DR-PL-10-MO-LR/HR

Pulse Medium Output Voltage Driver Module

Photline Technologies
Delivering Modulation Solutions

Pulse Driver

Features

- Specific design for pulse signals
- Accommodate a variety of pulse formats
- High pulse fidelity

Applications

- Pulse generation
- Pulse picking
- Spectroscopy
- Lidar

Options

- Heat-sink
- Custom design: higher PW, lower PRF

DR-PL series RF drivers are amplifiers modules designed to drive $LiNb0_3$ optical modulators so as to generate undistorted optical pulses.

Electrical pulsed signals differ from classical telecom signals by long periods with no signal, when telecom signals are usually well balanced in 1 and 0. They also differ from analog signal by a wider frequency content. In order to generate clean optical pulses with sharp edges, sustained high and low levels and no overshoot, pulsed signals do require specific amplifiers.

The DR-PL-10-LR driver is optimized for low Pulse Repetition Frequency (PRF) signals, with bandwidths up to 10 GHz. It accommodates pulse trains with repetition rate as low as several seconds, short rise and fall time (down to 25 ps), high extinction ratio and width up to 10 ns.

The DR-PL-10-HR is optimized for signals with higher Pulse Repetition Frequency and can withstand longer pulses up to 100 ns.

DR-PL drivers come in compact connectorized modules that match directly with Photline modulators, they use a single voltage power supply for ease and safety of use and feature an output voltage control for maximum flexibility. An optional heat sink is proposed as an accessory.

Performance Highlights

Parameter	Min	Typ	Max	Unit
Cut-off frequencies	50 k	-	7 G	Hz
Output voltage	3.5	-	6.5	V_{pp}
Gain	-	20	-	dB
Saturated output power	20	-	-	dBm
Pulse repetition frequency	10	-	1 G	Hz
Pulse width	100 p	-	100 n	s
Rise / Fall time	-	40	-	ps

Measurements for V_{bias} = 12 V, V_{amp} = 0.3 V, I_{bias} = 370 mA

DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage (fixed)	V_{bias}	-	12	-	V
Current consumption	I_{bias}	-	0.370	-	A
Gain control voltage	V_{amp}	0	0.4	-	V

Electrical Characteristics

Conditions: V_{in} = 0.25 V_{pp}, T_{amb} = 25 °C, 50 Ω system

Parameter	Symbol	Model	Condition	Min	Typ	Max	Unit
Lower frequency	f_{3dB}, lower	DR-PL-10	-3 dB point	-	-	45	kHz
Upper frequency	f_{3dB}, upper	DR-PL-10	-3 dB point	7	-	-	GHz
Gain	S_{21}	DR-PL-10	Small signal, P_{in} = -30 dBm	-	21	-	dB
Gain ripple	-	DR-PL-10	< 7 GHz	-	±1.5	-	dB
Input / Output return loss	S_{11} / S_{22}	DR-PL-10	50 kHz < f < 10 GHz	-	-10	-	dB
Saturated output power	P_{sat}	DR-PL-10	V_{in} = 0.2 V_{pp} - 0.5 V_{pp}	20	-	-	dBm
Output voltage	V_{out}	DR-PL-10	V_{in} = 0.2 V_{pp} - 0.5 V_{pp}	3.5	5.5	6.5	V_{pp}
Pulse repetition frequency	PRF	DR-PL-10-LR	100 ps < PW < 10 ns	10	-	100 M	Hz
		DR-PL-10-HR	100 ps < PW < 100 ns	50 k	-	1 G	Hz
Pulse width	PW	DR-PL-10-LR	10 Hz < PRF < 100 Mz	100 p	-	10 n	s
		DR-PL-10-HR	50 kHz < PRF < 1 GHz	100 p	-	100 n	s
Rise / Fall time	t_R / t_F	DR-PL-10	20 % - 80 %	-	25	-	ps
Delay time	D_t	DR-PL-10	-	-	400		ps
Power dissipation			V_{out} = 8 V_{pp}	-	3.2	-	W

