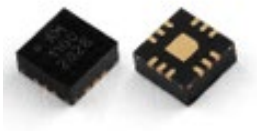
AM1100 – Amplifier

2 GHz to 26.5 GHz Gain Blocks

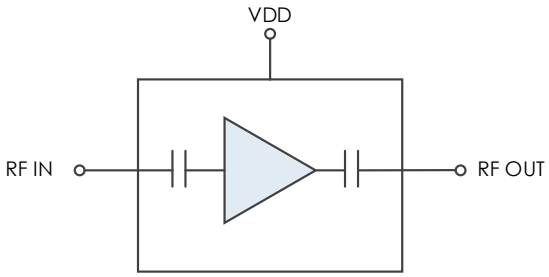


AM1100 is a wideband cascadable gain block covering the 2 GHz to 26.5 GHz frequency range. It is a low SWaP device drawing less than 100mW of power and packaged in a 3mm QFN with internal 50Ω matching. The device's low noise figure and wideband operation makes it an excellent choice for many broadband receiver applications.

FEATURES

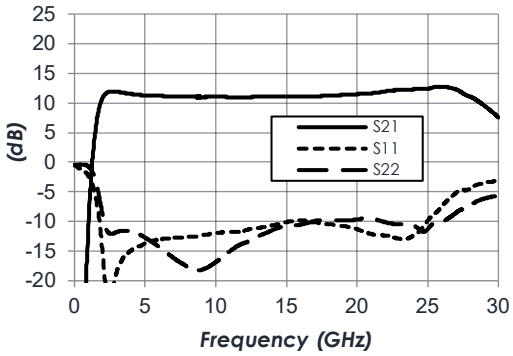
- 2.2 dB Noise Figure
- 11.5 dB gain
- +23 dBm OIP3
- +12 dBm P1dB
- +3.3V Supply
- 99 mW Power Consumption
- -40C to +85C Operation

FUNCTIONAL DIAGRAM

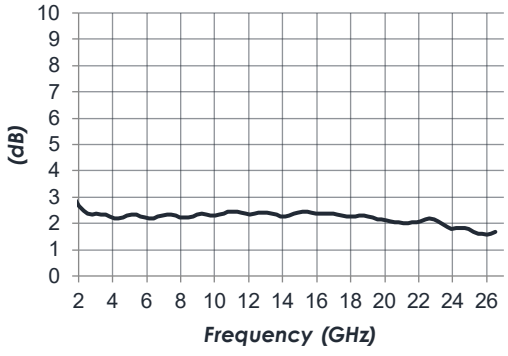


CHARACTERISTIC PERFORMANCE

Gain and Return Loss at +25C



Noise Figure at +25C

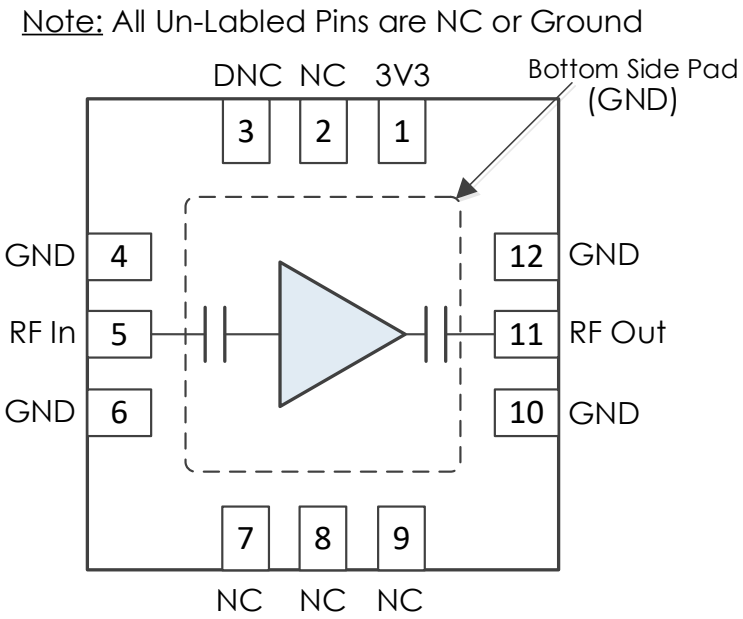


CONTENTS

REVISION HISTORY

Date	Revision	Notes
June 12, 2020	1	Initial Release
March 23, 2021	2	Updated Power Requirements
August 19, 2021	3	Updated Plots
June 20, 2024	4	Changed to Mercury branding. No content changes.

