AM1302 – Amplifier

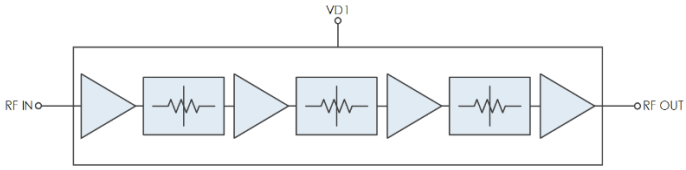
Amplifier 2 to 18 GHz Power Limiting Amplifier

AM1302 is a wideband, power limiting amplifier servicing the 2 to 18 GHz frequency range. The device exhibits high small signal gain across a large frequency band and high output power over a wide input power range which makes the AM1302 a useful component for many broadband applications.

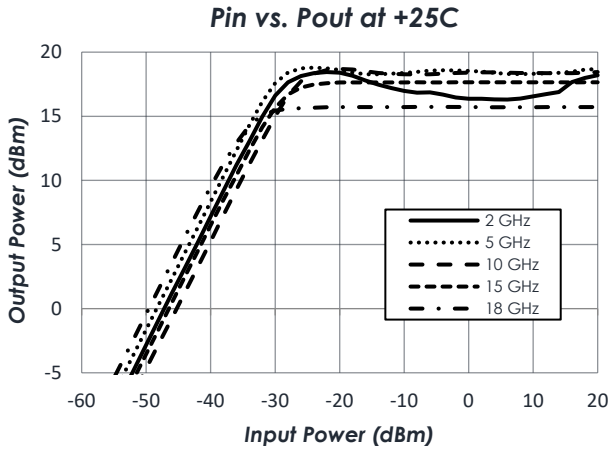
FEATURES

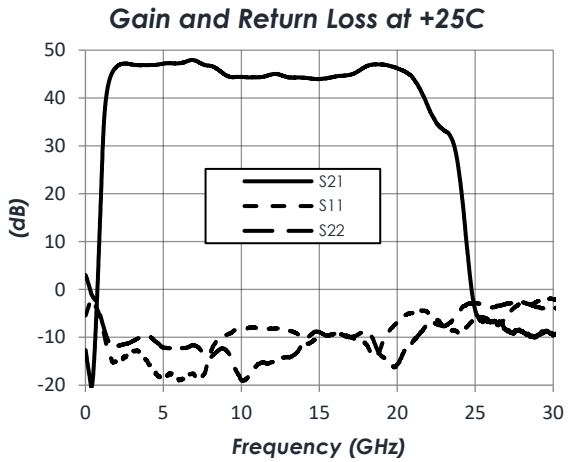
- 45 dB Gain
- 3 dB Noise Figure
- +25 dBm Small Signal OIP3
- 18 dBm Saturation Power
- +3.5 V Operation
- -40C to +85C Operation

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE





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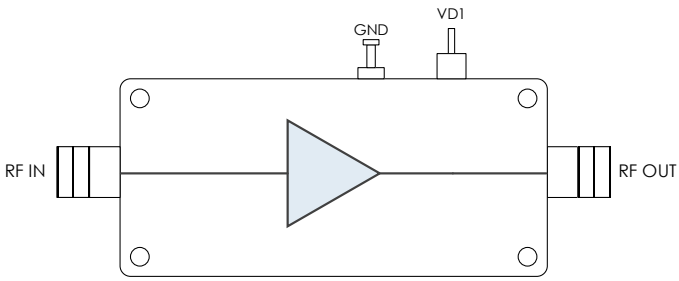
REVISION HISTORY

Date	Revision	Notes
June 27, 2023	1	Initial Release
February 14, 2025	2.0	Changed to Mercury branding. No content changes.

