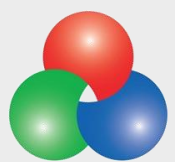


„Applied 3D Microtechnologies“

microTEC Gesellschaft für Mikrotechnologie mbH

RMPD Additive Manufacturing/ 3D
Printing, from Microstructures to
Microsystems with optical waveguide



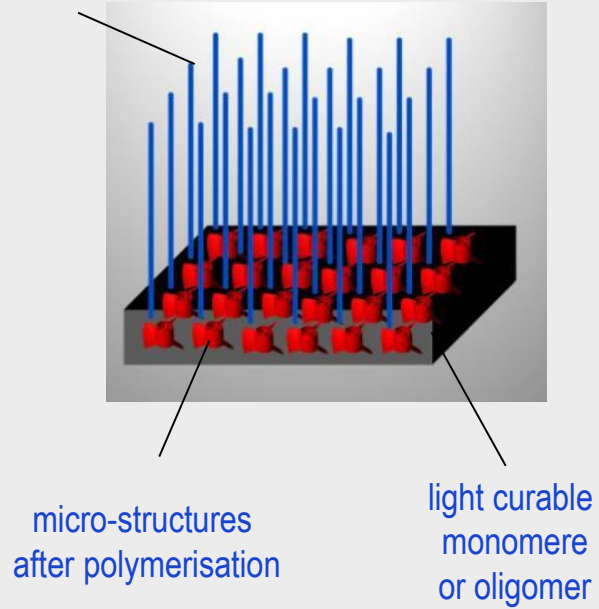
DAY OF
PHOTONICS
21 OCTOBER 2021

Duisburg 19.10.2021

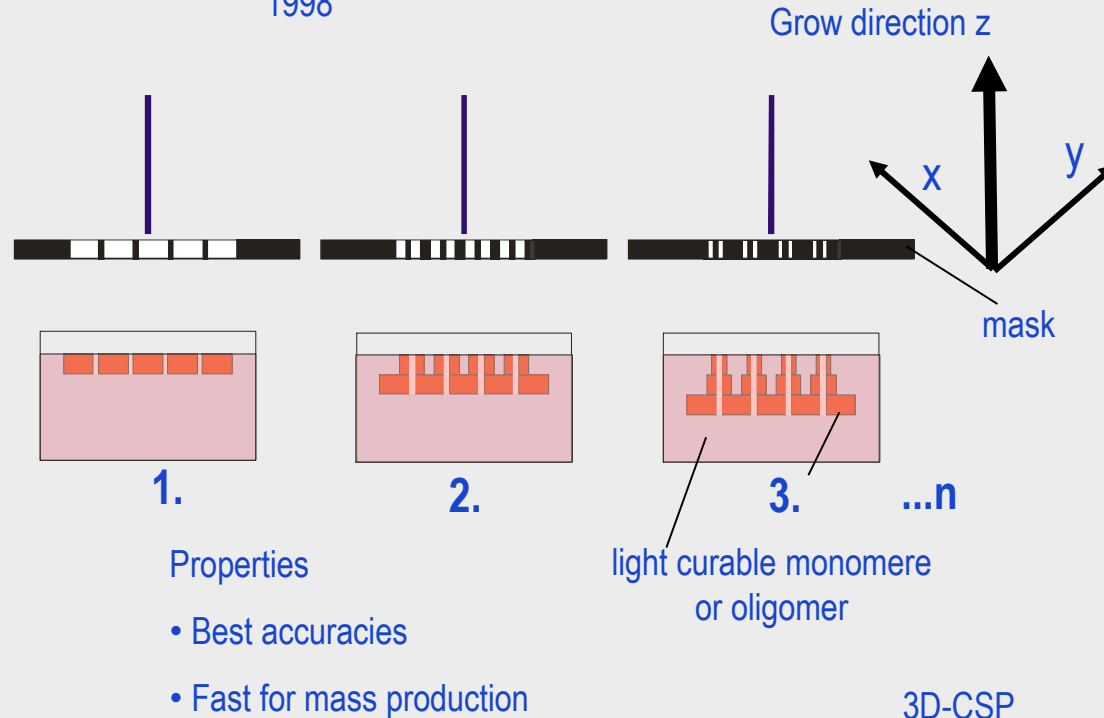
RMPD- technologies for microstructures and systems

