# AM1095 – Amplifier

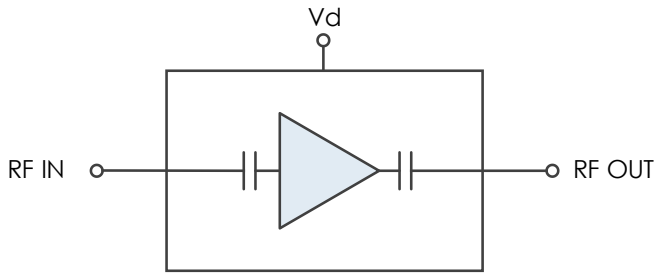
## 6 GHz to 22.25 GHz Driver Block

**The AM1095 is an AC-coupled amplifier covering 6 GHz to 22.25 GHz.** The device exhibits high output P1dB performance, relatively low noise figure, and excellent gain stability over the operating temperature range. With internal 50Ω matching and packaged in a 3mm QFN, the AM1095 represents a compact total PCB footprint.

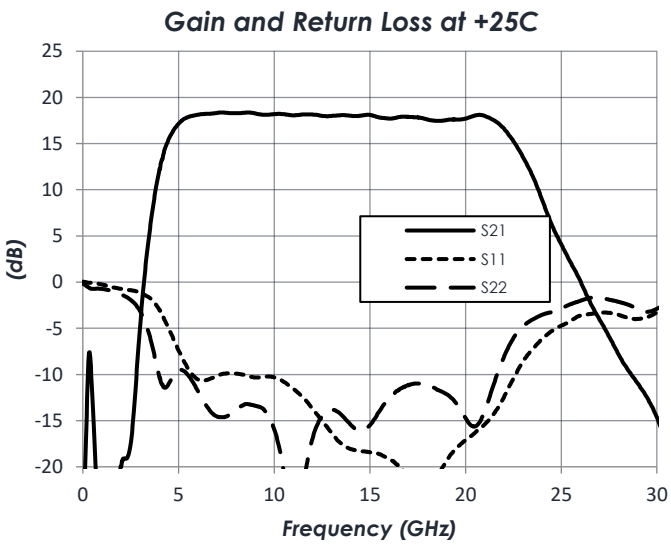
### FEATURES

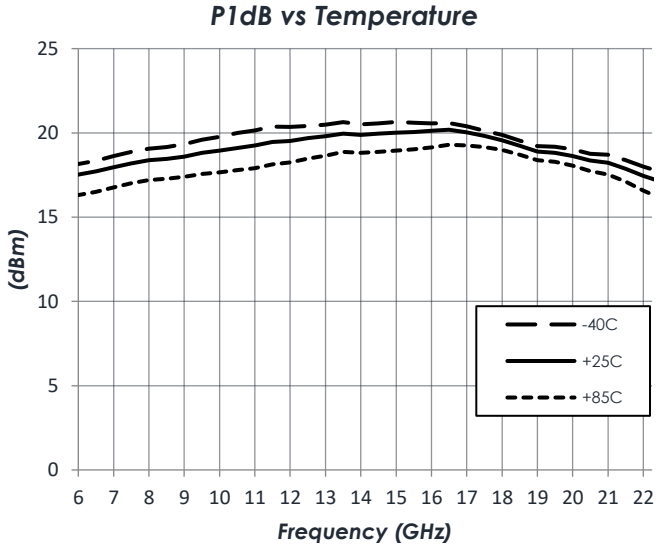
- 18 dB Gain
- 3.5 dB Noise Figure
- +24 dBm OIP3
- +19 dBm P1dB
- +5 V, 136 mA
- 3mm QFN
- -40C to +85C Operation

