

10A High Efficiency Laser Controller ATLD10A5-D

Evaluation Board Rev. 1.0

By Gang Liu

Introduction

The ATLD10A5-D is an electronic module designed for driving high current diode lasers with well controlled output current and laser power or voltage. Its efficiency is so high that no heat sink is needed even outputting a 10A current. The output voltage range is from 0V to 14.25V when powered by a 15V power supply. This laser driver module can be evaluated conveniently by using the ATLD10A5-D EV1.0, the Evaluation Board for ATLD10A5-D Revision 1.0. It is recommended to read this application note with the ATLD10A5 datasheet which provides more detail information about the specifications and application guidance for the laser driver module.

The main purpose of using the evaluation board is to let the controller drive an unbreakable power resistors load (It isn't in evaluation board ATLD10A5-D EV1.0, and need to provide additional.) to emulate users' actual expensive laser diode with constant current mode and constant power or constant voltage mode. After making sure the controller works properly and all the features and the set-values meet the requirements of the application. The user will be able to set and monitor the output current, read the controller's temperature, monitor the working status of the controller, etc.

Board Description

The ATLD10A5-DEV1.0 Evaluation Board is consisted of a polished application circuit for driving a laser diode. It can set the output current and voltage, the output current and voltage limit, and has three LEDs for indicating the working status of the controller, has numerous connection pads, terminal connectors and banana sockets for making connections with external components and instruments.

The silkscreen layer of the evaluation board is shown in Figure 1 with other top layers, including top silkscreen, top copper, top solder mask, and multilayer (vias). Figure 2 only shows the image of top silkscreen layer. There is no component in the bottom side of the board, so that there is no bottom silkscreen layer image.

There are solder pads on the left, top and the right edges of the board. These pads can be used for connecting the external instruments or components with and the connections can be made by either soldering wires or clipping by alligator clips.

There are 4 terminal blocks also located on the left, top and the right side of the board, their connectors are for the same nodes of the solder pads. See the silkscreen image in Figure 2.

There are 4 banana sockets located on the top and the right side of the board, their connectors are for the same nodes of the terminal blocks TB2 and TB4. See Figure 1.

On the bottom left location of the board, there is a shut down control switch S1, and on the bottom right location of the board, there is a working mode control switch S2. The 4 potentiometers are located on the right side the switch S1 and on the left the switch S2. See the silkscreen image in Figure 2.

In the four corners of the board, there are 4 copper cylinders for supporting the evaluation board. Please notice that the only copper cylinder in the upper right corner of the board is float, and the others are connected to ground.

When the controller works perfectly, the LEDs on the top left location will be lit up.

