

# 5.26μm Low-Power Benchtop DFB-QCL Mid-Infrared Quantum Cascade Laser, 10mW (TDLAS Integrated Control Module)



## ● Product Description

The QCL5260-5.26um Low Power Desktop DFB-QCL Mid-Infrared Quantum Cascade Laser is a domestically leading, ultra-low power QCL-DFB laser developed by Idealphotonics in the first half of 2018. It offers a tunable range of over 100 nm and an output power greater than 40 mW, meeting industrial needs such as gas sensing for customer testing. The laser provides collimated output with stable power and superior temperature and wavelength stability, surpassing the stability of traditional high-power quantum cascade lasers by several orders of magnitude. This makes it an excellent test source for our mid-infrared testing customers.

## ● Part Number

TDLAS-MIR-QCL-W5260-1-DFB-010

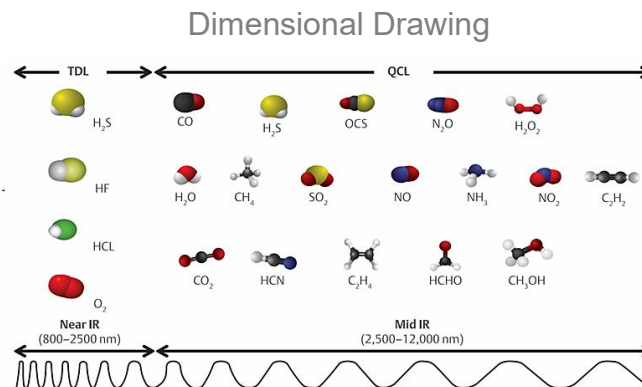
## ● Product features

Low power, high power 、 High side-mode suppression ratio 、 Software intelligent control 、 Compact size

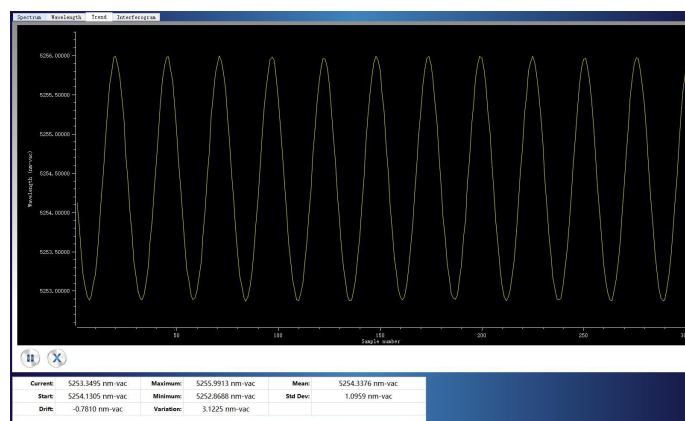
## ● Application area

TDLAS NO system measurement setup 、 Mid-infrared system light source 、 Mid-infrared device analysis