PIN LAYOUT AND DEFINITIONS



Pin	Name	Function
1	3V3	3.3V DC Power Input
2	NC	No connect
3	DNC	Do not connect*
4	GND	Ground – Common
5	RF In	RF Input – 50 Ohms – AC Coupled
6	GND	Ground – Common
7-9	NC	No connect
10	GND	Ground – Common
11	RF Out	RF Output – 50 Ohms – AC Coupled
12	GND	Ground – Common

***Note:** NC pins may be grounded or left open. Pin 3 (DNC) cannot be grounded and must be left open.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+3.5 V
RF Input Power		+10 dBm
Operating Junction Temperature	-40 C	+150 C
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. 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.

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage	+3.0 V	+3.3 V	+3.3 V
Operating Case Temperature	-40 C		+85 C
Operating Junction Temperature	-40 C		+150 C

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
DC Supply Voltage			+3.3 V	
DC Supply Current	VDD = +3.3 V		30 mA	
Power Dissipated	VDD = +3.3 V		99 mW	

RF Performance

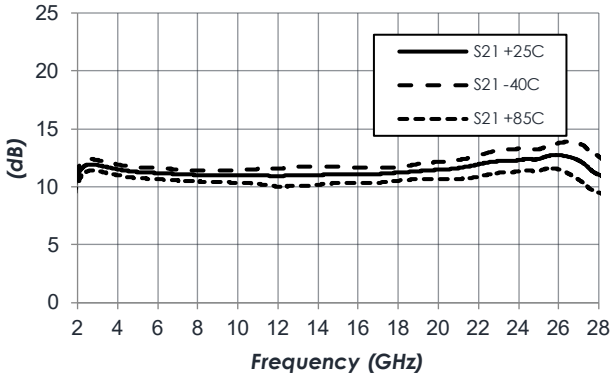
(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
Frequency Range		2 GHz		26.5 GHz
Gain	f = 2 GHz		12 dB	
	f = 13 GHz		11 dB	
	f = 26.5 GHz		13 dB	
Return Loss	f = 13 GHz		-10 dB	
Output IP3			+23 dBm	
Output P1dB			+12 dBm	
Noise Figure			2.2 dB	

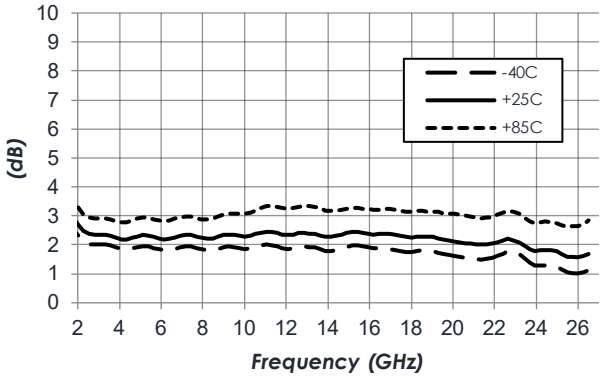
TYPICAL PERFORMANCE

(VDD = +3.3V, T = 25 °C unless otherwise specified)

