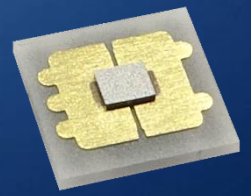
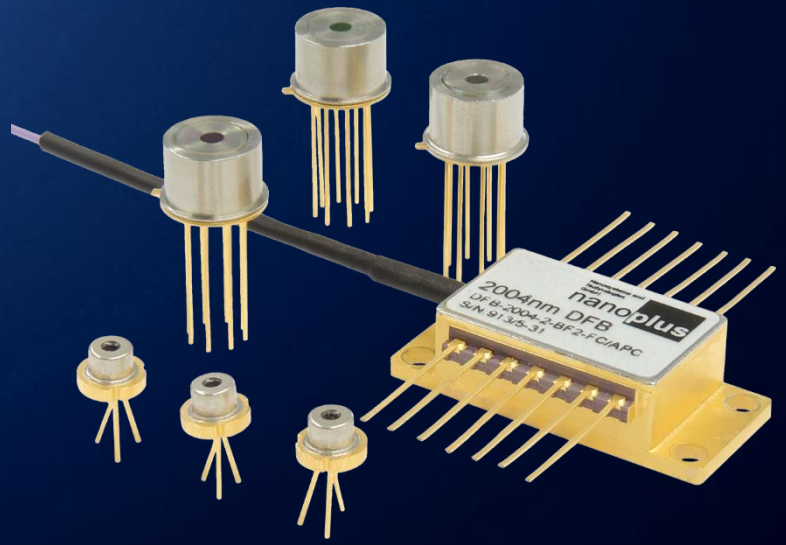
Nanosystems and Technologies GmbH

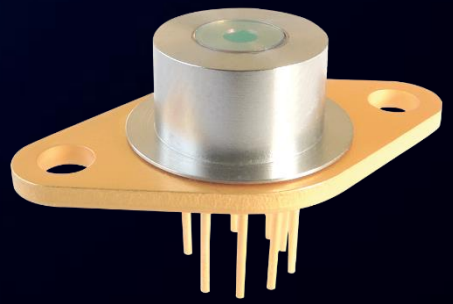
nanoplus

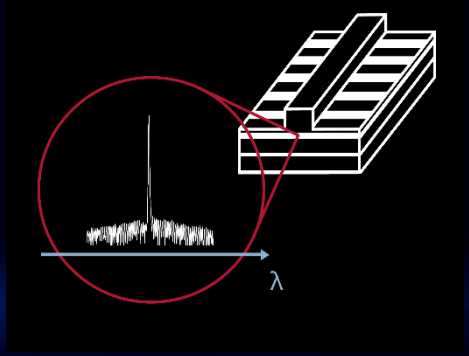
Mid-infrared light emitting diodes (MIR LED) from 3 µm to 6 µm

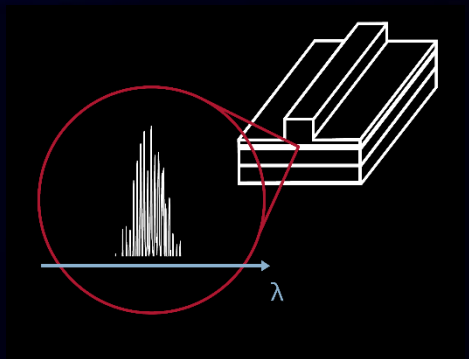
Sensalight Technologies

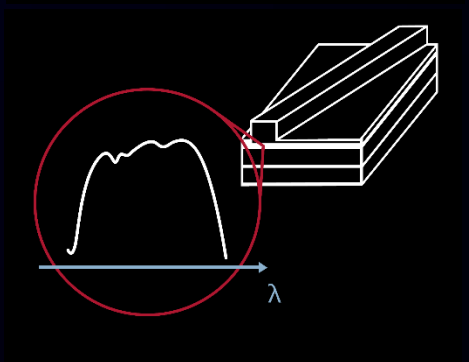


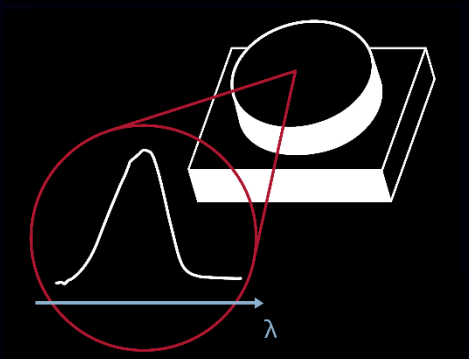












2021

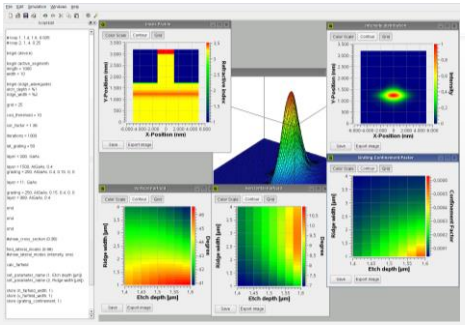
Dr. Johannes Koeth, CEO
nanoplus GmbH
Nanosystems and Technologies
Oberer Kirschberg 4
D-97218 Gerbrunn

MEMBER of EPIC

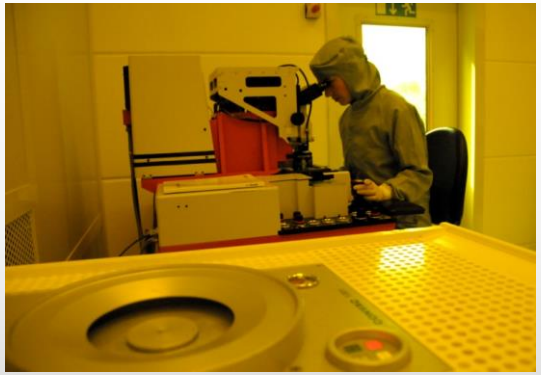
full vertical integration

Nanosystems and Technologies GmbH
nanoplus

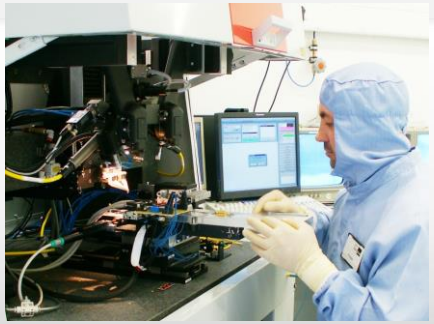
Material
Design
Simulation
Epitaxy



Device Processing



Device mounting



Device Burn-In and Characterisation

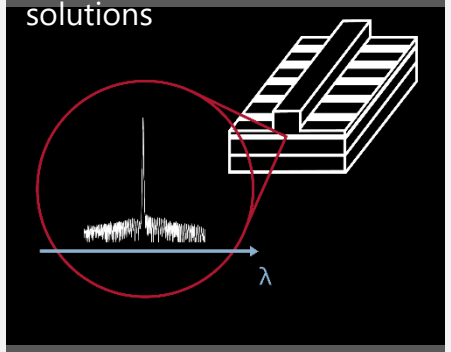
our products

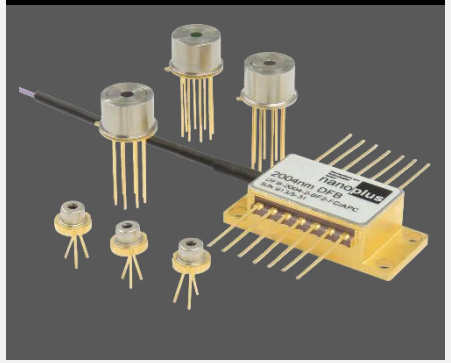
Nanosystems and Technologies GmbH
nanoplus

DFB Laser

- wavelengths:
  760 nm – 14.000 nm
  (DL, ICL, QCL)

