TC MTT-14
Reporting period: Jan.-May 2009

Chair: Luciano Boglione, l.boglione@ieee.org
Vice-chair: Phil Smith, pmsmith@ieee.org

Mission

The role of the Technical Committee on Low-Noise Techniques is to contribute to the development and facilitate the distribution of knowledge in the field of noise and random phenomena occurring in microwave devices, circuits and systems. As such, the Committee interests span a very broad range of topics. These topics include, for example, fundamental research in basic noise-generating mechanisms, noise properties of linear and nonlinear circuits, design of low-noise amplifiers, mixers and oscillators for microwave through optical frequencies. These topics would also include measurement techniques of the noise properties of devices, circuits and systems, as well as the design of complex receivers for ground and space communications and for passive and active remote sensing.

The means for fulfilling this role are:

- *Publishing review and tutorial articles*
- *Origination of special issues of Transactions*
- *Initiation and popularization of standards*
- *Organization of workshops, focused sessions and panel sessions at international symposia supported by MTT*
- *Close collaboration with other Technical Committees of MTT Society, as well as with Technical Program Committees of international and national conferences of interest to MTT Society and its members*

The Committee consists of a number of experts in the field representing industry, government and academia from around the world.

Note: The above mission statement is available on the MTT14 website

Meetings

- No new meeting since last report on January 17, 2009
- Next dinner meeting scheduled on June 9, 2009 as planned

Membership

- No changes in membership since last report (January 2009)

- Current Chair and Vice-Chair terms end in 2010
    - Vice chair will take over chairmanship in 2011

Website status

- Webmaster is Luciano Boglione
- Website is maintained and operated by webmaster
- MTT14 documents are made available on the website

Competition

Low Noise Amplifier Design Competition at IMS 2009 in Boston

- *Organizers:*
    - *Roger Kaul, r.kaul(at)ieee.org*
    - *Ed Niehenke, e.niehenke(at)ieee.org*
    - *Stefan Heinen, stefan.heinen(at)ieee.org*
    - *Luciano Boglione, l.boglione(at)ieee.org*
- *Sponsors*
    - *Microwave and Millimeter-Wave Integrated Circuits (MTT-6)*
    - *Microwave Low-Noise Techniques (MTT-14)*
    - *Microwave Systems (MTT-16)*
    - *Wireless Communications (MTT-20)*

Publications

Nothing to report

IMS workshops

http://www.ims2009.org/workshop_descrip.htm#WSL

WSL (IMS/RFIC) Sunday 13:00 – 17:00 BCEC Room 153C
State-of-the-Art of Low-Noise III-V Narrow-Bandgap and Silicon FET Technologies for Low-Power Applications [pdf]
Half-day workshop reviewed by MTT-14, MTT-7, MTT-23.
Organizer(s):

Francois Danneville, IEMN-DHS, UMR CNRS, France; MTT-14, IMS TPC.
Paulius Sakalas, CEDIC, Dresden University of Technology, Germany; MTT-14.

This workshop aims to investigate various state-of-the-art low-noise FET technologies for low-power applications: (i) narrow-bandgap III-V HEMTs technologies (on InP or GaAs substrate) (ii) Si CMOS Technology. The first part will focus on InGaAs/InAlAs and Antimonide-Based Compound Semiconductor (ABCS) InAs/AlSb HEMTs. Devices specifically designed to operate at lower DC power consumption, or for low-noise operation, will be presented along with corresponding characterizations (models extraction). Their capability will be shown through ultra-low power MMIC (or hybrid) circuits, including low-noise amplifiers (operating at room and cryogenic temperatures) and switches in cm/mm-wave range. Strengths and limitations of such technologies will also be addressed. The second part will focus on Si CMOS technology. Millimeter-wave LNA will be presented with recent advances concerning CMOS mm-wave building blocks. Special attention will be paid on particular techniques taking advantage of CMOS technology while circumventing its weaknesses. Finally, a new scheme to optimize RF noise of MOSFETs through channel engineering will be described in detail.

