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RENESAS

RX63N Group, RX631 Group

Renesas MCUs

R01DS0098EJ0100
Rev.1.00
Jun 13, 2012

100-MHz 32-bit RX MCU, on-chip FPU, 165 DMIPS, up to 2-MB flash memory, Ethernet MAC, full-speed USB 2.0 host/function/OTG interface, various communications interfaces including CAN, 10- & 12-bit A/D converters, RTC

Features

RX63N Group products incorporate an Ethernet controller while RX631 Group products do not.

■ 32-bit RX CPU core

- Max. operating frequency: 100 MHz
- Capable of 165 DMIPS in operation at 100 MHz
- Single precision 32-bit IEEE-754 floating point
- Two types of multiply-and-accumulation unit (between memories and between registers)
- 32-bit multiplier (fastest instruction execution takes one CPU clock cycle)
- Divider (fastest instruction execution takes two CPU clock cycles)
- Fast interrupt
- CISC Harvard architecture with 5-stage pipeline
- Variable-length instructions: Ultra-compact code
- Supports the memory protection unit (MPU)
- JTAG and FINE (two-line) debugging interfaces

■ Low-power design and architecture

- Operation from a single 2.7- to 3.6-V supply
- Low power consumption: A product that supports all peripheral functions draws only 500 µA/MHz.
- RTC is capable of operation from a dedicated power supply (min. operating voltage: 2 V).
- Four low-power modes

■ On-chip main flash memory, no wait states

- Supports ROM-less versions and versions with up to 2 Mbytes of ROM (ROM-less version: RX631 Group only)
- 100-MHz operation, 10-ns read cycle (no wait states)
- 384-Kbyte to 2-Mbyte capacities
- User code programmable via the USB, SCI, or JTAG

■ On-chip data flash memory

- ROM-less or 32 Kbytes of ROM (reprogrammable up to 100,000 times)
- Programming/erasing as background operations (BGOs)

■ On-chip SRAM, no wait states

- 32- to 128-Kbyte capacities
- For instructions and operands
- Can provide backup on deep software standby

■ DMA

- DMAC: Four channels
- DTC
- EXDMAC: Two channels
- Dedicated DMAC for the Ethernet controller: Single channel

■ Reset and supply management

- Power-on reset (POR)
- Low voltage detection (LVD) with voltage settings

■ Clock functions

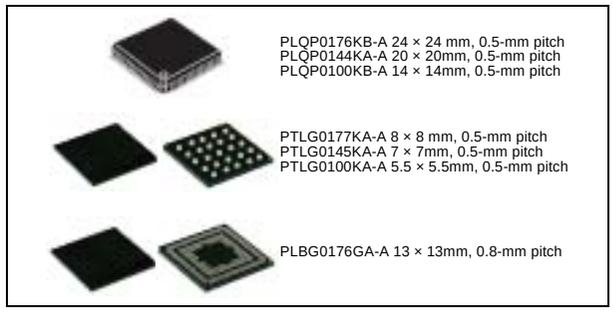
- External crystal oscillator or internal PLL for operation at 4 to 16 MHz
- Internal 125-kHz LOCO and 50-MHz HOCO
- Dedicated 125-kHz LOCO for the IWDT

■ Real-time clock

- Adjustment functions (30 seconds, leap year, and error)
- Time capture function
  (for capturing times in response to event-signal input on external pins)

■ Independent watchdog timer

- 125-kHz LOCO clock operation



PLQP0176KB-A 24 × 24 mm, 0.5-mm pitch
PLQP0144KA-A 20 × 20mm, 0.5-mm pitch
PLQP0100KB-A 14 × 14mm, 0.5-mm pitch

PTLG0177KA-A 8 × 8 mm, 0.5-mm pitch
PTLG0145KA-A 7 × 7mm, 0.5-mm pitch
PTLG0100KA-A 5.5 × 5.5mm, 0.5-mm pitch

PLBG0176GA-A 13 × 13mm, 0.8-mm pitch

■ Useful functions for IEC60730 compliance

- Oscillation-stoppage detection, frequency measurement, CRC, IWDT, self-diagnostic function for the A/D converter, etc.

■ Various communications interfaces

- Ethernet MAC (1) (not in RX631 Group products)
- Host/function or OTG controller (1) and function controller (1) with full-speed USB 2.0 transfer
- CAN (compliant with ISO11898-1), incorporating 32 mailboxes (up to 3 modules)
- SCI with multiple functionalities (up to 13)
- Choose from among asynchronous mode, clock-synchronous mode, smart-card interface mode, simplified SPI, simplified I2C, and extended serial mode.
  I^2C bus interface for transfer at up to 1 Mbps (up to 4)
- RSPI for high-speed transfer (up to 3)

■ External address space

- Buses for high-speed data transfer (max. operating frequency of 50 MHz)
- 8 CS areas (8 × 16 Mbytes)
- Multiplexed address data or separate address lines are selectable per area.
- 8-, 16-, or 32-bit bus space is selectable per area
- Independent SDRAM area (128 Mbytes)

■ Up to 20 extended-function timers

- 16-bit MTU2: input capture, output compare, PWM waveform output, phase-counting mode (6 channels)
- 16-bit TPU: input capture, output compare, phase-counting mode (12 channels)
- 8-bit TMR (4 channels)
- 16-bit compare-match timers (4 channels)

■ A/D converter for 1-MHz Operation

- Up to 21 12-bit channels, and incorporating 1 sample-and-hold circuit
  Up to 8 10-bit channels, and incorporating 1 sample-and-hold circuit
- Addition of results of A/D conversion (in the 12-bit converter)
- Self diagnosis (for the 10-bit converter)

■ 10-bit D/A converter: 2 channels

■ Temperature sensor for measuring temperature within the chip

■ Register write protection can protect values in important registers against overwriting.

■ Up to 134 pins for GPIO

- 5-V tolerance, open drain, input pull-up, switchable driving ability

■ Operating temp. range

- –40°C to +85°C

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1. Overview

1.1 Outline of Specifications

Table 1.1 lists the specifications in outline, and table 1.2 gives a comparison of the functions of products in different packages.
Table 1.1 is for products with the greatest number of functions, so numbers of peripheral modules and channels will differ in accord with the package. For details, see Table 1.2, Comparison of Functions for Different Packages in the RX63N/RX631 Group.

Table 1.1 Outline of Specifications (1/5)

Classification	Module/Function	Description
CPU	CPU	• Maximum operating frequency: 100 MHz • 32-bit RX CPU • Minimum instruction execution time: One instruction per state (cycle of the system clock) • Address space: 4-Gbyte linear • Register set of the CPU General purpose: Sixteen 32-bit registers Control: Nine 32-bit registers Accumulator: One 64-bit register • Basic instructions: 73 • Floating-point instructions: 8 • DSP instructions: 9 • Addressing modes: 10 • Data arrangement Instructions: Little endian Data: Selectable as little endian or big endian • On-chip 32-bit multiplier: 32 x 32 → 64 bits • On-chip divider: 32 / 32 → 32 bits • Barrel shifter: 32 bits • Memory protection unit (MPU)
	FPU	• Single precision (32-bit) floating point • Data types and floating-point exceptions in conformance with the IEEE754 standard
Memory	ROM	• Capacity: Romless, 768 Kbytes, 1 Mbyte, 1.5 Mbytes, 2 Mbytes • 100 MHz, no-wait access • On-board programming: Four types • Off-board programming (parallel programmer mode)
	RAM	• Capacity: 128 Kbytes • 100 MHz, no-wait access
	E2 data flash	Capacity: 32 Kbytes Programming/erasing: 100,000 times
MCU operating modes		Single-chip mode, on-chip ROM enabled expansion mode, and on-chip ROM disabled expansion mode (software switching)
Clock	Clock generation circuit	• Main clock oscillator, subclock oscillator, low-speed/high-speed on-chip oscillator, PLL frequency synthesizer, and IWDT-dedicated on-chip oscillator • Main-clock oscillation stoppage detection • Separate frequency-division and multiplication settings for the system clock (ICLK), peripheral module clock (PCLK), FlashIF clock (FCLK) and external bus clock (BCLK) The CPU and other bus masters run in synchronization with the system clock (ICLK): Up to 100 MHz Peripheral modules run in synchronization with the peripheral module clock (PCLK): Up to 50 MHz Flash IF run in synchronization with the flashIF clock (FCLK): Up to 50 MHz Devices connected to the external bus run in synchronization with the external bus clock (BCLK): Up to 50 MHz
Reset		Pin reset, power-on reset, voltage-monitoring reset, independent watchdog timer reset, watchdog timer reset, deep software standby reset, and software reset
Voltage detection circuit		When the voltage on VCC passes the voltage detection level (Vdet), an internal reset or internal interrupt is generated.

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Table 1.1 Outline of Specifications (2/5)

Classification	Module/Function	Description
Low power consumption	Low power consumption facilities	• Module stop function • Four low power consumption modes Sleep mode, all-module clock stop mode, software standby mode, and deep software standby mode • Battery backup function
Interrupt	Interrupt controller (ICUb)	• Peripheral function interrupts: 187 sources • External interrupts: 16 (pins IRQ0 to IRQ15) • Software interrupts: One source • Non-maskable interrupts: 6 sources Sixteen levels specifiable for the order of priority
External bus extension		• The external address space can be divided into nine areas (CS0 to CS7, SDCS), each with independent control of access settings. Capacity of each area: 16 Mbytes (CS0 to CS7), 128 Mbytes (SDCS) A chip-select signal (CS0# to CS7#, SDCS#) can be output for each area. Each area is specifiable as an 8-, 16-, or 32-bit bus space. The data arrangement in each area is selectable as little or big endian (only for data). • SDRAM interface connectable • Bus format: Separate bus, multiplex bus • Wait control • Write buffer facility
DMA	DMA controller (DMAC)	• 4 channels • Three transfer modes: Normal transfer, repeat transfer, and block transfer • Activation sources: Software trigger, external interrupts, and interrupt requests from peripheral functions
	EXDMA controller (EXDMACa)	• 2 channels • Four transfer modes: Normal transfer, repeat transfer, block transfer, and cluster transfer • Single-address transfer enabled with the EDACK signal • Capable of direct data transfer to TFT LCD panels • Activation sources: Software trigger, external DMA requests (EDREQ), and interrupt requests from peripheral functions
	Data transfer controller (DTCa)	• Three transfer modes: Normal transfer, repeat transfer, and block transfer • Activation sources: External interrupts and interrupt requests from peripheral functions
I/O ports	Programmable I/O ports	• I/O ports for the 177-pin TFLGA (in the planning stage), 176-pin LFBGA (in the planning stage), and 176-pin LQFP I/O pins: 133 Input pins: 1 Pull-up resistors: 133 Open-drain outputs: 133 5-V tolerance: 18 • I/O ports for the 145-pin TFLGA (in the planning stage) and 144-pin LQFP I/O pins: 111 Input pins: 1 Pull-up resistors: 111 Open-drain outputs: 111 5-V tolerance: 18 • I/O ports for the 100-pin LQFP I/O pins: 78 Input pins: 1 Pull-up resistors: 78 Open-drain outputs: 78 5-V tolerance: 17

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Table 1.1 Outline of Specifications (3/5)

Classification	Module/Function	Description
Timers	16-bit timer pulse unit (TPUa)	• (16 bits x 6 channels) x 2 unit • Maximum of 16 pulse-input/output possible • Select from among seven or eight counter-input clock signals for each channel • Input capture/output compare function Output of PWM waveforms in up to 15 phases in PWM mode • Buffered operation and phase-counting mode (two phase encoder input) depending on the channel • Support for cascade-connected operation (32 bits x 2 channels) • PPG output trigger can be generated • Capable of generating conversion start triggers for the A/D converters • Signals from the input capture pins are input via a digital filter • Clock frequency measuring method
	Multi-function timer pulse unit 2 (MTU2a)	• (16 bits x 6 channels) x 1 unit • Time bases for the 6 16-bit timer channels can be provided via up to 16 pulse-input/output lines and three pulse-input lines • Select from among eight counter-input clock signals for each channel (PCLK/1, PCLK/4, PCLK/16, PCLK/64, MTCLKA, MTCLKB, MTCLKC, MTCLKD) other than channel 5, for which only four signals are available. • Input capture function • 21 output compare/input capture registers • Complementary PWM output mode • Reset synchronous PWM mode • Phase-counting mode • Generation of triggers for A/D converter conversion • Digital filter • Signals from the input capture pins are input via a digital filter • PPG output trigger can be generated • Clock frequency measuring function
	Frequency measuring method (MCK)	The MTU or unit 0 TPU module can be used to monitor the main clock, subclock, HOCO clock, LOCO clock, and PLL clock for abnormal frequencies.
	Port output enable 2 (POE2a)	Controls the high-impedance state of the MTU's waveform output pins
	Programmable pulse generator (PPG)	• (4 bits x 4 groups) x 2 units • Pulse output with the MTU2 or TPU output as a trigger • Maximum of 32 pulse-output possible
	8-bit timers (TMR)	• (8 bits x 2 channels) x 2 units • Select from among seven internal clock signals (PCLK/1, PCLK/2, PCLK/8, PCLK/32, PCLK/64, PCLK/1024, PCLK/8192) and one external clock signal • Capable of output of pulse trains with desired duty cycles or of PWM signals • The 2 channels of each unit can be cascaded to create a 16-bit timer • Generation of triggers for A/D converter conversion • Capable of generating baud-rate clocks for SCI5, SCI6, and SCI12
	Compare match timer (CMT)	• (16 bits x 2 channels) x 2 units • Select from among four internal clock signals (PCLK/8, PCLK/32, PCLK/128, PCLK/512)
	Realtime clock (RTCa)	• Clock sources: Main clock, subclock • Clock and calendar functions Interrupt sources: Alarm interrupt, periodic interrupt, and carry interrupt • Battery backup operation • Time-capture facility for three values
	Watchdog timer (WDTA)	• 14 bits x 1 channel • Select from among 6 counter-input clock signals (PCLK/4, PCLK/64, PCLK/128, PCLK/512, PCLK/2048, PCLK/8192)
	Independent watchdog timer (IWDTa)	• 14 bits x 1 channel • Counter-input clock: IWDT-dedicated on-chip oscillator • Dedicated clock/1, dedicated clock/16, dedicated clock/32, dedicated clock/64, dedicated clock/128, dedicated clock/256

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Table 1.1 Outline of Specifications (4/5)

Classification	Module/Function	Description
Communication function	Ethernet controller (ETHERC)	• Input and output of Ethernet/IEEE 802.3 frames • Transfer at 10 or 100 Mbps • Full- and half-duplex modes • MII (Media Independent Interface) or RMII (Reduced Media Independent Interface) as defined in IEEE 802.3u • Detection of Magic Packets™*1 or output of a "wake-on-LAN" signal (WOL) • Compliance with flow control as defined in IEEE 802.3x standards Note 1. Magic PacketTM is a registered trademark of Advanced Micro Devices, Inc.
	DMA controller for Ethernet controller (EDMAC)	• Alleviation of CPU loads by the descriptor control method • Transmission FIFO: 2 Kbytes; Reception FIFO: 2 Kbytes
	USB 2.0 host/function module (USBa)	• Includes a UDC (USB Device Controller) and transceiver for USB 2.0 • Host/function module: one port, function module: one port • Compliance with the USB 2.0 specification • Transfer rate: Full speed (12 Mbps) • Self-power mode and bus power are selectable • OTG (On the Go) operation is possible • Incorporates 2 Kbytes of RAM as a transfer buffer
	Serial communications interfaces (SCIc, SCId)	• 13 channels (SCIc: 12 channels + SCId: 1 channel) • SCIc Serial communications modes: Asynchronous, clock synchronous, and smart-card interface Multi-processor function On-chip baud rate generator allows selection of the desired bit rate Choice of LSB-first or MSB-first transfer Average transfer rate clock can be input from TMR timers for SCI5, SCI6, and SCI12 Simple I^2C Simple SPI • SCId (The following functions are added to SCIc) Supports the serial communications protocol, which contains the start frame and information frame Supports the LIN format
	I^2C bus interfaces (RIIC)	• 4 channels (one of them is FM+) • Communication formats I^2C bus format/SMBus format Supports the multi-master Max. transfer rate: 1 Mbps (channel 0)
	IEBus (IEB)	• 1 channel • Supports protocol control for the IEBus Half-duplex asynchronous transfer Multi-master operation Broadcast communications function Two selectable modes, differentiated by transfer rate Note: • IEBus (Inter Equipment Bus) is a registered trademark of Renesas Electronics Corporation.
	CAN module (CAN)	• 3 channels • Compliance with the ISO11898-1 specification (standard frame and extended frame) • 32 mailboxes each
	Serial peripheral interfaces (SPI)	• 3 channels • RSPI transfer facility Using the MOSI (master out, slave in), MISO (master in, slave out), SSL (slave select), and RSPCK (RSPI clock) signals enables serial transfer through SPI operation (four lines) or clock-synchronous operation (three lines) Capable of handling serial transfer as a master or slave • Data formats Switching between MSB first and LSB first The number of bits in each transfer can be changed to any number of bits from 8 to 16, or to 20, 24, or 32 bits. 128-bit buffers for transmission and reception Up to four frames can be transmitted or received in a single transfer operation (with each frame having up to 32 bits) • Buffered structure • Double buffers for both transmission and reception

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Table 1.1 Outline of Specifications (5/5)

