

PCO-7120 PULSED LASER DIODE DRIVER MODULE



- Compact, Economical OEM Module
- 5A To 50A Output
- <9ns Rise Time
- Variable Pulse Width From 12ns to >1 μ s
- Repetition Frequency To 1MHz
- Diodes May Be Mounted Directly On The PCO-7120, Eliminating The Need For Interconnect Cables Or Striplines
- Pulsed Current Monitor Output

The PCO-7120 is a compact, economical OEM laser diode driver module designed to provide extremely fast, high current pulses to drive laser diodes in range finder, LIDAR, atmospheric communications and other applications requiring high current, nanosecond pulses. It offers variable output current from 5A to 50A, with continuously variable pulse widths from 12ns to >1 μ s and frequencies up to 1MHz.

Mounting pads are provided to mount the laser diode directly to the driver, eliminating the need for interconnect cables or striplines. The four-hole mounting pattern accepts TO-18, TO-5, TO-52, 5.6MM, and 9MM packages, as well as other packages of similar dimensions and lead spacing, mounted perpendicular to the driver circuit board. To facilitate different packages and mounting preferences, there are two solder pads on the end of the board to accept various laser diode packages mounted on axis to the driver. Furthermore, the diode can be connected remotely from the driver using a low-impedance stripline interconnection between the mounting pads and the leads of the laser diode.

A current monitor output may be viewed with an oscilloscope, providing a straight-forward means to observe the diode current waveform in real-time.

The PCO-7120 driver provides high-speed performance, variable pulse width, current and frequency, a robust design, flexible mounting configurations and the ability to drive a wide range of laser diodes in a small package. These features provide the user with an economical OEM module with the flexibility to be readily designed into a wide range of products.

Technical Overview

The PCO-7120 uses an IXYS-RF DE-150 Series MOSFET driven with an IXYS-RF IXDD415SI high speed gate drive IC as the main switching element. Unlike avalanche transistor drivers, the power MOSFET of the PCO-7120 is not operated in breakdown, but instead is controlled via its gate with a high-speed gate drive circuit. This design provides a high degree of reliability, excellent switching performance, variable pulse width and superior amplitude and temporal stability over a broad operating temperature range.

The driver requires three user-supplied inputs: A TTL gate in-

put, +15VDC support power, and a high voltage DC input (+100V maximum). The output pulse follows the input gate in width and frequency. The output current depends upon the available charge of the driver's energy storage network. This charge is directly proportional to the voltage by the high voltage DC power supply. Therefore the output current amplitude of the PCO-7120 is controlled by varying the input high voltage amplitude. The output current can be varied over a large range with little variation in pulse width.

To minimize cost, the driver is designed so that the laser diode is floating on the voltage of the drain of the output transistor. **The diode must be electrically isolated from earth (chassis) ground.** The cathode (-) connects to "NEG" terminal of D3, and the anode (+) connects to the "POS" terminal of D3. The diode can be connected remotely using a low-impedance stripline interconnection between the mounting pads and the leads of the laser diode.

High speed clamp diodes are incorporated into the output network to protect the laser diode against reverse voltage conditions.

The driver is supplied mounted on a 1/4" aluminum heat spreader to provide the cooling needed for the switching transistor, and to simplify mounting or installation of the driver.

Ordering Information:

- The PCO-7120 is provided on an aluminum heat spreader. Mating input connector (2 x 12 housing) is supplied with the driver.
- PCO-7120 is sold without the laser diode. Laser diode is shown in product photo for illustrative purposes only.

Optional Accessories:

- PCA-9145: 36" Current Monitor Connector to BNC Male Coaxial Cable to connect current monitor to an oscilloscope.
- PCA-9245 36" BNC Male to SMB Plug Coaxial Cable For Gate Input.
- 1820-0030 Low-Impedance Stripline to remotely connect PCO-7120 to the laser diode.



