

December 10, 2008

Epson Toyocom Develops World's Smallest* Low-Current Real-Time Clock Modules

Epson Toyocom Corporation, the leader in crystal devices, has developed the world's smallest real-time clock modules^(*). The maximum dimensions of the new RTC modules, known as the RX-4571BD and RX-8571BD, are just 3.4 mm x 1.7 mm x 1.0t mm.

With a footprint and cubic volume that are 43% and 52% smaller, respectively, than those of conventional real-time clock modules in an LC package, the new real-time clock modules will help electronic equipment manufacturers further downsize their products while boosting performance.

Samples of the RX-8571BD will be available from April 2009.

In recent years all manner of electronic equipment, from compact portable devices such as digital cameras and personal health care products to office and factory automation equipment, has seen explosive growth in functions, features and performance, coupled with lower power budgets. Not coincidentally, there is strong—and growing—market demand for thin, space-saving, low-power components.

To meet this demand, Epson Toyocom has developed and is on target to commercializing the RX-4571BD and RX-8571BD real-time clock modules, which are in high demand for time and date data management applications.

The RX-4571BD supports a 3-wire serial interface, while the RX-8571BD is I²C-Bus^(*) interface compliant.

The RX-4571BD and RX-8571BD, equipped with an ultra-compact QMEMS^(*) crystal chip, are the world's smallest real-time clock modules with built-in crystal unit. Epson Toyocom was able to diminish the size of these modules by using a new structure that applies Epson Toyocom's original NPO (New Platform Oscillator) structure^(*), wherein a crystal unit in a ceramic package is sealed together with an oscillation circuit in a molded plastic housing. Combining a compact crystal unit with a real-time clock IC rather than providing them separately significantly shrinks the module's real estate requirements.

With a crystal unit built into an ultra-compact package along with clock and calendar circuitry that operates at low voltage, the modules provide and manage the clock and calendar data for electronic devices at low power.

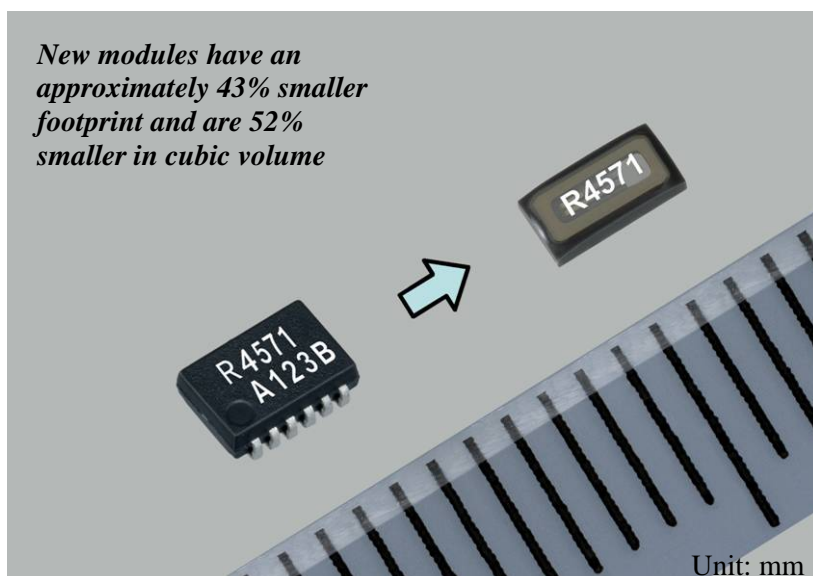
In Standby, the RX-4571BD consumes 0.32 μ A of current, while the RX-8571BD consumes just 0.22 μ A (at 3 V, respectively).

The RX-4571BD and RX-8571BD will help customers add value to their systems by allowing them to use space more efficiently in feature-rich electronic equipment and by helping them extend the time their equipment can run on a battery or charge.

The modules will also pay dividends in the form of greater system reliability and quality, since the crystal unit's characteristics will be assured prior to shipment, alleviating the need for customers to design oscillation circuits or adjust output frequencies.

* Smallest real-time clock module with integrated crystal as of December 10, 2008. Based on Epson Toyocom research.

Size comparison between the newly developed RX-4571BD/RX-8571BD and the conventional RX-4571LC/RX-8571BD



Right: Newly developed RX-4571BD/RX-8571BD (3.4 × 1.7 × 1.0t mm)
 Left: Conventional RX-4571LC/RX-8571LC (3.6 × 2.8 × 1.2t mm)

Main Specifications

Item	RX-4571BD Specification	RX-8571BD Specification
Supply voltage	1.6 V to 5.5 V	1.6 V to 5.5 V
Clock power supply voltage	Ta = -40°C to +85°C: 1.1 V to 5.5 V Ta = +25°C: 1.0 V to 5.5 V	Ta = -40°C to +85°C: 1.3 V to 5.5 V
Standby current consumption	0.40 μA (Typ) / 5 V 0.32 μA (Typ) / 3 V	0.24 μA (Typ) / 5 V 0.22 μA (Typ) / 3 V
Interface	Serial 3-wire	I ² C-Bus
Functions	<ul style="list-style-type: none"> - Automatic leap year correction, full calendar and clock functions - Alarms settable for dates, days of the week, hours and minutes - Timer function: 244.14 μs to 4095 min - 32.768-kHz output enable (CMOS output) 	<ul style="list-style-type: none"> - Automatic leap year correction, full calendar and clock functions - Alarms settable for dates, days of the week, hours and minutes - Timer function: 244.14 μs to 65535 min - Alarm interrupt function - 32.768-kHz output enable (CMOS output) - User RAM: 128 bit
Operating temperature range	-40°C to +85°C	
Max. external dimensions	3.4 x 1.7 x 1.0 t mm (10-pin SON)	

Glossary

(*1) real-time clock module

A product that integrates in a single package an IC with clock and calendar functions and a 32,768-kHz crystal unit, these modules are used in computers, fax machines and other electronic equipment that require time management. RTC modules not only benefit users by eliminating the need to design oscillator circuits and adjust clock accuracy, they also offer more efficient use of the limited space available on a circuit board.

(*2) I²C-bus is a trademark of NXP Semiconductors.

(*3) QMEMS

QMEMS is a combination of “Quartz,” a crystalline material with excellent characteristics such as high stability and high accuracy, and “MEMS” (micro electro mechanical system). QMEMS quartz devices are created using quartz material instead of the semiconductors used by MEMS. We perform precision microfabrication on the quartz material to offer high performance in a compact package.

QMEMS is a registered trademark of Epson Toyocom.

(*4) NPO (New Platform Oscillator) Structure

An oscillator that combines a ceramic packaged crystal unit and an oscillator circuit in a plastic mold. Better heat stress absorption and vibration resistance give the NPO structure higher throughput in batch processing than ceramic packages.