Parallel production
with RMPD
1996

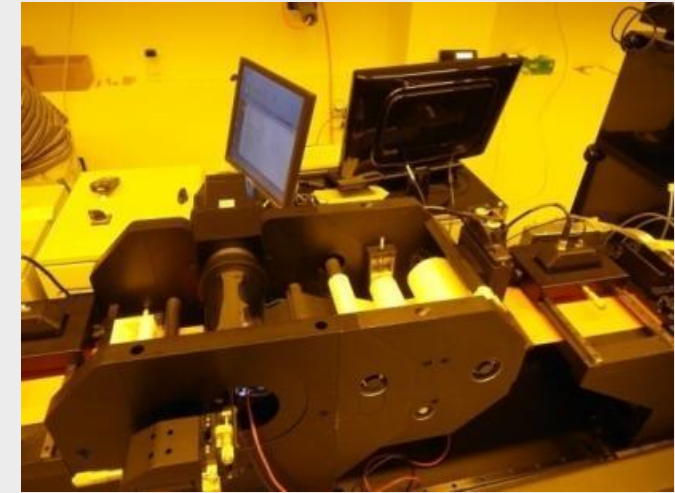
Parallel laser beams



Structures with RMPD-mask
1998



RMPD- Rotation
2013



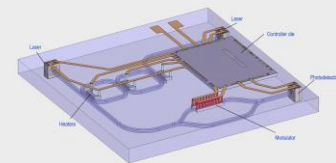
3D-CSP
2000



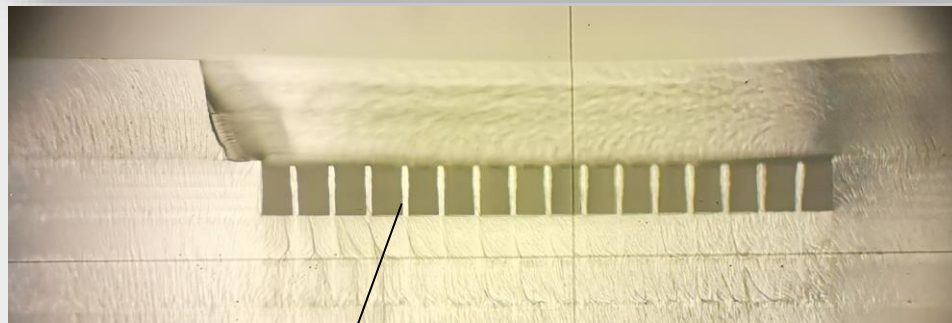
3D-WLP
2019



RMPD- Photonics
2021

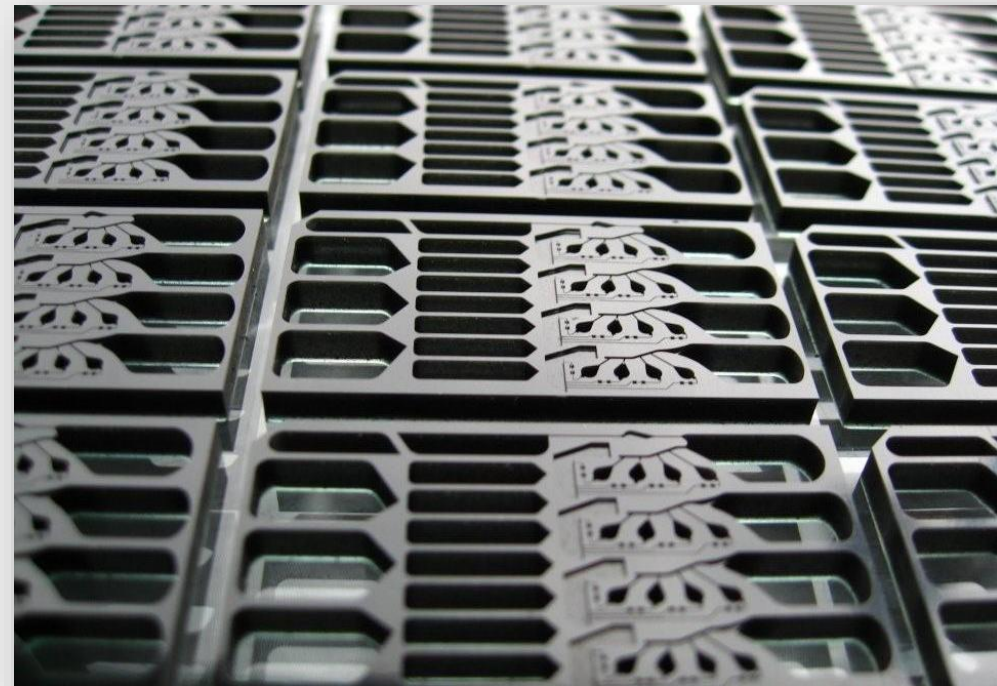


micro fluidic cartridges for life science applications

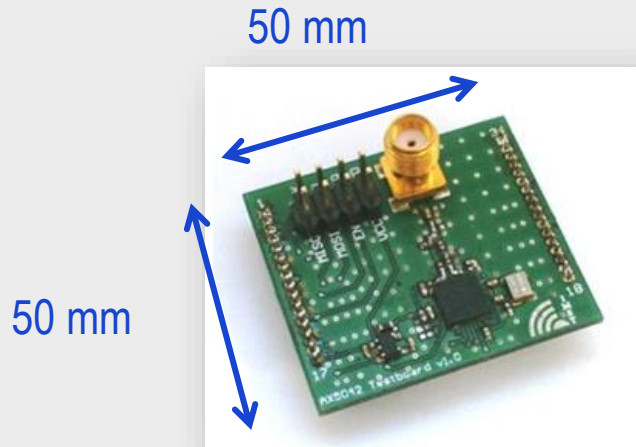


5 μm x 40 μm

micro fluidic cartridges in black polymer, with glass bottom



3D-CSP, Wireless communication module



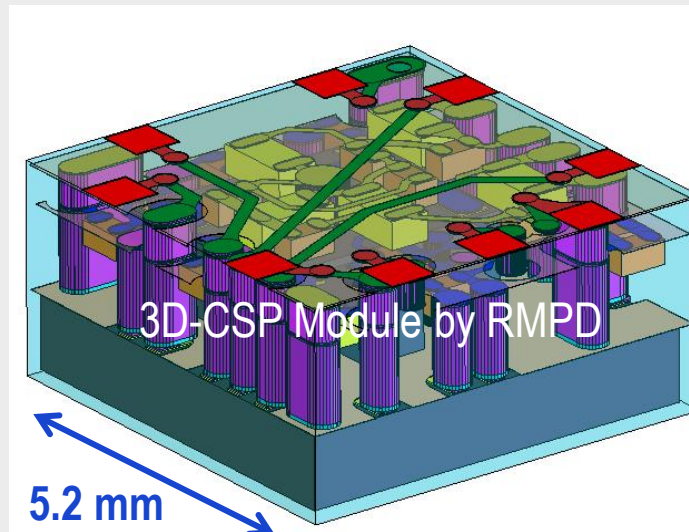
Conventional Transceiver

- 433 MHz narrow band radio module
- AX 5042: Advanced multi-channel single chip UHF transceiver
- About 30 parts



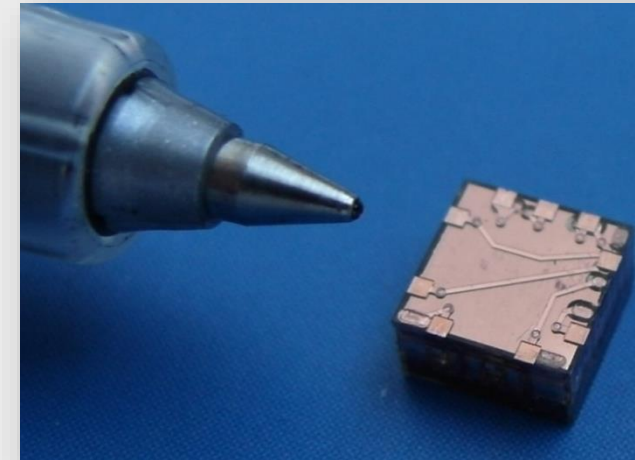
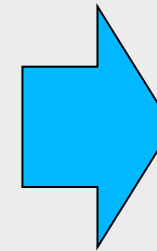
3D-CSP Module by RMPD:

- Advanced multi-channel single chip UHF transceiver
- 200-mA RF Low-Dropout Regulator