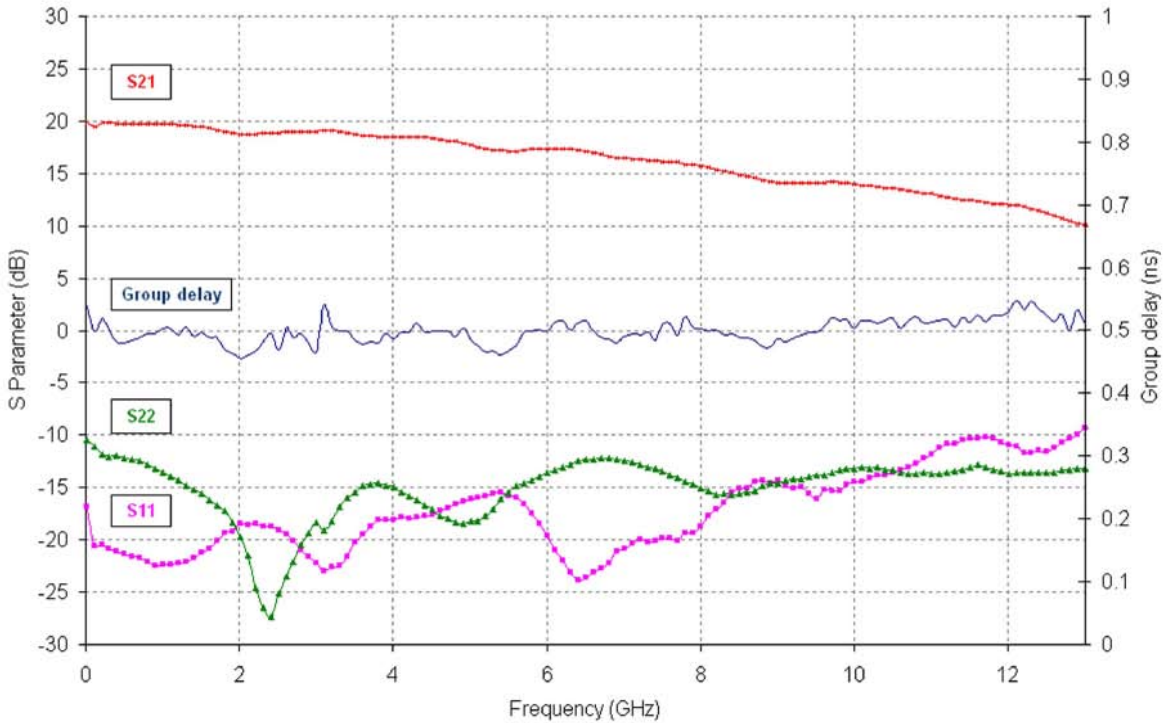
Absolute Maximum Ratings

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}	-	0.6	V_{pp}
Supply voltage	V_{bias}	0	13	V
DC current	I_{bias}	0	0.4	A
Gain control voltage	V_{amp}	0	0.6	V
Power dissipation	P_{diss}	-	5.2	W
Temperature of operation	T_{op}	-5	+50	W
Storage temperature	T_{st}	-40	+70	°C

