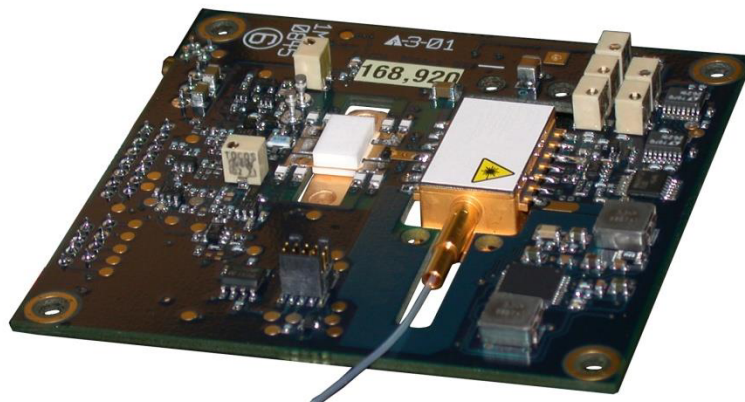


OEM Seed Laser Diode Driver Assembly

- OUTPUT CURRENT UP TO 2.5 AMPS
- OUTPUT PULSEWIDTH 20 ns TO CW
- COMPLIANCE VOLTAGE TO 10.0 V
- ON-BOARD PULSE GENERATOR
- DIGITAL OR ANALOG CONTROL
- +5 VDC INPUT POWER
- RoHS COMPLIANT



DESCRIPTION:

AMI's Model 762 OEM programmable seed laser diode drivers are ideal for driving 14-pin butterfly packaged laser diode modules for use in CW or pulsed fiber MOPA systems. Applications include materials processing, LIDAR systems for remote sensing, laser communication and rangefinding.

SPECIFICATION:

	762			762-EXT			
PARAMETER	Min.	Typical	Max.	Min.	Typical	Max.	Units
INPUT							
Power (Driver and TEC)	4.75	5.0	5.25	4.75	5.0	5.25	VDC
Current (Driver and TEC)	-	0.330	3.5	-	0.330	3.5	A
Power (Laser)	3.0	5.0	12	3.0	5.0	12	VDC
Current (Laser) (Laser dependent)	-	-	2.5	-	-	2.5	A
Control Voltage (50 Ω Impedance)	-	N/A	-	0	-	2.5	V
OUTPUT							
Current	0.1	-	2.5	0.1	-	2.5	A
Compliance Voltage	-	2.0	10.0	-	2.0	10.0	V
Pulsewidth	20	-	CW	20	-	CW	ns
Repetition Rate	Single Shot	-	10	Single Shot	-	10	MHz
Duty Cycle	0	-	100	0	-	100	%
Risetime (Optical) @ 2 A	-	10	15	-	10	15	ns
Falltime (Optical) @ 2 A	-	10	-	-	10	-	ns
Analog Back Facet Monitor	0	-	3.7	0	-	3.7	V
TEC Voltage	0	-	4.2	0	-	4.2	V
TEC Current	0	-	3.0	0	-	3.0	A

*Faster risetimes, shorter pulse widths, higher voltage, and CW operation possible under certain operating conditions (consult factory).

Specifications are subject to change without notice.



APPLICATIONS:

Seeding Fiber Lasers, Remote Fiber Optic Sensing, Laser Communication

PROTECTION:	Adjustable current limit
	Driver disabled when laser temperature exceeds temp window
CONNECTIONS:	
Back Facet Monitor:	Micro Coax Connector (<i>Amphenol 908-24100</i>)
Power:	3 pin Terminal Block (<i>Molex 0393570003</i>)
Interface:	8 & 14 Pin AMP MicroMatch Connectors (<i>7-215460-8 & 8-215460-4</i>)
TEMPERATURE:	
Operating:	0°C to +50°C
Storage:	-20°C to +70°C
SIZE:	2.9" x 3.00" x 0.5"
DIGITAL CONTROL:	Asynchronous (9600bps, 8nl serial) protocol or I ² C slave protocol (100 or 400 kHz). All logic inputs are TTL, 5 V CMOS compatible. Digital outputs are pulled up to +5 V internally with 4.75 kΩ except AMP SYNC1/AMP SYNC 2 pulled up to +5 V with 300 Ω.
THERMAL:	On-board TEC Controller will provide heating and cooling as necessary to maintain desired operating point. Thermistor and the TE cooler are in the laser diode package (not included). Customer may need to provide thermal mass for heatsinking under high dissipation conditions.