- customer-specific solutions

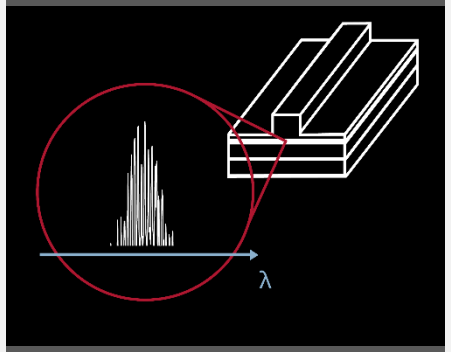




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

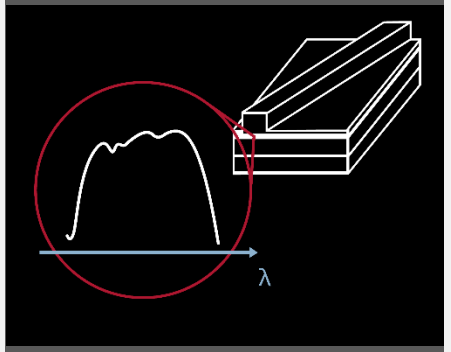
- up to 1 W cw

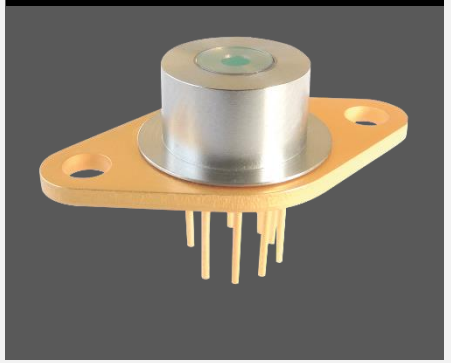


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT

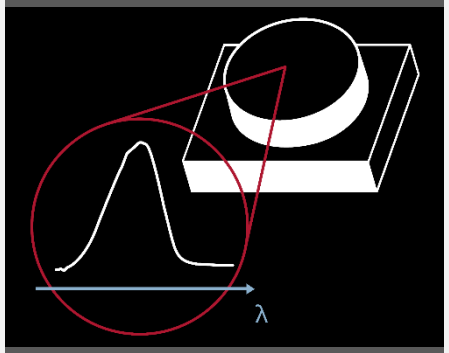


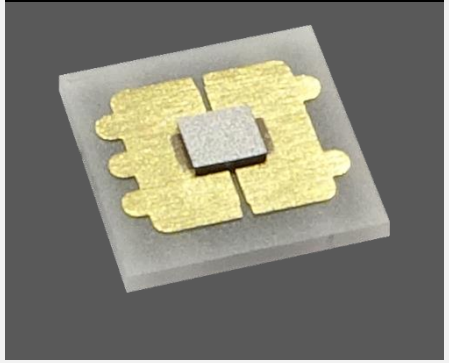


MIR-LED

- wavelengths:
  2800 nm – 6500 nm

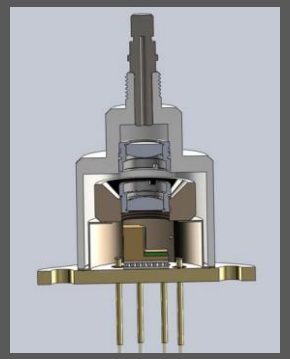
- cw & RT

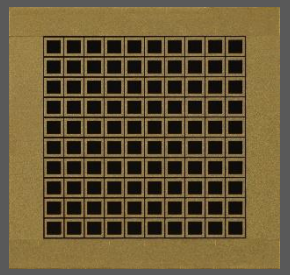




more...

- custom packaging
- collimation
- technology development
- lithography service





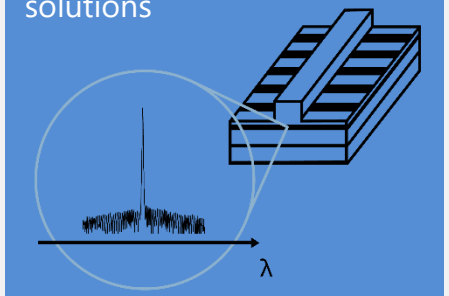
our products

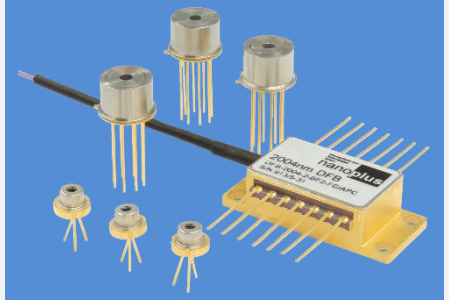
Nanosystems and Technologies GmbH
nanoplus

DFB Laser

- wavelengths:
  760 nm – 14.000 nm
  (DL, ICL, QCL)

- customer-specific solutions

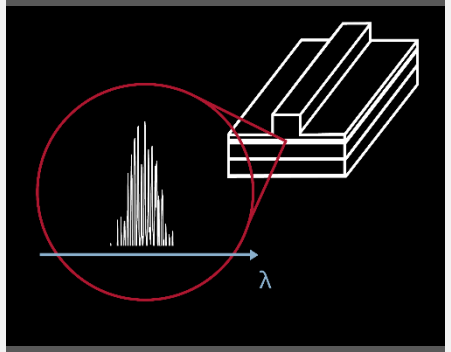




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

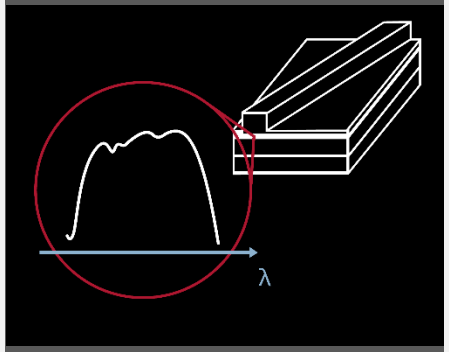
- up to 1 W cw

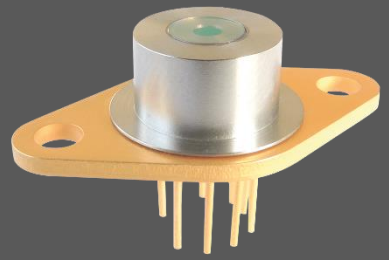


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT

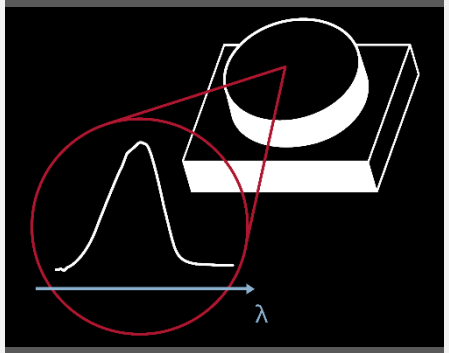


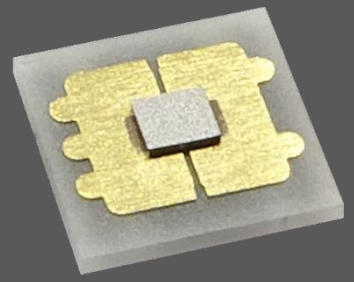


MIR-LED

- wavelengths:
  2800 nm – 6500 nm

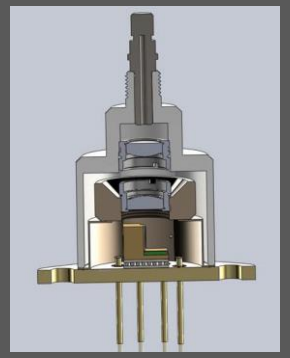
- cw & RT

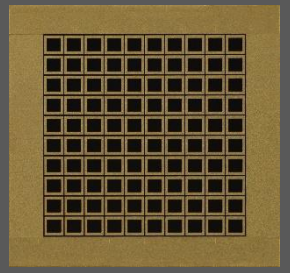




more...

