

DR-AN-10-MO

10 GHz Analog Driver Module

Analog Driver



Features

- Output voltage up to 9 V_{pp}
- Linear amplifier
- Flat gain up to 12 GHz
- Single voltage power supply
- Low group delay variation

Applications

- LiNbO₃ modulators
- OFDM, RF over fiber
- Linear amplification
- Clock amplifier
- Research & Development

Options

- Heat-sink
- Alternative RF connectors gender

The DR-AN-10-MO is a wideband RF amplifier module designed for analog applications at frequencies up to 12 GHz.

The DR-AN-10-MO is characterized by a low Noise Figure and a linear transfer function whose 1 dB compression point is above 21 dBm. It exhibits flat Group Delay and Gain curves with reduced ripple over the entire bandwidth.

The DR-AN-10-MO operates from a single power supply for safety and ease of use, and offers gain control over 3 dB. It comes in a compact 52 mm x 25.6 mm housing with K type RF connectors (compatible SMA) and with an optional heat sink.

This amplifier module is ideally suited to drive optical modulators for analog applications.

Performance Highlights

| Parameter | Min | Typ | Max | Unit |
|------------------------|-------|------|-----|-----------------|
| Cut-off frequencies | 100 k | 11 G | - | Hz |
| Output voltage | 0 | - | 9 | V _{pp} |
| Gain | - | 30 | - | dB |
| Saturated output power | 23 | - | - | dBm |
| Output power 1dB comp | 20 | 21 | - | dB |
| Harmonics | - | - | -15 | dBc |
| Noise Figure | 3 | - | - | dB |

Measurements for V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 310 mA

Analog Driver

DC Electrical Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit |
|------------------------|------------|-----|-----|-----|------|
| Supply voltage (fixed) | V_{bias} | - | 12 | - | V |
| Current consumption | I_{bias} | - | 310 | - | mA |
| Gain control voltage | V_{amp} | - | 1.2 | - | V |

Electrical Characteristics

Conditions: S parameters conditions : $P_{in} = -30$ dBm, $T_{amb} = 25$ °C, 50 Ω system

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|------------------------|------------------|----------------------------|-----|-----------|-----|----------|
| Lower frequency | $f_{3dB, lower}$ | -3 dB point | - | - | 100 | kHz |
| Upper frequency | $f_{3dB, upper}$ | -3 dB point | - | 11 | - | GHz |
| Gain | S_{21} | Small signal, $f < 10$ GHz | - | 30 | - | dB |
| Gain ripple | - | $f < 10$ GHz | - | ± 1.5 | - | dB |
| Input return loss | S_{11} | $f < 10$ GHz | - | -10 | - | dB |
| Output return loss | S_{22} | $f < 10$ GHz | - | -10 | - | dB |
| Isolation | S_{12} | $f < 10$ GHz | - | -60 | - | dB |
| Output power 1dB | P_{1dB} | 2 GHz $< f < 10$ GHz | 20 | 21 | - | dBm |
| Saturated output power | P_{sat} | 2 GHz $< f < 10$ GHz | 23 | - | - | dBm |
| Output voltage | V_{out} | Linear | 0 | - | 5.5 | V_{pp} |
| | | Maximum swing | 0 | - | 9 | |
| Noise Figure | NF | 2 GHz $< f < 10$ GHz | 3 | - | 7 | dB |
| Harmonics | Harm | @ P_{1dB} , $f < 5$ GHz | - | - | -15 | dBc |
| Power dissipation | P | Small signal | - | 3.7 | - | W |

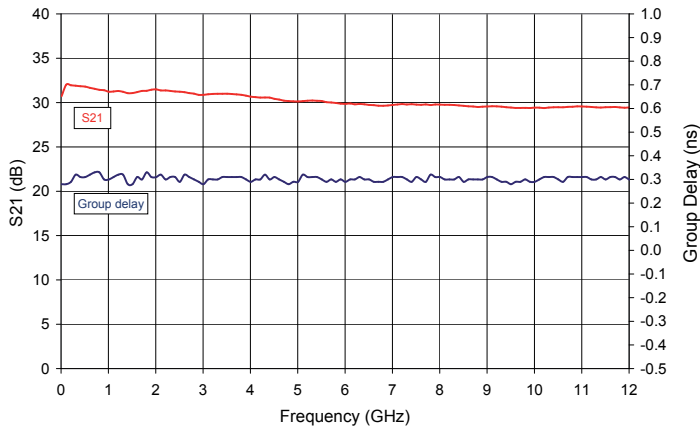
Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