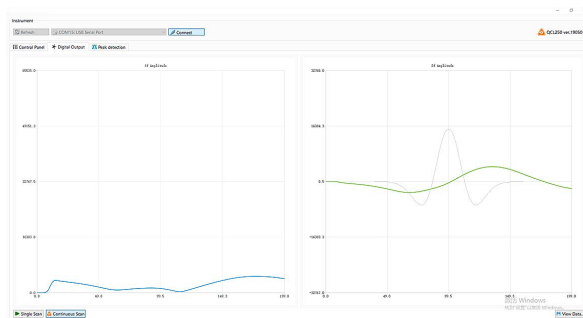
## Parameters



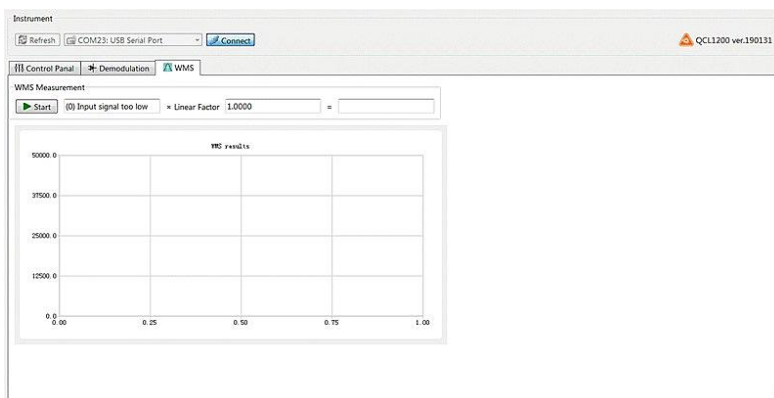
No jump mode scanning interval



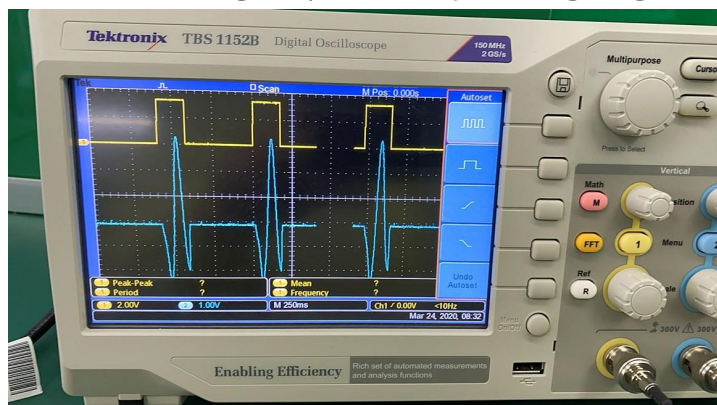
2F signal acquisition interface:



Algorithm calibration interface:



Linearity test of modulation signal (oscilloscope voltage signal effect diagram)



Parameters

Parameters	Unit	Technical Specification		
		Min.	Typ.	Max.
PN#			5.26umDFB-QCL	
Laser collimated output power	mW		10	
Peak operating wavelength	um		5.26	

Spectral width (FWHM)	MHz		<3	
Output side-mode suppression ratio (SMSR)	dB	20		
Output isolation	dB		30	
Wavelength temperature coefficient	nm/°C		0.6	
Wavelength current coefficient	nm/mA		0.2	
Output power stability (8 hours)	%		±1	±4
Output power adjustable range	%	0		100
TEC working range	°C	0		50
Operating voltage	VAC	100	220	240
Operating temperature	°C	0		55
Storage temperature	°C	-20		65
Specifications dimensions	mm	290(L)×180(W)×68(H)mm		

Technical specification explanation:

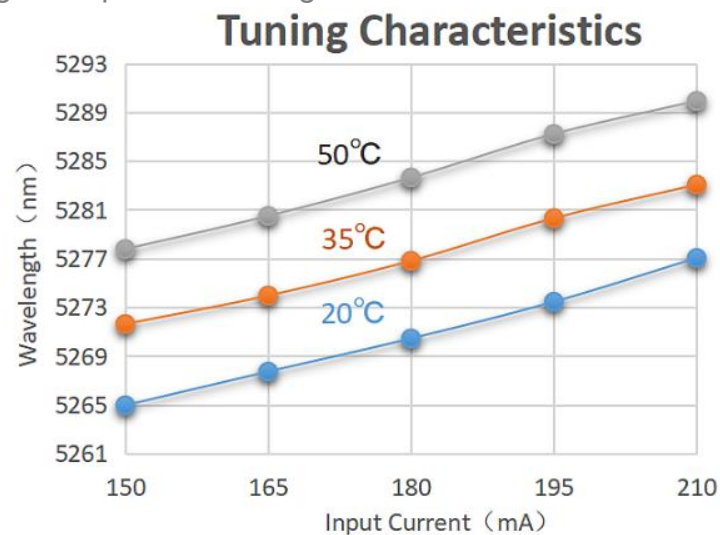
1. Output power is selectable;
2. Peak operating wavelength is selectable;
3. Output power stability test condition is at 25° C, with a 30-minute warm-up after power-on;
4. Maximum power consumption refers to the overall power consumption under extreme operating conditions.



