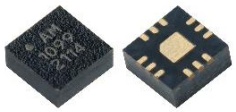
AM1099 – Amplifier

26 GHz to 32 GHz Gain Block

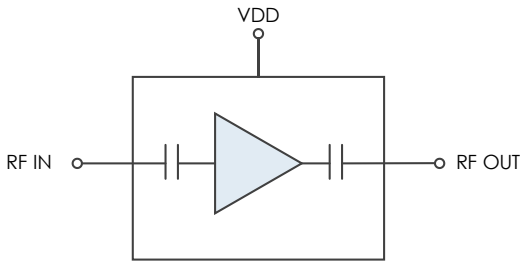


AM1099 is a high frequency, cascadable amplifier servicing the 26 to 32 GHz frequency range. The device exhibits moderate gain and noise figure which makes the AM1099 a useful component for applications such as 5G wireless and Ka-band satcom. Packaged in a 3mm QFN with internal 50Ω matching, the AM1099 represents a compact total PCB footprint.

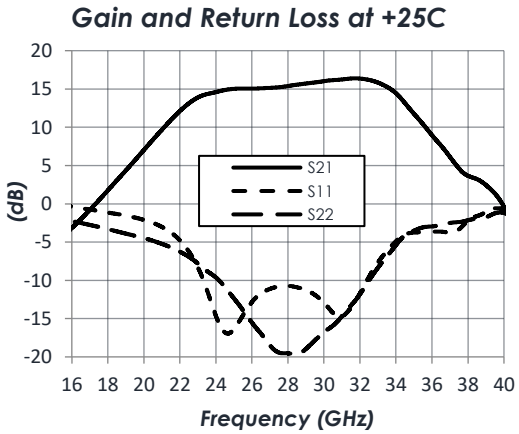
FEATURES

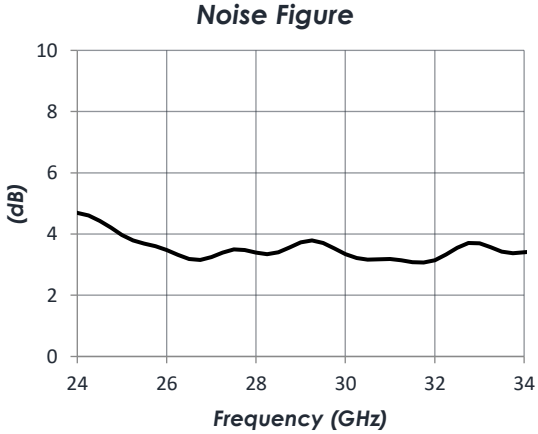
- 15 dB Gain
- 3.5 dB Noise Figure
- +25 dBm OIP3
- +14 dBm P1dB
- +3.3V Operation
- 198 mW Power Consumption
- 3mm QFN
- -40C to +85C Operation

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE





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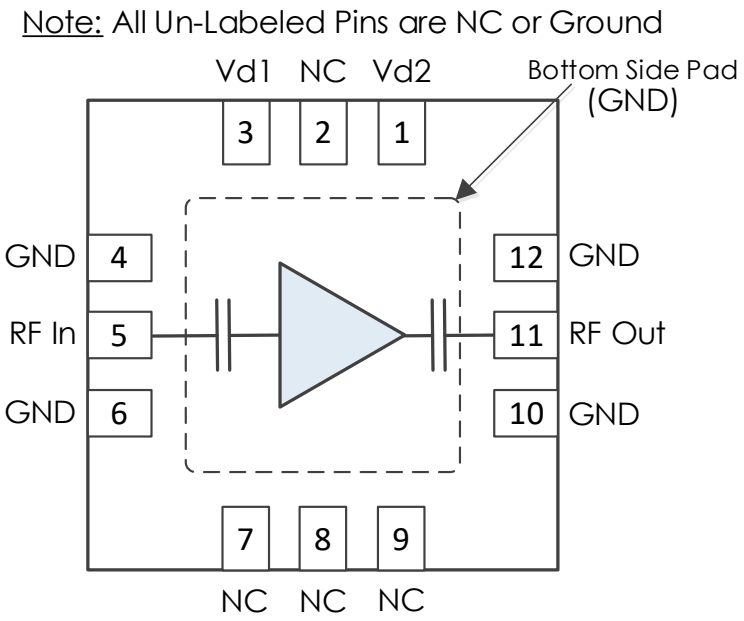
REVISION HISTORY