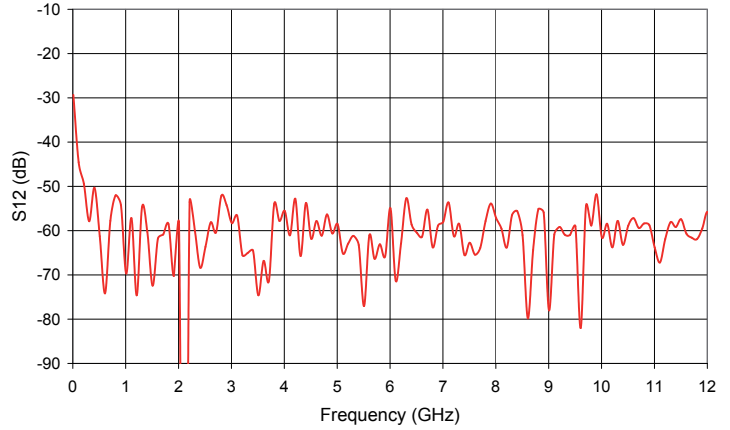
| Parameter | Symbol | Min | Max | Unit |
|--------------------------|------------|-----|-----|----------|
| RF input voltage | V_{in} | - | 1 | V_{pp} |
| Supply voltage | V_{bias} | 7 | 15 | V |
| DC current | I_{bias} | 0 | 0.4 | A |
| Gain control voltage | V_{amp} | 0 | 1.3 | V |
| Power dissipation | P_{diss} | - | 4.8 | W |
| Temperature of operation | T_{op} | 0 | +50 | W |
| Storage temperature | T_{st} | -20 | +70 | °C |

