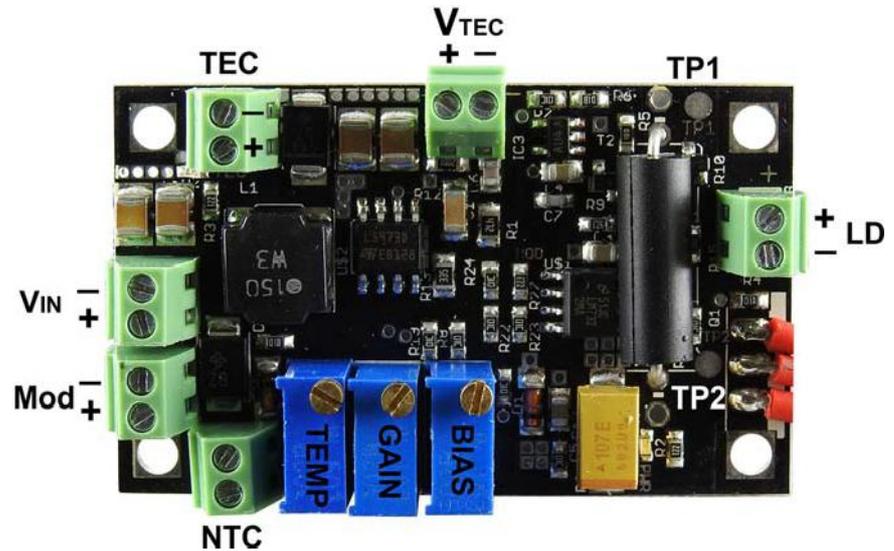


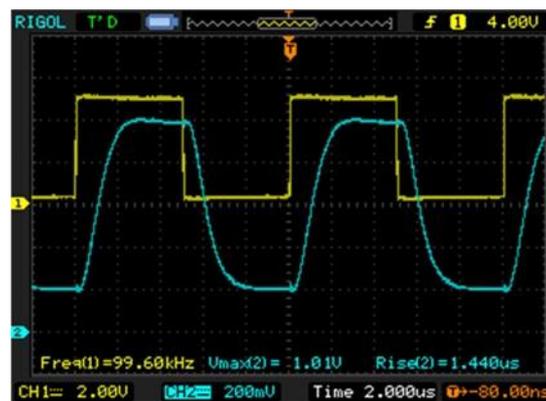
Datasheet

APS-LD-TEC-4500 Laser Diode Driver With TEC Controller



- High Drive Current
- Fast Modulation
- Precise TEC Control
- Wide Diode Range
- Small Size

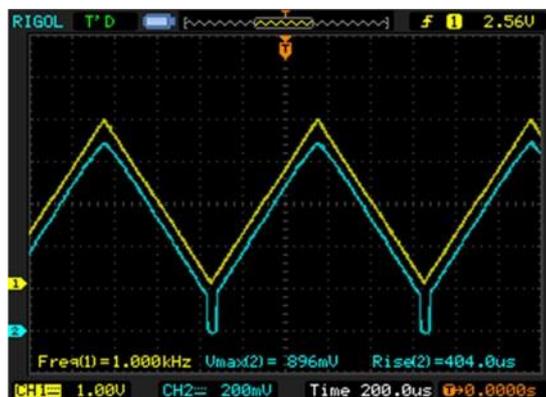
Modulation



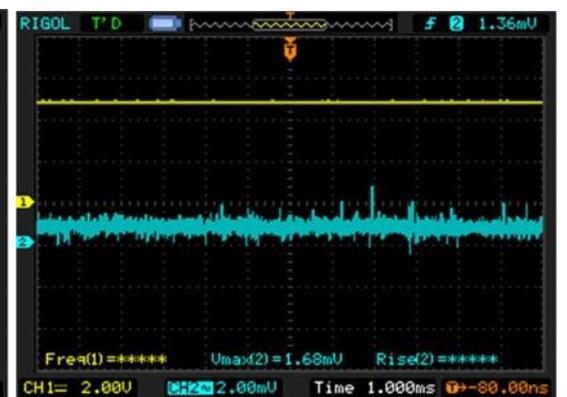
Rise Time



Linearity



Noise



Datasheet

APS-LD-TEC-4500

Laser Diode Driver With TEC Controller

- High Drive Current
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Setting the Laser Diode Driver