Date	Revision	Notes
July 30, 2021	1	Initial Datasheet Release
August 10, 2021	2	Added Bias Current vs Pin Plot.
November 18, 2024	3	Changed to Mercury branding. No content changes.

PIN LAYOUT AND DEFINITIONS



Pin	Name	Function
1	Vd2	DC Power Input 2
2	NC	Not Connected
3	Vd1	DC Power Input 1
4	GND	Ground – Common
5	RF In	RF Input – 50 Ohms – DC Blocked
6	GND	Ground – Common
7-9	NC	Not Connected
10	GND	Ground – Common
11	RF Out	RF Output – 50 Ohms – DC Blocked
12	GND	Ground - Common

NC pins may be grounded or 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	-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.

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage (VDD)	+3.0 V	+3.3 V	
Operating Case Temperature	-40 C		+85 C
Operating Junction Temperature	-40 C		+125 C

DC Electrical Characteristics

(VD1 = VD2 = +3.3V, T = 25°C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
DC Supply Voltage			+3.3 V	
DC Supply Current			60 mA	
Power Dissipated			198 mW	

RF Performance

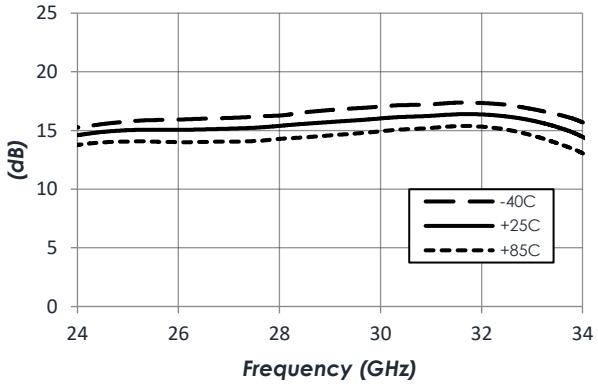
(T = 25 °C, VDD = VDD1 = VDD2 = VSW = +3.3 V unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
Frequency Range		26 GHz		32 GHz
Gain	f = 26 GHz		15.1 dB	
	f = 29 GHz		15.7 dB	
	f = 32 GHz		16.4 dB	
Return Loss	f = 26 GHz		12.9 dB	
	f = 29 GHz		11.2 dB	
	f = 32 GHz		11.7 dB	
Output IP3	f = 29 GHz		25 dBm	
Output P1dB	f = 29 GHz		14 dBm	
Noise Figure	f = 29 GHz		3.7 dB	

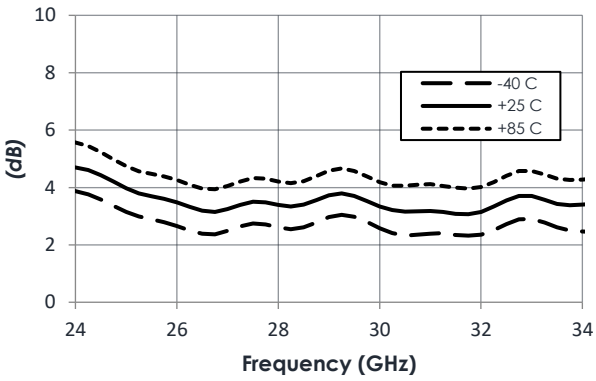
TYPICAL PERFORMANCE

(VD1 = VD2 = +3.3V, T = 25°C unless otherwise specified)

