

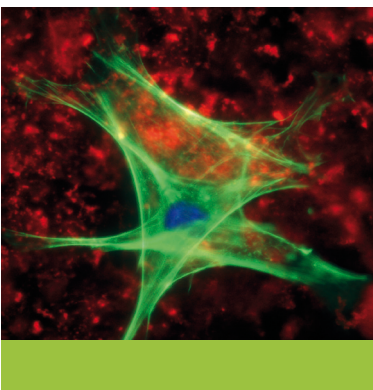


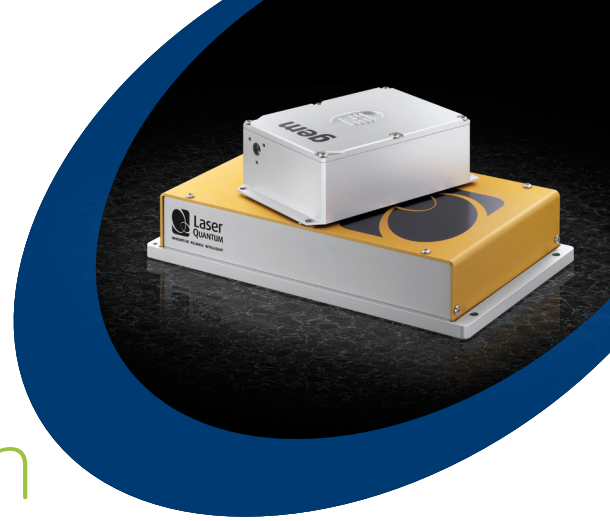
# gem

532nm high spec OEM laser

- CW 532nm laser
- Extremely low noise
- Power from 25 - 600mW

## TECHNICAL DATA SHEET





# The high specification CW 532nm laser

## Overview

The gem is the jewel in the Laser Quantum collection. Its small and compact design makes it an ideal choice for OEM integration and has an exceptional output of up to 600mW with a highly stable, diffraction limited beam. It is a high specification, single transverse mode CW green laser making it ideal for Raman spectroscopy, fluorescence spectroscopy, DNA sequencing and for integration into OEM packages in general, and can be equipped with fibre-delivery.

## Low Noise

Low noise results from the cavity architecture which restricts the number of oscillation modes and maintains exact control of the component temperature. What little heat is generated within the head is removed by conduction, therefore no water cooling is required. Only high quality optical components are used, resulting in a noise specification of <0.8% rms over a wide operating temperature range.

## Stability

The smd6000 power supply is a highly intelligent and functional control unit. It allows the laser to be operated in power or current mode; in power mode the output power is stabilised to better than 1% using optical feedback to the laser head.

The temperature of all critical components is regulated by PID temperature controllers, solidly maintaining all temperature-sensitive parameters within the cavity at their optimum values. The stability is maintained over a wide operating temperature.

## Construction

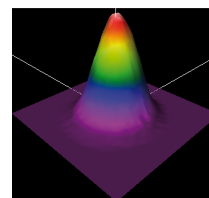
Laser Quantum builds all lasers to a high standard, and the gem is no exception.

To minimise the effect of shock impacts zero-stress mounts are used throughout the cavity. The laser's feet are engineered to deform under high stress, eliminating mechanical strain within the head. The gem is capable of withstanding extreme vibrational shocks without diminishing its performance.

Before shipment each gem is subjected to rigorous quality assurance, in line with our strict ISO9001 procedures. Every unit is nitrogen purged and hermetically sealed. This is followed by a rigorous burn-in procedure under user-realistic conditions.

## Beam Quality

The typical M-squared value of the gem beam is <1.1. The resulting TEM<sub>00</sub> beam has >98% fit to a Gaussian profile in both the X and Y directions, with an ellipticity typically of 1:1.1. This beam quality is maintained across the power range of the laser.



## Fibre Coupling

The gem is also available with a small core, FC fibre output of 50µm which is factory fitted to the laser head. This enables even greater flexibility, as the photons can be delivered where needed without the concern of accurate laser head positioning.

## Features

Features include: low noise, stable output, extremely compact design, low M-squared, zero-stress cavity, hermetically sealed, single phase mains driven, diode >40,000 hrs MTTF and full RS232 control.

