

Real Time Clock (RTC) IP

Overview

Cadence® IP Factory delivers custom, synthesizable IP to support specific design requirements.

The **Cadence Real Time Clock IP** is compliant with *AMBA® 2 Specification*.

Supporting real-time applications, the **Cadence Real Time Clock IP** provides complete clock and calendar information with automatic time units adjustment and easy configuration. An event detection function is available as well.

All the above characteristics of the **Cadence Real Time Clock IP** allow you to set alarm interrupts in a precise and accurate manner. The solution provides a wide combination of alarms that match the target operation requirements.

The **Cadence Real Time Clock IP** is architected to quickly and easily integrate into any system on chip (SoC) that supports an ARM® AMBA® 2 Advanced Peripheral Bus (APB).

The **Cadence Real Time Clock IP** provides a low power, cost-effective solution for demanding applications. It offers SoC integrators the advanced capabilities and support that not only meet, but exceed the requirements of high-performance designs and implementations.

Cadence SoC Peripheral IP is silicon proven and has been extensively validated with multiple hardware platforms.

Cadence IP Factory offers comprehensive IP solutions that are in volume production, and have been successfully implemented in more than 400 applications.

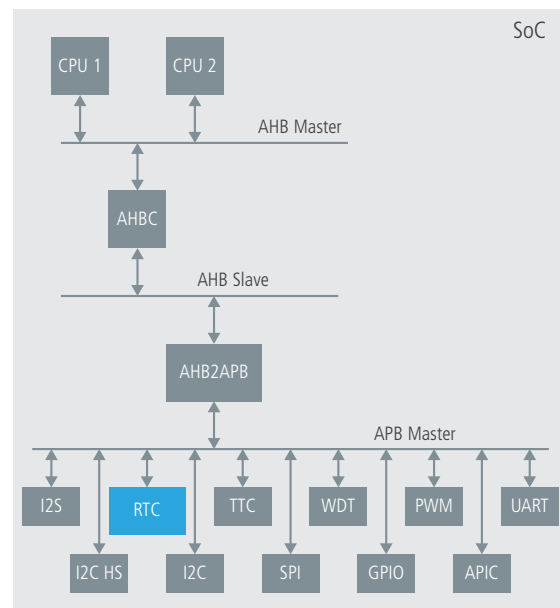


Figure 1: Example System-level Block Diagram

Key Features

- Compliant with AMBA 2 Specification
- Counter clock configurable to 100Hz or 1Hz
- Calendar functions including day of week, date (day, month, year), century, and leap year compensation
- Time of day clock with hour (12/24), minute, second, and hundredth counters
- Optional APB byte addressing mode and power down mode with *standby_pclk* clock option
- Time and calendar registers are available as core outputs with associated changed indicator
- Event interrupt on any calendar or time unit

Product Details

The **Cadence Real Time Clock IP** is a binary-coded decimal (BCD) design with clock and calendar functions. It keeps track of the time of day to a resolution of one hundredth of a second with a 100Hz clock, or one second with a 1Hz clock. The calendar functionality keeps track of the day of week, day of month, month, and year with compensation for leap years.

RTC Module

The RTC Module uses binary coded decimal counters that support a year range from 1900 to 2999, as well as full month, date, minute, second, and hundredth of second ranges. Hour ranges of 0 to 23 (24 hour format), or 1 to 12 with a.m./p.m. flag (12 hour format) are supported.

Alarms and Events

The **Cadence Real Time Clock IP** can generate an alarm in one of two ways, as a one-time alarm, or as a recurring alarm.

First, an alarm can be set for a specific date and time, e.g., 11:43:14.12 a.m. on January 6, 2016.

Second, any field within the alarm registers can be masked so the alarm recurs at a specific time every day of the week or month. For example, year, month, and day of week fields can be masked so that the alarm in the previous example occurs at 11:43:14.12 a.m. on the sixth of every month. Alternatively, the day of month field can be masked so the alarm occurs at 11:43:14.12 a.m. every Wednesday.

In addition to alarms, the **Cadence Real Time Clock IP** can detect when a particular event occurs. Each field of the calendar and time counter can generate an event when it rolls over. For example, an

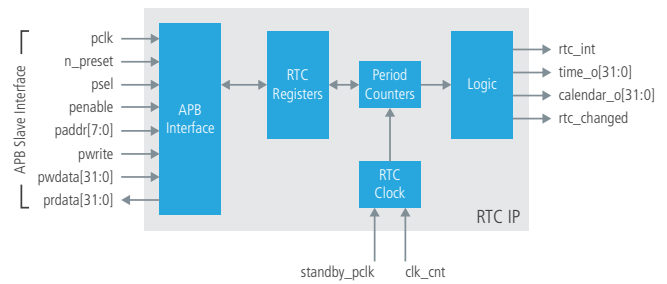


Figure 2: IP-level Block Diagram

event can be generated every new month, new week, new day, new half day (12-hour mode), new minute, or new second.

Both alarms and events can generate an interrupt so the application processor does not have to poll the **Cadence Real Time Clock IP** registers to determine when an alarm or event occurs.

Interrupts

The **Cadence Real Time Clock IP** generates interrupts for alarms or events. Interrupts can be set, enabled, disabled, or masked through the APB interface.

Cadence IP Factory

Cadence IP Factory can deliver various configurations of SoC Peripheral IP to meet your design requirements.

With 10+ years of experience and 400+ successful designs in process nodes ranging from 180nm to 22nm, Cadence IP Factory solutions have been proven in everything from low-power MP3 players to leading edge supercomputers.

For more information, visit ip.cadence.com

Benefits

- Low-risk solutions—silicon-proven design
- Fully configurable—easy interrupts setting
- Ease-of-use—customizable with easy integration

Related Products

- Triple Timer Counter (TTC) IP
- Pulse Width Modulator (PWM) IP

Deliverables

- Clean, readable, synthesizable Verilog HDL
- Cadence Encounter® RTL Compiler synthesis scripts
- Documentation—integration and user guide, release notes
- Sample verification testbench

Available Products

- Real Time Clock (RTC) IP

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