### FUNCTIONAL DIAGRAM




### CHARACTERISTIC PERFORMANCE



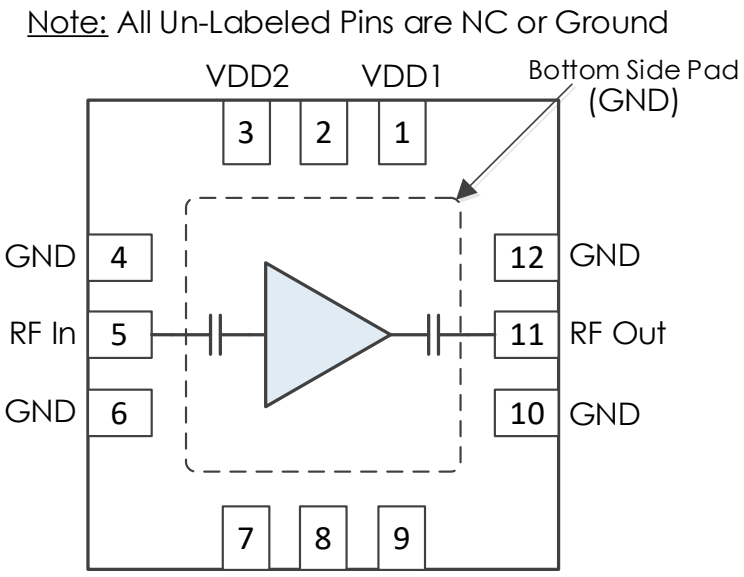
## CONTENTS



## REVISION HISTORY

| Date | Revision | Notes |
|---|---|---|
| October 5, 2021 | 1 | Initial Release |
| November 18, 2024 | 2 | Changed to Mercury branding. No content changes. |

## PIN LAYOUT AND DEFINITIONS




| Pin | Name | Function |
|---|---|---|
| 1 | VDD1 | DC Power Input |
| 2 | NC | Not Connected* |
| 3 | VDD2 | DC Power Input |
| 4 | GND | Ground - Common |
| 5 | RF In | RF Input – 50 Ohms – AC Coupled. |
| 6 | GND | Ground - Common |
| 7-9 | NC | Not Connected* |
| 10 | GND | Ground - Common |
| 11 | RF Out | RF Output – 50 Ohms – AC Coupled. |
| 12 | GND | Ground - Common |

* NC pins may be grounded or left open.

## SPECIFICATIONS

### Absolute Maximum Ratings

| | Minimum | Maximum |
|---|---|---|
| DC Voltage, Vd | -0.3 V | +4.8 V |
| RF Input Power | | +20 dBm |
| Operating Junction Temperature | -40 C | +150 C |
| Storage Temperature Range | -50 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 |
|---|---|---|
| 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, Vsupply | +4.7 V | +5.0 V | +5.2 V |
| Device Voltage, Vd | +4.1 V | +4.4 V | +4.7 V |
| Operating Case Temperature | -40 C | | +85 C |
| Operating Junction Temperature | -40 C | | +150 C |

### Thermal Information

| | Thermal Resistance (°C / W) |
|---|---|
| Junction to Case Thermal Resistance ($\theta_{JC}$) | 87 |

### DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

| Param | Testing Conditions | Min | Typical | Max |
|---|---|---|---|---|
| Device Voltage, Vd | Vsupply = +5.0 V | +4.1 | +4.4 V | +4.7 |
| DC Supply Current (Total) | VDD1 = VDD2 = +4.4 V | | 136 mA | |
| Power Dissipated | VDD1 = VDD2 = +4.4 V | | 0.6 W | |

### RF Performance

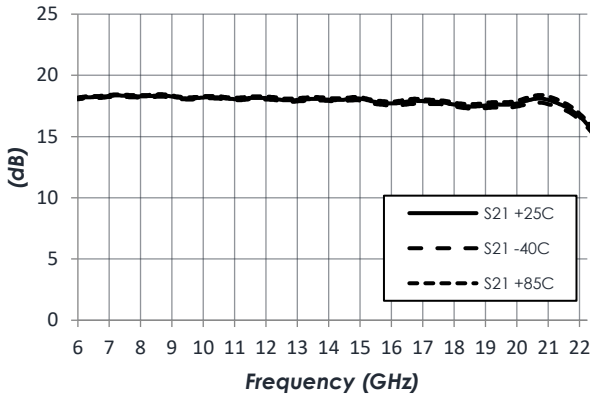
(T = 25 °C unless otherwise specified)

