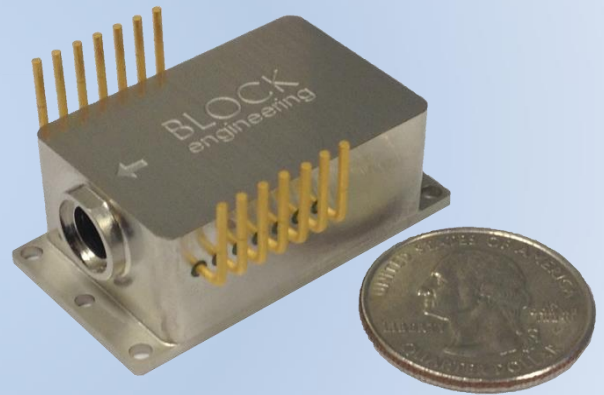


**WIDELY TUNABLE MID-IR OEM LASER MODULE**

**Key Features**

- ▣ Industry-leading widely tunable QCLs  
Selected > 250 cm<sup>-1</sup> ranges from 5.4 to 12.8 μm
- ▣ Laser control electronics capable of controlling up to 4 laser modules
- ▣ Fastest tuning (settling < 15 msec)
- ▣ Excellent beam pointing stability
- ▣ Ultra small and lightweight Laser module
- ▣ Compact and flexible control electronics

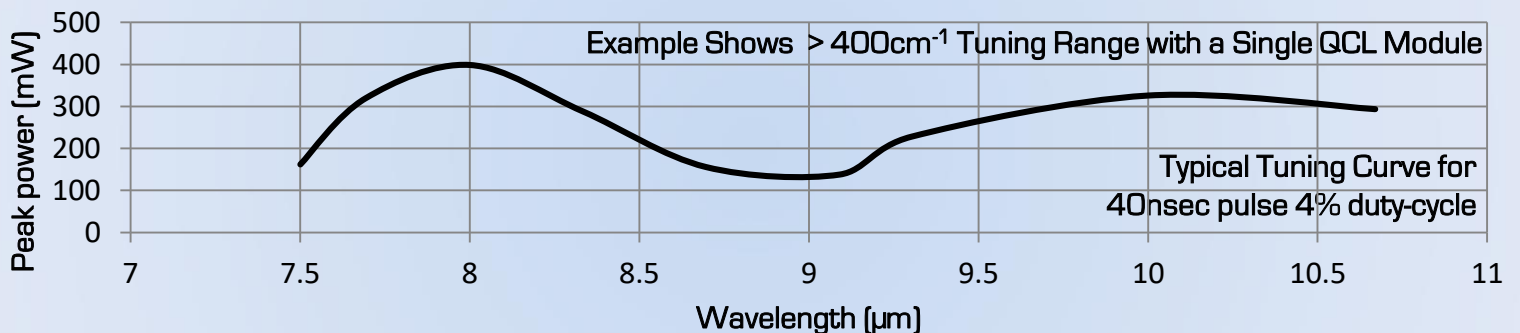
**Smallest Widely Tunable QCL Module**



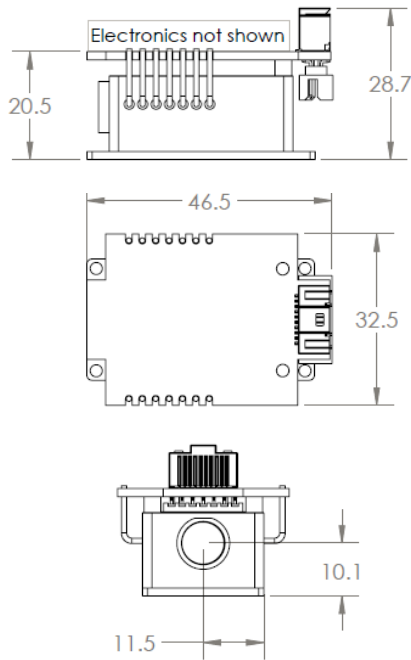
**Flexible OEM System Configurations**

Components/Features	mini-QCL™ 200
Tunable Laser Module	✓
Laser Module Electronics	✓
Laser Control Electronics	✓
System Control Electronics	✓
Ethernet Communication (HTML/SOAP)	✓

**Industry-Leading Tuning Range**



**Tunable Laser Module & Electronics**



**Tunable Mid-IR Laser OEM Module Specifications**

<b>Module Tuning Range</b>	Selected >250 cm <sup>-1</sup> ranges over 5.4 -12.8 μm Electronics configurable up to 4 Laser Modules
<b>Spectral Linewidth</b>	2 cm <sup>-1</sup> (typical)
<b>Spectral Accuracy / Repeatability</b>	< 2 cm <sup>-1</sup> / < 0.5 cm <sup>-1</sup> (typical)
<b>Maximum Peak Power</b>	150 - 400 mW (typical, see tuning curve)*
<b>Average Power</b>	Varies 2 - 20 mW across range (5% duty cycle)**
<b>Power Stability</b>	< 5% pulse-to-pulse (typical) < 0.05% over 10 msec @ 1 MHz
<b>Pulse Width</b>	30 - 300 nsec <ul style="list-style-type: none"> <li>▫ continuously variable with External Pulse Control</li> <li>▫ 10-ns-resolution with Triggering</li> </ul>
<b>Pulse Repetition Frequency</b>	Up to 3 MHz
<b>Maximum Duty Cycle</b>	2 - 20% (depending on operational conditions, mounting and tuner wavelength range)
<b>Beam Quality</b>	Single spatial mode
<b>Beam Diameter</b>	2 x 4 mm, collimated output
<b>Beam Divergence</b>	< 5 mrad
<b>Pointing Stability</b>	< 1 mrad
<b>Polarization</b>	Vertically polarized, 100:1 extinction
<b>Tuning Modes</b>	Move Tune - manual control at one wavelength Step Tune - programmable linear steps Sweep Tune - variable sweep speed
<b>Step Tune Speed</b>	10 cm <sup>-1</sup> step in < 1 msec (100 cm <sup>-1</sup> step in < 2 msec) Example: Step across 1000 cm <sup>-1</sup> in 1.1 seconds with 100 steps with 10 msec dwell per step
<b>Sweep Tune Speed</b>	Linear sweep up to 15 cm <sup>-1</sup> /msec
<b>Computer Control</b>	mini-QCL-200: Ethernet with HTML/SOAP
<b>Synchronous Pulse Control</b>	Trigger input - with Sync-Out and adjustable offset Trigger output - for laser pulse & wavelength tune Digital input for pulse control - directly controls rising & falling edges
<b>Temperature, Operating / Storage</b>	10 to 30 °C / -10 to 70 °C
<b>Electrical Power</b>	100 to 240 Volts

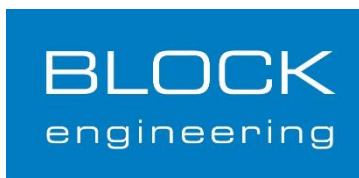
**mini-QCL-200 Control Electronics**



[All dimensions in mm]

\* With temperature stabilization  
\*\* Cooling dependent

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