

EPIC Members - New Product Release
November 2022



Advanced InP DFB Laser Sources for Silicon Photonics Hybrid Integration



8th Nov 2022

About Us

UK-based design and manufacturing, located in Glasgow, Scotland

100mm wafer fab with capacity of 5,000 wafer starts per year (2000m² class 50 facility)

ISO 9001 Certification

Key strategic supplier to many Fortune 100 and Silicon Valley customers

20 year history designing and manufacturing III-V photonic devices

End-to-end chip solutions from design to volume manufacture

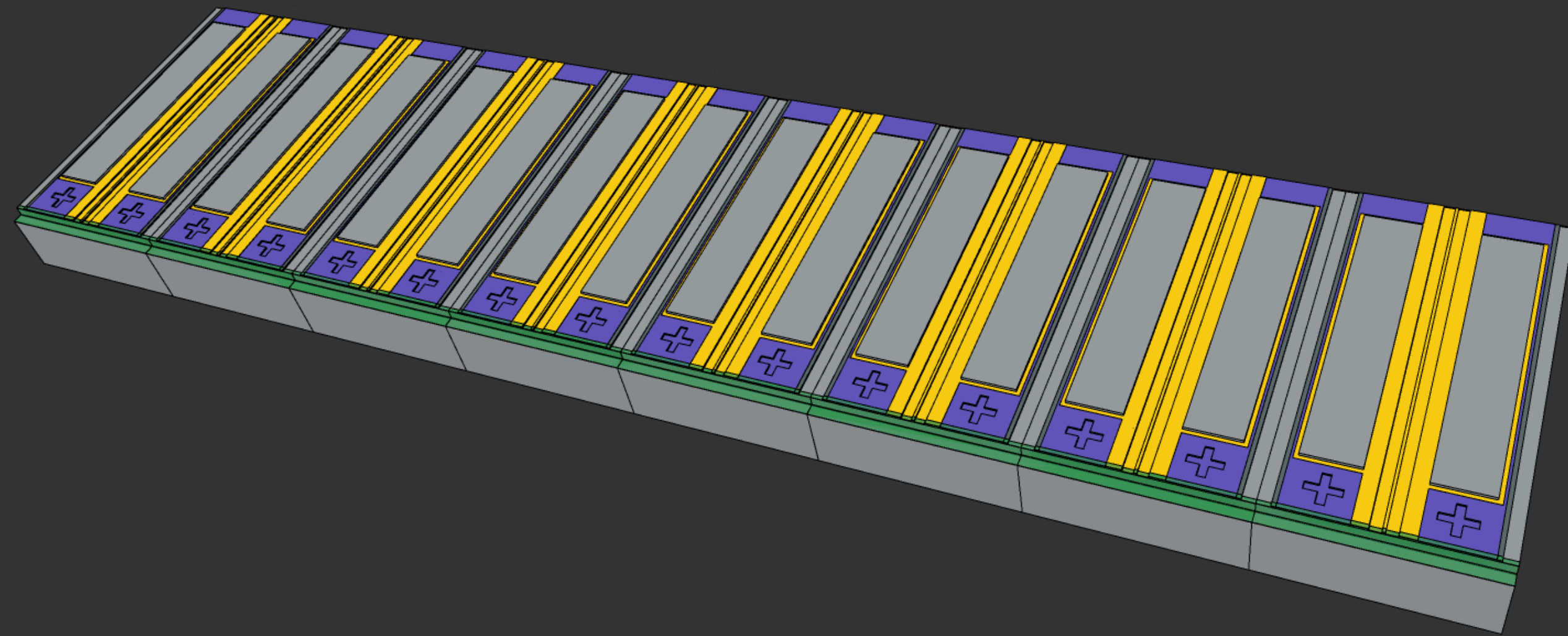
Over 80 staff and growing rapidly

Technology Expertise

- Integrated design and manufacturing services for a broad range of photonic devices: FP & DFB lasers, SOAs, RSOAs, Detectors
- Key player in the SiPh ecosystem
- World class InP100 manufacturing platform
 - Multiple commercial users
- Established volume supplier shipping over 1 million lasers per month
- **>45 million lasers in the field**



InP100 DFB Lasers: Optimised for Si Photonic Integration



- Vertical alignment surfaces. +/- 5nm height accuracy to optical mode centre. (z-axis)
- Etched facets with self-aligned front-side fiducials to both ridge (x-axis) and facet (y-axis).
- Metal pads optimised for flip chip bonding. Optional AuSn solder.
- Back side alignment fiducials and chip IDs

Multi emitter arrays for integration with multiple Si input waveguides.