| Param | Testing Conditions | Min | Typical | Max |
|---|---|---|---|---|
| Frequency Range | | 6 GHz | | 22.5 GHz |
| Gain | VDD = +4.4 V | | 18 dB | |
| Return Loss | VDD = +4.4 V | | 12 dB | |
| Output IP3 | VDD = +4.4 V | | 24 dBm | |
| Output P1dB | VDD = +4.4 V | | 19 dBm | |
| Output PSat | VDD = +4.4 V | | 20 dBm | |
| Noise Figure | VDD = +4.4 V | | 3.5 dB | |

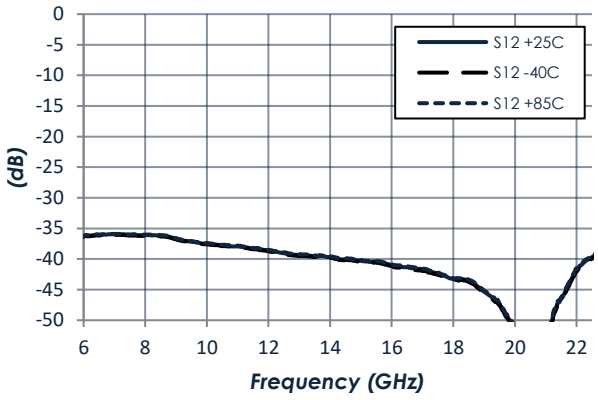
## TYPICAL PERFORMANCE

VDD1 = VDD2 = +4.4 V, Id = 136 mA)

