

AM1173 – Amplifier

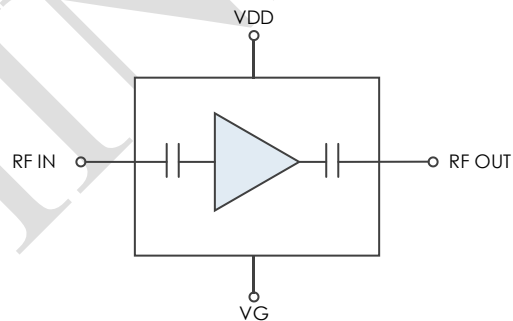
6 GHz to 18 GHz Medium Power Amplifier

AM1173 is a medium power amplifier covering the 6 to 18 GHz frequency range. The device exhibits high P1dB, achieves saturated output power greater than 1 W, and has excellent power added efficiency above 35% at saturation using a 9V supply rail. The AM1173 is packaged in a 5mm QFN with internal matching and DC blocking capacitors. With its high output power and efficiency, the AM1173 enables many high-performance applications with stringent power requirements.

FEATURES

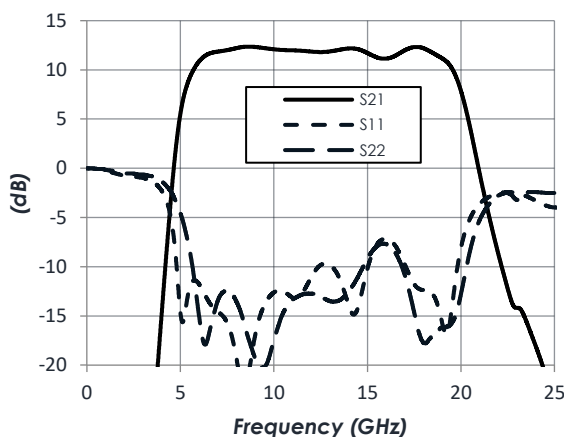
- 12 dB Gain
- +29.5 dBm P1dB
- +30.5 dBm Psat
- 35% PAE @ Psat
- +38 dBm OIP3
- +9V/275mA Operation
- 5mm QFN
- -40C to 85C

FUNCTIONAL DIAGRAM

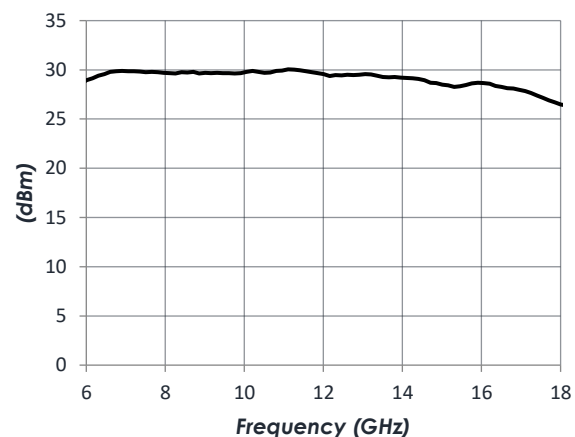


CHARACTERISTIC PERFORMANCE

Gain and Return Loss at +25C



P1dB at +25C



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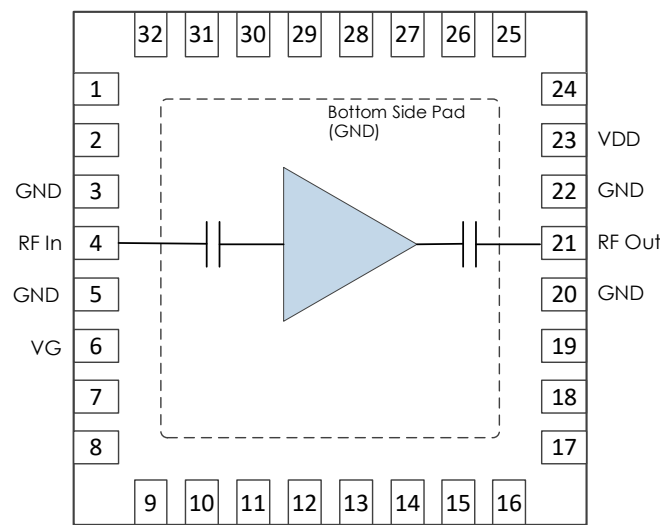
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REVISION HISTORY

