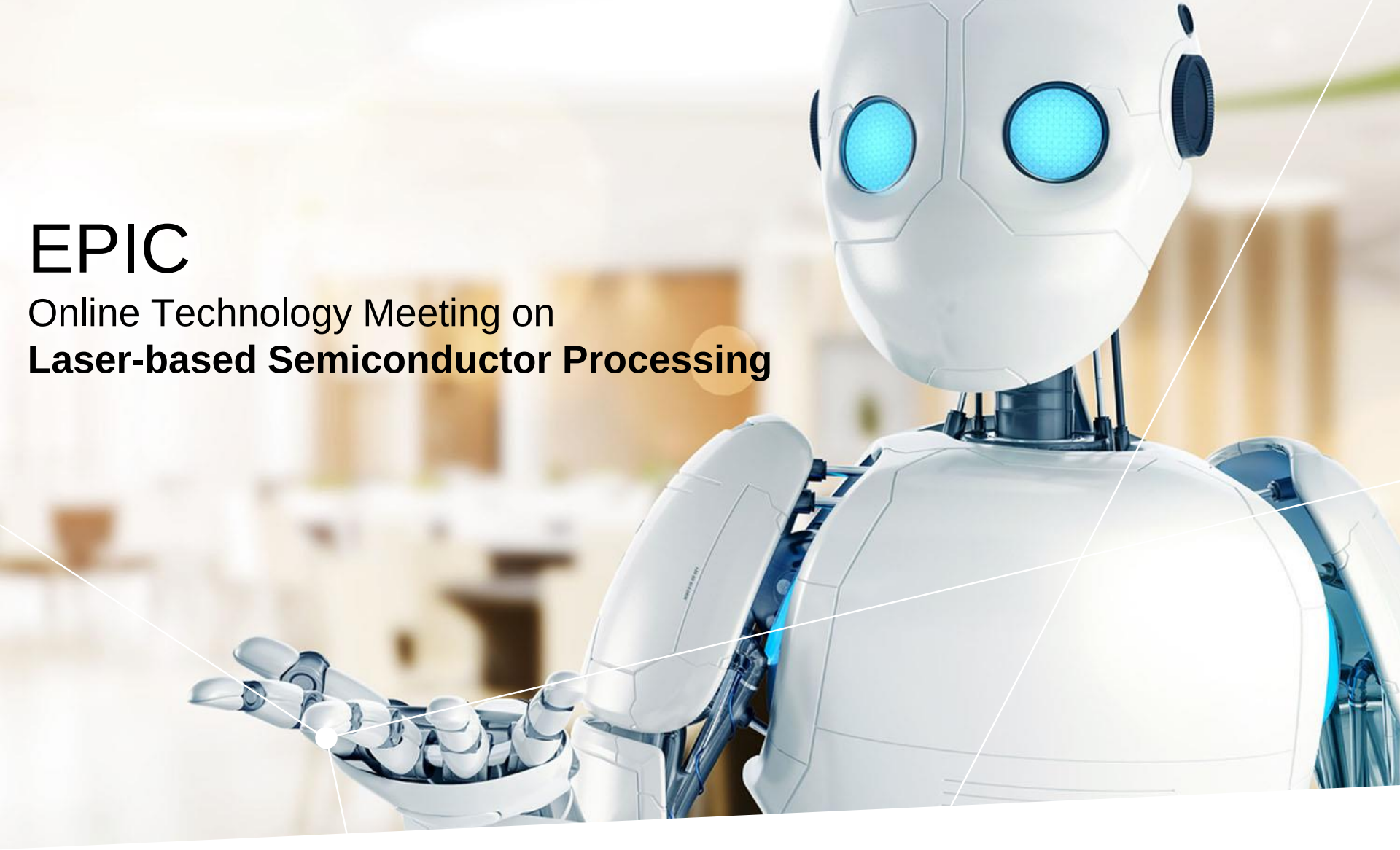


EPIC

Online Technology Meeting on

Laser-based Semiconductor Processing

Benjamin Bernard

09.06.2020

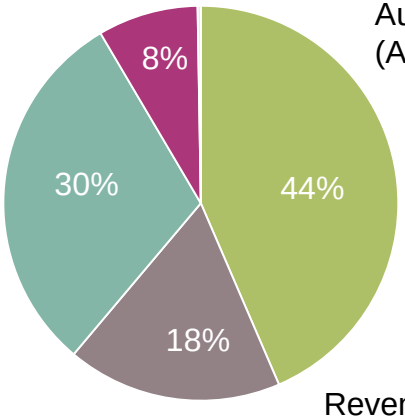
Infineon at a glance

Business Segments

Digital Security Solutions (DSS)

