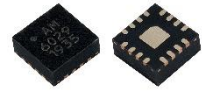


AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

Description

AM1137 is a wideband, cascadable amplifier that covers the 10 MHz to 18 GHz frequency range. The device exhibits strong linearity and output power handling along with high gain and moderate noise figure across its frequency range. The AM1137 performs well down to 10 MHz and its low frequency performance is limited only by the frequency response of the input and output bias tees present in the application circuit. With internal 50 Ω matching and packaged in a 3mm QFN, the AM1137 represents a compact total PCB footprint.

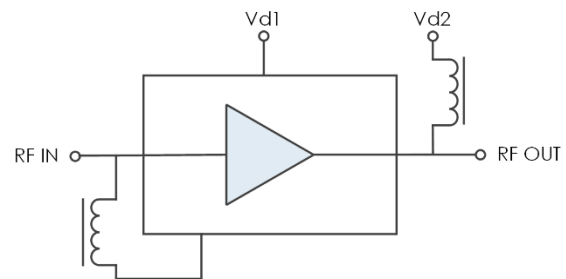


NOTE: Similar part picture shown. Size and footprint identical.

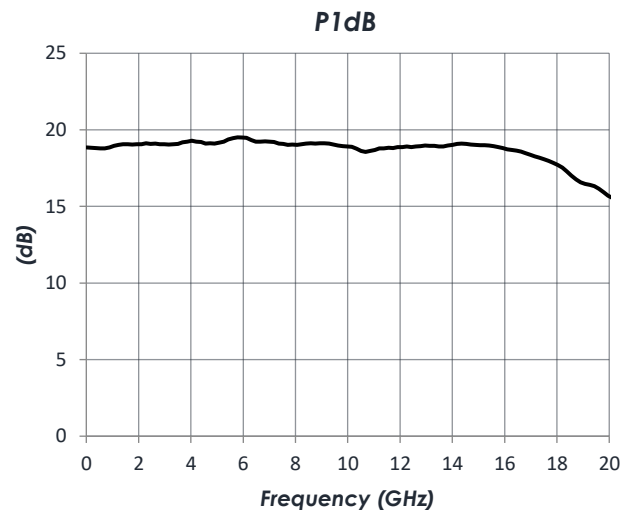
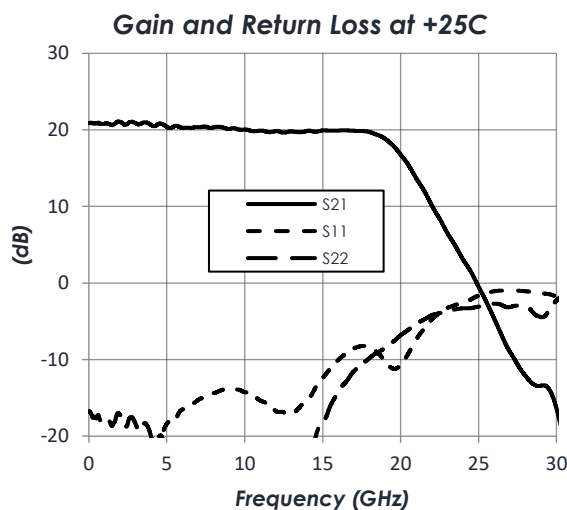
Features

- 20 dB Gain
- +19 dBm P1dB
- +29 dBm OIP3
- 4.1 dB Noise Figure
- +4.2V and +5.0V Operation
- 3mm QFN
- -40C to +85C Operation