Date	Revision	Notes
4/13/2024	1	Preliminary Release
4/25/2025	1.1	Added watermark. Changed bias instructions

PIN LAYOUT AND DEFINITIONS

Note: All Non-Named Pins are GND



Pin	Name	Function
1-3	GND	Ground - Common
4	RF In	RF Input - 50 Ohms - AC Coupled
5	GND	Ground - Common
6	VG	Amplifier Gate Control - External bypass capacitors required
7-20	GND	Ground - Common
21	RF Out	RF Output - 50 Ohms - AC Coupled
22	GND	Ground - Common
23	VDD	DC Power Input
24-32	GND	Ground - Common

Note: All unnamed pins should be grounded.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage		+10 V
RF Input Power		+27 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	



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

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage		+9.0 V	+10.0 V
Operating Case Temperature	-40C		+85C

Thermal Information

Thermal Resistance (°C / W)	
Junction to Case Thermal Resistance (θ_{JC})	38 C/W
Nominal Junction Temperature at +85 C ambient	182 C

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
DC Supply Voltage			+9.0 V	
DC Supply Current	Note 1.		275mA	
Power Dissipated	VDD = +9.0 V		2.475W	

Notes:

- Adjust VG between -2V to 0V to achieve 275mA quiescent drain current.

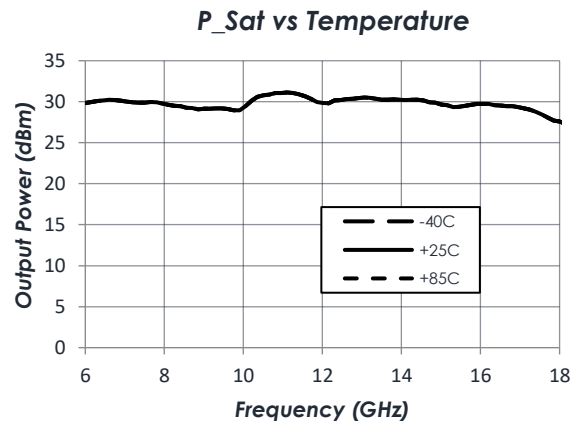
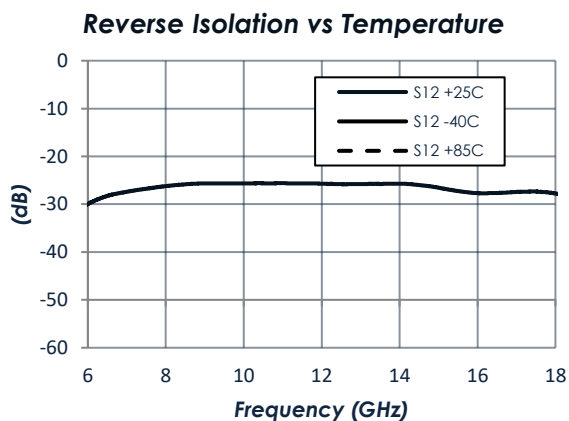
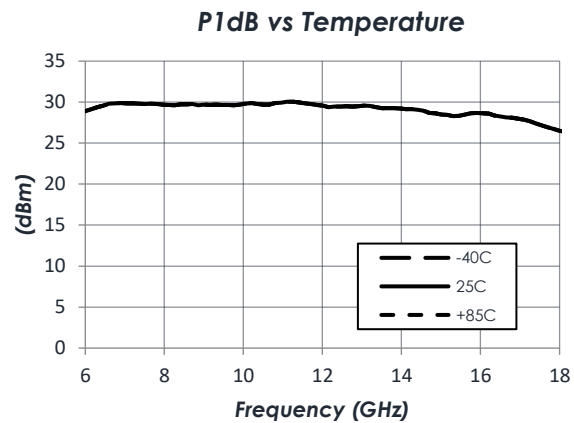
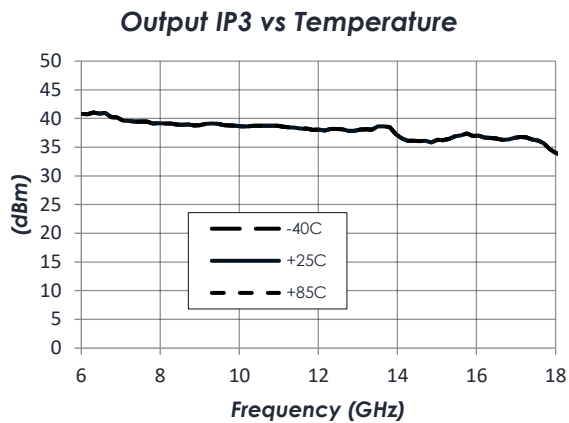
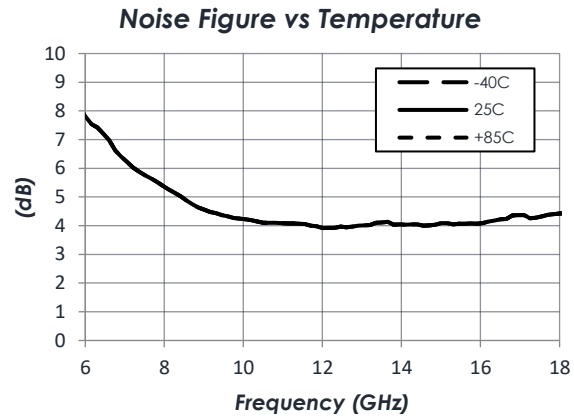
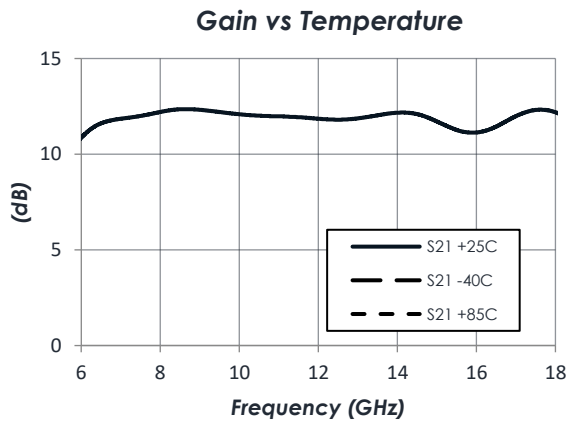
RF Performance

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
Frequency Range		6 GHz		18 GHz
Gain	f = 6 GHz		10.8 dB	
	f = 12 GHz		11.8 dB	
	f = 18 GHz		12.2 dB	
Return Loss	f = 6 GHz		-12 dB	
	f = 12 GHz		-11 dB	
	f = 18 GHz		-12 dB	
Output IP3	f = 12 GHz		38 dBm	
Output P1dB	f = 12 GHz		29.6 dBm	
Noise Figure	f = 12 GHz		3.9 dB	