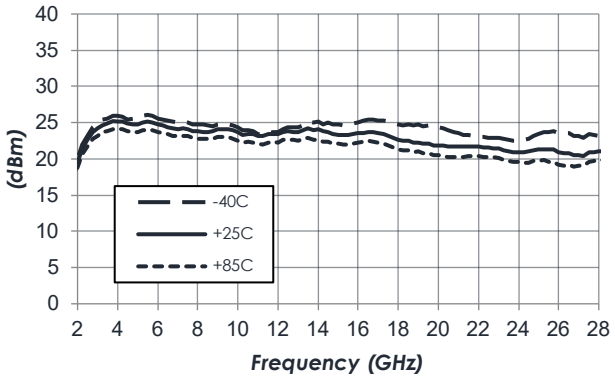
Gain vs Temperature



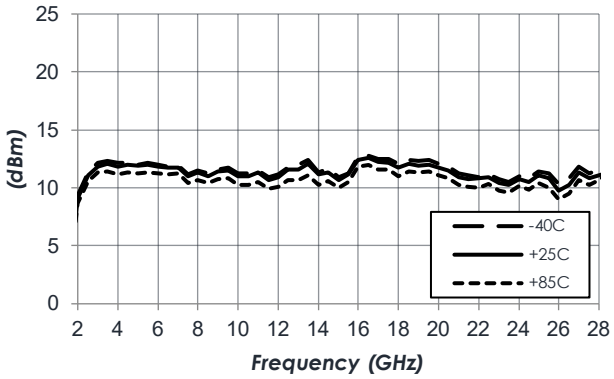
Noise Figure vs Temperature



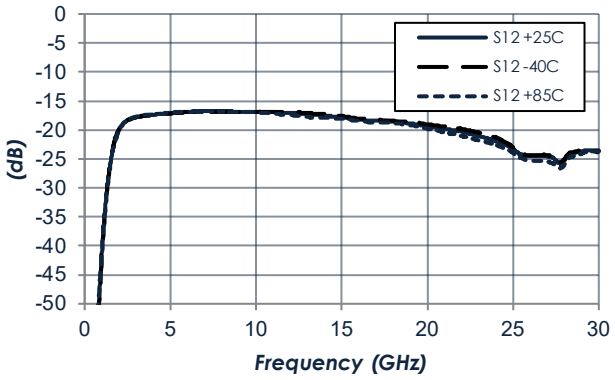
Output IP3 vs Temperature



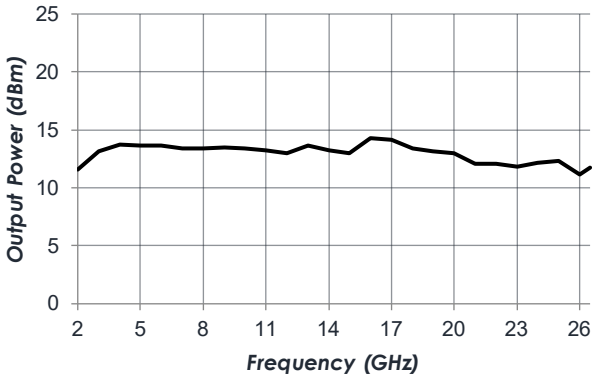
P1dB vs Temperature



Reverse Isolation vs Temperature

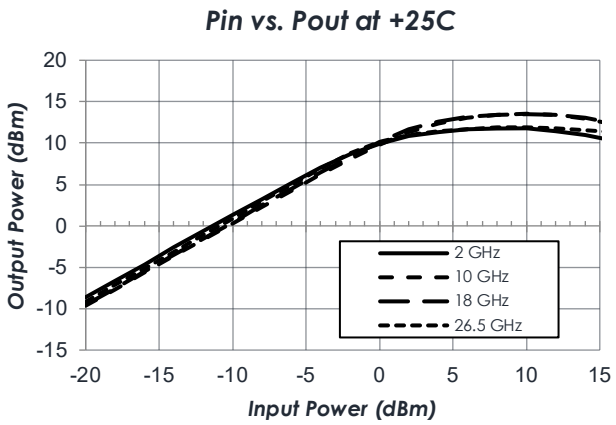


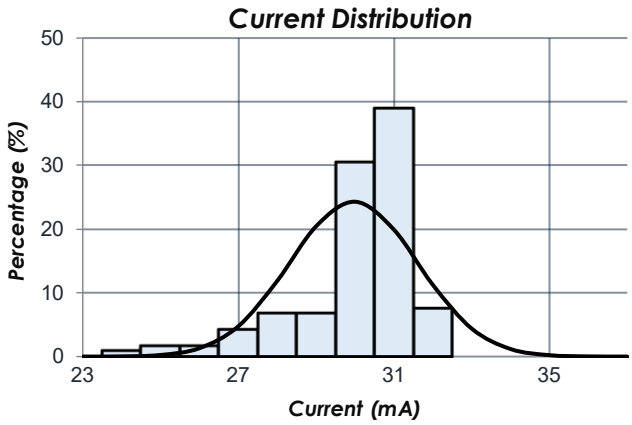
P_Sat at +25C



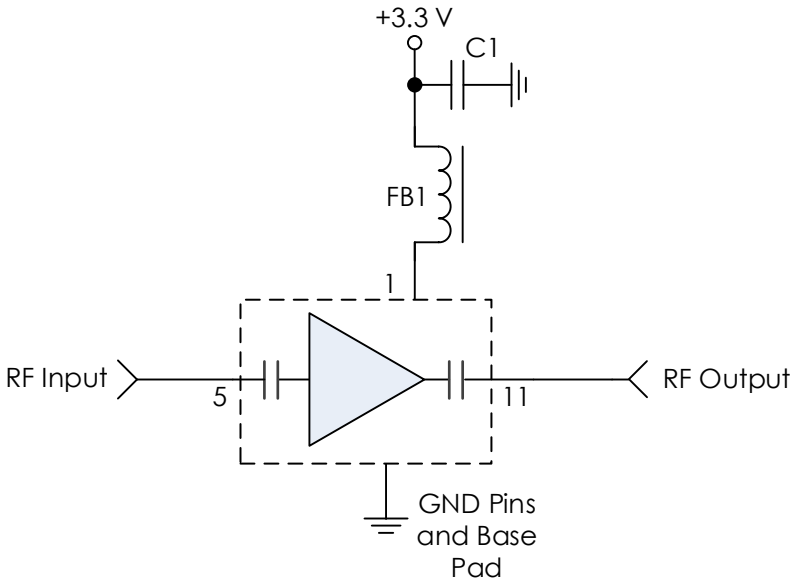
TYPICAL PERFORMANCE (CONTINUED)

