



- Supports MOT6550GC and MOT5550GC Series modules
- Very small size 72 x 51mm
- Standalone or host-controlled
- On-board dummy laser load
- Complete evaluation and verification solution



Introduction

The MOT605\_OEM is designed to allow the user to quickly evaluate and implement a laser diode design based on the MOT6550GC and MOT5550GC-series laser driver module families. The board contains all required components including the laser driver and is ready to be used in your system. on-board diodes can be used to simulate the load even if no laser is present.

It can be used standalone, utilizing on-board potentiometers to set output current/power. Connection points are provided which can be used for monitoring system parameters such as diode current and module temperature.

Various control signals are also accessible, including output current control voltage and reset/shutdown functions, making it viable to connect the OEM board to a host control system, further simplifying system development.

This User's Guide describes the various functions of the board, how to set it up and how to use it in your system.

**Please also refer to the appropriate Module datasheet for further description of the module functionality.**

Available Part #s:

Part #	Max. Output Current	Power Supply
MOT605_25GC_CC	250mA constant current GC laser driver OEM board	Single
MOT605_50GC_CC	500mA constant current GC laser driver OEM board	Single
MOT605_100GC_CC	1000mA constant current GC laser driver OEM board	Single
MOT605_25GC_CP	250mA dual mode GC laser driver OEM board	Single
MOT605_50GC_CP	500mA dual mode GC laser driver OEM board	Single
MOT605_100GC_CP	1000mA dual mode GC laser driver OEM board	Single



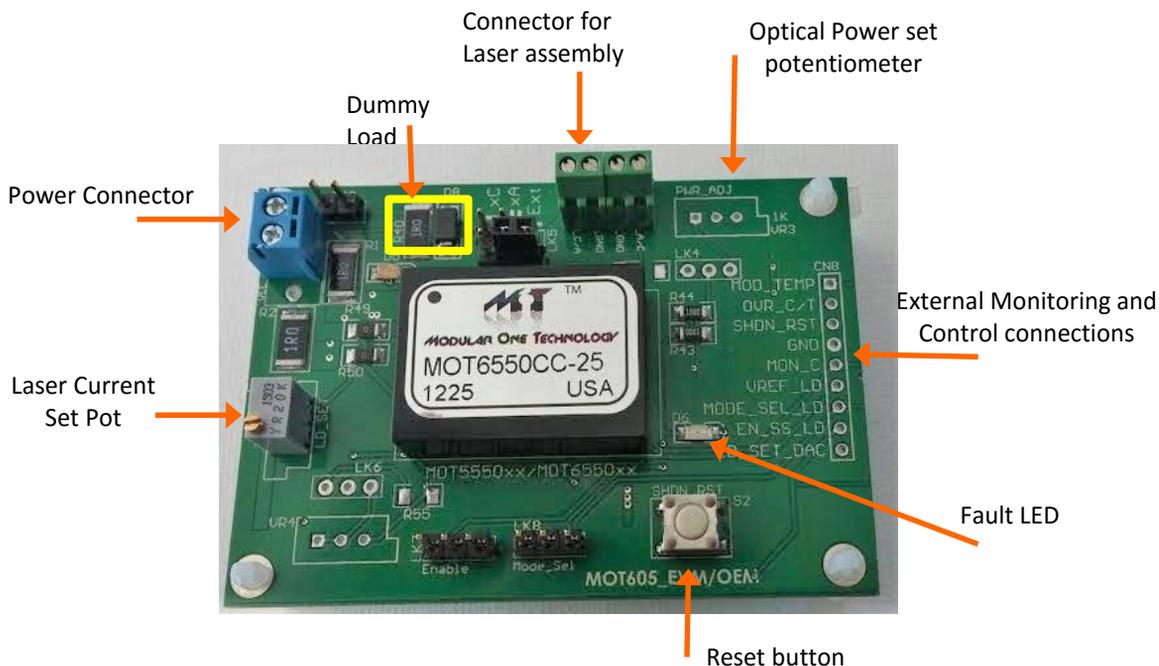
*Before applying power to the OEM please ensure all jumpers are configured correctly! (see following pages)*



Contents

Overview	1
Component Identification	2
Configuration Links	3
Power Supply and Laser Connections	3,4
Operating Modes	4
Laser Current / Power Setting	5
Module Enable and Shutdown Functionality	6
External Monitoring & Control	7
Appendix 1 – OEM Schematic	8

Component Identification





### Configuration Links

Various modes of operation, as well as setup for the particular module in use, are set with jumpers attached to the link pins. Descriptions of the function of each link are covered in the following paragraphs.

