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Analog Bits Provides Enabling IP for Graphcore IPU-Machine M2000

Wide-range PLL and low-power, small footprint PVT sensor deployed in new machine Intelligence compute blade on 7nm technology

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Highlights

- ◉ Graphcore sets a new bar for performance and scalability with their IPU-Machine M2000

- ◉ Analog Bits' low power, wide-range integer/fractional, ultra-low jitter PLL and small footprint, integrated sensor for PVT and power supply monitoring, both in 7nm were key IP for the design to deliver reliable clocking and power management

Graphcore recently introduced its second-generation IPU platform with greater processing power, more memory and built-in scalability for handling extremely large machine intelligence workloads. The IPU-Machine M2000 is a plug-and-play machine intelligence compute blade that has been designed for easy deployment and supports systems that can grow to massive scale.

Each IPU-Machine M2000 is powered by four new 7nm Colossus™ Mk2 GC200 IPU processors. GC200 integrates 1,472 separate IPU-cores and is capable of executing 8,832 separate parallel computing threads. Each IPU processor core gets a performance boost from a set of novel floating-point technologies developed by Graphcore, called AI-Float. By tuning arithmetic implementations for energy and performance in machine intelligence computation, Graphcore is able to serve up one PetaFlop of AI compute in each IPU-Machine M2000 1U blade.

The Colossus Mk2 GC200 IPU processor required a reliable and precise clocking scheme. The Analog Bits low power, wide-range integer/fractional, ultra-low jitter PLL in 7nm was chosen because of its low jitter, reliability and support for the required frequency range to clock the IPU processor. Analog Bits' small footprint, integrated sensor for PVT and power supply monitoring in 7nm was used to ensure the device maintained the required thermal profile. The sensor also helped to ensure the integrity of the entire power delivery subsystem.

"The Mk2 IPU is a highly complex, challenging design. We needed to count on a reliable, low jitter PLL so we could focus on its unique requirements. Power dissipation for a chip this large was also a focus for us," said Phil Horsfield, vice president silicon at Graphcore. "The Analog Bits high-performance PLL addressed our clocking needs, and their small, integrated PVT sensor ensured power dissipation stayed in spec. Access to proven IP that is easy to integrate from a reliable vendor like Analog Bits helped our design process quite a bit."

"Every new product release from Graphcore sets a new standard for performance and scalability," said Mahesh Tirupattur, executive vice president at Analog Bits. "We're excited to help enable the new frontiers being opened by Graphcore's IPU-Machine M2000."

Resources

To learn more about Analog Bits' PLLs and PVT sensors, visit www.analogbits.com or email us at: info@analogbits.com.

About Analog Bits

Founded in 1995, Analog Bits, Inc. (www.analogbits.com), is the leading supplier of mixed-signal IP with a reputation for easy and reliable integration into advanced SOCs. Products include precision clocking macros such as PLLs & DLLs, programmable interconnect solutions such as multi-protocol SERDES and programmable I/O's as well as specialized Sensors.

With billions of IP cores fabricated in customer silicon, from 0.35-micron to 7-nm processes, Analog Bits has an outstanding heritage of "first-time-working" with foundries and IDMs.

Editorial Contact:

Hailey Carroll
Analog Bits
haileyc@analogbits.com
(650) 314-0200