Speakers:
1. Jan Grahn, Chalmers University of Technology, Göteborg, Sweden
"Narrow-Bandgap InGaAs/InAlAs and InAs/AlSb HEMTs for Low-Noise and Low-Power Applications"
2. Jonathan Hacker, Teledyne Scientific
"Antimonide Based Compound Semiconductors (ABCS) for Ultra-Low Power Applications"
3. Tatsuya Hirose, Fujitsu Ltd.
"InP HEMT and Si-CMOS Device and Circuit Design for mm-Wave Low-Noise Applications"
4. Ali Niknejad, University of California - Berkeley
"Recent Advances in CMOS mm-Wave Building Blocks"
5. Francois Danneville, IEMN-DHS, UMR CNRS
"Noise Properties of Low-Power Si MOSFETs Through Different Channel Engineering"

Events beyond IMS

Nothing to report

DML and Speakers Bureau status

Speaker Bureau MTT14 members:

- Francois Danneville
- Marian Pospieszalski

Identification of DML speakers within MTT14 has been discussed last year and it will be brought up again at the dinner meeting in Boston

IEEE Award candidate nominations

Nothing to report

Liaisons to other technical professional organizations

The chair believes that many MTT14 members are involved in other technical activities and organizations since many MTT14 members reside outside the US.

Furthermore,

- Tony Kerr is involved with IEEE Working Group P1785
- Paul Tasker is a MTTS DML

However, MTT14 is not requiring any reporting activities for these activities since they are not representing or endorsing MTT14.

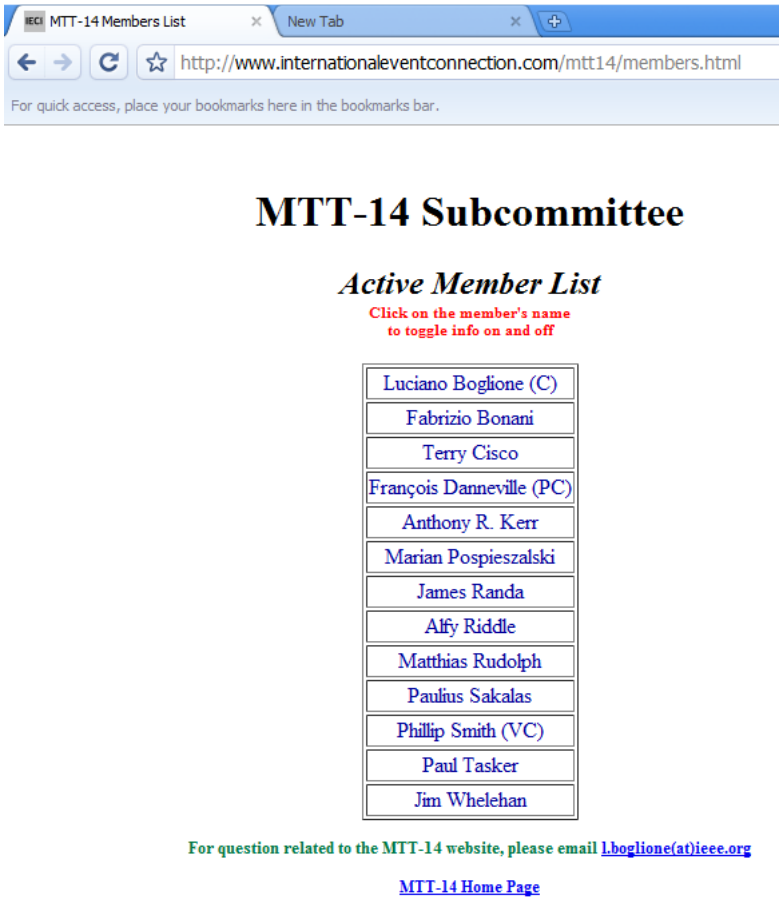
Other items to report

None to report

Plans for next months

To be discussed in Boston

List of members



Please consult webpage at for up-to-date information.