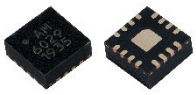
AM1137 – Amplifier

10 MHz to 18 GHz Driver Amplifier



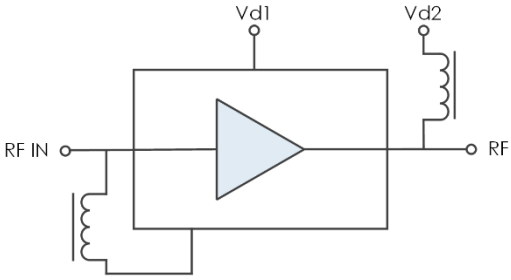
NOTE: Similar part picture shown. Size and footprint identical.

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 50Ω matching and packaged in a 3mm QFN, the AM1137 represents a compact total PCB footprint.

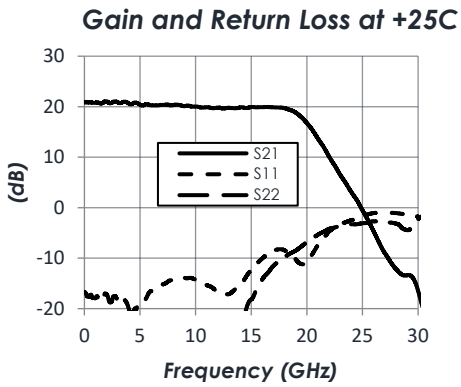
FEATURES

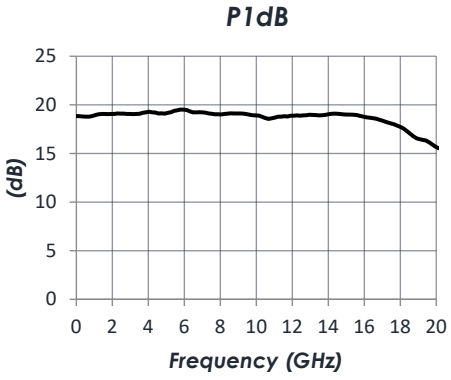
- 20 dB Gain
- +19 dBm P1dB
- +29 dBm OIP3
- 4.1 dB Noise Figure
- +4.2V and +5.0V Operation
- 3mm QFN
- -40C to +85C Operation

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE





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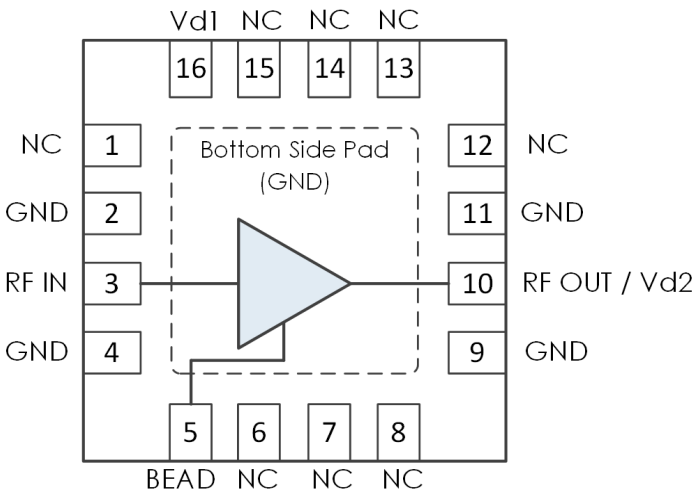
REVISION HISTORY

Date	Revision	Notes
June 26, 2023	1	Initial Release
October 24, 2024	2	Fixed inconsistencies for VD1 and VD2 voltages.
February 12, 2025	3	Changed to Mercury branding. No content changes.

PIN LAYOUT AND DEFINITIONS



Pin	Name	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

* NC pins may be grounded or left floating.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+6 V
RF Input Power		+20 dBm
Storage Temperature Range	-55C	+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. Devices subjected to conditions outside of what is recommended for extended periods may affect device reliability.

Handling Information

	Minimum	Maximum
Moisture Sensitivity Level	MSL 3	

Mercury 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	
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 MTTF	+175 C

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
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)

Param	Testing Conditions	Min	Typical	Max
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]	f = 16 GHz			
Output P1dB[2]	f = 16 GHz			
Noise Figure	State 00, f=16 GHz			

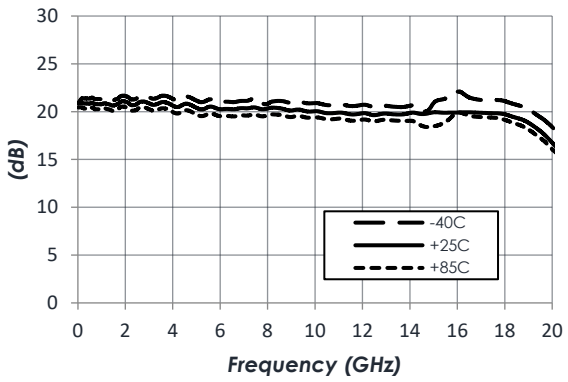
*Notes:

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.