**DIRECTED
ENERGY
INCORPORATED**

SPECIFICATIONS

PARAMETER

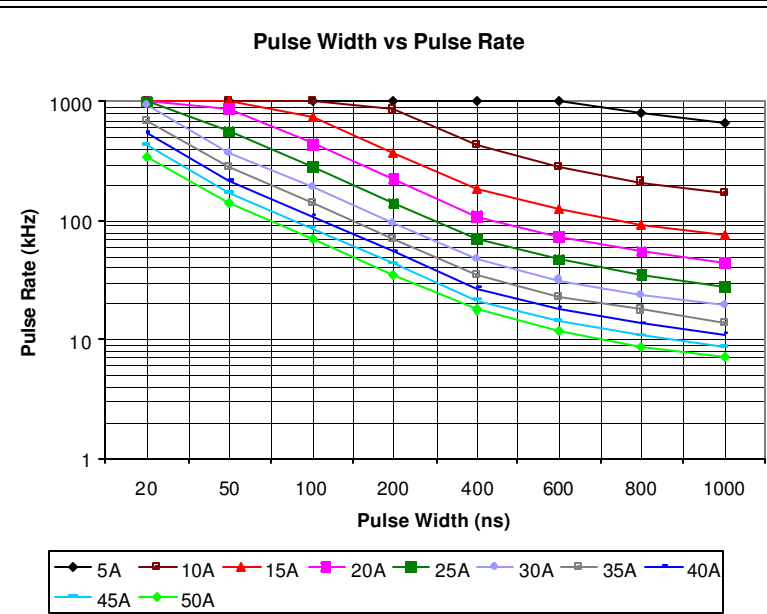
Output Current	5A to 50A, controlled by input high voltage amplitude
Minimum Pulse Width (Typical)	12ns (12E-9S)
Maximum Pulse Width with 5% Pulse Droop	1 μ s (1E-6S) @ 50A, 10 μ s (10E-6S) @ 5A
Pulse Rise Time (10% to 90%) (Typical)	8ns (8E-9S)
PRF (Pulse Recurrence Frequency)	Single Shot to 1MHz, limited by maximum average current, controlled by input gate frequency (see table and graph below)
Gate (Trigger) In	+5V into 50 Ω , Output pulse width and freq. follow input gate width and freq.
Support Power	+12VDC to +15VDC at 60mA typical
DC HV Input	5V to 100V, Output current amplitude controlled by input DC voltage amplitude
Throughput (Propagation) Delay	<40ns, typically 36ns

MECHANICAL

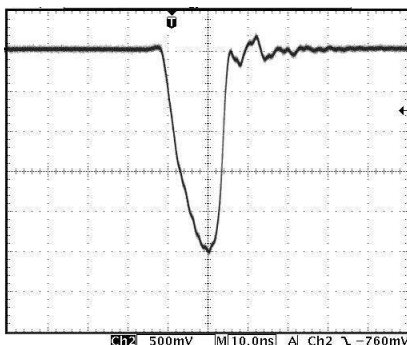
Size	Driver Only: 51mm (2.00") W x 82.5mm (3.25") L x 13mm (0.51") H Driver and Heatsink: 51mm (2.00") W x 103mm (4.06") L x 19.3mm (0.76") H
Weight	Driver Only: 35g (1.22oz) Driver and Heatsink: 128g (4.5oz)
Operating Temperature	-20C to +55C

ALL SPECIFICATIONS MEASURED INTO A SHORTED OUTPUT.

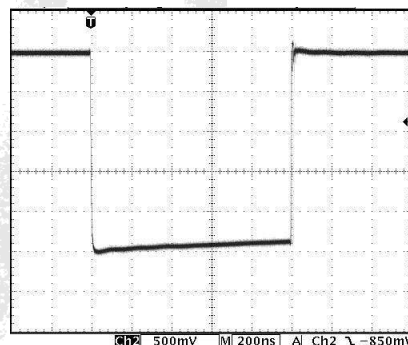
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



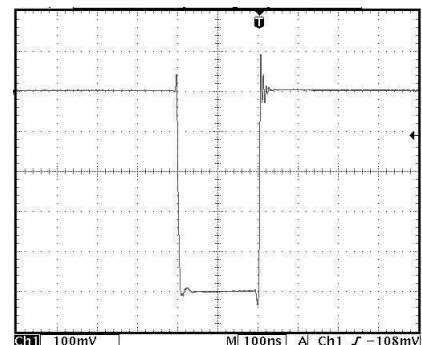
Output Current (A)	Maximum Duty Cycle	Typical DC HV Input (VDC)
5	0.65	10
10	0.17	18
15	0.075	26
20	0.045	34
25	0.028	42
30	0.019	51
40	0.011	70
50	0.007	92



12ns Pulse Width, 50A Output



1us Pulse Width, 50A Output



200ns Pulse Width, 10A Output



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