DRIVER

DR-VE-0.1-MO

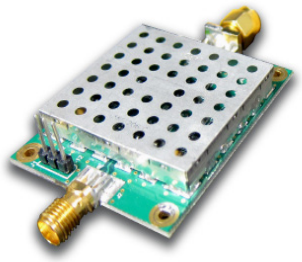
Low frequencies VErsatile Medium Output Voltage Driver

The DR-VE-0.1-MO is a VErsatile RF amplifier module that can be used for analog, pulse and digital applications.

The DR-VE-0.1-MO is an amplifier generating ± 10 V with a fixed gain factor for both negative and positive voltages.

Simple and inexpensive, the DR-VE-0.1-MO is a DC-coupled voltage amplifier that operates over a DC to 200 MHz bandwidth. It draws very little current.

The DR-VE-0.1-MO is a useful driver for low frequency external modulation applications using $LiNbO_3$ phase modulators (MPX-LN-0.1, NIR-MPX-LN-0.1, NIR-MPX800-LN-0.1, NIR-MPX950-LN-0.1), amplitude modulators MX-LN-10 family.



Features

- Output voltage up to 20 V_{pp}
- Linear / pulse / digital amplifier
- Bandwidth from DC up to 200 MHz

Applications

- Laser beam combining
- Low RAM phase modulation
- Spectrum broadening
- Laser frequency locking / PDH
- Low frequencies NRZ modulation

Related Equipments

- NIR / NIR800 / NIR950-MPX-LN-0.1 phase modulators
- MX-LN-10 amplitude modulator

Performance Highlights

Parameter	Min	Typ	Max	Unit
Low cut-off frequency	DC	-	-	-
High cut-off frequency	-	200	-	MHz
Output voltage (10 kΩ Z_{IN} modulator)	-	20	-	V_{pp}
Output voltage (50 Ω Z_{IN-Mod} modulator)	-	10	-	V_{pp}
Gain (10 kΩ Z_{IN-Mod} modulator)	25	26	-	dB
Gain (50 Ω Z_{IN-Mod} modulator)	19	20	-	dB

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Input Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Input impedance matching	Z_{IN}	-	50	-	Ω
Input voltage	V_{IN}	-	1	-	V_{pp}
Supply voltage	$V+_{bias}$	11.5	12	13	V
Current consumption	$I+_{bias}$	20	-	100	mA
Supply voltage	$V-_{bias}$	-11.5	-12	-13	V
Current consumption	$I-_{bias}$	-20	-	-100	mA

Output Electrical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Lower frequency	f_{lower}	-	DC			-
Upper frequency	f_{upper}	-3 dB point	-	200	-	MHz
Modulator Z_{IN} matching	Z_{IN-Mod}	Modulator input impedance		10 k or 50	-	Ω
Gain	G	@10 MHz, 10 kΩ Z_{IN-Mod} modulator	25	26	-	dB
		@10 MHz, 50 Ω Z_{IN-Mod} modulator	19	20	-	dB
Output voltage	V_{OUT}	@10 MHz, 10 kΩ Z_{IN-Mod} modulator	-	20	-	Vpp
		@10 MHz, 50 Ω Z_{IN-Mod} modulator	-	10	-	Vpp
Saturation output voltage	$V_{SAT-OUT}$	@10 MHz, 10 kΩ Z_{IN-Mod} modulator	-10	-	+10	V
		@10 MHz, 50 Ω Z_{IN-Mod} modulator	-5	-	+5	V
Pulse width	PW	Pulse mode	8	-	-	ns
Frequency repetition rate	FRR	Pulse mode	0	-	50	MHz
Rise and fall times	Rt / Ft	Pulse mode	-	6	10	ns
Data-rate	PRBS	Digital mode	-	-	150	Mb/s
Input return loss	S_{11}	f < 200 MHz	-	-10	-	dB
Output return loss	S_{22}	f < 200 MHz	-	-10	-	dB