S21 and Group Delay Parameter Curves

Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 310\text{ mA}$

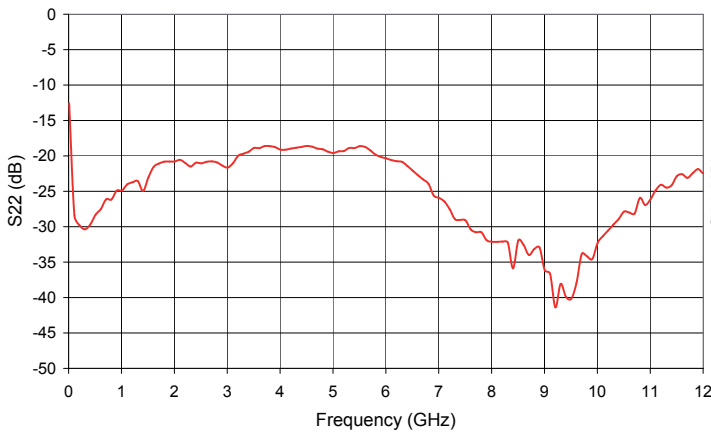


S12 Parameter Curve

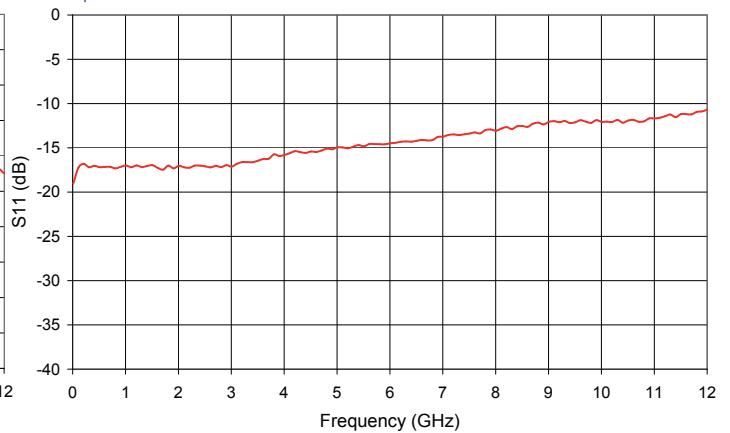


S22 Parameter Curve

Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 310\text{ mA}$

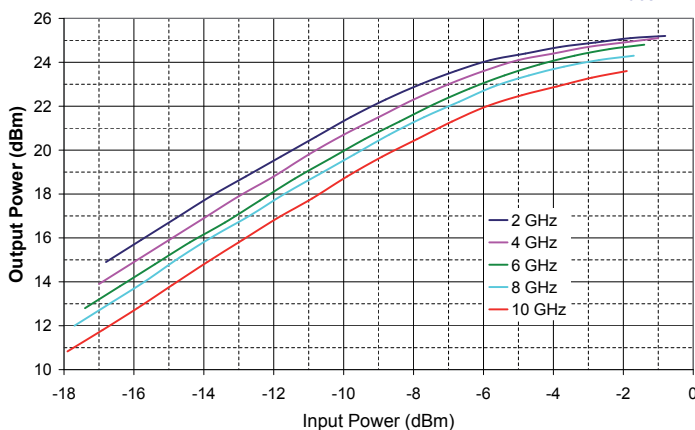


S11 Parameter Curve

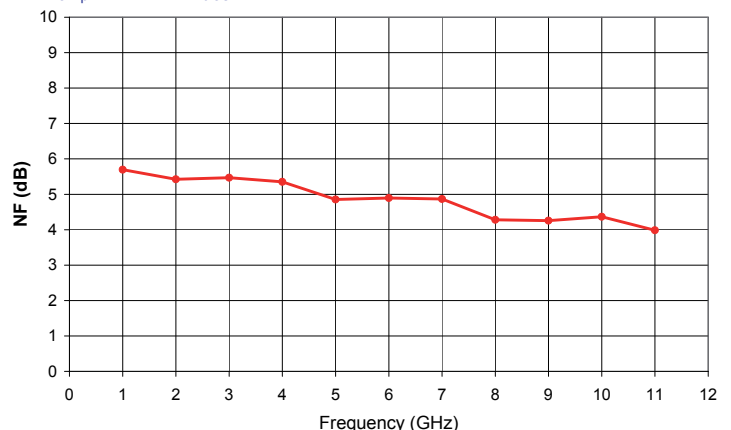


Saturated Output Power Curve

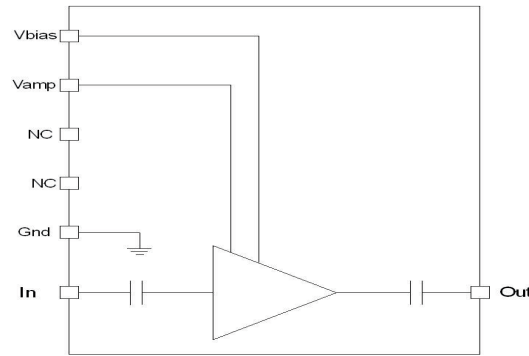
Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 310\text{ mA}$



Noise Figure Curve

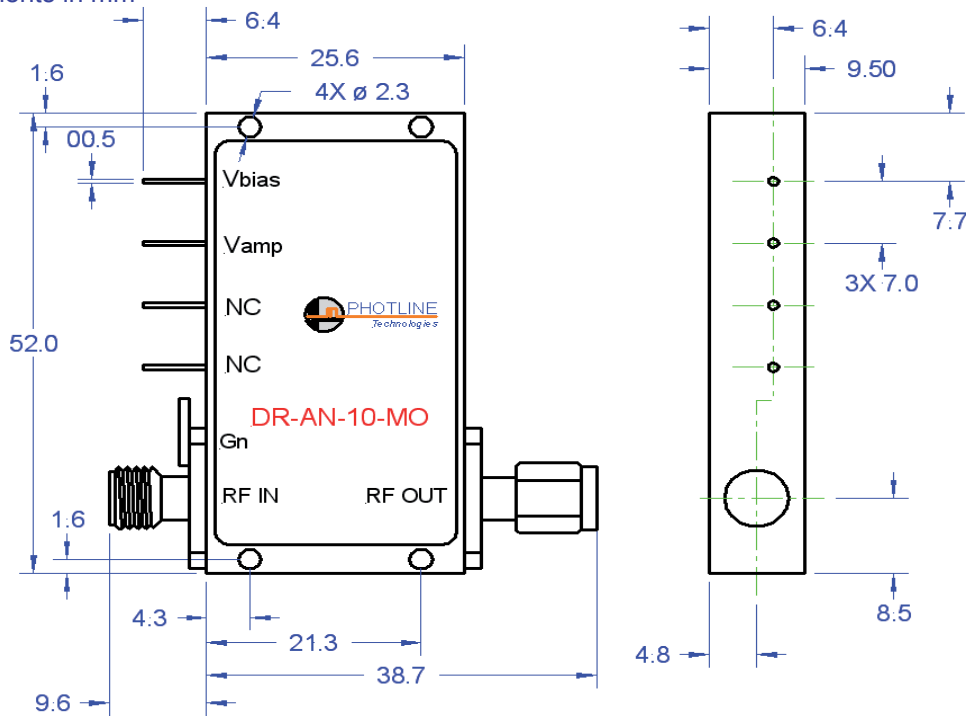


Electrical Schematic Diagram



Mechanical Diagram and Pinout

All measurements in mm



The heatsinking of the module is necessary. It's user responsibility to use an adequate heatsink. Refer to page 5 for Photline Technologies recommended heatsink.

| PIN | Function | Operational Notes |
|------------|-------------------------------------|--|
| IN | RF In | K-connector female |
| OUT | RF Out | K-connector male |
| V_{bias} | Power supply voltage | Set at typical operating specification |
| V_{amp} | Output voltage amplitude adjustment | Adjust for gain control tuning |