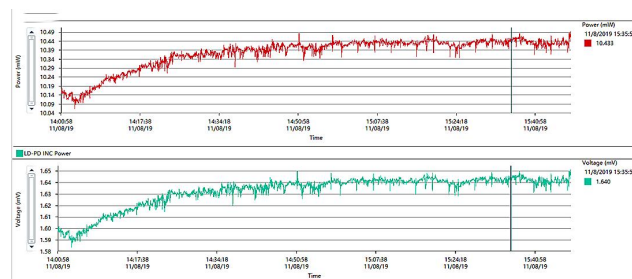
The wavelength chart of the 5.26μm DFB-QCL laser  
 Voltage characteristic curve



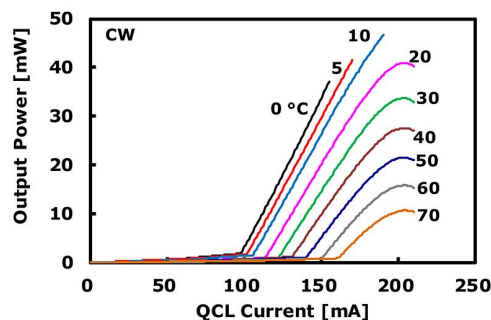
The wavelength temperature tuning curve of the 5.26um DFB-QCL laser



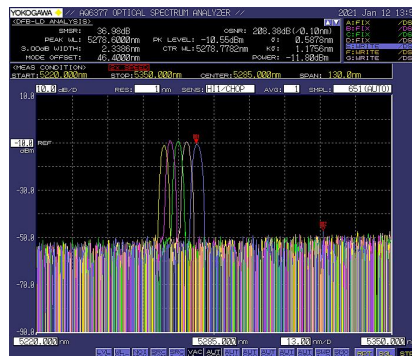
## The power stability of the 5.26um DFB-QCL laser



The characteristic curve of the QCL laser (using a typical wavelength of 5.26um) shows the output power characteristics

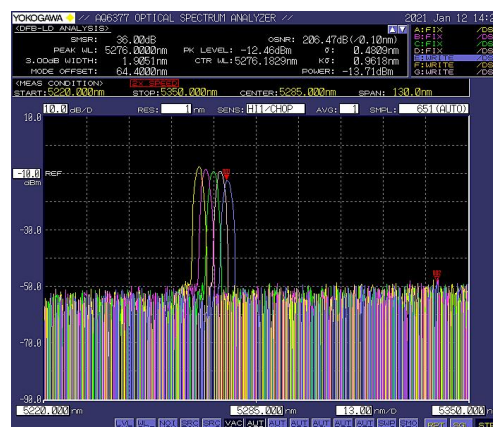


The wavelength-current spectral diagram of the 5.26um DFB-QCL laser at 25° C



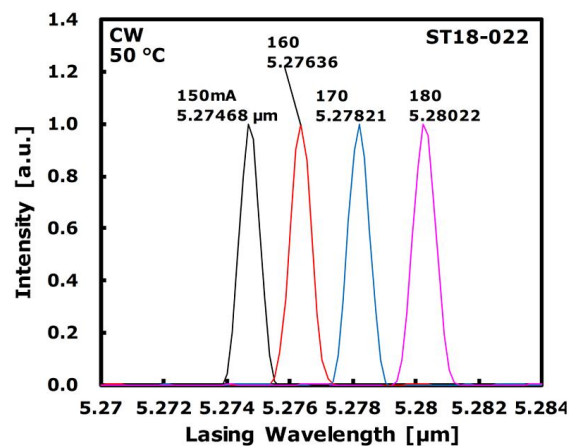
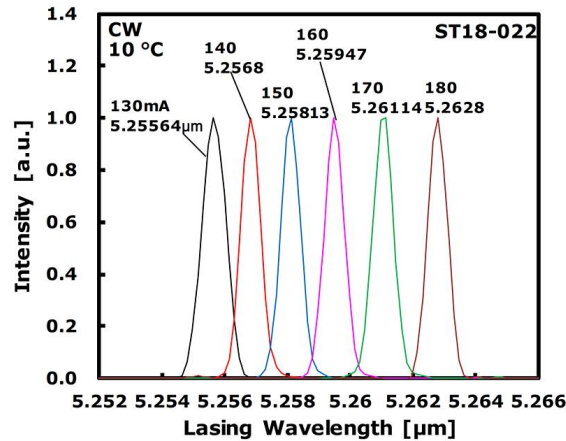
Yellow line: 150mA, 5267.08nm; Red line: 165mA, 5269.48nm; Green line: 180mA, 5271.52nm; Pink line: 195mA, 5274.60nm; Blue line: 210mA, 5278.28nm.

