SmartFusion2 MSS

Real Time Counter (RTC) Configuration

User Guide

Microsemi

Power Matters.™

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Introduction

The real-time counter (RTC) system has two main modes of operation:

- Real-time Calendar: Counts seconds, minutes, hours, days, week, months, and years
- Binary Counter.

In the Calendar mode, the RTC counts seconds, minutes, hours, days, month, years, weekdays, and weeks. In Binary mode, the RTC consecutively counts from 0 all the way to 2^{43}. In both modes, the alarm event generation logic simply compares the content of the Alarm Register with that of RTC; when they are equal, the RTC_MATCH output is asserted.

For details, refer to the SmartFusion2 SoC and IGLOO2 FPGA Fabric User Guide.

The values entered in the configurator will be exported into the programming files for programming of the flash bits that control this functionality. The flash bits are loaded in the system registers at power up (or when the DEVRST_N external pad is asserted/de-asserted).

1 – Configuration Options

Clock Source - Select the clock that drives the RTC system (RTCCLK) (Figure 1-1).

- External 32KHz RTC Crystal Oscillator
- External Main Oscillator - Crystal (32KHz - 20MHz)
- External Main Oscillator - Ceramic Resonator (0.5MHz - 4MHz)
- External Main Oscillator - RC Network (32KHz - 4MHz)
- On-chip 1-MHz RC Oscillator
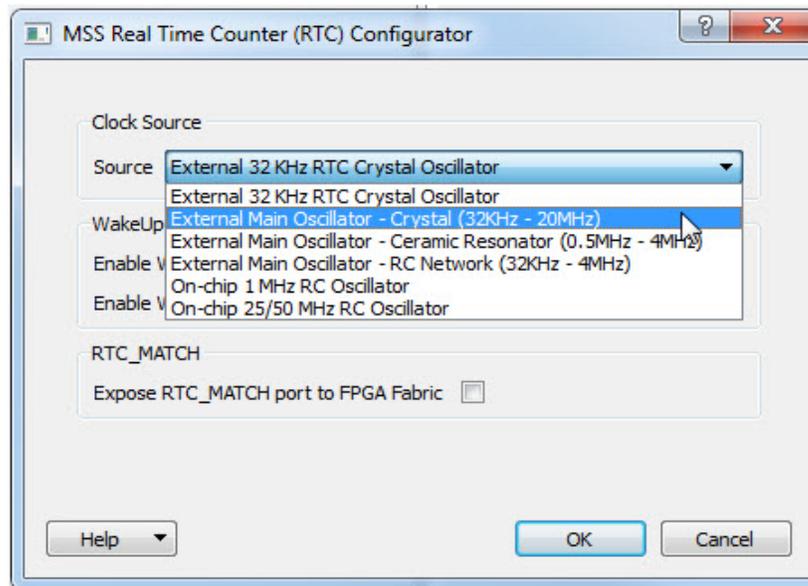- On-chip 25/50-MHz RC Oscillator (50MHz in 1.2v part and 25MHz in a 1.0v part)

Figure 1-1 • **RTC Clock Source Configuration**

WakeUp Interrupt - The RTC_WAKEUP_CR in the SYSREG block provides masking for the RTC_WAKEUP interrupt to the FPGA fabric and the Cortex-M3 microcontroller (Figure 1-2). You can select which interrupt to enable using this configurator.
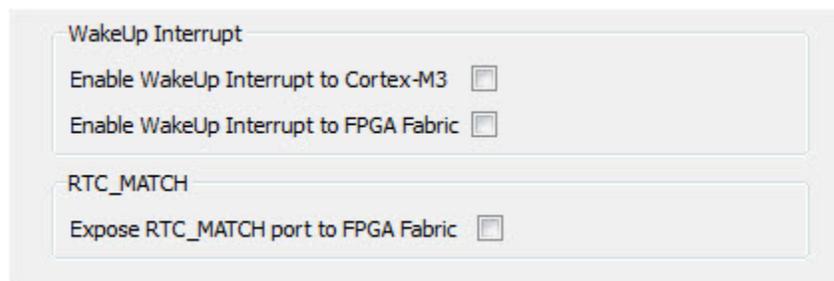

Figure 1-2 • **WakeUp Interrupt Configuration**

RTC_MATCH - RTC_MATCH status bit and output is asserted whenever the Alarm system is enabled and a match occurs (Figure 1-3). In Calendar mode, it is asserted for a 1 second period whilst the alarm condition is valid. The output is synchronous to the rising edge of the RTCCLK. You can expose the RTC_MATCH output signal to drive the FPGA fabric by checking the checkbox. The RTC_MATCH signal is then available to be used in the design.

Figure 1-3 • **RTC_MATCH Configuration**

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From the rest of the world, call **650.318.4460**
Fax, from anywhere in the world, **650.318.8044**

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Website

You can browse a variety of technical and non-technical information on the Microsemi SoC Products Group home page, at www.microsemi.com/soc.

Contacting the Customer Technical Support Center

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