Power & Sensor Systems (PSS)

Industrial Power Control (IPC)

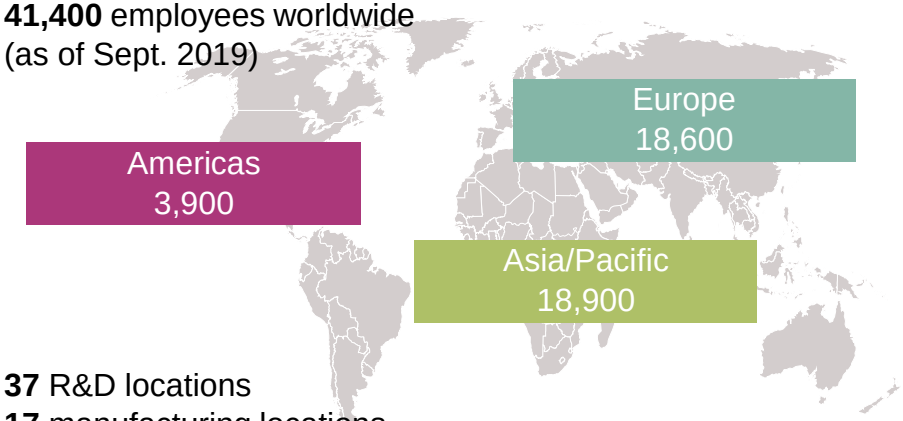


Automotive (ATV)

Revenue FY 2019

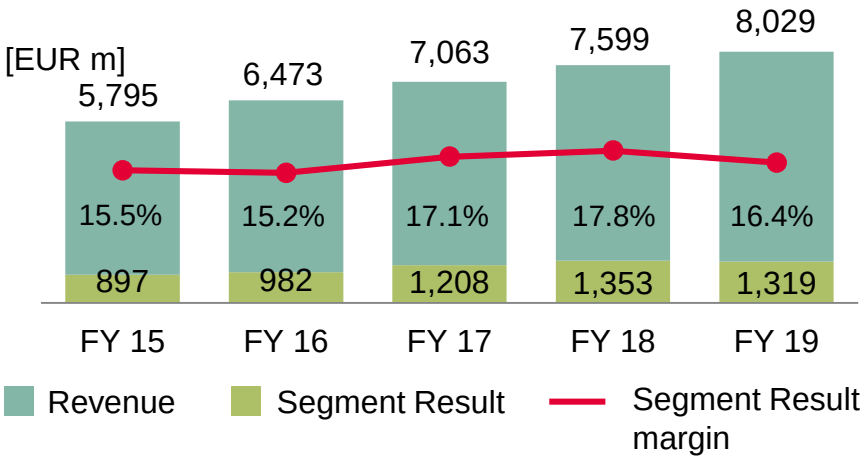
Employees

41,400 employees worldwide (as of Sept. 2019)



