Leibniz Ferdinand Braun Institut

Ferdinand-Braun-Institut gGmbH
Leibniz-Institut für Höchstfrequenztechnik
Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany
www.fbh-berlin.de

Contact
sales@fbh-berlin.de
+49.30.6392-2634

Versatile laser source – miniaturized MOPA on CCP

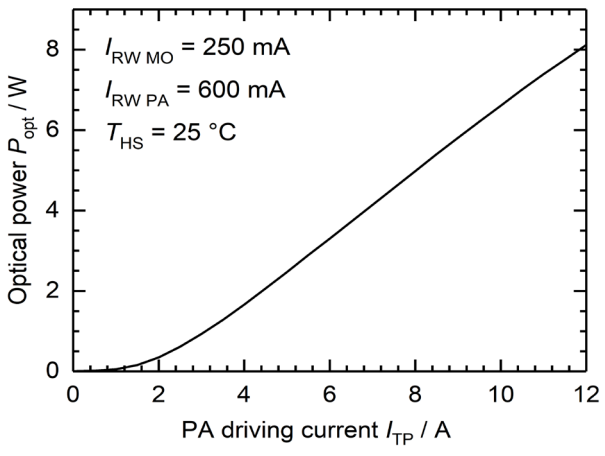
Lasers generating high optical power with a small spectral width and high beam quality are key components for a variety of applications. They are used for medical, metrological as well as quantum applications.

FBH scientists have developed a suitable miniaturized master oscillator power amplifier (MOPA) that meets the often required optical characteristics. With a small spatial footprint, it increases the applicability towards more compact and even handheld devices. For an increased resilience against optical feedback, the MOPA is equipped with a miniaturized optical isolator. Both MO and PA are based on FBH developed and manufactured diode edge emitters. The MO is spectrally stabilized via an internal distributed Bragg reflector (DBR). A tapered amplifier was chosen for the PA.

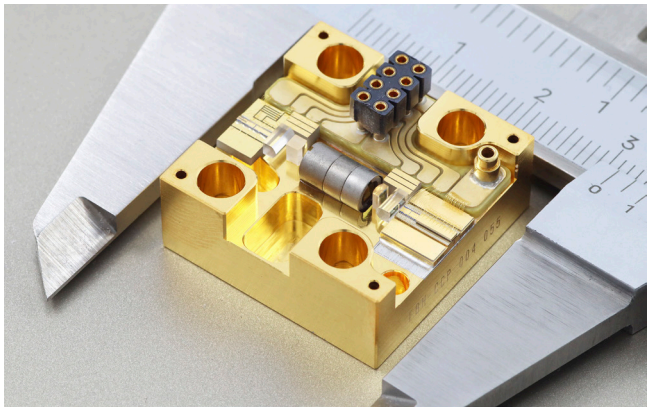
The compact CCP3 mount offers high flexibility and therefore simple integration in measurement setups and systems. Optionally, the MOPA can also be integrated into a closed butterfly housing.

MOPA specifications

- footprint: 25 x 25 mm^2
- high optical output power: P_{opt} > 8 W (cw)
- custom NIR wavelengths (single frequency): 980 nm - 1180 nm
- linewidth: < 100 MHz
- beam quality: M^2 < 2
- optical isolation: (PA to MO) > 60 dB



MOPA characteristic power output curve as function of PA driving current at an emission wavelength of 1120 nm.



MOPA with P_{opt} > 8 W output power.

Flexible wavelength adaption

Semiconductor light emitters offer a wide bandwidth of possible emission wavelengths. Hence, the presented concept is transferrable to FBH inhouse developed emitters in the spectral range of 620 nm to 1180 nm. Achievable output power levels and isolator performance may vary.

Profile

The Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) researches electronic and optical components, modules and systems based on compound semiconductors. In the field of III-V electronics, it manufactures high-frequency devices and circuits for communications, power electronics, and sensor technology. Moreover, FBH develops light sources from the visible to the UV spectral range: high-power diode lasers, UV light sources, and hybrid laser systems. Applications range from medical technology, materials processing and sensors to optical communications in space and integrated quantum technology. In close cooperation with industry, its research results lead to cutting-edge products.

The institute is a member of the Leibniz Association and part of Research Fab Microelectronics Germany (FMD).