Classification	Module/Function	Description
12-bit A/D converter (S12ADa)		• 1 unit (1 unit x 14 channels) • 12-bit resolution • Conversion time: 1.0 μs per channel (in operation with PCLK at 50 MHz) • Operating mode Scan mode (single scan mode or continuous scan mode) • Sample-and-hold function • Reference voltage generation • Three ways to start A/D conversion Conversion can be started by software, a conversion start trigger from a timer (MTU, TPU, or TMR), or an external trigger signal. • A/D conversion of the temperature sensor output
10-bit A/D converter (ADb)		• 1 unit (1 unit x 8 channels) • 10-bit resolution • Conversion time: 1.0 μs per channel (in operation with PCLK at 50 MHz) • Operating mode Scan mode (single scan mode or continuous scan mode) External amplifier connection mode • Sample-and-hold function • Three ways to start A/D conversion Conversion can be started by software, a conversion start trigger from a timer (MTU, TPU, or TMR), or an external trigger signal.
D/A converter (DAa)		• 2 channels • 10-bit resolution • Output voltage: 0 V to VREFH
Temperature sensor		• 1 channel • Precision: ±1ºC • The voltage of the temperature is converted into a digital value by the 12-bit A/D converter.
CRC calculator (CRC)		• CRC code generation for arbitrary amounts of data in 8-bit units • Select any of three generating polynomials: $X^8 + X^2 + X + 1$, $X^{16} + X^{15} + X^2 + 1$, or $X^{16} + X^{12} + X^5 + 1$. • Generation of CRC codes for use with LSB-first or MSB-first communications is selectable
Operating frequency		Up to 100 MHz
Power supply voltage		VCC = AVCC0 = VREFH = VCC_USB = 2.7 to 3.6 V, VREFH0 = 2.7 V to AVCC0, Vbatt = 2.0 V to 3.6 V
Operating temperature		–40 to +85°C (products with wide-temperature-range spec.)
Package		177-pin TFLGA (PTLG0177KA-A) (in the planning stage) 176-pin LFBGA (PLBG0176GA-A) (in the planning stage) 176-pin LQFP (PLQP0176KB-A) 145-pin TFLGA (PTLG0145KA-A) (in the planning stage) 144-pin LQFP (PLQP0144KA-A) 100-pin LQFP (PLQP0100KB-A)
On-chip debugging system		• E1 emulator (JTAG and FINE interfaces) • E20 emulator (JTAG interface)

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Table 1.2 Comparison of Functions for Different Packages in the RX63N/RX631 Group

Functions		RX63N Group			RX631 Group		
Package		177-pin 176-pin	145-pin 144-pin	100-pin	177-pin 176-pin	145-pin 144-pin	100-pin
External bus width	External bus width	32 bits	16 bits		32 bits	16 bits	
	SDRAM area controller	Available		Not available	Available		Not available
DMA	DMA controller	Ch. 0 to 3			Ch. 0 to 3		
	EXDMA controller	Ch. 0 and 1			Ch. 0 and 1		
	Data transfer controller	Available			Available		
Timers	16-bit timer pulse unit	Ch. 0 to 11		Ch. 0 to 5	Ch. 0 to 11		Ch. 0 to 5
	Multi-function timer pulse unit 2	Ch. 0 to 5			Ch. 0 to 5		
	Port output enable 2	Available			Available		
	Programmable pulse generator	Ch. 0 and 1			Ch. 0 and 1		
	8-bit timers	Ch. 0 to 3			Ch. 0 to 3		
	Compare match timer	Ch. 0 to 3			Ch. 0 to 3		
	Realtime clock	Available			Available		
	Watchdog timer	Available			Available		
	Independent watchdog timer	Available			Available		
Communication function	Ethernet controller	Available			Not available		
	DMA controller for Ethernet controller	Available			Not available		
	USB 2.0 host/function module	Ch. 0 and 1	ch0		Ch. 0 and 1	ch0	
	Serial communications interfaces (SCIc)	Ch. 0 to 11		Ch. 0 to 3, 5, 6, 8 and 9	Ch. 0 to 11		Ch. 0 to 3, 5, 6, 8 and 9
	Serial communications interfaces (SCId)	Ch. 12			Ch. 12		
	I^2C bus interfaces	Ch. 0 to 3		ch0, 2	Ch. 0 to 3		ch0, 2
	IEBus	Available			Available		
	Serial peripheral interfaces	ch0 to 2		Ch. 0 and 1	ch0 to 2		Ch. 0 and 1
	CAN module	For 1.5 M or more: Ch. 0 to 2, For 1 M or less: Ch. 0 and 1		Ch. 0 and 1	For 1.5 M or more: Ch. 0 to 2, For 1 M or less: Ch. 0 and 1		Ch. 0 and 1
12-bit A/D converter (channel)		AN000 to 020		AN000 to 013	AN000 to 020		AN000 to 013
10-bit A/D converter (channel)		AN0 to 7			AN0 to 7		
D/A converter (resolution x channel)		Ch. 0 and 1		ch1	Ch. 0 and 1		ch1
Temperature sensor		Available			Available		
CRC calculator		Available			Available		

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1.2 List of Products

Table 1.3 is a list of products, and Figure 1.1 shows how to read the product part no.

Table 1.3 List of Products (1/3)

Group	Part No.	Package	ROM Capacity	RAM Capacity	E²Data Flash	Operating Frequency (Max.)
RX63N	R5F563NACDFP	PLQP0100KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDFP	PLQP0100KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NACDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NACDLK	PTLG0145KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDLK	PTLG0145KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NACDFC	PLQP0176KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDFC	PLQP0176KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NACDLC	PTLG0177KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDLC	PTLG0177KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NACDBG	PLBG0176GA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NADDBG	PLBG0176GA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDFP	PLQP0100KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDFP	PLQP0100KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDFC	PLQP0176KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDFC	PLQP0176KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDLC	PTLG0177KA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDLC	PTLG0177KA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBCDBG	PLBG0176GA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NBDDBG	PLBG0176GA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDFP	PLQP0100KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDFP	PLQP0100KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDFB	PLQP0144KA-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDFB	PLQP0144KA-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDLK	PTLG0145KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDLK	PTLG0145KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDFC	PLQP0176KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDFC	PLQP0176KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDLC	PTLG0177KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDLC	PTLG0177KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDCDBG	PLBG0176GA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NDDDBG	PLBG0176GA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDFP	PLQP0100KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NEDDFP	PLQP0100KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDFB	PLQP0144KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NEDDFB	PLQP0144KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDLK	PTLG0145KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz

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Table 1.3 List of Products (2/3)

Group	Part No.	Package	ROM Capacity	RAM Capacity	E^2Data Flash	Operating Frequency (Max.)
RX63N	R5F563NEDDLK	PTLG0145KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDFC	PLQP0176KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NEDDFC	PLQP0176KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDLC	PTLG0177KA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NEDDLC	PTLG0177KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NECDBG	PLBG0176GA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F563NEDDBG	PLBG0176GA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
RX631	R5F5631ACDFP	PLQP0100KB-A	768K Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDFP	PLQP0100KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ACDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ACDLK	PTLG0145KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDLK	PTLG0145KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ACDFC	PLQP0176KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDFC	PLQP0176KB-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ACDLC	PTLG0177KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDLC	PTLG0177KA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ACDBG	PLBG0176GA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ADDBG	PLBG0176GA-A*1	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDFP	PLQP0100KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDFP	PLQP0100KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDFC	PLQP0176KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDFC	PLQP0176KB-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDLC	PTLG0177KA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDLC	PTLG0177KA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BCDBG	PLBG0176GA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631BDDBG	PLBG0176GA-A*1	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDFP	PLQP0100KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDFP	PLQP0100KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDFB	PLQP0144KA-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDFB	PLQP0144KA-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDLK	PTLG0145KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDLK	PTLG0145KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDFC	PLQP0176KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDFC	PLQP0176KB-A	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDLC	PTLG0177KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDLC	PTLG0177KA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DCDBG	PLBG0176GA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631DDDBG	PLBG0176GA-A*1	1.5 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDFP	PLQP0100KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz

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Table 1.3 List of Products (3/3)

Group	Part No.	Package	ROM Capacity	RAM Capacity	E²Data Flash	Operating Frequency (Max.)
RX631	R5F5631EDDFP	PLQP0100KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDFB	PLQP0144KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631EDDFB	PLQP0144KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDLK	PTLG0145KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631EDDLK	PTLG0145KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDFC	PLQP0176KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631EDDFC	PLQP0176KB-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDLC	PTLG0177KA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631EDDLC	PTLG0177KA-A	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631ECDBG	PLBG0176GA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5F5631EDDBG	PLBG0176GA-A*1	2 Mbyte	128 Kbytes	32 Kbytes	100 MHz
	R5S56310CDFC	PLQP0176KB-A	0 Mbyte	128 Kbytes	0 Kbytes	100 MHz

Note 1. In the planning stage

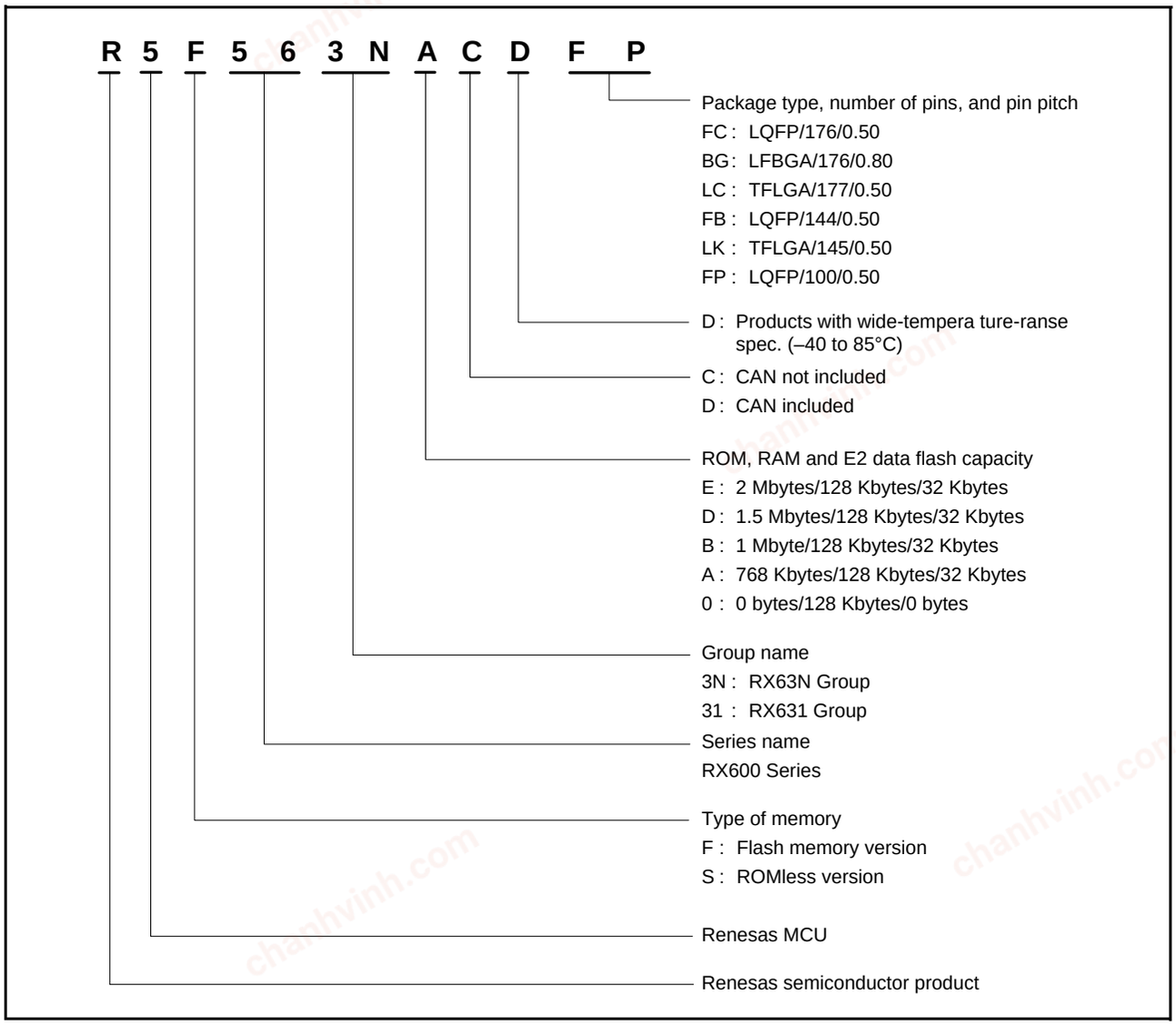


Figure 1.1 How to Read the Product Part No.

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1.3 Block Diagram

Figure 1.2 shows a block diagram.

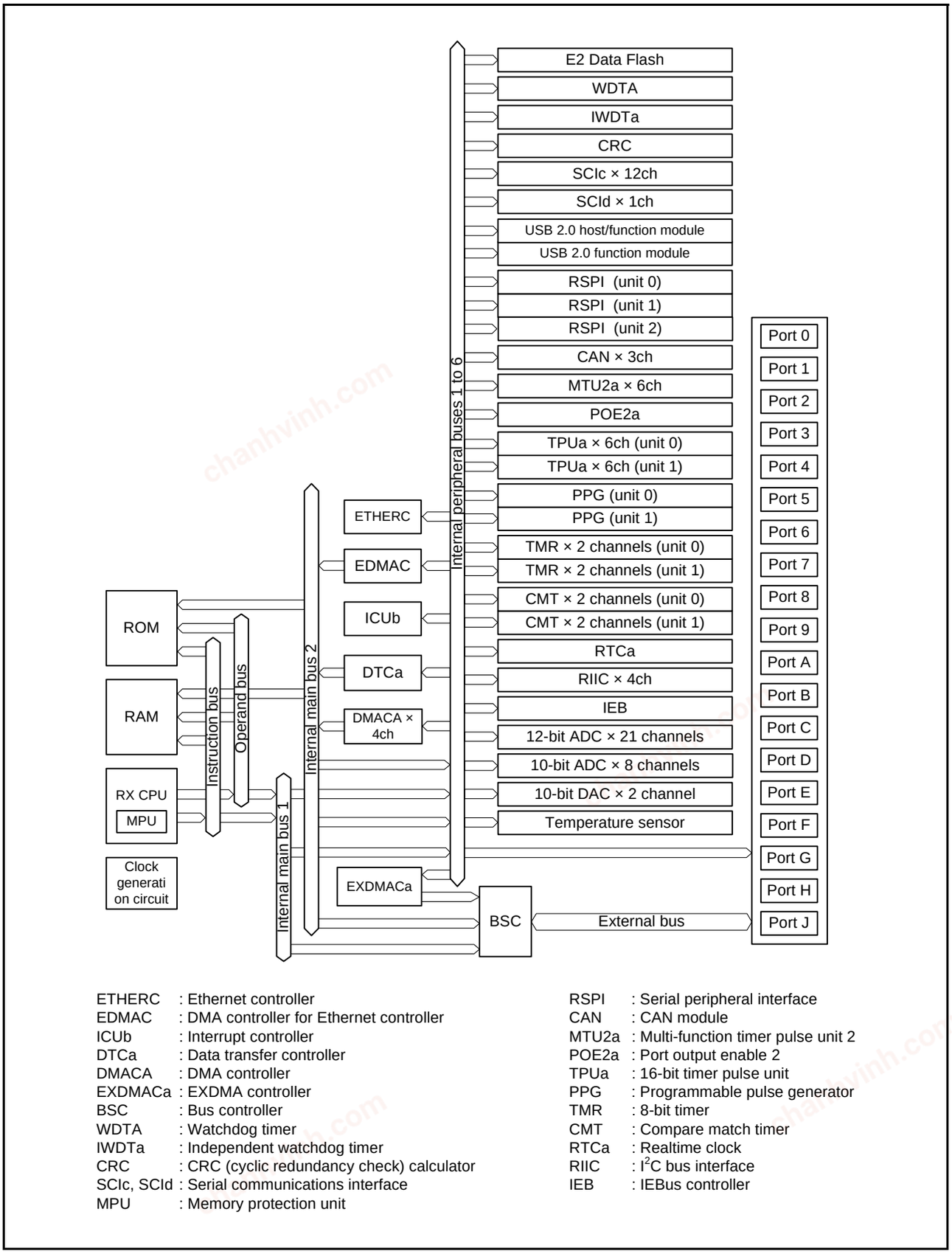


Figure 1.2 Block Diagram

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1.4 Pin Functions

Table 1.4 lists the pin functions.