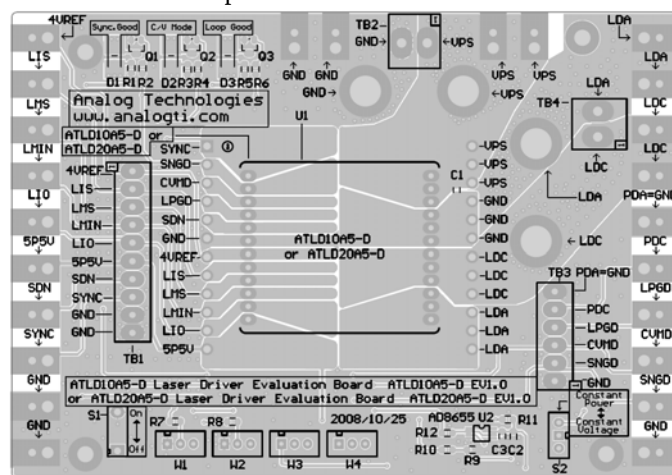


Figure 1 Top Silkscreen Layer with Other Top Layers

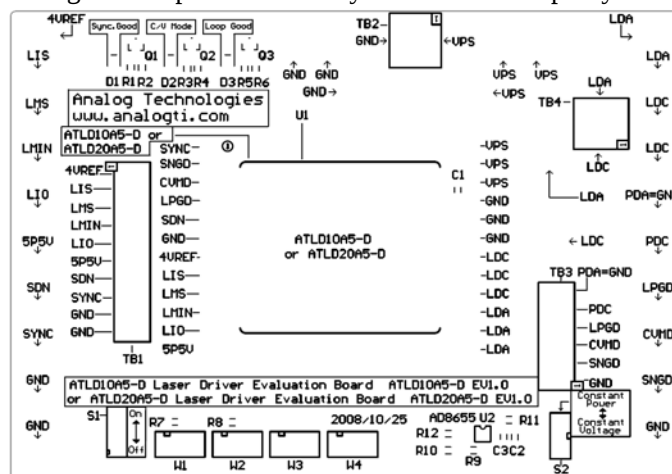


Figure 2 Top Silkscreen

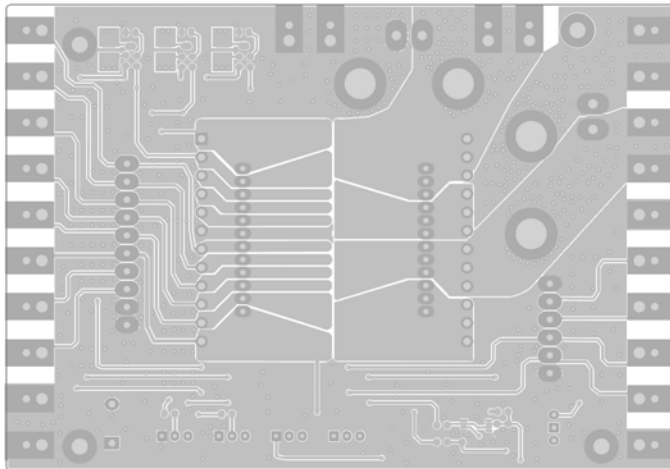


Figure 3 Top Layers without Top Screen Layer

Figure 3 shows the top layers without the silkscreen layer. Figure 4 below shows the bottom layers, including bottom copper, bottom solder mask, and multilayer (vias). Please notice that this is a “see through” image from the top side.

Figures 3 and 4 can be used as a layout reference for designing a system using the ATLD10A5-D in the system. These are the main points:

1. Connect the power supply return node directly to the power ground pins of the controller before connecting it to any other points. For thermal management purpose, the returned node was not done in this way on the evaluation board.
2. Use as large copper area as possible for the PCB traces of the solder pads of all the pins so that these copper areas become heat-sinks and help dissipating the heat generated by the controller.
3. Use as wide and thick copper area as possible for the PCB traces of power supply nets(VPS, Power ground) and laser diode output nets(LDA, LDC) so that these copper areas become high current wires and help transferring 10A and up current.

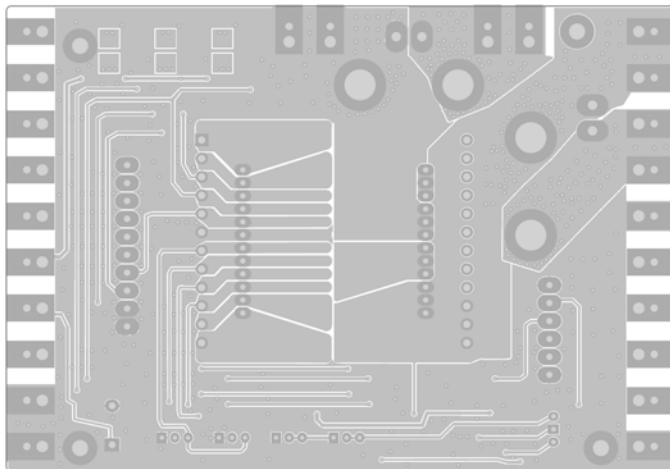


Figure 4 Bottom Layers

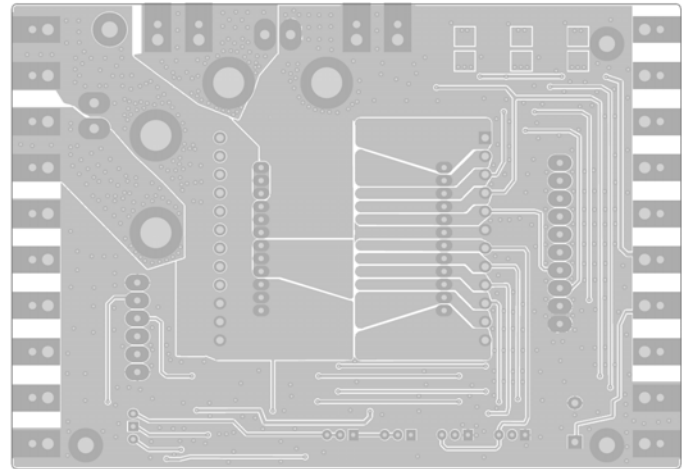


Figure 5 Mirrored Bottom Layers

Figure 5 shows the mirrored bottom layers which is a directly-seen image from the bottom side.

Figure 6 shows ATLD10A5-D EV1.0 Photo.

The ATLD10A5-D laser controller module is located in the center of the ATLD10A5-D EV1.0 Evaluation Board. The voltages of all its pins can be measured directly by probing the vias on the left and right side of the module sockets which are connected directly with pins of the electronic module. Some of the pins are also connected to the connectors of the 4 terminal blocks, the soldering pads, and/or 4 banana sockets on the edges of the board. The names of all these nodes are marked on the board.