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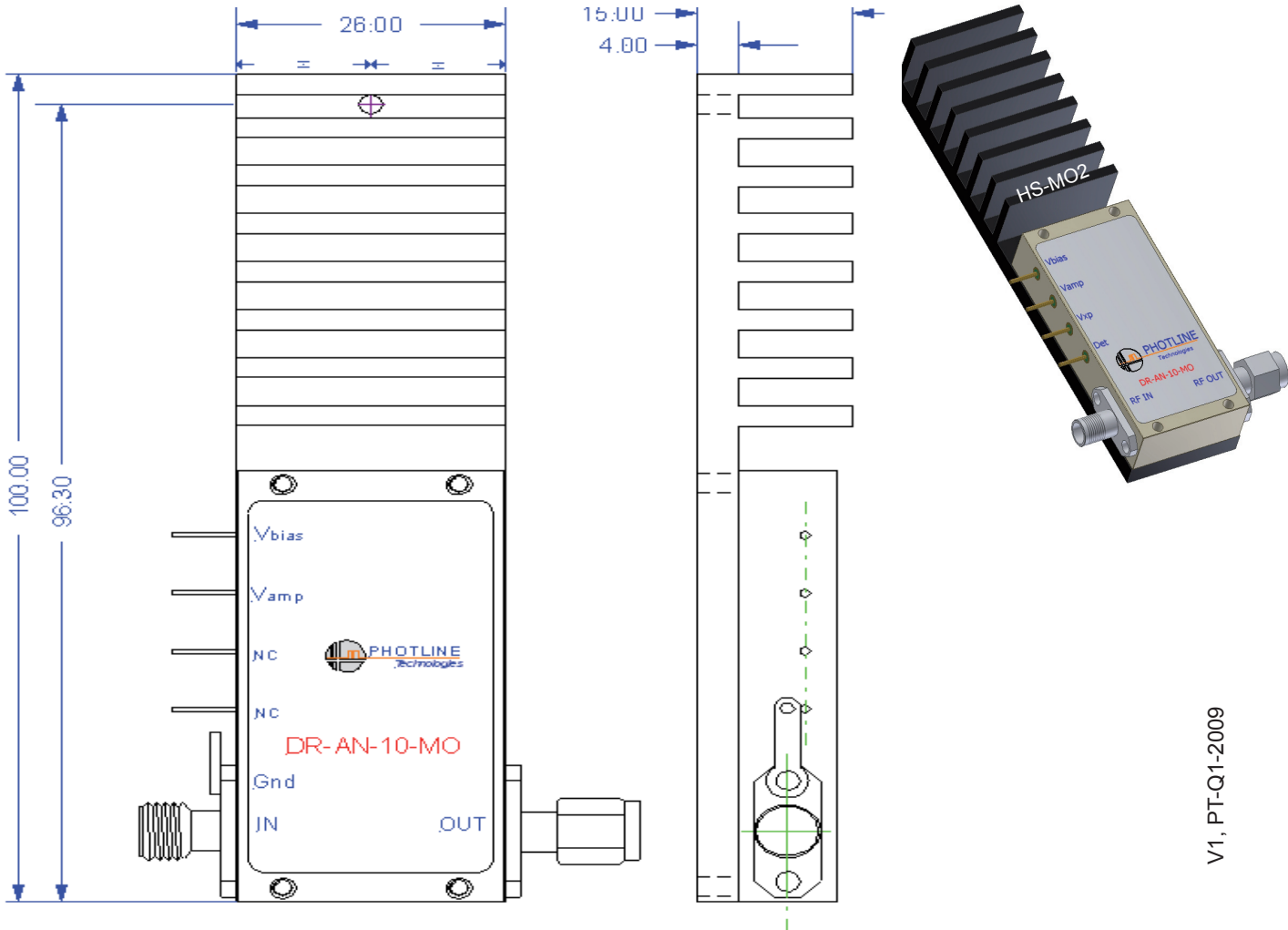


Delivering Modulation Solutions

Analog Driver

Mechanical Diagram and Pinout with HS-MO2 Heatsink

All measurements in mm



V1, PT-Q1-2009

ABOUT US

Photline Technologies is a provider of Fiber Optics Modulation Solutions based on the company LiNbO3 modulators and high-speed electronics modules. Photline Technologies offers high speed and high data rate modulation solutions for the telecommunication industry and the defense, aerospace, instruments and sensors markets. The products offered by the company include : comprehensive range of intensity and phase modulators (800 nm, 1060 nm, 1300 nm, 1550 nm), RF drivers and modules, transmitters and modulation units.

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