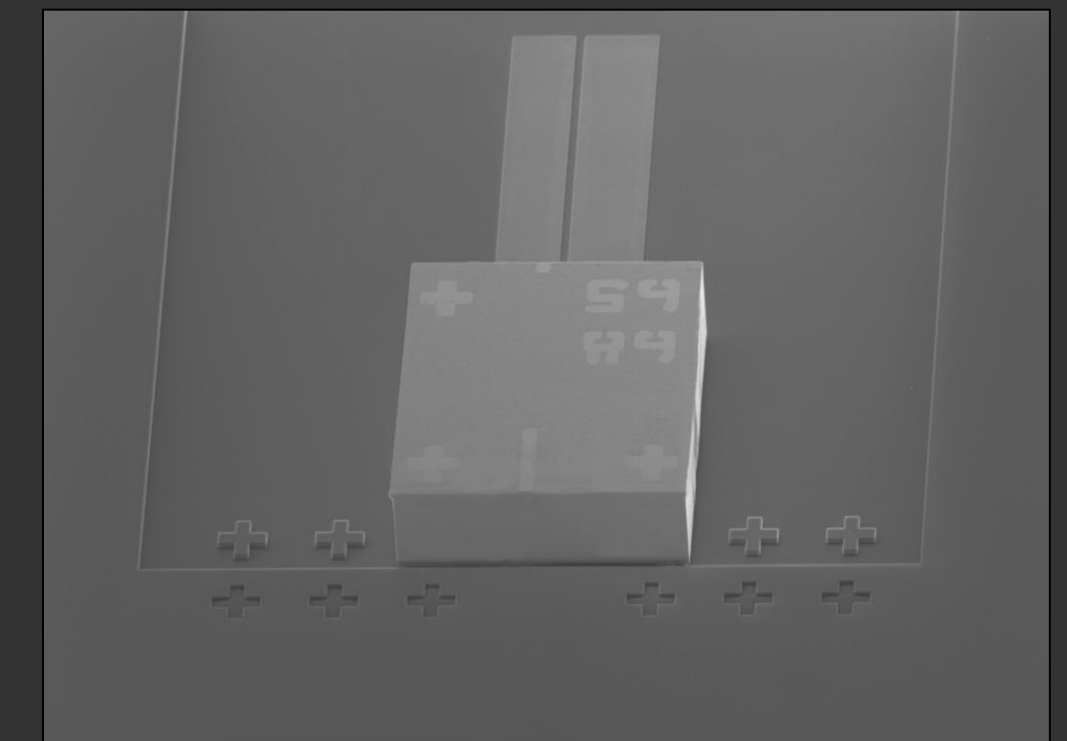
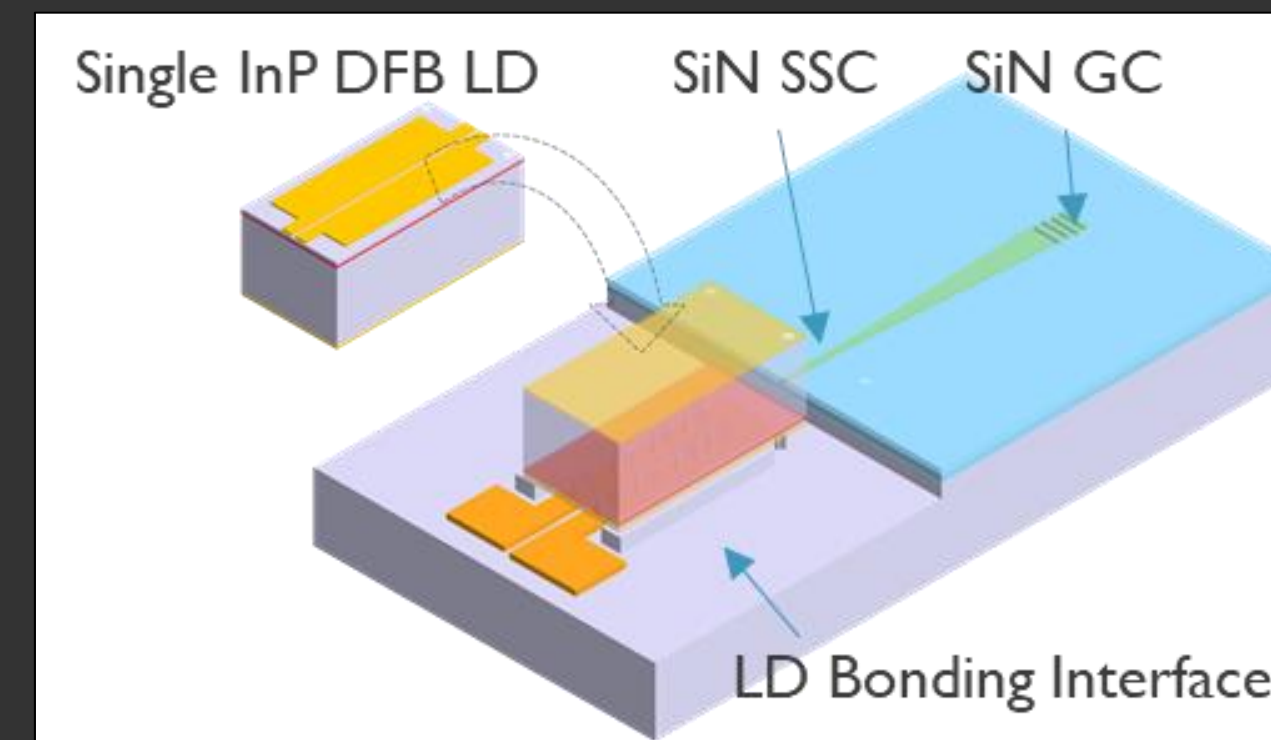
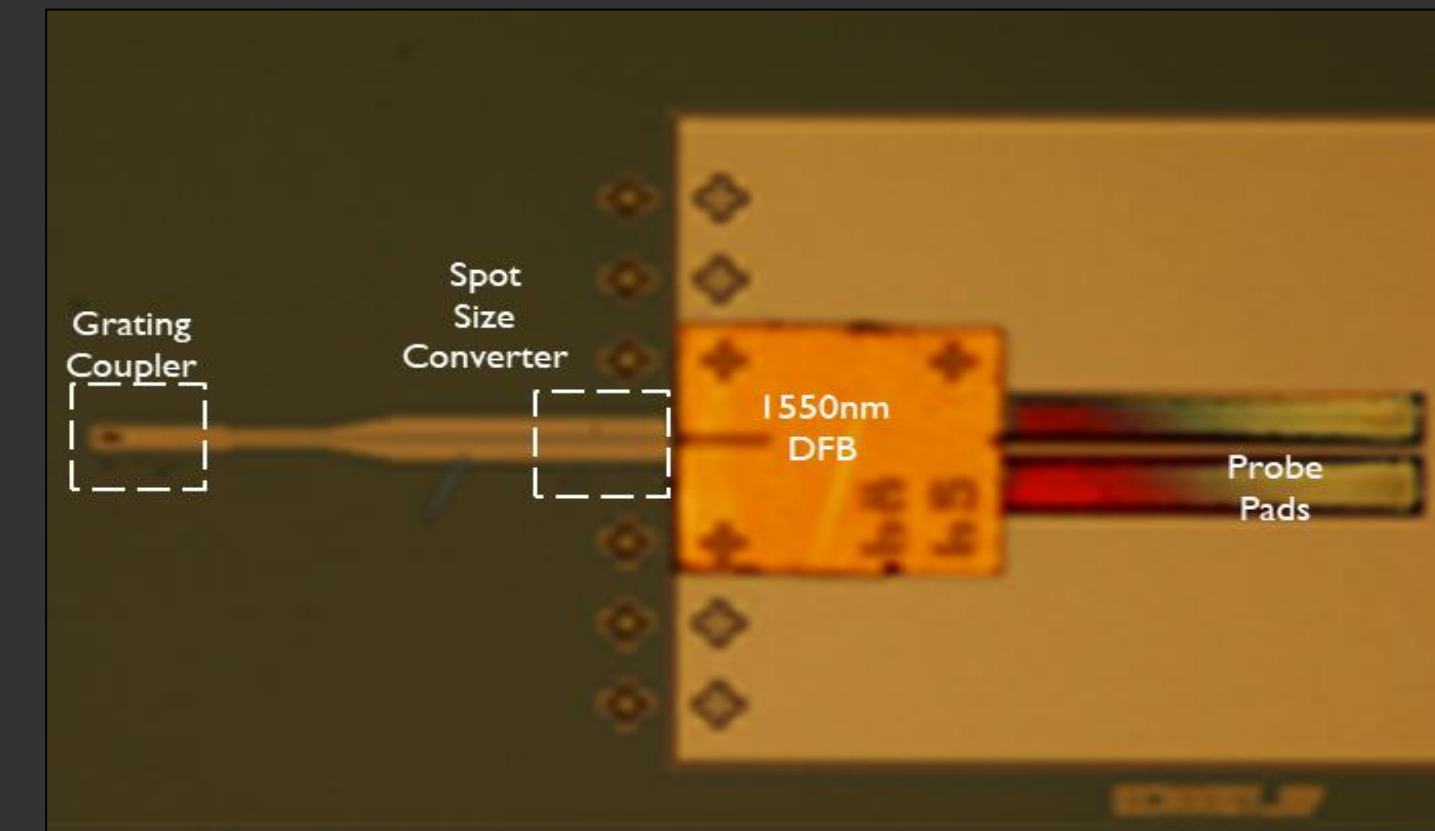
Sivers Photonics InP laser sources being integrated into all commercial SiPh Platforms