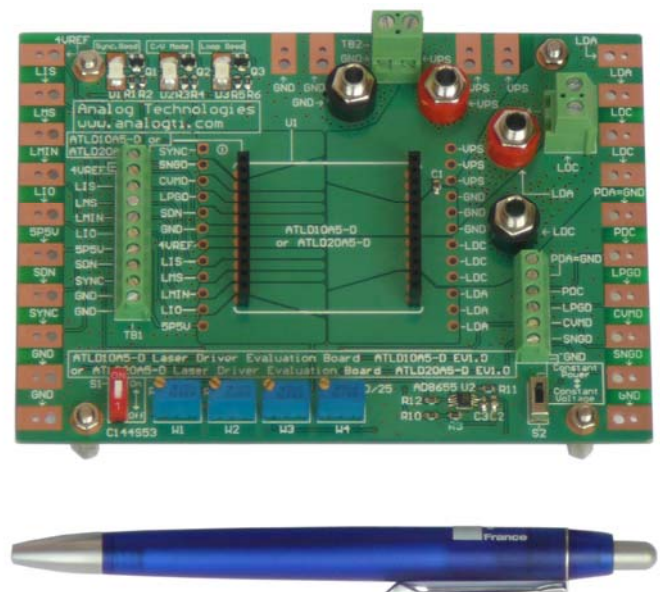


Figure 6 ATLD10A5-D EV1.0 Photo

The schematic is shown in Figure 7 below.

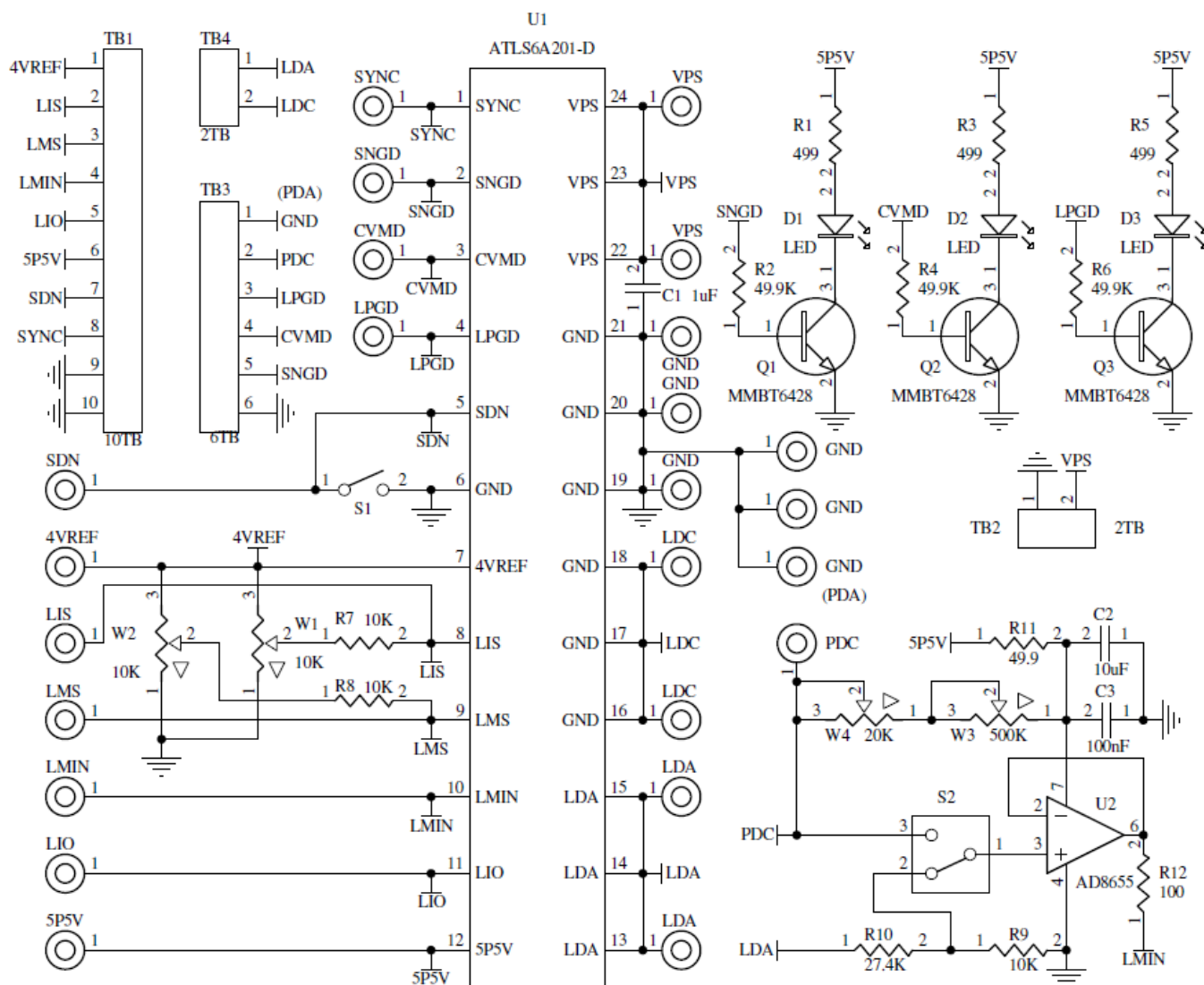


Figure 7 Schematic of Laser Driver ATLD10A5-D Evaluation Board Rev. 1.0

**Ordering Information**

Part Number	Description	1 – 9	10 – 49	≥50
ATLD10A5-D EV1.0	Laser controller ATLD10A5-D evaluation board Rev. 1.0	\$90	\$80	\$70

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