- custom packaging
- collimation
- technology development
- lithography service

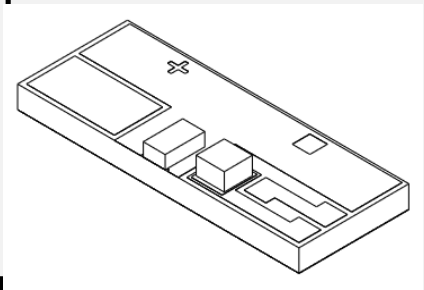


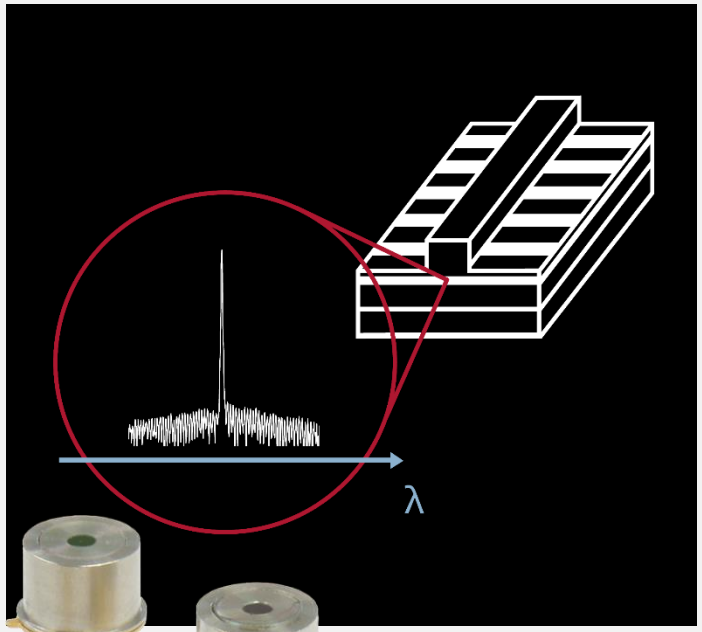


DFB Semiconductor Laser

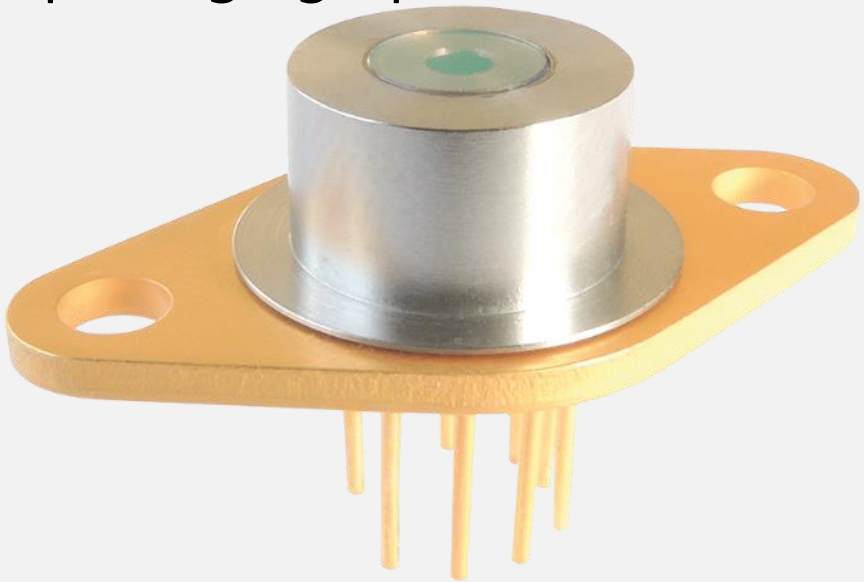
Nanosystems and Technologies GmbH
nanoplus

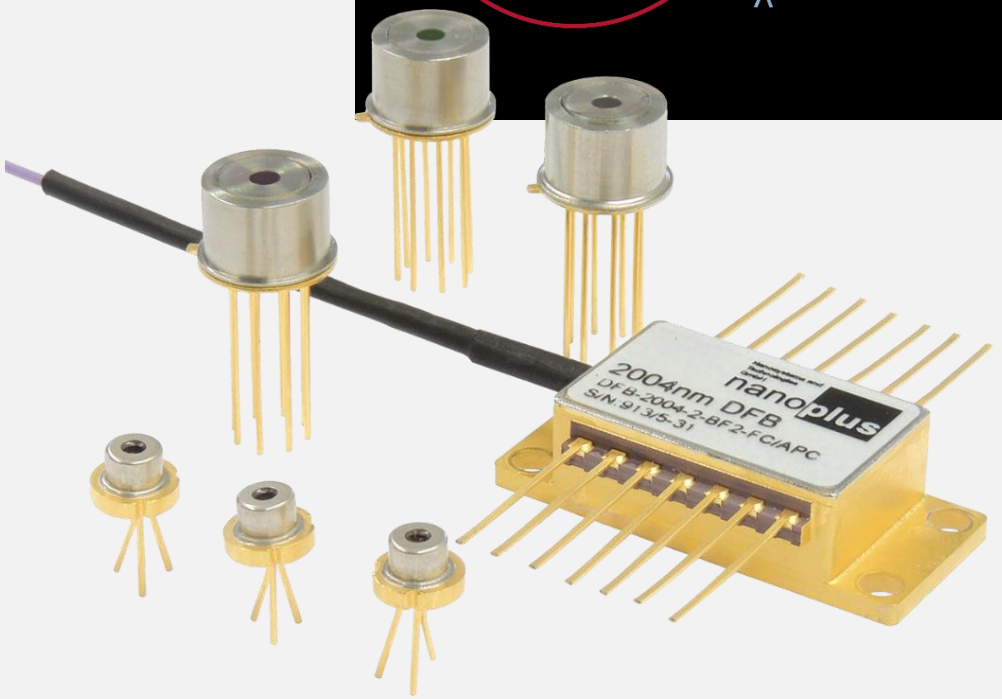
→ Diode-Laser (DL): 760 nm … 2900 nm
→ Interband Cascade Laser (ICL): 2800 nm … 6500 nm
→ Quantum Cascade Laser (QCL): 6 µm … 14 µm





large tuning coefficient
high-power
customer-specific solutions for every wavelength
various packaging options w/wo TEC and NTC





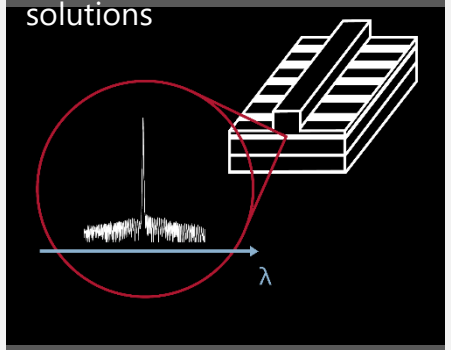
our products

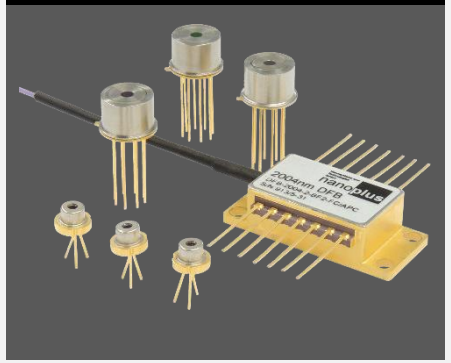
Nanosystems and Technologies GmbH
nanoplus

DFB Laser

- wavelengths:
  760 nm – 14.000 nm
  (DL, ICL, QCL)