The default link positions are as shown in the following table:

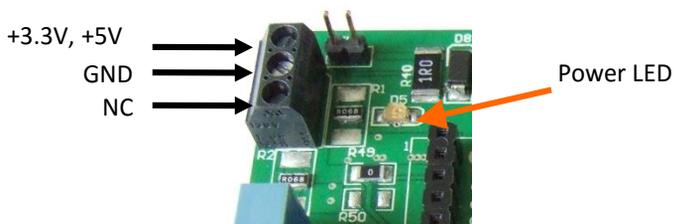
Link	Function	Default	Alternate	Page Reference
LK5*	Load config	Internal (no link)		p4
LK7	Enable	Enabled (no link)	Standby ( $V_{CC}$ )	p10
LK8	MODE	Constant Current	Constant Power ( $V_{CC}$ )	p6

**Note: With LK8 and LK9 left open circuit – The module is in an ENABLED, CONSTANT CURRENT configuration due to module pull-down resistors.**

### FUNCTIONAL DESCRIPTIONS

#### Power Supply

An appropriate power supply should be connected to CN6. The power supply should be capable of sourcing sufficient current as shown in the datasheet for the module being used, plus an additional 15mA for the current drawn by the indicator LEDs. The supply voltage may be anywhere in the range from +3.3V to +5V nominal.



#### Laser connection

For quick initial evaluation the on-board dummy load can be used in place of a real laser. The dummy load consists of 3 series-connected diodes and a resistor, which approximate to an actual laser diode. Link LK5 is used to ensure the correct polarity for the module configuration being used. In this configuration only Constant Current mode can be used (see LK8) since there is no feedback mechanism for measuring power.

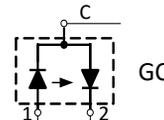


Dummy Load Resistor = 1R  
(Can be used to measure output current across TP3)



The correct settings for LK5 are as shown:

Only GC Modules Can be used with MOT605\_OEM



Be sure that the laser assembly configuration matches the module configuration

### Operating Mode

The MOT6550xx can be operated in either Constant Current or Constant Power modes. Selection of mode is accomplished using LK8, by default LK8 is set to the CC / External position. The module can be forced into the CP mode, by simply moving the jumper on LK9:



CC / External



CP Mode

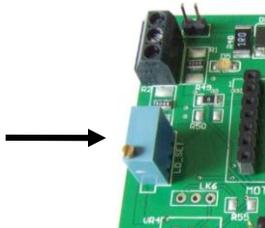


Alternatively, Mode control can be set by an external system. With the link in the CC/External position the control line can be accessed via Mod\_SEL\_LD at CN8. This node should be pulled high for Constant Power mode, and released, or pulled down, for Constant Current mode. (an internal pull-down inside the module sets Constant Current as the default mode).

### Laser Current / Power Setting

Control of the laser output power (in Constant Power mode) or current (in Constant Current mode) is accomplished by adjusting VR5. This applies a control voltage to the module in the range 0 – 2.0V.

VR5 for Laser current set.





**Constant Power Mode (MOT6550xx Modules only)**

In Constant Power mode a real laser should be attached to the MOT605\_OEM using CN7 connector. Power supply to the MOT605\_OEM must be turned off at this time.

**Important note:**

***Before connecting a laser to MOT605\_OEM make sure that the laser maximum current rating is compatible with the laser driver module you are using. Always use a laser with current rating greater than the laser driver module. Applying current greater than the laser maximum rating shall destroy the laser permanently.***

Before attaching the laser, set VR3 to its maximum (fully anti-clockwise), and set LK5 to external. Place LK4 for using on-board pot (VR5).

Connect the laser to CN7 making sure correct terminals have been identified and connected according to the module being used. Following is an example for GC modules:

- LD\_C (laser cathode) = GND (CN7 PIN 2)
- LD\_A (laser anode) = LD\_C/A (CN7 pin 1)
- PD\_A (photodiode anode) = GND (CN7 PIN 3)
- PD\_C (photodiode cathode) = PD\_A/C (CN7 pin4)

**Important note:**

**Lasers must be handled by qualified personnel having full understanding of laser safety principles and procedures.**

Connect the laser pigtail optical connector to a suitable optical power meter. The power meter must be capable of handling high power if you are using high power lasers.

1). Set the mode to constant current (CC) using LK8 and set VR5 for minimum current (fully clockwise).

Turn on the power supply to the MOT605\_OEM. Increase the laser current using VR5 (turning anti-clockwise) - by increasing the voltage at the LD\_SET pin. The optical power meter should now be reading corresponding power and increasing as the LD\_SET voltage is being increased. Set LD\_SET to approximately 1.75V and note optical power as well as the laser current for this LD\_SET value.