InP DFB lasers bonded onto imec Si/SiN Platform wafers

Initial results from first bonded devices:

- Single InP DFB lasers at wavelength ~1550nm
- Optical Power up to 40mW coupled into SiN waveguide
- High-Precision ($\leq 0.3\mu\text{m}$) Laser Assisted FC Bonder Tool
- High mechanical stability with epoxy underfill process
- Coupling efficiency of 1.5 ± 0.5 dB achieved
- FC-bonding of 4- and 8-channel O-band RSOA arrays (with 200GHz channel spacing) underway

More details available at the [workshop on Heterogeneous Photonic Integrated Circuits](#) (September 18, 9:00-12:30, room Shanghai)

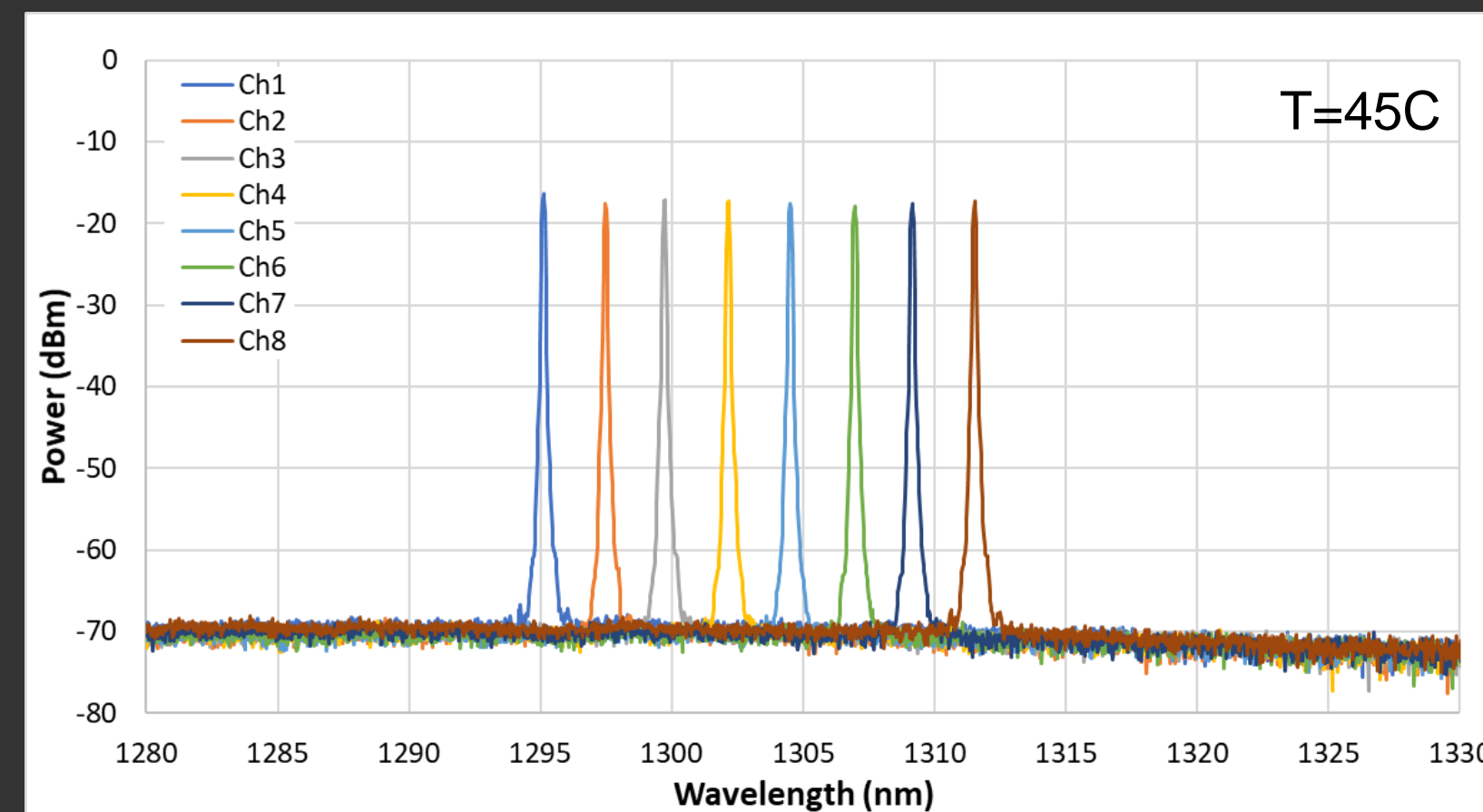
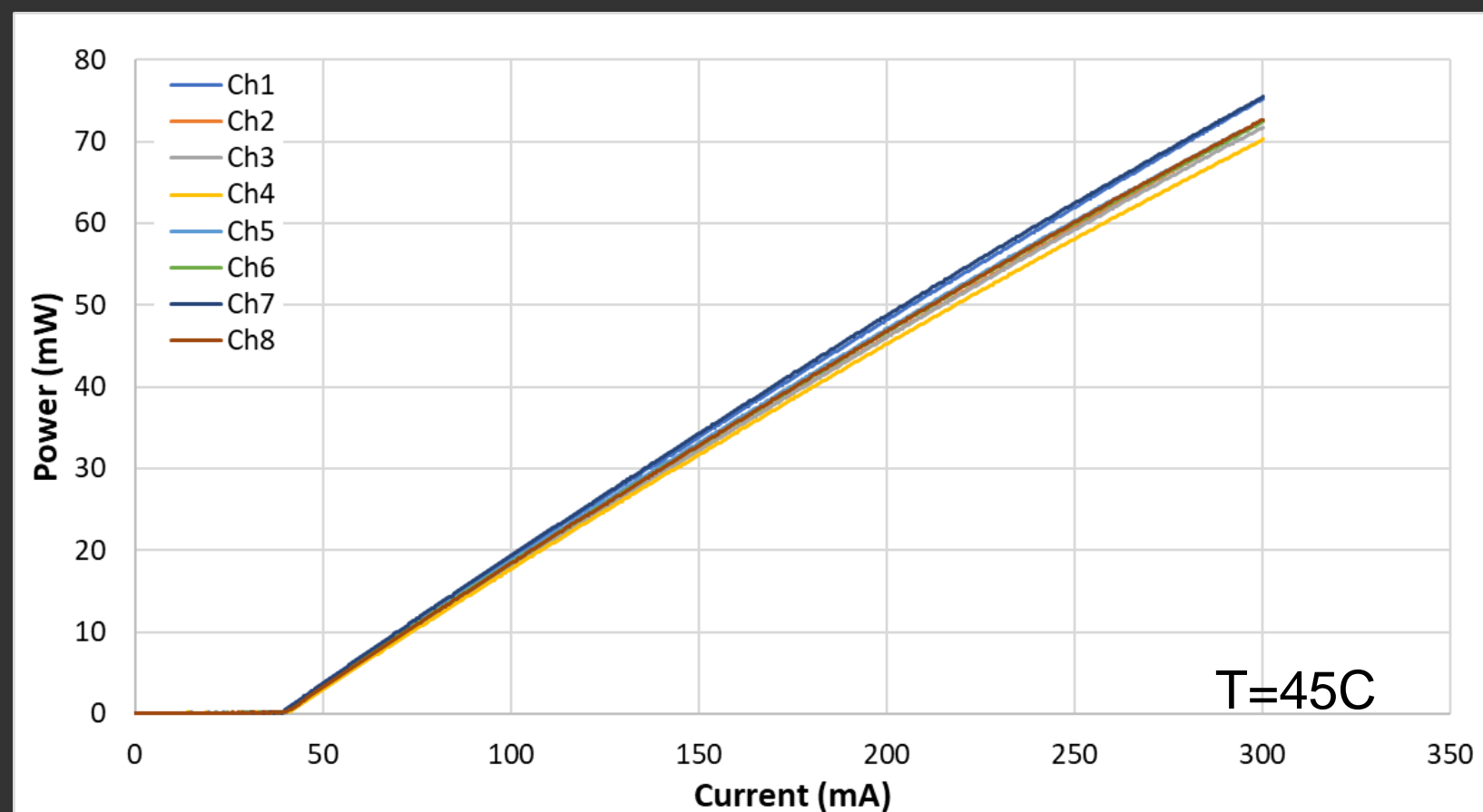
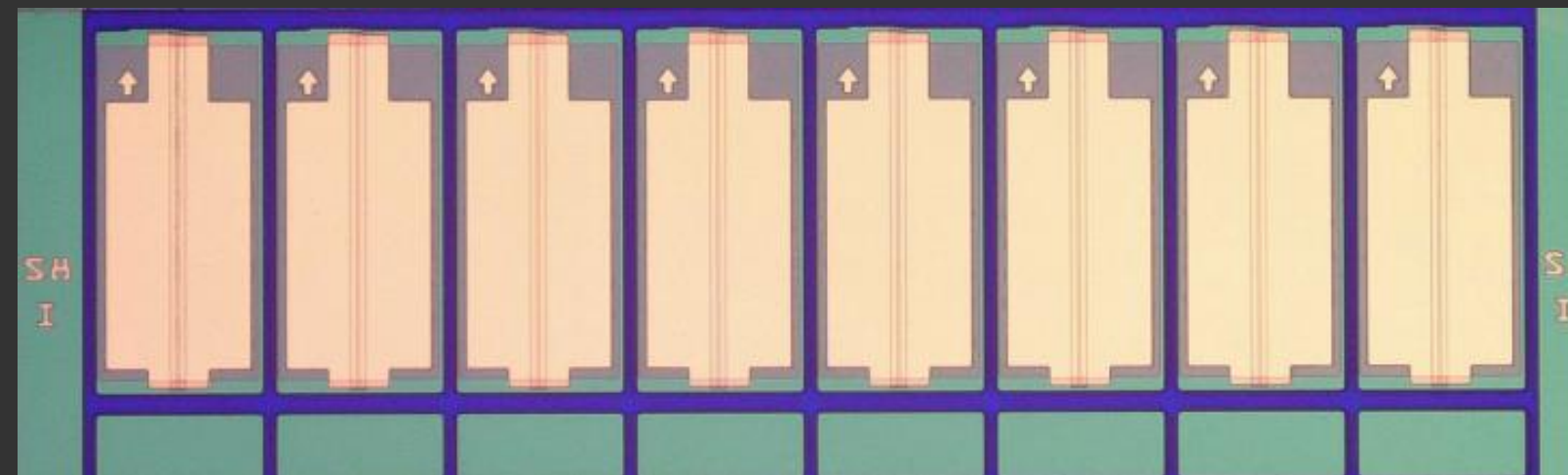