OPERATING NOTES:

The driver circuitry operates from a single +5 V power source. Additional voltages are generated on the board by high efficiency switching power supplies. The laser power input may be operated down to +3 V to conserve power at the expense of switching speed. Input laser power may also be increased up to +12 V to enhance switching speed for high inductance lasers. For most applications laser power may be tied to the driver +5 V supply, or through an external switch as an additional safety interlock.

An on-board field programmable gate array (FPGA) is programmed to handle communications, to modify adjustable features, and to provide external flags and signals to a host system. The FPGA also contains a comprehensive pulse generation system with many programmable features. Adjustments can also be made through analog operation by the use of multi-turn potentiometers and providing an external TTL trigger pulse so a serial interface is not required. A graphical user interface (GUI) program is included for easy control and programming from a PC. The driver supplies a bidirectional proportional-integral-derivative (PID) thermoelectric cooler (TEC) controller with current capability of 3 A and voltage capability of 4.2 V.

The 762-EXT is offered for those who require agile control of the laser current, want to modulate the current or drive the laser with arbitrary waveforms, pulses with variable rise/fall times or modified pulse flatness. An external control voltage with a calibration of 1 A/V is required for this mode of operation and the potentiometer and digital control of the laser current are disabled.

The board is manufactured as a RoHS compliant assembly built to the Directive 2002/95/EC requirements. A heatsink adapter plate to mount to an external heatsink and all required mating cables are supplied with each unit. Contact AML today to discuss your custom requirements.

14-pin Connector (J7)

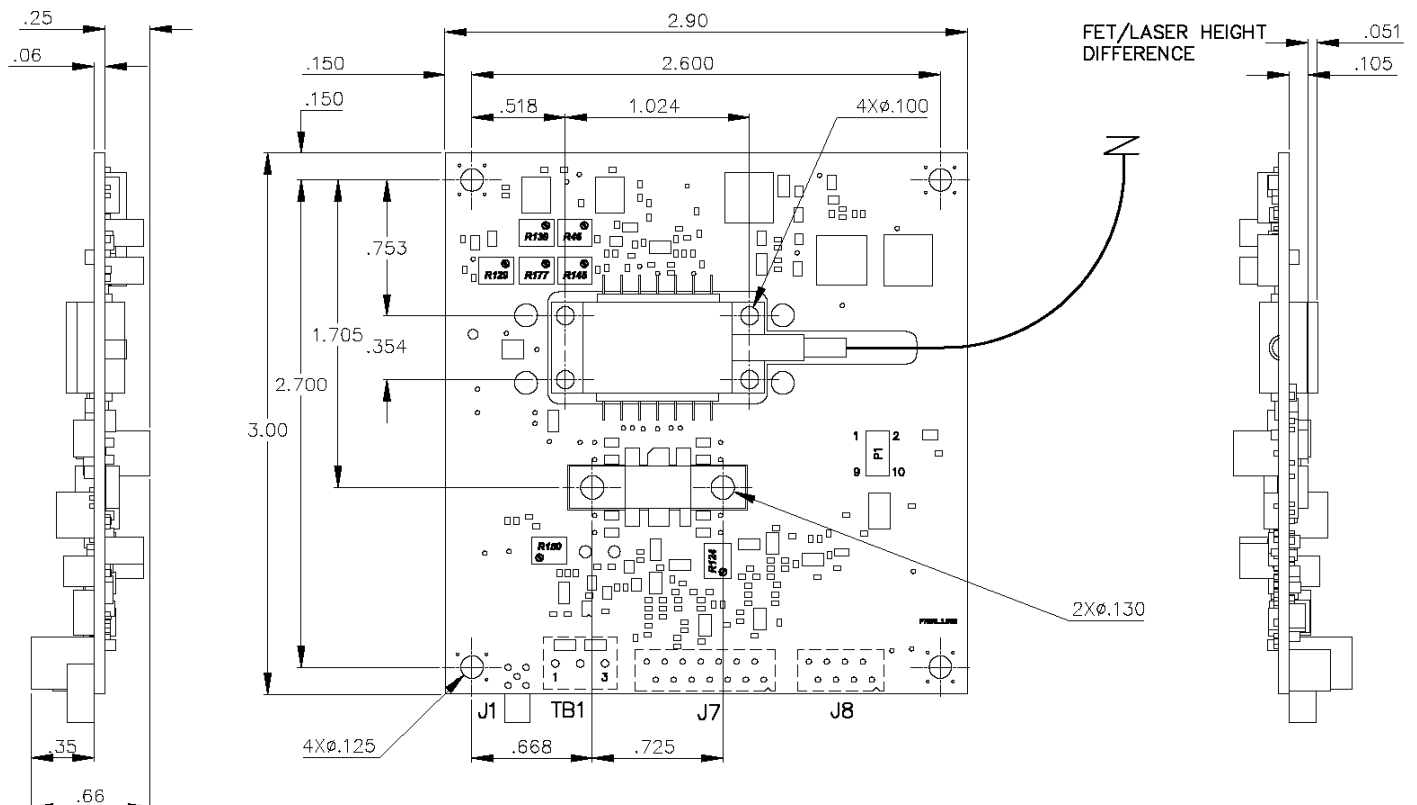
Pin	Signal
1	<u>ENABLE</u>
2	GND
3	CONTROL VOLTAGE
4	MONITOR GAIN MSB
5	MONITOR GAIN LSB
6	GND
7	TRIG/PW
8	GND
9	<u>TRIG/PW</u>
10	GND
11	I ² C CLK/ASSYNC TX
12	I ² C DATA/ASSYNC RX
13	GND
14	SERIAL SEL.

