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User's Manual

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SH7780

Hardware Manual

Renesas 32-Bit RISC Microcomputer
SuperH™ RISC Engine Family
SH7780 Series

R8A77800A

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Rev.1.00 2005.12

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General Precautions on Handling of Product

1. Treatment of NC Pins

Note: Do not connect anything to the NC pins.
The NC (not connected) pins are either not connected to any of the internal circuitry or are used as test pins or to reduce noise. If something is connected to the NC pins, the operation of the LSI is not guaranteed.

2. Treatment of Unused Input Pins

Note: Fix all unused input pins to high or low level.
Generally, the input pins of CMOS products are high-impedance input pins. If unused pins are in their open states, intermediate levels are induced by noise in the vicinity, a pass-through current flows internally, and a malfunction may occur.

3. Processing before Initialization

Note: When power is first supplied, the product's state is undefined.
The states of internal circuits are undefined until full power is supplied throughout the chip and a low level is input on the reset pin. During the period where the states are undefined, the register settings and the output state of each pin are also undefined. Design your system so that it does not malfunction because of processing while it is in this undefined state. For those products which have a reset function, reset the LSI immediately after the power supply has been turned on.

4. Prohibition of Access to Undefined or Reserved Addresses

Note: Access to undefined or reserved addresses is prohibited.
The undefined or reserved addresses may be used to expand functions, or test registers may have been be allocated to these addresses. Do not access these registers; the system's operation is not guaranteed if they are accessed.

5. Reading from/Writing Reserved Bit of Each Register

Note: Treat the reserved bit of register used in each module as follows except in cases where the specifications for values which are read from or written to the bit are provided in the description.
The bit is always read as 0. The write value should be 0 or one, which has been read immediately before writing.
Writing the value, which has been read immediately before writing has the advantage of preventing the bit from being affected on its extended function when the function is assigned.

Configuration of This Manual

This manual comprises the following items:

1. General Precautions on Handling of Product
2. Configuration of This Manual
3. Preface
4. Contents
5. Overview
6. Description of Functional Modules
    - CPU and System-Control Modules
    - On-Chip Modules

      The configuration of the functional description of each module differs according to the module. However, the generic style includes the following items:

    i) Feature
    ii) Input/Output Pin
    iii) Register Description
    iv) Operation
    v) Usage Note

When designing an application system that includes this LSI, take notes into account. Each section includes notes in relation to the descriptions given, and usage notes are given, as required, as the final part of each section.

7. Electrical Characteristics
8. Appendix
9. Main Revisions and Additions in this Edition (only for revised versions)

The list of revisions is a summary of points that have been revised or added to earlier versions. This does not include all of the revised contents. For details, see the actual locations in this manual.

10. Index

Preface

This LSI is a RISC (Reduced Instruction Set Computer) microcomputer which includes a Renesas Technology-original RISC CPU as its core, and the peripheral functions required to configure a system.

Target Users: This manual was written for users who will be using this LSI in the design of application systems. Users of this manual are expected to understand the fundamentals of electrical circuits, logical circuits, and microcomputers.

Objective: This manual was written to explain the hardware functions and electrical characteristics of this LSI to the above users.

Notes on reading this manual:

- In order to understand the overall functions of the chip
  Read the manual according to the contents. This manual can be roughly categorized into parts on the CPU, system control functions, peripheral functions and electrical characteristics.

Rules:		
	Bit order:	The MSB is on the left and the LSB is on the right.
	Number notation:	Binary is B'xxxx, hexadecimal is H'xxxx, decimal is xxxx.
	Signal notation:	An overbar is added to a low-active signal: $\overline{\text{xxxx}}$

Abbreviations

ALU	Arithmetic Logic Unit
ASID	Address Space Identifier
BGA	Ball Grid Array
CMT	Compare Match Timer (Timer/Counter)
CPG	Clock Pulse Generator
CPU	Central Processing Unit
DDR	Double Data Rate
DDRIF	DDR-SDRAM Interface
DMA	Direct Memory Access
DMAC	Direct Memory Access Controller
FIFO	First-In First-Out
FLCTL	NAND Flash Memory Controller
FPU	Floating-point Unit
HAC	Audio Codec
HSPI	Serial Protocol Interface
H-UDI	User Debugging Interface
INTC	Interrupt Controller
JTAG	Joint Test Action Group
LBSC	Local Bus State Controller
LRAM	L Memory
LRU	Least Recently Used
LSB	Least Significant Bit

MMCIF	Multimedia Card Interface
MMU	Memory Management Unit
MSB	Most Significant Bit
PC	Program Counter
PCI	Peripheral Component Interconnect
PCIC	PCI (local bus) Controller
RISC	Reduced Instruction Set Computer
RTC	Realtime Clock
SCIF	Serial Communication Interface with FIFO
SIOF	Serial Interface with FIFO
SSI	Serial Sound Interface
TAP	Test Access Port
TLB	Translation Lookaside Buffer
TMU	Timer Unit
UART	Universal Asynchronous Receiver/Transmitter
UBC	User Break Controller
WDT	Watchdog Timer

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