Renesas' SH7780 Microprocessor Incorporates SH-4A CPU Core and PCI Bus Controller for High Performance Multimedia System

August 12 2004

Renesas Technology America, Inc. today announced the SH7780, a microprocessor incorporating the high end SuperH(TM) SH-4A CPU core and a PCI (peripheral component interconnect) bus controller (PCIC). The device features a dedicated 3-bus architecture and delivers 720 MIPS (million instructions per second) and 2.8 GFLOPS (giga-flops) at 400 MHz, a combination that provides an overall improvement in system performance. For example, the SH7780 supports sophisticated speech recognition and speech synthesis without the need for external DSP. The microprocessor is designed for high-performance multimedia applications such as car navigation systems, game machines and digital home electronics products.

The SH7780 employs three dedicated external busses: a 32-bit Double Data Rate-SDRAM bus at 160MHz (DDR-SDRAM320); a 32-bit bus for PCI bus connections; and a 32-bit local bus at 100MHz for connecting to flash memory, SRAM, ATAPI (advanced technology attachment packet interface) and PCMCIA. These are connected via an internal SuperHyway(TM) 64-bit "router type" bus. Furthermore, the three external buses can be operated simultaneously, allowing for efficient data transfer and improved performance. This architecture allows fast boot-up time when transferring data from flash memory to DDR-SDRAM. The result is an overall enhancement in system performance.

In addition, the SH7780 incorporates an on-chip floating point unit (FPU) with a maximum operating speed of 400 MHz. The FPU supports both single-precision and double-precision arithmetic operations and delivers a maximum processing performance of 2.8 GFLOPS when operating in single-precision mode. Hardware support for sine/cosine arithmetic operations also contributes to high-speed rendering of 3-D graphics and DSP calculations.

The four-way set-associative cache memory is divided into two 32 Kbyte areas, one for instructions and one for data. This results in an improved cache hit ratio in comparison with existing products based on the SH-4 core. The SH7780 also offers 16 Kbytes on-chip high-speed RAM for real-time performance, to store exception handling routines.

The SH7780 incorporates an on-chip PCIC. This makes it possible to connect the microprocessor to a PCI bus, the type of general purpose bus commonly used in PCs. Moreover, the PCIC supports the PCI Rev. 2.2, allowing connections with LSI devices incorporating a PCI interface and operating at either 66 MHz or 33 MHz. This makes it easy to make connections with graphic chipsets or low-cost external devices such as PC peripherals.

The instruction set from the new SH-4A core is fully SH-4 upward compatible. This makes it possible to utilize existing programs and helps reduce system development time.

Readers can find additional product and contact information on the Renesas Technology Web site at www .renesas.com.

Citation: Renesas' SH7780 Microprocessor Incorporates SH-4A CPU Core and PCI Bus Controller for High Performance Multimedia System (2004, August 12) retrieved 25 April 2024

from https://phys.org/news/2004-08-renesas-sh7780-microprocessor-incorporates-sh-4a.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.