PORT LAYOUT AND DEFINITIONS



Port Name	Port Function
RF IN	RF Input – 50 Ohms
OUT	RF Output – 50 Ohms
GND	Ground – Common
VD1	DC Power Input

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+6 V
RF Input Power		+20 dBm
Operating Case Temperature	-40 C	+85 C
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
Storage Temperature Range (Recommended)	-50 C	+125 C
Moisture Sensitivity Level	MSL 3	

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

DC Electrical Characteristics

Param	Testing Conditions	Min	Typical	Maximum
DC Supply Voltage		+3.4 V	+3.5 V	+4.0 V
DC Supply Current			226 mA	
Power Dissipated			0.79 W	

RF Performance

Param	Testing Conditions	Min	Typical	Max
Frequency Range		2 GHz		18 GHz
Gain[1]	f=2 GHz		46.6 dB	
	f=10 GHz		44.4 dB	
	f=18 GHz		46.6 dB	
Return Loss[1]	f=2 GHz		15.1 dB	
	f=10 GHz		-8.2 dB	
	f=18 GHz		-11.4 dB	
Output IP3[2]			25 dBm	
Output P1dB			1.3 dBm	
Noise Figure			2.9 dB	

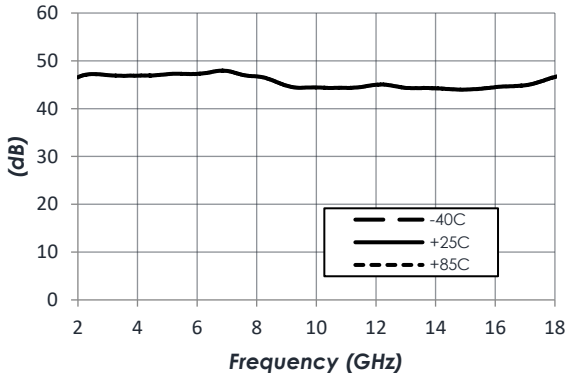
Note:

1. Small signal gain and return loss measured with -60 dBm input signal.
2. OIP3 measured with 10 MHz tone spacing with Pin/tone = -50 dBm.

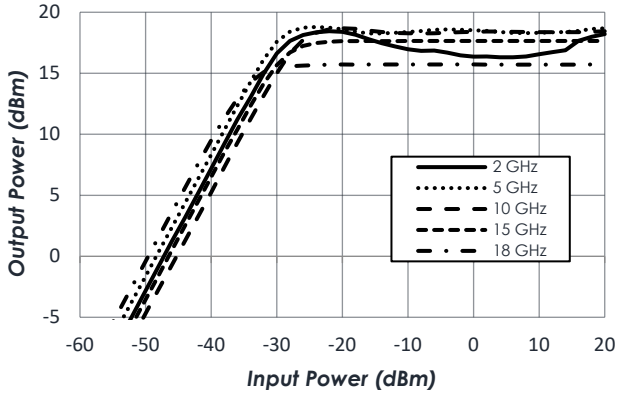
TYPICAL PERFORMANCE

(VDD = +3.5 V, T = 25°C unless otherwise specified)

