

NEC Electronics Introduces 40-nanometer Embedded DRAM (eDRAM) Technologies

KAWASAKI, Japan, DUESSELDORF, Germany, and SANTA CLARA, USA November 19, 2007—NEC Electronics Corporation and its subsidiaries NEC Electronics America, Inc. and NEC Electronics (Europe) GmbH, today introduced two new technologies for the manufacture of 40-nanometer (nm) system-on-chip (SoC) devices with embedded dynamic random access memory (eDRAM). The UX8GD eDRAM technology boasts clock speeds up to 800 megahertz and low operating power, making it optimal for use in consumer electronics products such as digital video cameras and game consoles. The UX8LD eDRAM technology features low leakage-current levels that reduce power consumption by as much two-thirds compared to equivalent SRAM, making it ideal for use in mobile handsets and other portable devices that require low standby power.

The UX8GD and UX8LD technologies combine leading-edge 40 nm CMOS process technology with NEC Electronics' unique eDRAM process technology, and are available in memory configurations up to 256 megabits. Cell size is 0.06 square micron meters, 50 percent smaller than the company's previous 55 nm UX7LSeD eDRAM. This translates to a 50 percent reduction in overall chip size, which contributes to lower bill-of-materials costs.

The new 40 nm technologies also leverage innovative high-dielectric (high-k) materials— such as hafnium gate dielectrics, nickel-silicide gate electrodes, and zirconium-oxide DRAM capacitors—that have been proven in NEC Electronics' 55 nm UX7LSeD technology. These innovations lower the concentration of impurities and parasitic resistance in the channels, resulting in benefits such as lower leakage current between the drain and source, longer-term data storage, fewer variations in transistor performance, and greater performance of both logic and memory.

As consumers demand smaller form factors and longer operating times in mobile applications and other electronic products, semiconductor companies must deliver devices with higher performance, smaller footprints, lower power consumption, and lower costs. To meet these requirements, the development and implementation of advanced process technologies is vital.

The advantages of the new technologies featured in NEC Electronics' 40 nm eDRAM will enable customers to more easily build electronic digital consumer products such as digital video cameras, game consoles, and mobile phones with lower power consumption and smaller and slimmer form factors.

NEC Electronics began shipment of 55 nm eDRAM samples in October 2007 and plans to ramp to volume production by the end of this fiscal year (ending March 31, 2008).

Volume production of 40 nm devices is scheduled to begin by the end of the next fiscal year at NEC Electronics' 300-millimeter wafer line at manufacturing subsidiary NEC Yamagata (<http://www.necel.com/news/en/archive/0711/1601.html>).

To learn more about NEC Electronics' advanced process technologies, visit <http://www.necel.com/process/en/index.html>. To learn more about NEC Electronics' leadership in eDRAM, visit <http://www.necel.com/process/en/edram.html>.

About NEC Electronics

NEC Electronics Corporation (TSE: 6723) specializes in semiconductor products encompassing advanced technology solutions for the high-end computing and broadband networking markets, system solutions for the mobile handset, PC peripherals, automotive and digital consumer markets, and platform solutions for a wide range of customer applications. NEC Electronics Corporation has 25 subsidiaries worldwide including NEC Electronics America, Inc. (www.am.necel.com) and NEC Electronics (Europe) GmbH (www.eu.necel.com). For additional information about NEC Electronics worldwide, visit www.necel.com.

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