Absolute Maximum Ratings

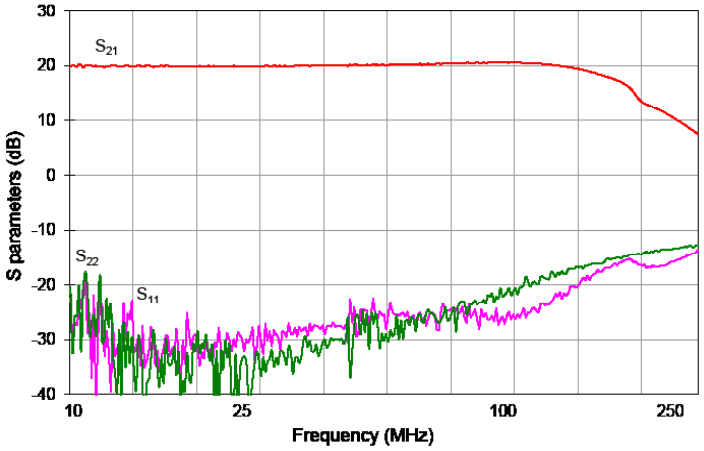
Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute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

Parameter	Symbol	Min	Max	Unit
RF input voltage	V_{in}	-	10	V_{pp}
Supply voltage	V_{bias}	-16	16	V
Operating temperature	T_{op}	0	+55	°C
Storage temperature	T_{st}	-40	+85	°C