8-pin Connector (J8)

Pin	Signal
1	<u>CURRENT FAULT</u>
2	<u>TEMP. FAULT</u>
3	GND
4	LASER FIRE OUT
5	GND
6	AMP SYNC1
7	GND
8	AMP SYNC2

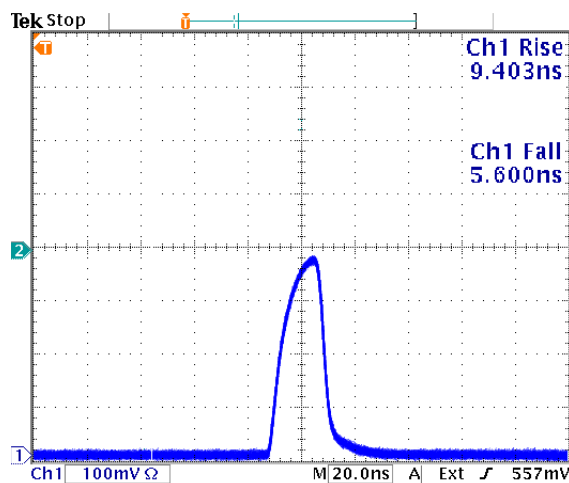
**14-Pin Butterfly Package Interface
(Customer-supplied)**

Pin	Connection
1	TEC Cooler (+)
2	Thermistor
3	Back facet monitor anode (+)
4	Back facet monitor cathode (-)
5	Thermistor
6	N/C
7	N/C
8	N/C
9	N/C
10	Laser diode anode (+)
11	Laser diode cathode (-)
12	N/C
13	Case ground
14	TEC cooler (-)