Table 1.4 Pin Functions (1/6)

Classifications	Pin Name	I/O	Description
Power supply	VCC	Input	Power supply pin. Connect it to the system power supply. Connect this pin to VSS via a 0.1-µF capacitor. The capacitor should be placed close to the pin.
	VCL	Input	Connect this pin to VSS via a 0.1-µF capacitor. The capacitor should be placed close to the pin.
	VSS	Input	Ground pin. Connect it to the system power supply (0 V).
	VBAT	Input	Backup power pin
Clock	XTAL	Output	Pins for a crystal resonator. An external clock signal can be input through the EXTAL pin.
	EXTAL	Input	
	BCLK	Output	Outputs the external bus clock for external devices.
	SDCLK	Output	Outputs the clock dedicated for the SDRAM.
	XCOUT	Output	Input/output pins for the subclock oscillator. Connect a crystal resonator between XCOUT and XCIN.
	XCIN	Input	
Operating mode control	MD	Input	Pins for setting the operating mode. The signal levels on these pins must not be changed during operation.
System control	RES#	Input	Reset signal input pin. This LSI enters the reset state when this signal goes low.
	EMLE	Input	Input pin for the on-chip emulator enable signal. When the on-chip emulator is used, this pin should be driven high. When not used, it should be driven low.
	BSCANP	Input	Boundary scan enable pin. Boundary scan is enabled when this pin goes high. When not used, it should be driven low.
On-chip emulator	FINEC	Input	Fine interface clock pin
	FINED	I/O	Fine interface pin
	TRST#	Input	On-chip emulator or boundary scan pins. When the EMLE pin is driven high, these pins are dedicated for the on-chip emulator.
	TMS	Input	
	TDI	Input	
	TCK	Input	
	TDO	Output	
	TRCLK	Output	This pin outputs the clock for synchronization with the trace data.
	TRSYNC#	Output	This pin indicates that output from the TRDATA0 to TRDATA3 pins is valid.
	TRDATA0 to TRDATA3	Output	These pins output the trace information.
Address bus	A0 to A23	Output	Output pins for the address.
Data bus	D0 to D15	I/O	Input and output pins for the bidirectional data bus.
Multiplexed bus	A0/D0 to A15/D15	I/O	Address/data multiplexed bus

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Table 1.4 Pin Functions (2/6)

Classifications	Pin Name	I/O	Description
Bus control	RD#	Output	Strobe signal which indicates that reading from the external bus interface space is in progress.
	WR#	Output	Strobe signal which indicates that writing to the external bus interface space is in progress, in 1-write strobe mode.
	WR0# to WR3#	Output	Strobe signals which indicate that either group of data bus pins (D7 to D0 and D15 to D8) is valid in writing to the external bus interface space, in byte strobe mode.
	BC0# to BC3#	Output	Strobe signals which indicate that either group of data bus pins (D7 to D0 and D15 to D8) is valid in access to the external bus interface space, in 1-write strobe mode.
	ALE	Output	Address latch signal when address/data multiplexed bus is selected.
	CKE	Output	Output pin for SDRAM clock enable signals.
	SDCS#	Output	Output pin for SDRAM chip select signals.
	RAS#	Output	Output pin for SDRAM row address strobe signals.
	CAS#	Output	Output pin for SDRAM column address strobe signals.
Bus control	WE#	Output	Output pin for SDRAM write enable signals.
	DQM0 to DQM3	Output	Output pins for SDRAM I/O data mask enable signals.
	CS0# to CS7#	Output	Select signals for CS area.
	WAIT#	Input	Input pins for wait request signals in access to the external space.
EXDMA controller	EDREQ0, EDREQ1		Input pins for external DMA transfer requests.
	EDACK0, EDACK1		Output pins for single address transfer acknowledge signals.
Interrupt	NMI	Input	Non-maskable interrupt request signal.
	IRQ0 to IRQ15	Input	Maskable interrupt request signals.
Multi-function timer pulse unit 2	MTIOC0A, MTIOC0B MTIOC0C, MTIOC0D	I/O	The TGRA0 to TGRD0 input capture input/output compare output/PWM output pins.
	MTIOC1A, MTIOC1B	I/O	The TGRA1 and TGRB1 input capture input/output compare output/PWM output pins.
	MTIOC2A, MTIOC2B	I/O	The TGRA2 and TGRB2 input capture input/output compare output/PWM output pins.
	MTIOC3A, MTIOC3B MTIOC3C, MTIOC3D	I/O	The TGRA3 to TGRD3 input capture input/output compare output/PWM output pins.
	MTIOC4A, MTIOC4B MTIOC4C, MTIOC4D	I/O	The TGRA4 to TGRD4 input capture input/output compare output/PWM output pins.
	MTIC5U, MTIC5V MTIC5W	Input	The TGRU5, TGRV5, and TGRW5 input capture input/dead time compensation input pins.
	MTCLKA, MTCLKB MTCLKC, MTCLKD	Input	Input pins for external clock signals.
Port output enable 2	POE0# to POE3# POE8#	Input	Input pins for request signals to place the MTU large-current pins in the high impedance state.

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Table 1.4 Pin Functions (3/6)

Classifications	Pin Name	I/O	Description
16-bit timer pulse unit	TIOCA0, TIOCB0 TIOCC0, TIOCD0	I/O	The TGRA0 to TGRD0 input capture input/output compare output/PWM output pins.
	TIOCA1, TIOCB1	I/O	The TGRA1 and TGRB1 input capture input/output compare output/PWM output pins.
	TIOCA2, TIOCB2	I/O	The TGRA2 and TGRB2 input capture input/output compare output/PWM output pins.
	TIOCA3, TIOCB3 TIOCC3, TIOCD3	I/O	The TGRA3 to TGRD3 input capture input/output compare output/PWM output pins.
	TIOCA4, TIOCB4	I/O	The TGRA4 and TGRB4 input capture input/output compare output/PWM output pins.
	TIOCA5, TIOCB5	I/O	The TGRA5 and TGRB5 input capture input/output compare output/PWM output pins.
	TCLKA, TCLKB TCLKC, TCLKD	Input	Input pins for external clock signals.
	TIOCA6, TIOCB6 TIOCC6, TIOCD6	I/O	The TGRA6 to TGRD6 input capture input/output compare output/PWM output pins.
	TIOCA7, TIOCB7	I/O	The TGRA7 and TGRB7 input capture input/output compare output/PWM output pins.
	TIOCA8, TIOCB8	I/O	The TGRA8 and TGRB8 input capture input/output compare output/PWM output pins.
	TIOCA9, TIOCB9 TIOCC9, TIOCD9	I/O	The TGRA9 to TGRD9 input capture input/output compare output/PWM output pins.
	TIOCA10, TIOCB10	I/O	The TGRA10 and TGRB10 input capture input/output compare output/PWM output pins.
	TIOCA11, TIOCB11	I/O	The TGRA11 and TGRB11 input capture input/output compare output/PWM output pins.
	TCLKE, TCLKF TCLKG, TCLKH	Input	Input pins for external clock signals.
Programmable pulse generator	PO0 to PO31	Output	Output pins for the pulse signals.
8-bit timer	TMO0 to TMO3	Output	Output pins for the compare match signals.
	TMCI0 to TMCI3	Input	Input pins for the external clock signals that drive for the counters.
	TMRI0 to TMRI3	Input	Input pins for the counter-reset signals.
Serial communications interface (SCIc)	• Asynchronous mode/clock synchronous mode		
	SCK0 to SCK11	I/O	Input/output pins for clock signals.
	RXD0 to RXD11	Input	Input pins for data reception.
	TXD0 to TXD11	Output	Output pins for data transmission.
	CTS0# to CTS11#	Input	Transfer start control input pins
	RTS0# to RTS11#	Output	Transfer start control output pins
	• Simple I^2C mode		
	SSCL0 to SSCL11	I/O	Input/output pins for the I^2C clock
	SSDA0 to SSDA11	I/O	Input/output pins for the I^2C data
Serial communications interface (SCIc)	• Simple SPI mode		
	SCK0 to SCK11	I/O	Input/output pins for the clock
	SMISO0 to SMISO11	I/O	Input/output pins for slave transmit data.
	SMOSI0 to SMOSI11	I/O	Input/output pins for master transmit data.
	SS0# to SS11#	Input	Input pins for chip select signals

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Table 1.4 Pin Functions (4/6)

Classifications	Pin Name	I/O	Description
Serial communications interface (SCId)	• Asynchronous mode/clock synchronous mode		
	SCK12	I/O	Input/output pin for clock signals.
	RXD12	Input	Input pin for data reception.
	TXD12	Output	Output pin for data transmission.
	CTS12#	Input	Transfer start control input pins
	RTS12#	Output	Transfer start control output pins
	• Simple I^2C mode		
	SSCL12	I/O	Input/output pins for the I^2C clock
	SSDA12	I/O	Input/output pins for the I^2C data
	• Simple SPI mode		
	SCK12	I/O	Input/output pins for the clock
	SMISO12	I/O	Input/output pins for slave transmit data.
	SMOSI12	I/O	Input/output pins for master transmit data.
	SS12#	Input	Input pins for chip select signals
	• Extended serial mode		
	RXDX12	Input	Input pin for receive data
	TXDX12	Output	Output pin for transmit data
	SIO12	I/O	Input/output pin for transfer data
I^2C bus interface	SCL0[FM+], SCL1 to SCL3	I/O	Input/output pin for clocks. Bus can be directly driven by the N-channel open drain output.
	SDA0[FM+], SDA1 to SDA3	I/O	Input/output pin for data. Bus can be directly driven by the N-channel open drain output.
Ethernet controller	REF50CK	Input	50-MHz reference clock. This pin inputs reference signals for transmission/reception timings in RMII mode.
	RMII_CRS_DV	Input	Indicates that there are carrier detection signals and valid receive data on RMII_RXD1 and RMII_RXD0 in RMII mode.
	RMII_TXD0, RMII_TXD1	Output	2-bit transmit data in RMII mode.
	RMII_RXD0, RMII_RXD1	Input	2-bit receive data in RMII mode.
	RMII_TXD_EN	Output	Output pin for data transmit enable signals in RMII mode.
	RMII_RX_ER	Input	Indicates an error has occurred during reception of data in RMII mode.
	ET_CRS	Input	Carrier detection/data reception enable pin.
	ET_RX_DV	Input	Indicates that there are valid receive data on ET_ERXD3 to ET_ERXD0.
	ET_EXOUT	Output	General-purpose external output pin.
	ET_LINKSTA	Input	Inputs link status from the PHY-LSI.
	ET_ETXD0 to ET_ETXD3	Output	4 bits of MII transmit data.
	ET_ERXD0 to ET_ERXD3	Input	4 bits of MII receive data.
	ET_TX_EN	Output	Transmit enable pin. Indicates that transmit data is ready on ET_ETXD3 to ET_ETXD0.
	ET_TX_ER	Output	Transmit error pin. Notifies the PHY_LSI of an error during transmission.
	ET_RX_ER	Input	Receive error pin. Recognizes an error during reception.
	ET_TX_CLK	Input	Transmit clock pin. This pin inputs reference signals for output timings from ET_TX_EN, ET_ETXD3 to ET_ETXD0, and ET_TX_ER.
	ET_RX_CLK	Input	Receive clock pin. This pin inputs reference signals for input timings to ET_RX_DV, ET_ERXD3 to ET_ERXD0, and ET_RX_ER.

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Table 1.4 Pin Functions (5/6)

Classifications	Pin Name	I/O	Description
Ethernet controller	ET_COL	Input	Inputs collision detection signals.
	ET_WOL	Output	Receives Magic packets.
	ET_MDC	Output	Outputs reference clock signals for information transfer via ET_MDIO.
	ET_MDIO	I/O	Inputs or outputs bidirectional signals for exchange of management information between the RX63N Group and the PHY-LSI.
USB 2.0 host/function module	VCC_USB	Input	Power supply pin.
	VSS_USB	Input	Ground pin.
	USB0_DP, USB1_DP	I/O	Inputs or outputs USB transceiver D+ data.
	USB0_DM, USB1_DM	I/O	Inputs or outputs USB transceiver D- data.
	USB0_VBUS, USB1_VBUS	Input	Input pins for detection of connection and disconnection of the USB cable.
	USB0_EXICEN	Output	Output pin for control the low power of the OTG chip.
	USB0_VBUSEN	Output	Supply enable pin of VBUS (5 V) for the OTG chip.
	USB0_OVRCURA, USB0_OVRCURB,	Input	Input pin for detection of external over current.
	USB0_ID	Input	ID input pin of mini-AB connector at the OGT operation.
	USB0_DPUPE, USB1_DPUPE	Output	Pull-up control pins of the D+ signal at the function operation.
	USB0_DPRPD	Output	Pull-down control pins of the D+ signal at the host operation.
	USB0_DRPD	Output	Pull-down control pins of the D- signal at the host operation.
CAN module	CRX0 to CRX2	Input	Input pin.
	CTX0 to CTX2	Output	Output pin.
Serial peripheral interface	RSPCKA, RSPCKB RSPCKC	I/O	Clock input/output pin.
	MOSIA, MOSIB, MOSIC	I/O	Inputs or outputs data output from the master.
	MISOA, MISOB, MISOC	I/O	Inputs or outputs data output from the slave.
	SSLA0, SSLB0, SSLC0	I/O	Input or output pins slave selection
	SSLA1 to SSLA3 SSLB1 to SSLB3 SSLC1 to SSLC3	Output	Output pins slave selection
IEBus controller	IERXD	Input	Input pin for data reception.
	IETXD	Output	Output pin for data transmission.
Realtime clock	RTCOUT	Output	Output pin for 1-Hz clock.
	RTCIC0 to RTCIC2	Input	Time capture event input pin
12-bit A/D converter	AN000 to AN020	Input	Input pins for the analog signals to be processed by the A/D converter.
	ADTRG0#	Input	Input pins for the external trigger signals that start the A/D conversion.
10-bit A/D converter	AN0 to AN7	Input	Input pins for the analog signals to be processed by the A/D converter.
	ANEX0	Output	Extended analog output pin
	ANEX1	Input	Extended analog input pin
	ADTRG#	Input	Input pins for the external trigger signals that start the A/D conversion.
D/A converter	DA0, DA1	Output	Output pins for the analog signals to be processed by the D/A converter.
Analog power supply	AVCC0	Input	Analog voltage supply pin for the 12-bit A/D converter. Connect this pin to VCC if the 12-bit A/D converter is not to be used.
	AVSS0	Input	Analog ground pin for the 12-bit A/D converter. Connect this pin to VSS if the 12-bit A/D converter is not to be used.
	VREFH0	Input	Analog reference voltage supply pin for the 12-bit A/D converter. Connect this pin to VCC if the 12-bit A/D converter is not to be used.

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Table 1.4 Pin Functions (6/6)

Classifications	Pin Name	I/O	Description
Analog power supply	VREFL0	Input	Analog reference ground pin for the 12-bit A/D converter. Connect this pin to VSS if the 12-bit A/D converter is not to be used.
	VREFH	Input	Reference voltage input pin for the 10-bit A/D converter and D/A converter. This is used as the analog power supply for the respective modules. Connect this pin to VCC if neither the 10-bit A/D converter nor the D/A converter is in use.
	VREFL	Input	Reference ground pin for the 10-bit A/D converter and D/A converter. This is used as the analog ground for the respective modules. Set this pin to the same potential as the VSS pin.
I/O ports	P00 to P03, P05, P07	I/O	6-bit input/output pins.
	P10 to P17	I/O	8-bit input/output pins.
	P20 to P27	I/O	8-bit input/output pins.
	P30 to P37	I/O	8-bit input/output pins. (P35 input/output pins)
	P40 to P47	I/O	8-bit input/output pins.
	P50 to P57	I/O	8-bit input/output pins.
	P60 to P67	I/O	8-bit input/output pins.
	P70 to P77	I/O	8-bit input/output pins.
	P80 to P87	I/O	8-bit input/output pins.
	P90 to P97	I/O	8-bit input/output pins.
	PA0 to PA7	I/O	8-bit input/output pins.
	PB0 to PB7	I/O	8-bit input/output pins.
	PC0 to PC7	I/O	8-bit input/output pins.
	PD0 to PD7	I/O	8-bit input/output pins.
	PE0 to PE7	I/O	8-bit input/output pins.
	PF0 to PF5	I/O	6-bit input/output pins.
	PG0 to PG7	I/O	8-bit input/output pins.
	PJ3, PJ5	I/O	2-bit input/output pins.

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1.5 Pin Assignments

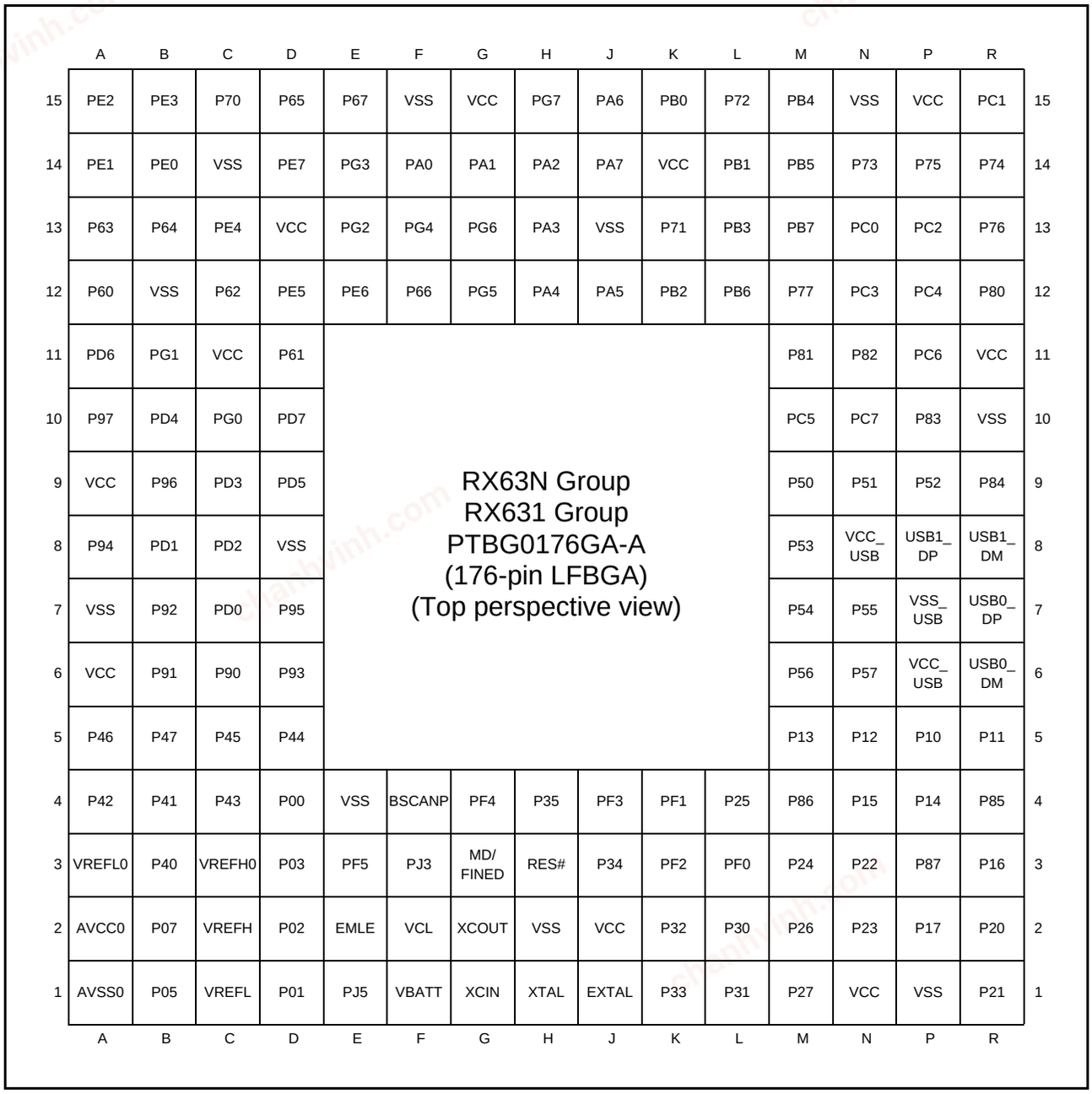
Figure 1.5 to Figure 1.8 show the pins assignments. Table 1.5 to Table 1.9 show the list of pins and pin functions. Power pins and I/O ports are shown in the pin assignment diagrams.

