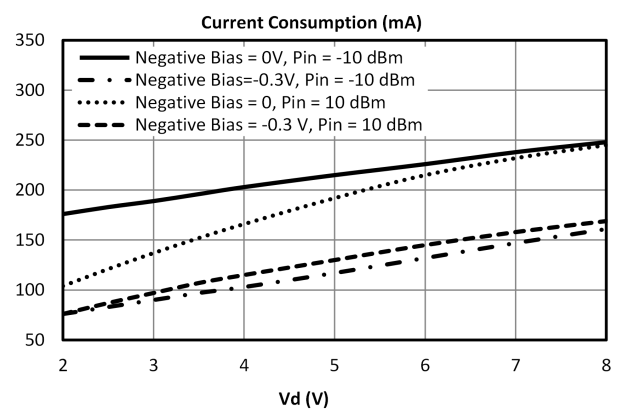
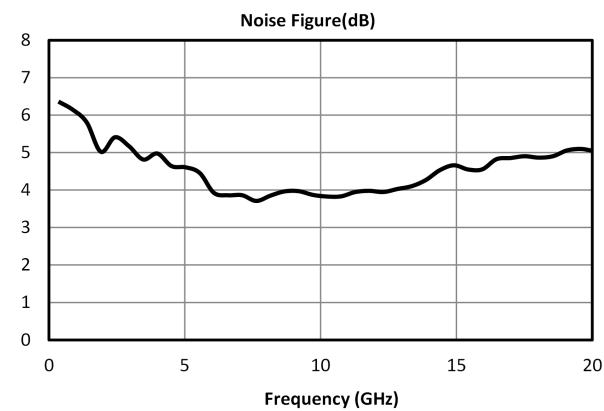
Typical Performance Plots – Positive and Negative Bias



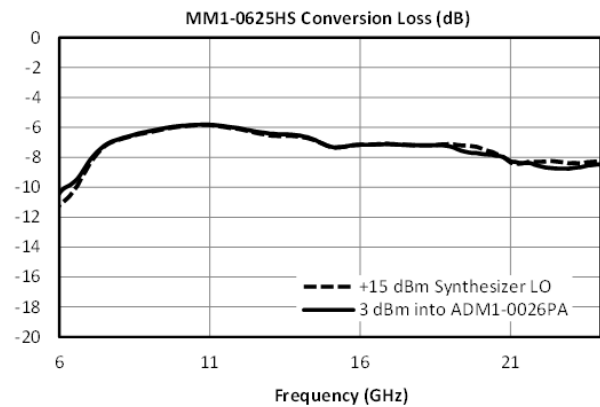
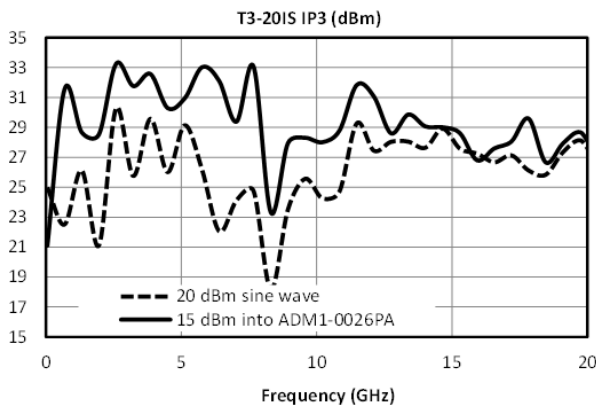
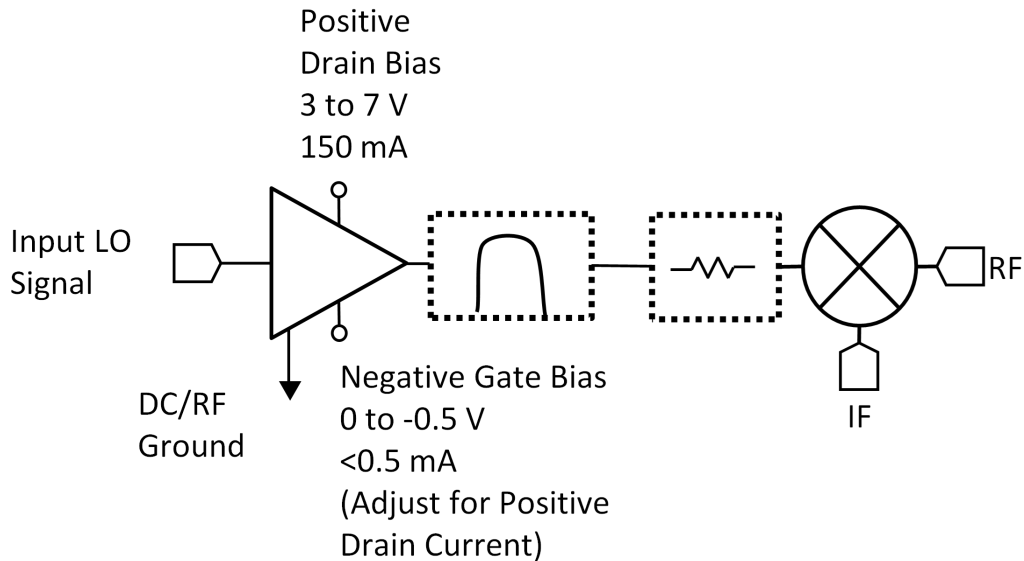




