CoreLogika™

What's next after the CMOS FET?

InventionShare is planning to launch a new CMOS digital design platform called CoreLogika, that in some implementations could be up to 100x faster than conventional CMOS FET designs.

Patented core technology

Starting with a standard CMOS field-effect transistor, the shape of the internal gate structure is modified, and a new electrical signal path called an iPort is added. Second, two complementary versions of this structure are connected directly in silicon. The resulting generalized structure is called a Complementary Current-Injection Field-Effect Transistor or CiFET. The CiFET has been extensively analyzed, modeled and measured to produce a deep library of engineering knowledge for applying CiFETs to analog circuit design. CoreLogika enables the CiFET to be applied to digital designs.

Benefits

CoreLogika will bring important improvements and benefits to digital design, as summarized in the table below:

Speed	Expected 100x CMOS FET
Temperature variation	Linear performance over military spec
Manufacturability	Fully compatible across all CMOS digital process nodes

Additionally, CoreLogika offers a wide range of optimization possibilities, including operating voltage, speed, power and heat. CoreLogika is also fully compatible with its analog sister technology, Circuit Seed™, enabling efficient designs for applications such as analog-to-digital conversion.

Wide range of applications

CoreLogika can be applied to virtually any digital design including:

- Logic gates, flip flops, clock trees
- High speed data buses, SRAM memory
- CPUs & GPUs
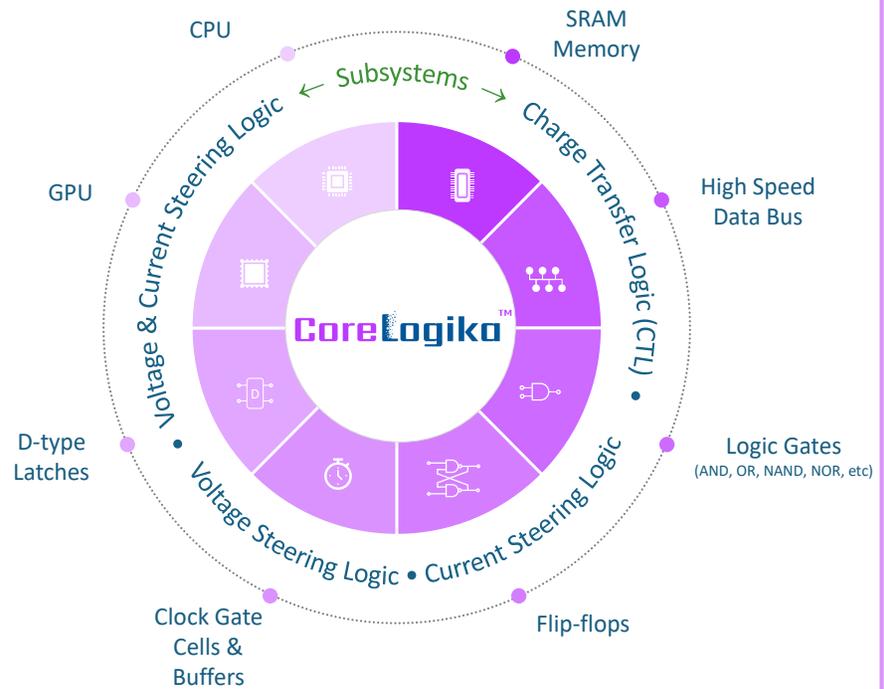
The speed advantage

The key to CoreLogika's impressive speed is the use of current as a signal input, rather than voltage. Current signals encounter only small CV^2 voltage changes. A conventional CMOS FET uses a voltage signal applied to a gate to saturate a semiconductor channel allowing supply current to transit from source to drain. This all takes a finite amount of time. By contrast, a CiFET channel is always saturated and the input signal is applied in the form of an electrical current, rather than a voltage. The input electrons essentially bump the carriers in the saturated channel and an output signal appears almost instantaneously. The effect is analogous to how a Newton cradle works.
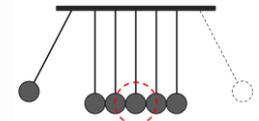
Speed improvements of the magnitude expected by CoreLogika are normally achieved by migrating to lower, and much more expensive, process nodes. With CoreLogika, high performance designs can be achieved using cost-effective process nodes and, if required, dramatic performance increases can be achieved at lower process nodes.

CoreLogika Projects

InventionShare is seeking investment partners with digital logic experience to help design, develop and tune the CoreLogika technology for key application opportunities.