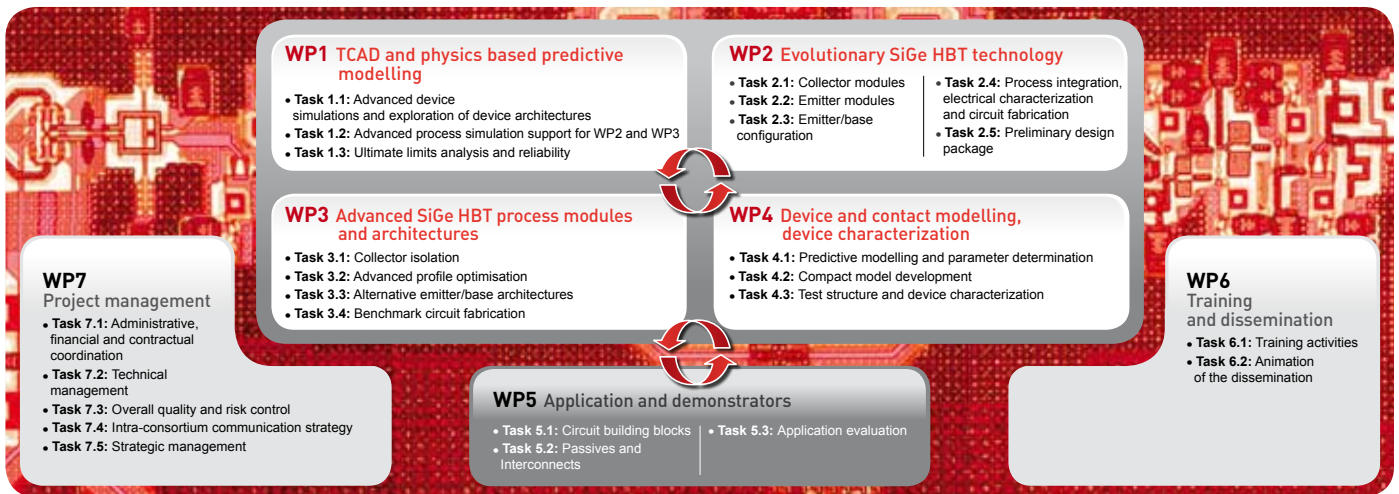


## DOTFIVE: Towards 0.5 TeraHertz Silicon/Germanium Heterojunction Bipolar Technology (SiGe HBT)

ICT – 2007 – 1

DOTFIVE is a three-year FP7 Integrated Project focused on research and development activities necessary to move the Silicon / Germanium Heterojunction Bipolar Transistor (HBT) into the operating frequency range of 0.5 terahertz (THz) (500 gigahertz).

### DOTFIVE is split into 7 Work Packages



### Addressing applications in the range 80 to 180 GHz:



#### High-speed Communication

**Wireless:**

- Personal and Local Area Networks (PANs/LANs) – consumer electronic devices
- Consumer electronic devices
- Wireless backhaul
- Inter-building communication, E-band (71-76, 81-86GHz)
- Secure links and surveillance
- Space and inter-satellite communication

**Digital:**

- High-speed interconnects
- Data switches (Mux/DeMux)
- Analog to Digital Conversion (ADC/DAC)



#### Radar Applications

**Automotive:**

- Long Range Radar (LRR) – collision avoidance, automated cruise control (77GHz)
- Short Range Radar (SRR) – pre-crash detection, stop-and-go, lane change assistant (77-81GHz)
- Road condition detection

**Space:**

- Aviation safety in extremely poor visibility (94GHz)
- Airport ground control (94GHz)

**Industrial:**

- Distance measurement
- Alarm systems and motion detection



#### mmWave, THz Imaging and Sensing

**Security:**

- Non-invasive imaging
- Drug and explosive detection

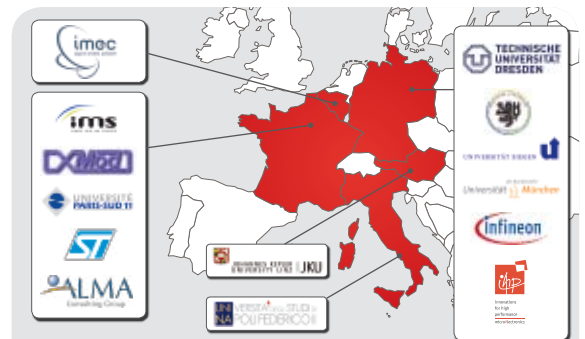
**Sensing:**

- Earth sensing and climate control
- Industrial process control
- Astronomy, microwave background

**Biotechnology:**

- Medical imaging, tumor recognition
- Genetic screening

### DOTFIVE has 15 partners in 5 countries:



**France:** STMicroelectronics (ST), XM0D Technologies (XM0D), l'Ecole Nationale Supérieure d'Electronique, Informatique et Radiocommunications de Bordeaux (IMS), Paris-Sud University (UPS), ALMA Consulting Group (ALMA)

**Germany:** Infineon Technologies (IFX), Innovations for High Performance microelectronics (IHP), the Bundeswehr University in Munich (BU), TU Dresden, University of Siegen (UoS), University of Wuppertal (UoW)

**Austria:** Johannes Kepler University of Linz (JKU)

**Belgium:** IMEC

**Italy:** the University of Naples (UTN)

**4 Companies:** IFX, ST SA ST SAS, ALMA  
**1 SME:** XM0D  
**2 Research institutes:** IMEC, IHP

**8 Universities:** JKU, IMS, UPS, TUDresden, BU, UoS, UoW, UTN

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