Custom DFB Laser Arrays for SiPh Applications

DFB laser diode arrays designed for use in CW-WDM MSA compliant applications

Key features

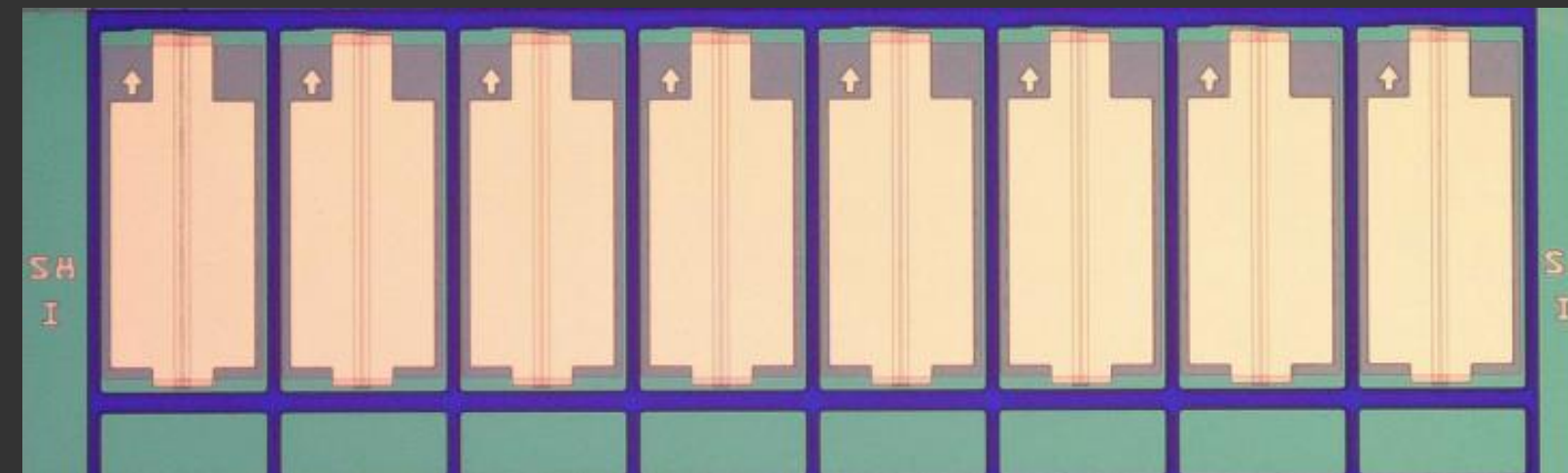
- > 50mW per channel CW operation
- 400GHz channel spacing around 1300nm
- Operating temp 20°C - 70°C
- AllnGaAs MQW active region
- Proven high reliability - GR468 qualification
- Suitable for non-hermetic applications