The wavelength-temperature spectrum of the 5.26um DFB-QCL laser at 180mA

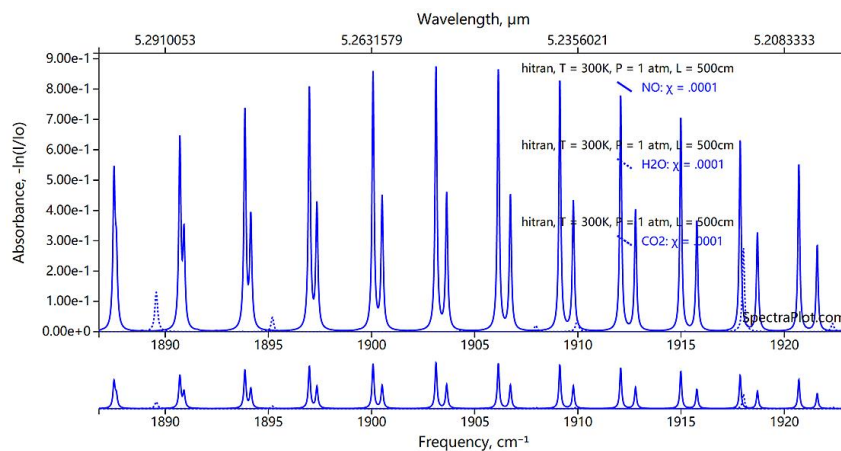


Yellow line: 15° C, 5267.84nm; Red line: 20° C, 5269.20nm; Green line: 25° C, 5272.24nm; Pink line: 30° C, 5274.44nm; Blue line: 35° C, 5275.76nm.

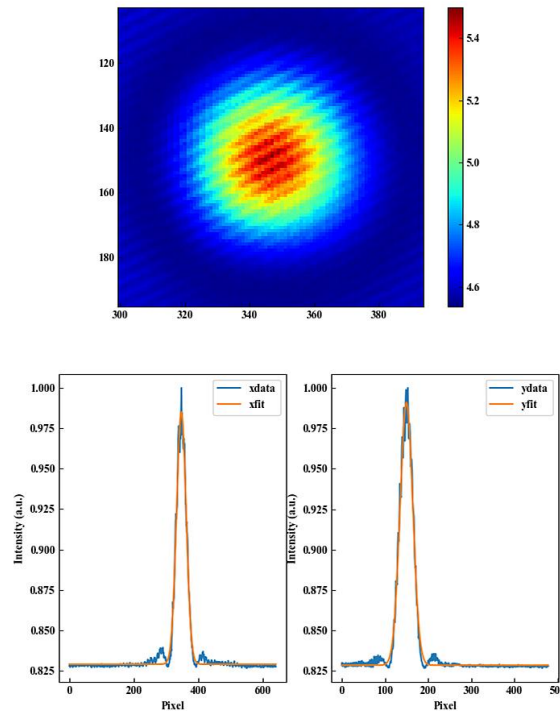
Laser spectrum (continuous) of the laser operating at 10° C



Absorption spectrum simulation curve

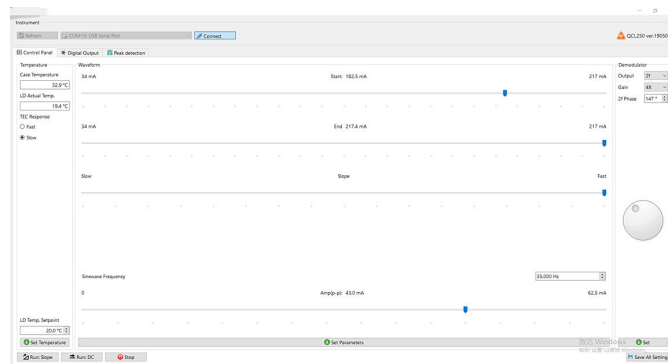


## Quantum cascade laser output spot



The camera's pixel size is  $5 \mu\text{m}$ , and the Gaussian fit spot diameter is  $320 \mu\text{m}$

