

Supported by the European Commission through the Seventh Framework Programme (FP7) for Research and Technology Development with up to 9,7M€ out of a total budget of 14,75M€. The DOTFIVE project addresses the area “More than Moore” targeting heterogeneous Systems-on-Chip (SoC) solutions of the Information Society Technologies priority.

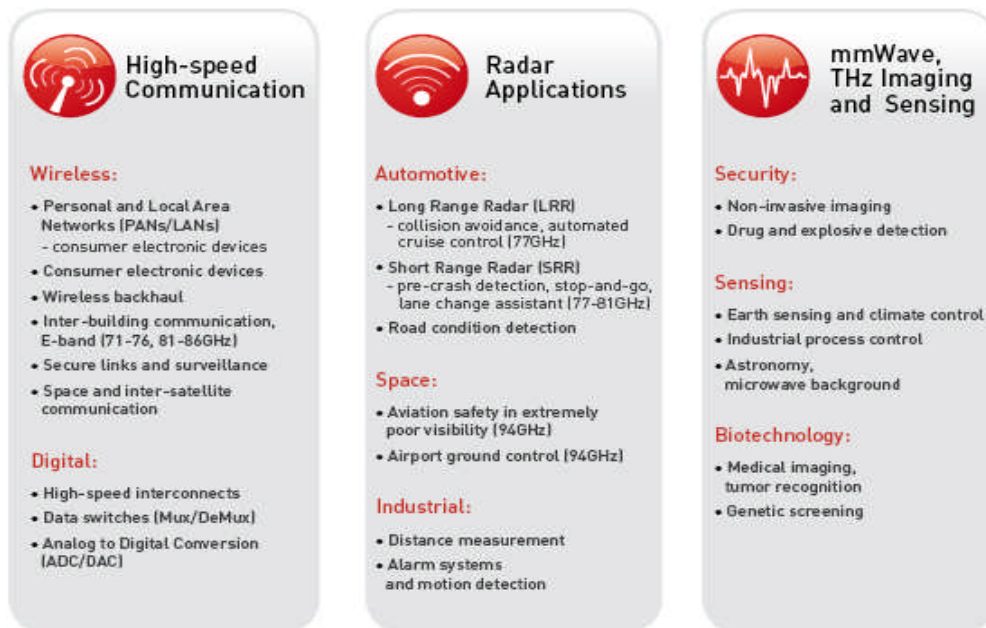
The project runs from February 1st, 2008 to January 31st, 2011

DOTFIVE is an ambitious three-year European project focused on advanced RTD activities necessary to move the **Silicon-Germanium Heterojunction Bipolar Transistor (HBT)** into the operating frequency range of **0.5THz (500 GHz)** at room temperature and evaluate the achievable performance of integrated mmWave circuits using those HBTs.

The semiconductor research and industry wish to achieve individual devices and integrated circuits with higher operating speed allowing to realize new applications in new portions of the electromagnetic spectrum. In 2010 the targeted results should reach  $f_{\max} / t_d = 500\text{GHz} / 2.5\text{ps}$

This high frequency performance is currently only possible with more expensive technology based on III-V semiconductors, making high integration and functionality for large volume consumer applications difficult.

The new transistors developed by DOTFIVE will be used for designing circuits enabling power efficient millimetre-wave applications such as **automotive radar** (Collision avoidance or automated cruise control 77 GHz) or **WLAN communications systems** (60 GHz – Wireless Local Area Network). In addition to these already evolving markets, DOTFIVE technology sets out to be a key enabler for silicon based millimetre-wave circuits with applications in **the security, medical and scientific areas** operating speed can open up new application areas at very high frequencies, or can be traded in for lower power dissipation.



Potential to Transform Modern Information Society

After two years, important progress towards the main objective has been achieved by 4 technology providers (2 companies and 2 research institutes). For this second year, 3 partners have achieved the 2<sup>nd</sup> year goal of  $F_{\max} \geq 400\text{GHz}$ . One of the latest experimental results, demonstrates wafer average values of **425GHz** for  $f_{\max}$  and suggests that the 500GHz goal will be closely approached on future silicon within 2010 or early 2011.

Concerning DOTFIVE's applications, the expected final targeted performance of **160GHz operating frequency on key functional block** has already been achieved one year ahead of schedule. The performance is already sufficient for some active imaging applications but further gain/NF improvements are useful to increase detection range to prove and demonstrate the complete system integration.

The DOTFIVE consortium is currently leading the race for the world's highest frequency best Silicon Germanium HBT.

**The further information about the events, publications and the project seminars videos** are free available at the project public web page: <http://www.dotfive.eu>

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