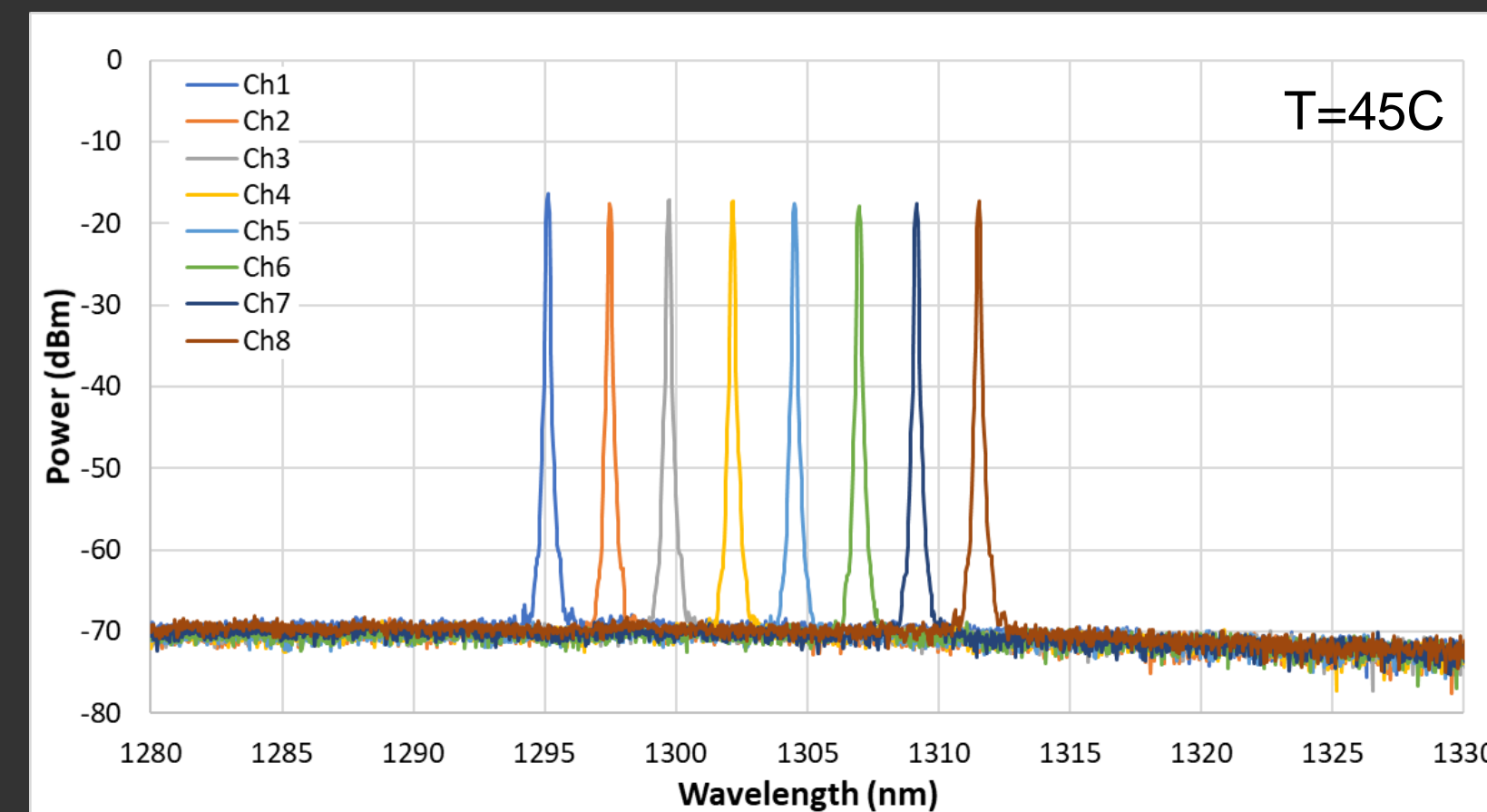
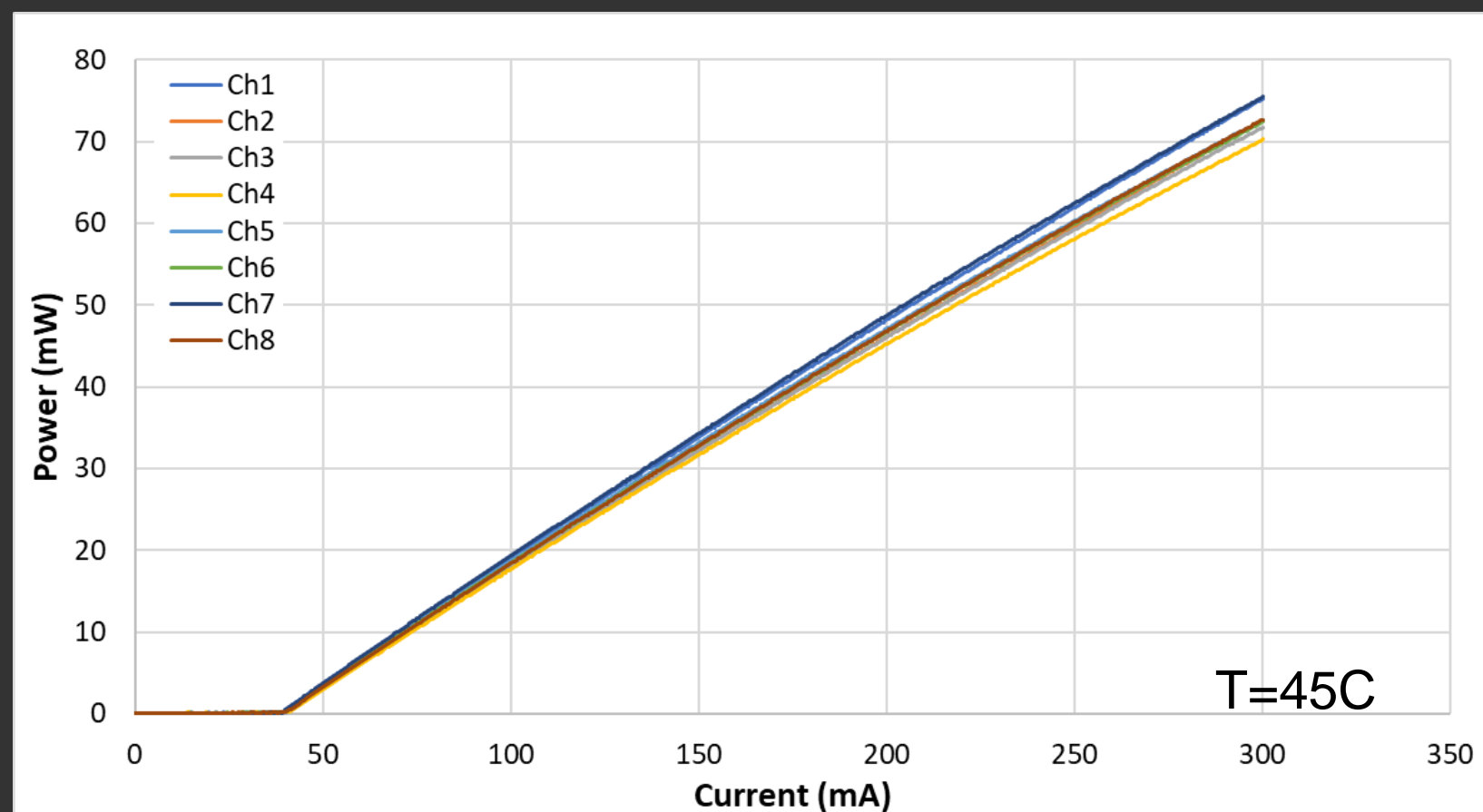
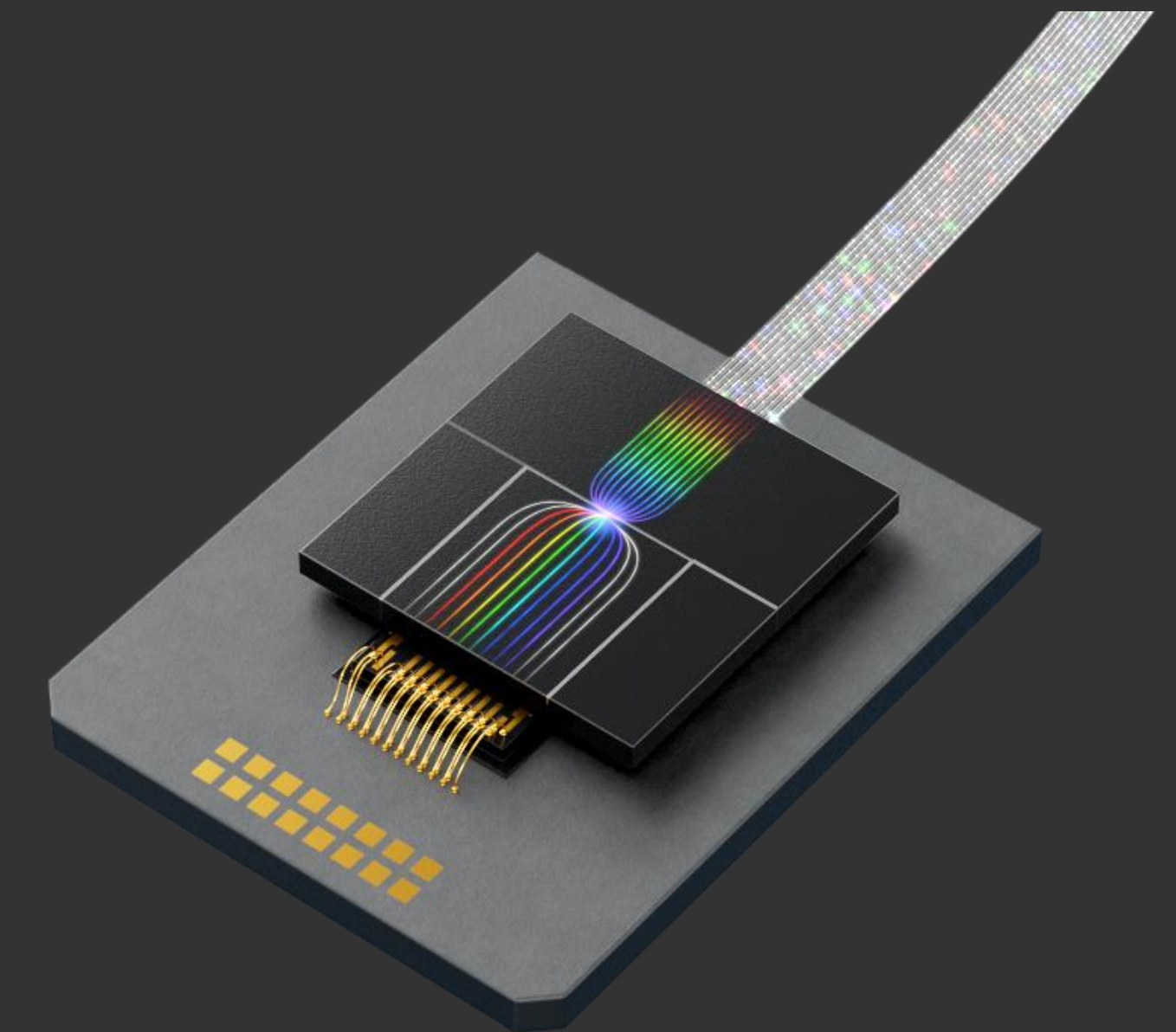
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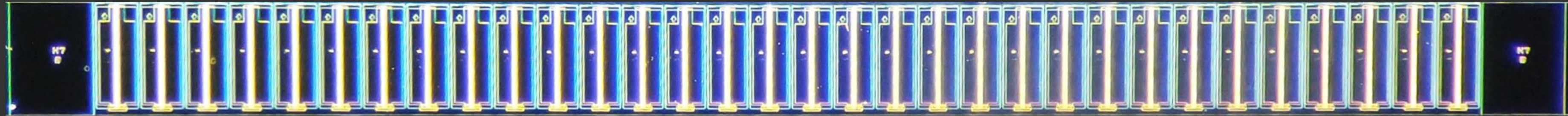


