

DR-AN-20-MO

20 GHz Analog Driver Module



Delivering Modulation Solutions

Analog Driver



Features

- Output voltage up to 9 V_{pp}
- Linear amplifier
- Flat gain up to 20 GHz
- Single voltage power supply
- Low group delay variation

Applications

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

Options

- Heat-sink
- Alternative RF connectors gender

The DR-AN-20-MO is a wideband RF amplifier module designed for analog applications at frequencies up to 20 GHz.

The DR-AN-20-MO is characterized by a low Noise Figure and a linear transfer function whose 1 dB compression point is above 20 dBm. It exhibits flat Group Delay and Gain curves with reduced ripple over the entire bandwidth.

The DR-AN-20-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	20 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	-	5	-	dB

Measurements for V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 305 mA

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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 -30 dBm, $T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	18	20	-	GHz
Gain	S_{21}	Small signal, $f < 15\text{ GHz}$	-	30	-	dB
Gain ripple	-	$f < 15\text{ GHz}$	-	± 1.5	-	dB
Input return loss	S_{11}	$f < 10\text{ GHz}$	-	-10	-	dB
Output return loss	S_{22}	$f < 20\text{ GHz}$	-	-10	-	dB
Isolation	S_{12}	$f < 20\text{ GHz}$	-	-60	-	dB
Output power 1dB	P_{1dB}	$2\text{ GHz} < f < 14\text{ GHz}$	21	-	-	dBm
Saturated output power	P_{sat}	$2\text{ GHz} < f < 12\text{ GHz}$	23	-	-	dBm
Output voltage	V_{out}	Linear	0	-	7	V_{pp}
		Maximum swing	0	-	9	
Noise Figure	NF	$f < 7\text{ GHz} \ \& \ f > 14\text{ GHz}$	5	-	7	dB
		$7\text{ GHz} < f < 14\text{ GHz}$	3	-	5	
Harmonics	Harm	@ P_{1dB} , $f < 5\text{ GHz}$	-	-	-15	dBc
Power dissipation	P	Small signal	-	3.7	-	W

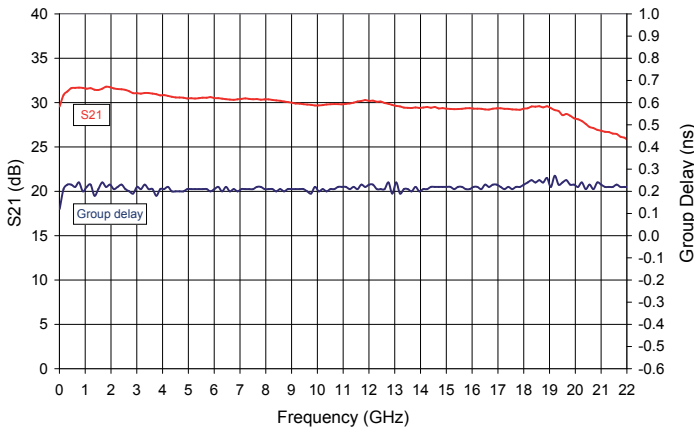
Absolute Maximum Ratings

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.

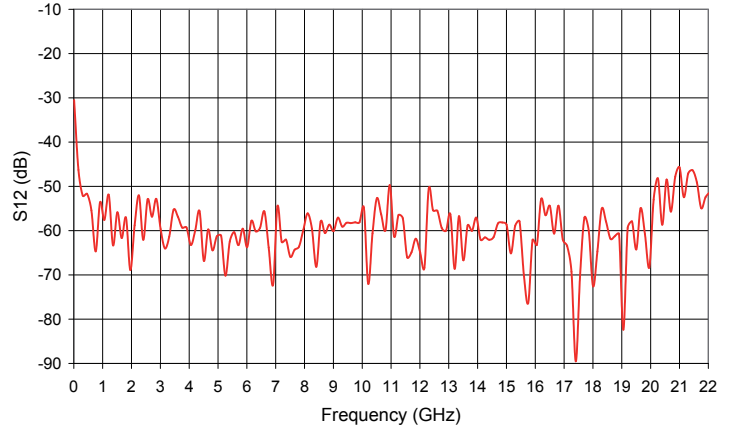
Parameter	Symbol	Min	Max	Unit
RF input voltage	V_{in}	-	1	V_{pp}
Supply voltage	V_{bias}	7	15	V
DC current	I_{bias}	0	0.4	A
Gain control voltage	V_{amp}	0	1.3	V
Power dissipation	P_{diss}	-	4.8	W
Temperature of operation	T_{op}	0	+50	W
Storage temperature	T_{st}	-20	+70	$^{\circ}\text{C}$

