New super-chip is made in Singapore

It uses a fraction of the power to do seven times the job of other models

BY CHUA HIAN HOU

A SINGAPORE-American brain trust has made a new microchip they claim is seven times more powerful than its existing cousin.

The icing on this cake: This new chip consumes 30 times less power.

Mobile phones that could need re-charging just once every two weeks and surgically-implanted devices lasting several lifetimes could be a reality a few years down the road, once this 2mm-by-2mm chip finds its way into the heart of electronic devices.

The chip, unveiled at the International Solid-State Circuit conference in San Francisco yesterday, can make such a leap over current chip technology because of its design, said Associate Professor Yeo Kiat Seng, who heads the School of Electrical and Electronic Engineering’s circuits and systems division at the Nanyang Technological University (NTU).

Traditionally, to get better performance out of a microchip, more power is required. The additional power is used to drown out the interference generated by the chip. This interference is known in engineering parlance as “noise”.

Over time, it has become harder and harder to make microchips any more powerful than they already were, especially since smaller chips—which are in demand for portable devices like mobile phones—generate more noise than larger ones.

Instead of passing more power through the chip to boost its performance, Prof Yeo and his co-researchers harnessed the interference generated to do this.

This out-of-the-box concept for the microchip, which was invented back in 1947, came in 2003 from Rice University computer scientist Professor Krisna Palen, who is also the director of NTU’s Institute of Sustainable Nanoelectronics.

Since then, “thousands of man hours” have been burned to develop the idea, said Prof Yeo.

When the first batch of microchips was delivered last December, it had to be put through repeated test runs because no one on the NTU or Rice teams could believe it worked so well.

Intel Microprocessor Technology Lab director Shekhar Berkar called the “energy and speed advantages” of the new technology a “significant achievement”.

Prof Yeo reckons it will take about four years for actual products to appear, since chip-makers will need time to design chips tailored to specific products.

chua@hps.com.sg