37 R&D locations
17 manufacturing locations

Financials

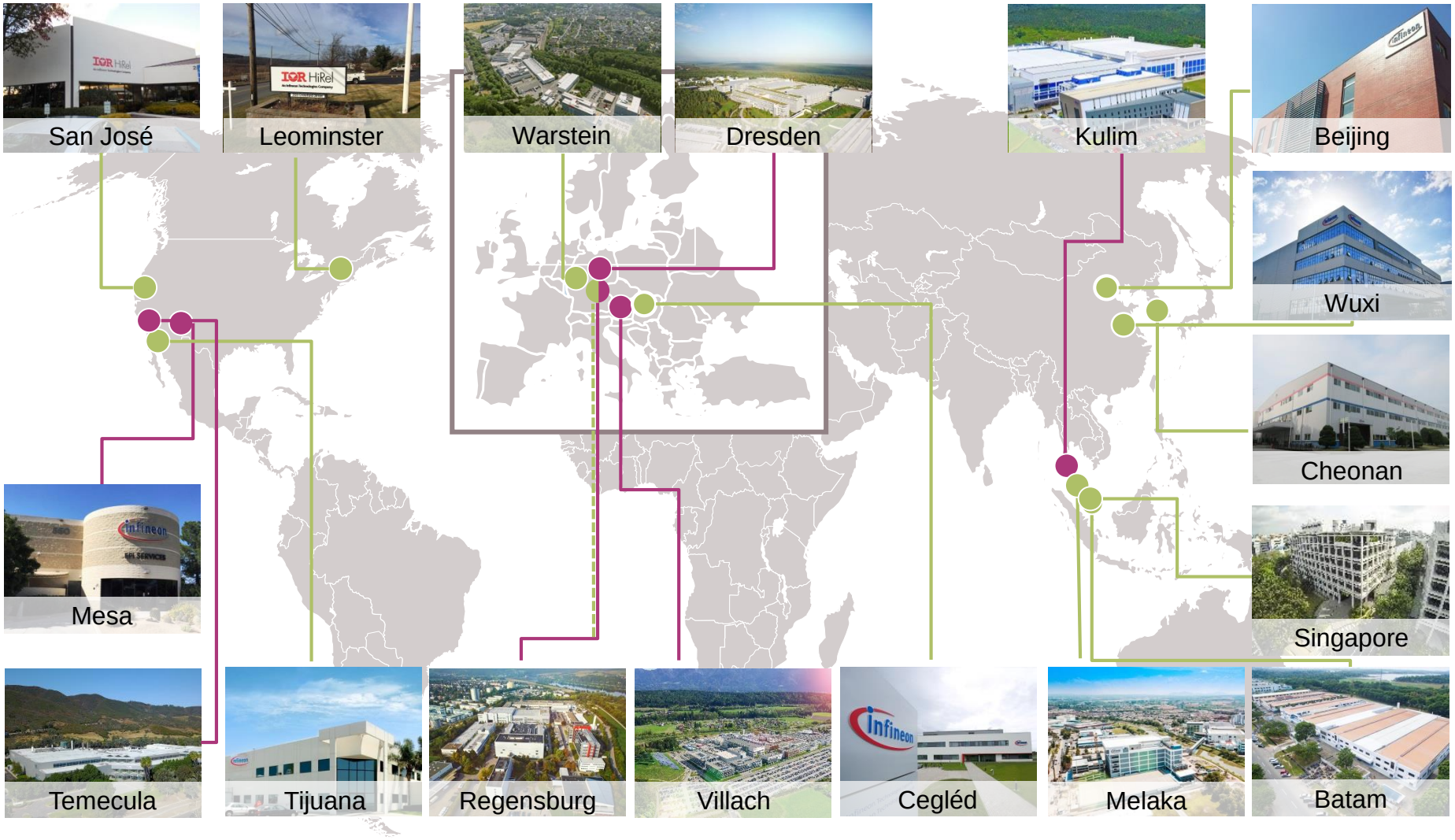


Market Position

Automotive	Power	Security ICs
		
# 1	**# 1**	**# 2**
Strategy Analytics, April 2020	Omdia (former Informa Tech), September 2019	ABI Research, September 2019