S21 and Group Delay Parameter Curves

Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 305\text{ mA}$

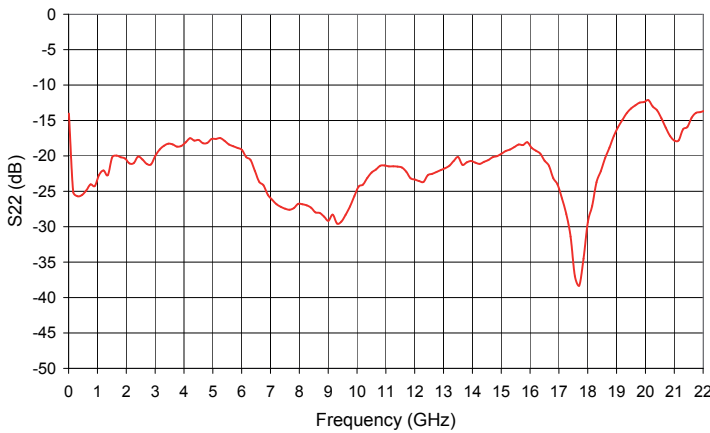


S21 Parameter Curve

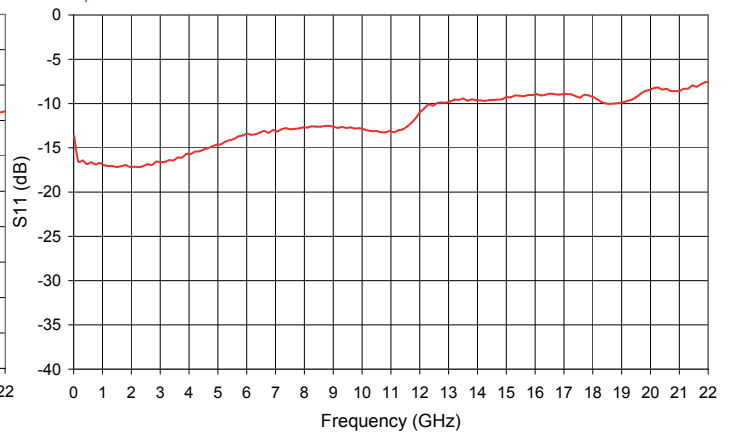


S22 Parameter Curve

Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 305\text{ mA}$

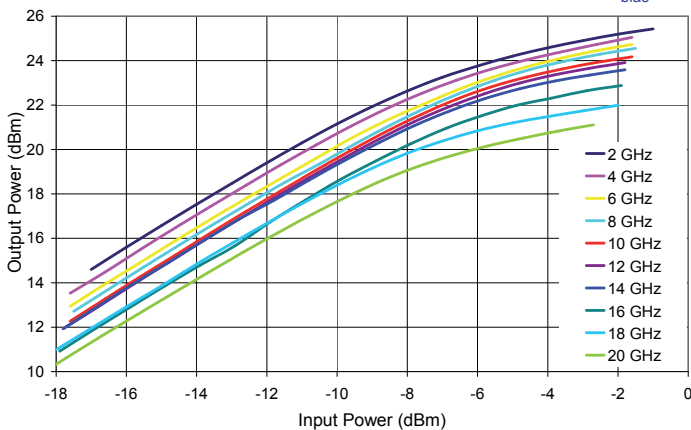


S11 Parameter Curve

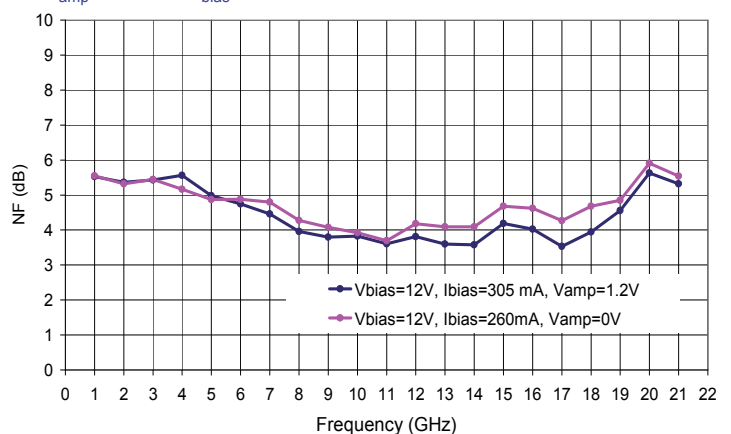


Saturated Output Power Curve

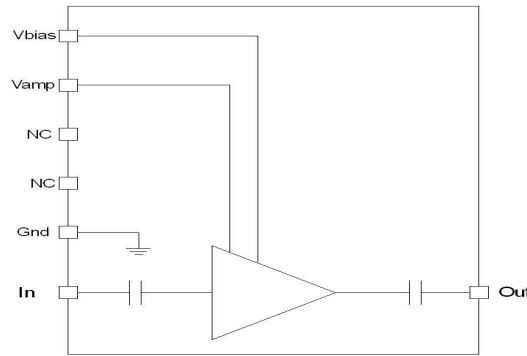
Conditions: $V_{bias} = 12\text{ V}$, $V_{amp} = 1.2\text{ V}$, $I_{bias} = 305\text{ mA}$