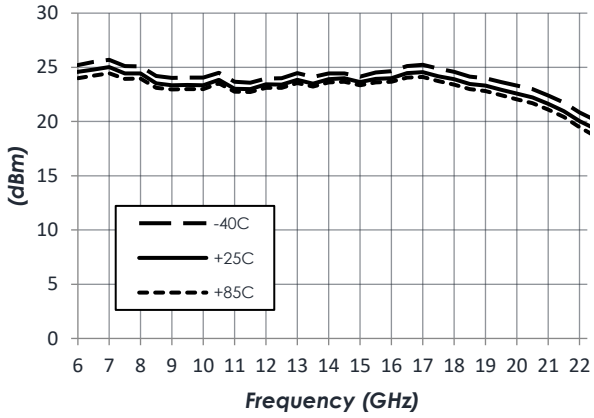
### *Gain vs Temperature*



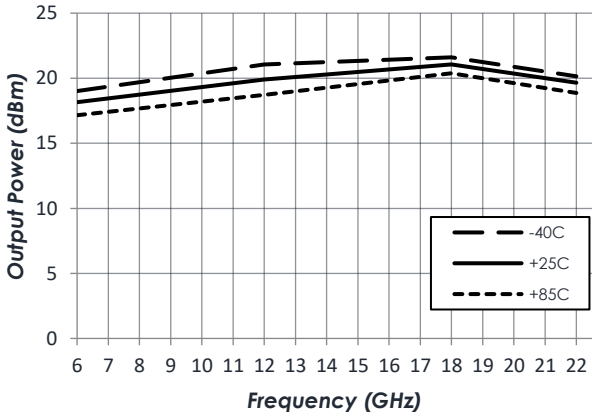

### *Reverse Isolation vs Temperature*



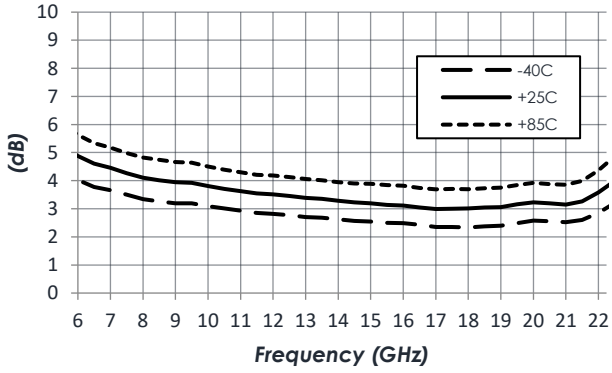

### *Output IP3 vs Temperature**




### *P_Sat vs Temperature*



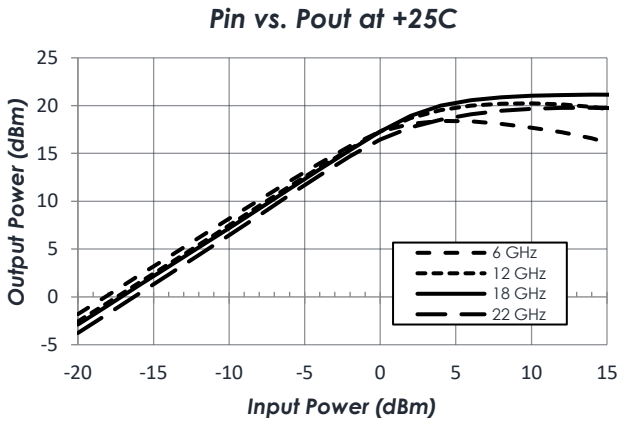

### *Noise Figure vs Temperature*

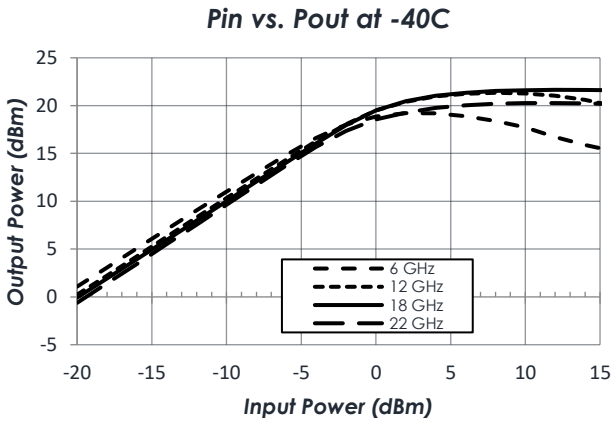


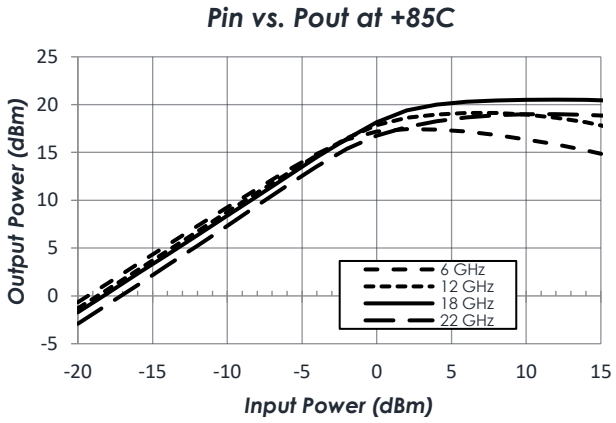

*Note: Measured with 2 tone test; tone spacing 10 MHz

## TYPICAL PERFORMANCE (CONTINUED)

(VDD1 = VDD2 = +4.4 V, Id = 136 mA)

