

MORE LIGHT

UFO Probe® Card: New dimensions in PIC wafer test.

Application and Market

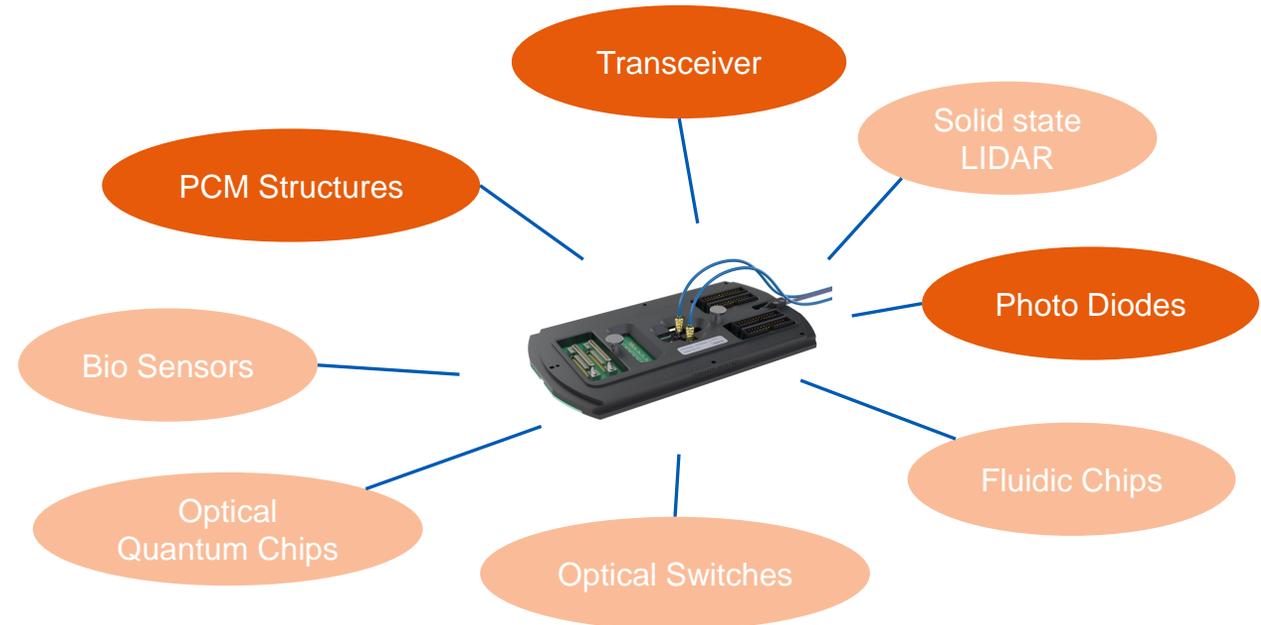
UFO Probe® - ultra-fast opto-electronic probe card.

JENOPTIK's solution for high-volume wafer level test of photonic integrated circuits (PIC).



Current PIC Test Applications in focus

- **Optical Transceivers** – ramping up
- Monitoring PIC manufacturing process (PCM)



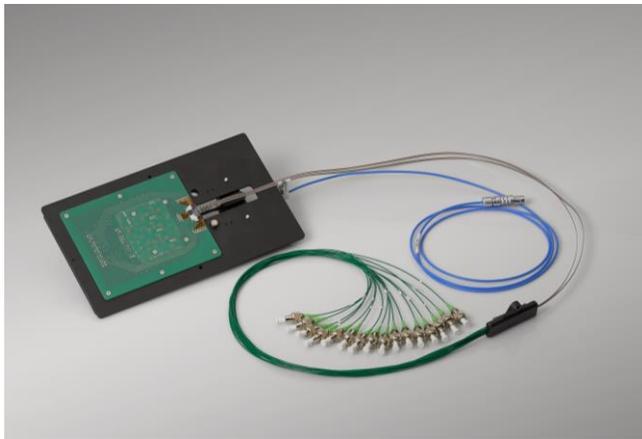
USP

- **Plug & Play' ready** for existing **standard IC wafer probers** and **automated test equipment**
- **No active alignment** time per chip
- **Parallel qualification** possible → multi-DUT regime
- Operated by same personnel as standard IC equipment