## Control software



## PN#/Ordering info

MIR-QCL- W□□□□ -☆-△-XX

W□□□□: Wavelength

5260: 5260nm

7400: 7400nm

10530: 10530nm

☆ : Collimated output

1: With

0: Without

△: Laser type

FP: QCL-FP

DFB: QCL-DFB

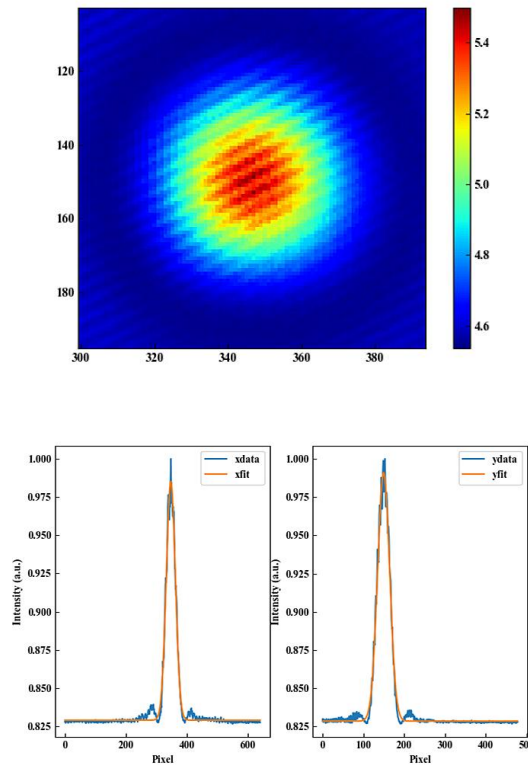
XX: Output power

001=1mw

010=10mw

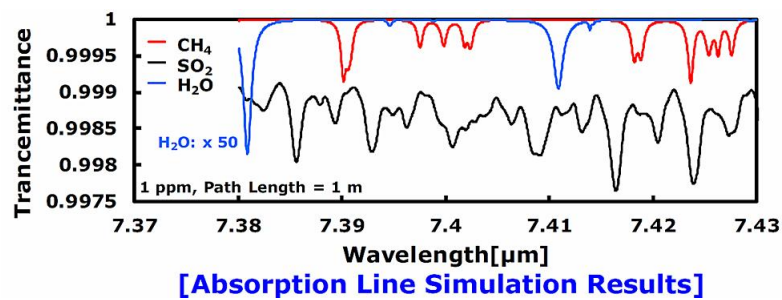
100=100mw

1000=1000mw

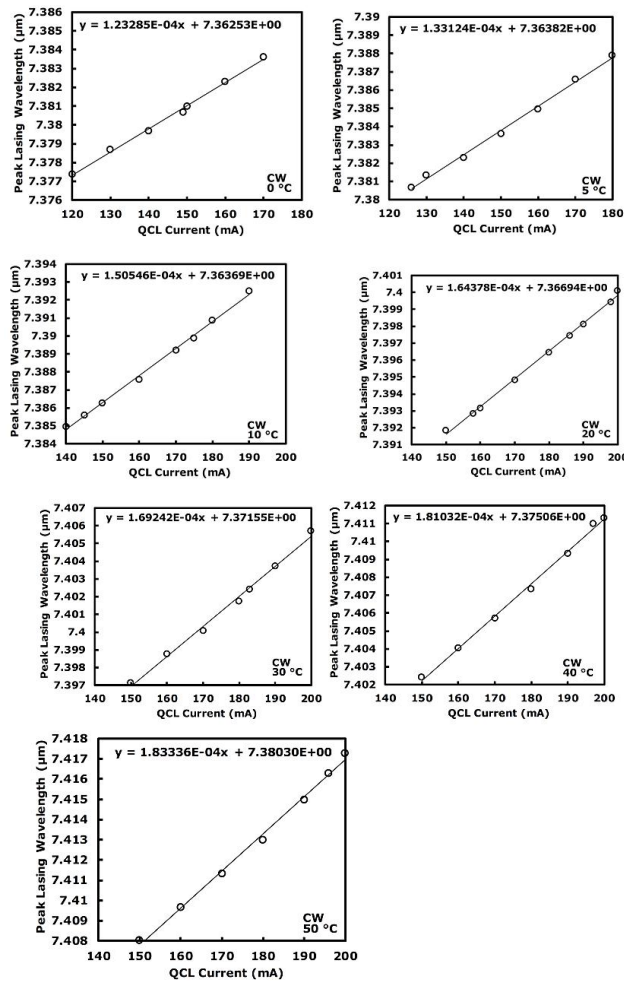


The pixel size of the test camera is 5  $\mu\text{m}$ , and the Gaussian fitting spot diameter is 320  $\mu\text{m}$ .

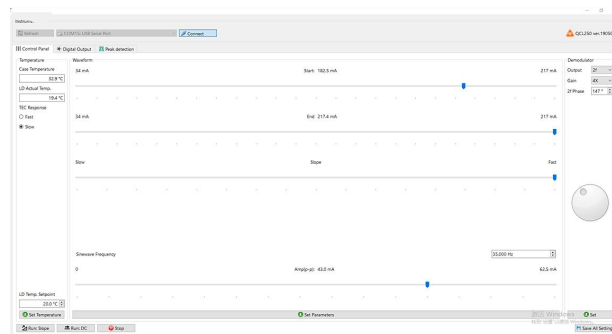
Simulation results of absorption spectral lines near 7.4 $\mu\text{m}$  Test result