Functional Diagram



Characteristic Performance



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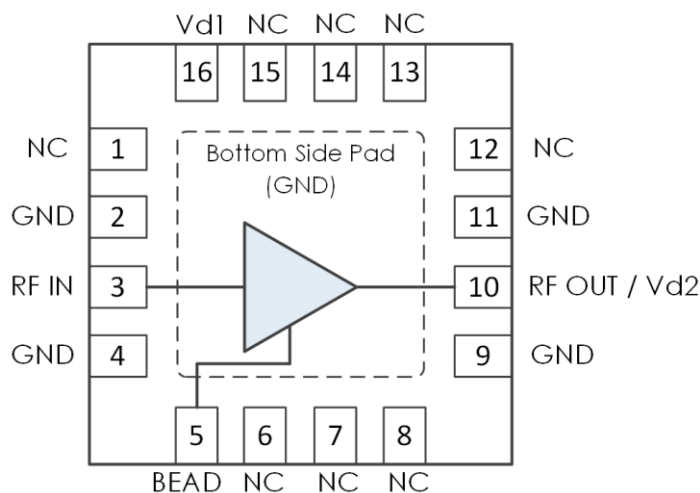
Table of Contents

Description	1	Recommended Operating Conditions ...	4
Features.....	1	Thermal Information	4
Functional Diagram.....	1	10 MHz Electrical Characteristics	5
Characteristic Performance	1	RF Performance	5
Revision History	2	Typical Performance	6
Pin Layout and Definitions.....	3	Typical Application.....	8
Specifications	4	Evaluation PC Board	9
Absolute Maximum Ratings.....	4	Related Parts.....	9
Handling Information.....	4	Component Compliance Information.....	10

Revision History

Date	Revision Number	Notes
June 26, 2023	1	Initial Release
October 24, 2024	2	Fixed inconsistencies for VD1 and VD2 voltages

Pin Layout and Definitions



Pin Number	Pin Name	Pin Function
1	NC	Not Connected
2	GND	Ground – Common
3	RF IN	RF Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required
4	GND	Ground – Common
5	BEAD	Connect to RF IN through external ferrite bead or large inductor
6-8	NC	Not Connected
9	GND	Ground – Common
10	RF OUT / Vd2	RF Output and DC Power Input– 50 Ohms – DC Coupled. External DC Blocking Capacitor Required
11	GND	Ground – Common
12-15	NC	Not Connected
16	Vd1	DC Power Input

Note: NC pins may be grounded or left open.

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10 MHz to 18 GHz Driver Amplifier

Specifications

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	6 V
RF Input Power		+20 dBm
Storage Temperature Range	-55 C	+150 C

Note: Any device operation beyond the Absolute Maximum Ratings may result in permanent damage to the device. The values listed in this table are extremes and do not imply functional operation of the device at these or any other conditions beyond what is listed under Recommended Operating Conditions. Any part subjected to conditions outside of what is recommended for an extended amount of time may suffer from reliability concerns.

Handling Information

	Minimum	Maximum
Moisture Sensitivity Level	MSL 3	



Atlanta Micro products are electrostatic sensitive.
Follow safe handling practices to avoid damage

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage (Vd1)		5.0 V	
Supply Voltage (Vd2)		4.2 V	4.4 V
Operating Case Temperature	-40 C		+85 C

Thermal Information

Junction to Case Thermal Resistance (θ_{JC})	152 C/W
Nominal Junction Temperature at +85C Ambient	+165 C
Channel Temperature to Maintain 1 Million Hour MTF	+175 C

AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
DC Supply Voltage (Vd1)			5.0 V	
DC Supply Voltage (Vd2)			4.2 V	4.4 V
DC Supply Current (Vd1)			53 mA	
DC Supply Current (Vd2)			63 mA	
Power Dissipated	Vd1 = 5.0 V, Vd2 = 4.2 V		0.53 W	

RF Performance

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		10 MHz		18 GHz
Gain ²	f = 10 MHz		21 dB	
	f = 9 GHz		20 dB	
	f = 18 GHz		20 dB	
Return Loss ²	f = 10 MHz		-21 dB	
	f = 9 GHz		-14 dB	
	f = 18 GHz		-8.5 dB	
Output IP3 ^{1,2}			+29 dBm	
Output P1dB ²			+19 dBm	
Noise Figure			4.1 dB	

Notes:

1. OIP3 measured with 10 MHz tone spacing with $P_{out/tone} = 0$ dBm.
2. Measured directly at output of device with board probes. Output bias voltage supplied through equipment bias tee and is measured exclusive of bias tee effects.

