MEDEA+ DECISIF

Cooling down mobile devices

At some point, we all have experienced the overheating of an electronic device: be it ears burning after an hour-long phone conversation or tablets you cannot hold for more than 15 minutes. A solution to this problem might already reach our ears and pockets by 2013.

The problem of how to prevent a chip from overheating has long challenged computer experts and almost all telecommunication companies have had to deal with the matter over the recent years. But now a Franco-German team of engineers and scientists has decided to solve the problem head-on by carrying out an R&D project under the code name DECISIF, with the support of the EUREKA MEDEA+ technological Cluster. The main aim of the project was to develop the best possible power- efficient architecture for electronic circuits.

For project coordinator Gilles Thomas, from STMicroelectronics, this meant creating digital transistors combining minimal power consumption with maximal calculation capacity. 'It was not easy to meet both ends from high-quality computer chips to low-energy-low-cost consumer products, it is a huge gap to bridge.' The technology will be introduced next year in the mass-production of smartphones, tells us an ST Ericsson top executive. It should bring a solution to a problem that has long plagued the mobile phone market.

When the iPad3 was launched last March, some customers complained about it becoming uncomfortably warm during use. After only 15 minutes, the device could reach a temperature of up to 40°C. The issue was attributed to the functioning of the faster computer chips used in the last generation of iPads - and to the larger battery making them run. 'Designing circuits for a smartphone is a real challenge: it has to fit in your pocket, the off-the-shelf price has to be below a few hundred euro – and you expect the Internet to work like on a big computer unit,' tells us Thomas.

Heat and power

The computational power required to read a web page located 'in the cloud' is far beyond what one might imagine, and a high-speed Internet connection also means a huge leap in power consumption, and not just on the device's side: 'Each time two people get a new high-end 3G smartphone, you need to power one extra server in a data centre somewhere in the world,' says the project manager.

The project involved partners all along the energy chain: CEA, the French public institute for alternative energies, joined forces with conductive material engineering company SOITEC and first-class German electronics manufacturers: Siltronic, Aixtron and Global foundries. But like many EUREKA projects, DECISIF was also the occasion for potential European competitors to collaborate for the development of a new technology. 'People who normally would not work hand-in-hand decided to work together towards a common goal,' concludes Thomas.

If the technology is to be introduced first in smartphones and ultra-thin devices, the achievements of the company from Grenoble, France, in collaboration with its European partners go far beyond simple telecommunications. 'We use electronic chips every day without even realising it,' says Thomas. There could be a whole new, cooler, era starting for nano-electronics.

> People who normally would not work hand-in-hand decided to work together towards a common goal.
>
> **Gilles Thomas -** Project Manager STMicroelectronics

Project participants
France, Germany

Duration **36 months**

Contact
Gilles Thomas
STMicroelectronics
gilles.thomas@st.com
+33 4 38 92 27 91