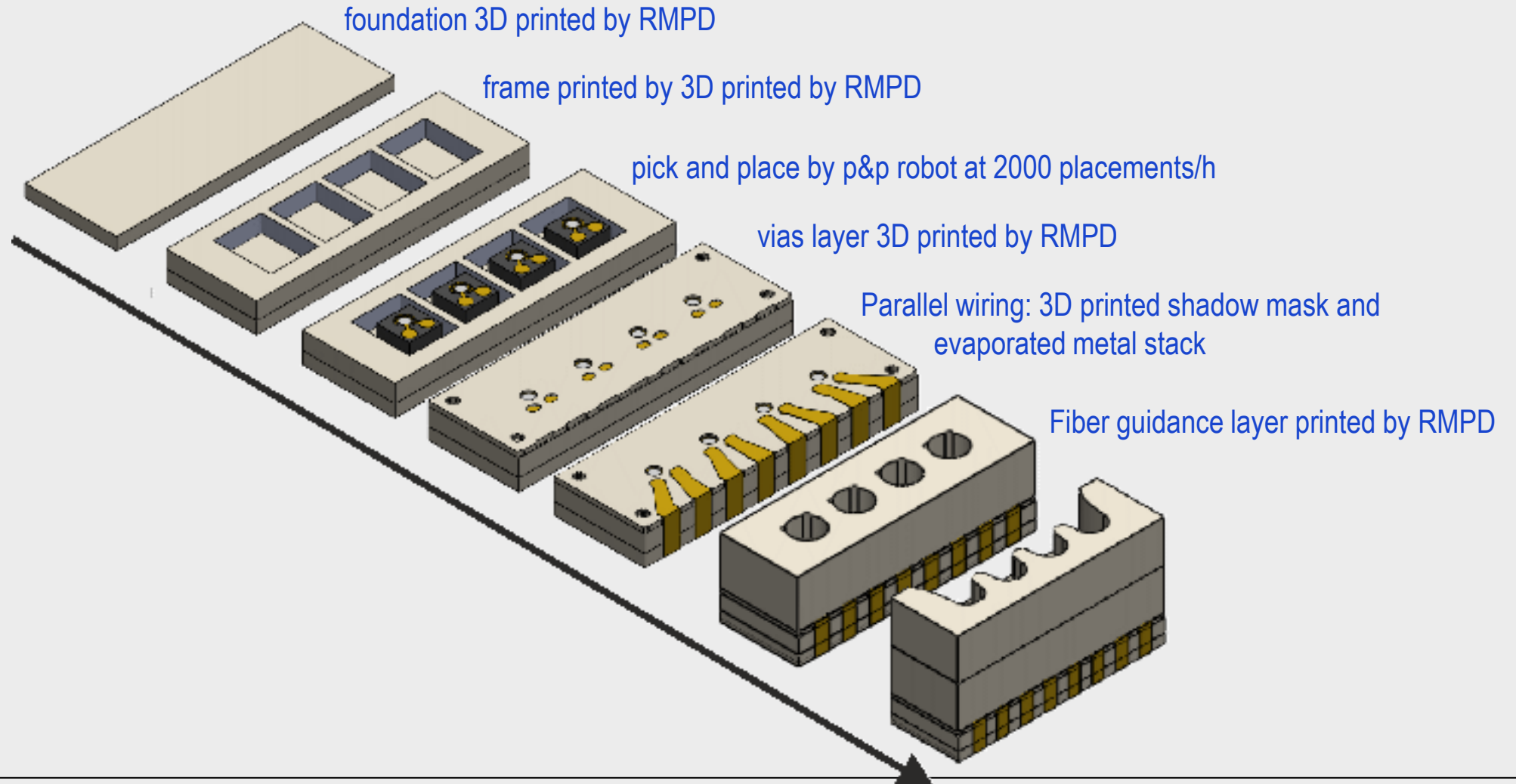


3D CAD model

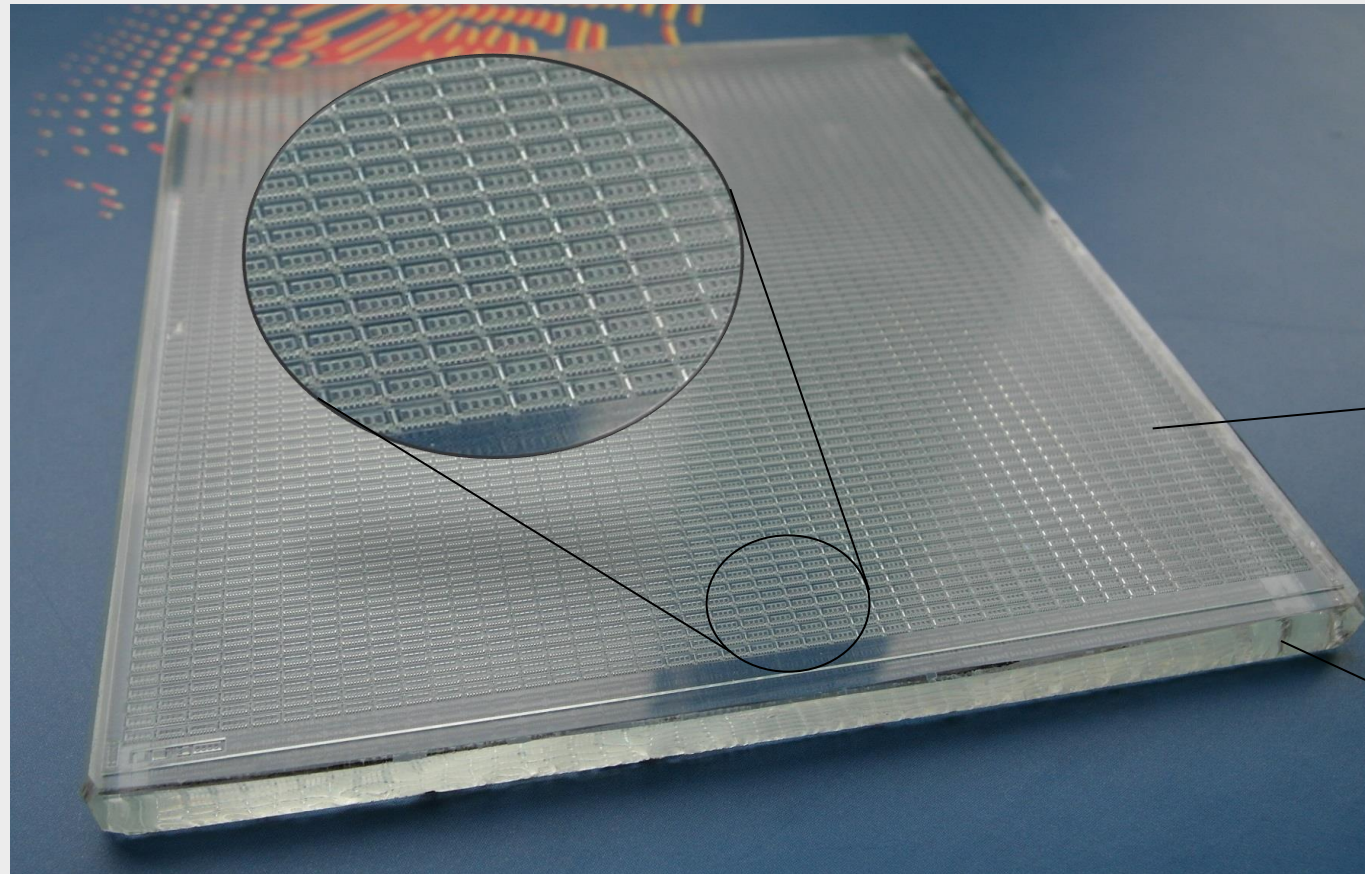
Customer: IMST



3D-CSP Batch process to build optical sub assemblies (OSAs)