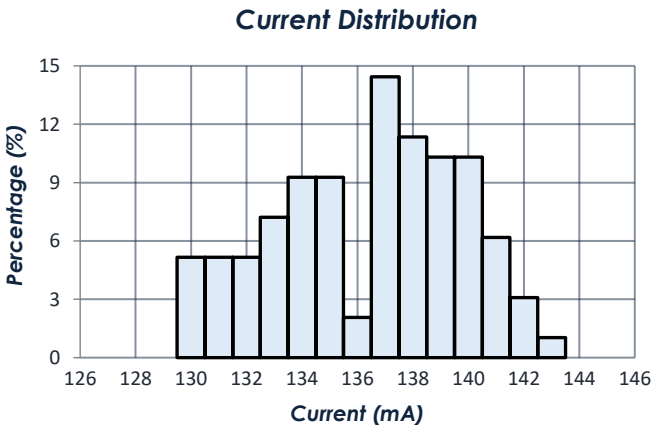


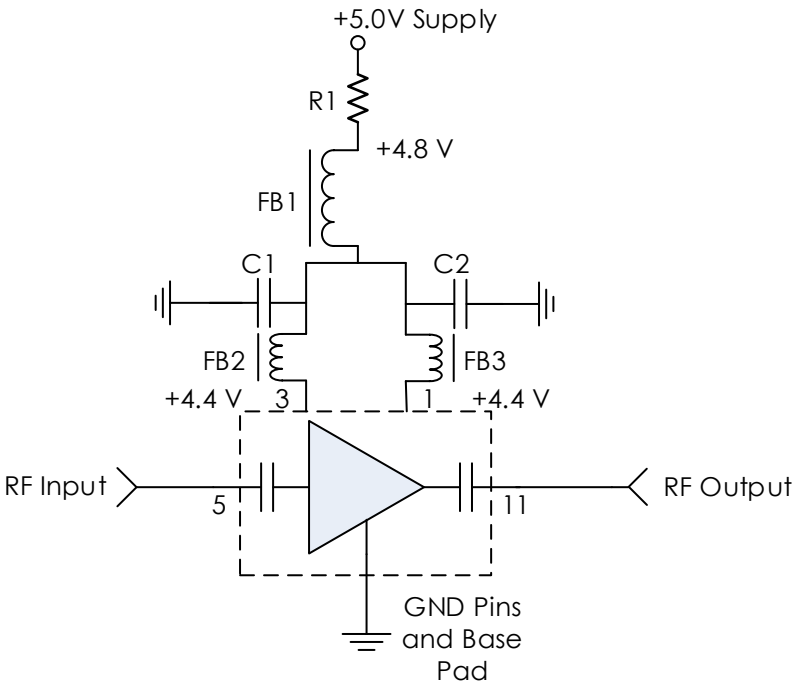




## TYPICAL DEVICE CHARACTERISTICS

(VDD1 = VDD2 = +4.4V, Id = 136 mA, T = 25°C unless otherwise specified)



## TYPICAL APPLICATION




## RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

| Part | Value | Part Number | Manufacturer |
|---|---|---|---|
| C1, C2 | 0.1µF | GRM155R71C104KA88 | Murata |
| FB1, FB2, FB3 | | MMZ1005A222E | TDK |
| R1 | 1.5 ohm | CRCW04021R50FNED | Vishay Dale |

Notes:

1. Dropping resistor R1 or a similar component is required.
2. NC pins may be grounded or left open.

## 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.**

**Corporate Headquarters**

50 Minuteman Road
Andover, MA 01810 USA
+1 978.967.1401 tel
+1 866.627.6951 tel
+1 978.256.3599 fax

**International Headquarters**
**Mercury International**
Avenue Eugène-Lance, 38
PO Box 584
CH-1212 Grand-Lancy 1
Geneva, Switzerland
+41 22 884 5100 tel

**Learn more**
**Visit**: mrcy.com
For pricing details, contact: MMICsales@mrcy.com
For technical details, contact: MMICsupport@mrcy.com

The Mercury Systems logo is a registered trademark of Mercury Systems, Inc. Other marks used herein may be trademarks or registered trademarks of their respective holders. Mercury products identified in this document conform with the specifications and standards described herein. Conformance to any such standards is based solely on Mercury's internal processes and methods. The information contained in this document is subject to change at any time without notice.

MADE IN USA

© 2024 Mercury Systems, Inc. 2-0-2025-07-16-DS-AM1095