

**Duration: 08:30 - 17:50**

**Room: Singapur**

**WTh-03**

**Integrated Circuits for High Datarate THz-Communication**

**Organisers:**

Herbert Zirath, Chalmers University, Sweden

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**Abstract**

Due to the constant demand for higher data rate in mobile networks, new frequency bands above 100 GHz are attracting increasing interest due to the practically unlimited available bandwidth. Wireless datacom applications such as wireless backhaul data transfer for the next generations of mobile communication systems, wireless communication in data centres, wireless download kiosks, high resolution video transfer with low latency are some examples of future use of new frequency bands above 100 GHz. On the other hand, frequency bands have to be first allocated, and standards have to be developed before these higher frequency bands will become of commercial interest. Today, the E-band (71-76, 81-86, 92-95 GHz) is employed increasingly in the networks, allowing multi Gbps data rate. In a near future however, the E-band will be crowded, and novel, higher frequency bands can to be employed as well. With newly developed RFIC-processes, it is now possible to design multifunctional integrated circuits, realising a full 'frontend on a chip' at frequencies well beyond 100 GHz. Recent results from ongoing projects are reported in this workshop with focus on the circuit design and packaging. Critical building blocks such as LNA, PA, VCOs, modulators and demodulators, frequency multipliers, power detectors and mixers will be reported realised in SiGe BiCMOS, CMOS, InP DHBT and GaAs mHEMT/pHEMT RFIC-technologies. Multifunction front-end circuits such as complete receive and transmit RFICs will be reported as well, demonstrating bitrates up to and beyond 40 Gbps.

**Programme**

**8:30 - 9:10 0.24 THz BiCMOS Transmit/Receive Circuits for Short-Range Ultra-High Speed Communication**

M. H. Eissa, IHP GmbH, Germany

**9:10 - 9:50 Broadband Communication at 240GHz in Silicon Technologies - From Circuits to System Implementation**

Ullrich Pfeiffer, University of Wuppertal, Germany

**09:50 - 10:10 200GHz BiCMOS Frontends for Energy-Efficient 50Gbps Wireless Communications (Part 1)**

C. Carta, Technical University of Dresden, Germany

**10:10 - 10:50 Break**

**10:50 - 11:10 200GHz BiCMOS Frontends for Energy-Efficient 50Gbps Wireless Communications (Part 2)**

C. Carta, Technical University of Dresden, Germany

**11:10 - 11:50 Radio Front-End Architectures and Circuits for Emerging Wireless Applications**

F. Dielacher, Infineon Technologies, Germany

**11:50 - 12:30 A D-band InP DHBT-Based Chipset for Point-to-Point High Data Rate Communication**

Herbert Zirath, Chalmers University of Technology, Sweden

**12:30 - 13:50 Break**

**14:00 - 14:40 5G Wireless Backhaul Applications and Technologies for Frequencies Above 100 GHz, D-Band (130 to 175 GHz) and J-Band**

R. Lombardi, Huawei, Italy

**14:40 - 15:20 Millimetre Wave and THz Circuitry Design Techniques Based on InP and CMOS**

Y. Kawano, Fujitsu Laboratories, Japan

**15:20 - 15:40 THz Communications for the Future Terabit Connectivity Applications (Part 1)**

H.J. Song, POSTECH, Korea

**15:30 - 16:10 Break**

***16:10 - 16:30 THz Communications for the Future Terabit Connectivity Applications (Part 2)***

H.J. Song, POSTECH, Korea

***16:30 - 17:10 THz Communications using Photonics***

G. Ducournau, IEMN Lille, France

***17:10 - 17:50 300 GHz Wireless Communication Frontend Based on a Highly Integrated GaAs mHEMT Chip Set***

I. Kallfass, University of Stuttgart, Germany