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
15	PE2	PE3	P70	P65	P67	VSS	VCC	PG7	PA6	PB0	P72	PB4	VSS	VCC	PC1	15
14	PE1	PE0	VSS	PE7	PG3	PA0	PA1	PA2	PA7	VCC	PB1	PB5	P73	P75	P74	14
13	P63	P64	PE4	VCC	PG2	PG4	PG6	PA3	VSS	P71	PB3	PB7	PC0	PC2	P76	13
12	P60	VSS	P62	PE5	PE6	P66	PG5	PA4	PA5	PB2	PB6	P77	PC3	PC4	P80	12
11	PD6	PG1	VCC	P61								P81	P82	PC6	VCC	11
10	P97	PD4	PG0	PD7								PC5	PC7	P83	VSS	10
9	VCC	P96	PD3	PD5								P50	P51	P52	P84	9
8	P94	PD1	PD2	VSS								P53	VCC_ USB	USB1_ DP	USB1_ DM	8
7	VSS	P92	PD0	P95								P54	P55	VSS_ USB	USB0_ DP	7
6	VCC	P91	P90	P93								P56	P57	VCC_ USB	USB0_ DM	6
5	P46	P47	P45	P44	NC							P13	P12	P10	P11	5
4	P42	P41	P43	P00	VSS	BSCANP	PF4	P35	PF3	PF1	P25	P86	P15	P14	P85	4
3	VREFL0	P40	VREFH0	P03	PF5	PJ3	MD/ FINED	RES#	P34	PF2	PF0	P24	P22	P87	P16	3
2	AVCC0	P07	VREFH	P02	EMLE	VCL	XCOUT	VSS	VCC	P32	P30	P26	P23	P17	P20	2
1	AVSS0	P05	VREFL	P01	PJ5	VBATT	XCIN	XTAL	EXTAL	P33	P31	P27	VCC	VSS	P21	1
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	

RX63N Group
RX631 Group
PTLG0177KA-A
(177-pin TFLGA)
(Top perspective view)

Figure 1.3 Pin Assignment (177-Pin TFLGA)

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	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
15	PE2	PE3	P70	P65	P67	VSS	VCC	PG7	PA6	PB0	P72	PB4	VSS	VCC	PC1	15
14	PE1	PE0	VSS	PE7	PG3	PA0	PA1	PA2	PA7	VCC	PB1	PB5	P73	P75	P74	14
13	P63	P64	PE4	VCC	PG2	PG4	PG6	PA3	VSS	P71	PB3	PB7	PC0	PC2	P76	13
12	P60	VSS	P62	PE5	PE6	P66	PG5	PA4	PA5	PB2	PB6	P77	PC3	PC4	P80	12
11	PD6	PG1	VCC	P61								P81	P82	PC6	VCC	11
10	P97	PD4	PG0	PD7								PC5	PC7	P83	VSS	10
9	VCC	P96	PD3	PD5								P50	P51	P52	P84	9
8	P94	PD1	PD2	VSS								P53	VCC_ USB	USB1_ DP	USB1_ DM	8
7	VSS	P92	PD0	P95								P54	P55	VSS_ USB	USB0_ DP	7
6	VCC	P91	P90	P93								P56	P57	VCC_ USB	USB0_ DM	6
5	P46	P47	P45	P44								P13	P12	P10	P11	5
4	P42	P41	P43	P00	VSS	BSCANP	PF4	P35	PF3	PF1	P25	P86	P15	P14	P85	4
3	VREFL0	P40	VREFH0	P03	PF5	PJ3	MD/ FINED	RES#	P34	PF2	PF0	P24	P22	P87	P16	3
2	AVCC0	P07	VREFH	P02	EMLE	VCL	XCOUT	VSS	VCC	P32	P30	P26	P23	P17	P20	2
1	AVSS0	P05	VREFL	P01	PJ5	VBATT	XCIN	XTAL	EXTAL	P33	P31	P27	VCC	VSS	P21	1
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	

Figure 1.4 Pin Assignment (176-Pin LFBGA)

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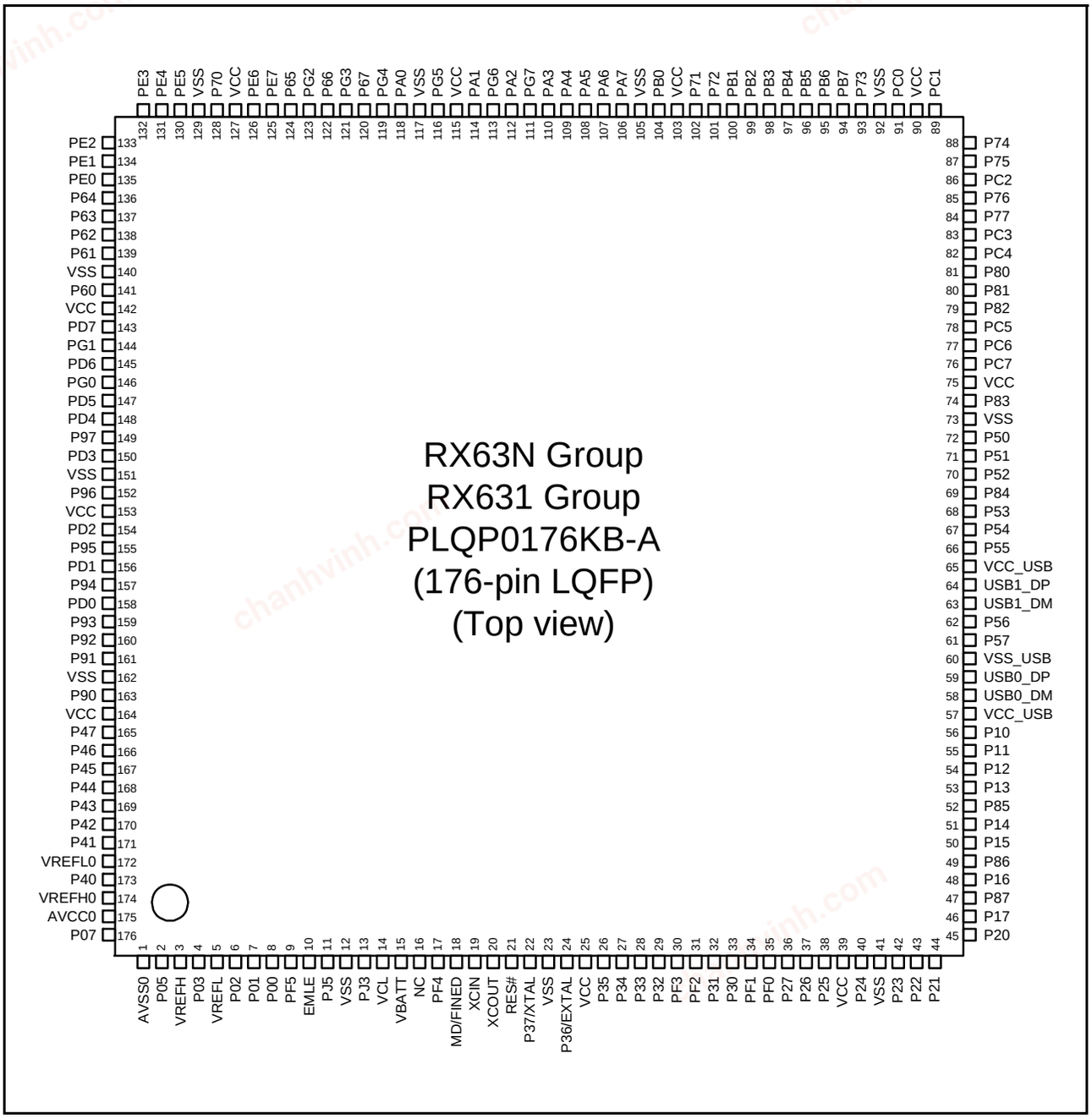
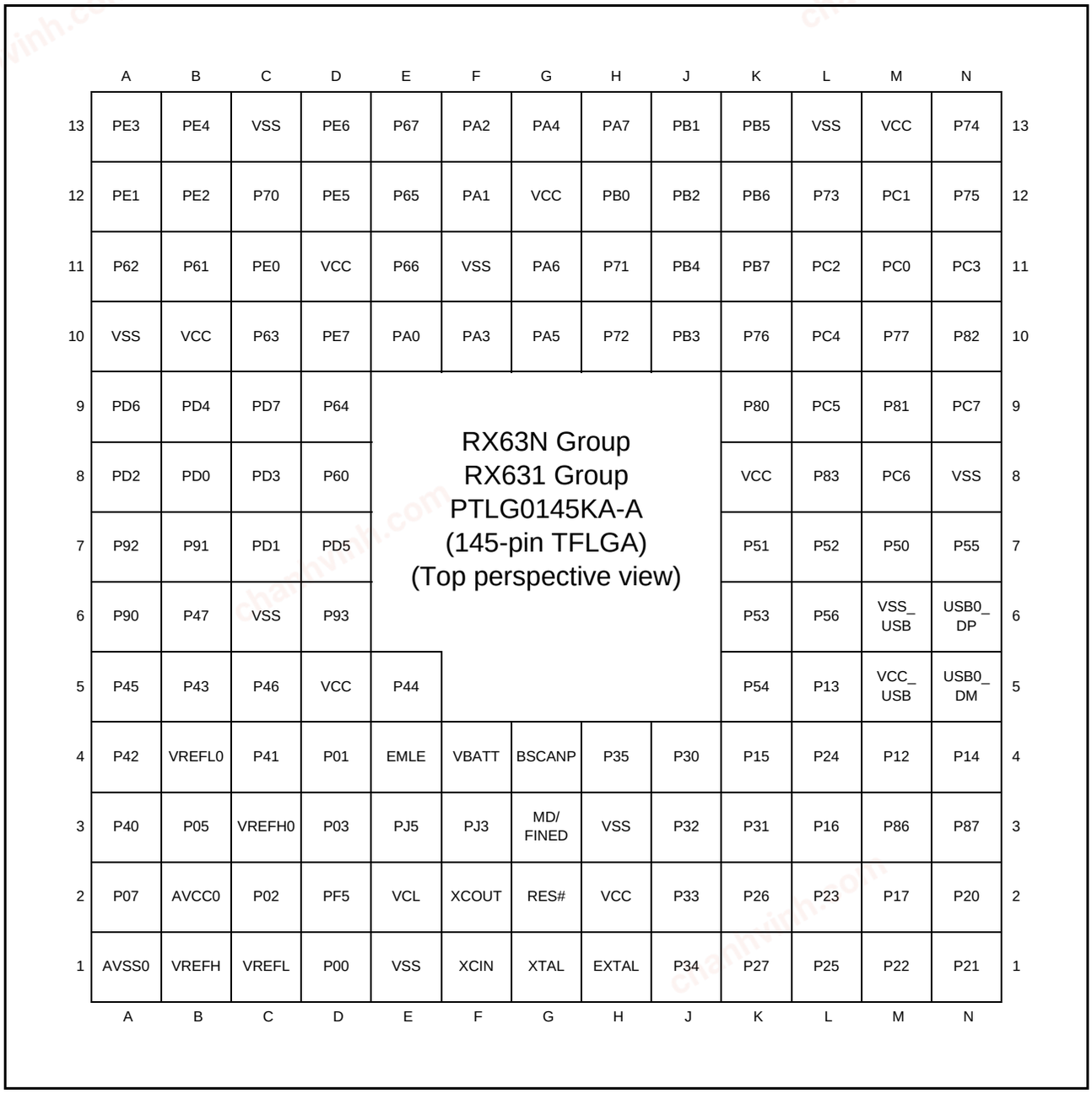


Figure 1.5 Pin Assignment (176-Pin LQFP)

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	A	B	C	D	E	F	G	H	J	K	L	M	N	
13	PE3	PE4	VSS	PE6	P67	PA2	PA4	PA7	PB1	PB5	VSS	VCC	P74	13
12	PE1	PE2	P70	PE5	P65	PA1	VCC	PB0	PB2	PB6	P73	PC1	P75	12
11	P62	P61	PE0	VCC	P66	VSS	PA6	P71	PB4	PB7	PC2	PC0	PC3	11
10	VSS	VCC	P63	PE7	PA0	PA3	PA5	P72	PB3	P76	PC4	P77	P82	10
9	PD6	PD4	PD7	P64						P80	PC5	P81	PC7	9
8	PD2	PD0	PD3	P60						VCC	P83	PC6	VSS	8
7	P92	P91	PD1	PD5						P51	P52	P50	P55	7
6	P90	P47	VSS	P93						P53	P56	VSS_ USB	USB0_ DP	6
5	P45	P43	P46	VCC	P44					P54	P13	VCC_ USB	USB0_ DM	5
4	P42	VREFL0	P41	P01	EMLE	VBATT	BSCANP	P35	P30	P15	P24	P12	P14	4
3	P40	P05	VREFH0	P03	PJ5	PJ3	MD/ FINED	VSS	P32	P31	P16	P86	P87	3
2	P07	AVCC0	P02	PF5	VCL	XCOUT	RES#	VCC	P33	P26	P23	P17	P20	2
1	AVSS0	VREFH	VREFL	P00	VSS	XCIN	XTAL	EXTAL	P34	P27	P25	P22	P21	1
	A	B	C	D	E	F	G	H	J	K	L	M	N	

Figure 1.6 Pin Assignment (145-Pin TFLGA)

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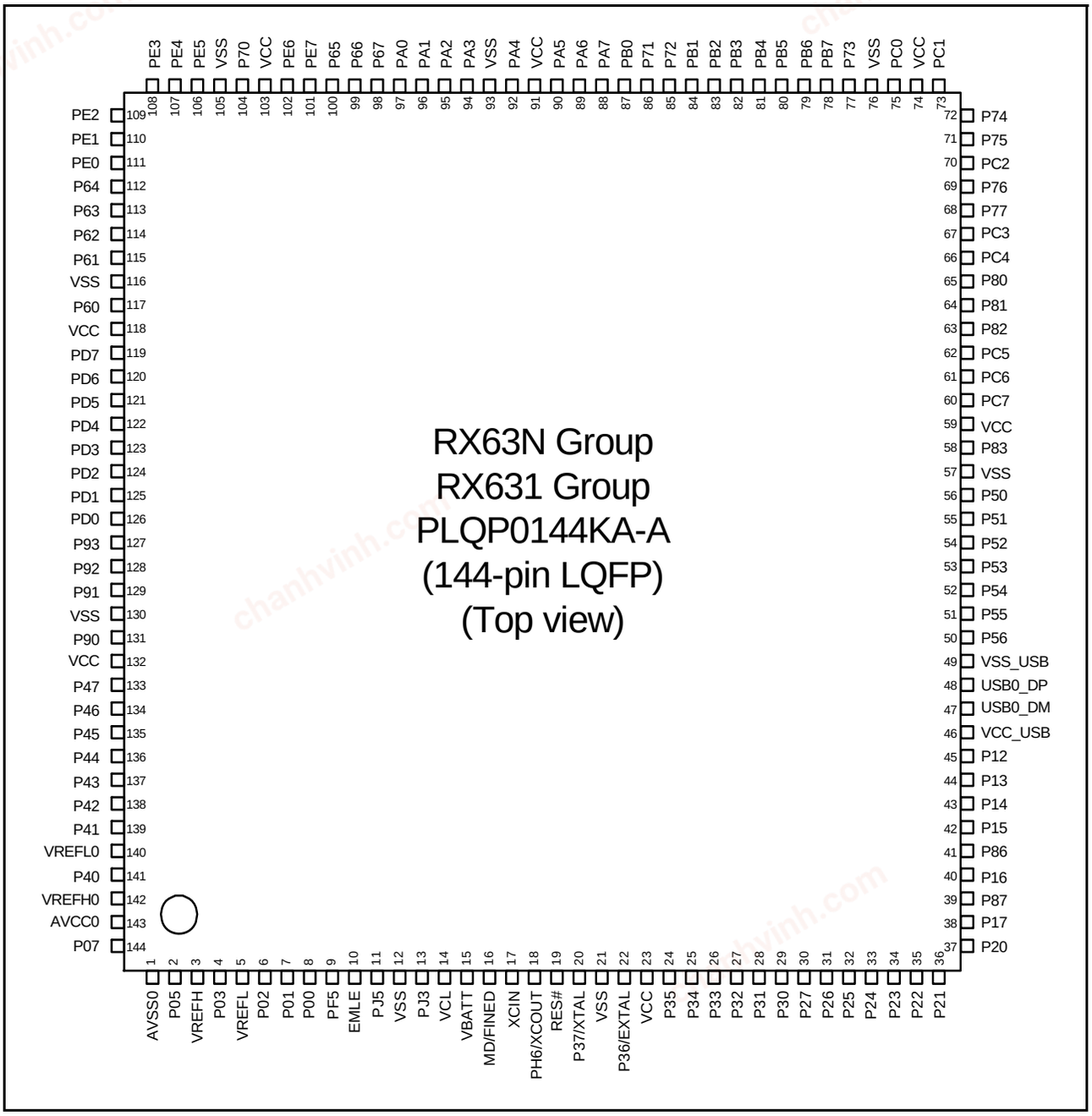