Noise Figure Curve

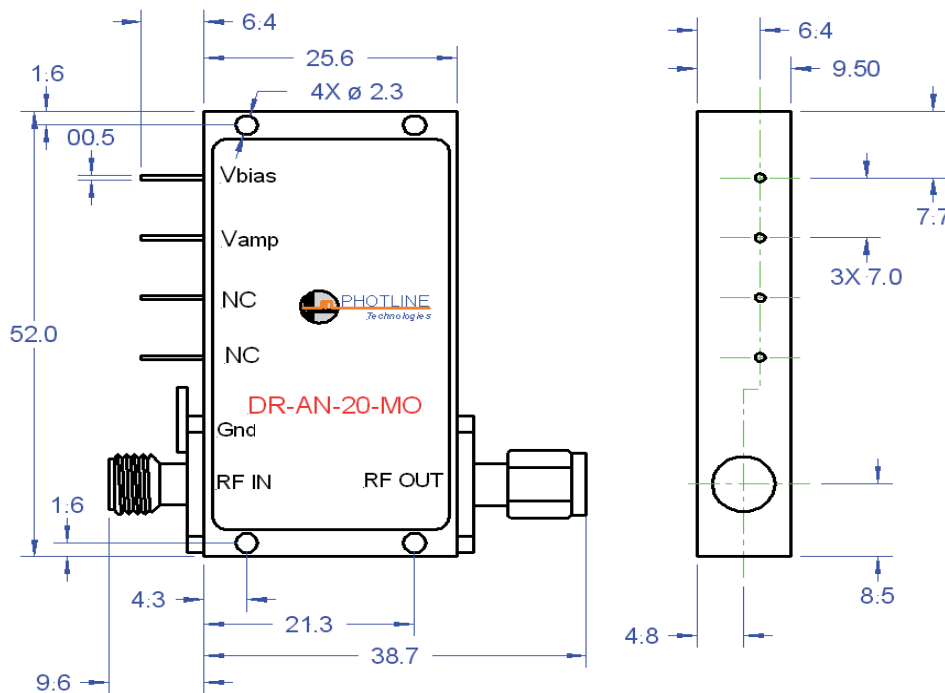


Electrical Schematic Diagram



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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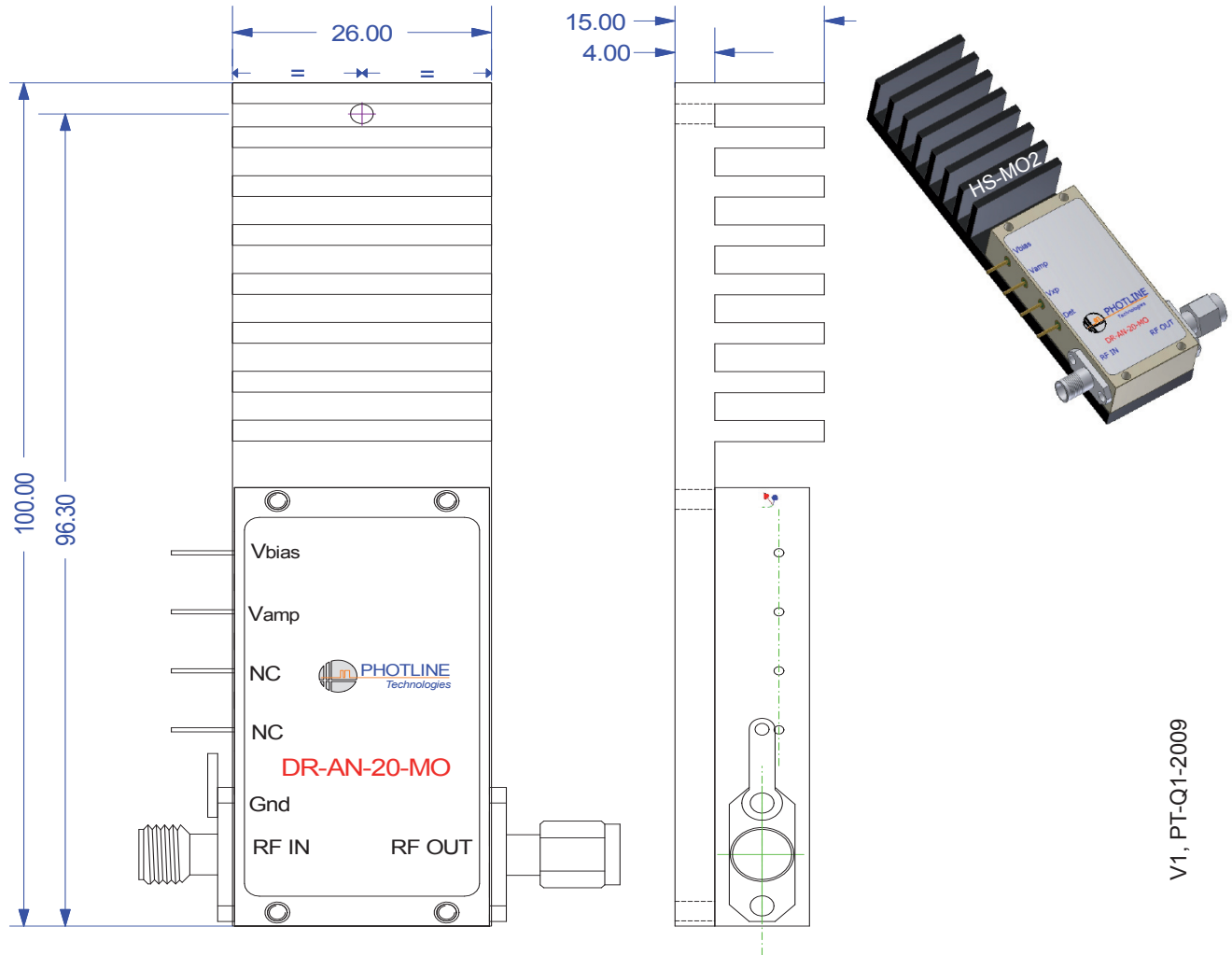


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Mechanical Diagram and Pinout with HS-MO2 Heatsink

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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