MAKE it POSSIBLE

Co-Packaged Optics at the IPEC

Eric Bernier, Optoelectronic R&D

eric.bernier@huawei.com

23 May 2022

HISILICON OPTOELECTRONICS

1200+ employees

Global R&D Team

Revenue: 1.45 billion USD

Industry Patents 1300+

Our Mission

Optical connection and optical sensing for intelligent world.

Provide competitive optoelectronic solutions.

International Photonics & Electronics Committee

- Open Standard organization
- Based in Geneva Switzerland
- Industry Members : 31
- Industry : Optoelectronic
- Target:
  - optical chips,
  - optical/electrical components, and
  - optical module
- Market :5G, IoT and AI

Source: oif2021.026.06

HUAWEI

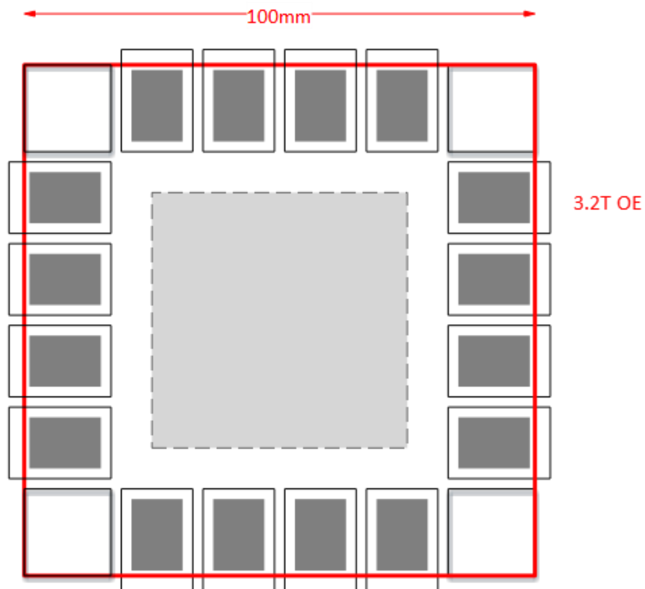
Project #1 : Standard Research Report

100T+OIO Standard

Source: oif2021.026.06

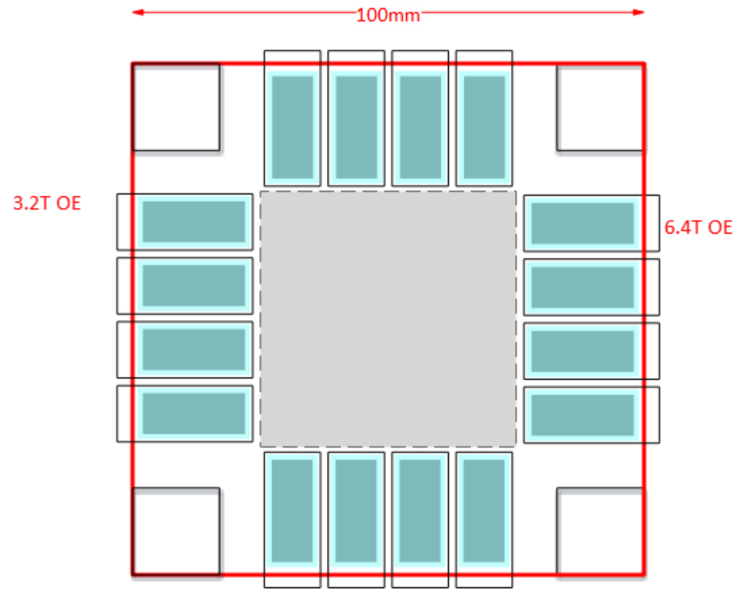
100T co-packaged optics challenge

50T ASIC substrate



Industry First introduction Rate: 50T

100T ASIC substrate



Industry Adoption Rate: 100T

- 6.4T+ capable at full density to meet volume demand specification.
- 200G/s/fibre [Min] required.
- The ultimate target is higher density and smaller footprint than OIF.
- Power delivery from the ELSFP will need to grow to meet demand.