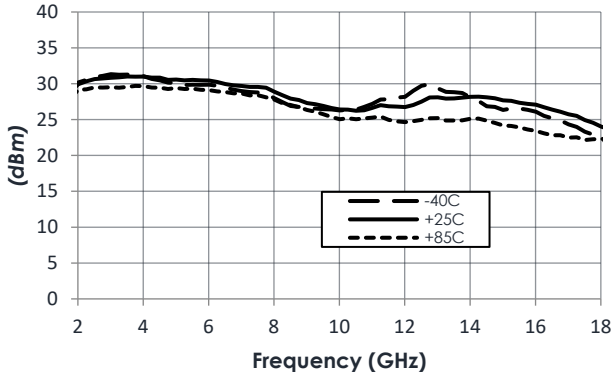
Gain vs Temperature



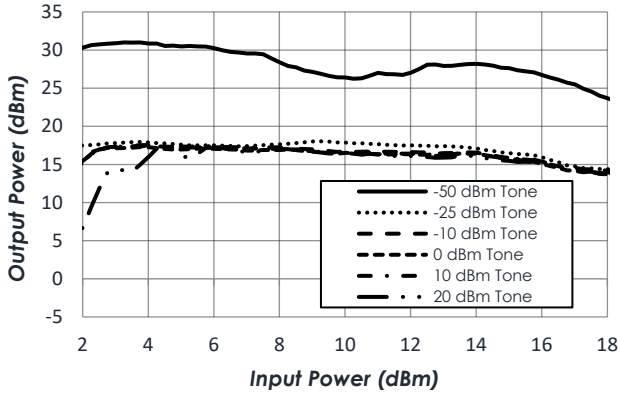
Pin vs. Pout at +25C



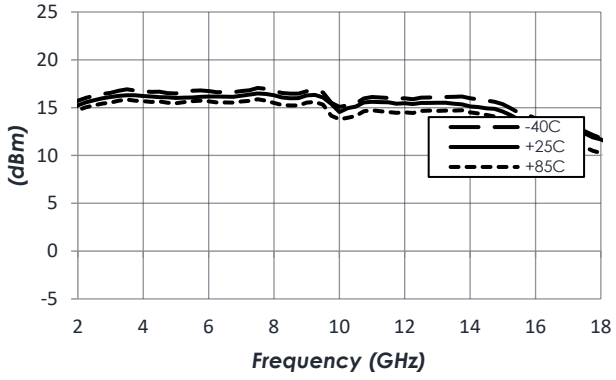
Output IP3 vs Temperature



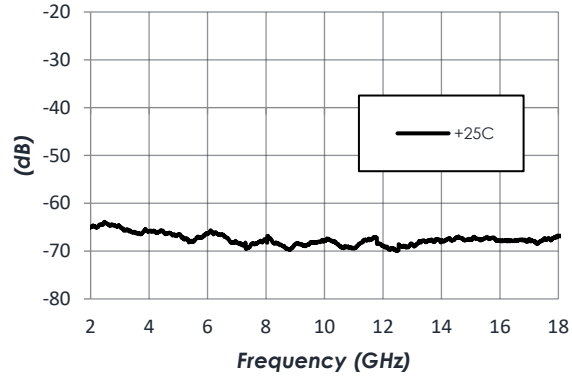
OIP3 vs Power Tone Levels



P1dB vs Temperature

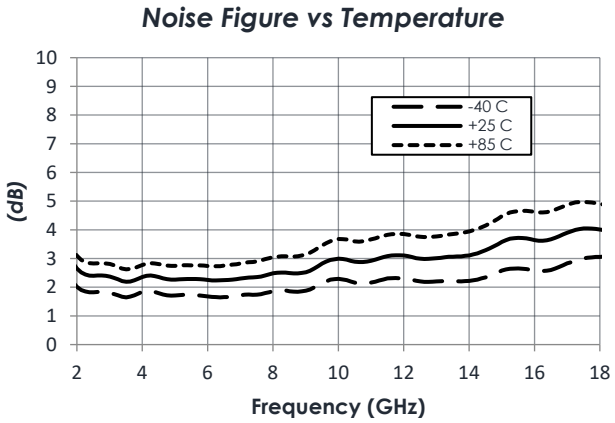


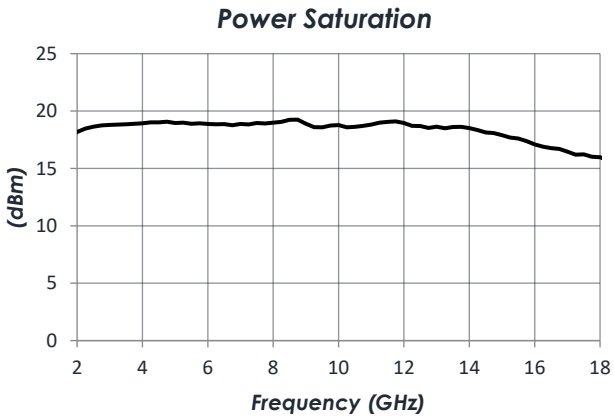
Reverse Isolation vs Temperature



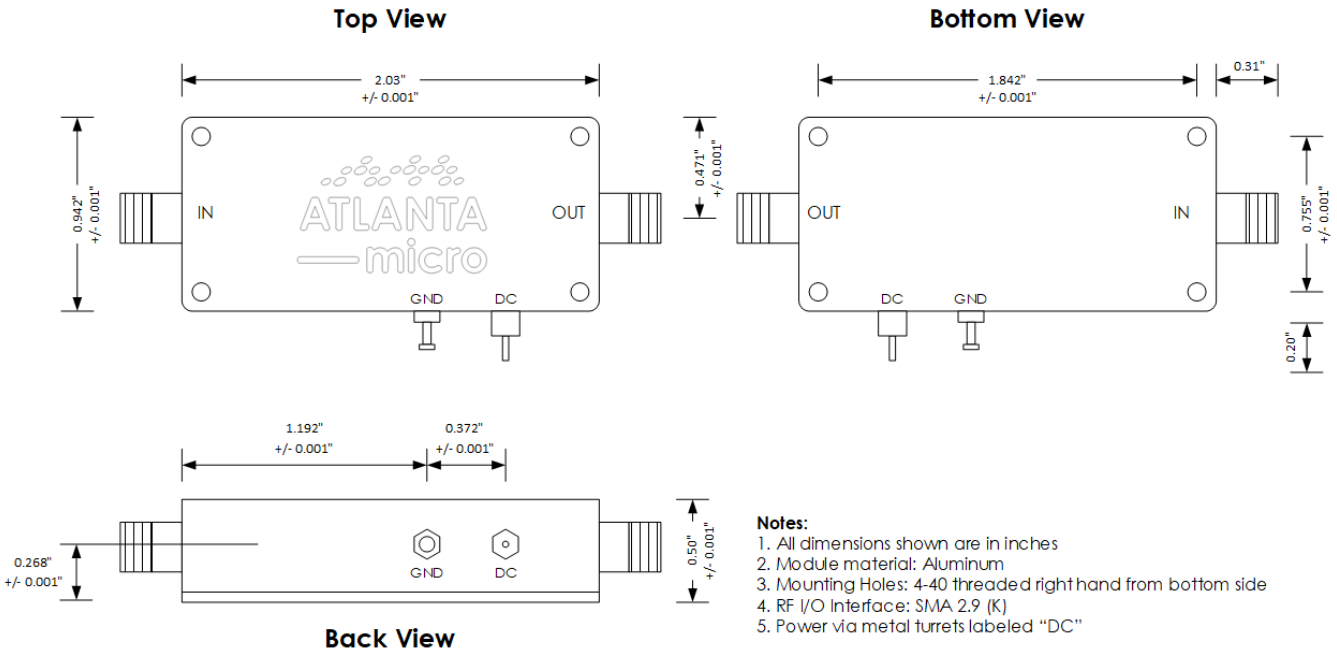
TYPICAL PERFORMANCE (CONTINUED)

(VDD = +3.5 V, T = 25°C unless otherwise specified)





MODULE DIMENSIONS



Notes:
1. All dimensions shown are in inches
2. Module material: Aluminum
3. Mounting Holes: 4-40 threaded right hand from bottom side
4. RF I/O Interface: SMA 2.9 (K)
5. Power via metal turrets labeled "DC"

RELATED PARTS

Part Number		Description
AM1300	20 MHz to 8 GHz	Power Limiting Amplifier
AM1301	20 MHz to 6 GHz	Power Limiting Amplifier
AM1302	6 GHz to 22 GHz	Power Limiting Amplifier

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 (CrVl)	<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)

REACH: Mercury Systems, Inc. neither uses nor intentionally adds any of the substances considered to be a Substance of Very High Concern (SVHC) as defined by the EU Regulation (EC) No. 1907-2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH).

Conflict Materials: Mercury does not knowingly use materials that are sourced from the Democratic Republic of Congo (DRC) or any other known conflict regions. Mercury's supply chain is comprised of sources that are both environmentally and socially responsible. We periodically review this requirement with our vendors to ensure continued compliance.

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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