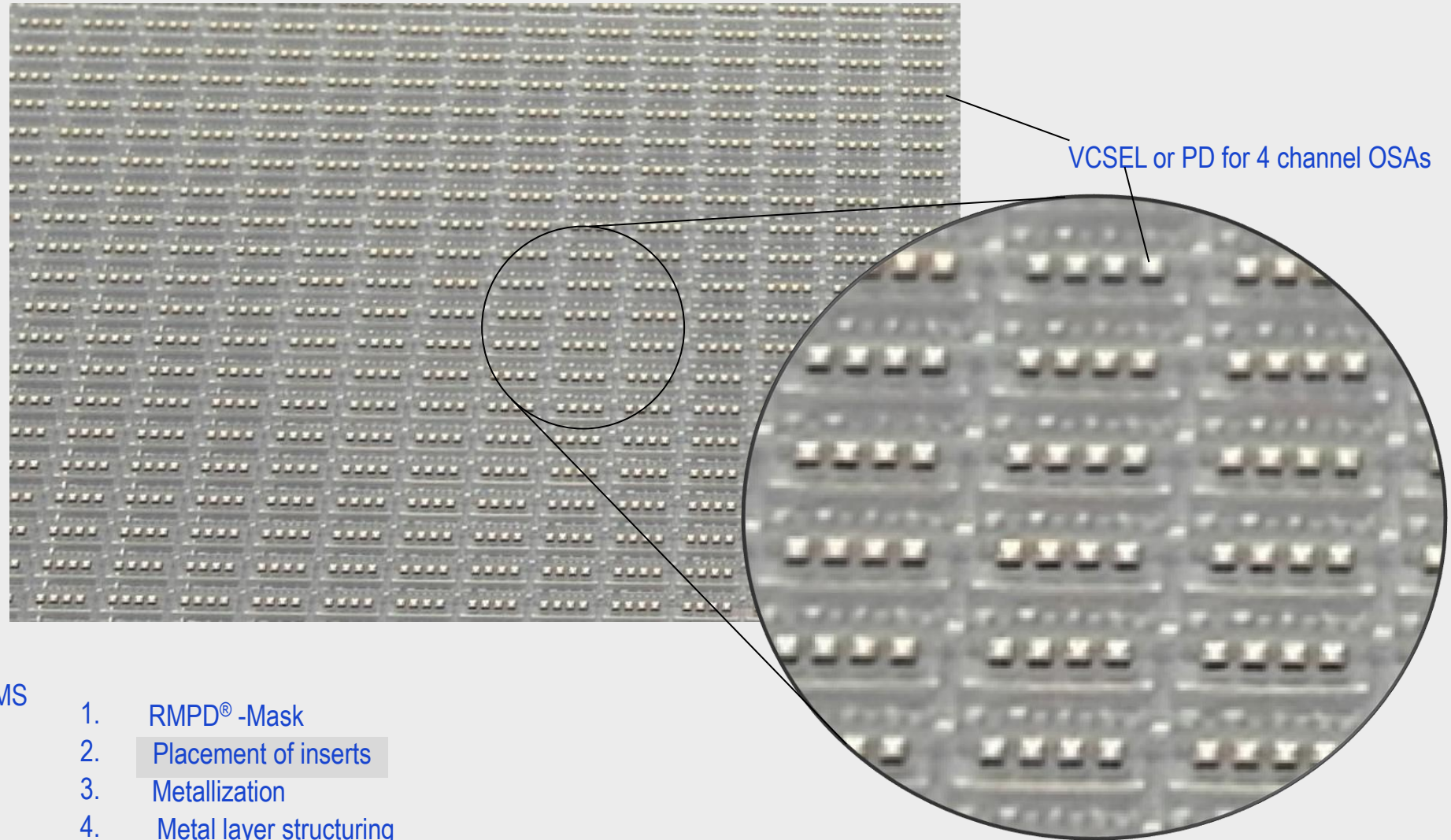
3D-CSP Batch process for MOEMS



4 Step process to build MOEMS

1. RMPD® -Mask
2. Placement of inserts
3. Metallization
4. Metal layer structuring

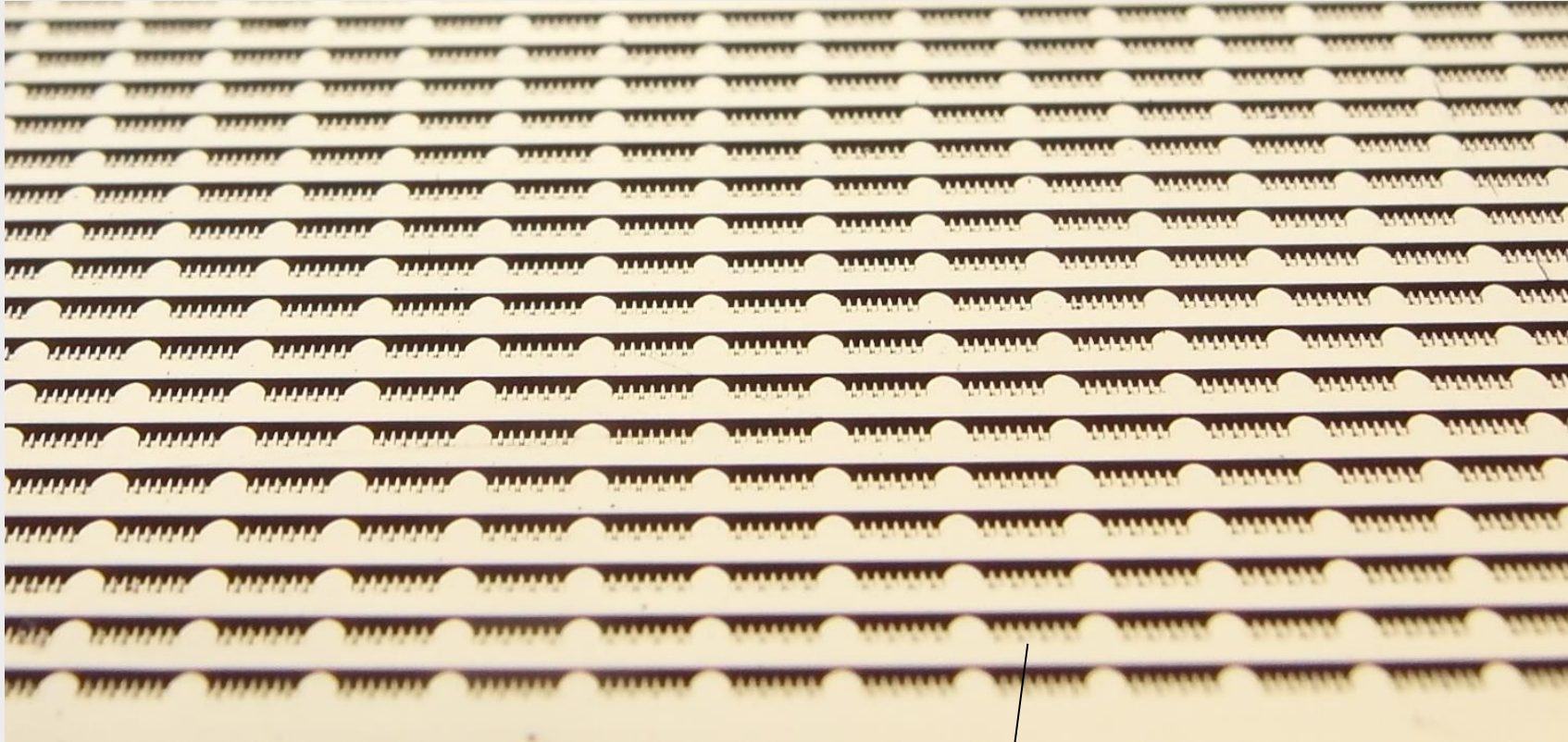
3D-CSP Batch process pic & place



4 Step process to build MOEMS

1. RMPD® -Mask
2. Placement of inserts
3. Metallization
4. Metal layer structuring

3D-CSP Batch process, lift-off mask with metallization



