DR-AN-20-MO

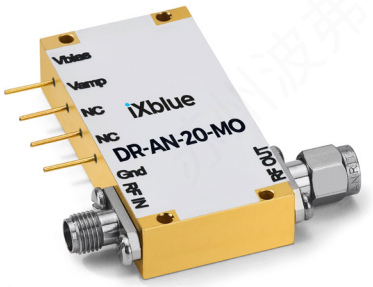
20 GHz Analog Driver

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 curve with reduced ripple over the entire bandwidth.

The DR-AN-20-MO comes in a compact 52 mm x 25.6 mm housing with K type RF connectors (compatible SMA) and with an optional heat-sink. It operates from a single power supply for safety and ease of use, and offers gain control over 3 dB.

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



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

- $LiNbO_3$ modulators
- OFDM, RF over Fiber
- Linear amplification
- Research & Development

OPTIONS

- Heat-sink

Performance Highlights

Parameter	Min	Typ	Max	Unit
Cut-off frequencies	50 k	20 G	-	Hz
Output voltage	0	-	9	V_{pp}
Gain	28	30	-	dB
Saturated output power	23	-	-	dBm
Output power 1 dB comp	20	21	-	dB
Harmonics	-	-	-15	dBc
Noise figure	5	-	7	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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Lower frequency	f_{3db}, lower	-3 dB point	-	-	50	kHz
Upper frequency	f_{3db}, upper	-3 dB point	18	20	-	GHz
Gain	S_{21}	Small signal, f < 15 GHz	28	30	-	dB
Gain ripple	-	f < 15 GHz	-	-	± 1.5	dB
Input return loss	S_{11}	f < 10 GHz	-	-10	-	dB
Output return loss	S_{22}	f < 20 GHz	-	-10	-	dB
Isolation	S_{12}	f < 20 GHz	-	-60	-	dB
Output power 1 dB	$P_{1\,dB}$	2 GHz < f < 16 GHz	20	21	-	dBm
Saturated output power	P_{sat}	2 GHz < f < 12 GHz	23	-	-	dBm
Output voltage	V_{out}	Linear	0	-	7	V_{pp}
		Maximum swing	0	-	9	
Noise figure	NF	f < 7 GHz & f > 18 GHz	5	-	7	dB
		7 GHz < f < 18 GHz	3		5	
Harmonics	Harm	@$P_{1\,dB}$, f < 5 GHz	-	-	-15	dBc
Power dissipation	P	Small signal	-	3.6	5.2	W

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

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}	-	0.6	V_{pp}
Supply voltage	V_{bias}	0	13	V
DC current	I_{bias}	0	400	mA
Gain control voltage	V_{amp}	0	1.3	V
Power dissipation	P_{diss}	-	5.2	W
Operating temperature	T_{op}	0	+40	°C
Storage temperature	T_{st}	-10	+70	°C

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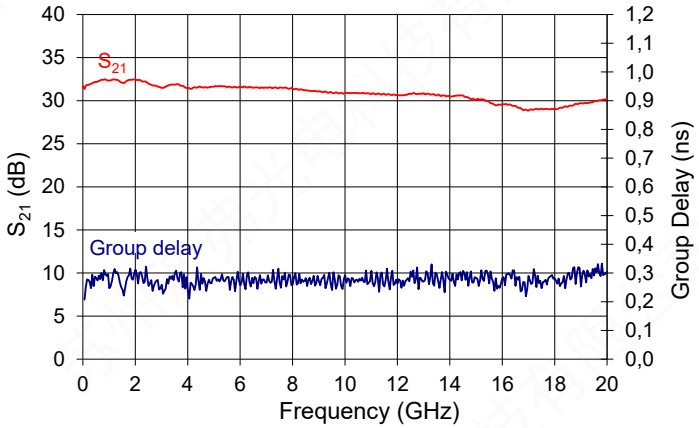
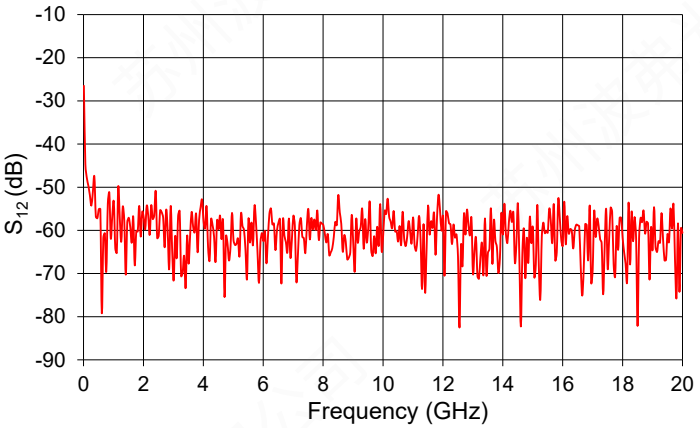
S_{21} and Group Delay Parameter Curves