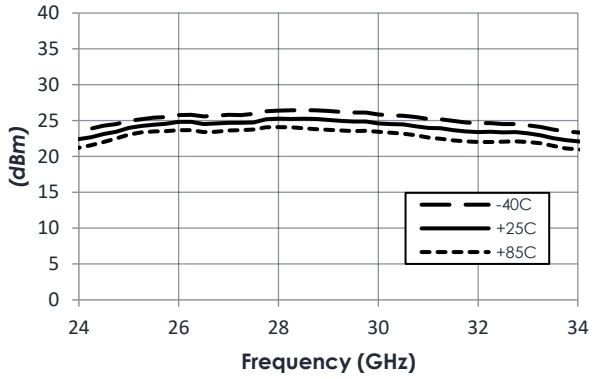
Gain vs Temperature



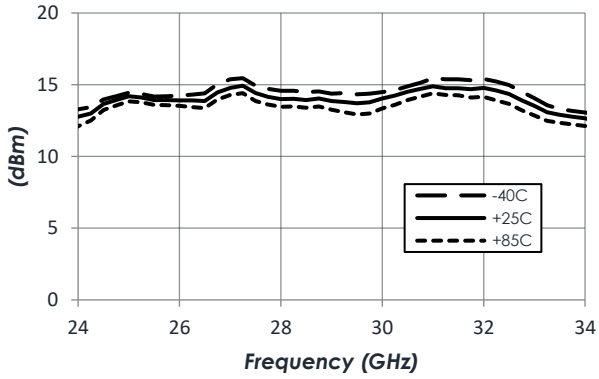
Noise Figure vs Temperature



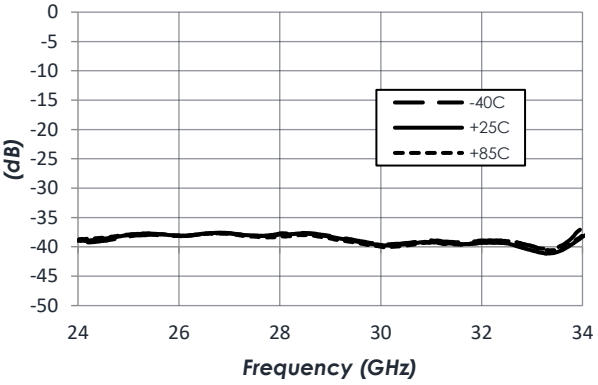
Output IP3 vs Temperature



P1dB vs Temperature

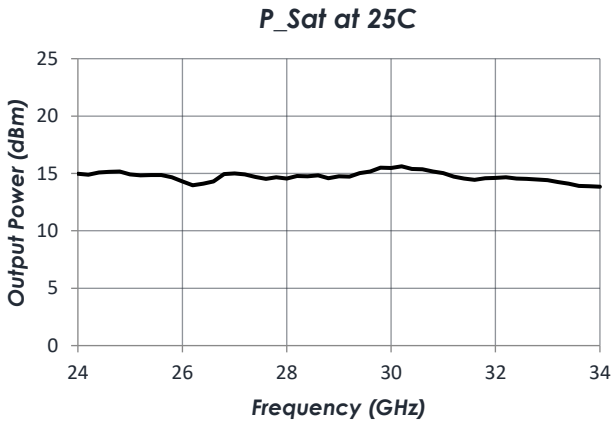


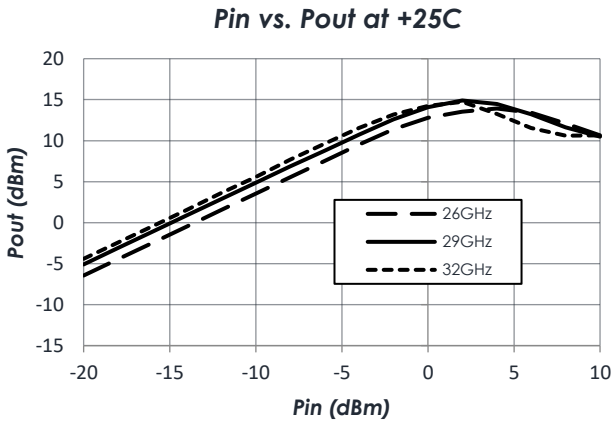
Reverse Isolation vs Temperature