2). Change the mode to constant power mode using LK8. You will notice that the laser current as well as the laser power decreases. Increase the laser current (power) using VR3 (turn clockwise) until laser power reaches approximately 1dB less than the power you noted in step 1.

3). If you wish to keep this module together with this OEM board and laser / photodiode setup: The ohmic value of VR3 can optionally be measured (Between PD A/C and pin1 of LK4), and a resistor having the closest value to VR3 can now be placed for R41. (This is more stable than the VR3 pot). When using R41, LK4 should be replaced accordingly to link terminals 2 and 3.

The laser power can now be changed using VR5 (LD\_SET). It is now possible to change mode from CC to CP and vice versa with only minimal transients.



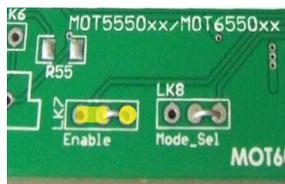
### Module Enable

By default the module will power up when a supply is connected since an internal pull-down resistor will hold EN\_SS at a low level. With the jumper on LK7 in the default position the module can be shutdown by applying a high logic level to the EN\_SS pin on CN8. If the jumper is moved to the alternate position the module will go into standby until the jumper is removed or restored to the default position.

Once the module is enabled an internal softstart circuit will ramp up the output current gradually until the programmed output current value is reached.



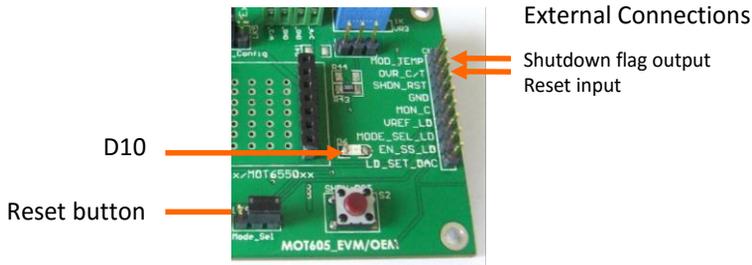
- LK7 Default**
- Module starts when power applied
  - Module can be shut down if high logic level applied to EN\_SS on CN8



- LK7 Alternate**
- Module in standby
  - Remove link to enable module

### Shutdown functionality

If over-current or over-temperature conditions are detected the module will shutdown and D6 will illuminate red. The module will remain shutdown until reset by pressing S2. If the fault conditions have been cleared the module will resume operation after performing a soft start. If a fault persists the module will not restart and D6 will illuminate once more when S2 is released.



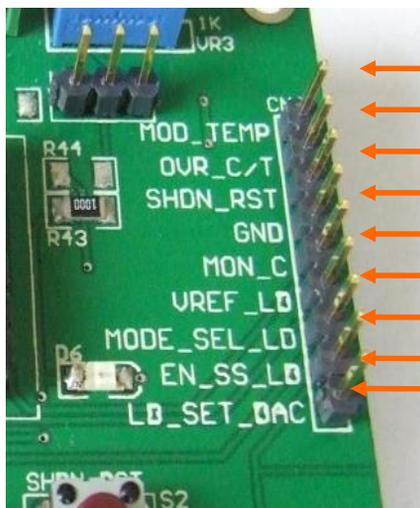
The shutdown functionality can also be monitored and restarted externally:

1. In shutdown the OVR\_C/T connection on CN8 will be pulled low.
2. A reset can be initiated by pulling the SHDN\_RST pin on CN8 low

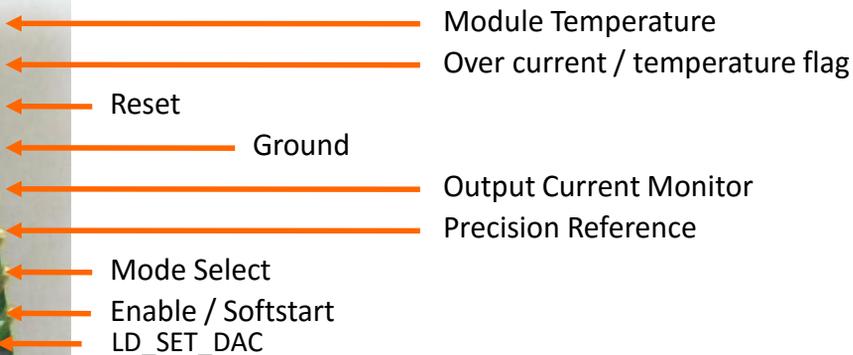


### External Monitoring and Control

A number of system parameters are available for monitoring, along with several control signal inputs, which would be used when the laser driver module is connected to a host controller. For convenience these are grouped together on CN8.