- customer-specific solutions

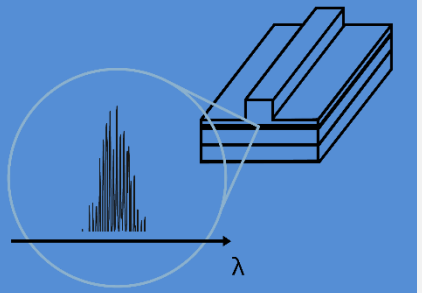




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

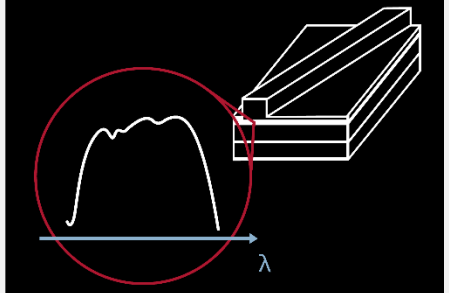
- up to 1 W cw

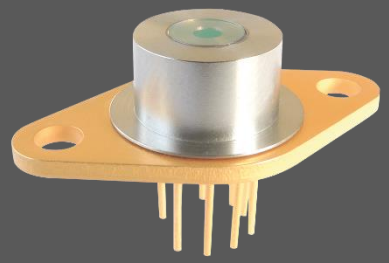


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT

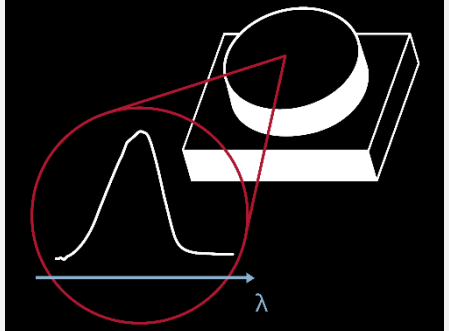


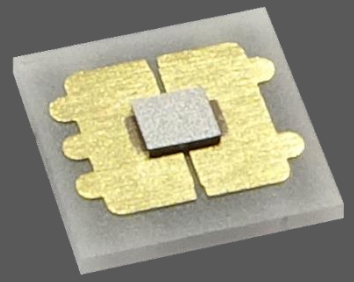


MIR-LED

- wavelengths:
  2800 nm – 6500 nm

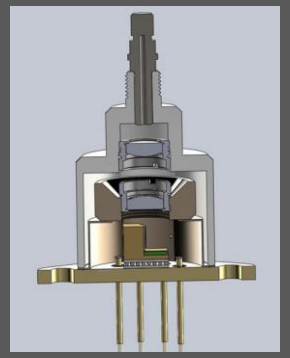
- cw & RT

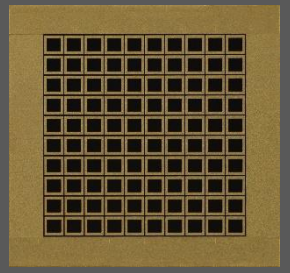




more...

- custom packaging
- collimation
- technology development
- lithography service



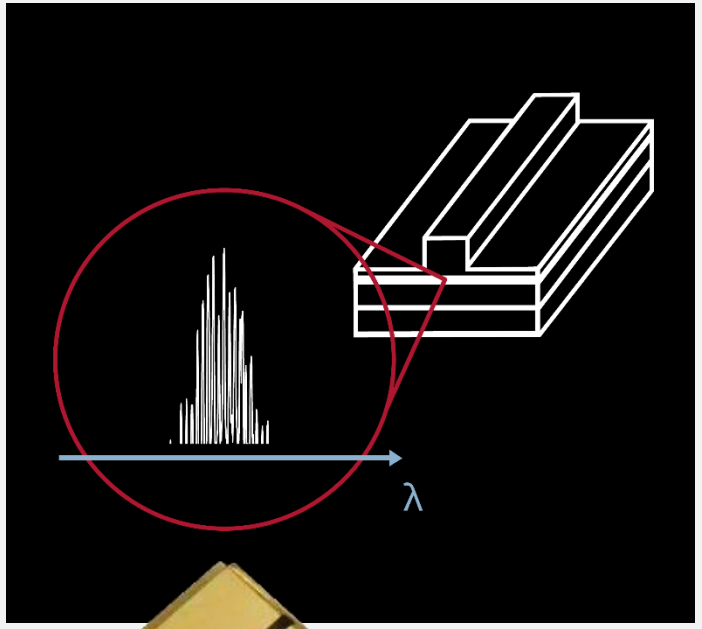


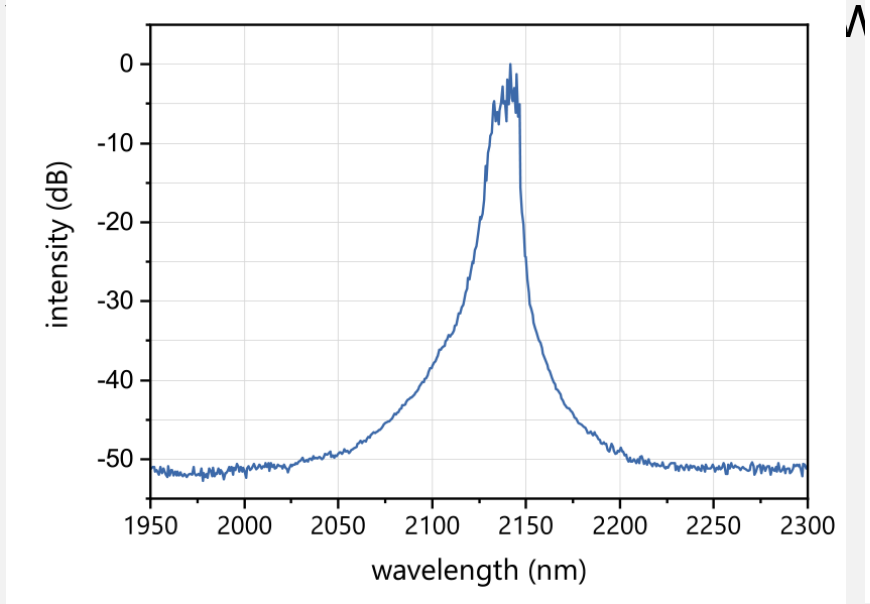
Fabry-Pérot Laser Diode

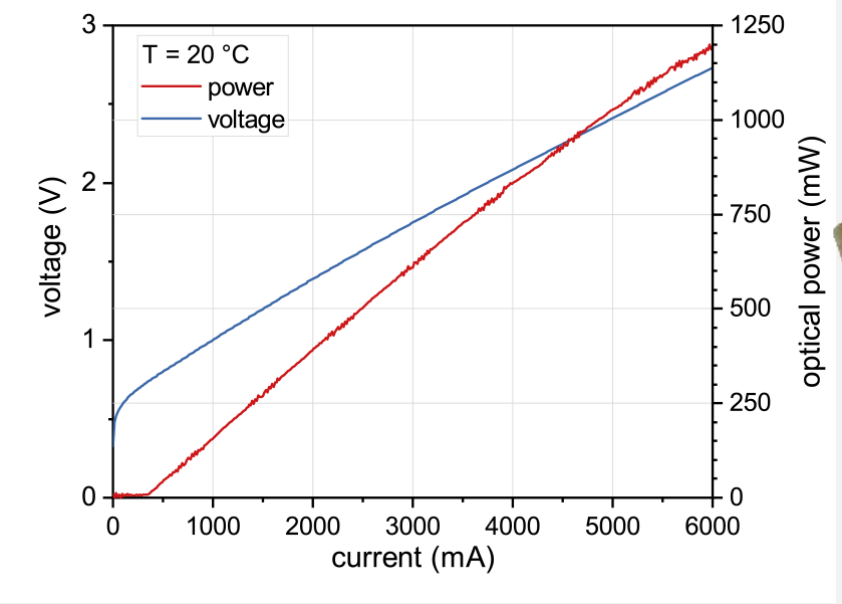
Nanosystems and Technologies GmbH
nanoplus