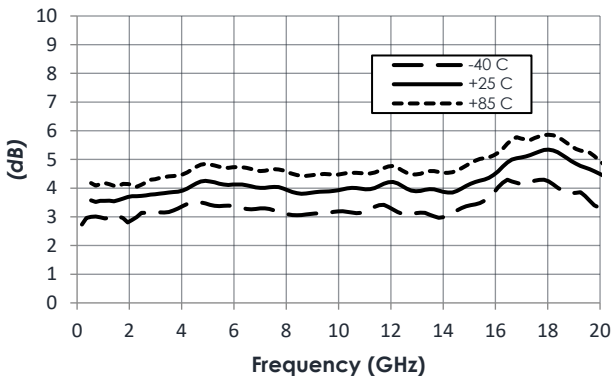
TYPICAL PERFORMANCE

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

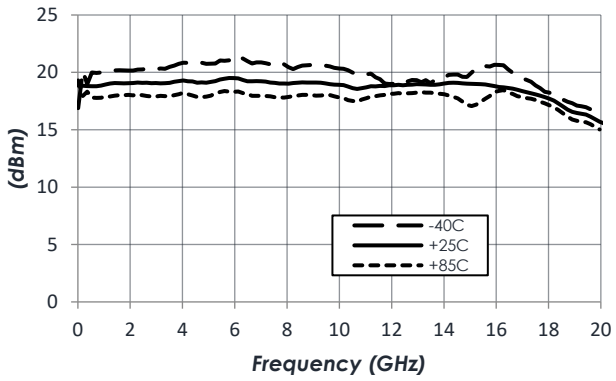
Gain vs Temperature



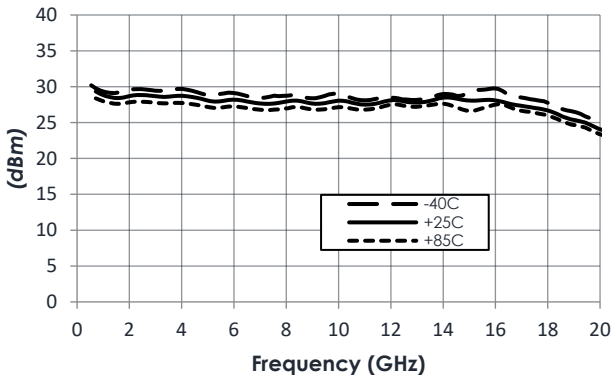
Noise Figure vs Temperature



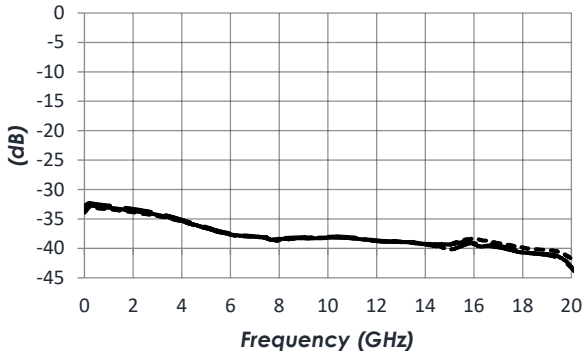
P1dB vs Temperature



Output IP3 vs Temperature

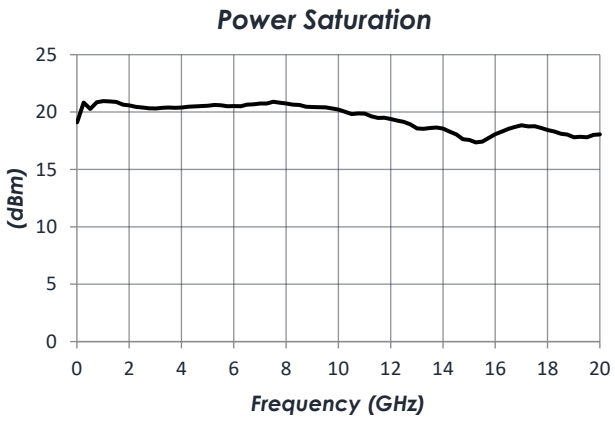


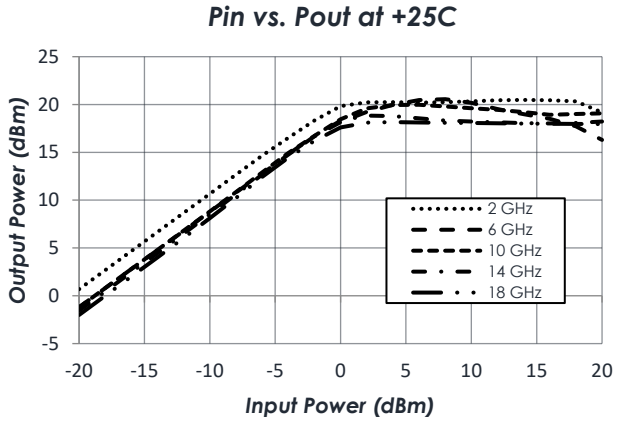
Reverse Isolation vs Temperature



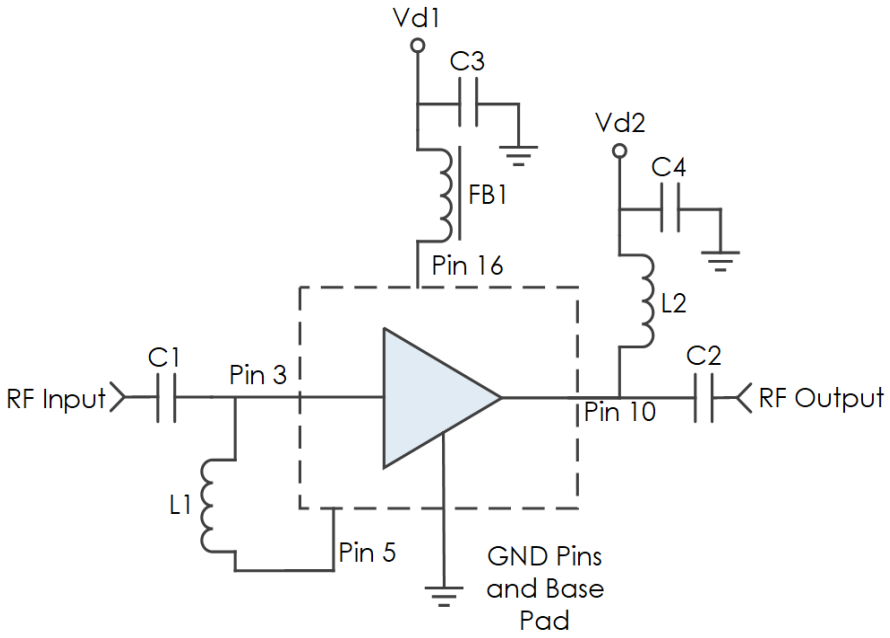
TYPICAL PERFORMANCE (CONTINUED)

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





TYPICAL APPLICATION



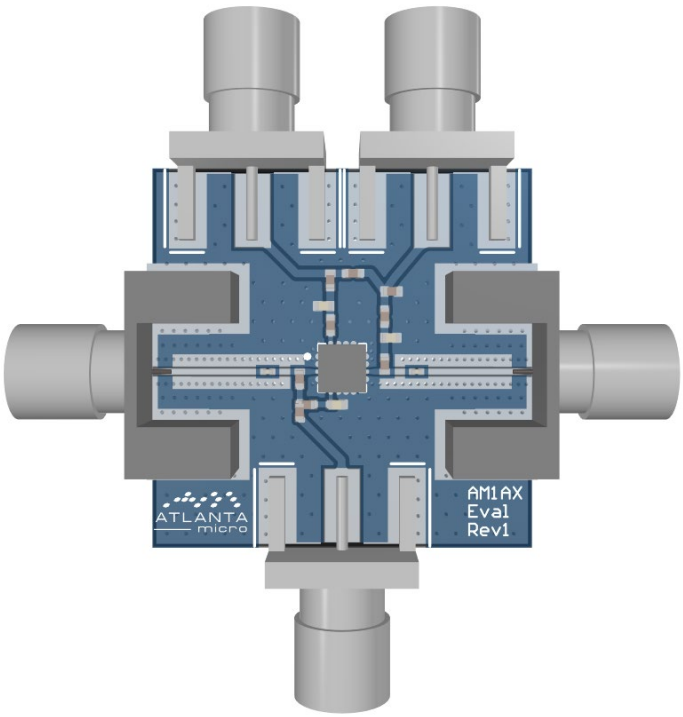
Recommended Component List (or Equivalent)

Part	Value	Part Number	Manufacturer
C1, C2	0.1 µF	0201BB104KW160	Passives Plus
C3, C4	0.1 µF	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.

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

COMPONENT COMPLIANCE INFORMATION

RoHS: Mercury Systems, Inc. hereby certifies that all products comply with the EC Directive 2011/65/EC on the Restriction of Hazardous Substances, commonly known as EU-RoHS 6 and 10. All products supplied by Mercury shall be compliant with the European Directive 2011/65/EC based on the following substance list.

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-ethylheyl) 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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Mercury takes its responsibility as a global partner seriously and will use due diligence within our supply chain to ensure all standards are met to the best of our knowledge.

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