SuperNova™ Multi-Wavelength Optical Source with Sivers DFB Laser Arrays Inside

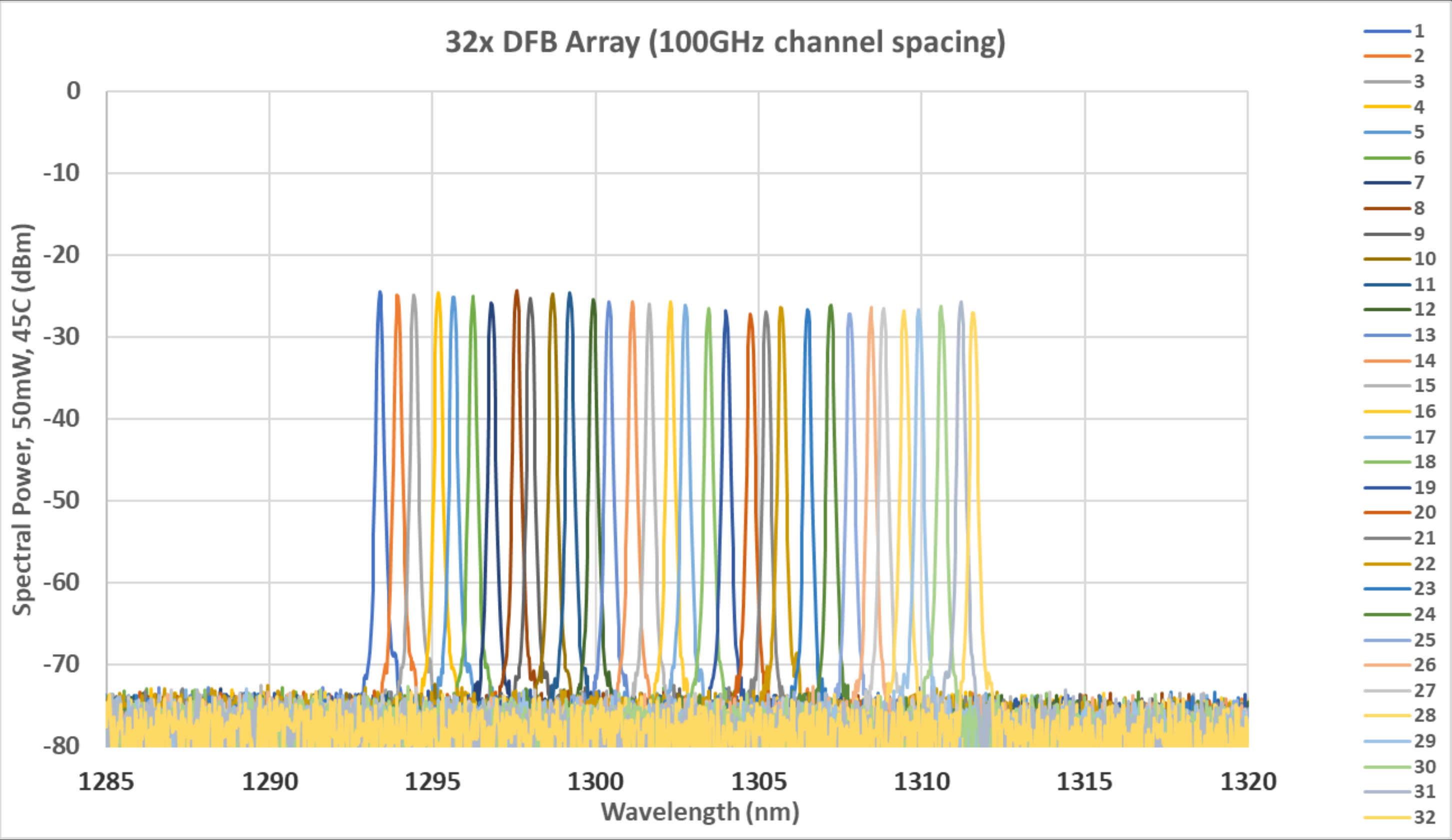


DEMONSTRATED LIVE AT ECOC 2022, SIVERS BOOTH #616

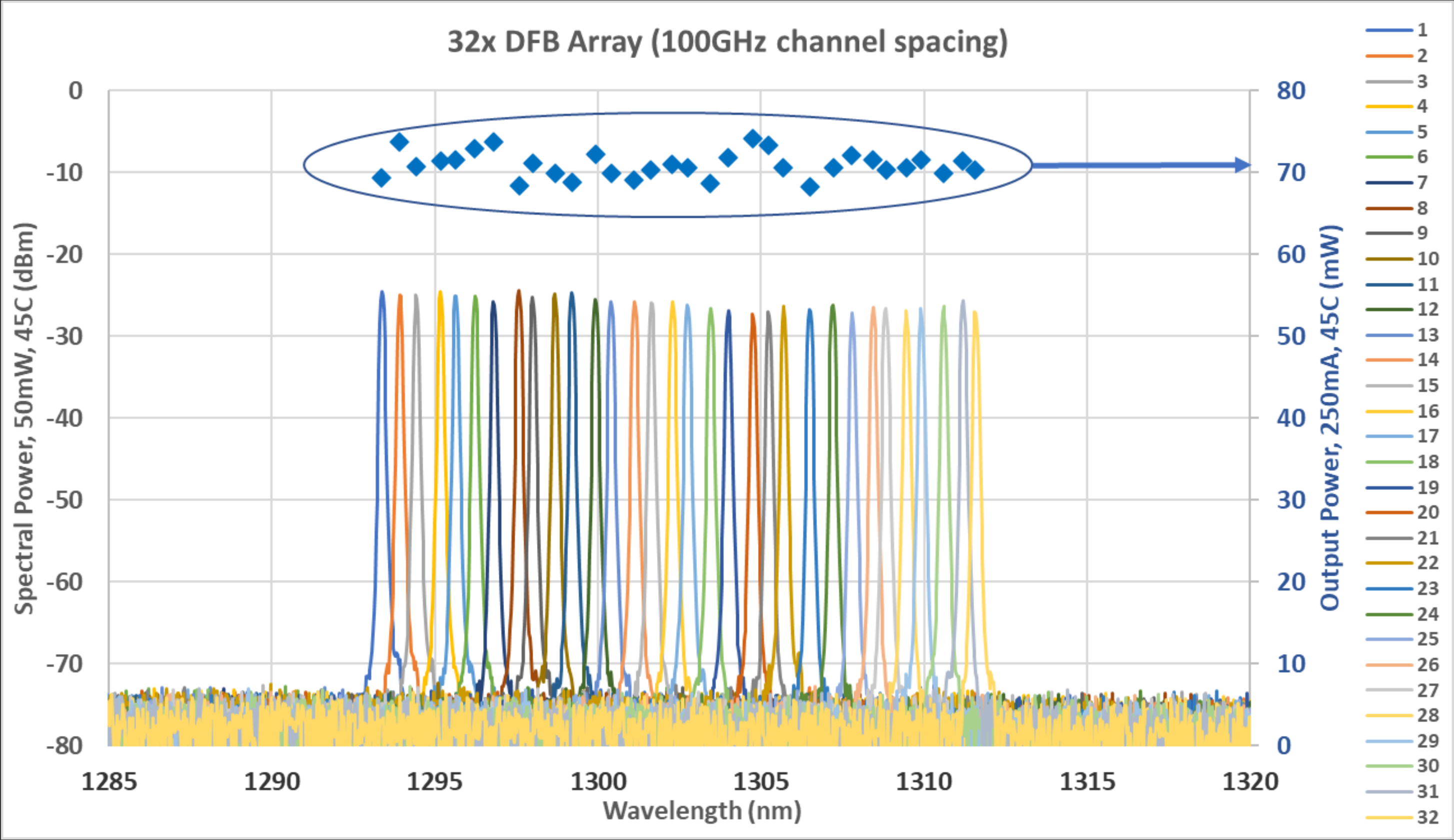
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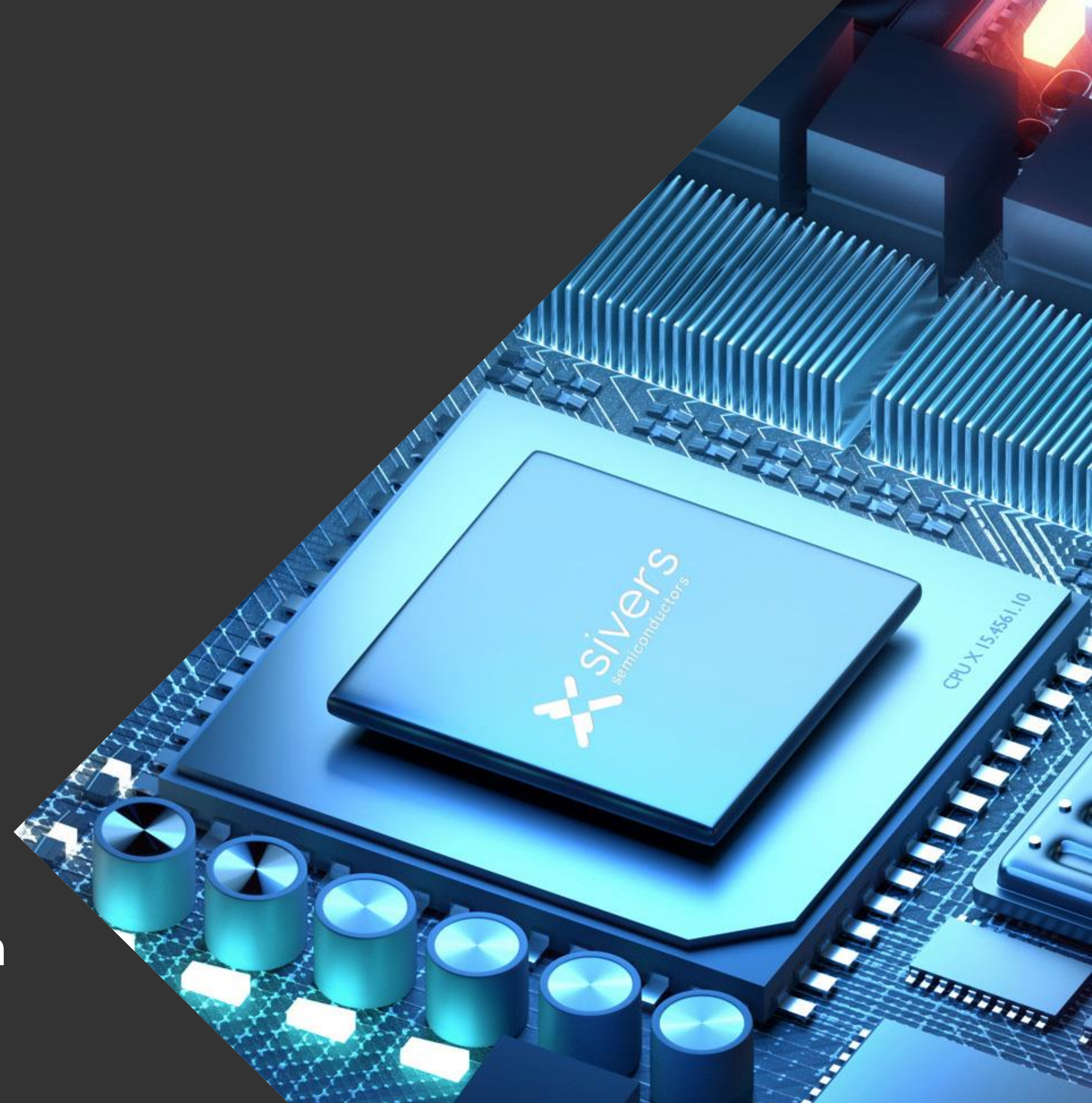


DFB laser diode arrays designed for use in CW-WDM MSA compliant applications. Demonstration of 32x arrays at 100GHz.



Summary

- Sivers Photonics has complete in-house capability for III-V chip design, fabrication, test, reliability and qualification
- Our InP100 platform provides advanced customised III-V devices for SiPh hybrid integration
- Sivers Photonics form a vital part of the SiPh ecosystem and are a key strategic supplier to many Fortune 100 and Silicon Valley customers.



Thank you

<https://www.sivers-semiconductors.com/sivers-photonics/>