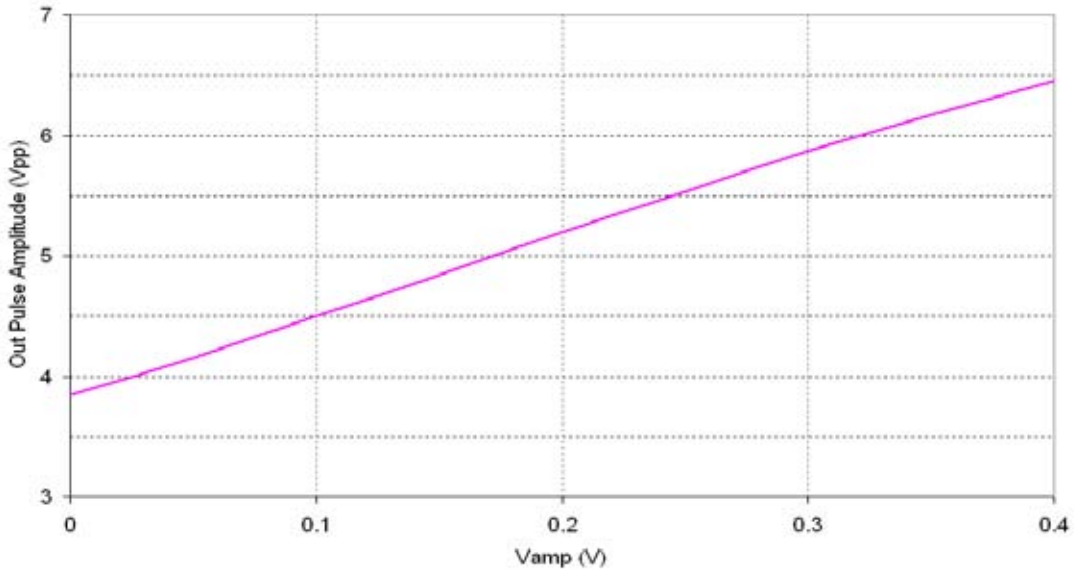
S Parameters Curves

Conditions: V_{bias} = 12 V, V_{amp} = 0.3 V, I_{bias} = 366 mA



Typical Output Voltage Amplitude vs V_{amp}

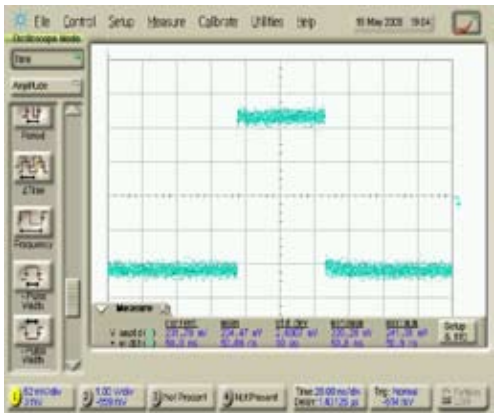
Conditions: V_{bias} = 12 V



Eye Diagrams

Low frequency repetition rate width wide pulse width
PW = 40 ns, PRF = 100 kHz

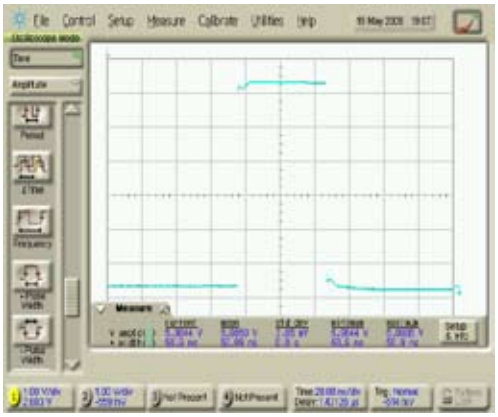
V_{bias} = 12 V, V_{amp} = 0.3 V, I_{bias} = 370 mA



Input signal

Genrated by Anritsu MP1758A

Eye amplitude = 0.25 V_{pp}, Rise time = 17 ps



Output response

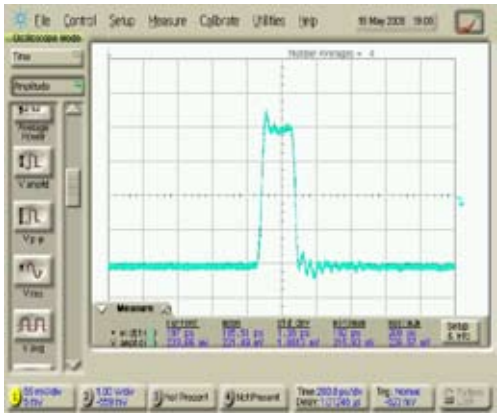
Measured using Agilent 86100B with two 50 GHz