#### InputsOutputs



#### **Module Temperature**

An analog voltage representing the internal temperature of the module (0.744V = 25 C)

#### **Over Current / Temperature flag – see “Shutdown Functionality”**

This pin is pulled low when a fault has caused shutdown.

#### **Reset– see “Shutdown Functionality”**

Pull this pin low to reset the device

#### **Output Current Monitor**

An analog voltage representing laser current. Values from 0 – 2.6V correspond to output current from zero to the specified maximum..

#### **Precision Reference**

A 2.5V reference voltage, stable over temperature and voltage.

#### **Mode Select – see “Operating Mode”**

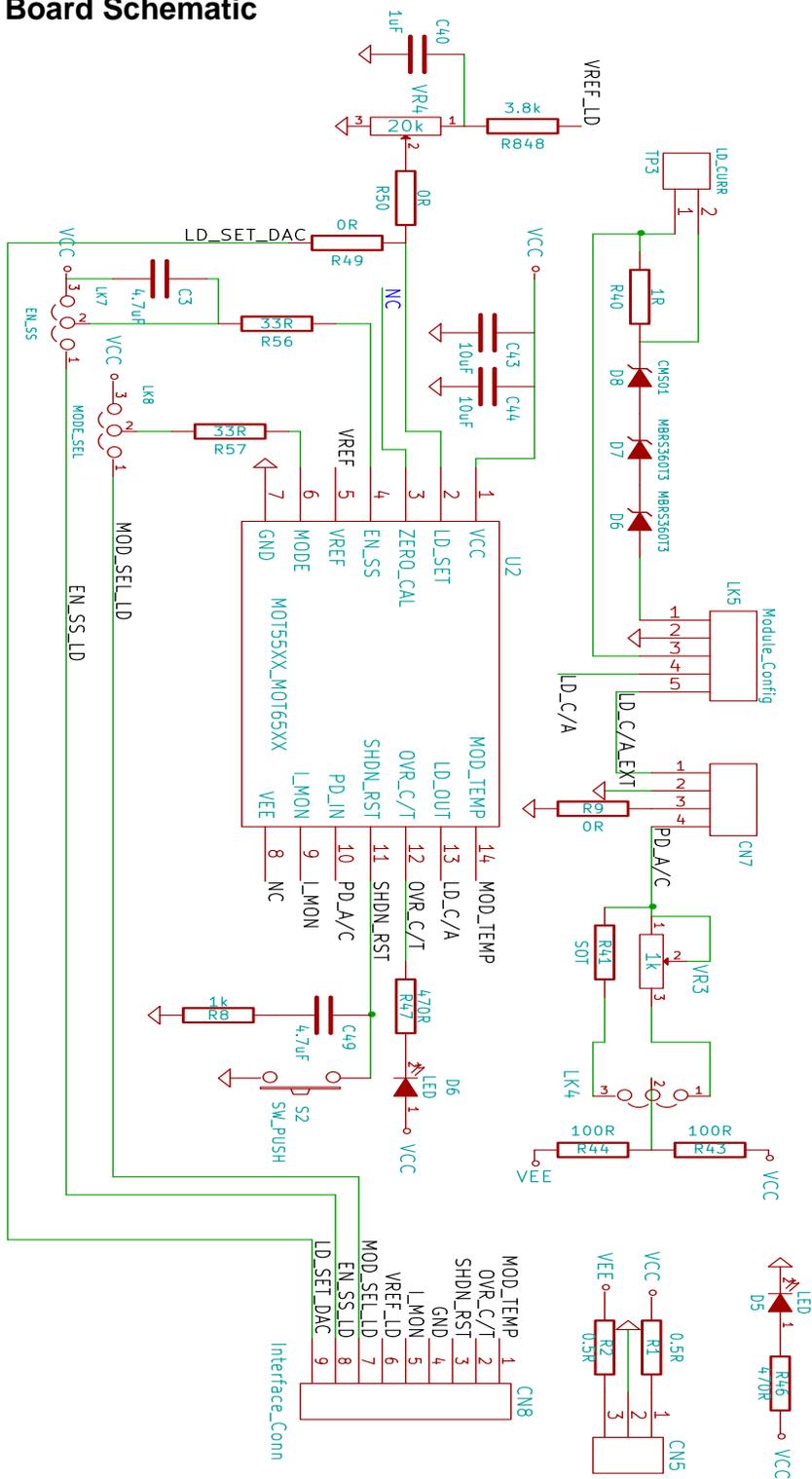
A low level sets Constant Current mode, a high level sets Constant Power mode.

#### **Enable / Softstart– see “Module Enable”**

By default this pin is at a low level which enables the module. When taken high the the module will go into standby.



Appendix 2 – Board Schematic





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