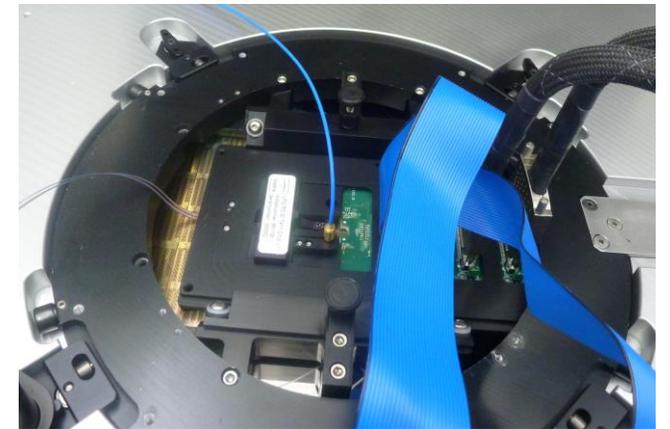


Benefits

- optical and electrical probe integrated in a **single probe card**
- Compatible to existing interfaces
- **Optics** that works **alignment insensitive** and
- Deals with **'coarse' prober alignment tolerances**
- Scalable solution with simple handling



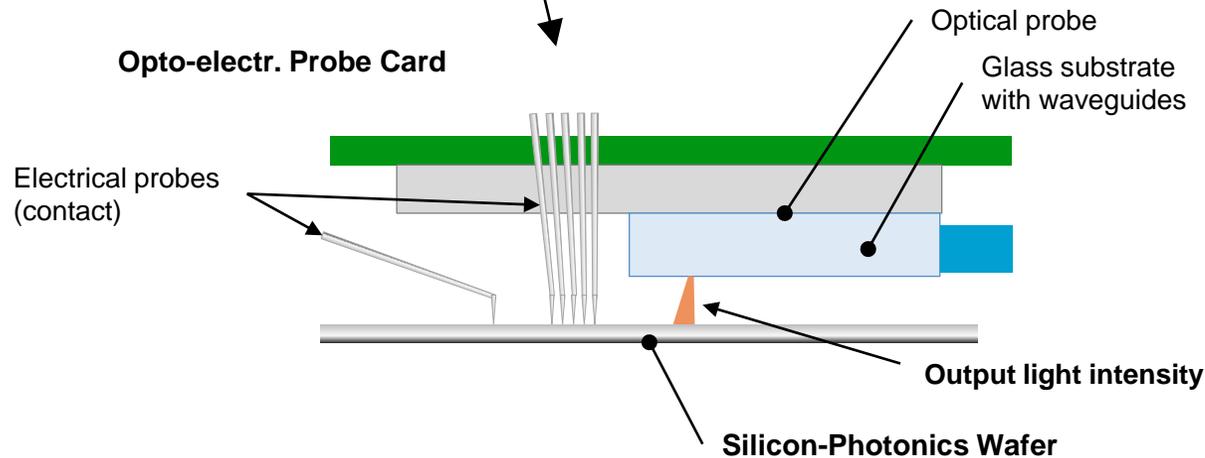
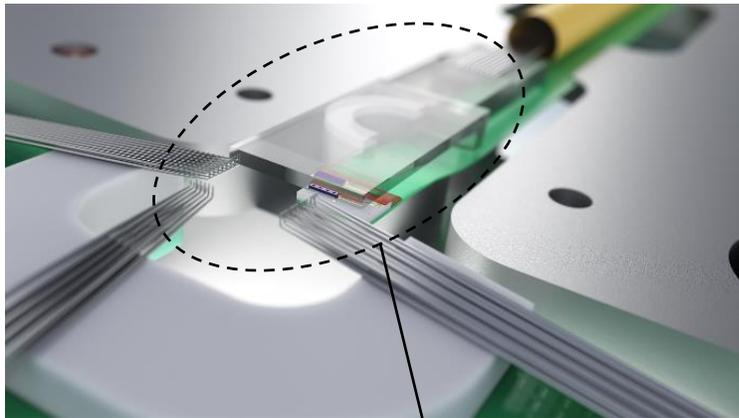
Source: Accretech