Figure 1.7 Pin Assignment (144-Pin LQFP)

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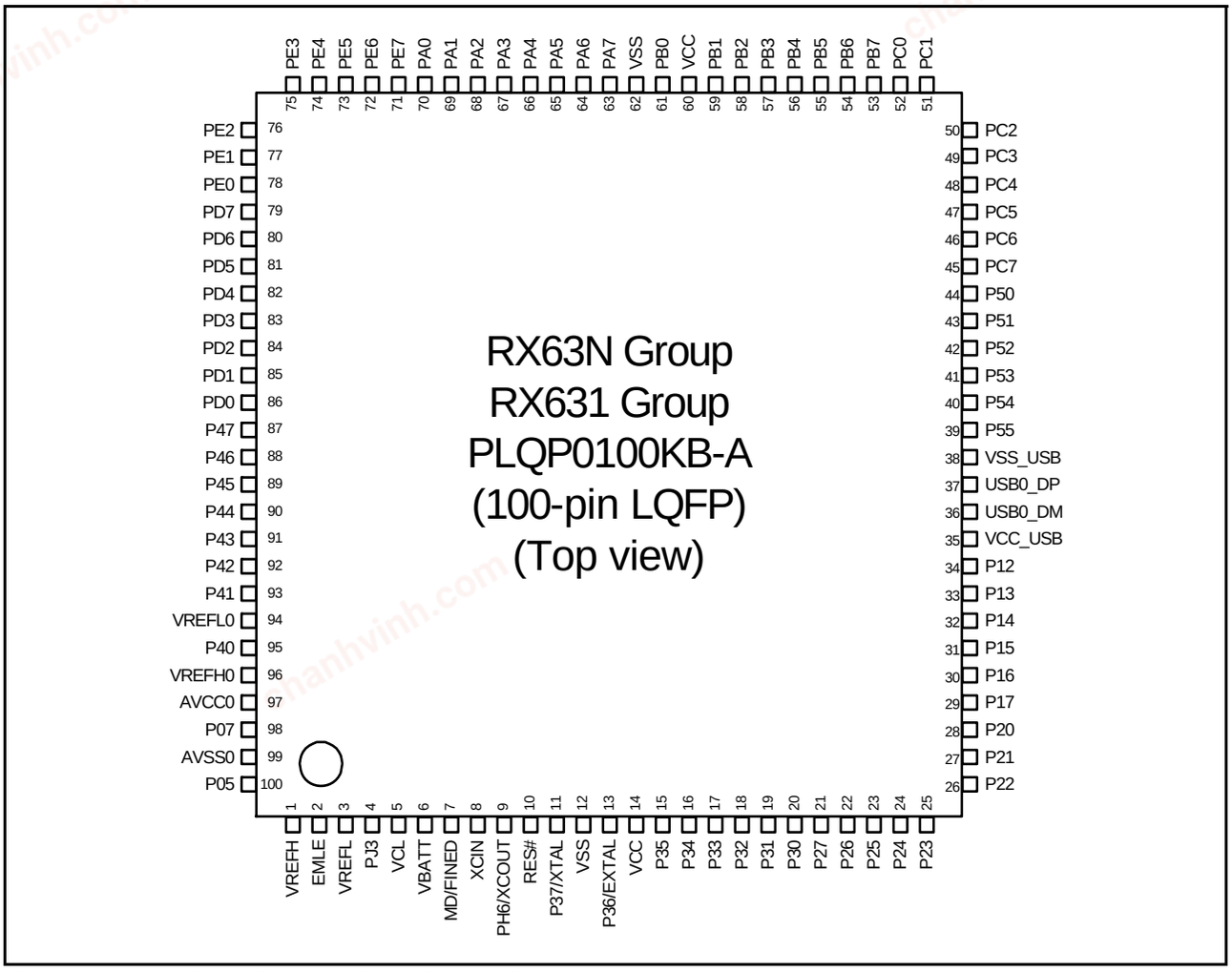


Figure 1.8 Pin Assignment (100-Pin LQFP)

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Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (1/5)

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
A1	AVSS0						
A2	AVCC0						
A3	VREFL0						
A4		P42				IRQ10-DS	AN002
A5		P46				IRQ14-DS	AN006
A6	VCC						
A7	VSS						
A8		P94	A20/D20				
A9	VCC						
A10		P97	A23/D23				
A11		PD6	D6[A6/D6]	MTIC5V/POE1#	SSLC2	IRQ6	AN6
A12		P60	CS0#				
A13		P63	CS3#/CAS#				
A14		PE1	D9[A9/D9]	MTIOC4C/TIOCD9/PO18	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12/SSLB2/RSPCKB		ANEX1
A15		PE2	D10[A10/D10]	MTIOC4A/TIOCA9/PO23	RXD12/SMISO12/ SSCL12/RXDX12/SSLB3/ MOSIB	IRQ7-DS	AN0
B1		P05				IRQ13	DA1
B2		P07				IRQ15	ADTRG0#
B3		P40				IRQ8-DS	AN000
B4		P41				IRQ9-DS	AN001
B5		P47				IRQ15-DS	AN007
B6		P91	A17/D17		SCK7		AN015
B7		P92	A18/D18		RXD7/SMISO7/SSCL7		AN016
B8		PD1	D1[A1/D1]	MTIOC4B/TIOCB7/ TCLKG	MOSIC/CTX0	IRQ1	AN009
B9		P96	A22/D22				
B10		PD4	D4[A4/D4]	POE3#	SSLC0	IRQ4	AN012
B11		PG1	D25				
B12	VSS						
B13		P64	CS4#/WE#				
B14		PE0	D8[A8/D8]	TIOCC9	SCK12/SSLB1		ANEX0
B15		PE3	D11[A11/D11]	MTIOC4B/TIOCB9/PO26/ POE8#	ET_ERXD3/CTS12#/ RTS12#/SS12#/MISOB		AN1
C1	VREFL						
C2	VREFH						
C3	VREFH0						
C4		P43				IRQ11-DS	AN003
C5		P45				IRQ13-DS	AN005
C6		P90	A16/D16		TXD7/SMOSI7/SSDA7		AN014
C7		PD0	D0[A0/D0]	TIOCA7		IRQ0	AN008
C8		PD2	D2[A2/D2]	MTIOC4D/TIOCA8	MISOC/CRX0	IRQ2	AN010
C9		PD3	D3[A3/D3]	TIOCB8/TCLKH/POE8#	RSPCKC	IRQ3	AN011
C10		PG0	D24				
C11	VCC						
C12		P62	CS2#/RAS#				
C13		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ TIOCA10/PO28	ET_ERXD2/SSLB0		AN2

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Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (2/5)

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
C14	VSS						
C15	SDCLK	P70					
D1		P01		TMCI0	RXD6/SMISO6/SSCL6	IRQ9	AN019
D2		P02		TMCI1	SCK6	IRQ10	AN020
D3		P03				IRQ11	DA0
D4		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
D5		P44				IRQ12-DS	AN004
D6		P93	A19/D19		CTS7#/RTS7#/SS7#		AN017
D7		P95	A21/D21				
D8	VSS						
D9		PD5	D5[A5/D5]	MTIC5W/POE2#	SSLC1	IRQ5	AN013
D10		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
D11		P61	CS1#/SDCS#				
D12		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ TIOCB10	ET_RX_CLK/REF50CK/ RSPCKB	IRQ5	AN3
D13	VCC						
D14		PE7	D15[A15/D15]	TIOCB11	MISOB	IRQ7	AN5
D15		P65	CS5#/CKE				
E1		PJ5					
E2	EMLE						
E3		PF5				IRQ4	
E4	VSS						
E5*1	NC						
E12		PE6	D14[A14/D14]	TIOCA11	MOSIB	IRQ6	AN4
E13	TRDATA0	PG2	D26				
E14	TRDATA1	PG3	D27				
E15		P67	CS7#/DQM1		CRX2*3	IRQ15	
F1	VBATT						
F2	VCL						
F3		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
F4	BSCANP						
F12		P66	CS6#/DQM0		CTX2*3		
F13	TRSYNC#	PG4	D28				
F14		PA0	A0/BC0#/DQM2	MTIOC4A/TIOCA0/PO16	ET_TX_EN/ RMII_TXD_EN/SSLA1		
F15	VSS						
G1	XCIN						
G2	XCOUT						
G3	MD/FINED						
G4	TRST#	PF4					
G12	TRCLK	PG5	D29				
G13	TRDATA2	PG6	D30				
G14		PA1	A1/DQM3	MTIOC0B/MTCLKC/ TIOCB0/PO17	ET_WOL/SCK5/SSLA2	IRQ11	
G15	VCC						
H1	XTAL	P37					
H2	VSS						

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Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (3/5)

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
H3	RES#						
H4		P35				NMI	
H12		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	ET_MDC/TXD5/SMOSI5/ SSDA5/SSLA0	IRQ5-DS	
H13		PA3	A3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	ET_MDIO/RXD5/SMISO5/ SSCL5	IRQ6-DS	
H14		PA2	A2	PO18	RXD5/SMISO5/SSCL5/ SSLA3		
H15	TRDATA3	PG7	D31				
J1	EXTAL	P36					
J2	VCC						
J3		P34		MTIOC0A/TMCI3/PO12/ POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
J4	TMS	PF3					
J12		PA5	A5	TIOCB1/PO21	ET_LINKSTA/RSPCKA		
J13	VSS						
J14		PA7	A7	TIOCB2/PO23	ET_WOL/MISOA		
J15		PA6	A6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	ET_EXOUT/CTS5#/ RTS5#/SS5#/MOSIA		
K1		P33		MTIOC0D/TIOCD0/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/SSCL0/ CRX0	IRQ3-DS	
K2		P32		MTIOC0C/TIOCC0/TMO3/ PO10/RTCOUT/RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/SSDA0/ CTX0/USB0_VBUSEN	IRQ2-DS	
K3	TDI	PF2			RXD1/SMISO1/SSCL1		
K4	TCK/FINEC	PF1			SCK1		
K12		PB2	A10	TIOCC3/TCLKC/PO26	ET_RX_CLK/REF50CK/ CTS4#/RTS4#/CTS6#/ RTS6#/SS4#/SS6#		
K13		P71	CS1#		ET_MDIO		
K14	VCC						
K15		PB0	A8	MTIC5W/TIOCA3/PO24	ET_ERXD1/RMII_RXD1/ RXD4/RXD6/SMISO4/ SMISO6/SSCL4/SSCL6/ RSPCKA	IRQ12	
L1		P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
L2		P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
L3	TDO	PF0			TXD1/SMOSI1/SSDA1		
L4		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD		ADTRG0#
L12		PB6	A14	MTIOC3D/TIOCA5/PO30	ET_ETXD1/RMII_TXD1/ RXD9/SMISO9/SSCL9		
L13		PB3	A11	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	ET_RX_ER/RMII_RX_ER/ SCK4/SCK6		
L14		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	ET_ERXD0/RMII_RXD0/ TXD4/TXD6/SMOSI4/ SMOSI6/SSDA4/SSDA6	IRQ4-DS	
L15		P72	CS2#		ET_MDC		
M1		P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
M2		P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3# SMOSI1/SS3#/SSDA1/ MOSIB		

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Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (4/5)

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
M3		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN		
M4		P86		TIOCA0			
M5		P13		MTIOC0B/TIOCA5/TMO3/ PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
M6		P56	WR2#/BC2#/ EDACK1	MTIOC3C/TIOCA1			
M7		P54	ALE/EDACK0	MTIOC4B/TMCI1	ET_LINKSTA/CTS2#/ RTS2#/SS2#/CTX1		
M8		P53*2	BCLK				
M9		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		
M10		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TIOCD6/TCLKF/TMRI2/ PO29	ET_ETXD2/SCK8/ RSPCKA		
M11		P81	EDACK0	MTIOC3D/PO27	ET_ETXD0/RMII_TXD0/ RXD10/SMISO10/SSCL10		
M12		P77	CS7#	PO23	ET_RX_ER/RMII_RX_ER/ TXD11/SMOSI11/SSDA11		
M13		PB7	A15	MTIOC3B/TIOCB5/PO31	ET_CRS/RMII_CRS_DV/ TXD9/SMOSI9/SSDA9		
M14		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	ET_ETXD0/RMII_TXD0/ SCK9		
M15		PB4	A12	TIOCA4/PO28	ET_TX_EN/ RMII_TXD_EN/CTS9#/ RTS9#/SS9#		
N1	VCC						
N2		P23	EDACK0	MTIOC3D/MTCLKD/ TIOCD3/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE		
N3		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD		
N4		P15		MTIOC0B/MTCLKB/ TIOCB2/TCLKB/TMCI2/ PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS/ USB1_DPUPE	IRQ5	
N5		P12		MTIC5U/TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
N6		P57	WAIT#/WR3#/ BC3#/EDREQ1				
N7		P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	ET_EXOUT/CRX1	IRQ10	
N8	VCC_USB						
N9		P51	WR1#/BC1#/ WAIT#		SCK2/SSLB2		
N10		PC7	A23/CS0#	MTIOC3A/MTCLKB/ TIOCB6/TMO2/PO31	ET_COL/TXD8/SMOSI8/ SSDA8/MISOA	IRQ14	
N11		P82	EDREQ1	MTIOC4A/PO28	ET_ETXD1/RMII_TXD1/ TXD10/SMOSI10/SSDA10		
N12		PC3	A19	MTIOC4D/TCLKB/PO24	ET_TX_ER/TXD5/ SMOSI5/SSDA5/IETXD		
N13		PC0	A16	MTIOC3C/TCLKC/PO17	ET_ERXD3/CTS5#/ RTS5#/SS5#/SSLA1/ SCL3	IRQ14	
N14		P73	CS3#	PO16	ET_WOL		
N15	VSS						
P1	VSS						

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Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (5/5)

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
P2		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/ IETXD/USB1_VBUS	IRQ7	ADTRG#
P3		P87		TIOCA2			
P4		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMRI2/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
P5		P10		MTIC5W/TMRI3		IRQ0	
P6	VCC_USB						
P7	VSS_USB						
P8					USB1_DP		
P9		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
P10		P83	EDACK1	MTIOC4C	ET_CRS/RMII_CRS_DV/ CTS10#/RTS10#/SS10#		
P11		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TIOCA6/TMCI2/PO30	ET_ETXD3/RXD8/ SMISO8/SSCL8/MOSIA	IRQ13	
P12		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TIOCC6/TCLKE/TMCI1/ PO25/POE0#	ET_TX_CLK/SCK5/ CTS8#/RTS8#/SS8#/ SSLA0		
P13		PC2	A18	MTIOC4B/TCLKA/PO21	ET_RX_DV/RXD5/ SMISO5/SSCL5/SSLA3/ IERXD		
P14		P75	CS5#	PO20	ET_ERXD0/RMII_RXD0/ SCK11		
P15	VCC						
R1		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ SCL1/USB0_EXICEN	IRQ9	
R2		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ SDA1/USB0_ID	IRQ8	
R3		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/SSCL3/ MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
R4		P85					
R5		P11		MTIC5V/TMCI3	SCK2	IRQ1	
R6					USB0_DM		
R7					USB0_DP		
R8					USB1_DM		
R9		P84					
R10	VSS						
R11	VCC						
R12		P80	EDREQ0	MTIOC3B/PO26	ET_TX_EN/ RMII_TXD_EN/SCK10		
R13		P76	CS6#	PO22	ET_RX_CLK/REF50CK/ RXD11/SMISO11/SSCL11		
R14		P74	CS4#	PO19	ET_ERXD1/RMII_RXD1/ CTS11#/RTS11#/SS11#		
R15		PC1	A17	MTIOC3A/TCLKD/PO18	ET_ERXD2/SCK5/SSLA2/ SDA3	IRQ12	

Note 1. 176-pin LFBGA does not have E5 pin
Note 2. The BCLK function is multiplexed with the I/O port function for pin P53, so the port function is not available if the external bus is enabled.
Note 3. Enabled only for the ROM capacity: 2 Mbytes/1.5 Mbytes

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Table 1.6 List of Pin and Pin Functions (176-Pin LQFP) (1/5)