*including Cypress

Worldwide manufacturing sites frontend and backend

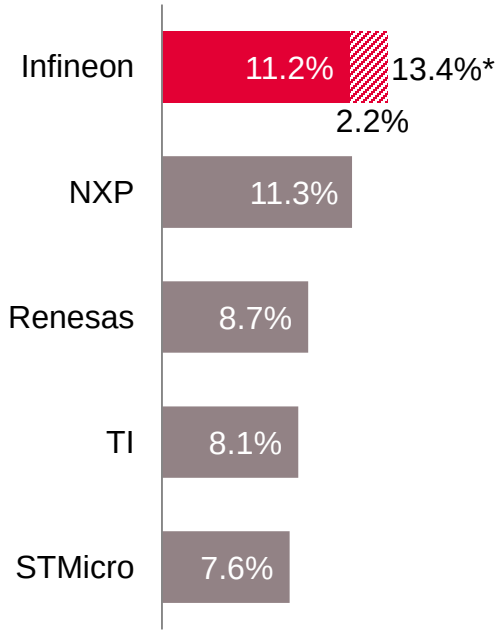


As of September 2019

Infineon is a top player in all target markets

Automotive semiconductors

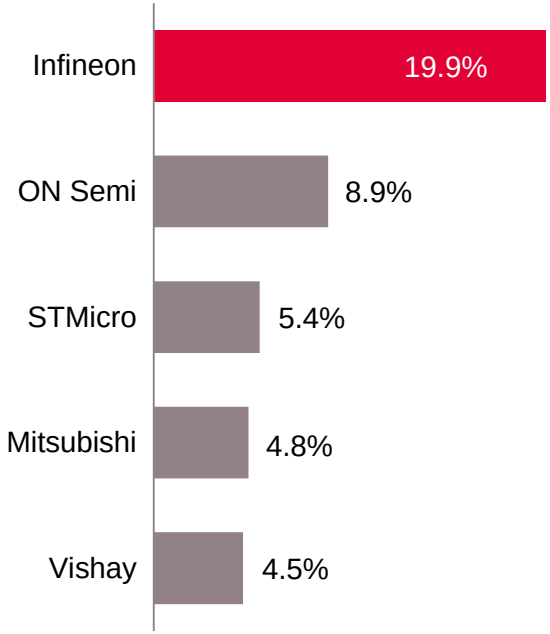
total market in 2019: $37.2bn



Source: Strategy Analytics, “Automotive Semiconductor Vendor Share", April 2020
*Cypress share 2.2%

Power discretes and modules

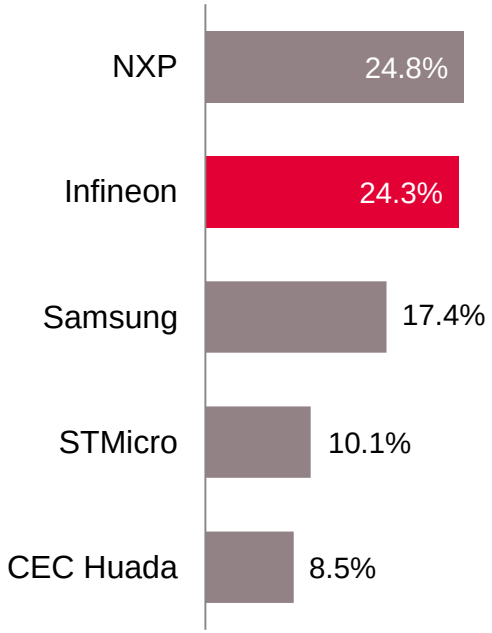
total market in 2018: $21.0bn



Source: Based on or includes content supplied by Informa Tech (former IHS Markit Technology), "Power Semiconductor Market Share Database – 2018", September 2019

