Large Scale Collaborative Project

DOTSEVEN

Towards 0.7 Terahertz Silicon Germanium Heterojunction Bipolar Technology

FP7 Contract Number: 316755

WP5 – Training and dissemination

Deliverable report

Due date of deliverable:	M36
Actual Submission date:	M36

Deliverable ID:	**D5.4**
Deliverable Title:	**DOTSEVEN workshop 3**
Responsible beneficiary:	UB
Contributing beneficiaries:	UB, IFX, IHP, BUW, SIMA, TUD, JKU , DICE

Start Date of the Project: 1st October 2012 42 Months

Revision: Vf
Dissemination Level: PU

Document Information

Document Name: DOTSEVEN-WP5-D5.4
Document ID: DOTSEVEN_D5.4_UB_vf
Version: Vf
Version Date: 02/10/15
Authors:
Security: **Public**

Approvals

	Name	Organization	Date	Visa
Coordinator	Rudolf LACHNER	INFINEON	2.10.2015	Ok
Technical Manager	Michael SCHROTER	TUD	1.10.2015	Ok
Work Package Leader 5	Thomas ZIMMER	UB	07/09/2015	Ok
Quality Manager	Julie CHUPIN	ALMA	2.10.2015	Ok

Document history

Revision	Date	Modification	Authors
V0	07/09/2015	Initial Version	TZ
Vf	02/10/2015	Final	IFAG/TUDresden

Content

Section 1 - Executive summary

A Workshop entitled “SiGe for mmWave and THz” was held in Paris, France on September 6, 2015. In order to maximize the impact, this event was organised during the first day of the European Microwave Week.

This workshop covered SiGe HBT technologies as well as SiGe enabled mm-wave and THz applications. In fact, nowadays SiGe technologies have passed the 600 GHz barrier in terms of maximum oscillation frequency and the 700 GHz barrier is expected to be approached in 2016. Intrinsic advantages of SiGe HBTs such as co-integration with CMOS permit to design compact, reliable and cost efficient systems on chip for mm-wave applications.

The workshop comprised 4 sessions: In the first session, the world-leading SiGe technologies from Europe were presented. The second sessions addressed compact modelling and design challenges for mm-wave and THz devices and circuits. In the third session, radar related innovative design concepts were introduced. In the last session, system providers gave insights about application challenges and potential solutions for qualified products.

1.1 Description of the Workshop Program

Programme

Opening and Welcome (9h00), Thomas Zimmer, University of Bordeaux

Session 1: Technologies (9h10-10h40)

9:10 - 09:40 Advances in SiGe BiCMOS Technology for mm-Wave Applications in the DOTSEVEN Project
Klaus Aufinger, Infineon, Germany

9:40 - 10:10 55nm SiGe BiCMOS for Optical, Wireless and High-Performance Analog Applications
Pascal Chevalier, STMicroelectronics, France

10:10 - 10:40 Optimization of vertical doping profiles for high-speed SiGe HBTs
Holger Rücker, IHP, Germany

- 10:40 Coffee break

Session 2: : Compact model and circuit blocs (11h20-12h50)

11:20 - 12:05 Impact of physical effects and compact modeling on mm-wave circuit performance
Andreas Pawlak, Technical University Dresden, Germany

12:05 - 12:50 Challenges in Modeling, Design, and Characterization of Terahertz Circuits in Silicon
Ullrich Pfeiffer, University of Wuppertal, Germany

-13:00-14:20: Lunch break

Session 3: Innovative design concepts (14h20-16h00)

14:20 - 15:05 From Adaptive Modulation Schemes towards Software Defined Radar (SDR)
Andreas Stelzer, Johannes Kepler University Linz, Austria

15:05 - 16:00 Concepts for Highly Integrated Automotive Radar Circuits
Herbert Jäger, Infineon - DICE GmbH & Co KG, Austria

Matthias Porranzl, Johannes Kepler University Linz

- 16:00 Coffee break

Session 4: Application Challenges and potential solutions (16h30-18h00)

16:30 - 17:15 Beyond 10 Gbit/s mm-wave wireless communication using SiGe BiCMOS transceivers
Erik Öjefors, SiversIMA, Sweden

17:15 - 18:00 Application challenges and potential solutions for robust radar sensors
Dirk Steinbuch, Bosch, Germany

18:00 - 18:20 Open discussion and concluding remarks

1.2 Brief description of announcement strategy

The announcement has been carried out through 5 information channels:

1. DOTSEVEN Webpage
   http://www.dotseven.eu/
2. European Microwave Week conference Webpage
   http://www.eumweek.com/conferences/Workshops-Short-Courses.html
   see also: http://www.eumweek.com/docs/workshops/WS12.pdf
3. Use of the Mailing list of the DOTSEVEN consortium
4. Use of the Mailing list of the Rf2THz consortium
5. Use of the Mailing list of the ESSDERC Technical Program Committee
6. Use of the Mailing list for the HiCuM Wokshop community
7. Use of the Mailing list for the BipAk members

1.3 Attendees

About 40 persons registered for the workshop. A worldwide representation could be observed. During this day, 15 workshops took place. Our workshop was one of the most attractive one in terms of attendees.