## smd6000 power supply and controller

The smd6000 is more than just a power supply, it is an integral part of the gem laser system and is able to flip between power mode and user mode via the RS232 interface. The smd6000 also monitors component temperatures in the laser head, automatically maintaining laser output power and providing diagnostic analysis.

Supply voltage: 100, 120, 240 AC, frequency: 47 - 63 Hz

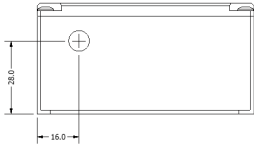
## Technical Specifications\*

	<b>GEM</b>
Power	25 - 600mW
Wavelength	532nm
Beam Size	0.9mm
Spatial Mode	TEM <sub>00</sub>
Ellipticity	< 1.1
Bandwidth	30 GHz
Divergence	0.8 mrad
M-squared	< 1.1
Power stability <sup>1</sup>	< 0.8% rms
Beam pointing stability <sup>2</sup>	10 µrad/°C
RMS noise	< 0.8%
Polarisation ratio	100:1
Polarisation direction	horizontal
Coherence length	1cm
Beam angle <sup>3</sup>	1 mrad
Operating temperature	10 - 40°C
Head weight	0.7 kg
Umbilical length	1.5m
Warm-up time	10 minutes

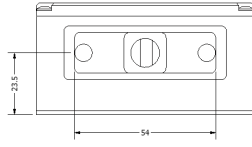
\* Subject to change without notice. <sup>1</sup> Test duration >100 hrs. <sup>2</sup> Measured over 36 hours at 22 to 28°C. <sup>3</sup> Tolerance relative to head orientation.

## Dimensions

Front view



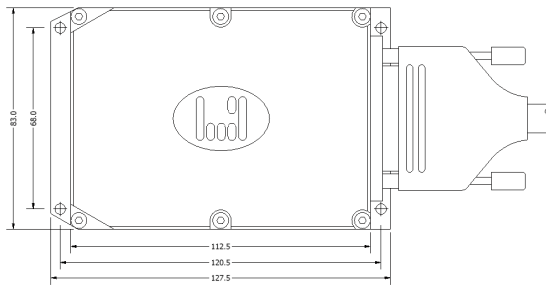
Back view



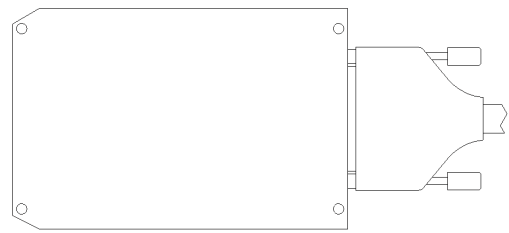
Side view



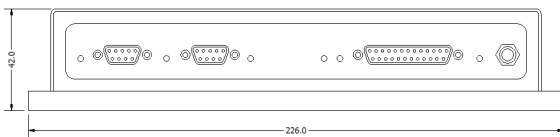
Top view



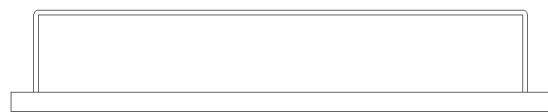
Bottom view



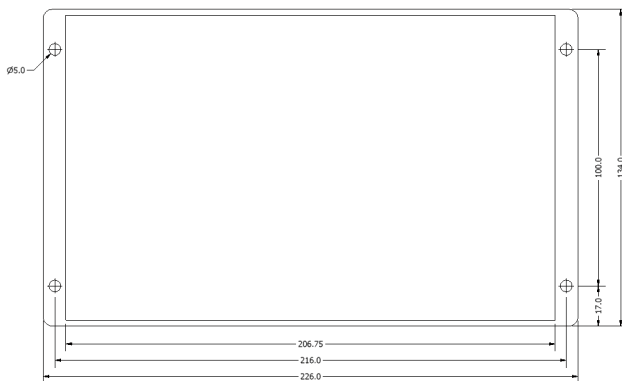
smd6000 - front view



smd6000 - back view



smd6000 - top view



## Typical Applications

- Raman spectroscopy
- DNA sequencing
- OEM integration

## PSU options

smd6000



Drawings are for illustrative purposes only, please contact Laser Quantum for complete engineer's drawings.

- INNOVATIVE
- RELIABLE
- INTELLIGENT

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