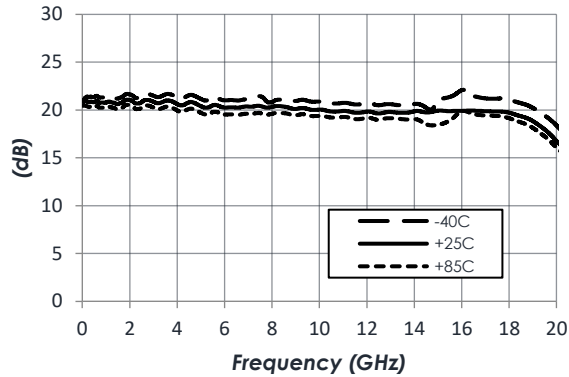
AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

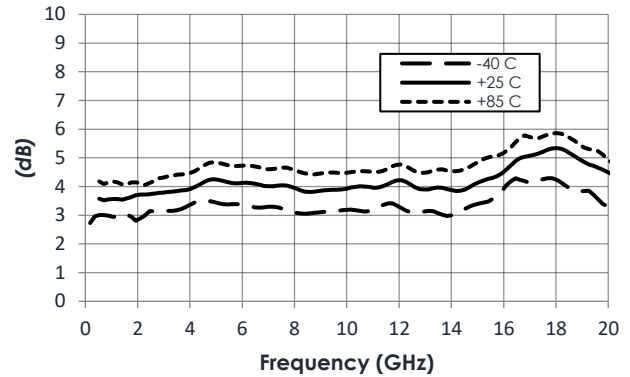
Typical Performance

(Vd1 = 5.0 V, Vd2 = 4.2 V, T = 25 °C unless otherwise specified)