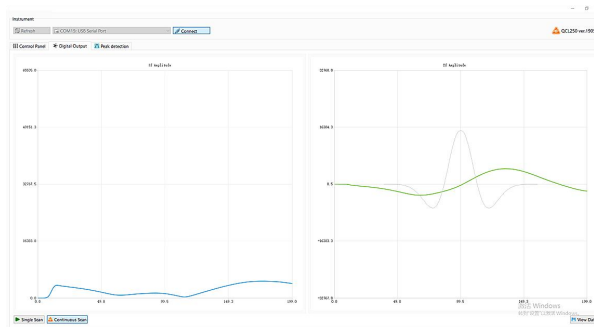
The relationship curve between peak wavelength and current



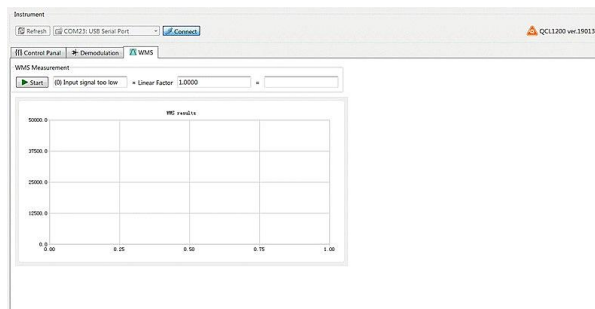
## Control software



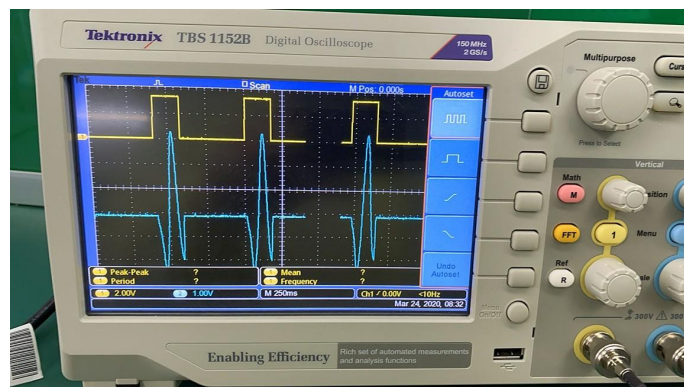
## 2F signal acquisition interface:



Algorithm calibration interface:



Modulation signal linearity test (oscilloscope voltage signal effect diagram):



Ordering Information

MIR-QCL- W □-☆-△-XX

W□□□□: Wavelength

7400: 7400nm

10530: 10530nm

☆: collimator

1: with

0: without

△: laser type

FP: QCL-FP

DFB: QCL-DFB

XX: output power

005=5mw

010=10mw

100=100mw