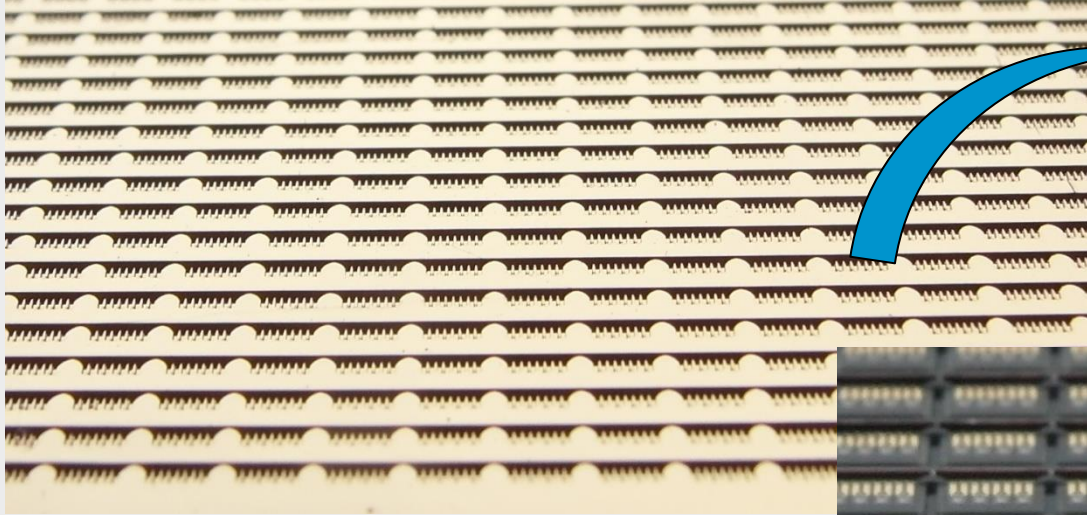
4 Step process to build MOEMS

1. RMPD® -Mask
2. Placement of inserts
3. Metallization
4. Metal layer structuring

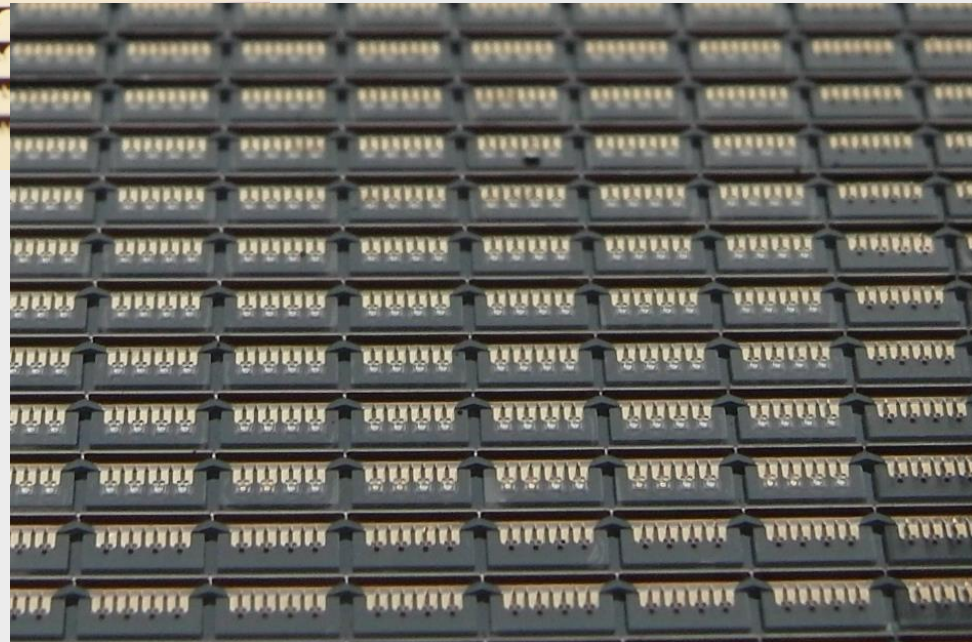
Metallization layer

3D-CSP Batch process to build MOEMS

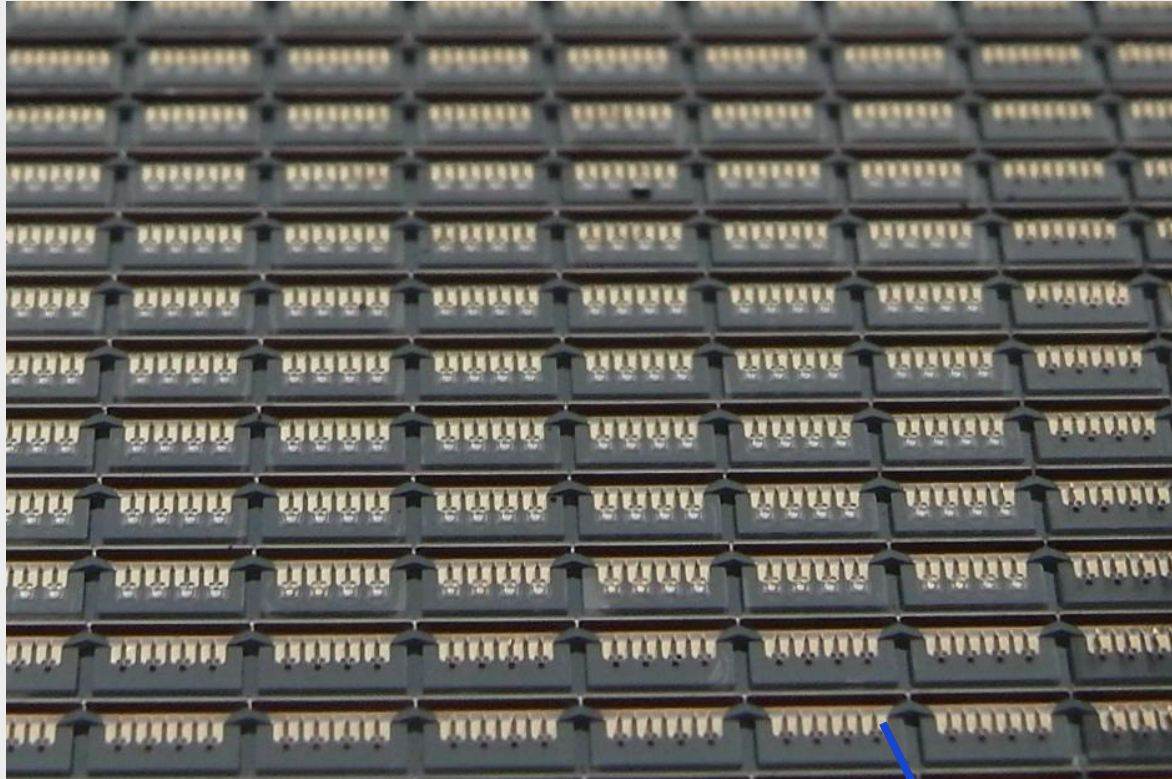
metallization layer via PVD



remove 3D lift-off mask



3D-CSP Batch process

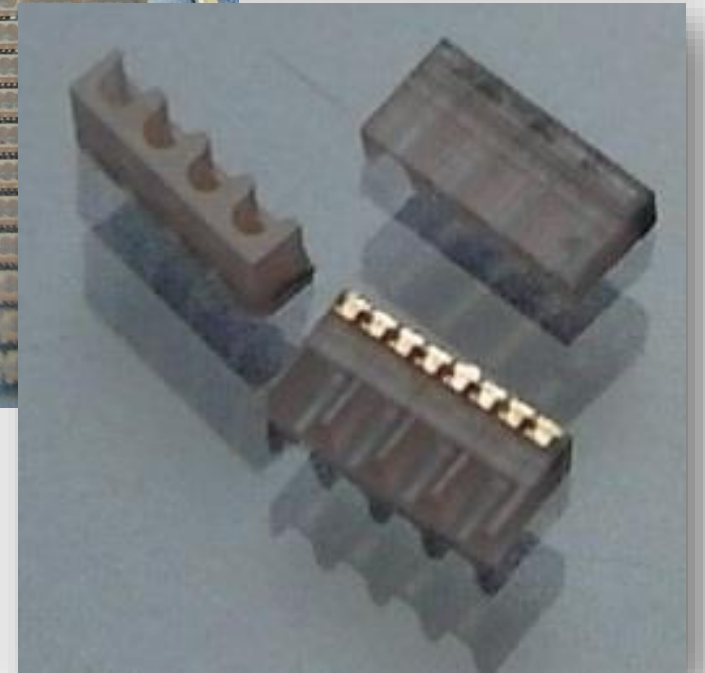
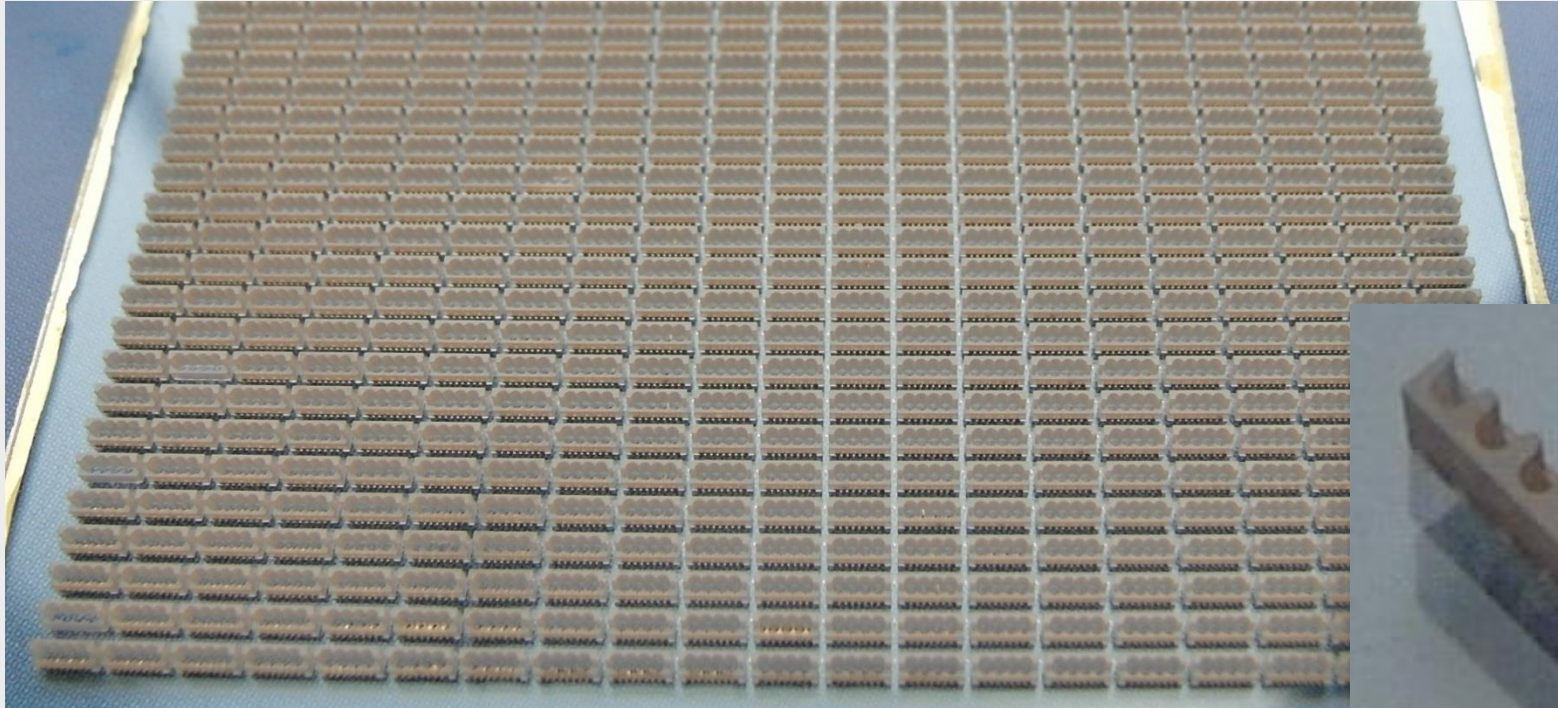


