

AM3167 - Filter Bank

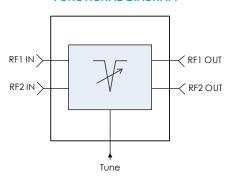
Analog Tunable 11 GHz to 13 GHz and 13 GHz to 16 GHz Notch

AM3167 is an analog voltage-tunable notch filter bank covering the 11 GHz to 16 GHz frequency range. The device offers two bands from 11 GHz to 13 GHz and 13 GHz to 16 GHz for continuous notch frequency within its operating range. Only one tune voltage input is required providing simple and precise control of the notch frequency. The AM3167 provides an excellent filtering solution for a receiver or transceiver requiring flexible frequency removal, high dynamic range, low insertion loss, and small size, weight, and power consumption (low SWaP).

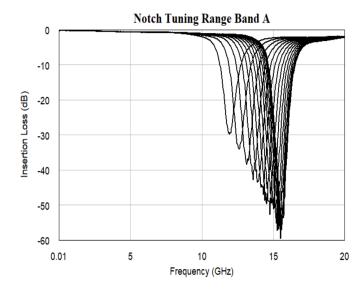
FEATURES

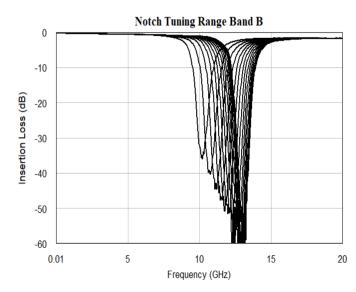
- Analog Tuning
- 1 dB Typical Insertion Loss
- 40+ dB Typical Rejection
- BW 20% of Tuned Frequency, TYP
- 0.0V to +8.0V Tuning Voltage Range
- 5mm QFN Package
- -40C to +85C Operation

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE





TECHNICAL DATA SHEET





CONTENTS

| REVISION HISTORY | 2 |
|----------------------------------|---|
| PIN LAYOUT AND DEFINITIONS | |
| SPECIFICATIONS | |
| | |
| STATE TABLE | |
| TYPICAL PERFORMANCE | |
| TYPICAL APPLICATION | 6 |
| EVALUATION PC BOARD | 7 |
| RELATED PARTS | 7 |
| COMPONENT COMPLIANCE INFORMATION | 8 |

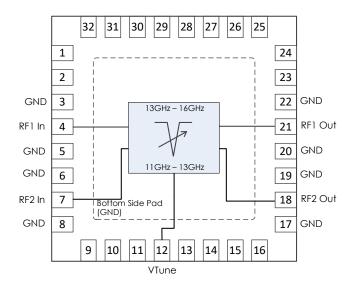
REVISION HISTORY

| Date | Revision | Notes | |
|-----------|----------|---|--|
| 4/17/2025 | 1 | Initial Revision | |
| 5/27/2025 | 2 | Corrected Description for RF In and Out | |



PIN LAYOUT AND DEFINITIONS

Note: All Non-Named Pins are NC or GND



| Pin | Name | Function |
|--------|---------|---|
| 1, 2 | NC | Not Connected* |
| 3 | GND | Ground - Common |
| 4 | RF1 In | Band A RF Input - 50 Ohms - DC Coupled |
| 5, 6 | GND | Ground – Common |
| 7 | RF2 In | Band B RF Input - 50 Ohms - DC Coupled |
| 8 | GND | Ground - Common |
| 9-11 | NC | Not Connected* |
| 12 | VTune | Notch Tune Voltage |
| 13-16 | NC | Not Connected* |
| 17 | GND | Ground - Common |
| 18 | RF2 Out | Band B RF Output - 50 Ohms - DC Coupled |
| 19, 20 | GND | Ground – Common |
| 21 | RF1 Out | Band A RF Output - 50 Ohms - DC Coupled |
| 22 | GND | Ground - Common |
| 23-32 | NC | Not Connected* |

Note: NC pins may be grounded or left floating.



SPECIFICATIONS

Absolute Maximum Ratings

| | Minimum | Maximum |
|---------------------------|---------|---------|
| DC Control Voltage | 0.0V | +10.0 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 |
|-------------------------------|---------|---------|---------|
| DC Control Voltage | 0.0 V | | +8.0V |
| Operating Case Temperature | -40 C | | 85 C |

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

| Param | Testing Conditions | Min | Typical | Max |
|-----------------------|-----------------------|-------|---------|--------|
| DC Control Voltage | | 0.0 V | | +8.0 V |
| DC Control Current | | | <1 mA | |

RF Performance

(T = 25 °C unless otherwise specified)

| Param | Testing Conditions | Min | Typical | Max |
|--------------------|-----------------------|--------|------------|--------|
| Frequency Range | Band A | 13 GHz | | 16 GHz |
| Frequency Range | Band B | 11 GHz | | 13 GHz |
| Insertion Loss | | | 1.0 dB | |
| Notch Depth | | | 40 dB | |
| Return Loss | | | -15 dB | |
| Input IP3 | | | +40 dBm | |