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
1	AVSS0						
2		P05				IRQ13	DA1
3	VREFH						
4		P03				IRQ11	DA0
5	VREFL						
6		P02		TMCI1	SCK6	IRQ10	AN020
7		P01		TMCI0	RXD6/SMISO6/SSCL6	IRQ9	AN019
8		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
9		PF5				IRQ4	
10	EMLE						
11		PJ5					
12	VSS						
13		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
14	VCL						
15	VBATT						
16	NC						
17	TRST#	PF4					
18	MD/FINED						
19	XCIN						
20	XCOUT						
21	RES#						
22	XTAL	P37					
23	VSS						
24	EXTAL	P36					
25	VCC						
26		P35				NMI	
27		P34		MTIOC0A/TMCI3/PO12/ POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
28		P33		MTIOC0D/TIOCD0/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/SSCL0/ CRX0	IRQ3-DS	
29		P32		MTIOC0C/TIOCC0/TMO3/ PO10/RTCOUT/RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/SSDA0/ CTX0/USB0_VBUSEN	IRQ2-DS	
30	TMS	PF3					
31	TDI	PF2			RXD1/SMISO1/SSCL1		
32		P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
33		P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
34	TCK/FINEC	PF1			SCK1		
35	TDO	PF0			TXD1/SMOSI1/SSDA1		
36		P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
37		P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3# SMOSI1/SS3#/SSDA1/ MOSIB		
38		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD		ADTRG0#
39	VCC						
40		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN		

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Table 1.6 List of Pin and Pin Functions (176-Pin LQFP) (2/5)

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
41	VSS						
42		P23	EDACK0	MTIOC3D/MTCLKD/ TIOCD3/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE		
43		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD		
44		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ SCL1/USB0_EXICEN	IRQ9	
45		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ SDA1/USB0_ID	IRQ8	
46		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/ IETXD/USB1_VBUS	IRQ7	ADTRG#
47		P87		TIOCA2			
48		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/SSCL3/ MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
49		P86		TIOCA0			
50		P15		MTIOC0B/MTCLKB/ TIOCB2/TCLKB/TMCI2/ PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS/ USB1_DPUPE	IRQ5	
51		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMRI2/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
52		P85					
53		P13		MTIOC0B/TIOCA5/TMO3/ PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
54		P12		MTIC5U/TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
55		P11		MTIC5V/TMCI3	SCK2	IRQ1	
56		P10		MTIC5W/TMRI3		IRQ0	
57	VCC_USB						
58					USB0_DM		
59					USB0_DP		
60	VSS_USB						
61		P57	WAIT#/WR3#/ BC3#/EDREQ1				
62		P56	WR2#/BC2#/ EDACK1	MTIOC3C/TIOCA1			
63					USB1_DM		
64					USB1_DP		
65	VCC_USB						
66		P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	ET_EXOUT/CRX1	IRQ10	
67		P54	ALE/EDACK0	MTIOC4B/TMCI1	ET_LINKSTA/CTS2#/ RTS2#/SS2#/CTX1		
68		P53*1	BCLK				
69		P84					
70		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
71		P51	WR1#/BC1#/ WAIT#		SCK2/SSLB2		
72		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		

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Table 1.6 List of Pin and Pin Functions (176-Pin LQFP) (3/5)

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
73	VSS						
74		P83	EDACK1	MTIOC4C	ET_CRS/RMII_CRS_DV/ CTS10#/RTS10#/SS10#		
75	VCC						
76		PC7	A23/CS0#	MTIOC3A/MTCLKB/ TIOCB6/TMO2/PO31	ET_COL/TXD8/SMOSI8/ SSDA8/MISOA	IRQ14	
77		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TIOCA6/TMCI2/PO30	ET_ETXD3/RXD8/ SMISO8/SSCL8/MOSIA	IRQ13	
78		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TIOCD6/TCLKF/TMRI2/ PO29	ET_ETXD2/SCK8/ RSPCKA		
79		P82	EDREQ1	MTIOC4A/PO28	ET_ETXD1/RMII_TXD1/ TXD10/SMOSI10/SSDA10		
80		P81	EDACK0	MTIOC3D/PO27	ET_ETXD0/RMII_TXD0/ RXD10/SMISO10/SSCL10		
81		P80	EDREQ0	MTIOC3B/PO26	ET_TX_EN/ RMII_TXD_EN/SCK10		
82		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TIOCC6/TCLKE/TMCI1/ PO25/POE0#	ET_TX_CLK/SCK5/ CTS8#/RTS8#/SS8#/ SSLA0		
83		PC3	A19	MTIOC4D/TCLKB/PO24	ET_TX_ER/TXD5/ SMOSI5/SSDA5/IETXD		
84		P77	CS7#	PO23	ET_RX_ER/RMII_RX_ER/ TXD11/SMOSI11/SSDA11		
85		P76	CS6#	PO22	ET_RX_CLK/REF50CK/ RXD11/SMISO11/SSCL11		
86		PC2	A18	MTIOC4B/TCLKA/PO21	ET_RX_DV/RXD5/ SMISO5/SSCL5/SSLA3/ IERXD		
87		P75	CS5#	PO20	ET_ERXD0/RMII_RXD0/ SCK11		
88		P74	CS4#	PO19	ET_ERXD1/RMII_RXD1/ CTS11#/RTS11#/SS11#		
89		PC1	A17	MTIOC3A/TCLKD/PO18	ET_ERXD2/SCK5/SSLA2/ SDA3	IRQ12	
90	VCC						
91		PC0	A16	MTIOC3C/TCLKC/PO17	ET_ERXD3/CTS5#/ RTS5#/SS5#/SSLA1/ SCL3	IRQ14	
92	VSS						
93		P73	CS3#	PO16	ET_WOL		
94		PB7	A15	MTIOC3B/TIOCB5/PO31	ET_CRS/RMII_CRS_DV/ TXD9/SMOSI9/SSDA9		
95		PB6	A14	MTIOC3D/TIOCA5/PO30	ET_ETXD1/RMII_TXD1/ RXD9/SMISO9/SSCL9		
96		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	ET_ETXD0/RMII_TXD0/ SCK9		
97		PB4	A12	TIOCA4/PO28	ET_TX_EN/ RMII_TXD_EN/CTS9#/ RTS9#/SS9#		
98		PB3	A11	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	ET_RX_ER/RMII_RX_ER/ SCK4/SCK6		
99		PB2	A10	TIOCC3/TCLKC/PO26	ET_RX_CLK/REF50CK/ CTS4#/RTS4#/CTS6#/ RTS6#/SS4#/SS6#		
100		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	ET_ERXD0/RMII_RXD0/ TXD4/TXD6/SMOSI4/ SMOSI6/SSDA4/SSDA6	IRQ4-DS	

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Table 1.6 List of Pin and Pin Functions (176-Pin LQFP) (4/5)

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
101		P72	CS2#		ET_MDC		
102		P71	CS1#		ET_MDIO		
103	VCC						
104		PB0	A8	MTIC5W/TIOCA3/PO24	ET_ERXD1/RMII_RXD1/ RXD4/RXD6/SMISO4/ SMISO6/SSCL4/SSCL6/ RSPCKA	IRQ12	
105	VSS						
106		PA7	A7	TIOCB2/PO23	ET_WOL/MISOA		
107		PA6	A6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	ET_EXOUT/CTS5#/ RTS5#/SS5#/MOSIA		
108		PA5	A5	TIOCB1/PO21	ET_LINKSTA/RSPCKA		
109		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	ET_MDC/TXD5/SMOSI5/ SSDA5/SSLA0	IRQ5-DS	
110		PA3	A3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	ET_MDIO/RXD5/SMISO5/ SSCL5	IRQ6-DS	
111	TRDATA3	PG7	D31				
112		PA2	A2	PO18	RXD5/SMISO5/SSCL5/ SSLA3		
113	TRDATA2	PG6	D30				
114		PA1	A1/DQM3	MTIOC0B/MTCLKC/ TIOCB0/PO17	ET_WOL/SCK5/SSLA2	IRQ11	
115	VCC						
116	TRCLK	PG5	D29				
117	VSS						
118		PA0	A0/BC0#/DQM2	MTIOC4A/TIOCA0/PO16	ET_TX_EN/ RMII_TXD_EN/SSLA1		
119	TRSYNC#	PG4	D28				
120		P67	CS7#/DQM1		CRX2*2	IRQ15	
121	TRDATA1	PG3	D27				
122		P66	CS6#/DQM0		CTX2*2		
123	TRDATA0	PG2	D26				
124		P65	CS5#/CKE				
125		PE7	D15[A15/D15]	TIOCB11	MISOB	IRQ7	AN5
126		PE6	D14[A14/D14]	TIOCA11	MOSIB	IRQ6	AN4
127	VCC						
128	SDCLK	P70					
129	VSS						
130		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ TIOCB10	ET_RX_CLK/REF50CK/ RSPCKB	IRQ5	AN3
131		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ TIOCA10/PO28	ET_ERXD2/SSLB0		AN2
132		PE3	D11[A11/D11]	MTIOC4B/TIOCB9/PO26/ POE8#	ET_ERXD3/CTS12#/ RTS12#/SS12#/MISOB		AN1
133		PE2	D10[A10/D10]	MTIOC4A/TIOCA9/PO23	RXD12/SMISO12/ SSCL12/RXDX12/SSLB3/ MOSIB	IRQ7-DS	AN0
134		PE1	D9[A9/D9]	MTIOC4C/TIOCD9/PO18	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12/SSLB2/RSPCKB		ANEX1
135		PE0	D8[A8/D8]	TIOCC9	SCK12/SSLB1		ANEX0
136		P64	CS4#/WE#				
137		P63	CS3#/CAS#				

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Table 1.6 List of Pin and Pin Functions (176-Pin LQFP) (5/5)

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD, AD, DA
138		P62	CS2#/RAS#				
139		P61	CS1#/SDCS#				
140	VSS						
141		P60	CS0#				
142	VCC						
143		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
144		PG1	D25				
145		PD6	D6[A6/D6]	MTIC5V/POE1#	SSLC2	IRQ6	AN6
146		PG0	D24				
147		PD5	D5[A5/D5]	MTIC5W/POE2#	SSLC1	IRQ5	AN013
148		PD4	D4[A4/D4]	POE3#	SSLC0	IRQ4	AN012
149		P97	A23/D23				
150		PD3	D3[A3/D3]	TIOCB8/TCLKH/POE8#	RSPCKC	IRQ3	AN011
151	VSS						
152		P96	A22/D22				
153	VCC						
154		PD2	D2[A2/D2]	MTIOC4D/TIOCA8	MISOC/CRX0	IRQ2	AN010
155		P95	A21/D21				
156		PD1	D1[A1/D1]	MTIOC4B/TIOCB7/ TCLKG	MOSIC/CTX0	IRQ1	AN009
157		P94	A20/D20				
158		PD0	D0[A0/D0]	TIOCA7		IRQ0	AN008
159		P93	A19/D19		CTS7#/RTS7#/SS7#		AN017
160		P92	A18/D18		RXD7/SMISO7/SSCL7		AN016
161		P91	A17/D17		SCK7		AN015
162	VSS						
163		P90	A16/D16		TXD7/SMOSI7/SSDA7		AN014
164	VCC						
165		P47				IRQ15-DS	AN007
166		P46				IRQ14-DS	AN006
167		P45				IRQ13-DS	AN005
168		P44				IRQ12-DS	AN004
169		P43				IRQ11-DS	AN003
170		P42				IRQ10-DS	AN002
171		P41				IRQ9-DS	AN001
172	VREFL0						
173		P40				IRQ8-DS	AN000
174	VREFH0						
175	AVCC0						
176		P07				IRQ15	ADTRG0#

Note 1. The BCLK function is multiplexed with the I/O port function for pin P53, so the port function is not available if the external bus is enabled.

Note 2. Enabled only for the ROM capacity: 2 Mbytes/1.5 Mbytes

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Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA) (1/5)

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
A1	AVSS0						
A2		P07				IRQ15	ADTRG0#
A3		P40				IRQ8-DS	AN000
A4		P42				IRQ10-DS	AN002
A5		P45				IRQ13-DS	AN005
A6		P90	A16		TXD7/SMOSI7/SSDA7		AN014
A7		P92	A18		RXD7/SMISO7/SSCL7		AN016
A8		PD2	D2[A2/D2]	MTIOC4D/TIOCA8	MISOC/CRX0	IRQ2	AN010
A9		PD6	D6[A6/D6]	MTIC5V/POE1#	SSLC2	IRQ6	AN6
A10	VSS						
A11		P62	CS2#/RAS#				
A12		PE1	D9[A9/D9]	MTIOC4C/TIOCD9/ PO18	TXD12/SMOSI12/SSDA12/ TXDX12/SIOX12/SSLB2/ RSPCKB		ANEX1
A13		PE3	D11[A11/D11]	MTIOC4B/TIOCB9/ PO26/POE8#	CTS12#/RTS12#/SS12#/ MISOB/ET_ERXD3		AN1
B1	VREFH						
B2	AVCC0						
B3		P05				IRQ13	DA1
B4	VREFL0						
B5		P43				IRQ11-DS	AN003
B6		P47				IRQ15-DS	AN007
B7		P91	A17		SCK7		AN015
B8		PD0	D0[A0/D0]	TIOCA7		IRQ0	AN008
B9		PD4	D4[A4/D4]	POE3#	SSLC0	IRQ4	AN012
B10	VCC						
B11		P61	CS1#/SDCS#				
B12		PE2	D10[A10/D10]	MTIOC4A/TIOCA9/ PO23	RXD12/SMISO12/SSCL12/ RXDX12/SSLB3/MOSIB	IRQ7-DS	AN0
B13		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ TIOCA10/PO28	SSLB0/ET_ERXD2		AN2
C1	VREFL						
C2		P02		TMCI1	SCK6	IRQ10	AN020
C3	VREFH0						
C4		P41				IRQ9-DS	AN001
C5		P46				IRQ14-DS	AN006
C6	VSS						
C7		PD1	D1[A1/D1]	MTIOC4B/TIOCB7/ TCLKG	MOSIC/CTX0	IRQ1	AN009
C8		PD3	D3[A3/D3]	TIOCB8/TCLKH/POE8#	RSPCKC	IRQ3	AN011
C9		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
C10		P63	CS3#/CAS#				
C11		PE0	D8[A8/D8]	TIOCC9	SCK12/SSLB1		ANEX0
C12	SDCLK	P70					
C13	VSS						
D1		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
D2		PF5				IRQ4	
D3		P03				IRQ11	DA0
D4		P01		TMCI0	RXD6/SMISO6/SSCL6	IRQ9	AN019

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Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA) (2/5)

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
D5	VCC						
D6		P93	A19		CTS7#/RTS7#/SS7#		AN017
D7		PD5	D5[A5/D5]	MTIC5W/POE2#	SSLC1	IRQ5	AN013
D8		P60	CS0#				
D9		P64	CS4#/WE#				
D10		PE7	D15[A15/D15]	TIOCB11	MISOB	IRQ7	AN5
D11	VCC						
D12		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ TIOCB10	RSPCKB/ET_RX_CLK/ REF50CK	IRQ5	AN3
D13		PE6	D14[A14/D14]	TIOCA11	MOSIB	IRQ6	AN4
E1	VSS						
E2	VCL						
E3		PJ5					
E4	EMLE						
E5		P44				IRQ12-DS	AN004
E10		PA0	A0/BC0#	MTIOC4A/TIOCA0/ PO16	SSLA1/ET_TX_EN/ RMII_TXD_EN		
E11		P66	CS6#/DQM0		CTX2*2		
E12		P65	CS5#/CKE				
E13		P67	CS7#/DQM1		CRX2*2	IRQ15	
F1	XCIN						
F2	XCOUT						
F3		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
F4	VBATT						
F10		PA3	A3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	RXD5/SMISO5/SSCL5/ ET_MDIO	IRQ6-DS	
F11	VSS						
F12		PA1	A1	MTIOC0B/MTCLKC/ TIOCB0/PO17	SCK5/SSLA2/ET_WOL	IRQ11	
F13		PA2	A2	PO18	RXD5/SMISO5/SSCL5/ SSLA3		
G1	XTAL	P37					
G2	RES#						
G3	MD/FINED						
G4	BSCANP						
G10		PA5	A5	TIOCB1/PO21	RSPCKA/ET_LINKSTA		
G11		PA6	A6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	CTS5#/RTS5#/SS5# MOSIA/ET_EXOUT		
G12	VCC						
G13		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/SSDA5/ SSLA0/ET_MDC	IRQ5-DS	
H1	EXTAL	P36					
H2	VCC						
H3	VSS						
H4		P35				NMI	
H10		P72	CS2#		ET_MDC		
H11		P71	CS1#		ET_MDIO		

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Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA) (3/5)

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
H12		PB0	A8	MTIC5W/TIOCA3/PO24	RXD4/RXD6/SMISO4/ SMISO6/SSCL4/SSCL6/ RSPCKA/T_ERXD1/ RMII_RXD1	IRQ12	
H13		PA7	A7	TIOCB2/PO23	MISOA/ET_WOL		
J1	TRST#	P34		MTIOC0A/TMCI3/PO12/ POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
J2		P33		MTIOC0D/TIOCD0/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/SSCL0/ CRX0	IRQ3-DS	
J3		P32		MTIOC0C/TIOCC0/ TMO3/PO10/RTCOUT/ RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/SSDA0/ CTX0/USB0_VBUSEN	IRQ2-DS	
J4	TDI	P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
J10		PB3	A11	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	SCK4/SCK6/ET_RX_ER/ RMII_RX_ER		
J11		PB4	A12	TIOCA4/PO28	CTS9#/RTS9#/SS9#/ ET_TX_EN/RMII_TXD_EN		
J12		PB2	A10	TIOCC3/TCLKC/PO26	CTS4#/RTS4#/CTS6#/ RTS6#/SS4#/SS6#/ ET_RX_CLK/REF50CK		
J13		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	TXD4/TXD6/SMOSI4/ SMOSI6/SSDA4/SSDA6/ ET_ERXD0/RMII_RXD0	IRQ4-DS	
K1	TCK/FINEC	P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
K2	TDO	P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1/ MOSIB		
K3	TMS	P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
K4		P15		MTIOC0B/MTCLKB/ TIOCB2/TCLKB/TMCI2/ PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS	IRQ5	
K5	TRDATA2	P54	ALE/EDACK0	MTIOC4B/TMCI1	CTS2#/RTS2#/SS2#/ CTX1/ET_LINKSTA		
K6		P53*1	BCLK				
K7		P51	WR1#/BC1#/ WAIT#		SCK2/SSLB2		
K8	VCC						
K9	TRDATA0	P80	EDREQ0	MTIOC3B/PO26	SCK10/ET_TX_EN/ RMII_TXD_EN		
K10		P76	CS6#	PO22	RXD11/SMISO11/SSCL11/ ET_RX_CLK/REF50CK		
K11		PB7	A15	MTIOC3B/TIOCB5/ PO31	TXD9/SMOSI9/SSDA9/ ET_CRS/RMII_CRS_DV		
K12		PB6	A14	MTIOC3D/TIOCA5/ PO30	RXD9/SMISO9/SSCL9/ ET_ETXD1/RMII_TXD1		
K13		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	SCK9/ET_ETXD0/ RMII_TXD0		
L1		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD		ADTRG0#
L2		P23	EDACK0	MTIOC3D/MTCLKD/ TIOCD3/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE		