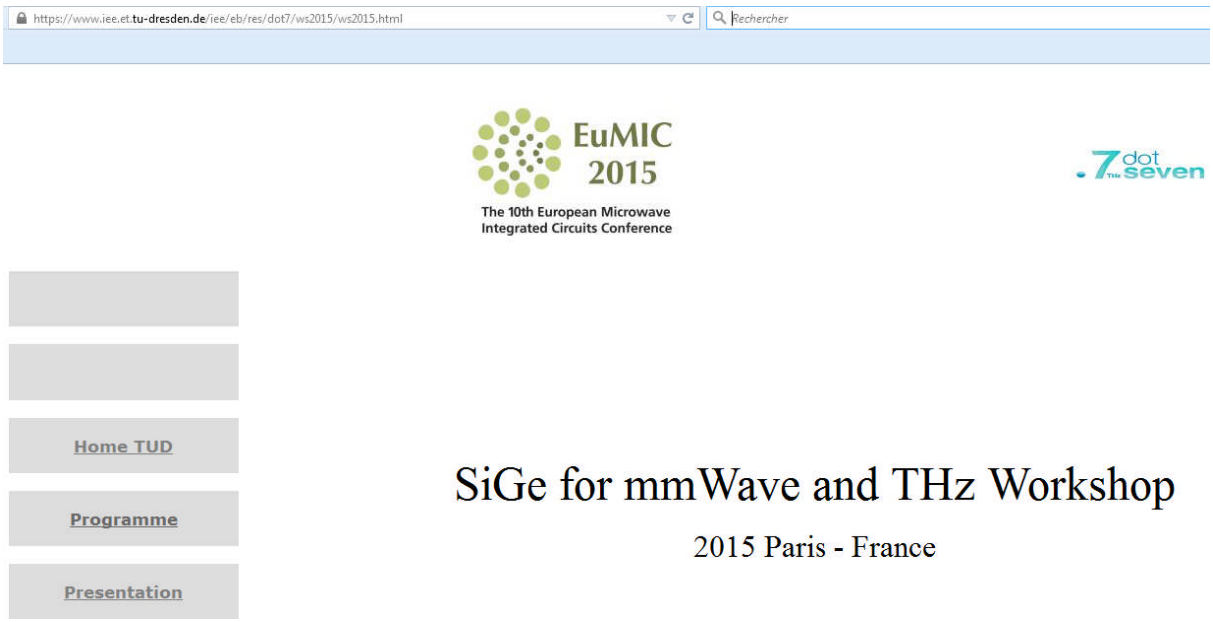
The photo below shows the audience:

1.4 Webpage for downloading the presentations

The workshop presentations have been made publicly available on a website managed by a dedicated system administrator of TUD.

The URL is:
http://www.iee.et.tu-dresden.de/iee/eb/res/dot7/dot7.html

The following picture shows the screenshot of the webpage.



1.5 Feedback from the audience

The feedback from the audience was positive. A lot of discussions continued beyond the presentations, e.g; during the lunch and coffee breaks.

1.6 Impact

During the workshop, 9 technical presentations were given. Two of them were presented by speakers from outside the DOTSEVEN consortium. In particular, we gave ST Microelectronics the possibility to introduce the latest advances in their technology development, and Bosch as system provider spoke about the challenges and solutions for building very reliable systems with SiGe technology. Since reliability is a very important topic, it has been decided that the last DOTSEVEN workshop will be dedicated to device physics and reliability of SiGe devices.

1.7 Publishable information

All information is public and the presentations are downloadable from a specific website (see above).

1.8 Conclusion

A Workshop was organized at which the objectives and the main results of the third year of the DOTSEVEN project were presented. This Workshop took place on September 6, 2015 in Paris, France.
Nearly 40 participants attended the Workshop from all over the world. The audience's feedback was positive. The research activities and reported results within DOTSEVEN were met with great interest.