

NEC Electronics Delivers Enhanced Design Flexibility and Performance with New 16-Bit Microcontrollers for Automotive Applications

New 78K0R/Fx3 MCUs Deliver 16-bit Performance with 8-bit Power Consumption for Body Electronics Systems

KAWASAKI, Japan, DUESSELDORF, Germany, SANTA CLARA, Calif., October 17, 2008 – NEC Electronics announced today it has expanded the company's lineup of 16-bit 78K0R microcontrollers (MCUs) to support cost-sensitive automotive applications. Based on NEC Electronics' fast and efficient 78K0R core, the new 78K0R/Fx3 MCUs are optimized to deliver higher performance and expanded memory options for automotive body electronics applications such as window, seat and door modules; and heating, ventilation and air conditioning (HVAC) systems. The new products complement NEC Electronics' current

F Series lineup of 8-bit and 32-bit MCUs and provide an easy scalability path for in-vehicle comfort systems.

"Automotive system designers are demanding higher performance and expanded memory configurations to accommodate the requirement for more electronic content in current and next-generation vehicles, particularly in lower-cost systems where 8-bit MCUs have traditionally been dominant," said Shinichi Iwamoto, vice president, microcomputer operations unit, NEC Electronics Corporation. "NEC Electronics' new 78K0R/Fx3 devices successfully bridge the cost/performance gap to provide a path to higher performance in a reliable, flash memory-based MCU."

Increased Flexibility and Higher Performance for Body Electronics

To deliver faster operating and CPU speeds than NEC Electronics' 8-bit 78K0 core, the 16-bit 78K0R core employs a three-stage pipeline architecture that achieves a CPU clock speed of 24 megahertz (MHz), and executes 15 Dhrystone million instructions per second (MIPS).

Additional features include expanded storage capacities, memory configurations ranging from 24 up to 256 kilobytes (KB) and an enhanced instruction set featuring 25 additional instructions. Dual-operating data flash memory (simultaneous code execution and internal EEPROM emulation) enables engineers to reduce memory access time and simplify software design, while eliminating the need for memory banking also helps them increase operating speed and reduce system costs.

In addition to supporting the controller area network (CAN) protocol, the new NEC Electronics MCUs also offer extended Local Interconnect Network (LIN) support with automatic baud rate detection and enhanced timer functionality. This allows engineers to reduce software overhead, and simplify LIN and complex timer design in increasingly sophisticated body electronics systems.

To facilitate shorter software development cycles, NEC Electronics offers a wide range of MCU development tools, including its full-function IECUBE[®] in-circuit emulator with real-time trace and emulation capabilities, MINICUBE2[™] on-chip serial debugging emulator and flash programmer, PG-FP5 flash programmer, integrated debugger and an automatic source code generator. For information about NEC Electronics' automotive MCUs, visit <http://www.am.necel.com/applications/automotive>.

Pricing and Availability

The 36 new 78K0R/Fx3 MCUs support a wide range of memory configurations, as well as pin counts ranging from 30 to 100 pins. The devices are available in quad flat no-lead (QFN) packages and quad flat pack/shrink small-outline packages (QFP/SSOPs). Samples are scheduled to be available in June 2009. Prices will vary depending on memory, package and pin configurations. Pricing and availability are subject to change.

Commitment to the Automotive Market

NEC Electronics is dedicated to serving the needs of automotive customers and offers a wide range of MCUs and power management devices (PMDs) for use in automotive applications. In addition, the company's zero-defect initiative has resulted in industry-leading MCU quality levels, while error-correction code (ECC) ensures flash memory-based MCU reliability. On a worldwide basis, NEC Electronics Corporation was rated the number one supplier of 32-bit MCUs in 2007, according to the Gartner Dataquest March 2008 rankings report. In addition to a strong product lineup, NEC Electronics also maintains a strong global manufacturing presence to support automotive

customers around the world, as evidenced by the Multifab™ strategy initiated in manufacturing plants at NEC Kyushu Yamaguchi (Japan) and NEC Electronics America (Roseville, California), and by the automotive design center and quality assurance teams established in Duesseldorf, Germany.

About NEC Electronics Corporation

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 peripheral, automotive and digital consumer markets; and multi-market solutions for a wide range of customer applications. NEC Electronics Corporation has subsidiaries worldwide including [NEC Electronics America, Inc.](#) and [NEC Electronics \(Europe\) GmbH](#). More information about NEC Electronics worldwide can be found at www.necel.com.