→ Diode Laser: 760 nm … 2900 nm
→ Interband Cascade Laser (ICL): 2800 nm … 6500 nm
→ Quantum Cascade Laser (QCL): 6 µm … 14 µm

high-power option up to **1 W**
broadband; customer-specific solutions for every wavelength







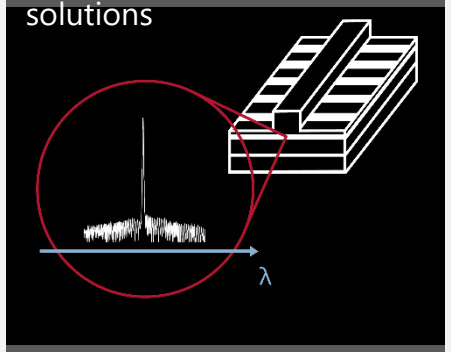
our products

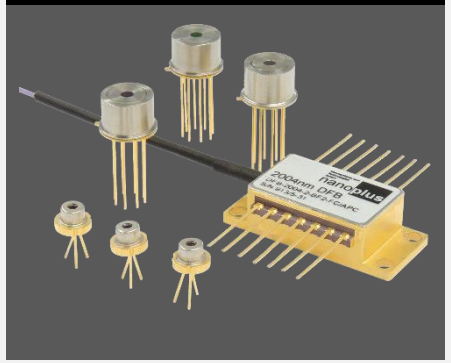
Nanosystems and Technologies GmbH
nanoplus

DFB Laser

- wavelengths:
  760 nm – 14.000 nm
  (DL, ICL, QCL)

- customer-specific solutions

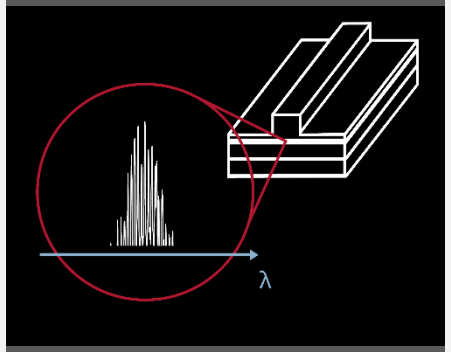




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

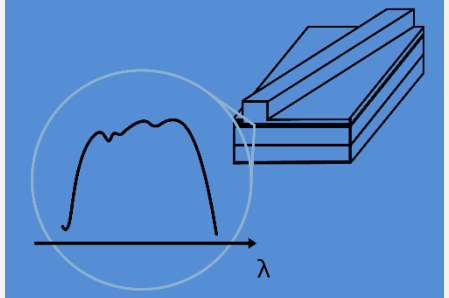
- up to 1 W cw

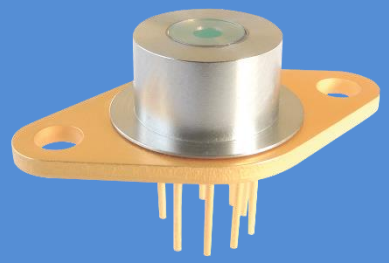


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT





MIR-LED

- wavelengths:
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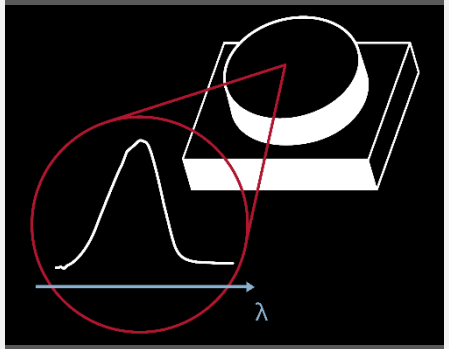
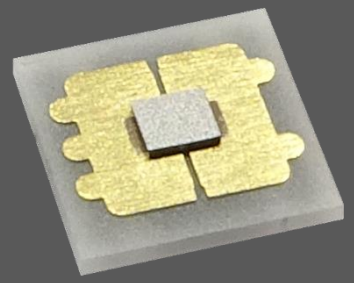
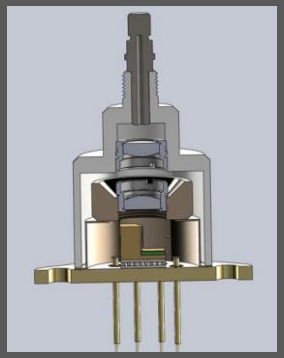
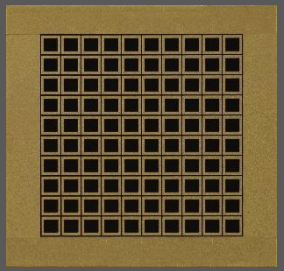




more...