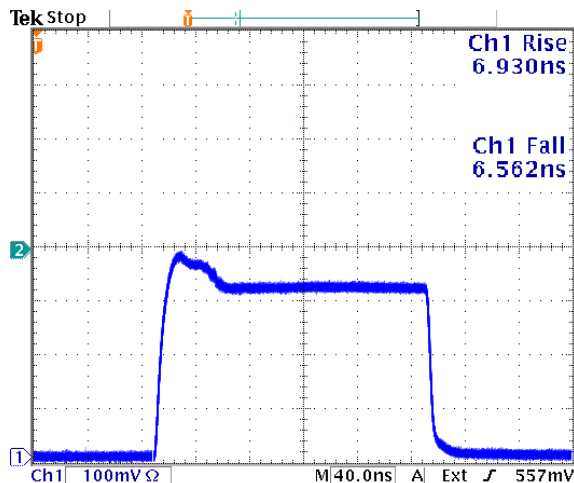


Sample Optical Output Waveforms

Data taken with 3S Photonics Model 1064CHP

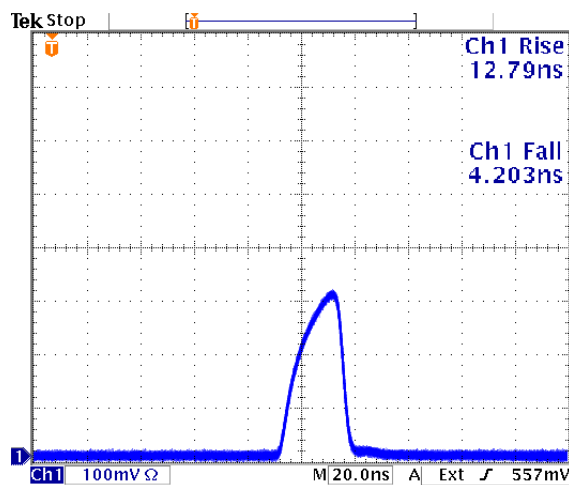


20 ns Pulse Width, 2 A Drive Current, 1 kHz Frequency

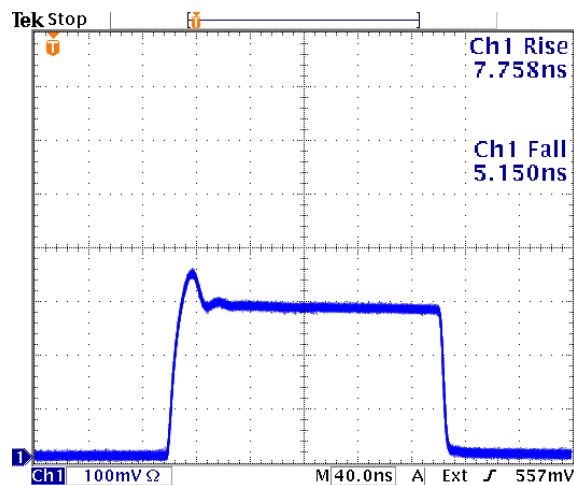


200 ns Pulse width, 2 A Drive Current, 1 kHz Frequency

Data taken with Oclaro Model LC96A1060-20R

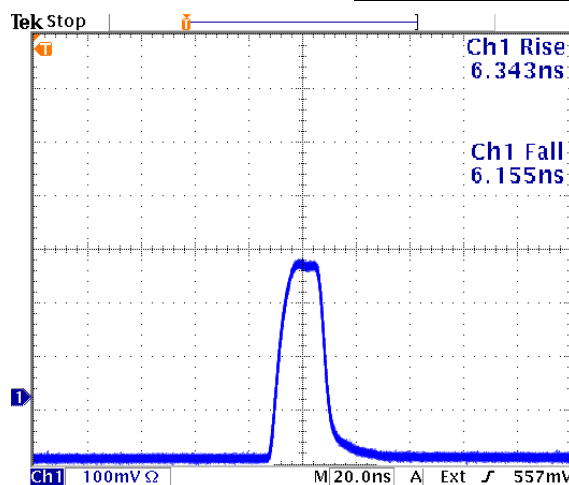


20 ns Pulsewidth, 2 A Drive Current, 1 kHz Frequency

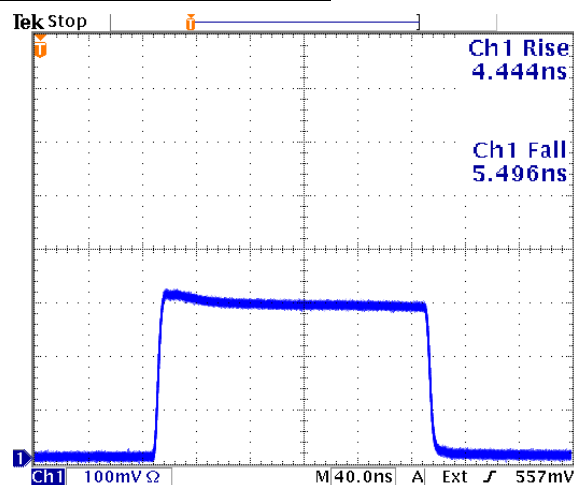


200 ns Pulsewidth, 2 A Drive Current, 1 kHz Frequency

Effects of increased laser voltage on output



3S Photonics, 20 ns Pulsewidth, 2 A Drive Current, 1 kHz Frequency, 6 V Laser Voltage



Oclaro, 200 ns Pulsewidth, 2 A Drive Current, 1 kHz Frequency, 12 V Laser Voltage

Included Graphical User Interface Program

762 / 762-EXT - Seed Laser Diode Driver - 7707 - Revision B

Communication Options

9600-8-N-1 **COM1** **Open Async.**

I2C Address: **0x50** **400 kHz** **Open I2C**

762 Device Information

Connected: No
Serial Num: Not Connected
FW Build: Not Connected
Signature: Not Connected

I2C Address: **Set**

Memory Control

Load from EEPROM **Write SRAM** Bank Num. **1**

Save to EEPROM **Read SRAM**

Enable

Ext. HW Control ☐ Int. Mem. Control **Set**

Enable ☐ Disable **Set**

Serial Select

Ext. HW Control ☐ Int. Mem. Control **Set**

I2C ☐ Asynchronous **Set**

Monitor Gain

Ext. HW Control ☐ Int. Mem. Control **Set**

☐ 11 ☐ 10 ☐ 01 ☐ 00 **Set**

Manual Command

1 2 3 **Send** **Clear**

1: Command (W, R, L, S, T, B)
2: Command Dependent
3: Command Dependent

Pulse Enable

☐ Trigger / PW
☐ Amp. Sync 1
