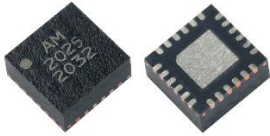


# AM2025 – Adjustable Equalizer

## 1 to 20 GHz, 4-Bits, 2 dB Steps



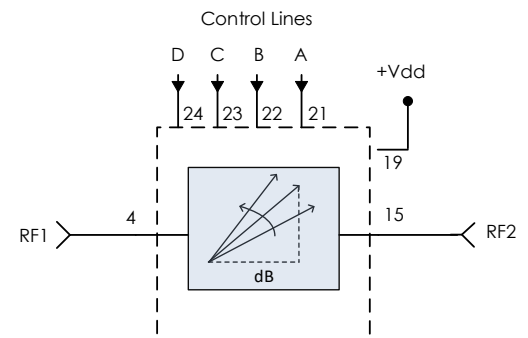
**AM2025 is a 4-Bit adjustable equalizer covering the 1 to 20 GHz frequency range.**

The device provides up to 24 dB of equalization in 2-dB steps over the operating temperature range of -40°C to +85°C. Digitally selectable equalizer settings allow for flexibility in flattening the gain response across broadband RF systems. Packaged in a 4mm QFN package, the AM2025 offers unmatched design flexibility in a low SWaP footprint.

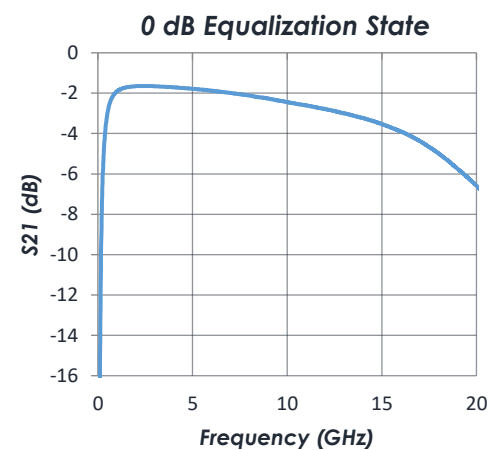
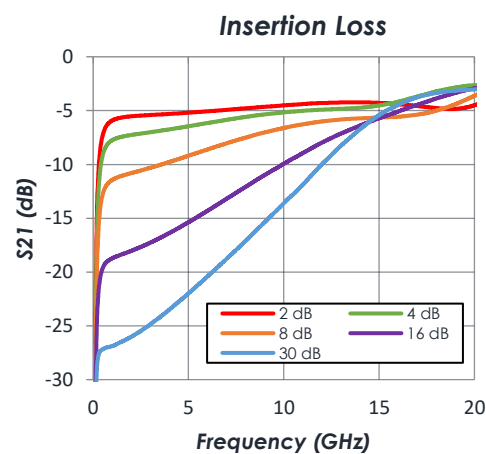
### FEATURES

- 2 dB Equalization Step Size
- 2.5 dB Insertion Loss
- +3.3V to +5V Supply
- +3.3V to +5V Control
- +42 dBm IIP3
- 4mm QFN Package
- -40°C to +85°C Operation

