

New computer chips help PCs compete with tablets

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In this Sept. 13, 2010 file photo, Intel CEO Paul Otellini gives the keynote address at a conference in San Francisco. Intel Corp. and Advanced Micro Devices Inc., whose processors are the “brains” of PCs, are both unveiling significant changes to their chips’ designs at this week’s International Consumer Electronics Show in Las Vegas. (AP Photo/Paul Sakuma, file)

Semiconductor companies are whipping up a new generation of chips to bring richer video and better battery life to personal computers and help them hold off threats from tablets and increasingly powerful smart phones.

Intel Corp. and [Advanced Micro Devices](#) Inc., whose processors are the "brains" of PCs, are unveiling significant changes to their chips' designs at this week's International [Consumer Electronics Show](#) in Las Vegas.

Tablet computers and other gadgets have taken on many of the tasks once performed by PCs, and there are already signs that those devices - led by Apple Inc.'s iPad - are eating away at PC sales.

[Intel](#) and AMD are responding with new chips designed to make people think twice before picking a tablet over a new PC. The new chips won't dampen the success of tablets, but they will make traditional, low-cost computers more competitive - by making them better at doing graphics-intensive tasks and playing video.

The improvements that Intel and AMD make to their products are felt with every keystroke or click of a mouse, even if most computer buyers aren't paying attention to the intricacies of [chip design](#).

For example, people have come to expect the benefits of Moore's Law, even if they don't know the technical specifics underlying the prediction that computer processors' performance will double every two years. The principle has guided the industry for more than 40 years, and is a key reason why computers have gotten smarter even as they've gotten smaller.

One major change in chip design that Moore's Law enabled and consumers felt came several years ago. That's when Intel and AMD took chips known as "memory controllers," which have historically been separate from a computer's main processor, and put them on the same piece of silicon as the processor itself.

The controllers act as middlemen between the processor and a computer's memory. Shortening the distance between the parts cuts the

amount of time they needed to talk to each other, helping the computers work faster.

A similar thing is happening in the new generation of chips.

This time, Intel and AMD have thrown another feature - graphics, which too had historically been handled by a separate chip - also onto the same silicon as the computer's main, general-purpose processor.

And by coupling graphics more tightly with a computer's main processor, there's another benefit besides faster communication. The power the parts need to talk to each other is also reduced, leading to longer battery life.

Think of what's happening in chips like what's happened with cell phones: Technical innovations mean more stuff can fit into a smaller space. In the case of computer processors, Moore's Law is driven by the fact that transistors, the tiny on-off switches that regulate the flow of data in computer chips, keep getting smaller.

"It's a natural evolution of integration," said Jon Peddie, who studies the semiconductor industry as president of Jon Peddie Research. "We keep putting more and more stuff into the processor - now it's graphics' turn to get shoved into the processor along with all the stuff that previous generations have shoved in. The big difference this time is because of the processors' smaller size, the capability of the graphics is significantly better."

With the current chips, cheap, low-end laptops are largely poor at playing high-quality video, a task too taxing for the machines' underpowered chips. Those laptops, which also include so-called "netbooks," will likely benefit first from the new chip designs, said Martin Reynolds, a vice president and research fellow at Gartner Inc.

who studies the computer market.

Intel and AMD are using different technical approaches, but the results are similar: Consumers should expect "snappier operations in anything involving pixel movement," from playing games to editing photos and video and preparing PowerPoint and other visually rich presentations, Peddie said.

But Peddie cautions that even with the new chips, the low-end computers will still be too weak for certain uses, including graphics-intensive video games.

Still, the changes could eliminate the need for many people to buy separate graphics cards, which can add hundreds of dollars to the price of a PC. The shift is an opportunity for Intel and AMD, which can charge higher prices for chips that have higher-quality graphics capabilities built in. Intel doesn't mind if people buy fewer graphics cards since it doesn't sell them. Intel's graphics have been built into its "chipsets," yet another type of chip inside computers. They handle a range of tasks.

The situation is more delicate for AMD, which does make the cards. AMD hopes that stealing even small amounts of business from Intel offsets any risks to graphics-card sales.

The latest lines of chips can be seen as a response to the sudden popularity of tablet PCs, starting with the launch of the [iPad](#) last April.

Tablet makers have turned to such chip-makers as Samsung Electronics Co., Texas Instruments Inc. and Qualcomm Inc. Even Apple now makes its own chips. Their chips are built on a different design and sip power rather than gulp it - a requirement of mobile devices and a problem that Intel and AMD have yet to crack.

Intel and AMD are trying to address that problem by aping the sleek and streamlined approach that has helped make tablets so popular.

"Tablets have forced the PC ecosystem to be thin and light," said Doug Freedman, an analyst with Gleacher & Co. "If they don't want to lose market share, they're going to have to design a more efficient PC."

The new chips aren't likely to upset the historically steady breakdown between Intel and AMD. Intel sells 80 percent of the chips that run on the so-called "x86" standard for chip design, which is used in Windows and Mac computers. AMD has the remaining 20 percent of the market.

But the new products could help keep both companies relevant in a tablet era. After all, despite the rise of tablets, they aren't good for everything.

"Tablets are great devices for consuming content, but creation of content is best done on PCs," said Tom Kilroy, an Intel senior vice president.

The attack on tablets by Intel and AMD isn't without a key disclaimer: Now that Apple has proved that there's an appetite for tablet computers, both chip-makers want in.

Both companies have been chosen to make chips for tablets, but analysts say power consumption will likely remain an issue that needs to be resolved.

"It's a great opportunity for them," Reynolds said. "They just haven't figured out a way to do that yet."

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