Network On Interconnect Fabric

Tech ID: 29596 / UC Case 2018-220-0

SUMMARY

Researchers at the UCLA Department of Electrical & Computer Engineering have developed a novel network on interconnect fabric (NoIF) to support global communication, power conversion and management, synchronization, and to facilitate testing within the silicon interconnect fabric (Si-IF).

BACKGROUND

Modern systems contain a variety of heterogeneous circuit blocks, and require ultra large-scale integration to accommodate different applications. Ideally, silicon interconnect fabric (Si-IF) is a compatible platform to satisfy the needs of modern systems through supporting integration of bare (unpackaged) dies using thermal compression bonding on a Si wafer substrate. Fine pitch horizontal and vertical interconnects are feasible within the Si-IF using standard Si processing techniques. However, to enable the Si-IF as a practical platform for ultra large-scale heterogeneous integration, system-level issues, similar to a large system on a chip, must be addressed.

INNOVATION

Researchers at UCLA have developed a novel network on interconnect fabric (NoIF), which enables integration of ultra large-scale heterogeneous systems within the technologically mature Si-IF platforms. NoIF is based on utility dies that serve as intelligent nodes within the network.

APPLICATIONS

NoIF offers a wafer-level framework to enable multiple services, including global and semi-global communication, power delivery, conversion, and management, synchronization, testing and more.

ADVANTAGES

NoIF is a novel wafer-level framework to support heterogeneous, ultra large-scale integration.

STATE OF DEVELOPMENT

Conceptual stage.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,239,542	02/01/2022	2018-220

RELATED MATERIALS

- B. Vaisband, A. Bajwa, and S. S. Iyer, Network on Interconnect Fabric, Proceedings of the IEEE International Symposium on Quality Electronic Design, March 2018.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Flexible And Stretchable Interconnects For Flexible Systems And Flextrate(Tm)
- A Plastic Synapse Based on Self-Heating-Enhanced Charge-Trapping in High-K Gate Dielectrics of Advanced-Node Transistors

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Silicon interconnect fabric, Si-IF, heterogeneous integration, performance scaling

CATEGORIZED AS

- **Engineering**
  - Engineering
- **Nanotechnology**
  - Electronics
- **Semiconductors**
  - Design and Fabrication

RELATED CASES

2018-220-0

- Power Distribution within Silicon Interconnect Fabric
- Intelligent Flexible Spinal Cord Stimulators For Pain And Trauma Management Through Neuromodulation
- Trademark: Flexible Fan Out Wafer Processing And Structure: Flextrate

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