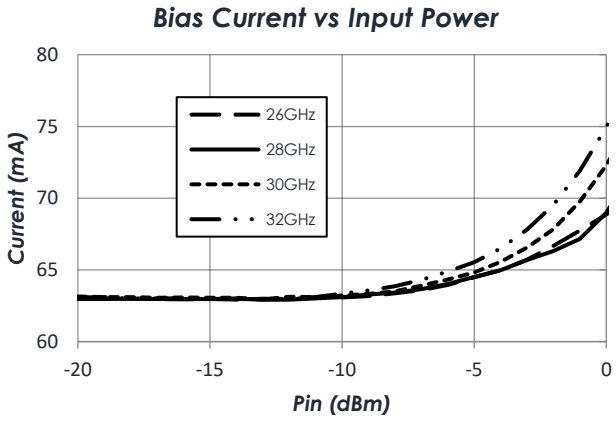


TYPICAL PERFORMANCE (CONTINUED)

(VD1 = VD2 = +3.3V, T = 25°C unless otherwise specified)

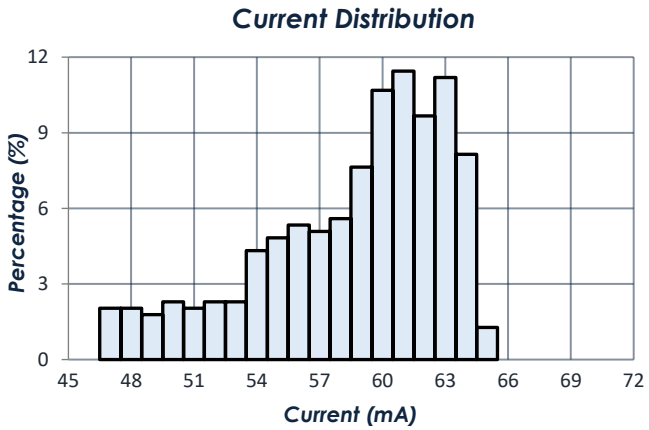




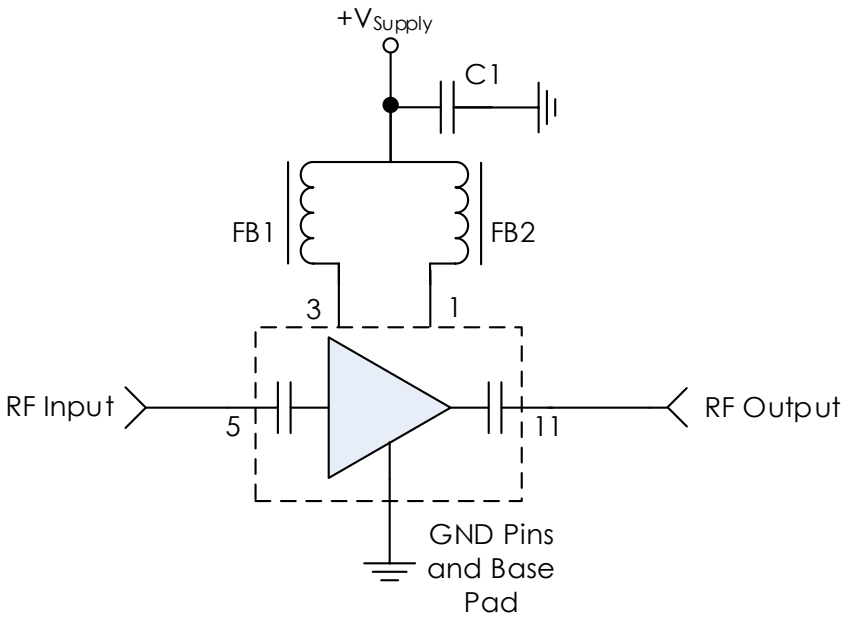


TYPICAL DEVICE CHARACTERISTICS

(VD1 = VD2 = +3.3V, T = 25°C unless otherwise specified)



