

## PCO-7110 PULSED LASER DIODE DRIVER MODULE



- Compact, Economical OEM Module
- 4A To 120A Output
- 4ns To 65ns Pulse Width
- Repetition Frequency Single-Shot To 50KHz
- Diodes May Be Mounted Directly On The PCO-7110, Eliminating The Need For Interconnect Cables Or Striplines
- Pulsed Current Monitor Output

The PCO-7110 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.

Six standard models are offered in the PCO-7110 product line, providing pulse currents ranging from 4A to 120A, and pulse widths from 4 nanoseconds to 65 nanoseconds, at frequencies as high as 50KHz. Custom pulse width and output current configurations are available for OEM applications – contact DEI for more information.

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 (EG&G Optoelectronics R, S, T and U 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-7110 driver provides high-speed performance, 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-7110 uses MOSFET transistors as the main switching element. Unlike avalanche transistor drivers, neither the power MOSFET or the gate drive transistor of the PCO-7110 are operated in breakdown, but instead are controlled via their gates. This design provides a high degree of reliability, excellent switching performance, and superior amplitude and temporal stability over a broad operating temperature range.

The driver requires three inputs: A TTL trigger, +15VDC support power, and a high voltage DC input (+195V or +495V maximum, depending upon the driver model). The output current depends upon the available charge of the driver's pulse forming network. This charge is directly proportional to the applied voltage. Therefore it is possible to vary the output of the PCO-7110 by varying the input high voltage amplitude. The output current can be varied over a large range with little variation in pulse width.

Protection circuitry is designed into the PCO-7110 to protect the driver against excessively long input trigger signals and support power supply transients and over-voltage conditions. Additionally, high speed clamp diodes are incorporated into the output network to protect the laser diode against reverse voltage conditions.



**DIRECTED  
ENERGY  
INCORPORATED**

**SPECIFICATIONS**

<b>PCO-7110 MODEL</b>	<b>40-4</b>	<b>50-15</b>	<b>90-30</b>	<b>100-7</b>	<b>120-15</b>	<b>45-65</b>
Pulse Output Current Range (Controlled by input high voltage amplitude)	4A to 40A	5A to 50A	5A to 90A*	5A to 100A*	5A to 120A*	4A to 45A
Maximum DC Input Voltage	+195V		+400V	+495V		
Pulse Width (FWHM at maximum output current)	4ns ±1ns	15ns ±2ns	30ns ±3ns	7ns ±1ns	15ns ±2ns	65ns ±3ns
Rise Time (10% - 90%, Typical)	<2ns	2.5ns	<3ns	2.5ns	2.5ns	35ns
Maximum PRF (Pulse Recurrence Frequency), CW at maximum output current, controlled by input trigger jitter (1st Sigma)	50KHZ	11KHz	1KHz	5KHz**	2KHz	1.5KHz
Throughput Delay (Delay from input trigger to output pulse)	33ns Typical					55ns Typ.
Maximum Overshoot at maximum output current	4%					
Output Current Monitor	10A/V into 50 Ohms					
Trigger In	+5V/50Ω, 50-100ns pulse width					
Support Power	+15V at 2mA					

**MECHANICAL**

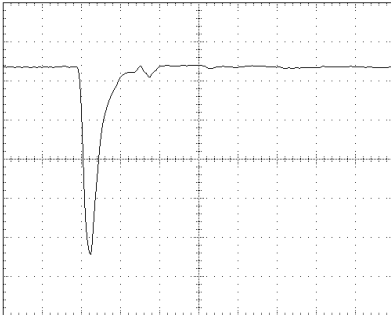
Length	2.45 in. (62.2mm)					
Width	1.0 in. (25.4mm)					
Height	0.3 in. (7.5mm)					0.5 in. (12.7mm)
Weight (Approximate)	10 grams	12 grams			14 grams	
Operating Temperature	-20°C to+85°C					

ALL SPECIFICATIONS MEASURED INTO A SHORTED OUTPUT AND MEASURED WITH THE INTERNAL CURRENT MONITOR

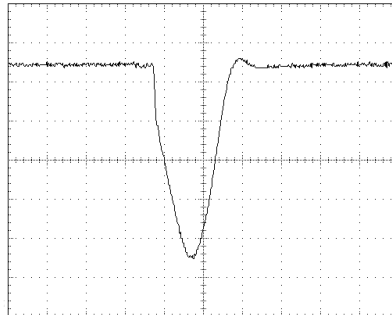
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE • LASER DIODE NOT INCLUDED

\* Maximum output current must be derated by 15% at operating temperatures above 60°C

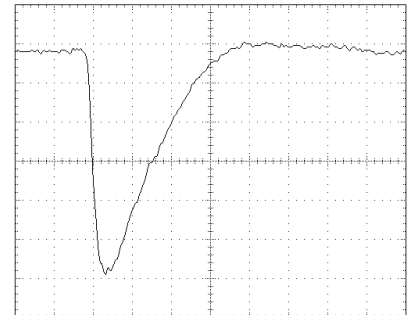
\*\* Maximum current must be limited to 90A at frequencies above 2.5KHz.



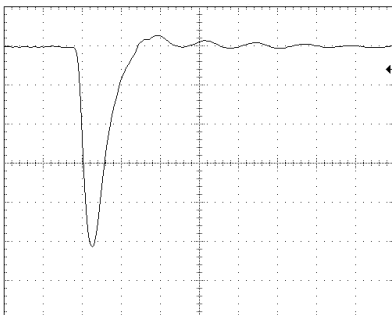
**Model 40-4 Typical Output Waveform**  
4ns Pulse Width, 45A Output  
(10ns/Div horizontal scale, 10A/Div vertical scale)



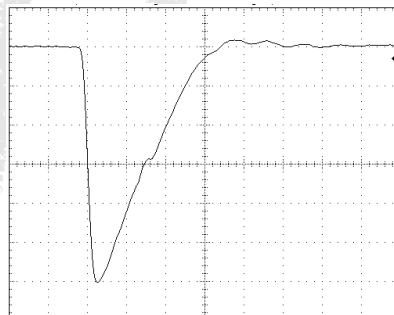
**Model 45-65 Typical Output Waveform**  
65ns Pulse Width, 48A Output  
(50ns/Div horizontal scale, 10A/Div vertical scale)



**Model 50-15 Typical Output Waveform**  
15ns Pulse Width, 56A Output  
(10ns/Div horizontal scale, 10A/Div vertical scale)



**Model 100-6 Typical Output Waveform**  
6ns Pulse Width, 102A Output  
(10ns/Div horizontal scale, 20A/Div vertical scale)



**Model 120-15 Typical Output Waveform**  
15ns Pulse Width, 120A Output  
(10ns/Div horizontal scale, 20A/Div vertical scale)

**Optional Accessories:**

- PCA-9210 Connector Kit  
Mating connectors for signal and power inputs and current monitor
- PCA-9140 Current Monitor Cable Assembly  
50 Ohm cable with connectors to connect current monitor to an oscilloscope, 3 feet in length
- 1820-0030 Low-Impedance Stripline  
To remotely connect PCO-7110 to the laser diode



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