8348A channels module, and without precision time-base module

Eye amplitude = 6 V_{pp}, Rise time = 27 ps

Wide frequency repetition rate with short pulse width
PW = 200 ps, PRF = 20 MHz

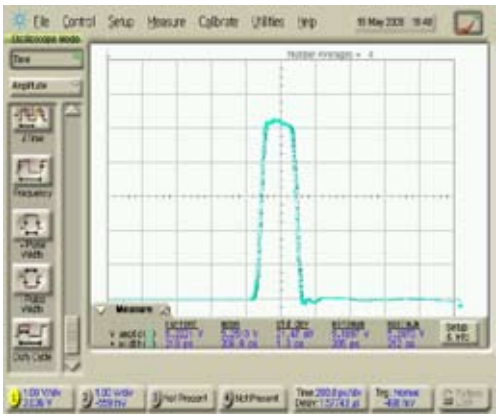
V_{bias} = 12 V, V_{amp} = 0.3 V, I_{bias} = 370 mA



Input signal

Genrated by Anritsu MP1758A

Eye amplitude = 0.25 mV_{pp}, Rise time = 16 ps



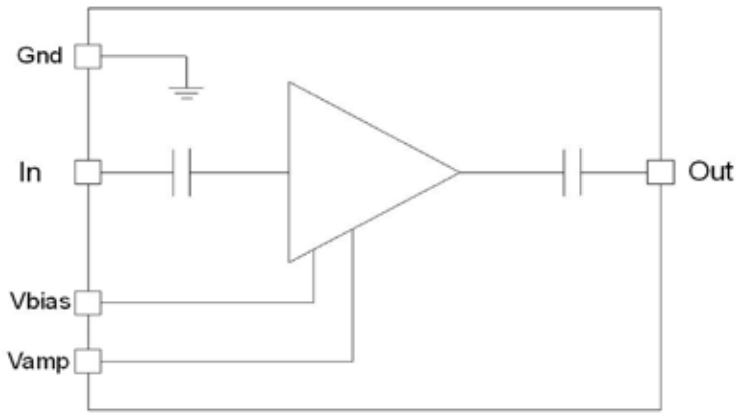
Output response

Measured using Agilent 86100B with two 50 GHz

8348A channels module, and without precision time-base module

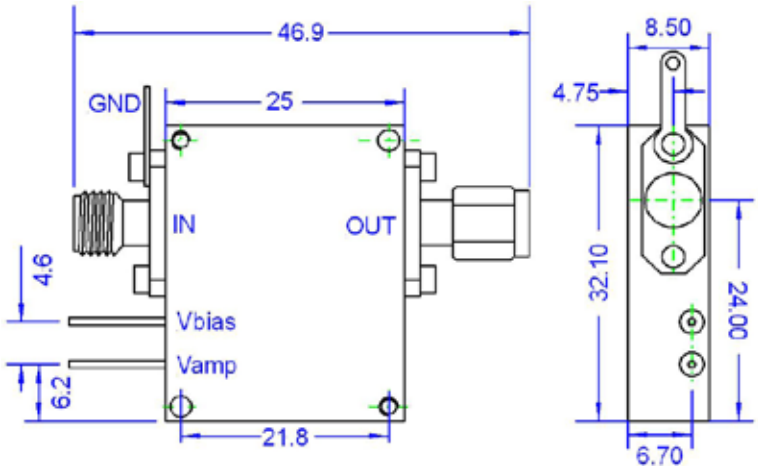
Eye amplitude = 6.18 V_{pp}, Rise time = 24 ps

