Reliable Storage & Embedded IoT Solutions

Chiplets are the next key innovation for the Open Source Hardware Community

"More than Moore beyond Moore"

Store. Secure. Trus

Swissbit Development & Production Site Berlin, Germany

swissbit®

Competence We Deliver





High-quality Manufacturing and Mass Customization

Established

1992 Optosys GmbH 2002 Swissbit Germany AG 2019 new fab on 10´000m² incl. Clean Room

Production

2–3 Million units per month depending on product mix Advanced 3D semiconductor Packaging, Test, BI, Data– & Certificate upload

Shift system 24/7 – 5 shift system

Certifications ISO 9001:2015 – IATF 16949 – ISO 14001 – ISO 27001 – ISO 50001

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Chiplet Applications – Open Foundry – Advanced Packaging Technology

Swissbit driving the Open Advanced Micro Integration Foundry with LAB-in-the-FAB Concept



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Global Overview of market change process with Chiplets

Supply Chain Overview – Strengthening sovereignty through chiplets



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SoP with Chiplet ECOsystem

Chiplet Substrate / Packaging buildup

The Smart Substrate for Chip Packaging

(Embedded Multi-DIE Interconnect Bridge (EMIB), Chip-on-Wafer-on-Substrate (CoWoS), Integrated-Fan-Out (InFO), System-on-Integrated-Chips (TSMC-SoIC) technologies)



Availability of Organic Interposer

Heterogeneous integration of multi-DIE solutions in a system-on-package of different FABs and semicon nodes is the central idea of chiplets.

Global Overview of market change process with Chiplets

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Heterogenous horizontal versus vertical integration



Swissbit understanding of micro electronic integration change suissbit[®] Chiplet brings Micro Integration / Packaging into the central focus



Generalized Chiplet System Architecture

Open Source Chiplet System Architecture Framework – resilience and technological sovereignty



Generalized Chiplet System Architecture



Open Source Chiplet System Architecture Framework – Open Source IP dependencies

• NoC based Architecture with generic D2D Interfaces

ARTERISImage: Network-on-ChipOpenNoCProNoCFlooNoC

- UCle • EHIPS OPEN DSENT Compute Project* •**E C ALLIANCE** Universal Chiplet A Tool Connecting Emerging terconnect Express Advanced Photonics with Electronics for Universal Chiplet Bunch-of-Wire Interface Bus (BoW), Open-HBI Interconnect Opto-Electronic Networks-on-(AIB) Express UCle Chip Modeling
- Bring-Up, Secure Boot of Chiplet Assemblies (RoT | HSM) UART, JTAG, BDM etc.
- DfM / DfT JTAG BSCAN, System Monitors

ADK

CDK

- Security & Safety by Design
 - ISO 26262 (automotive functional Safety)
 - ISO 21464 (automotive Cybersecurity)
 - ETSI TS 103 701 (test specification for consumer IoT devices)
 - EN 303 645 (Cyber Security for Consumer Internet of Things: Baseline Requirements)
 - IEC 62443 (Secure development process according to IEC 62443-4-1Certified service according to IEC 62443-2-4 Certified reference architectures and customer-specific solutions according to IEC 62443-3-3)
 - IEC TS 63074:2021 (Safety of machinery security aspects related to functional safety of control systems)
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/erifiable by

Open Source Community

Advanced Packaging, manufacturing & test facility



Demand of Chiplet based Open Advanced Micro Integration Foundry with LAB-in-the-FAB Concept



"Top research needs on-site production on an industrial scale!" Open Advanced Packaging / Micro Integration Foundry

focusing on new technologies



focusing on new product needs

"Manufacturing Pilot Facilities" in addition to "RTO Pilot Lines"

Technological Challenges in Microsystem Integration

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Chiplet dependencies between Design Kits – Chiplet System Architecture – Open Source Design Kits



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Product driven

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echnology driven



As part of the Swissbit's Open Advanced Micro Integration Foundry initiative, Swissbit want to offer:

- industrial partners (Start-ups, SME, LE),
- RTOs,
- technical colleges and universities
 the packaging of European designed custom ASICs (preferably Chiplet systems as SoP or multi DIE systems as SiP)
 on series production equipment at industrial conditions
 if it is in line with existing manufacturing capabilities or future
 planned ones Capabilities on the roadmap and current capacities



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Establishment of a series production / Open Foundry, research and innovation cluster Micro Integration of European Chiplet core/key technologies

Key Customers

- Automotive OEM's
- Robotics
- KI/ML Datacenter
- Critical Infrastructure

No more "*More than Moore beyond Moore*" progress without **Silicon Photonics** in Advanced Packaging!

>> Needs collaboration & partnership ! <<

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Chiplet Applications – a new opportunity of trusted electronic suissbit[®] Key Messages / Statements of European Chiplet core/key technologies

- System on Package with Chiplets: The New "Configurable" SoC Platform !
 - Substrates + CCT + Chiplets must be viewed holistically in design & semiconductor backend foundry
- No more "*More than Moore beyond Moore*" progress without Silicon Photonics in Advanced Packaging / Micro Integration!
 - Transition from an electrical D2D to a photonic D2D at the chip-edge I/O and interconnect layer.
 - Unique selling point of the advantages of silicon photonics for Chiplets!
 - missing Photonic digital MAC- & optical PHY- IP for CMOS-ASIC-Design
- Open Micro Integration Foundry with integrated LAB-in-the-FAB on a volume producing Packaging Foundry of trusted electronic!
 - Closing the gap between Technology R&D and Production
 - For Prototypes, small and medium Series Production BEYOND technology demonstration (TRL6).
 - Optimization for Manufacturability (DfM), Reliability (DfR), Test (DfT), Cost (DfC)
 - Yield Assessment, Yield Learning, Adjustment of Test process (margins)
 - Manufacturing Cost as base for the product/ service pricing
 - Compliance to certifications and regulations e.g. REACH, RoHS, PFAS; sustainability and environmental requirements

Storing and protecting data by trustworthy European value chain.



Contact

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