100T technologies assessment is in progress. New technologies are required.

HUAWEI

Expected Output

- **Standard Research Report discussing architectures and technologies tradeoff related to the OIO implementations.**

1. Networks and system architectures enabled by OIO
2. Evolution of optoelectronic packaging in support of OIO
3. Photonic device and process evolutions for OIO
4. Roadmap to Channel density improvement for OIO
5. Pluggable vs. CPO

HUAWEI

Proposed Timeline

IPEC
国际光电委员会
International Photonics & Electronics Committee

Q3 2021: Project Start
Q3 2022: Contribute and adopt a baseline draft for the Standard Research Report as per member contributions and consensus
Q4 2022: Edit baseline text per member contributions, submit for WG ballot
Q1 2023: Address WG ballot issues, submit for BoD ballot
Q2 2023: Standard Research Report published

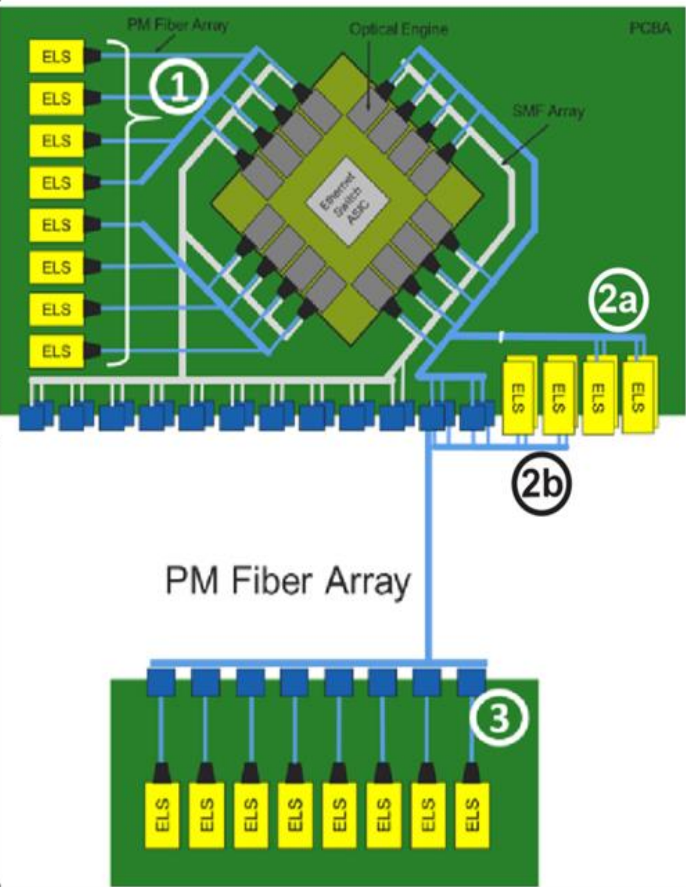
Project #2 : Form Factor

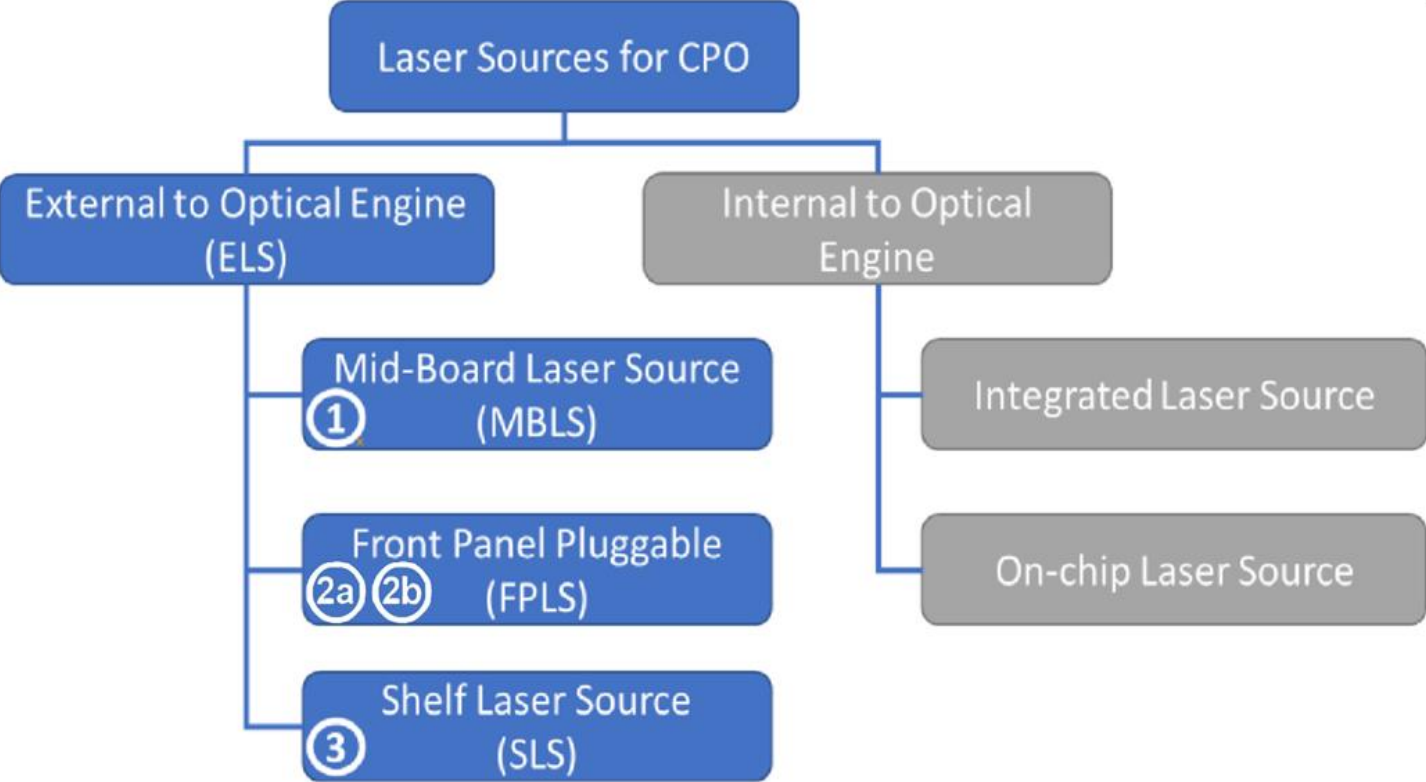
OIO Pluggable External Laser Source

Source: oif2021.026.06

HUAWEI

Family of External Laser Sources





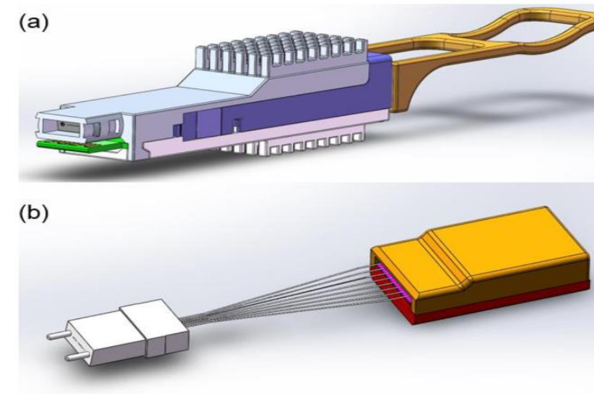
Automatic Power Reduction is being considered for safety where humans can easily access the power.

