National Revolutionizes Temperature Sensing for Sub-Micron CPUs

February 28 2005

a breakthrough for thermal management accuracy, National Semiconductor Corporation announced TruTherm™ thermal management technology, which uses a new measuring technique to provide pinpoint-accurate temperature measurement for chips with integrated thermal diodes.

“Measuring the internal temperature of sub-micron CPUs and FPGAs with traditional methods generates results that are inaccurate and unpredictable,” said Suneil Parulekar, National Semiconductor’s senior vice president of the Analog Products Group. “To solve this problem, National’s new TruTherm technology relies on a new measuring technique to achieve an unmatched level of temperature reading accuracy.”

As computing systems and consumer electronics incorporate more sub-micron processors and FPGAs that tend to run hot, engineers need to design cooling fans into their systems to prevent overheating. By providing a pinpoint-accurate temperature reading, National’s TruTherm™ technology enables designers to achieve higher levels of performance, extend system life and reduce acoustic noise in systems using central processing units, graphics processors, field-programmable gate arrays and other integrated circuits developed in 90-nanometer and below processes.

"More accurate temperature readings allow designers to optimize system performance, protect the system processor and lower acoustic noise,"

said Benson Inkley, senior processor applications engineer of Intel Corporation. "To support TruTherm technology, Intel will include additional parameters in the datasheet for our new 90-nanometer Pentium 4 processors."

New LM95231 Sensor with TruTherm Technology
National is producing a family of new temperature sensors featuring TruTherm technology. The first member of this family, the LM95231, is a high-precision, dual remote-diode temperature sensor with plus or minus 0.75 degrees Celsius accuracy. It features a precision sigma-delta analog-to-digital converter for reduced sensitivity to noise and includes digital filtering, remote-diode fault detection and local temperature sensing. The LM95231 is compatible with the SMBus 2.0 and I2C bus specifications.

The LM95231 is designed on National’s proprietary, analog-optimized advanced CMOS process, manufactured at National’s wafer fabrication plant in South Portland, Maine, and tested and assembled at the company’s facility in Melaka, Malaysia.

National Presents at IDF
National Semiconductor's experts in thermal management design will introduce the TruTherm technology in a tutorial session at the Intel Developer’s Forum in San Francisco. The session, “Improve Acoustic Performance Using a New Processor Temperature Sensing Technique,” will be held from 3:30 p.m. to 4:20 p.m. on Thursday, March 3 at the Moscone Center.

Pricing and Availability
Limited samples of the LM95231 temperature sensor, packaged in an 8-pin MSOP, are available now. Production quantities will be available in May 2005 and priced at $1.50 in 1,000-unit quantities.