TYPICAL APPLICATION



Note: NC pins may be grounded or left open

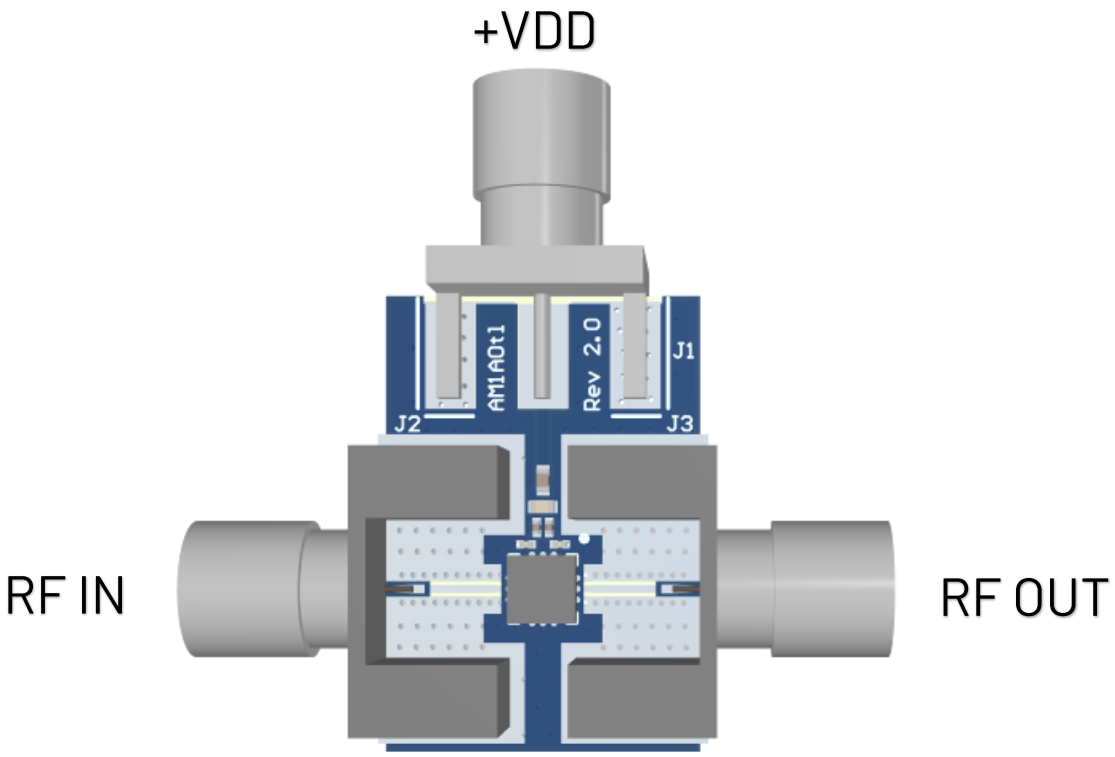
Recommended Component List (or Equivalent)

Part	Value	Part Number	Manufacturer
C1	0.1 µF	GRM155R71C104KA88	Murata
FB1, FB2	-	MMZ1005A222E	TDK

Notes:

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

EVALUATION PC BOARD



Note: Not all components shown may be installed.

RELATED PARTS

Part Number		Description
AM1053	5 GHz to 20 GHz	Driver Amplifier
AM1071	DC to 18 GHz	Broadband Gain Block
AM1082	5 GHz to 17 GHz	Driver 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).

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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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