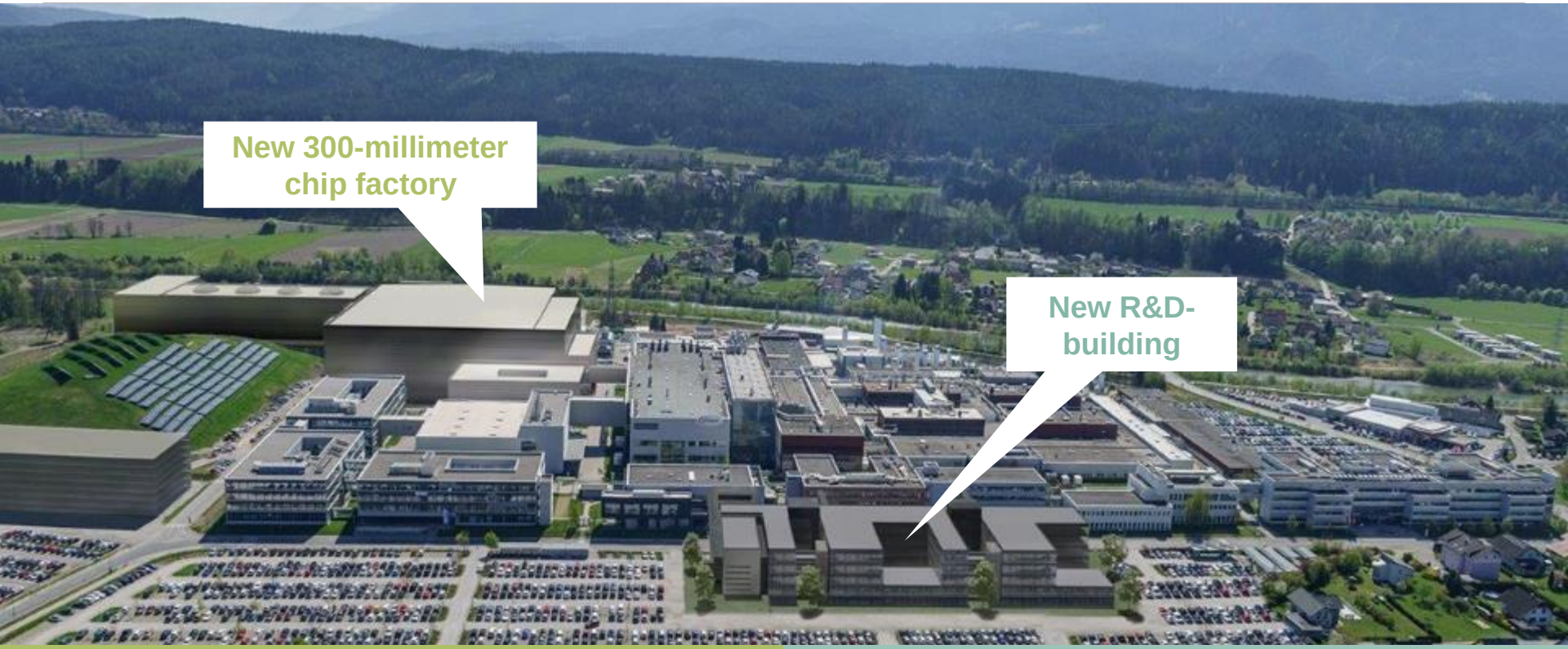
Security ICs

total market in 2018: $3.2bn



Source: ABI Research, "Smart card & secure ICs", September 2019

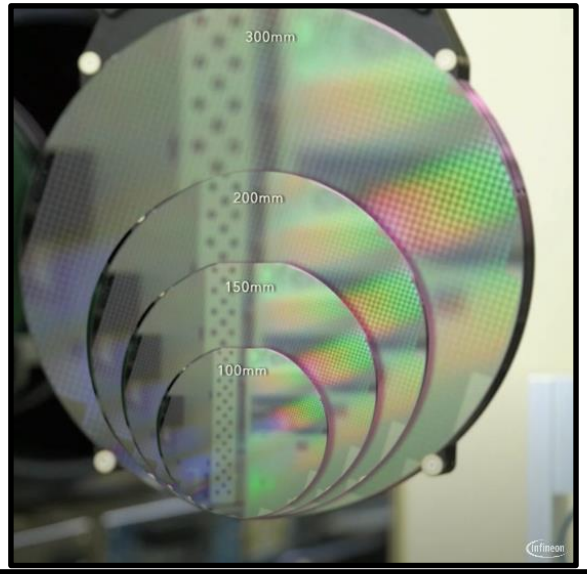
Billions to be invested in the Villach site