Electrical Schematic Diagram



Mechanical Diagram and Pinout

All measurements in mm

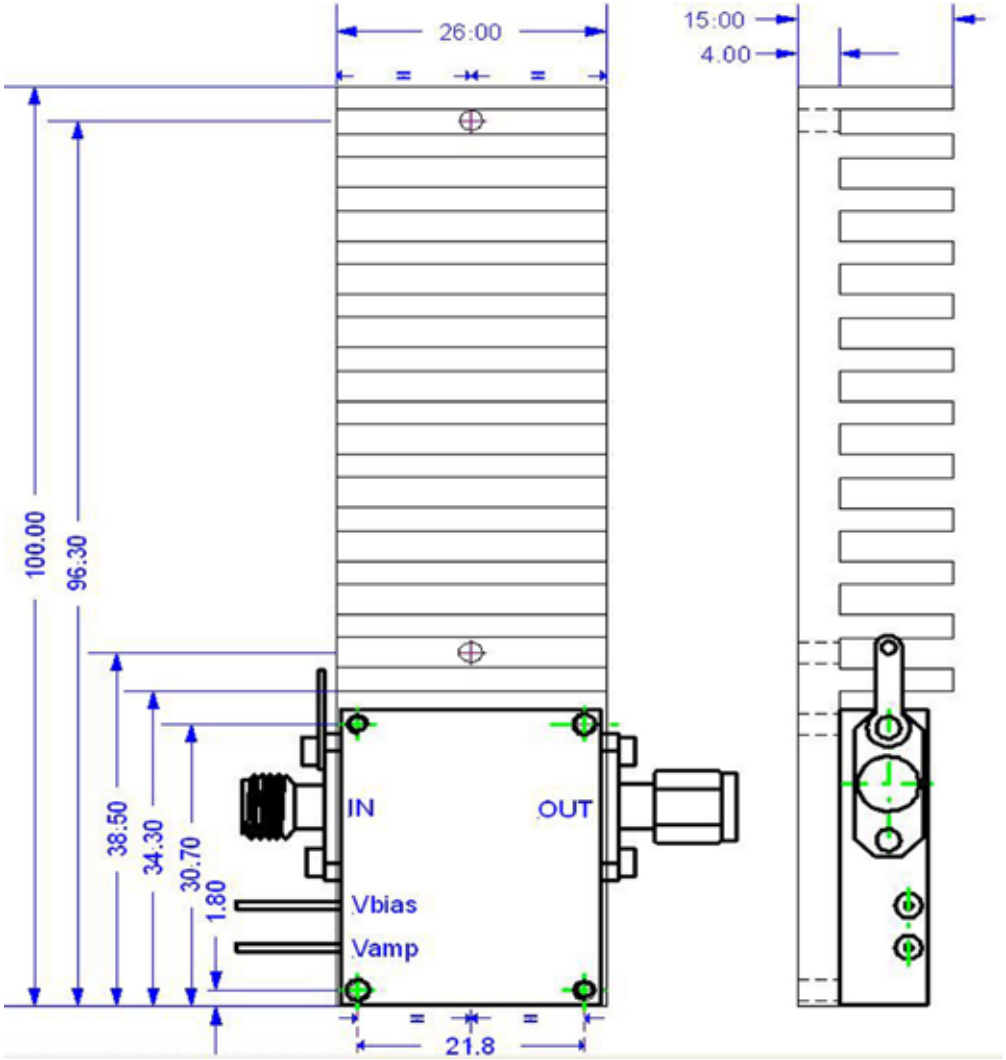


The heatsinking of the module is necessary. It's user responsability to use an adequate heatsink. Refer to page 6 for Photline Technologies recommended heatsink.

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

Mechanical Diagram and Pinout with HS-MO1 Heatsink

All measurements in mm



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ABOUT US

Photline Technologies is a provider of Fiber Optics Modulation Solutions based on the company LiNb03 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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