- custom packaging
- collimation
- technology development
- lithography service



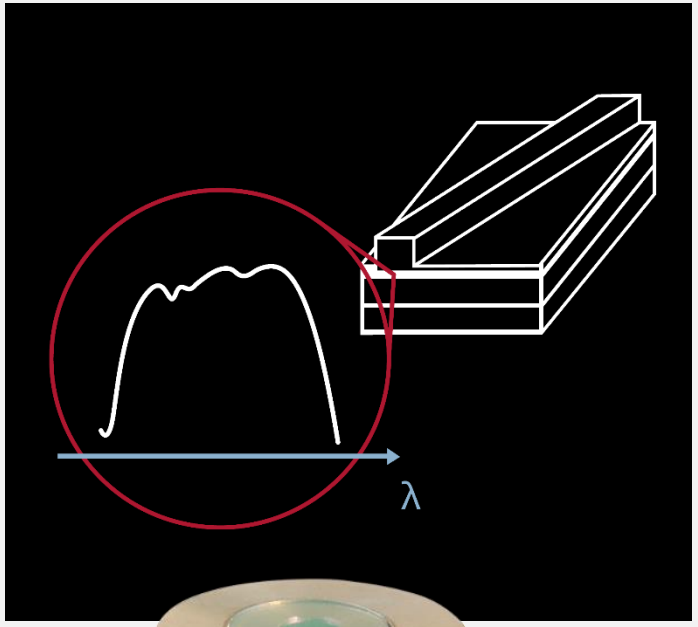


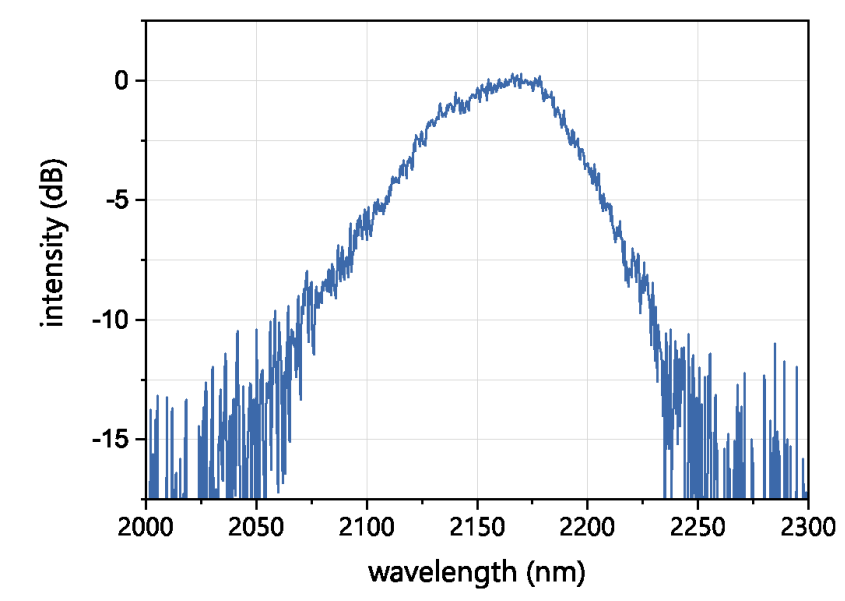
Superluminescent Diode

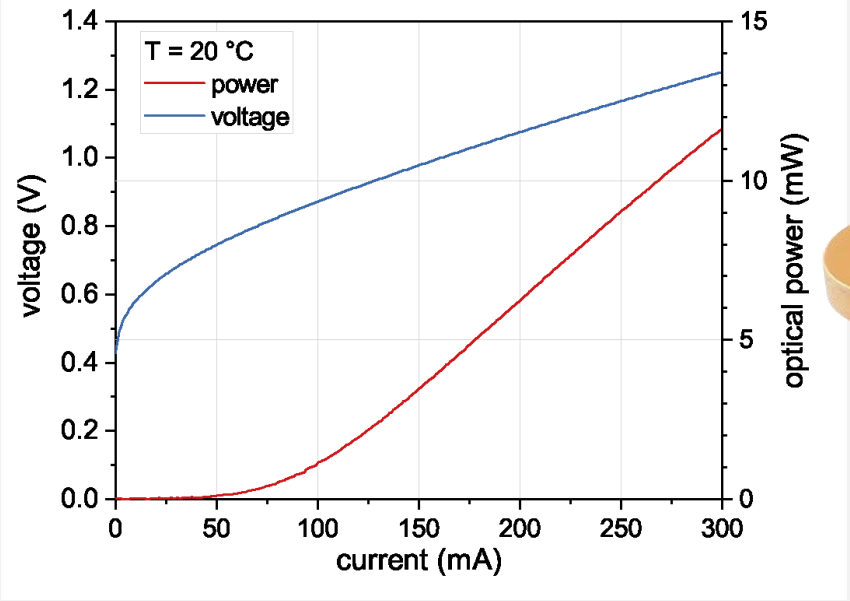
Nanosystems and Technologies GmbH
nanoplus

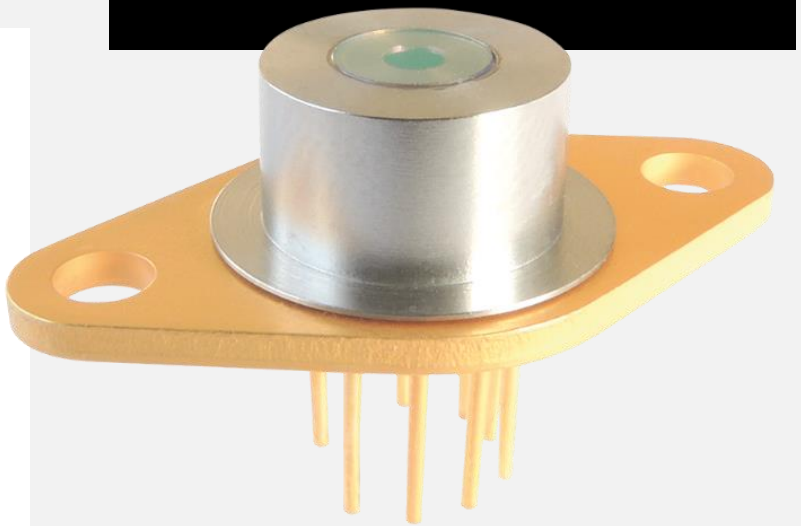
→ SLD: 760 nm … 2900 nm

high-power
broadband
customer-specific solutions for every wavelength
small footprint
various packaging options w/wo TEC and NTC









our products

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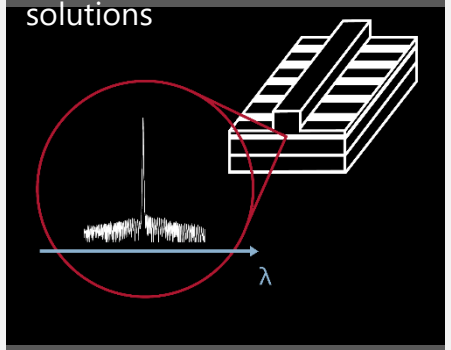
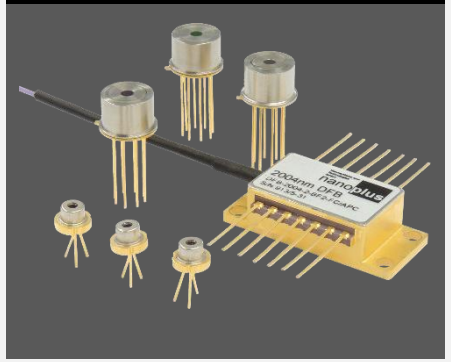
DFB Laser

- wavelengths:
  760 nm – 14.000 nm
  (DL, ICL, QCL)

- customer-specific solutions

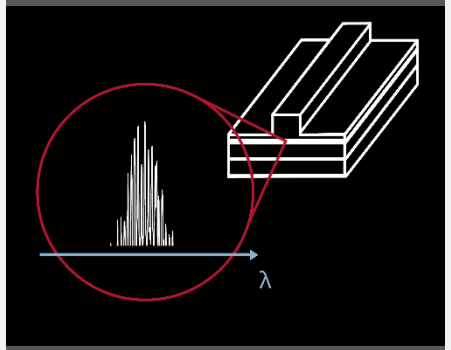




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

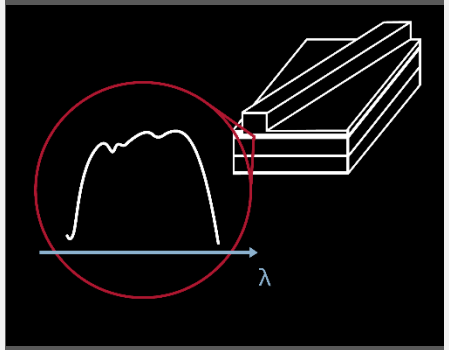
- up to 1 W cw

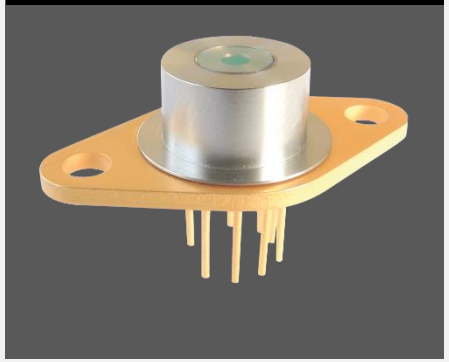


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT

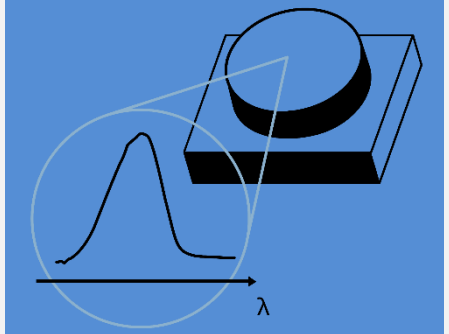


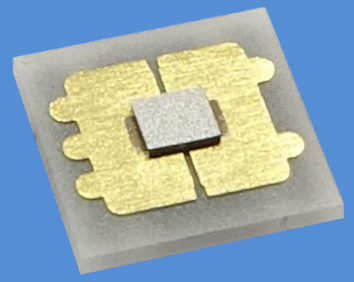


MIR-LED

- wavelengths:
  2800 nm – 6500 nm

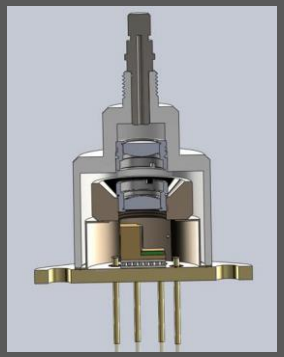
- cw & RT

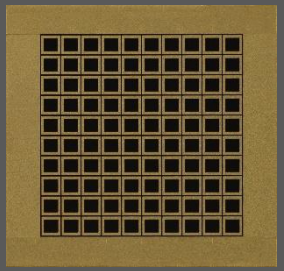




more...