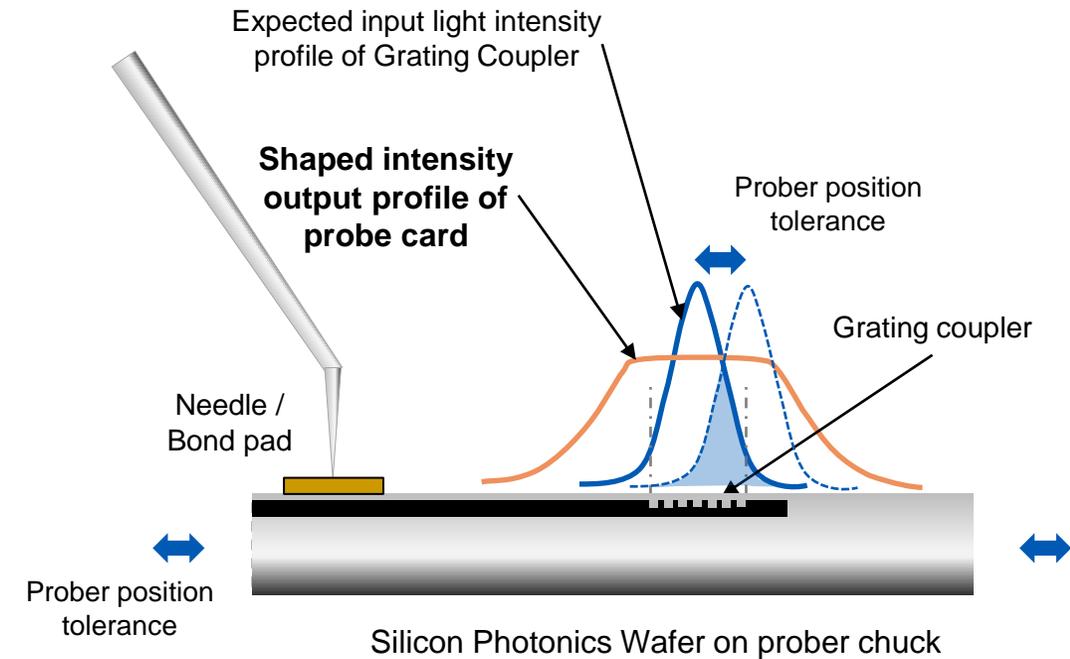
Courtesy of Rood Microtec

Probe Card Principle

How does it work?



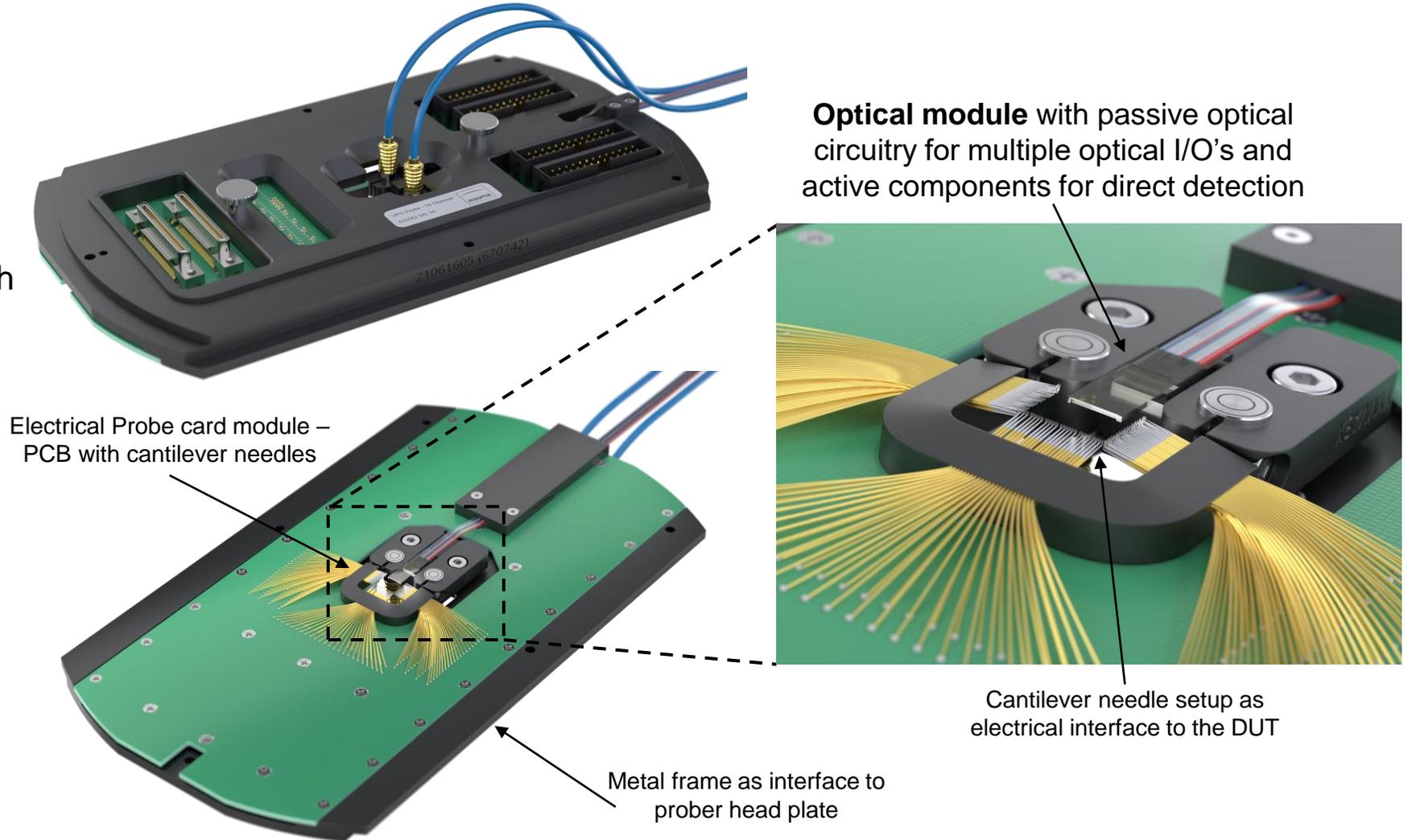
Optical concept compensates prober alignment tolerances.