1. Set the potentiometers BIAS and GAIN by turning the screws counterclockwise (25 turns) to zero.
2. Connect the laser diode to the "LD" connector on the board.
3. Set the supply voltage to 5-24VDC. Choose a supply voltage ~2VDC above the forward voltage of the laser diode.
4. Connect the main power supply to the "Vin" connector.
5. Connect the modulation source to the connector "MOD".
6. Set the modulation voltage to 0.2 VDC.
7. Now you can set the BIAS (lower limit) current turning the screw of the BIAS potentiometer clockwise until the threshold current of the laser diode is reached and it starts to lase.
8. Set the modulation voltage to 5VDC.
9. Now you can set the GAIN (upper limit) current by turning the screw of the GAIN potentiometer clockwise until the max. working current is reached.
10. Set the modulation voltage again to 0.2-0.3VDC and check the BIAS current. If it has changed, turn the screw of the BIAS counterclockwise to the value you set in step 7.
11. Set the modulation voltage again to 5VDC and check the GAIN current. If it has changed, turn the screw of the GAIN clockwise to the value you set in step 9.
12. The laser diode driver is set now.

Laser Diode Current Measurement Procedure

The measurement of the laser diode current can be done by measuring the reference voltage at the points TP1 and TP2 above the shunt resistor while the laser diode is connected.

Measure the voltage at the points TP1 und TP2. The ratio between measured voltage and current is 0.2V/A or 1:5.

The current calculation formula is: $A = V(TP1, TP2) * 5$

Example:

The reading is 0.04V. By applying the formula above the current at the laser diode is: $A = 0.04 * 5 = 0.2A$ or 200mA.

Caution:

Connect the laser diode to the driver prior connecting the driver to the power supply. Otherwise the laser diode can get damaged due to the open circuit voltage. For working current of >300mA it is necessary to mount the driver on a heat sink.

Model	APS-LT-LDTEC-4500
Current LD /TEC (mA)	2500 / 2000
Supply Voltage (VDC)	5-24
Modulation (kHz Analog / kHz TT L)	500 / 250
Modulation Voltage (VDC)	0~5
Rise-Fall-Time (µs)	1.4
Noise (mV)	1.6
LD Controller Type	High Side
TEC Controller Type	Unidirectional
Temperature Controller Accuracy	0.1°C
Temperature Sensor	10k NTC
Size (mm)	30x50
Compliance	RoHS

Datasheet

APS-LD-TEC-4500

Laser Diode Driver With TEC Controller

- High Drive Current
- Fast Modulation
- Precise TEC Control
- Wide Diode Range
- Small Size

Setting the TEC Driver

1. Connect the power supply to V_{TEC} . Choose a power supply which voltage is as close as possible to the forward voltage of the TEC element.
2. Solder the included 10 foil NTC to the connecting cables. The polarity of the cables is irrelevant for the NTC.
3. Connect the soldered NTC to the connector "NTC" on the board.
4. The setting of the temperature is done by turning the screw of the potentiometer "TEMP".
5. To set the right temperature, please use the resistance values shown in the R/T table*.
6. Measure the resistance at the points "TEMP_{Sensor}" and set the resistance value shown in the R/T table. The testing points are two holes above the "GAIN" potentiometer.
7. The TEC driver is now set.

The TEC driver is activated when the set temperature is about to exceed.

The temperature is actively regulated. That means that the TEC power is adapted to the current temperature automatically. The current may vary during operation and change of temperature.

When the TEC is activated the red "TEC LED" lights up.

* The resistor values shown in the table are only valid for the included 10k foil NTC. If you want to use another 10k NTC you need to adapt the values. Multiply the resistance value of the new NTC at the temperature you want to set by 1,68. Then set the calculated value as done in step 5.

The distance between the laser diode, the NTC and the TEC needs to be chosen as short as possible.

Otherwise the driver will not be able to keep the temperature stable at the needed value and may oscillate.

R/T-Table

Temp °C	R _{POT} kOhm
10	33.6252
15	26.4886
20	21.0201
25	16.8000
30	13.5186