### FUNCTIONAL DIAGRAM



### CHARACTERISTIC PERFORMANCE



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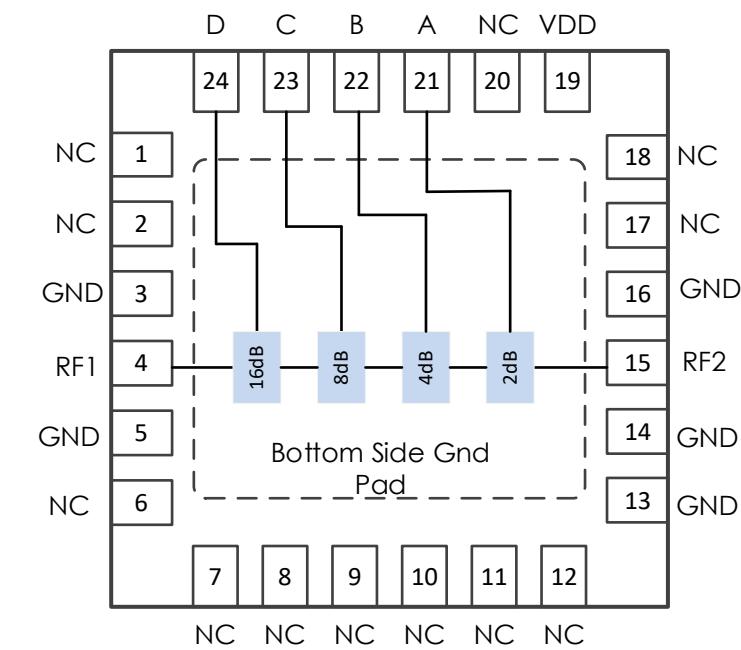
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REVISION HISTORY

| Date               | Revision | Notes           |
|--------------------|----------|-----------------|
| September 10, 2026 | 1        | Initial Release |

PIN LAYOUT AND DEFINITIONS



| Pin   | Name | Function                                           |
|-------|------|----------------------------------------------------|
| 1-2   | NC   | No Connect*                                        |
| 3     | GND  | Ground - Common                                    |
| 4     | RF1  | RF1 – 50 Ohms – AC Coupled                         |
| 5     | GND  | Ground - Common                                    |
| 6-13  | NC   | No Connect*                                        |
| 14    | GND  | Ground - Common                                    |
| 15    | RF2  | R2 –50 Ohms – AC coupled                           |
| 16    | GND  | Ground - Common                                    |
| 17-18 | NC   | No Connect*                                        |
| 19    | VDD  | DC Power Input                                     |
| 20    | NC   | No Connect*                                        |
| 21    | A    | Equalizer Control Bit A                            |
| 22    | B    | Equalizer Control Bit B                            |
| 23    | C    | Equalizer Control Bit C                            |
| 24    | D    | Equalizer Control Bit D                            |
|       |      | * NC pins may be left open or connected to ground. |

## SPECIFICATIONS

## Absolute Maximum Ratings

|                                | Minimum | Maximum |
|--------------------------------|---------|---------|
| Supply Voltage                 | -0.3 V  | 6.0 V   |
| RF Input Power                 |         | +29dBm  |
| Operating Junction Temperature |         | +175 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. 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             | +3.0 V  | +5.0 V  | +5.2 V  |
| Operating Case Temperature | -40 C   |         | +85 C   |

## DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

| Param             | Testing Conditions | Min    | Typical | Max    |
|-------------------|--------------------|--------|---------|--------|
| DC Supply Voltage |                    | +3.0 V | +5.0 V  | +5.2 V |
| DC Supply Current | Vdd = +5.0 V       |        | 3.3 mA  | 4.5 mA |
| Power Dissipated  | Vdd = +5.0 V       |        | 16.5 mW |        |
| Logic Level Low   |                    | 0.0 V  |         | +0.5 V |
| Logic Level High  |                    | +2.0 V |         | VDD    |

## RF Performance

(T = 25 °C unless otherwise specified)

| Param           | Testing Conditions           | Min  | Typical | Max    |
|-----------------|------------------------------|------|---------|--------|
| Frequency Range |                              | 1GHz |         | 20 GHz |
| Insertion Loss  | f = 5 GHz, 0dB equalization  |      | -1.8 dB |        |
| Insertion Loss  | f = 15 GHz, 0dB equalization |      | -3.5 dB |        |
| Return Loss     |                              |      | -10 dB  |        |
| Input IP3       |                              |      | +42 dBm |        |

**Timing Characteristics**

| Param                           | Min | Typical | Max |
|---------------------------------|-----|---------|-----|
| 0 dB to 16 dB 50% CTL to 10% RF |     | 9.4 ns  |     |
| 16 dB to 0 dB 50% CTL to 90% RF |     | 9.6 ns  |     |