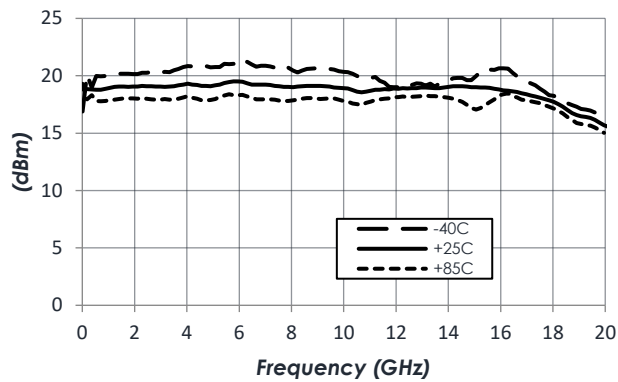
Gain vs Temperature



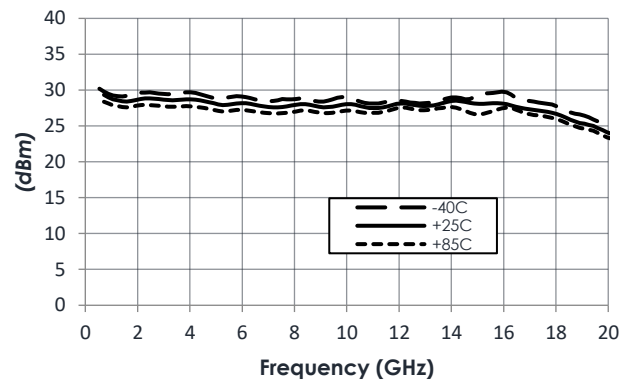
Noise Figure vs Temperature



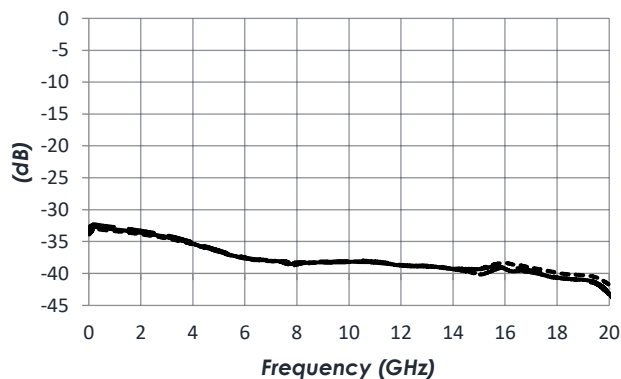
P1dB vs Temperature



Output IP3 vs Temperature



Reverse Isolation vs Temperature



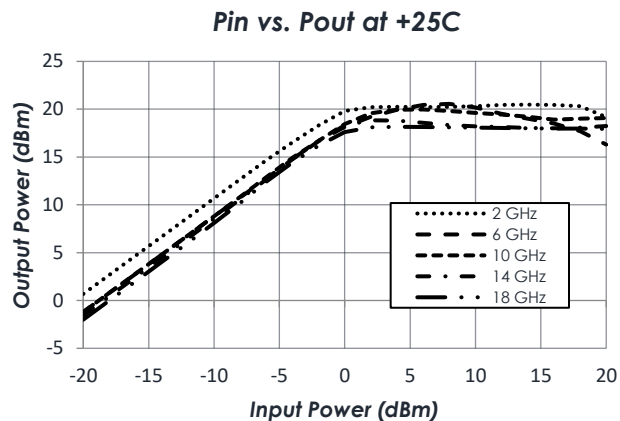
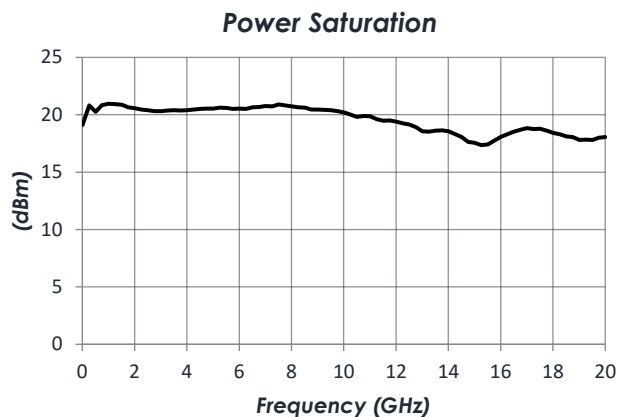
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AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

Typical Performance (continued)

(Vd1 = 5.0 V, Vd2 = 4.2 V, T = 25 °C unless otherwise specified)

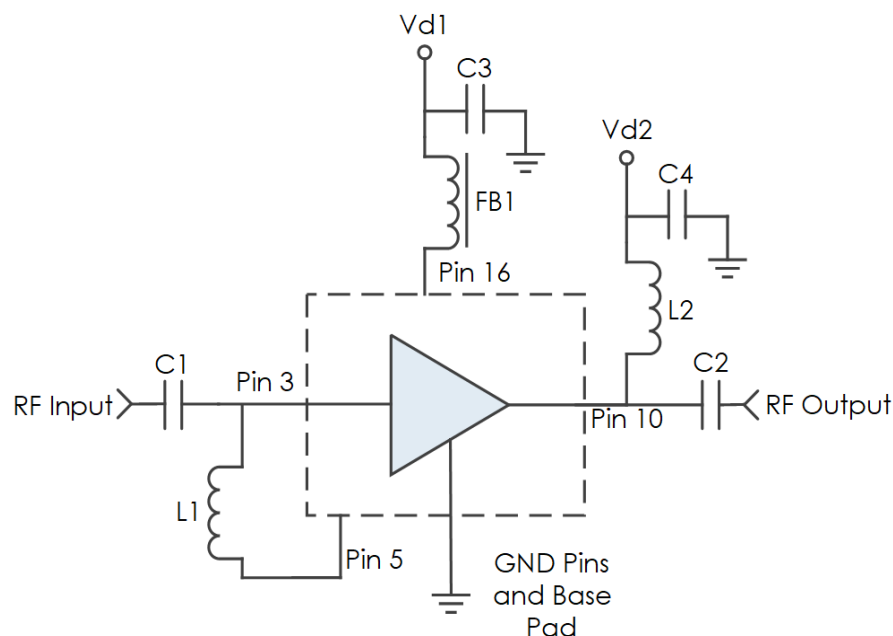


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AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