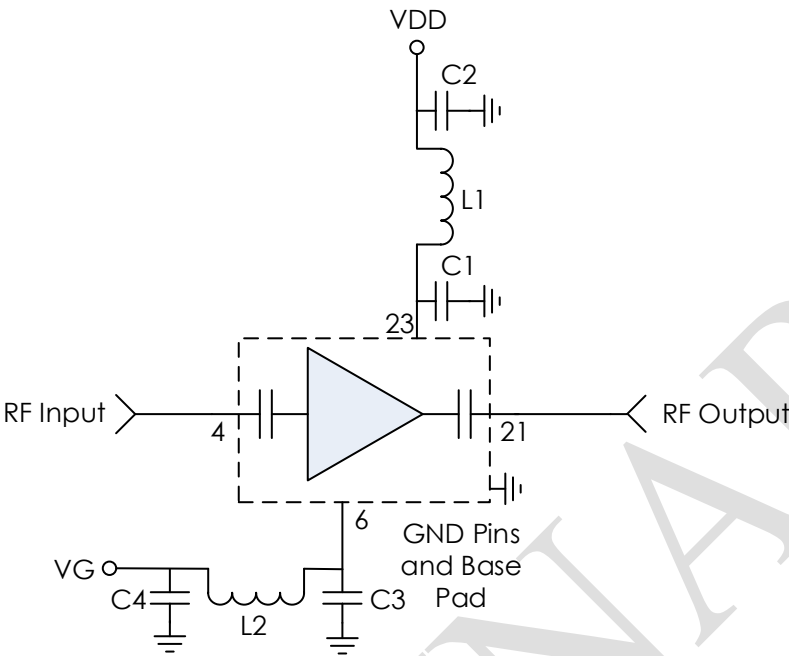
TYPICAL PERFORMANCE

(VDD = XXXX, T = 25°C unless otherwise specified)



NOTE: Preliminary Data shown at room temperature only including board/connector loss.

TYPICAL APPLICATION



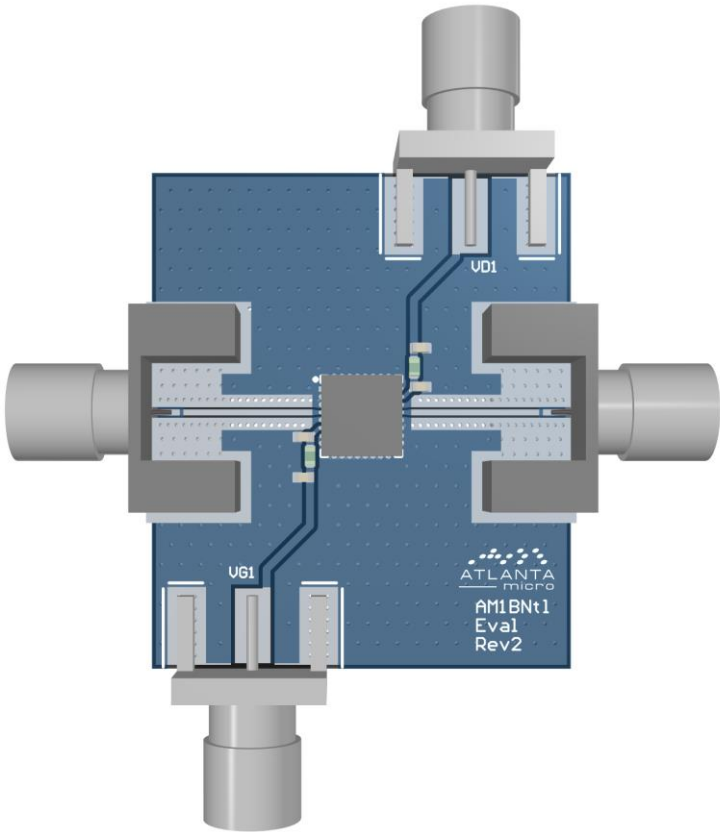
RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

Part	Value	Part Number	Manufacturer
C1-C4	0.1 uF	GRM155R71C104KA88	Murata
L1, L2	1.0 nH	0402DC-1N0XJRW	Coilcraft

Note:

- AM1173 is biased with a positive drain supply and negative gate supply. Biasing procedure is as follows:
 - Turn on Procedure
 - Apply -4V to the VG pin
 - Apply 9V to the VDD pin
 - Increase (towards zero) the VG voltage until the current draw from the 9V rail is 275mA. Nominally -1.56V
 - Turn Off Procedure
 - Reduce the VG voltage to -4V
 - Remove 9V from the VDD pin
 - Remove -4V from the VG pin
- AM1173 is AC Coupled
- C3 and C4 are required on pin 6 for proper operation

EVALUATION PC BOARD



RELATED PARTS

Part Number				Description
AM1175	6 GHz	to	18 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 (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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