DR-VE-0.1-MO

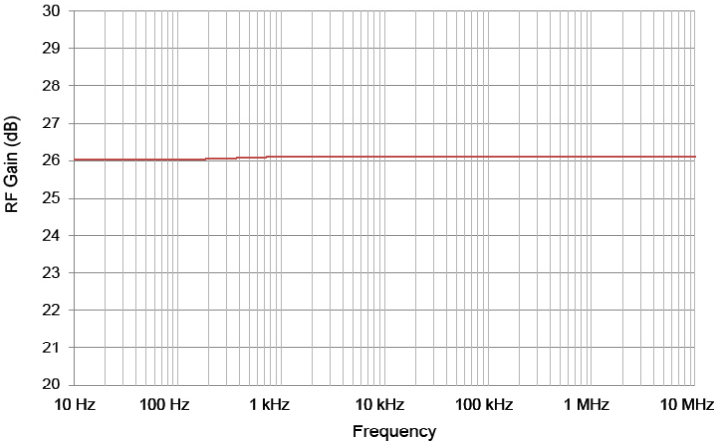
S Parameters curve

Conditions: V_{bias} = 12 V & -12 V, 50 Ω



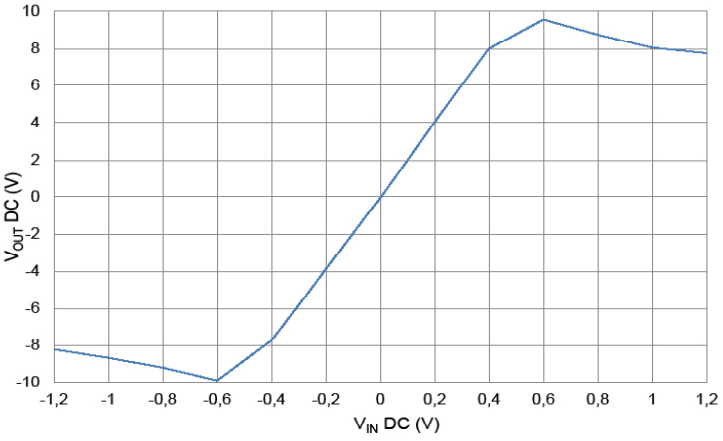
Low frequencies small signal gain

Conditions: V_{bias} = 12 V & -12 V, V_{IN} = 50 mV, 10 kΩ



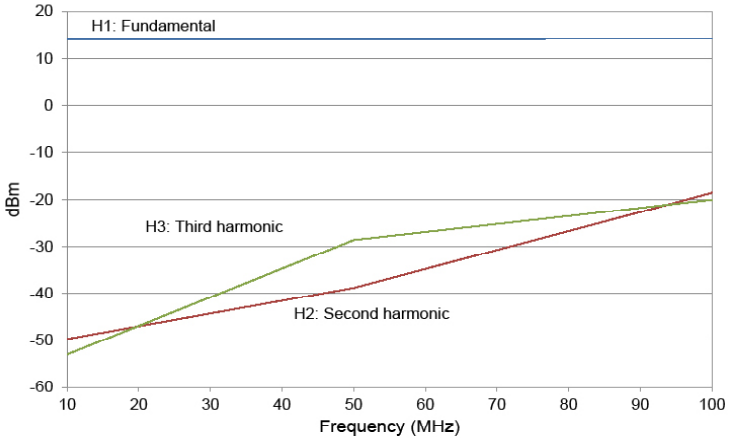
DC signal gain

Conditions: V_{bias} = 12 V & -12 V, V_{IN} = 50 mV, 10 kΩ

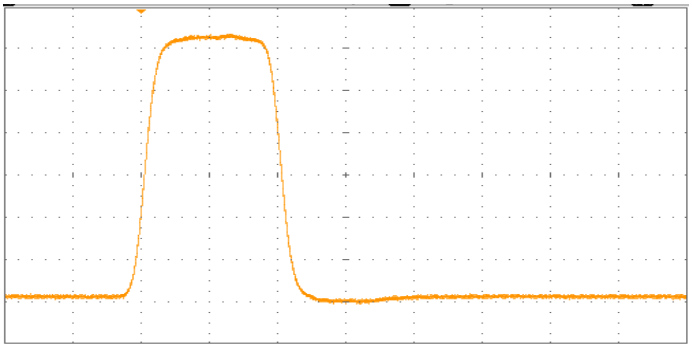


Harmonics vs frequency - Linearity driver response

Conditions: V_{bias} = 12 V & -12 V, P_{IN} = 10 dBm, 10 kΩ

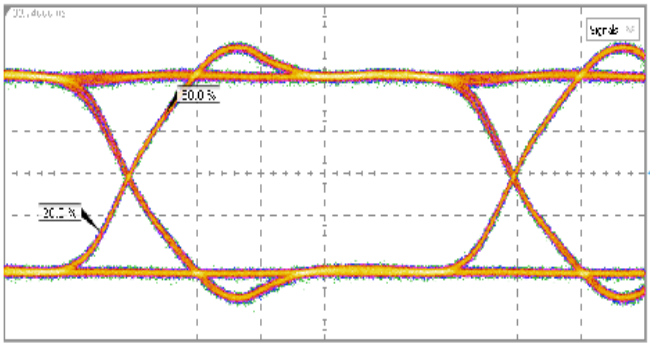


Electrical pulse - Pulse driver response



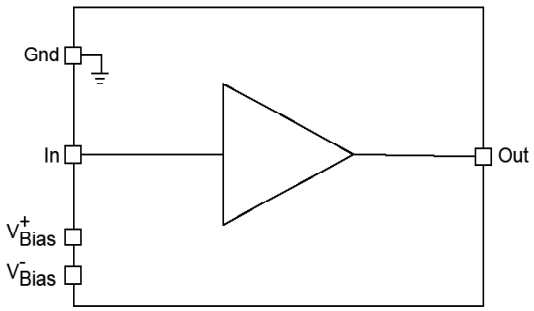
Pulse Width: 20 ns
Output voltage: 8 Vpp

100 Mb/s NRZ Eye Diagram - Digital driver response



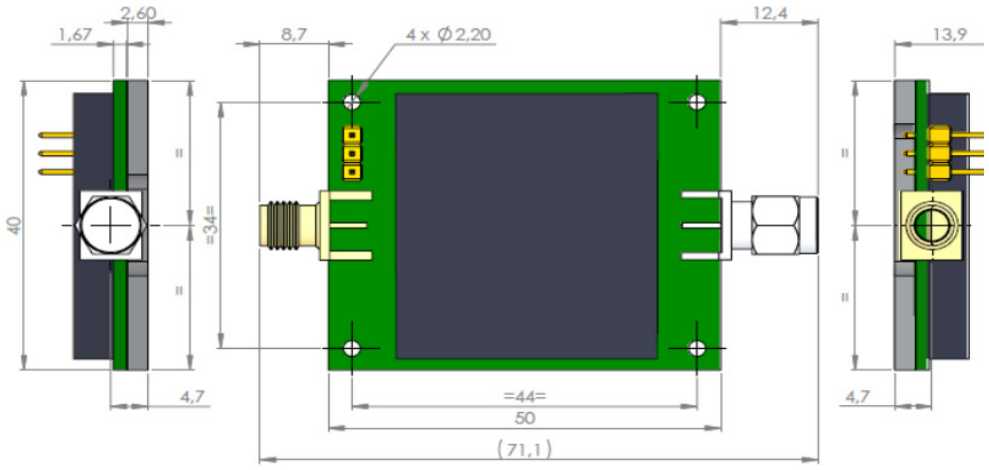
Rise Time: 1.6 ns
RMS jitter: 42 ps - Peak-peak jitter: 265 ps
SNR: 30

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.

Port	Function	Unit
IN	RF In	SMA Female connector
OUT	RF Out	SMA Male connector
V_{bias}	Power supply voltage	3 PINS - Cables are supplied

About us

Exail 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.
Exail 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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