Probe Card Key Figures

Key figures

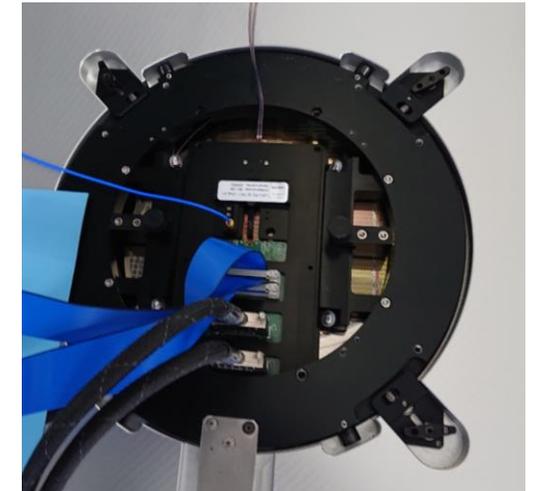
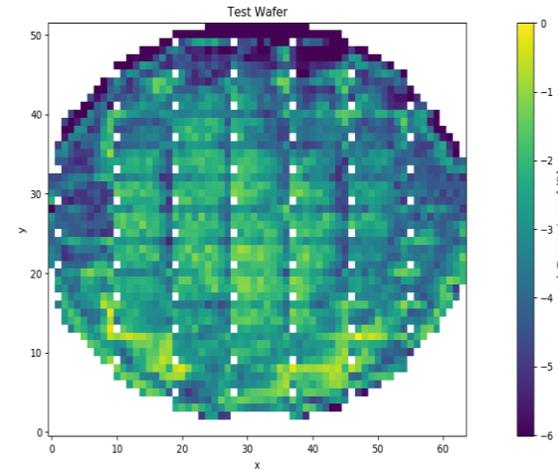
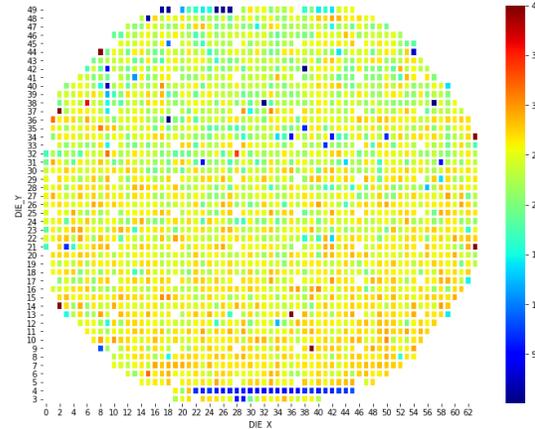
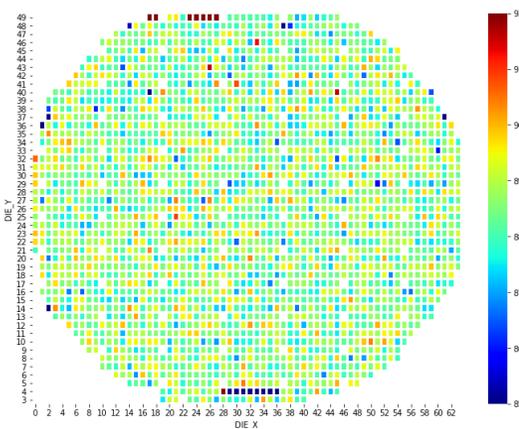
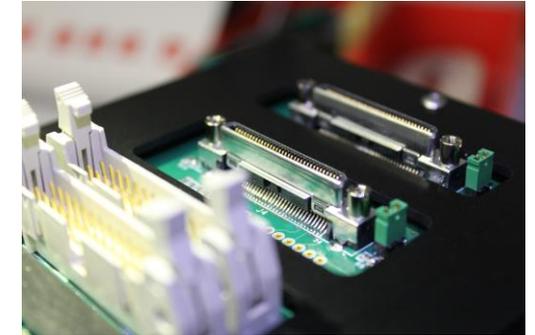
- **Simultaneous** optical and electrical probing
- **Monolithic optical module** with 16 optical I/O's at 250µm pitch
- Alignment insensitive optical coupling for **vertical emitting** PICs
- Standard prober interface (Eurocard format)
- Utilize **proven needle technology** (partnering with probe card manufacturer)