☐ Amp. Sync 2 **Set**

Adjustable Parameters - Digital to Analog Converter Values

EN	Min	Value	Max	Description
1 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set Laser Fire Threshold (mA)
2 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set TEC Maximum Current (A)
3 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set TEC Maximum Voltage (V)
4 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set TEC Set Point Temp. (C)
5 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set Laser Diode Current (A)
6 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set Current Limit (A)
7 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set Laser Diode Bias Curr. (mA)
8 <input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Set Test Point E7 - NC (V)

☐ Enable All DACs **Set All** All DACs (Simultaneously)
☐ Show Raw Values

Trigger Configuration and Options

☐ Follow External Trigger PW: **0/8** x10ns. **Set**

☐ Use External Trigger Trigger Delay: x10ns. **Set**

☐ Use Ext. Trigger as Gate Trigger Period: x10ns. **Set**

☐ Use Ext. Trigger as Sync

☐ Int. Pulse Generator **Set**

Amp. Sync 1 Options

Pulsewidth: **0/8** x10ns. **Set**

Set Delay: x10ns. **Set**

Amp. Sync 2 Options

Pulsewidth: **0/8** x10ns. **Set**

Set Delay: x10ns. **Set**

TEC Shutdown

Always Operating ☐ Int. Mem. Control **Set**

Operating ☐ Shutdown **Set**

Status

☐ 762 Enable (Low)
☐ 762 Ready
☐ DAC Ready
☐ EEPROM Ready
☐ Temp Fault (Low)
☐ Current Fault (Low)
☐ TEC Shutdown
☐ 762 Error
☐ Int. Memory Error
☐ DAC Error
☐ EEPROM Error

☐ Bank Number **Get Status**

Base
☐ Hexadecimal (F5)
☒ Decimal (F6)

Build 1.2.2.36