- custom packaging
- collimation
- technology development
- lithography service





MIR-LED

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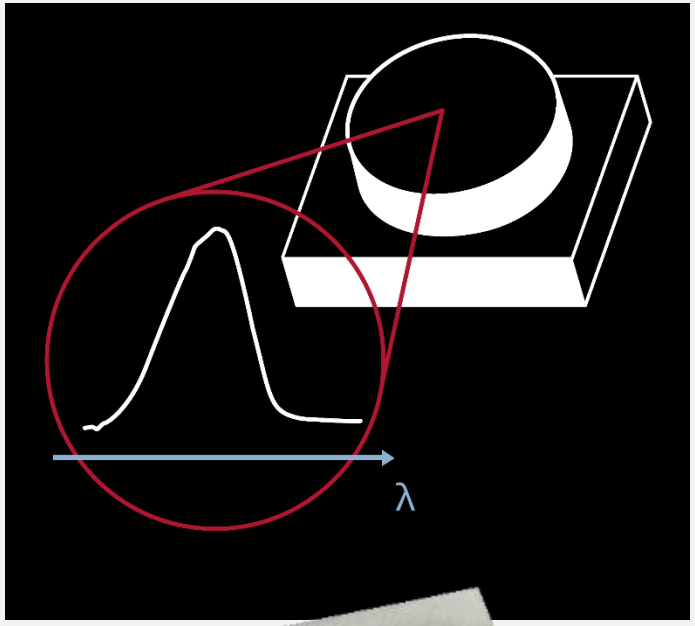
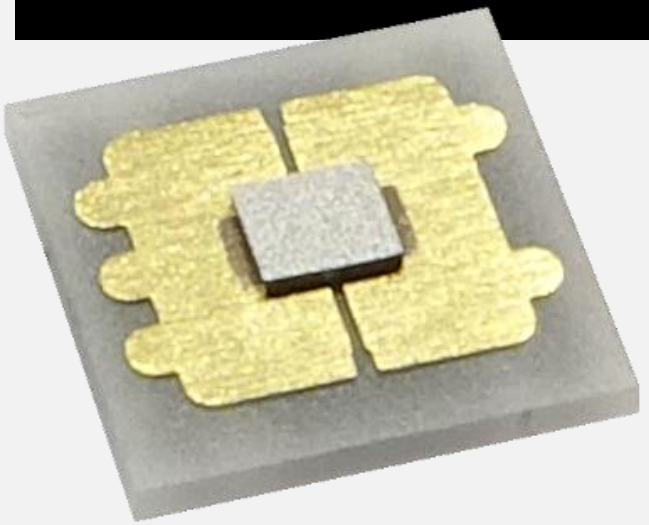
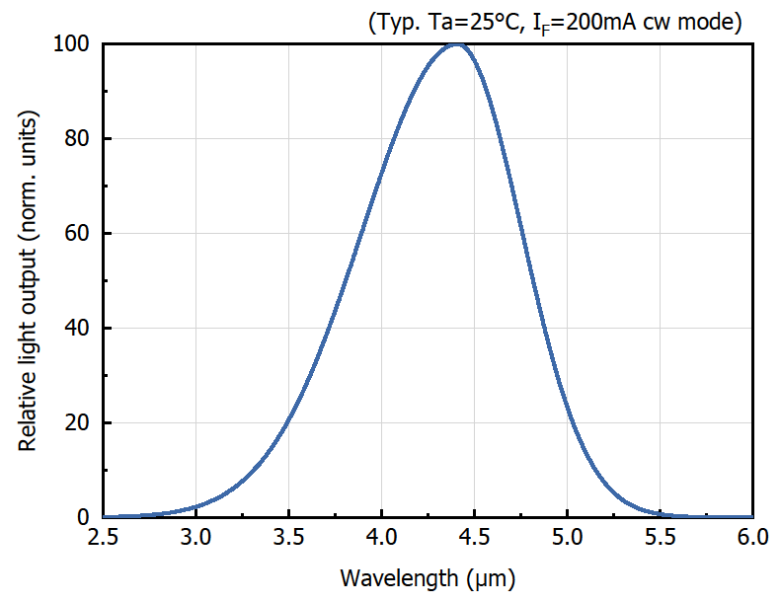
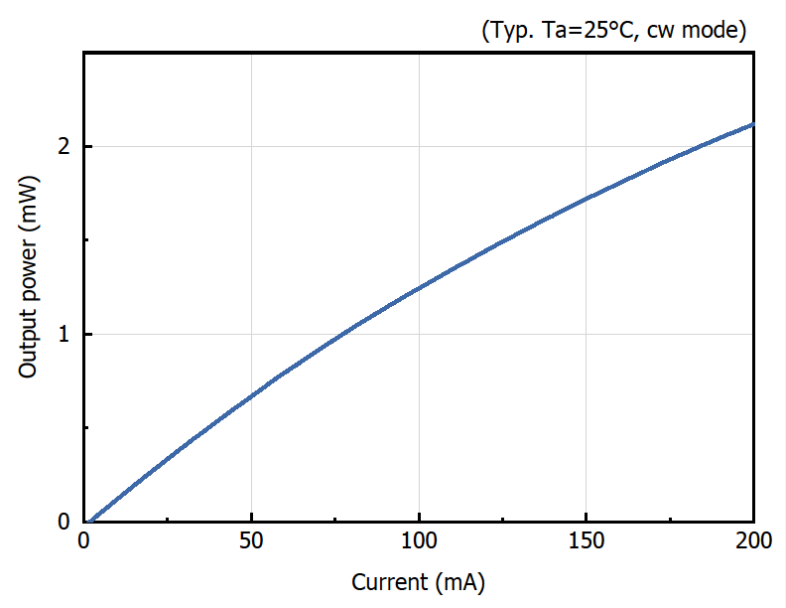
→ Mid InfraRed (Interband Cascade) LED: 2800 nm … 6500 nm



<u>true cw</u> operation at RT
high-power >1mW @ low power consumption
customer-specific solutions for every wavelength
various packaging options w/wo TEC and NTC







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Nanosystems and Technologies GmbH
nanoplus

DFB Laser

- wavelengths:
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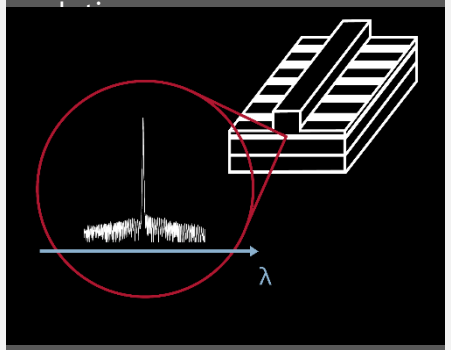
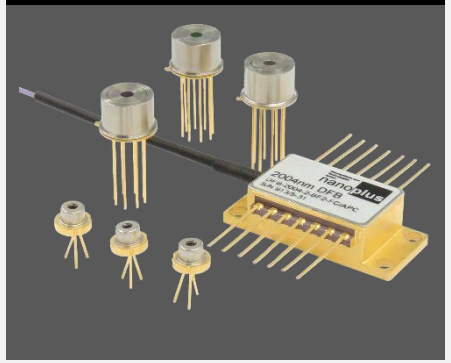
  (DL, ICL, QCL)