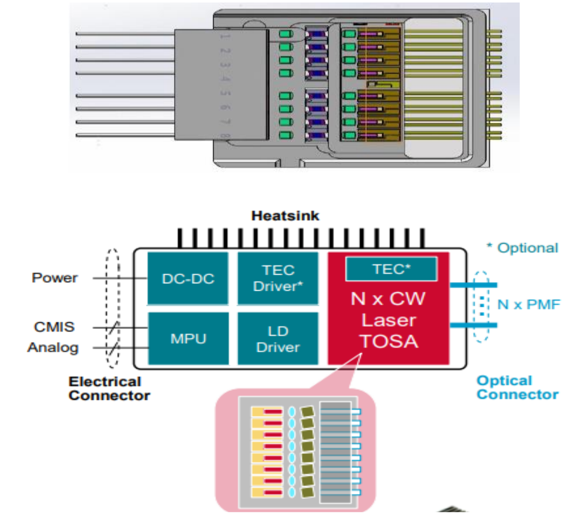
Source: oif2021.026.06

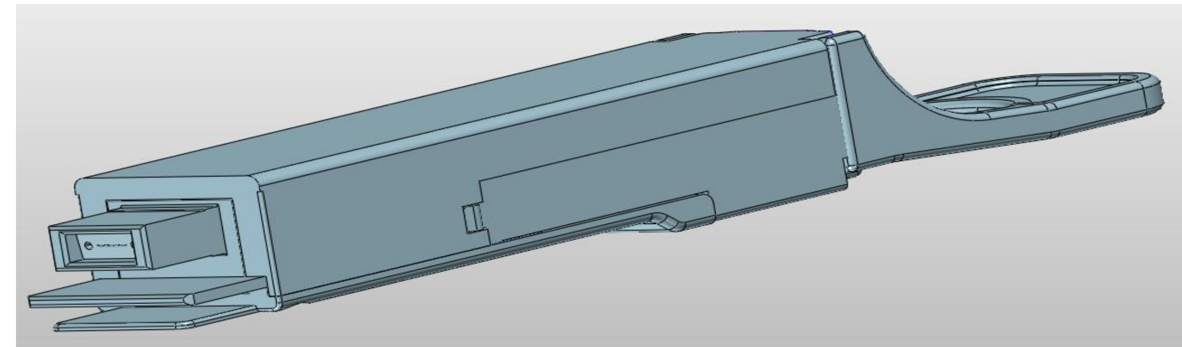
HUAWEI

External Light Source

- Common mechanical arrangements. (QSFP-DD/OSFP)
- Blind mate connector, with one ferrule.
- Stackable implementation
- Spring loaded host ferrule to prevents damage from high optical power hitting the ferrule, during mate-demate.
- ELSFP is a managed CMIS module. To adjust the output optical parameters with the OE.
- Conventional 3.3V power.
- The standard to provide OIO w/ PELS for :
    - High reliability
    - Operational Simplicity
    - Maintainability
    - Serviceability
    - Stability







HUAWEI

Scope

- **OIO PELS Scenarios Baseline**
- **Electrical specification**
  - Electrical Pinout
  - Power supplies
  - Power consumption
- **Optical specifications**
  - Wavelength lane assignments
  - PELS optical characteristics
  - PELS link power budget
  - Test point for PELS and OE
  - Measurement methods for optical parameters
- **Electrical and optical Connectors**
- **Mechanical and thermal specifications**
- **Management interface**
  - CMIS
- **Environmental Specifications**

HUAWEI

Schedule

IPEC
International Photonics & Electronics Committee

2022 Q1: Project start.

2022Q3: Submit and adopt the draft baseline to define the standard objectives based on the contributions and consensus of members.

2022Q4: Edit the baseline text contributed by each member and submit it to the working group for voting.

2022Q4: Resolve the issue of working group voting and submit it to the board for a vote.

2023Q1: Specification Publish

Thank You

Eric Bernier
Leader HiSilicon OE
Huawei Technologies Canada Co., LTD. – Ottawa, Canada
C: 613-867-0196
eric.bernier@huawei.com

HUAWEI