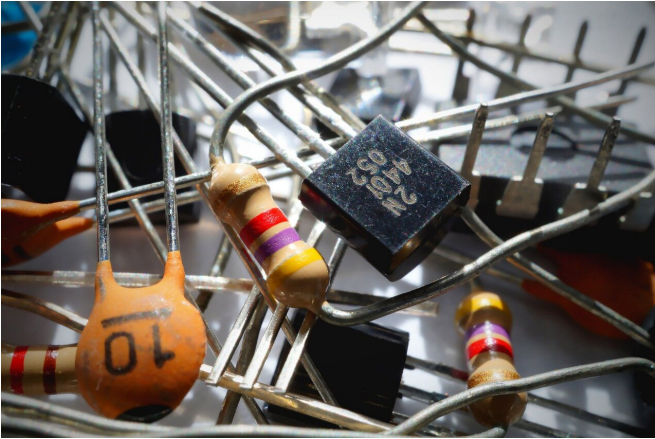


IBM and Samsung team up to design vertical transport field effect transistors

16 December 2021, by Bob Yirka



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Officials from IBM and Samsung announced at this year's IEDM conference in San Francisco a collaboration on a new chip design that adds transistors vertically on a chip. As part of their announcement, they suggested that their vertical transport field effect transistors (VTFET) could double the speed of processor chips, or alternatively, reduce the power they use by up to 85 percent.

Since the beginning of digital technology, processing chips have been made by placing tiny transistors on a chip and connecting them. Over time, engineers have placed increasingly more transistors on chips that have remained roughly the same size—adhering, generally, to Moore's Law, which states that the number of transistors on a [chip](#) should double every year. Engineers have known for a long time that there are limits to Moore's Law—eventually, it would become impossible to add even one more transistor, much less double the number that are there.

So researchers are looking for other ways to make chips. But in the meantime, engineers continue to

look for ways to add more transistors to conventional chips. In their announcement, IBM and Samsung have explained that they are taking steps to begin designing chips that can expand vertically. In a practical sense, the move was inevitable. As an analogy, when towns grew too big to be efficient, engineers began making buildings taller, essentially turning 2D towns into 3D cities. Officials and engineers at IBM and Samsung (and doubtless other corporations, such as Intel) suggest that now is the time to begin doing the same with microprocessors.

The VTFET design by IBM and Samsung is still very much in the [developmental stage](#)—there are no chips to install in actual computers, but it does mark the beginning of a new era in computing when computers and other [digital devices](#) such as phones and [tablet computers](#) will not only run faster, but will use far less energy, making batteries last much longer. This is because a vertical design will allow for shortening the path that electrons will need to travel when sending signals between transistors.

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