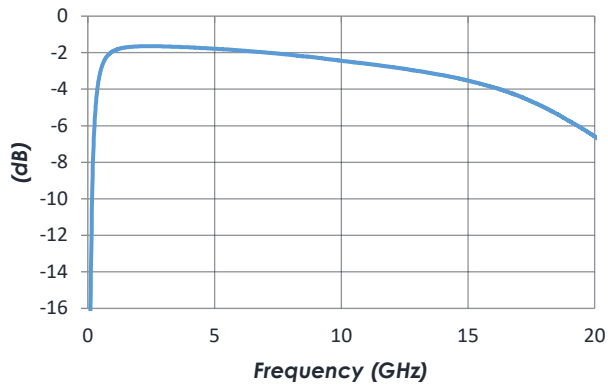
**Equalization State Table**

| D | C | B | A | Equalization (dB) |
|---|---|---|---|-------------------|
| L | L | L | L | 0                 |
| L | L | L | H | 2                 |
| L | L | H | L | 4                 |
| L | L | H | H | 6                 |
| L | H | L | L | 8                 |
| L | H | L | H | 10                |
| L | H | H | L | 12                |
| L | H | H | H | 14                |
| H | L | L | L | 16                |
| H | L | L | H | 18                |
| H | L | H | L | 20                |
| H | L | H | H | 22                |
| H | H | L | L | 24                |
| H | H | L | H | 26                |
| H | H | H | L | 28                |
| H | H | H | H | 30                |

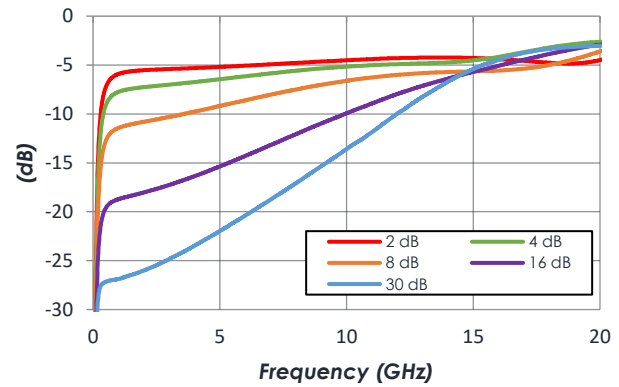
## TYPICAL PERFORMANCE

(VDD = +5V, T = 25°C unless otherwise specified)