Wafer-level Test of Customer Device

Wafer-level test of transceiver device

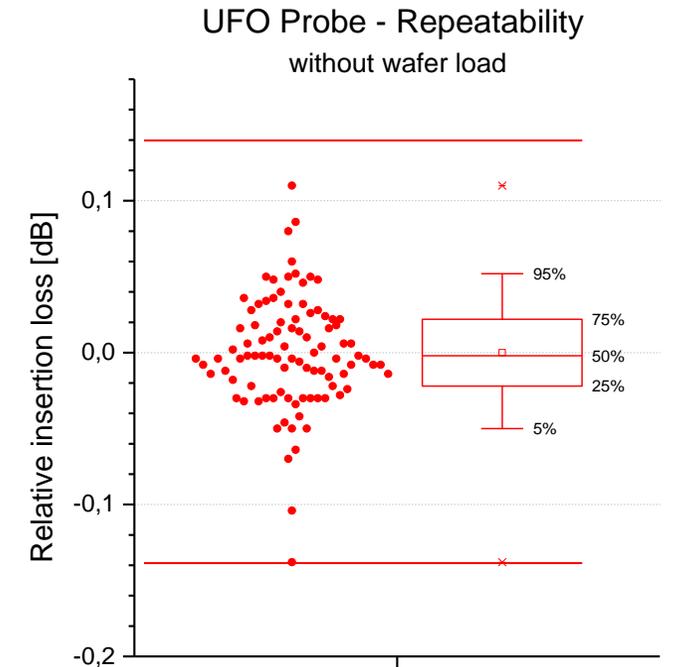
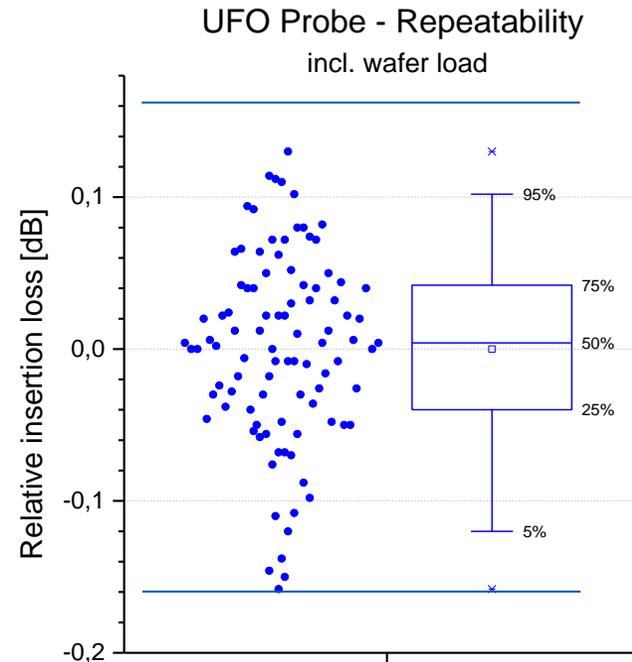
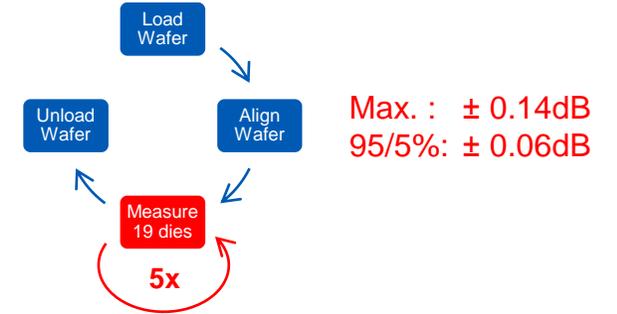
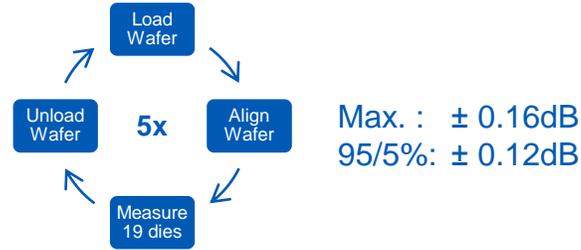
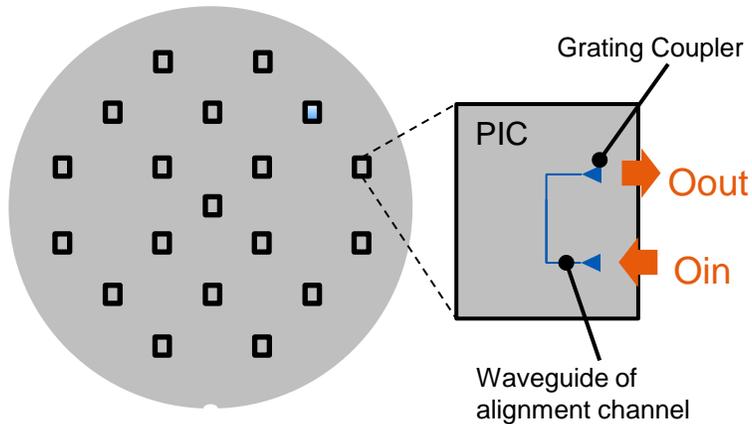
- Running as **final production test in a customer setup**
- RX, TX, alignment channel and comprehensive electrical tests in a **single touch-down**
- **1x alignment per batch**, no additional alignment per chip
- Example of wafer map for Contact Resistance, Receiver supply current and optical alignment channel



Measurement capabilities

Verification of test capabilities under realistic conditions:

- Measurement of **insertion loss** of an optical alignment channel
- 19 different chips, spread over the complete wafer
- 5 repetitions of each measurement with and without wafer load



UFO Probe® - General specifications

Specification	Current Generation	Next Generations
Device under test	Electronic and photonic integrated circuit (EPIC), Optical Transceivers for Datacom and Telecom Applications	EPIC for Transceivers, Sensors, Biosensors, LIDAR
Electrical needle technology	Cantilever	Vertical / Advanced
Optical coupling principle at DUT	Grating coupler	Grating coupler
Number of Optical Inputs/Outputs	Up to 16	<200
Pitch OI/OO	250µm	Typ. 250µm and 127µm, Min. 50µm
Layout configuration of optical OI/OO arrays	Linear array with same direction of I/Os	Freely configurable
Coupling Angle	0° and 11.6° in air	Range from 0-20°
Wavelength	1310nm and 1550nm	VIS to NIR (U-Band)
Insertion loss measurement	Repeatability: ~ 0.3 - 0.5dB	Repeatability Target: 0.1dB
RF-Measurement	up to 100 MHz	GHz
Number of PICs measured in parallel	1	Multi-DUT
Prober interface	Europa Card format	Europa Card format, ATE/ tester interfaces

UFO Probe®

The only commercially available solution for **High Volume PIC Testing** that runs on **standard equipment!**

Fab Proven!

Platform ready for other applications.





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Supporting the digital world.