4 Step process to build MOEMS

1. RMPD® -Mask
2. Placement of inserts
3. Metallization
4. Metal layer structuring

Interconnection layer

3D-CSP Batch process, fiber connector

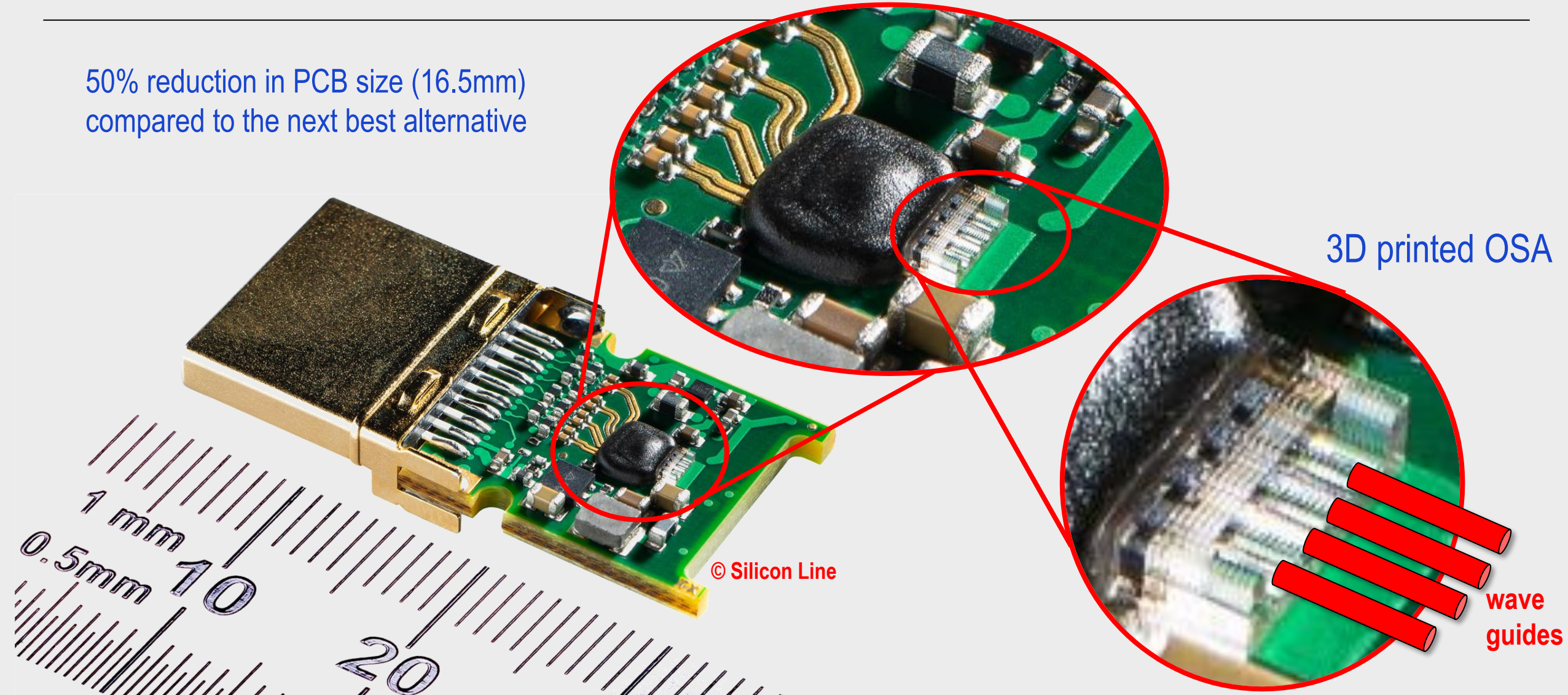


4 Step process to build MOEMS

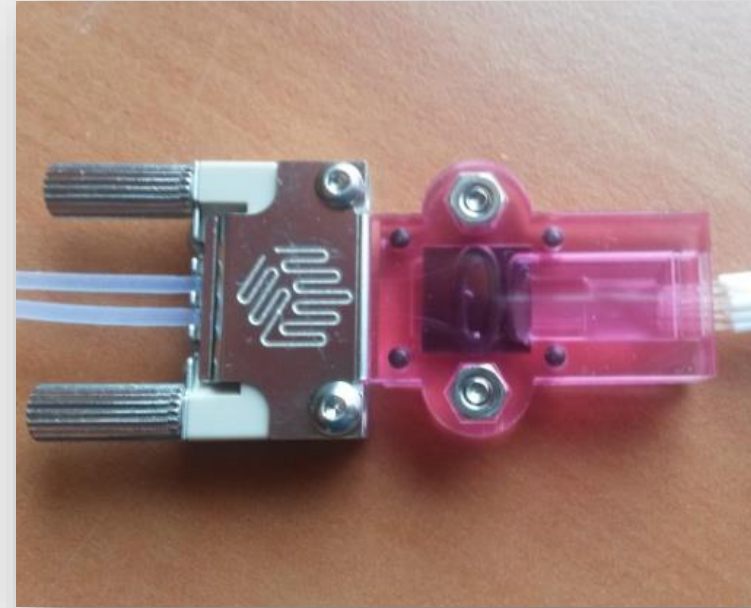
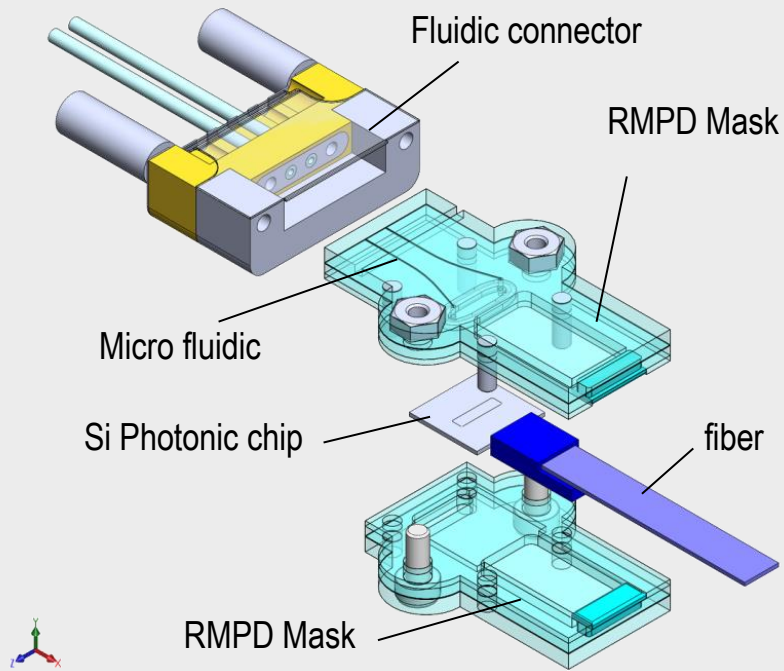
1. RMPD® -Mask
2. Placement of inserts
3. Metallization
4. Metal layer structuring

The latest HDMI 2.1 module with 3D printed optical sub-assembly by RMPD

50% reduction in PCB size (16.5mm)
compared to the next best alternative



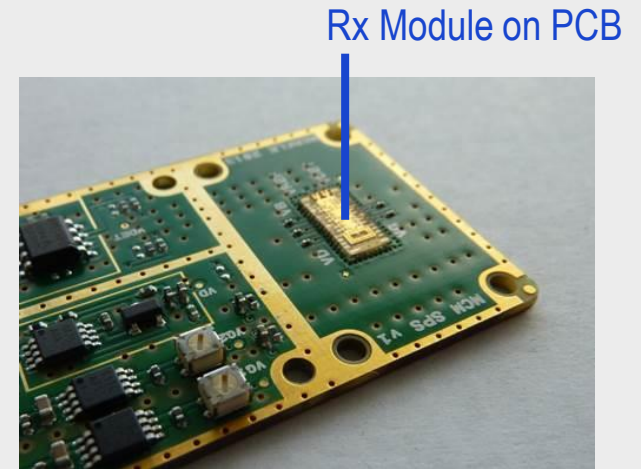
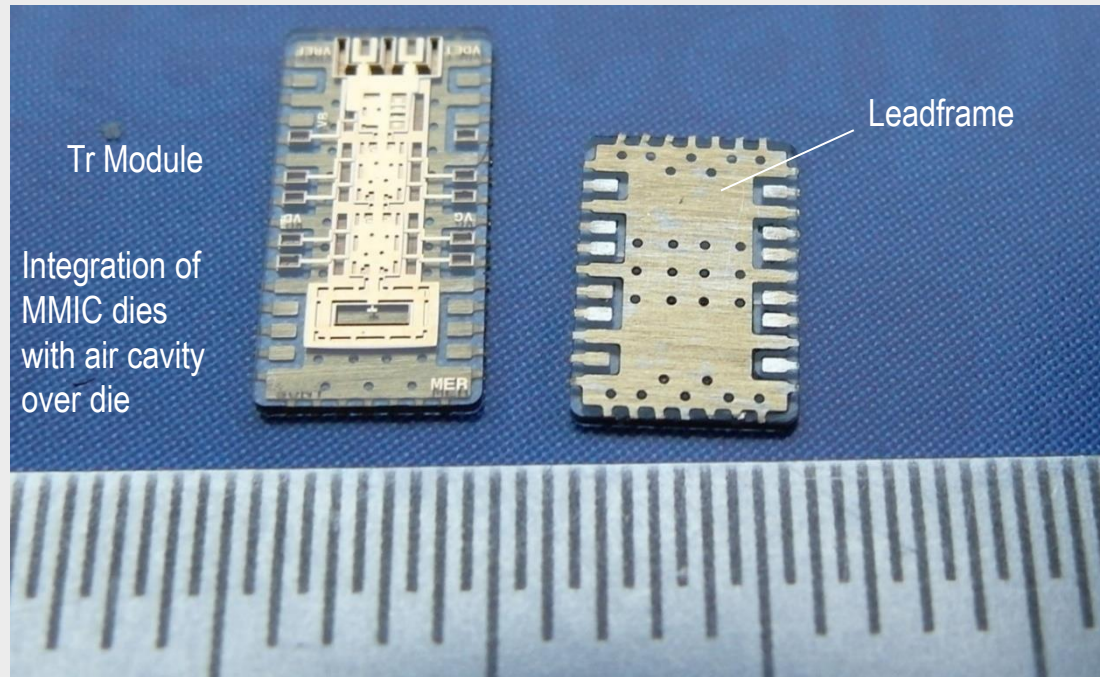
EC- Project BRAAVOO: Microfluidics and embedded photonic chip for water analysis