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



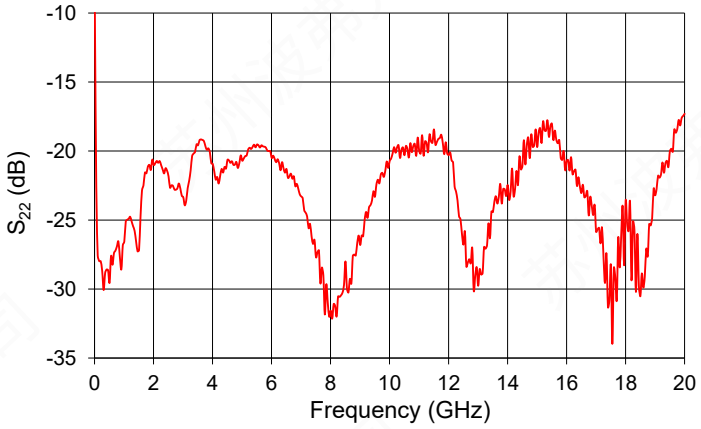
S_{12} Parameter Curve

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



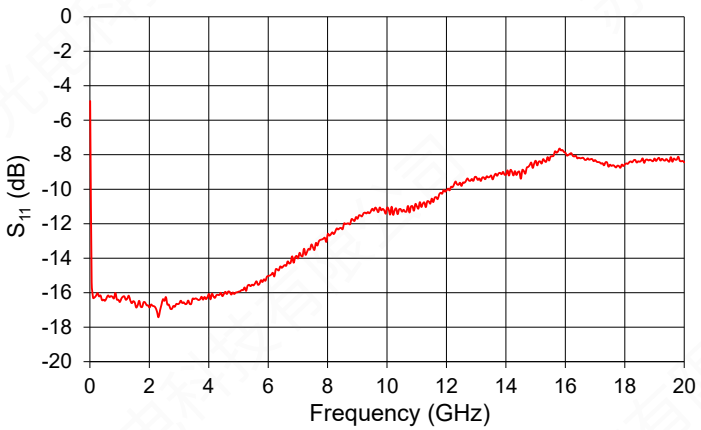
S_{22} Parameter Curve

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



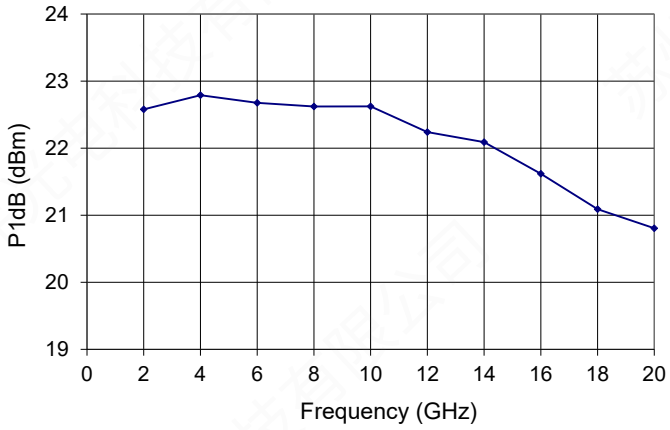
S_{11} Parameter Curve

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



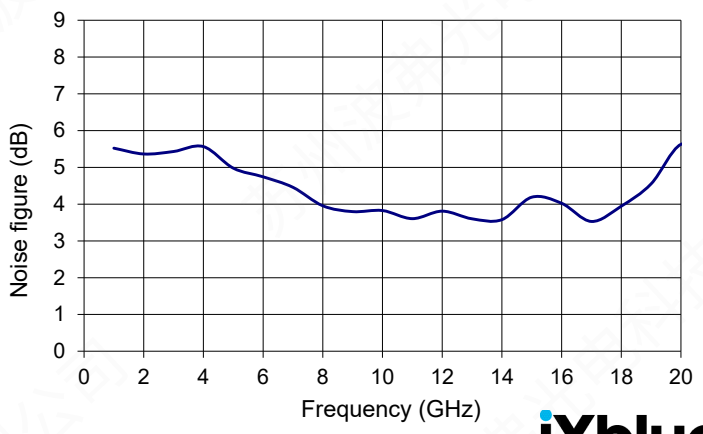
Saturated Output Power Curve

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



Noise Figure Curve

Conditions: V_{bias} = 12 V, V_{amp} = 1.2 V, I_{bias} = 300 mA



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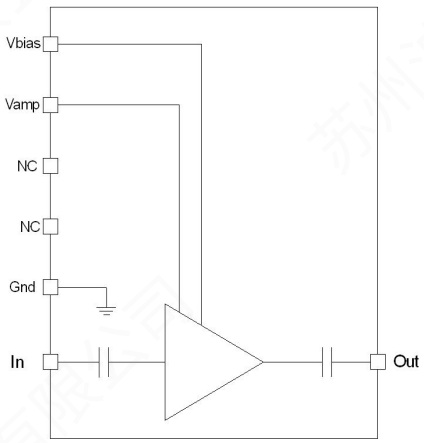
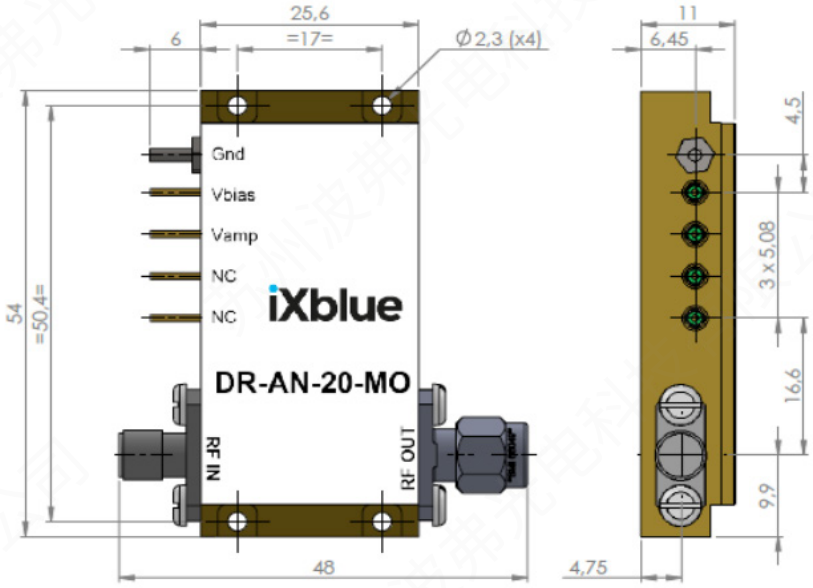
Electrical Schematic Diagram



Mechanical Diagram and Pinout

All measurements in mm

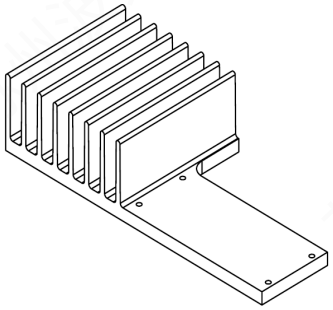


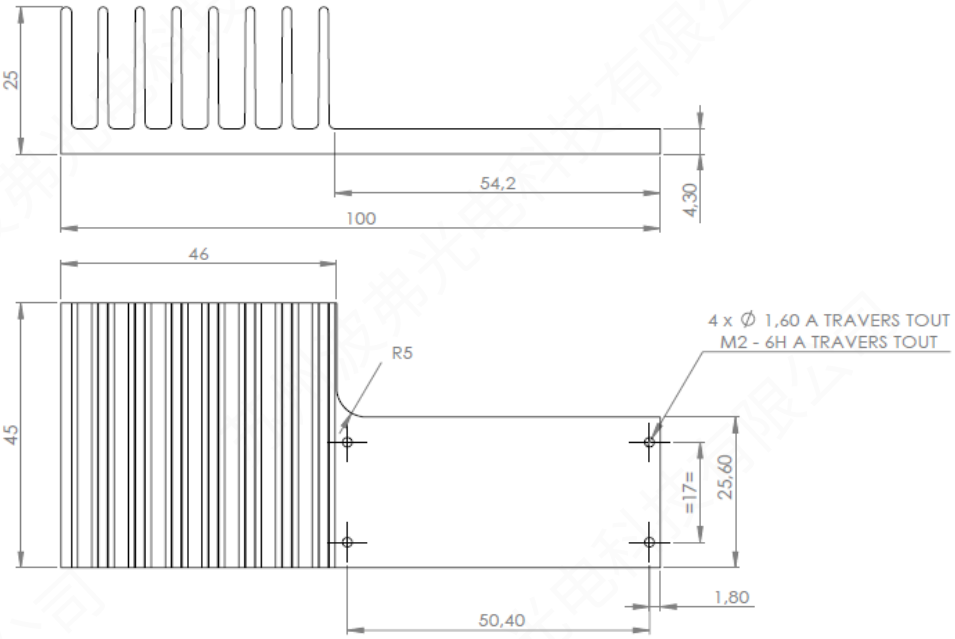
The heat-sinking of the module is necessary. It's user responsability to use an adequate heat-sink. Refer to page 5 for iXblue recommended heat-sink.

PIN	Function	Unit
IN	RF In	Female K connector
OUT	RF Out	Male K connector
V_{bias}	Power supply voltage	Set a typical operating specification
V_{amp}	Output voltage amplitude adjustment	Adjust for gain control tuning

Mechanical Diagram and Pinout with HS-MO2 Heat-sink

All measurements in mm





About us

iXblue Photonics produces specialty optical fibers and Bragg gratings based fiber optics components and provides optical modulation solutions based on the company lithium niobate ($LiNbO_3$) modulators and RF electronic modules.
iXblue Photonics serves a wide range of industries: sensing and instruments, defense, telecommunications, space and fiber lasers as well as research laboratories all over the world.

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