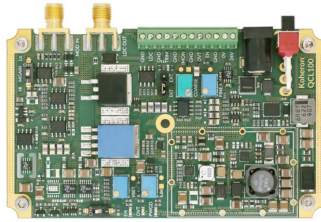# Quantum cascade laser driver

Koheron QCL100 is a high-performance current source designed to drive Quantum Cascade Lasers. With a low current noise of 650 pA/√Hz, the QCL100 driver provides an adjustable compliance voltage up to 15 V at 500 mA and an adjustable precision current limit. The QCL100 driver features a 5 MHz modulation input and a 10 Hz trimming input and is supplied from a single 24 V input.

## Specifications

|  | QCL100-A-500 |
| --- | --- |
| Laser current | 0 - 650 mA |
| Supply voltage $V_S$ | 19 V - 26 V |
| Compliance voltage | 15 V at 500 mA (13.5 V at 650 mA) |
| 3 db modulation bandwidth | 5 MHz |
| Current monitor gain | 2 V/A |
| RMS noise (10 Hz - 1 MHz) | 680 nA$_{rms}$ |
| Current noise density (1 kHz) | 650 pA/√Hz |
| Modulation gains | 10 mA/V, 50 mA/V |
| Operating temperature | 0 °C - 50 °C |
| Outside Dimensions | 100 mm x 68 mm x 16 mm |
| Compatible lasers | Anode-grounded / Floating diode |

## Characterization

### Current noise
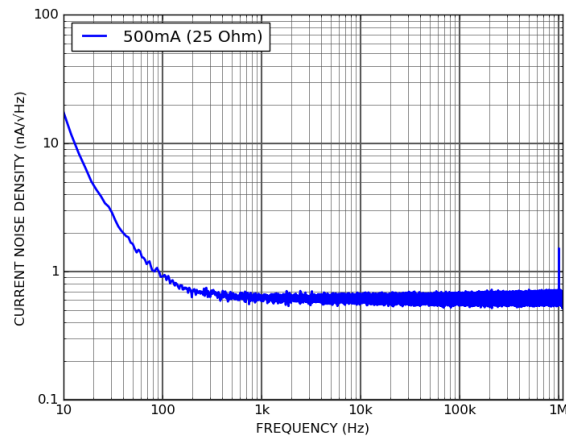
Current noise is measured across a 25 Ω resistor (VSET set to -13.9 V). Integrated noise in the 10 Hz - 1 MHz bandwidth is 653 nA$_{rms}$.

## Modulation

The modulation transfer function of the QCL100 driver was measured across a 25 Ω load at 400 mA (VSET set to -14.5 V) with a modulation input amplitude is 2 V$_{pp}$:
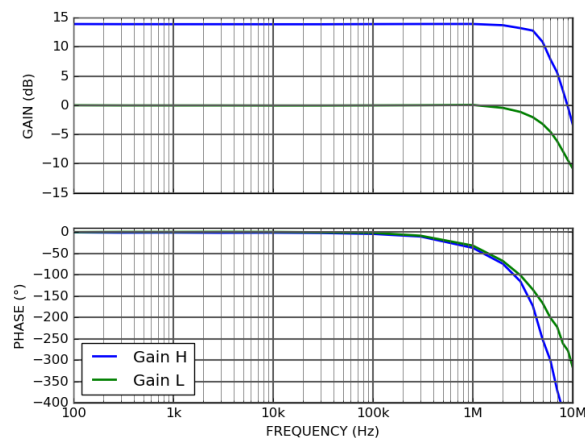


The gain at half the optical bandwidth is 6.9 MHz (in low gain) and 5.9 MHz (in high gain). A phase-shift of 90° is reached at 2.6 MHz (in low gain) and 2.3 MHz (in high gain).

The figure below shows the response (yellow) of the QCL100 driver to a 2 V$_{pp}$ triangle modulation (green):
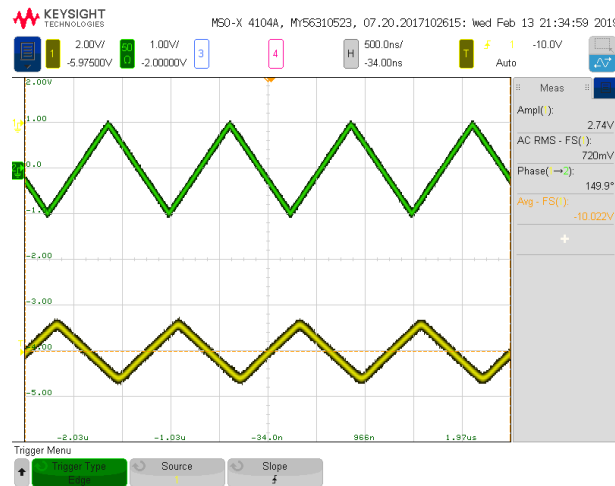
## Current limit

The QCL100 driver integrates a fast and precise current limit. Here the current limit clamps a 10 kHz sine wave at 400 mA:
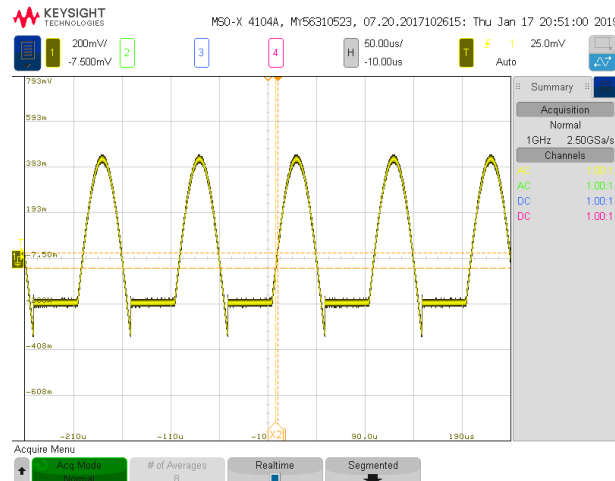


## External setpoint trimming input

The external trimming input can be use to perform a low frequency modulation with a 10 Hz bandwidth.