(VDD = +3.3V, T = 25 °C unless otherwise specified)





TYPICAL APPLICATION



Recommended Component List (or Equivalent)

Part	Value	Part Number	Manufacturer
C1	0.1 uF	GRM155R71C104KA88	Murata
FB1	-	MMZ1005A222E	TDK

Note:

1. RF Input and RF Output pins are internally DC blocked.

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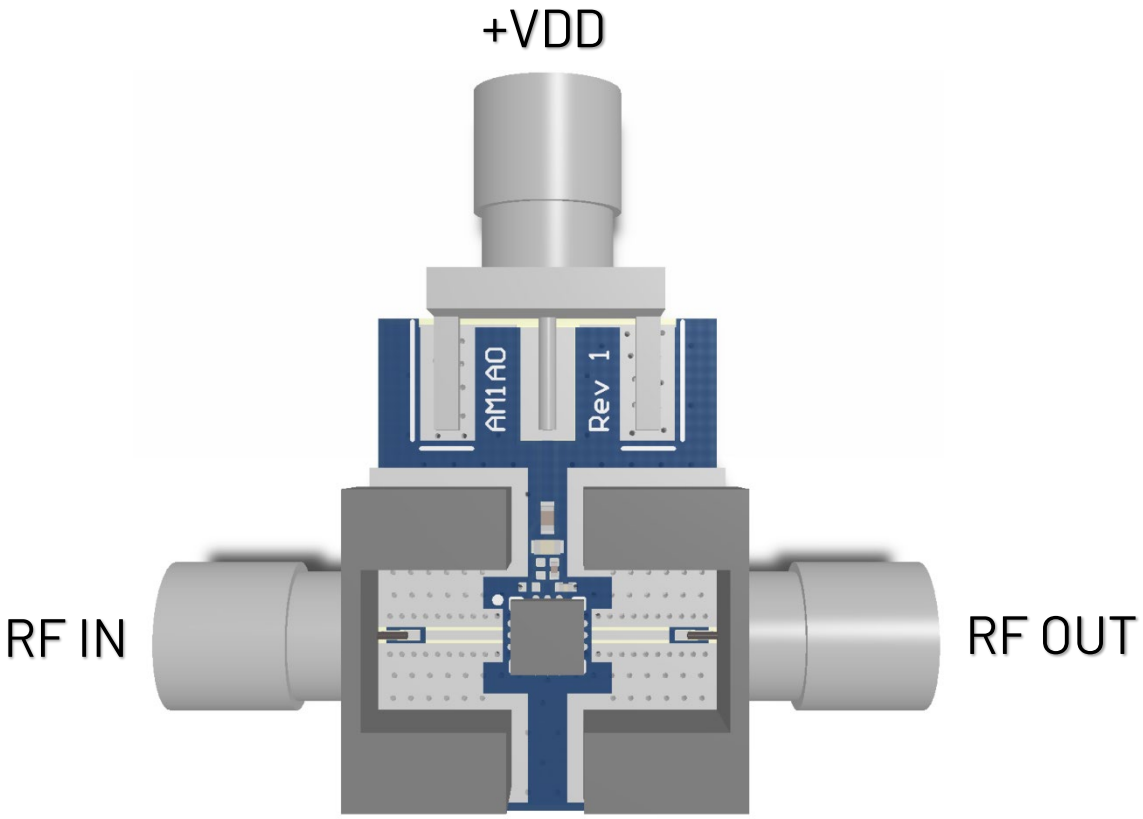
EVALUATION PC BOARD



RELATED PARTS

Part Number		Description
AM1053	5 GHz to 20 GHz	Gain Block
AM1101	2 GHz to 26.5 GHz	Bypassable Amplifier
AM1102	DC to 22 GHz	Low Noise Amplifier
AM1109	2 GHz to 20 GHz	Low Noise 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 (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)

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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