STATE TABLE

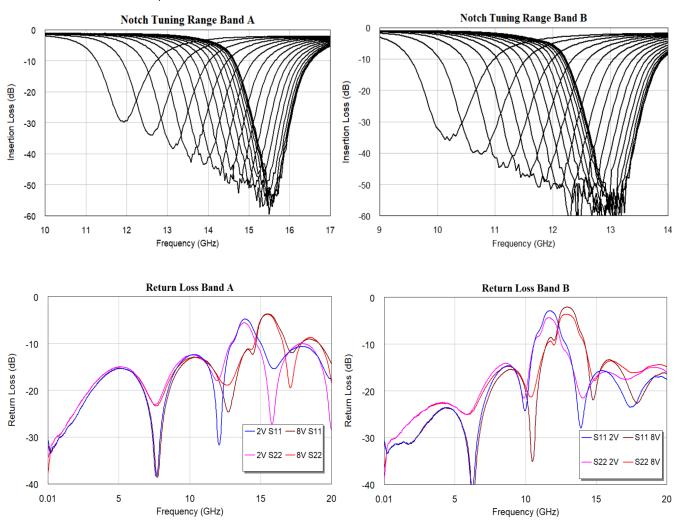
(T = 25 °C unless otherwise specified)

| Notch Filter Typical Center Frequencies | | | | | |
|---|--------------|--------------|--|--|--|
| Tune Voltage (V) | Band A (GHz) | Band B (GHz) | | | |
| 0.0 | 12 | 10.2 | | | |
| 1.0 | 13.1 | 11.1 | | | |
| 2.0 | 13.9 | 11.8 | | | |
| 3.0 | 14.5 | 12.2 | | | |
| 4.0 | 15.0 | 12.5 | | | |
| 5.0 | 15.2 | 12.8 | | | |
| 6.0 | 15.5 | 12.9 | | | |
| 7.0 | 15.6 | 13.0 | | | |
| 8.0 | 15.6 | 13.1 | | | |



TYPICAL PERFORMANCE

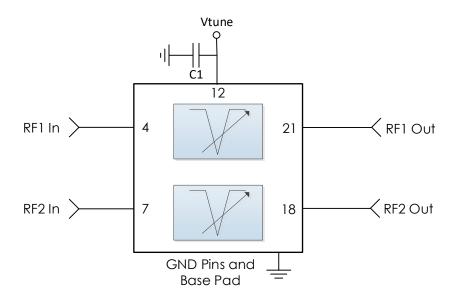
(T = 25°C unless otherwise specified)



NOTE: Only some states shown for simplicity



TYPICAL APPLICATION



RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

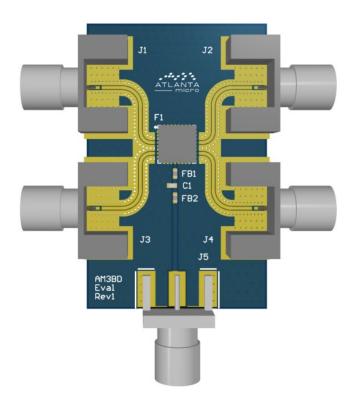
| Part | Value | Part Number | Manufacturer |
|------|--------|--------------------|--------------|
| C1 | 100 pF | GRM1555C1H101JA01D | Murata |

Note:

- 1. Pin 4 and Pin 21 are DC coupled. They are internally electrically connected and isolated from GND.
- 2. Pin 7 and Pin 18 are DC coupled. They are internally electrically connected and isolated from GND.
- 3. Filtering on tune voltage line is recommended to prevent digital noise from coupling to RF path.
 - a. Select C1 value based on desired logic source decoupling and switching speed. There is a 20 k0hm resistor internally in series for Band A and a 20 k0hm resistor internally in series for Band B.



EVALUATION PC BOARD



RELATED PARTS

| Part Number | | | | Description |
|-------------|---------|----|--------|--|
| AM3166 | 9 GHz | to | 19 GHz | Analog Tunable Notch Filter Dual Package |
| AM3168 | 13 GHz | to | 19 GHz | Analog Tunable Notch Filter Dual Package |
| AM3169 | 5.5 GHz | to | 10 GHz | Analog Tunable Notch Filter Dual Package |



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.

mercury

Corporate Headquarters

50 Minuteman Road Andover, MA 01810 USA

- +1978.967.1401 tel
- +1866.627.6951 tel
- +1978.256.3599 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

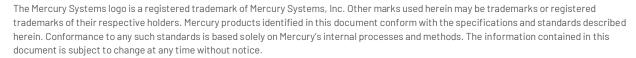
For pricing details, contact: MMICsales@mrcy.com For technical details, contact: MMICsupport@mrcy.com













© 2024 Mercury Systems, Inc. 2 -0-2025-10-07-DS- AM3167