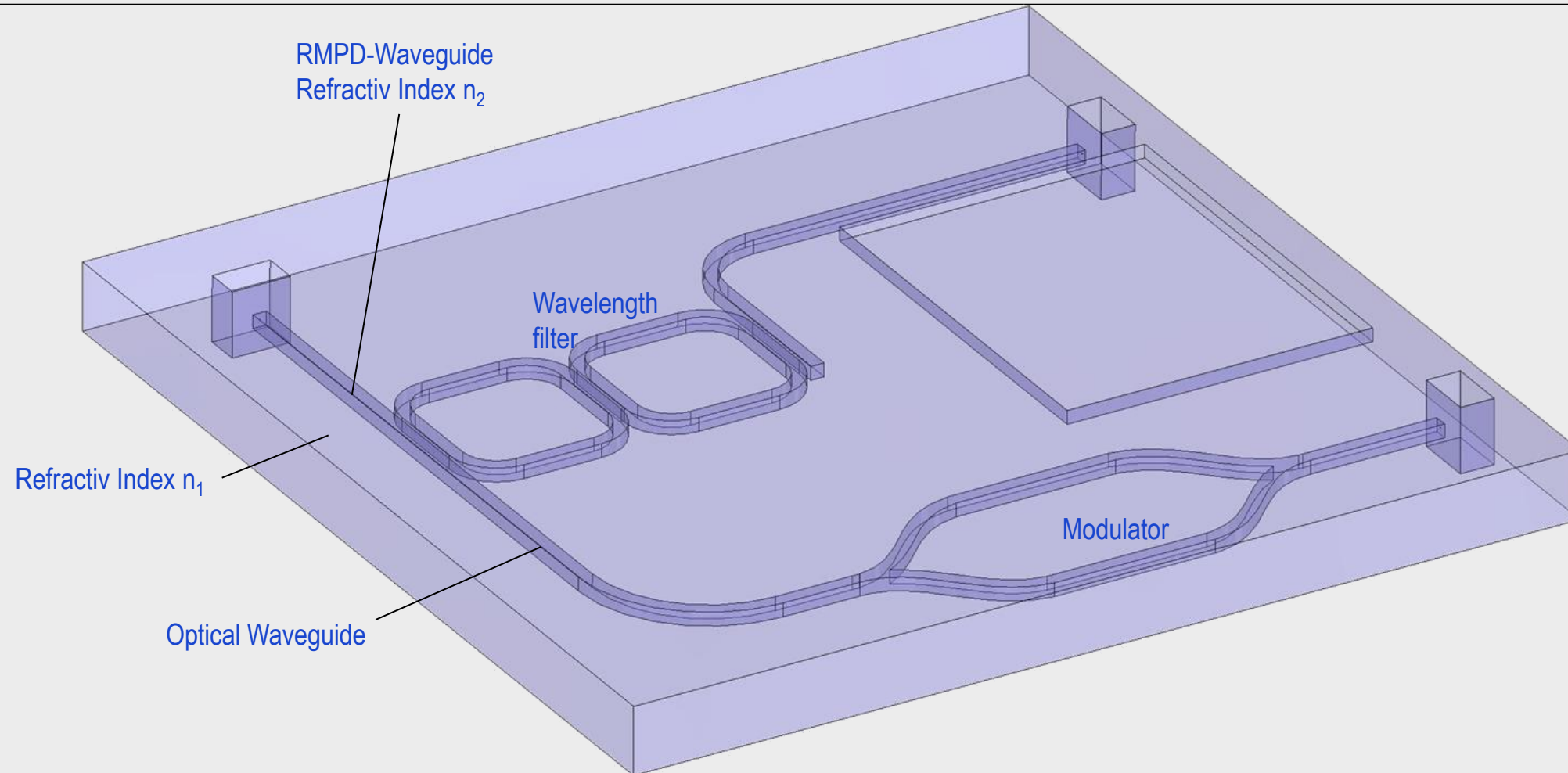
Cartridges/Connectors to realize a micro-macro interface for a nano-immunosensor:

- Integrated chip: asymmetric Mach-Zehnder interferometer
- Micro-fluidic channels and interface
- Optical fiber interface
- Optical lens interface
- Application: detection of toxic substances in water

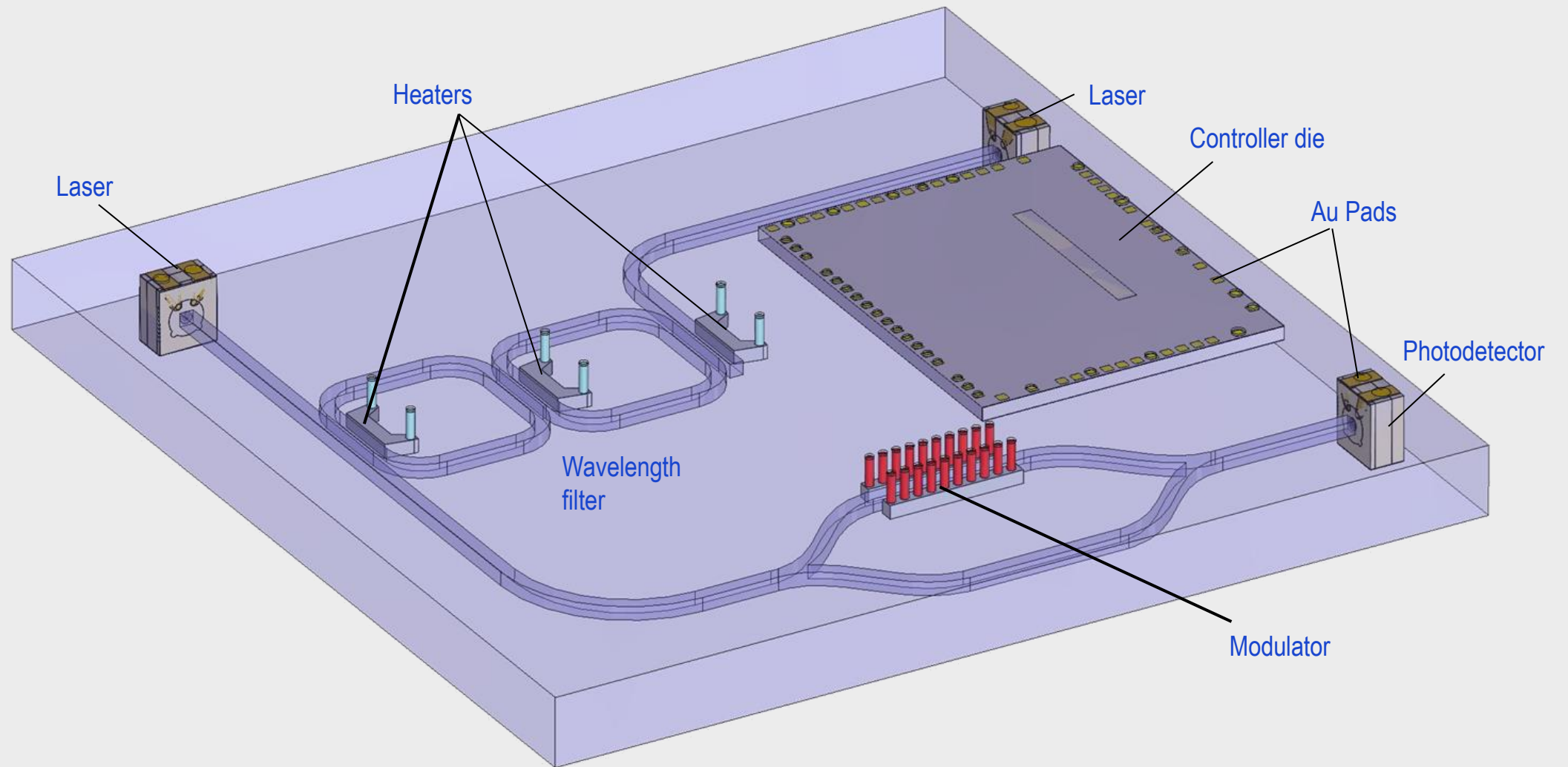
MMIC modules: 100 to 500 GHz, 4G, 5G, distance radar, motion sensor