Typical Application



Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
C1, C2	0.1 μ F	0201BB104KW160	Passives Plus
C3, C4	0.1 μ F	GRM155R71C104KA88	Murata
FB1	-	MMZ1005A222E	TDK
L1, L2	250 nH	CC25T47K240G5-C	Piconics

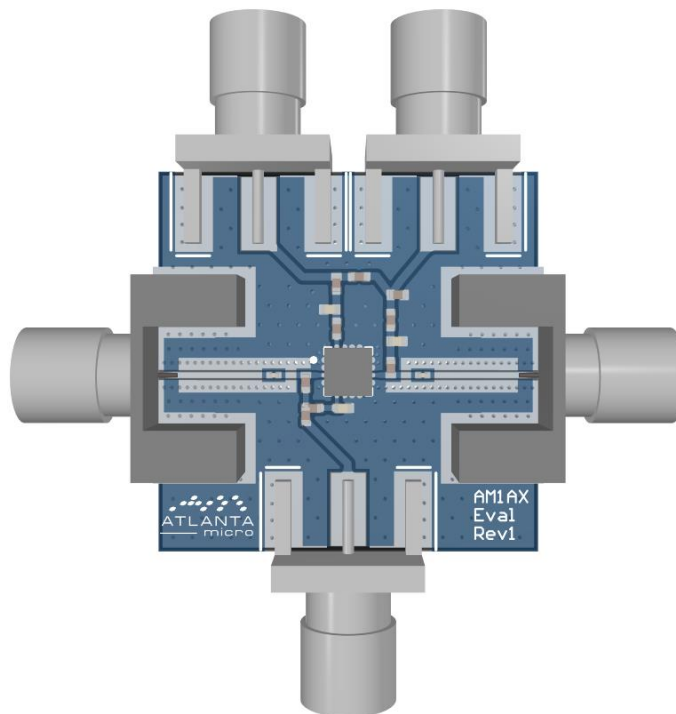
Notes:

1. NC pins may be grounded or left open
2. DC blocking capacitors should be high performance, low-loss, broadband capacitors for optimum performance

AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier

Evaluation PC Board



Related Parts

Part Number				Description
AM1053	5 GHz	to	20 GHz	Gain Block
AM1102	DC	to	22 GHz	Low Noise Amplifier
AM1111	2 GHz	to	18 GHz	Driver Amplifier
AM1136	1.4 GHz	to	20 GHz	Driver Amplifier
AM1142	20 MHz	to	18 GHz	Gain Block

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Substance List	Allowable Maximum Concentration
Lead (Pb)	<1000 PPM (0.1% by weight)
Mercury (Hg)	<1000 PPM (0.1% by weight)
Cadmium (Cd)	<75 PPM (0.0075% by weight)
Hexavalent Chromium (CrVI)	<1000 PPM (0.1% by weight)
Polybrominated Biphenyls (PBB)	<1000 PPM (0.1% by weight)
Polybrominated Diphenyl ethers (PBDE)	<1000 PPM (0.1% by weight)
Decabromodiphenyl Deca BDE	<1000 PPM (0.1% by weight)
Bis (2-ethylhexyl) Phthalate (DEHP)	<1000 PPM (0.1% by weight)
Butyl Benzyl Phthalate (BBP)	<1000 PPM (0.1% by weight)
Dibutyl Phthalate (DBP)	<1000 PPM (0.1% by weight)
Diisobutyl Phthalate (DIBP)	<1000 PPM (0.1% by weight)

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