

## 4.33um 20mW DFB-CW QCL Continuous Wave Quantum Cascade Laser



### ● Product Description

This quantum cascade laser adopts SPC (Single Phonon Continuum) and DFB (Distributed Feedback) structures, emitting in continuous-wave (CW) mid-infrared at room temperature. The operating temperature of the chip is controlled by a Peltier element mounted in an HHL package, enabling mode-hop-free tuning of the emission wavelength while maintaining longitudinal single-mode operation.



- **Product features**

Continuous wave output; DFB single-mode characteristics; precise temperature control; low-noise driving; industrial-grade package

- **Part Number**

MP-QCL-4330-DFB-20

- **Application area**

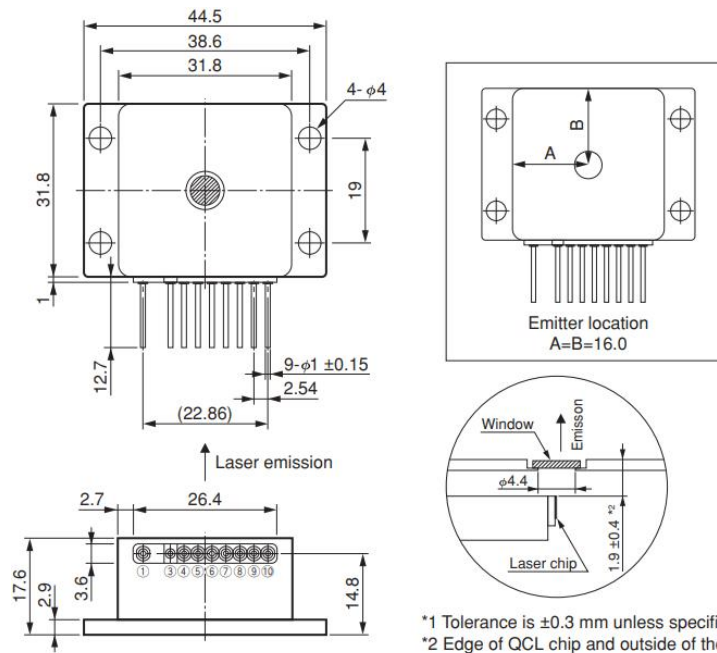
Gas Sensing | Medical Diagnostics | Defense and Security | Environmental Monitoring | Semiconductor Metrology

- **Core parameters**

Center Wavelength	Output Power
4.33um	20 mW



## ● Dimension Drawing



\*1 Tolerance is ±0.3 mm unless specified.

\*2 Edge of QCL chip and outside of the package.

Pin No. *3	Function	Pin No. *3	Function
①	TEC cathode (-)	⑦	QCL cathode (-)
③	N.C.	⑧	Thermistor, (Top(c))
④	QCL anode (+)	⑨	Thermistor, (Top(c))
⑤	Thermistor, (T <sub>op(qcl)</sub> )	⑩	TEC anode (+)
⑥	Thermistor, (T <sub>op(qcl)</sub> )	—	—

\*3 Pin of ③ is electrically connected to the case; package body. Other all pins are floating to the case

## ● General Parameters

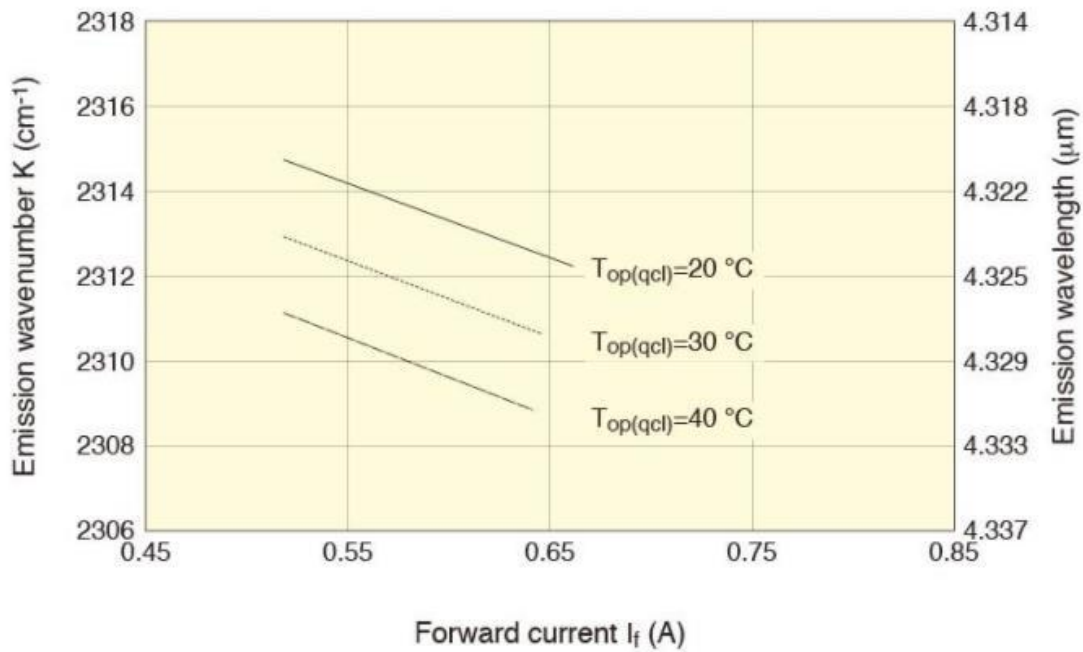
### Model Parameters

Parameter	Specification
Type	DFB-CW Type
Typical Peak Emission Wavelength	4.33 μm
Tuning Range Min.	±1.0 cm <sup>-1</sup>