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Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA) (4/5)

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
L3		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/SSCL3/ MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
L4		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN		
L5		P13		MTIOC0B/TIOCA5/ TMO3/PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
L6		P56	EDACK1	MTIOC3C/TIOCA1			
L7		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
L8	TRCLK	P83	EDACK1	MTIOC4C	CTS10#/RTS10#/SS10#/ ET_CRS/RMII_CRS_DV		
L9		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TIOCD6/TCLKF/TMRI2/ PO29	SCK8/RSPCKA/ ET_ETXD2		
L10		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TIOCC6/TCLKE/TMCI1/ PO25/POE0#	SCK5/CTS8#/RTS8#/ SS8#/SSLA0/ET_TX_CLK		
L11		PC2	A18	MTIOC4B/TCLKA/PO21	RXD5/SMISO5/SSCL5/ SSLA3/IERXD/ET_RX_DV		
L12		P73	CS3#	PO16	ET_WOL		
L13	VSS						
M1		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD		
M2		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/ IETXD	IRQ7	ADTRG#
M3		P86		TIOCA0			
M4		P12		TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
M5	VCC_USB						
M6	VSS_USB						
M7		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		
M8		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TIOCA6/TMCI2/PO30	RXD8/SMISO8/SSCL8/ MOSIA/ET_ETXD3	IRQ13	
M9	TRDATA1	P81	EDACK0	MTIOC3D/PO27	RXD10/SMISO10/SSCL10/ ET_ETXD0/RMII_TXD0		
M10		P77	CS7#	PO23	TXD11/SMOSI11/SSDA11/ ET_RX_ER/RMII_RX_ER		
M11		PC0	A16	MTIOC3C/TCLKC/PO17	CTS5#/RTS5#/SS5#/ SSLA1/SCL3/ET_ERXD3	IRQ14	
M12		PC1	A17	MTIOC3A/TCLKD/PO18	SCK5/SSLA2/SDA3/ ET_ERXD2	IRQ12	
M13	VCC						
N1		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ SCL1/USB0_EXICEN	IRQ9	
N2		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ SDA1/USB0_ID	IRQ8	
N3		P87		TIOCA2			
N4		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMRI2/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
N5					USB0_DM		
N6					USB0_DP		

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Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA) (5/5)

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
N7	TRDATA3	P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	CRX1/ET_EXOUT	IRQ10	
N8	VSS						
N9		PC7	A23/CS0#	MTIOC3A/MTCLKB/ TIOCB6/TMO2/PO31	TXD8/SMOSI8/SSDA8/ MISOA/ET_COL	IRQ14	
N10	TRSYNC#	P82	EDREQ1	MTIOC4A/PO28	TXD10/SMOSI10/SSDA10/ ET_ETXD1/RMII_TXD1		
N11		PC3	A19	MTIOC4D/TCLKB/PO24	TXD5/SMOSI5/SSDA5/ IETXD/ET_TX_ER		
N12		P75	CS5#	PO20	SCK11/ET_ERXD0/ RMII_RXD0		
N13		P74	CS4#	PO19	CTS11#/RTS11#/SS11#/ ET_ERXD1/RMII_RXD1		

Note 1. The BCLK function is multiplexed with the I/O port function for pin P53, so the port function is not available if the external bus is enabled.

Note 2. Enabled only for the ROM capacity: 2 Mbytes/1.5 Mbytes

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Table 1.8 List of Pins and Pin Functions (144-Pin LQFP) (1/5)

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
1	AVSS0						
2		P05				IRQ13	DA1
3	VREFH						
4		P03				IRQ11	DA0
5	VREFL						
6		P02		TMCI1	SCK6	IRQ10	AN020
7		P01		TMCI0	RXD6/SMISO6/SSCL6	IRQ9	AN019
8		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
9		PF5				IRQ4	
10	EMLE						
11		PJ5					
12	VSS						
13		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
14	VCL						
15	VBATT						
16	MD/FINED						
17	XCIN						
18	XCOUT						
19	RES#						
20	XTAL	P37					
21	VSS						
22	EXTAL	P36					
23	VCC						
24		P35				NMI	
25	TRST#	P34		MTIOC0A/TMCI3/ PO12/POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
26		P33		MTIOC0D/TIOCD0/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/ SSCL0/CRX0	IRQ3-DS	
27		P32		MTIOC0C/TIOCC0/ TMO3/PO10/RTCOUT/ RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/ SSDA0/CTX0/ USB0_VBUSEN	IRQ2-DS	
28	TMS	P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
29	TDI	P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
30	TCK/FINEC	P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
31	TDO	P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1/ MOSIB		
32		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD		ADTRG0#
33		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN		
34		P23	EDACK0	MTIOC3D/MTCLKD/ TIOCD3/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE		
35		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD		
36		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ SCL1/USB0_EXICEN	IRQ9	

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Table 1.8 List of Pins and Pin Functions (144-Pin LQFP) (2/5)

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
37		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ SDA1/USB0_ID	IRQ8	
38		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/IETXD	IRQ7	ADTRG#
39		P87		TIOCA2			
40		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/ SSCL3/MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
41		P86		TIOCA0			
42		P15		MTIOC0B/MTCLKB/ TIOCB2/TCLKB/ TMCI2/PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS	IRQ5	
43		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/ TMRI2/PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
44		P13		MTIOC0B/TIOCA5/ TMO3/PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
45		P12		TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
46	VCC_USB						
47					USB0_DM		
48					USB0_DP		
49	VSS_USB						
50		P56	EDACK1	MTIOC3C/TIOCA1			
51	TRDATA3	P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	CRX1/ET_EXOUT	IRQ10	
52	TRDATA2	P54	ALE/EDACK0	MTIOC4B/TMCI1	CTS2#/RTS2#/SS2#/ CTX1/ET_LINKSTA		
53		P53*1	BCLK				
54		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
55		P51	WR1#/BC1#/ WAIT#		SCK2/SSLB2		
56		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		
57	VSS						
58	TRCLK	P83	EDACK1	MTIOC4C	CTS10#/RTS10#/ SS10#/ET_CRS/ RMII_CRS_DV		
59	VCC						
60		PC7	A23/CS0#	MTIOC3A/MTCLKB/ TIOCB6/TMO2/PO31	TXD8/SMOSI8/SSDA8/ MISOA/ET_COL	IRQ14	
61		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TIOCA6/TMCI2/PO30	RXD8/SMISO8/SSCL8/ MOSIA/ET_ETXD3	IRQ13	
62		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TIOCD6/TCLKF/ TMRI2/PO29	SCK8/RSPCKA/ ET_ETXD2		
63	TRSYNC#	P82	EDREQ1	MTIOC4A/PO28	TXD10/SMOSI10/ SSDA10/ET_ETXD1/ RMII_TXD1		
64	TRDATA1	P81	EDACK0	MTIOC3D/PO27	RXD10/SMISO10/ SSCL10/ET_ETXD0/ RMII_TXD0		

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Table 1.8 List of Pins and Pin Functions (144-Pin LQFP) (3/5)

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
65	TRDATA0	P80	EDREQ0	MTIOC3B/PO26	SCK10/ET_TX_EN/ RMII_TXD_EN		
66		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TIOCC6/TCLKE/ TMCI1/PO25/POE0#	SCK5/CTS8#/RTS8#/ SS8#/SSLA0/ ET_TX_CLK		
67		PC3	A19	MTIOC4D/TCLKB/ PO24	TXD5/SMOSI5/SSDA5/ IETXD/ET_TX_ER		
68		P77	CS7#	PO23	TXD11/SMOSI11/ SSDA11/ET_RX_ER/ RMII_RX_ER		
69		P76	CS6#	PO22	RXD11/SMISO11/ SSCL11/ET_RX_CLK/ REF50CK		
70		PC2	A18	MTIOC4B/TCLKA/ PO21	RXD5/SMISO5/SSCL5/ SSLA3/IERXD/ ET_RX_DV		
71		P75	CS5#	PO20	SCK11/ET_ERXD0/ RMII_RXD0		
72		P74	CS4#	PO19	CTS11#/RTS11#/ SS11#/ET_ERXD1/ RMII_RXD1		
73		PC1	A17	MTIOC3A/TCLKD/ PO18	SCK5/SSLA2/SDA3/ ET_ERXD2	IRQ12	
74	VCC						
75		PC0	A16	MTIOC3C/TCLKC/ PO17	CTS5#/RTS5#/SS5#/ SSLA1/SCL3/ ET_ERXD3	IRQ14	
76	VSS						
77		P73	CS3#	PO16	ET_WOL		
78		PB7	A15	MTIOC3B/TIOCB5/ PO31	TXD9/SMOSI9/SSDA9/ ET_CRS/ RMII_CRS_DV		
79		PB6	A14	MTIOC3D/TIOCA5/ PO30	RXD9/SMISO9/SSCL9/ ET_ETXD1/RMII_TXD1		
80		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	SCK9/ET_ETXD0/ RMII_TXD0		
81		PB4	A12	TIOCA4/PO28	CTS9#/RTS9#/SS9#/ ET_TX_EN/ RMII_TXD_EN		
82		PB3	A11	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	SCK4/SCK6/ ET_RX_ER/ RMII_RX_ER		
83		PB2	A10	TIOCC3/TCLKC/PO26	CTS4#/RTS4#/CTS6#/ RTS6#/SS4#/SS6#/ ET_RX_CLK/REF50CK		
84		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	TXD4/TXD6/SMOSI4/ SMOSI6/SSDA4/ SSDA6/ET_ERXD0/ RMII_RXD0	IRQ4-DS	
85		P72	CS2#		ET_MDC		
86		P71	CS1#		ET_MDIO		
87		PB0	A8	MTIC5W/TIOCA3/ PO24	RXD4/RXD6/SMISO4/ SMISO6/SSCL4/ SSCL6/RSPCKA/ T_ERXD1/RMII_RXD1	IRQ12	
88		PA7	A7	TIOCB2/PO23	MISOA/ET_WOL		
89		PA6	A6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	CTS5#/RTS5#/SS5# MOSIA/ET_EXOUT		
90		PA5	A5	TIOCB1/PO21	RSPCKA/ET_LINKSTA		

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Table 1.8 List of Pins and Pin Functions (144-Pin LQFP) (4/5)

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
91	VCC						
92		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/SSDA5/ SSLA0/ET_MDC	IRQ5-DS	
93	VSS						
94		PA3	A3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	RXD5/SMISO5/SSCL5/ ET_MDIO	IRQ6-DS	
95		PA2	A2	PO18	RXD5/SMISO5/SSCL5/ SSLA3		
96		PA1	A1	MTIOC0B/MTCLKC/ TIOCB0/PO17	SCK5/SSLA2/ET_WOL	IRQ11	
97		PA0	A0/BC0#	MTIOC4A/TIOCA0/ PO16	SSLA1/ET_TX_EN/ RMII_TXD_EN		
98		P67	CS7#/DQM1		CRX2*2	IRQ15	
99		P66	CS6#/DQM0		CTX2*2		
100		P65	CS5#/CKE				
101		PE7	D15[A15/D15]	TIOCB11	MISOB	IRQ7	AN5
102		PE6	D14[A14/D14]	TIOCA11	MOSIB	IRQ6	AN4
103	VCC						
104	SDCLK	P70					
105	VSS						
106		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ TIOCB10	RSPCKB/ET_RX_CLK/ REF50CK	IRQ5	AN3
107		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ TIOCA10/PO28	SSLB0/ET_ERXD2		AN2
108		PE3	D11[A11/D11]	MTIOC4B/TIOCB9/ PO26/POE8#	CTS12#/RTS12#/ SS12#/MISOB/ ET_ERXD3		AN1
109		PE2	D10[A10/D10]	MTIOC4A/TIOCA9/ PO23	RXD12/SMISO12/ SSCL12/RXDX12/ SSLB3/MOSIB	IRQ7-DS	AN0
110		PE1	D9[A9/D9]	MTIOC4C/TIOCD9/ PO18	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12/SSLB2/ RSPCKB		ANEX1
111		PE0	D8[A8/D8]	TIOCC9	SCK12/SSLB1		ANEX0
112		P64	CS4#/WE#				
113		P63	CS3#/CAS#				
114		P62	CS2#/RAS#				
115		P61	CS1#/SDCS#				
116	VSS						
117		P60	CS0#				
118	VCC						
119		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
120		PD6	D6[A6/D6]	MTIC5V/POE1#	SSLC2	IRQ6	AN6
121		PD5	D5[A5/D5]	MTIC5W/POE2#	SSLC1	IRQ5	AN013
122		PD4	D4[A4/D4]	POE3#	SSLC0	IRQ4	AN012
123		PD3	D3[A3/D3]	TIOCB8/TCLKH/ POE8#	RSPCKC	IRQ3	AN011
124		PD2	D2[A2/D2]	MTIOC4D/TIOCA8	MISOC/CRX0	IRQ2	AN010
125		PD1	D1[A1/D1]	MTIOC4B/TIOCB7/ TCLKG	MOSIC/CTX0	IRQ1	AN009
126		PD0	D0[A0/D0]	TIOCA7		IRQ0	AN008
127		P93	A19		CTS7#/RTS7#/SS7#		AN017

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Table 1.8 List of Pins and Pin Functions (144-Pin LQFP) (5/5)

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
128		P92	A18		RXD7/SMISO7/SSCL7		AN016
129		P91	A17		SCK7		AN015
130	VSS						
131		P90	A16		TXD7/SMOSI7/SSDA7		AN014
132	VCC						
133		P47				IRQ15-DS	AN007
134		P46				IRQ14-DS	AN006
135		P45				IRQ13-DS	AN005
136		P44				IRQ12-DS	AN004
137		P43				IRQ11-DS	AN003
138		P42				IRQ10-DS	AN002
139		P41				IRQ9-DS	AN001
140	VREFL0						
141		P40				IRQ8-DS	AN000
142	VREFH0						
143	AVCC0						
144		P07				IRQ15	ADTRG0#

Note 1. The BCLK function is multiplexed with the I/O port function for pin P53, so the port function is not available if the external bus is enabled.
Note 2. Enabled only for the ROM capacity: 2 Mbytes/1.5 Mbytes

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Table 1.9 List of Pins and Pin Functions (100-Pin LQFP) (1/4)

Pin No. 100-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
1	VREFH						
2	EMLE						
3	VREFL						
4		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
5	VCL						
6	VBATT						
7	MD/FINED						
8	XCIN						
9	XCOUT						
10	RES#						
11	XTAL	P37					
12	VSS						
13	EXTAL	P36					
14	VCC						
15		P35				NMI	
16	TRST#	P34		MTIOC0A/TMCI3/ PO12/POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
17		P33		MTIOC0D/TIOCD0/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/ SSCL0/CRX0*1	IRQ3-DS	
18		P32		MTIOC0C/TIOCC0/ TMO3/PO10/RTCOUT/ RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/ SSDA0/CTX0*1/ USB0_VBUSEN	IRQ2-DS	
19	TMS	P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
20	TDI	P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
21	TCK/FINEC	P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
22	TDO	P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1/ MOSIB		
23		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD		ADTRG0#
24		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN		
25		P23	EDACK0	MTIOC3D/MTCLKD/ TIOCD3/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE		
26		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD		
27		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ USB0_EXICEN	IRQ9	
28		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ USB0_ID	IRQ8	
29		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/IETXD	IRQ7	ADTRG#
30		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/ SSCL3/MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#

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Table 1.9 List of Pins and Pin Functions (100-Pin LQFP) (2/4)