Typical Performance Plots – All Bias



Application Information



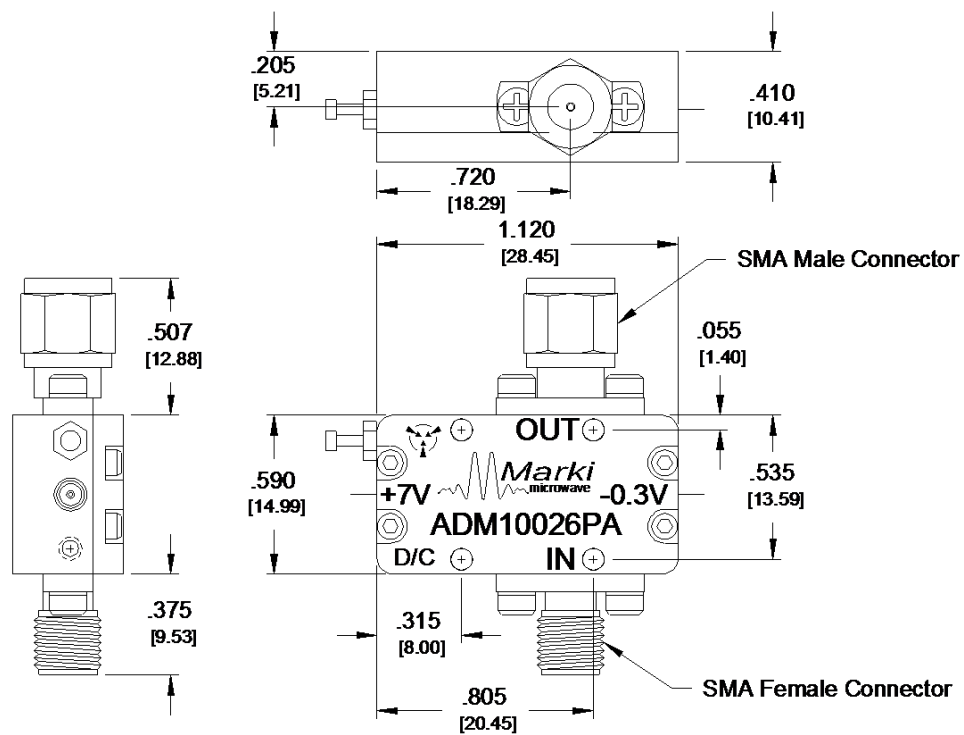
Applications Information		
Application	Input Power	Comments
T3 LO Driver	+10 to +15 dBm	Ideal choice for driving all T3 mixers down to 10 MHz. When driven beyond the 1 dB compression point (with inputs higher than 10 dBm), it will create a saturated square wave output that improves the IP3, spurious suppression, and 1 dB compression of the T3 mixer, especially at lower frequencies.
Broadband Mixer LO Driver	-5 to +10 dBm	Can be used to drive any double balanced mixer with an H diode or lower (including L, I, and M diodes). For this purpose saturated operation is not preferred, and may cause undesirable results. Input power should be kept in the -5 to +10 dBm range to provide appropriate output power, depending on the mixer.
General Purpose Linear RF Amplifier	<+5 dBm	Can be used as a general purpose amplifier for RF signals. Input power should be kept below +5 dBm for linear operation.

Biasing and Operation

Positive Bias (Vd) –Bias supply on Vd should be voltage limited below 9 V and current limited below 250 mA at all times. The operational bias voltage should be between 3 V and 7 V for full gain, efficiency, and linearity. In general linearity and output power will increase marginally with increased voltage from 3 to 7 V.

Mechanical Data

Outline Drawing



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