<b>Min. Output Power</b>	<b>20 mW</b>
<b>Max. Laser Threshold Current</b>	<b>1 A</b>
<b>Min. Side Mode Suppression Ratio (SMSR)</b>	<b>25 dB</b>
<b>Package</b>	<b>HHL</b>

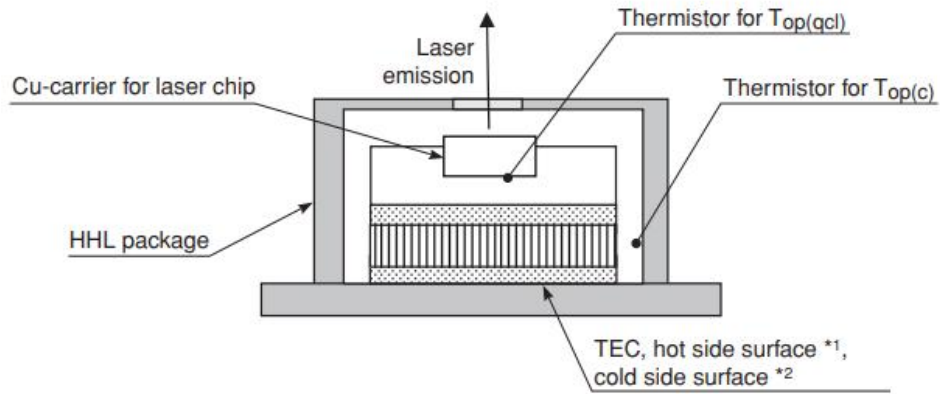
## Typical Characteristics



Parameter	Symbol	Condition	Typical value
Temperature coefficient of wavenumber	$\delta K_T$	$I_f$ fixed	-0.18 cm <sup>-1</sup> /°C
Current coefficient of wavenumber	$\delta K_C$	$T_{op(qcl)}$ fixed	-0.017 cm <sup>-1</sup> /mA

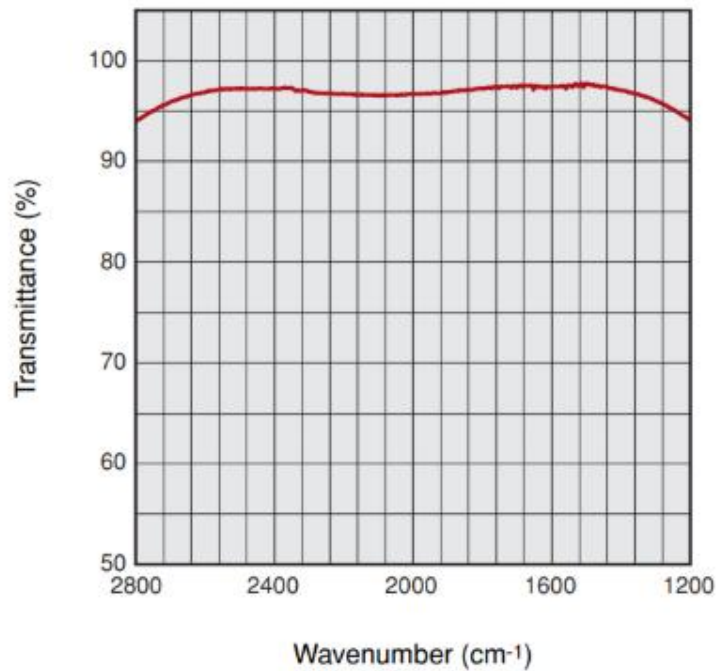
## General Parameters

### Thermistor Configuration (Schematic Diagram)



\*1 when TEC is operated in cooling mode.  
\*2 when TEC is operated in heating mode.

### Typical Transmittance Curve of the Window



# DFB-CW QCL Continuous Wave Quantum Cascade Laser Model List

## HHL Package

Wavelength	Wavenumber	Target gases
4.33 $\mu\text{m}$	2310 $\text{cm}^{-1}$	CO <sub>2</sub> , CO <sub>2</sub> isotope
4.53 $\mu\text{m}$	2209 $\text{cm}^{-1}$	N <sub>2</sub> O
4.57 $\mu\text{m}$	2190 $\text{cm}^{-1}$	N <sub>2</sub> O, CO
5.26 $\mu\text{m}$	1900 $\text{cm}^{-1}$	NO
6.13 $\mu\text{m}$	1631 $\text{cm}^{-1}$	NO <sub>2</sub>
7.18 $\mu\text{m}$	1392 $\text{cm}^{-1}$	SO <sub>3</sub>
7.39 $\mu\text{m}$	1354 $\text{cm}^{-1}$	SO <sub>2</sub>
7.73 $\mu\text{m}$	1294 $\text{cm}^{-1}$	CH <sub>4</sub>