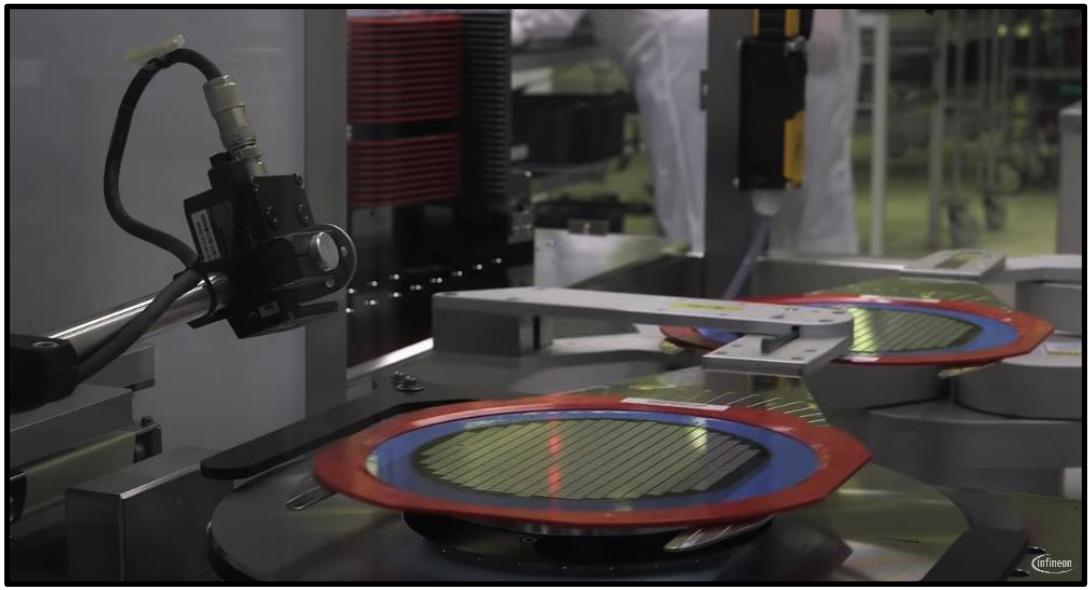


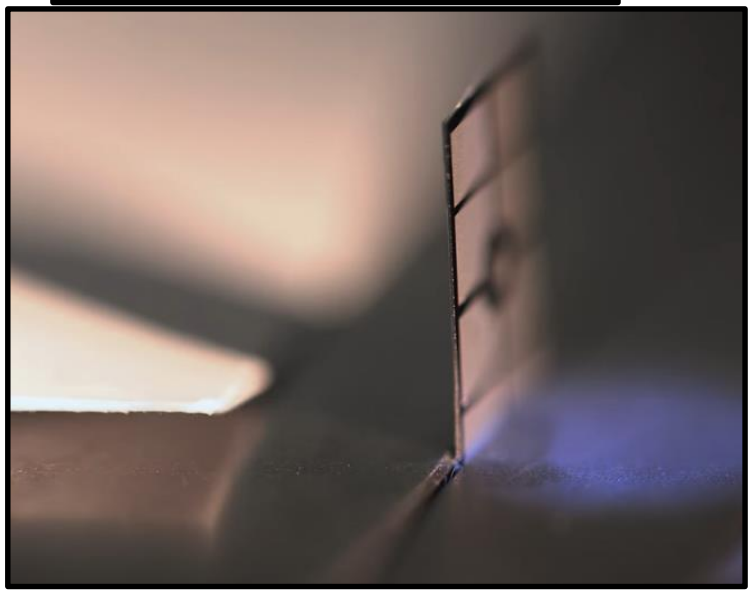
New fully automated chip factory		New R&D-building	
Start of construction:	First half of 2019	Start of construction:	Autumn of 2018
Start of production:	End of 2021	Implementation:	Spring of 2020
Total building area:	~ 60,000 m²	Total building area:	~ 20,000 m²
Headcount:	~ 400 highly qualified jobs	Building capacity:	600 R&D-workplaces, of which 350 additional R&D-workplaces
Volume of investment:	~ € 1.6 billion	Volume of investment:	€ 50 million

Example: Wafer separation

- Materials: Silicon, SiC, GaN
- Thin & Ultra Thin wafers (<100µm; <<100µm)
- Wafer Size: 6“, 8“ and 12“
- Highest quality