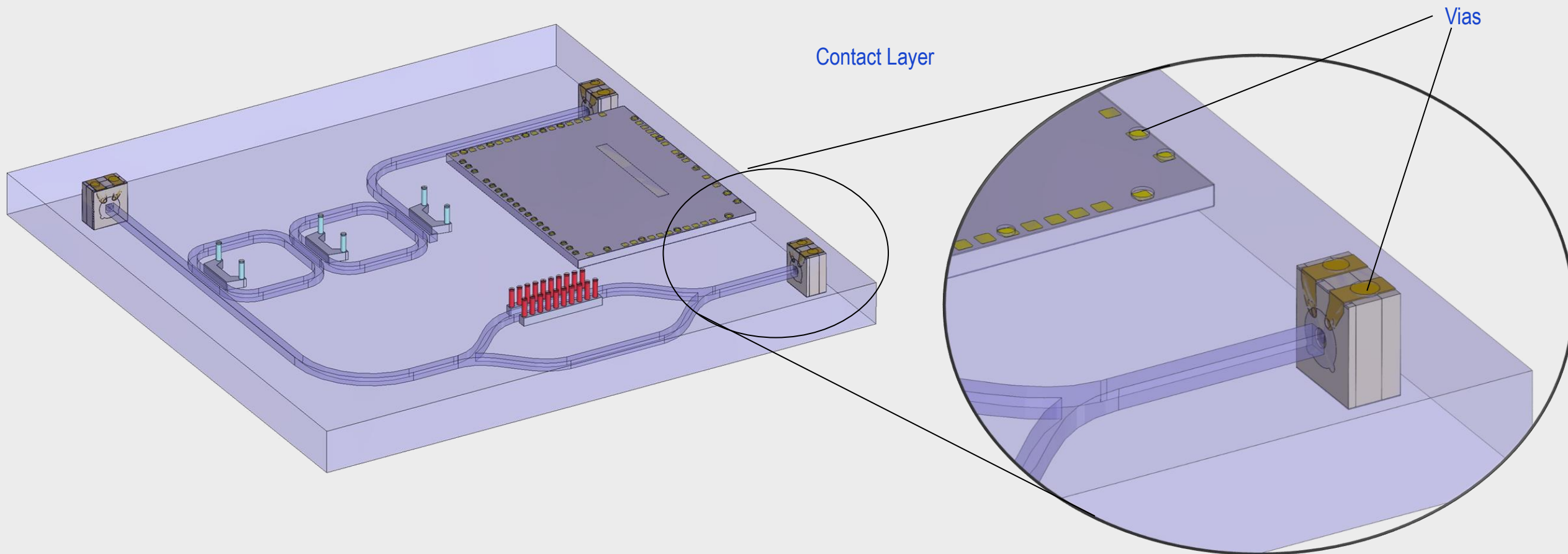
RMPD- Photonics Chip; optical waveguide



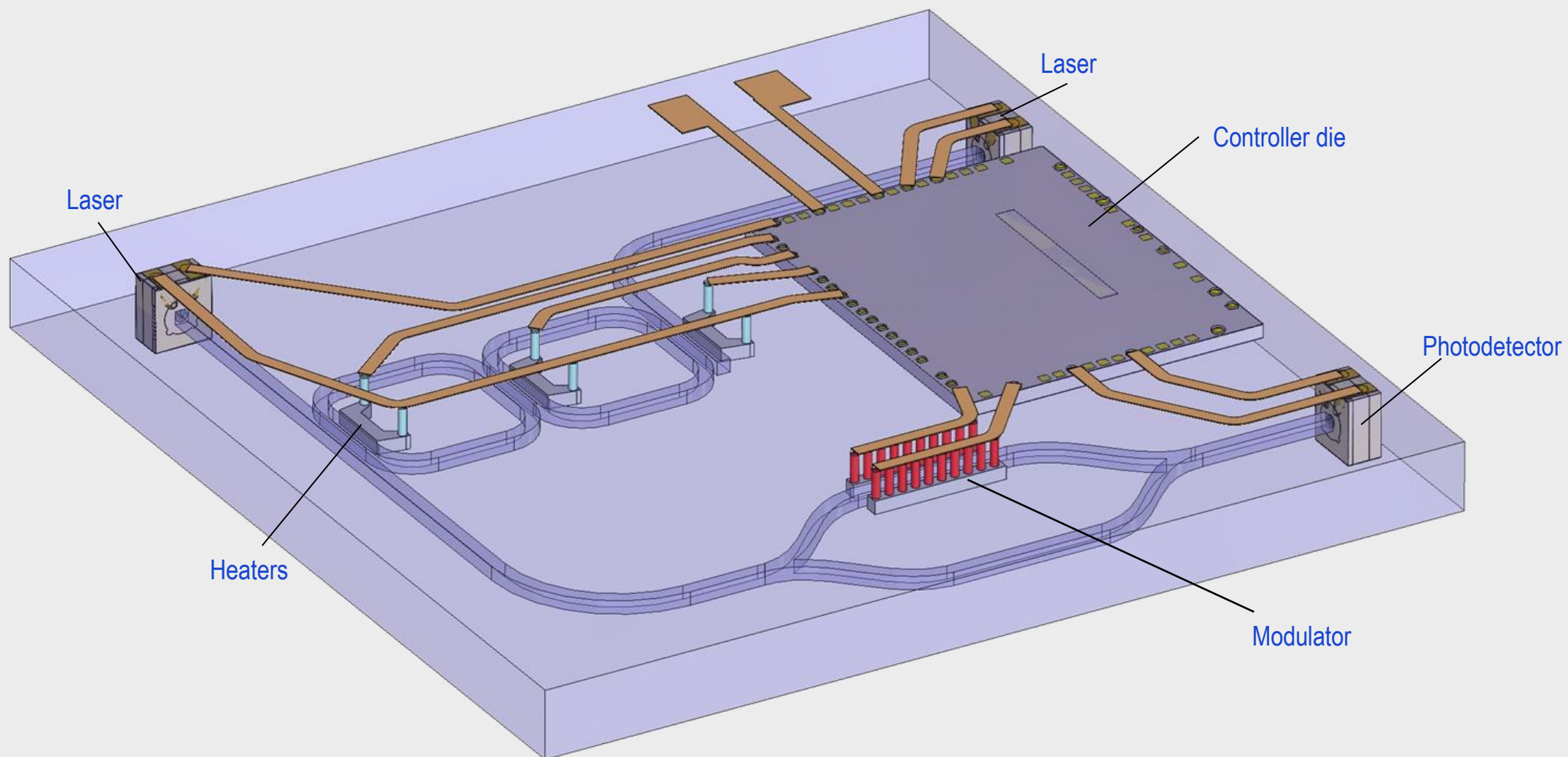
RMPD- Photonics Chip; pic and place



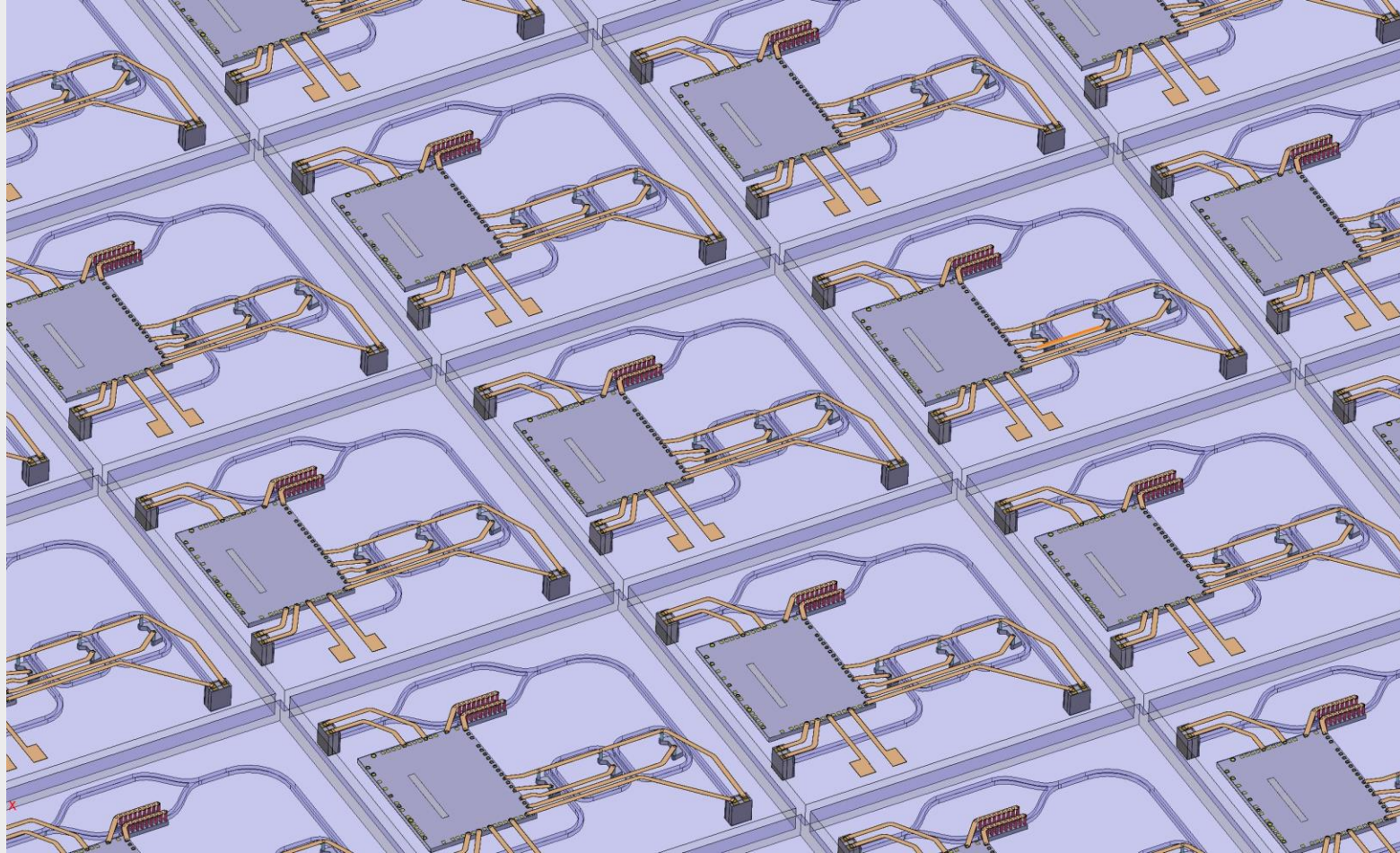
RMPD- Photonics Chip; Contact Layer



RMPD- Photonics Chip with 3D-CSP wiring layer



RMPD- Photonics Chip with 3D-CSP batch on substrat





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