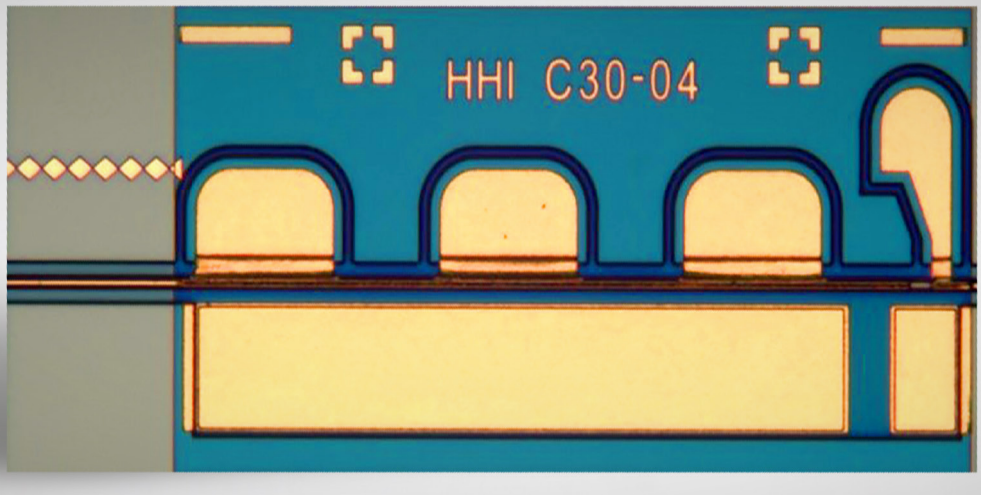
QD AND QW MODE-LOCKED LASERS AS COMB AND PULSE SOURCES

Fraunhofer HHI



AT A GLANCE

High performance buried heterostructure InAs/InP QD and InGaAsP/InP QW mode-locked lasers as comb and pulse sources

Features

- Wavelengths in O-, C-, L-Band
- > 33 channels > -3 dBm in the DWDM 50 GHz grid
- Combined laser modes RIN values of < -145 dB/Hz
- Individual mode RIN values of ≈ -130 dB/Hz
- < 500 fs pulses by using a simple SMF
- fully customizable

Applications

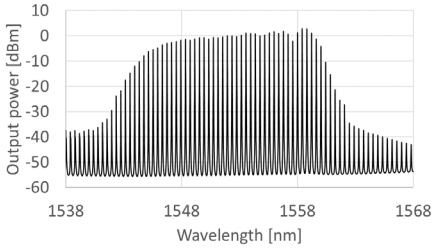
- Multiwavelength modulators in short reach transmission
- Phase controlled OFDM channels in long reach
- Pulse source with < 500 fs pulses

Device variants

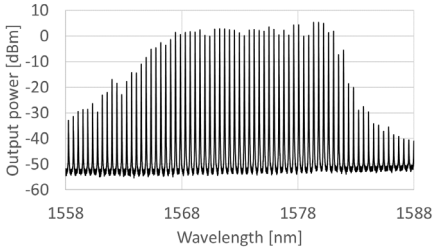
- Standard chip size 425 µm x 840 µm (for 50 GHz mode spacing)
- InAs/InP QDs or InGaAsP/InP QWs as active layers
- Optional:
  - Etched facets
  - Integrated heater stripe parallel for wavelength fine tuning of comb modes

Typical Performance

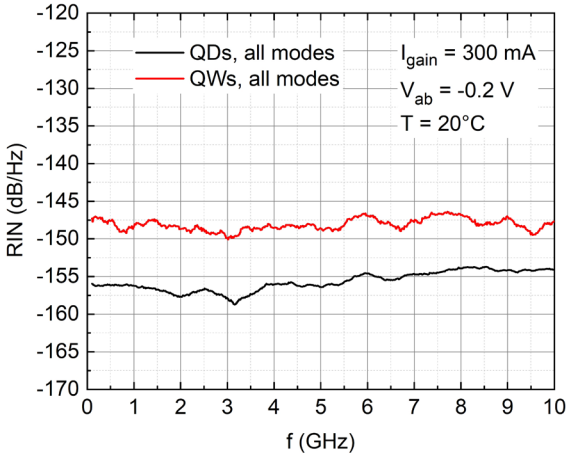
- Comb spectra with > 33 lines > -3 dBm
- Slope efficiency of ≈ 0.33 W/A
- Repetition frequency - 3 dB line-widths down to 60 and 140 kHz for QW and QD devices, respectively
- Individual mode optical linewidth of ≈ 0.6 and 14 MHz for QW and QD devices, respectively



Optical spectrum of the QD device with Igain = 300 mA and Vab = -0.2 V



Optical spectrum of the QW device with Igain = 300 mA and Vab = -0.2 V



RIN of all combined modes for the QD and QW devices, respectively

Dr. Martin Moehrle
Photonic Components

Phone +49 30 31002-724
martin.moehrle@hhi.fraunhofer.de

Fraunhofer Heinrich Hertz Institute
Einsteinufer 37, 10587 Berlin
Germany

www.hhi.fraunhofer.de/pc