Example: Ultra Thin wafer Separation

- Different thicknesses and multiple stack layers (Oxide, Metals, passivation layers) requiers fine tuning of separation process
  => High flexibility of Laser processing due to beamshaping and splitting
- Highest reliability of separation process requierd to garantee stable and continous process results in 24/7 production

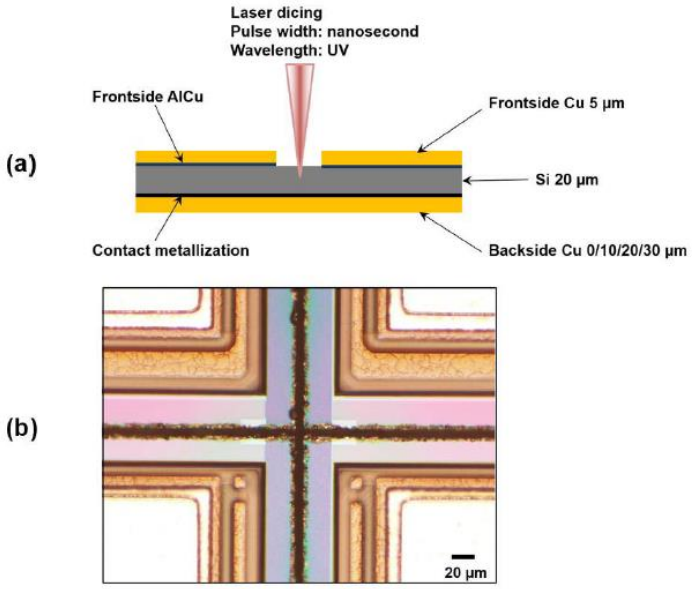


Fig. 3. (a) Laser dicing layers in the ultrathin wafer. (b) Top view of laser dicing kerf.

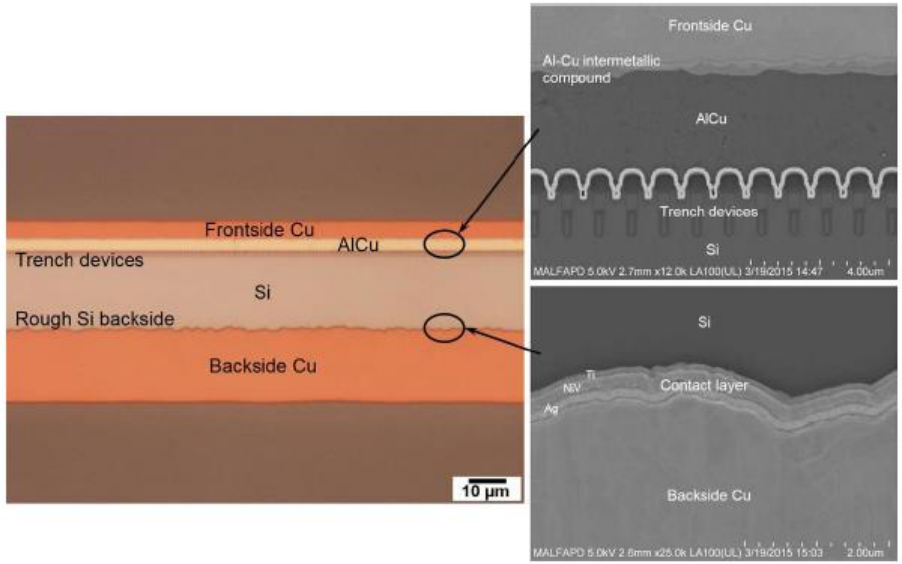


Fig. 4. Optical cross section of a 20 μm Si die with 5 μm frontside Cu and 20 μm backside Cu, with SEM close-up images of the AlCu and backside contact layers.

Effect of Nanosecond Laser Dicing on the Mechanical Strength and Fracture Mechanism of Ultrathin Si Dies With Cu Stabilization Layer
Michael Raj Marks, Zainuriah Hassan, *Member, IEEE*, and Kuan Yew Cheong, *Member, IEEE*

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