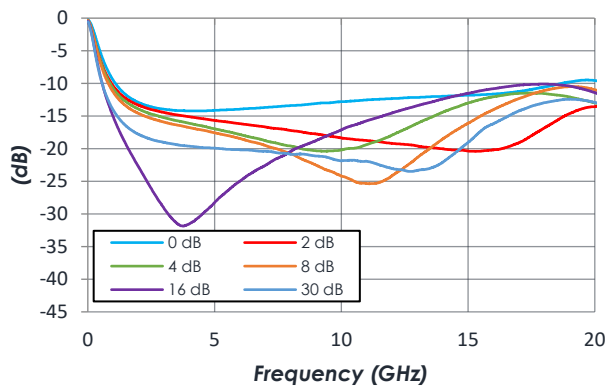
**0 dB Equalization State**



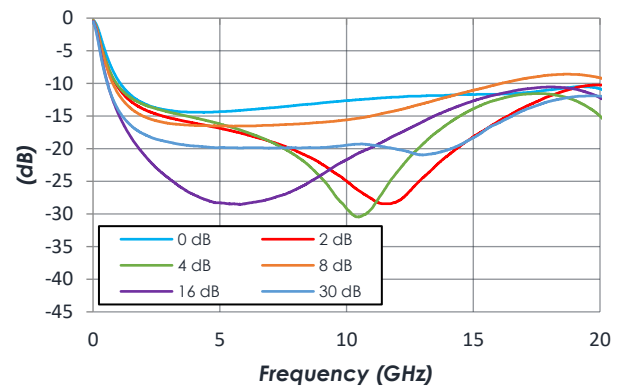
**S21 States**



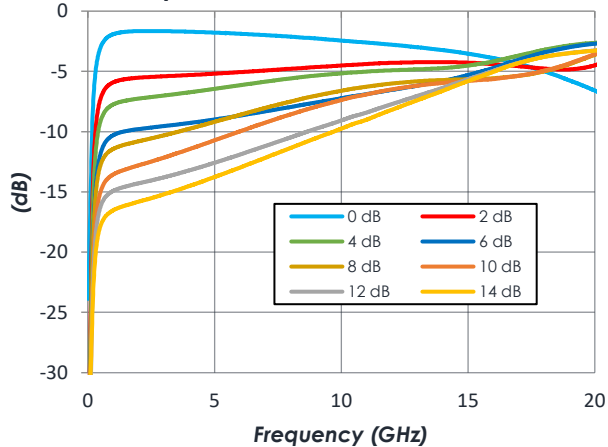
**RF1 Return Loss**



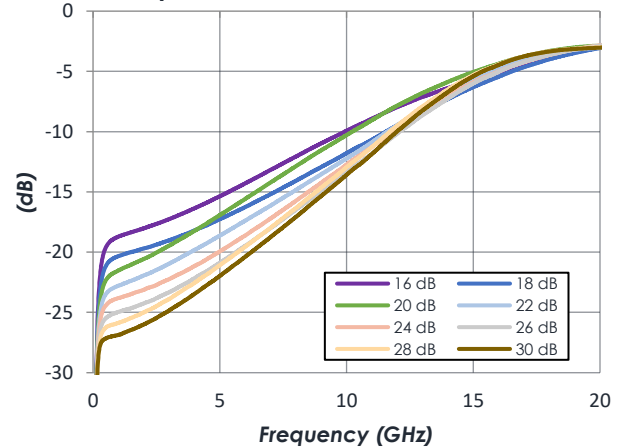
**RF2 Return Loss**



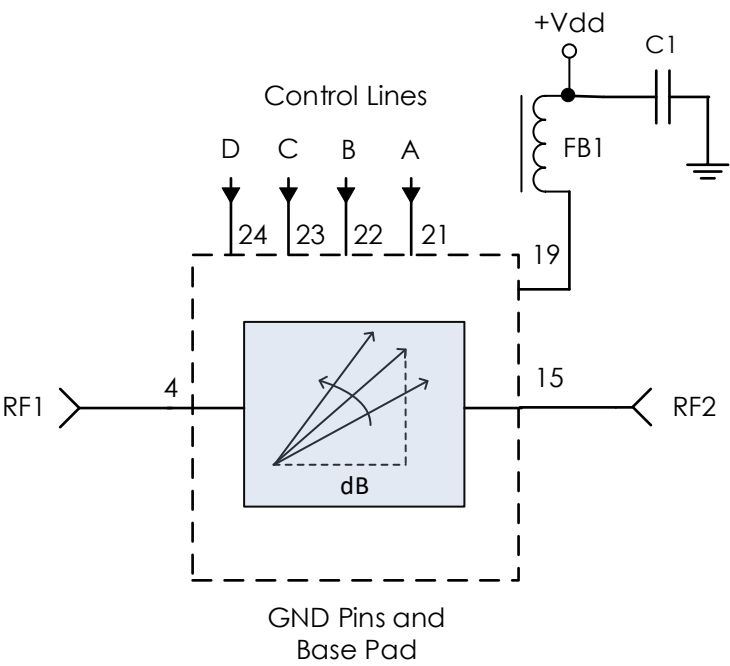
**Equalization States 0dB to 14dB**



**Equalization States 16dB to 30dB**



TYPICAL APPLICATION



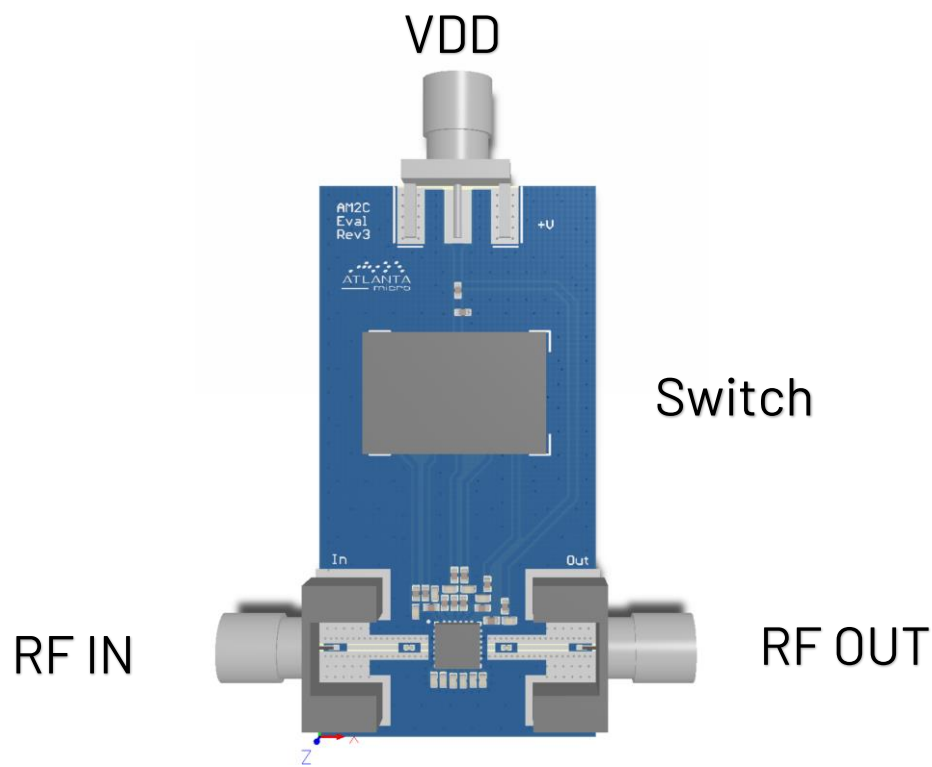
RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

| Part | Value       | Part Number       | Manufacturer |
|------|-------------|-------------------|--------------|
| C1   | 0.1 $\mu$ F | GRM155R71C104KA88 | Murata       |
| FB1  | -           | MMZ1005A222E      | TDK          |

Note:

1. VDD and control lines filtered internally to provide high frequency isolation.

EVALUATION PC BOARD



PART ORDERING DETAILS

| Part Number |                         | Description |
|-------------|-------------------------|-------------|
| AM2025      | 4mm 24 Lead QFN         |             |
| AM2025-Eval | AM2025 Evaluation Board |             |

RELATED PARTS

| Part Number |                 | Description                   |
|-------------|-----------------|-------------------------------|
| AM2005      | DC to 20GHz     | 5-bit, 1dB step Attenuator    |
| AM2152      | DC to 20GHz     | Fixed Slope Equalizer 2dB     |
| AM2154      | DC to 20GHz     | Fixed Slope Equalizer 4dB     |
| AM2156      | DC to 20GHz     | Fixed Slope Equalizer 6dB     |
| AM2158      | DC to 20GHz     | Fixed Slope Equalizer 8dB     |
| AM2024      | 2 GHz to 20 GHz | 6-bit, 0.25dB step Attenuator |
| AM2026      | DC to 40GHz     | 5-bit, 0.5dB step Attenuator  |

## COMPONENT COMPLIANCE INFORMATION

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| 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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## 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

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