- customer-specific

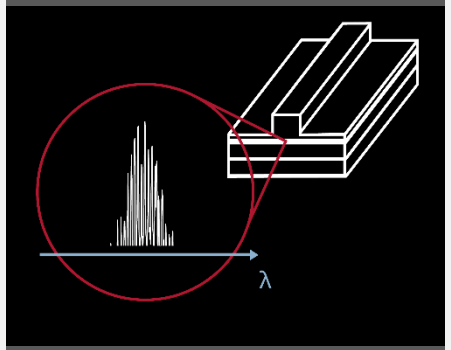




Fabry-Pérot LD

- wavelengths:
  760 nm – 14.000 nm

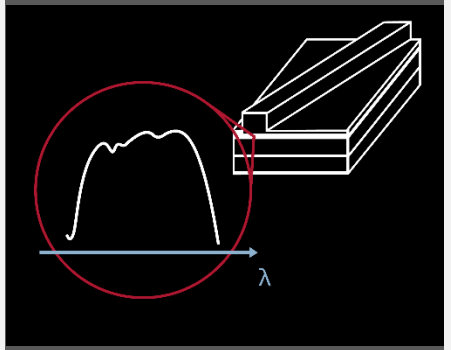
- up to 1 W cw

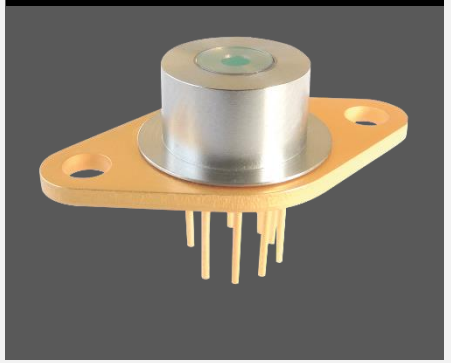


SLD

- wavelengths:
  760 nm – 2900 nm

- cw & RT

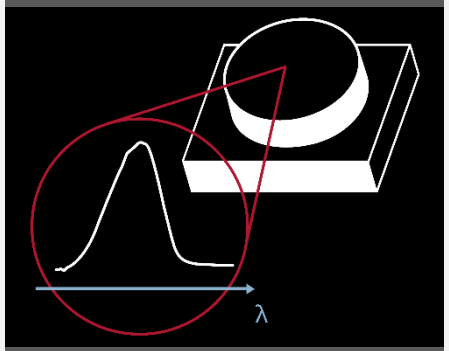


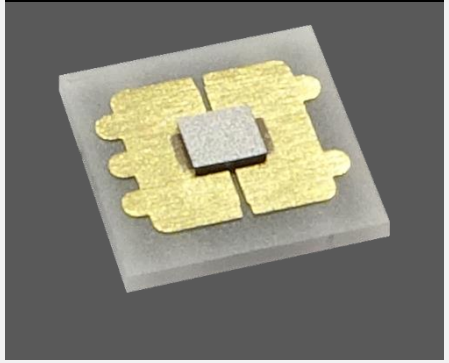


MIR-LED

- wavelengths:
  2800 nm – 6500 nm

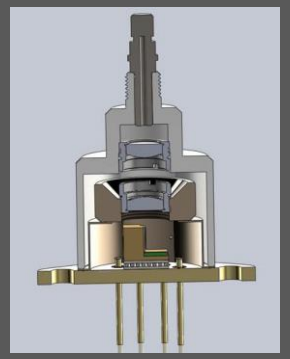
- cw & RT

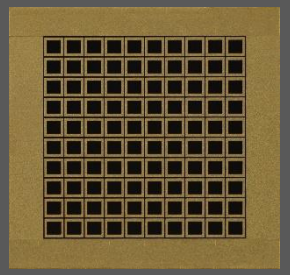


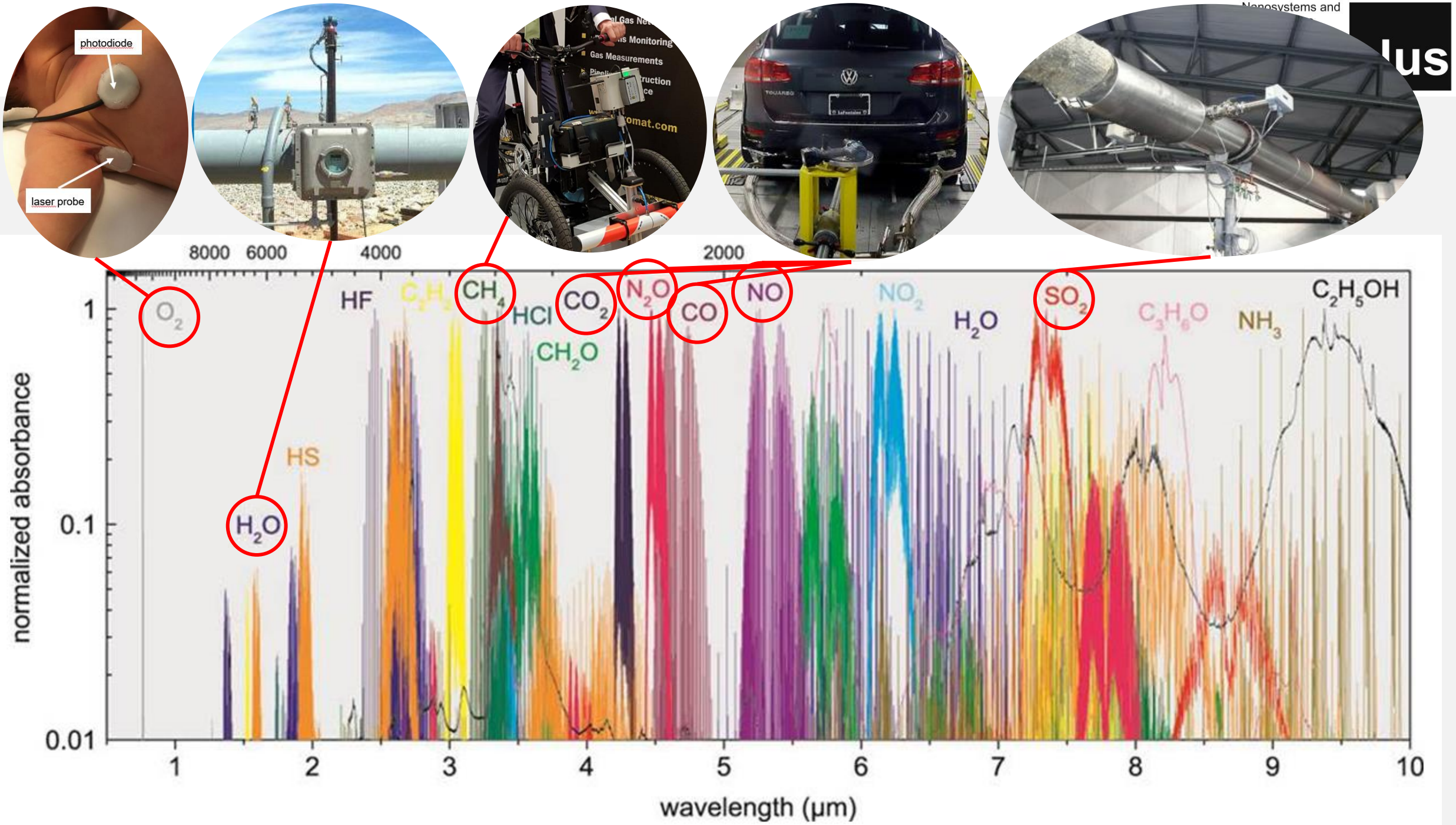


more...

- custom packaging
- collimation
- technology development
- lithography service






photodiode
laser probe
Gas Measurements
omat.com
8000
6000
4000
2000
O2
HF
C2H2
CH4
HCl
CO2
N2O
CO
NO
NO2
H2O
SO2
C3H6O
NH3
C2H5OH
CH2O
HS
H2O
normalized absorbance
1
0.1
0.01
1
2
3
4
5
6
7
8
9
10
wavelength (μm)

markets for nanoplus

Nanosystems and Technologies GmbH
nanoplus

Sensalight Technologies

small sensors/wearables/ daily use

10^6

high-volume, low margins, end user market

point of care/portable devices/..

10^5

one defined functionality in a defined environment

fixed point analyzer

10^3

complex expensive analyzers in a varity of installations, high margins along the value chain

ongoing development projects with partners from industry

tunable diode laser spectroscopy market

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