

New IBM chip to allow faster downloads

IBM has found a way to connect chips inside products ranging from cellphones to supercomputers, an advance that promises to prolong battery life in wireless devices and eventually speed data transfers between the processor and memory chips in computers, the company said Thursday.

The manufacturing technique outlined by IBM eliminates the long metal wires that are currently used to transfer information and electrical charge between chips.

The memory and processor chips are often spaced inches apart from each other, causing a lag in transmission as chip makers multiply the number and voracity of calculating cores on their processors.

Slowdowns crop up when data-hungry processors cannot retrieve information fast enough from memory to perform their increasingly complex functions.

In IBM's solution, two chips are sandwiched on top of one another - the distance between them measured in microns, or millionths of a meter - and held together by vertical connections that are etched in silicon holes that are filled with metal.

The vertical connections are referred to as "through-silicon vias," which allow multiple chips to be stacked together and for more information to flow between them.

IBM said that its three-dimensional approach creates the possibility of up to 100 times more pathways for information, and divides by 1,000 times the distance that information needs to travel on a chip.

"This is a big step, this is a really historic move," said David Lammers, director of WeSRCH.com, a social networking Web site for semiconductor enthusiasts and part of VLSI Research. "This has been studied to death, but it's the first time a company is saying, 'We can connect two chips in the vertical direction.' "

While it has the most promise for use in computers, the IBM technology will initially be used in wireless-communications chips when production begins next year. Stacked chips are already used in cellphones, but IBM's technology eliminates the need for wires wrapped around the outside of the chips.

The company said that it could have memory-on-processor technology by 2009 for use in servers, supercomputers and other machines.

"We are continuing to innovate - now we have a new degree of freedom to get more functionality out of chips," said Lisa Su, the vice president for semiconductor research and development at IBM.

Stacking chips three-dimensionally can become problematic because of the intricacy of etching holes directly into the silicon, and because processors kick off so much heat that they can disrupt the normal functioning of the memory when attached so closely to it, according to analysts and IBM competitors.

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