

## Lasing Reporting Summary

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### ü Experimental design

#### Please check: are the following details reported in the manuscript?

##### 1. Threshold

Plots of device output power versus pump power over a wide range of values indicating a clear threshold

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 2. Linewidth narrowing

Plots of spectral power density for the emission at pump powers below, around, and above the lasing threshold, indicating a clear linewidth narrowing at threshold

☐ Yes

☒ No

This item does not apply to our manuscript.

Resolution of the spectrometer used to make spectral measurements

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 3. Coherent emission

Measurements of the coherence and/or polarization of the emission

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 4. Beam spatial profile

Image and/or measurement of the spatial shape and profile of the emission, showing a well-defined beam above threshold

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 5. Operating conditions

Description of the laser and pumping conditions  
*Continuous-wave, pulsed, temperature of operation*

☒ Yes

☐ No

The laser power and energy density have been calibrated before each deposition, and the values are described in the methods section.

Threshold values provided as density values (e.g. W cm<sup>-2</sup> or J cm<sup>-2</sup>) taking into account the area of the device

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 6. Alternative explanations

Reasoning as to why alternative explanations have been ruled out as responsible for the emission characteristics  
*e.g. amplified spontaneous, directional scattering; modification of fluorescence spectrum by the cavity*

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 7. Theoretical analysis

Theoretical analysis that ensures that the experimental values measured are realistic and reasonable  
*e.g. laser threshold, linewidth, cavity gain-loss, efficiency*

☐ Yes

☒ No

This item does not apply to our manuscript.

##### 8. Statistics

Number of devices fabricated and tested

☐ Yes

☒ No

This item does not apply to our manuscript.

Statistical analysis of the device performance and lifetime (time to failure)

☐ Yes

☒ No

This item does not apply to our manuscript.