Pin No. 100-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
31		P15		MTIOC0B/MTCLKB/ TIOCB2/TCLKB/TMCI2/ PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS	IRQ5	
32		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMRI2/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
33		P13		MTIOC0B/TIOCA5/ TMO3/PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
34		P12		TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
35	VCC_USB						
36					USB0_DM		
37					USB0_DP		
38	VSS_USB						
39		P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	CRX1/ET_EXOUT	IRQ10	
40		P54	ALE/EDACK0	MTIOC4B/TMCI1	CTS2#/RTS2#/SS2#/ CTX1/ET_LINKSTA		
41		P53*2	BCLK				
42		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
43		P51	WR1#/BC1#/ WAIT#		SCK2/SSLB2		
44		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		
45		PC7	A23/CS0#	MTIOC3A/MTCLKB/ TMO2/PO31	TXD8/SMOSI8/SSDA8/ MISOA/ET_COL	IRQ14	
46		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TMCI2/PO30	RXD8/SMISO8/SSCL8/ MOSIA/ET_ETXD3	IRQ13	
47		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TMRI2/PO29	SCK8/RSPCKA/ ET_ETXD2		
48		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TMCI1/PO25/POE0#	SCK5/CTS8#/RTS8#/ SS8#/SSLA0/ ET_TX_CLK		
49		PC3	A19	MTIOC4D/TCLKB/ PO24	TXD5/SMOSI5/SSDA5/ IETXD/ET_TX_ER		
50		PC2	A18	MTIOC4B/TCLKA/PO21	RXD5/SMISO5/SSCL5/ SSLA3/IERXD/ ET_RX_DV		
51		PC1	A17	MTIOC3A/TCLKD/ PO18	SCK5/SSLA2/ ET_ERXD2	IRQ12	
52		PC0	A16	MTIOC3C/TCLKC/ PO17	CTS5#/RTS5#/SS5#/ SSLA1/ET_ERXD3	IRQ14	
53		PB7	A15	MTIOC3B/TIOCB5/ PO31	TXD9/SMOSI9/SSDA9/ ET_CRS/ RMII_CRS_DV		
54		PB6	A14	MTIOC3D/TIOCA5/ PO30	RXD9/SMISO9/SSCL9/ ET_ETXD1/RMII_TXD1		
55		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	SCK9/ET_ETXD0/ RMII_TXD0		
56		PB4	A12	TIOCA4/PO28	CTS9#/RTS9#/SS9#/ ET_TX_EN/ RMII_TXD_EN		
57		PB3	A11	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	SCK6/ET_RX_ER/ RMII_RX_ER		
58		PB2	A10	TIOCC3/TCLKC/PO26	CTS6#/RTS6#/SS6#/ ET_RX_CLK/REF50CK		

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Table 1.9 List of Pins and Pin Functions (100-Pin LQFP) (3/4)

Pin No. 100-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
59		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	TXD6/SMOSI6/SSDA6/ ET_ERXD0/ RMII_RXD0	IRQ4-DS	
60	VCC						
61		PB0	A8	MTIC5W/TIOCA3/PO24	RXD6/SMISO6/SSCL6/ RSPCKA/ET_ERXD1/ RMII_RXD1	IRQ12	
62	VSS						
63		PA7	A7	TIOCB2/PO23	MISOA/ET_WOL		
64		PA6	A6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	CTS5#/RTS5#/SS5#/ MOSIA/ET_EXOUT		
65		PA5	A5	TIOCB1/PO21	RSPCKA/ET_LINKSTA		
66		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/SSDA5/ SSLA0/ET_MDC	IRQ5-DS	
67		PA3	A3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	RXD5/SMISO5/SSCL5/ ET_MDIO	IRQ6-DS	
68		PA2	A2	PO18	RXD5/SMISO5/SSCL5/ SSLA3		
69		PA1	A1	MTIOC0B/MTCLKC/ TIOCB0/PO17	SCK5/SSLA2/ET_WOL	IRQ11	
70		PA0	A0/BC0#	MTIOC4A/TIOCA0/ PO16	SSLA1/ET_TX_EN/ RMII_TXD_EN		
71		PE7	D15[A15/D15]		MISOB	IRQ7	AN5
72		PE6	D14[A14/D14]		MOSIB	IRQ6	AN4
73		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B	RSPCKB/ET_RX_CLK/ REF50CK	IRQ5	AN3
74		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ PO28	SSLB0/ET_ERXD2		AN2
75		PE3	D11[A11/D11]	MTIOC4B/PO26/POE8#	CTS12#/RTS12#/ SS12#/MISOB/ ET_ERXD3		AN1
76		PE2	D10[A10/D10]	MTIOC4A/PO23	RXD12/SMISO12/ SSCL12/RXDX12/ SSLB3/MOSIB	IRQ7-DS	AN0
77		PE1	D9[A9/D9]	MTIOC4C/PO18	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12/SSLB2/ RSPCKB		ANEX1
78		PE0	D8[A8/D8]		SCK12/SSLB1		ANEX0
79		PD7	D7[A7/D7]	MTIC5U/POE0#		IRQ7	AN7
80		PD6	D6[A6/D6]	MTIC5V/POE1#		IRQ6	AN6
81		PD5	D5[A5/D5]	MTIC5W/POE2#		IRQ5	AN013
82		PD4	D4[A4/D4]	POE3#		IRQ4	AN012
83		PD3	D3[A3/D3]	POE8#		IRQ3	AN011
84		PD2	D2[A2/D2]	MTIOC4D	CRX0*1	IRQ2	AN010
85		PD1	D1[A1/D1]	MTIOC4B	CTX0*1	IRQ1	AN009
86		PD0	D0[A0/D0]			IRQ0	AN008
87		P47				IRQ15-DS	AN007
88		P46				IRQ14-DS	AN006
89		P45				IRQ13-DS	AN005
90		P44				IRQ12-DS	AN004
91		P43				IRQ11-DS	AN003
92		P42				IRQ10-DS	AN002
93		P41				IRQ9-DS	AN001

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Table 1.9 List of Pins and Pin Functions (100-Pin LQFP) (4/4)

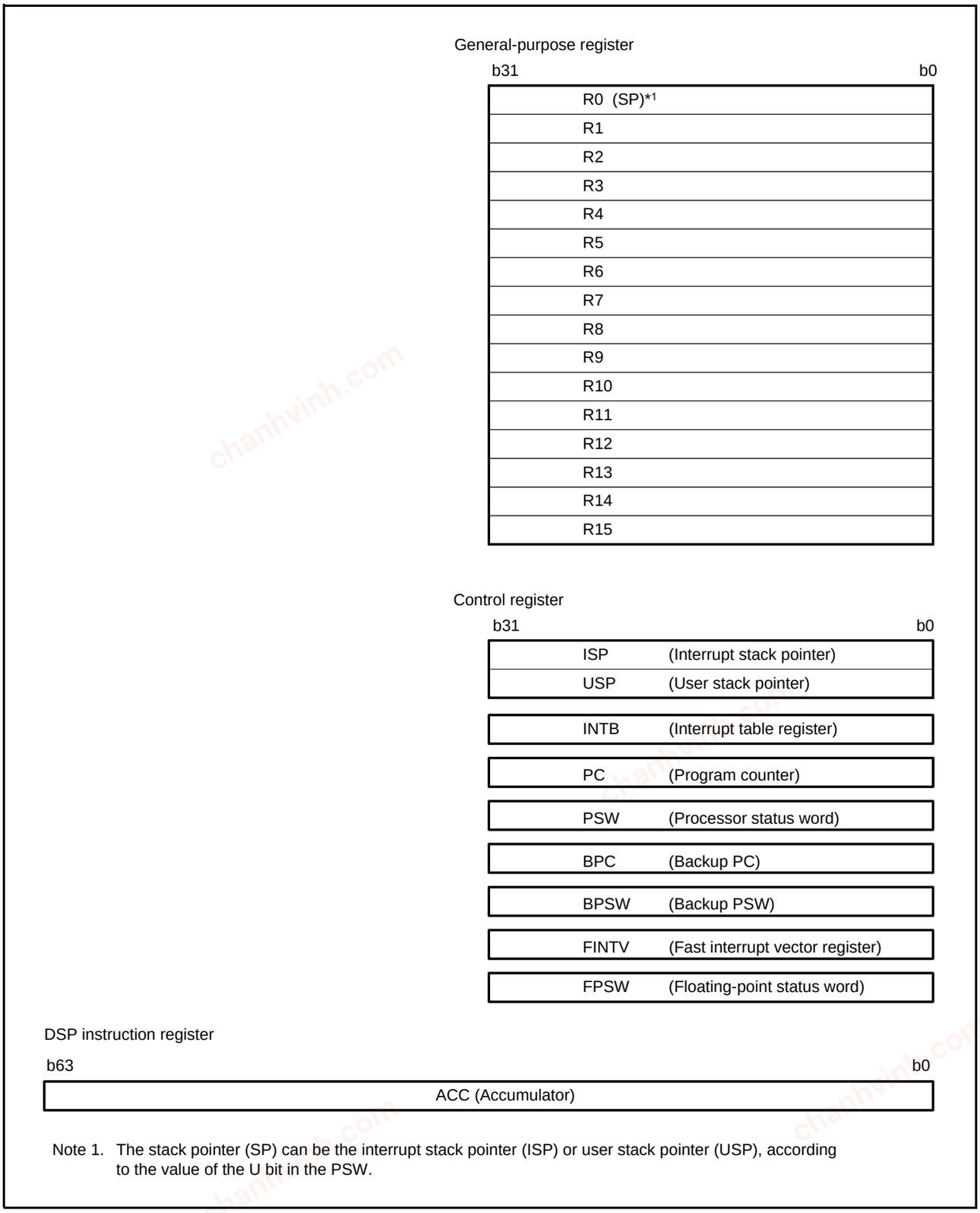
Pin No. 100-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIc, SCId, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12AD AD DA
94	VREFL0						
95		P40				IRQ8-DS	AN000
96	VREFH0						
97	AVCC0						
98		P07				IRQ15	ADTRG0#
99	AVSS0						
100		P05				IRQ13	DA1

Note 1. Enabled only for the ROM capacity of 768 Kbytes or more
Note 2. The BCLK function is multiplexed with the I/O port function for pin P53, so the port function is not available if the external bus is enabled.

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2. CPU

The RX CPU has sixteen general-purpose registers, nine control registers, and one accumulator used for DSP instructions.



Note 1. The stack pointer (SP) can be the interrupt stack pointer (ISP) or user stack pointer (USP), according to the value of the U bit in the PSW.

Figure 2.1 Register Set of the CPU

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2.1 General-Purpose Registers (R0 to R15)

This CPU has sixteen general-purpose registers (R0 to R15). R1 to R15 can be used as data registers or address registers. R0, a general-purpose register, also functions as the stack pointer (SP).
The stack pointer is switched to operate as the interrupt stack pointer (ISP) or user stack pointer (USP) by the value of the stack pointer select bit (U) in the processor status word (PSW).

2.2 Control Registers

(1) Interrupt Stack Pointer (ISP)/User Stack Pointer (USP)

The stack pointer (SP) can be either of two types, the interrupt stack pointer (ISP) or the user stack pointer (USP). Whether the stack pointer operates as the ISP or USP depends on the value of the stack pointer select bit (U) in the processor status word (PSW).
Set the ISP or USP to a multiple of four, as this reduces the numbers of cycles required to execute interrupt sequences and instructions entailing stack manipulation.

(2) Interrupt Table Register (INTB)

The interrupt table register (INTB) specifies the address where the relocatable vector table starts.

(3) Program Counter (PC)

The program counter (PC) indicates the address of the instruction being executed.

(4) Processor Status Word (PSW)

The processor status word (PSW) indicates the results of instruction execution or the state of the CPU.

(5) Backup PC (BPC)

The backup PC (BPC) is provided to speed up response to interrupts.
After a fast interrupt has been generated, the contents of the program counter (PC) are saved in the BPC register.

(6) Backup PSW (BPSW)

The backup PSW (BPSW) is provided to speed up response to interrupts.
After a fast interrupt has been generated, the contents of the processor status word (PSW) are saved in the BPSW. The allocation of bits in the BPSW corresponds to that in the PSW.

(7) Fast Interrupt Vector Register (FINTV)

The fast interrupt vector register (FINTV) is provided to speed up response to interrupts.
The FINTV register specifies a branch destination address when a fast interrupt has been generated.

(8) Floating-Point Status Word (FPSW)

The floating-point status word (FPSW) indicates the results of floating-point operations.
When an exception handling enable bit (Ej) enables the exception handling (Ej = 1), the exception cause can be identified by checking the corresponding Cj flag in the exception handling routine. If the exception handling is masked (Ej = 0), the occurrence of exception can be checked by reading the Fj flag at the end of a series of processing. Once the Fj flag has been set to 1, this value is retained until it is cleared to 0 by software (j = X, U, Z, O, or V).

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2.2.1 Register Associated with DSP Instructions

(1) Accumulator (ACC)

The accumulator (ACC) is a 64-bit register used for DSP instructions. The accumulator is also used for the multiply and multiply-and-accumulate instructions; EMUL, EMULU, FMUL, MUL, and RMPA, in which case the prior value in the accumulator is modified by execution of the instruction.

Use the MVTACHI and MVTACLO instructions for writing to the accumulator. The MVTACHI and MVTACLO instructions write data to the higher-order 32 bits (bits 63 to 32) and the lower-order 32 bits (bits 31 to 0), respectively.

Use the MVFACHI and MVFACMI instructions for reading data from the accumulator. The MVFACHI and MVFACMI instructions read data from the higher-order 32 bits (bits 63 to 32) and the middle 32 bits (bits 47 to 16), respectively.

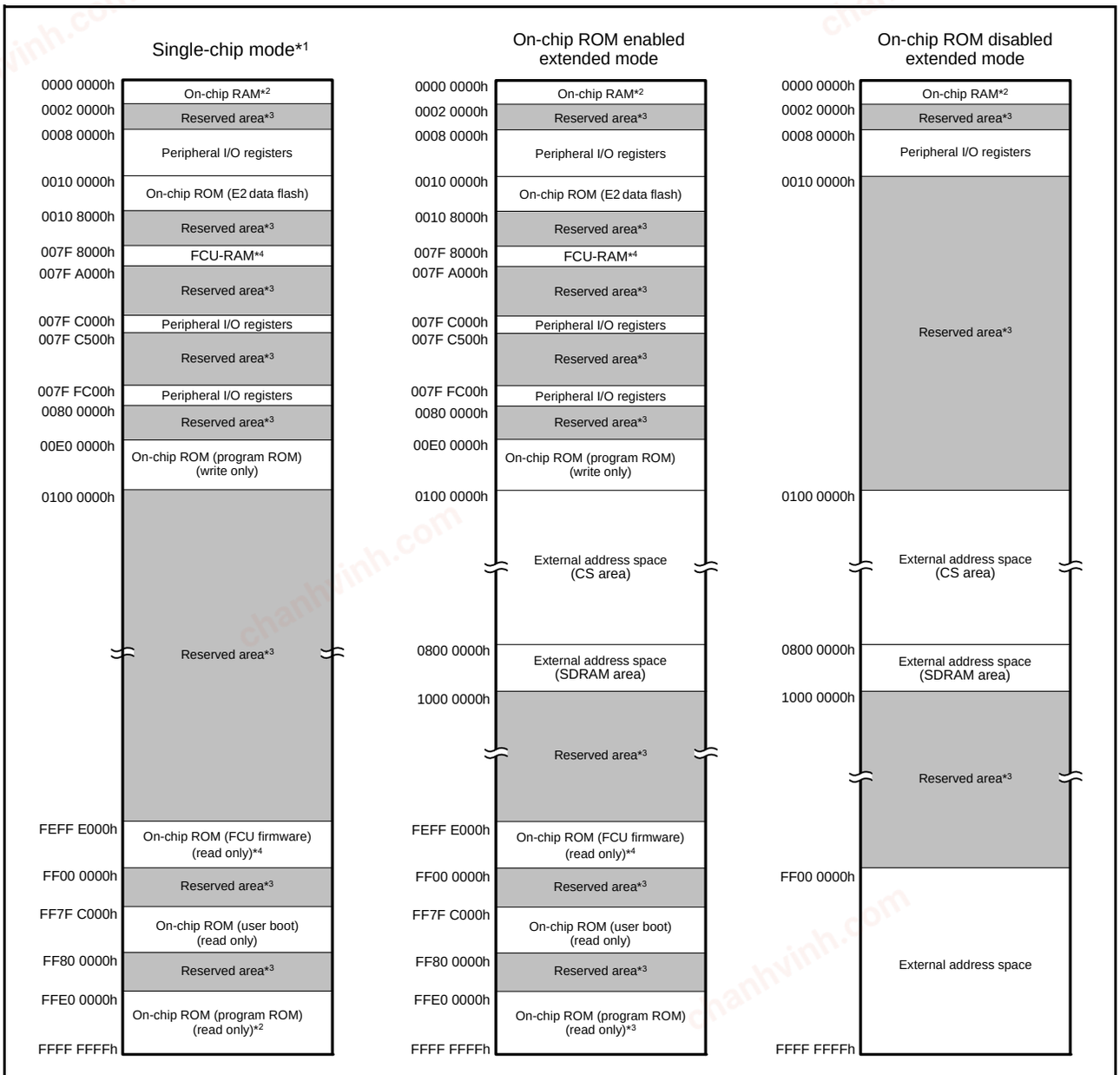
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3. Address Space

3.1 Address Space

This LSI has a 4-Gbyte address space, consisting of the range of addresses from 0000 0000h to FFFF FFFFh. That is, linear access to an address space of up to 4 Gbytes is possible, and this contains both program and data areas. Figure 3.1 shows the memory maps in the respective operating modes. Accessible areas will differ according to the operating mode and states of control bits.

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Note 1. The address space in boot mode and user boot mode/USB boot mode is the same as the address space in single-chip mode.
Note 2. The capacity of ROM/RAM differs depending on the products.

ROM (byt)			RAM (byt)	
Capacity	**Address (for reading only)**	**Address (for programming only)**	**Capacity**	**Address**
2 M	FFE0 0000h to FFFF FFFFh	00E0 0000h to 00FF FFFFh	128 K	0000 0000h to 0001 FFFFh
1.5 M	FFE8 0000h to FFFF FFFFh	00E8 0000h to 00FF FFFFh		
1 M	FFF0 0000h to FFFF FFFFh	00F0 0000h to 00FF FFFFh		
768 K	FFF4 0000h to FFFF FFFFh	00F4 0000h to 00FF FFFFh		

Note: • See Table 1.3, List of Products, for the product type name.

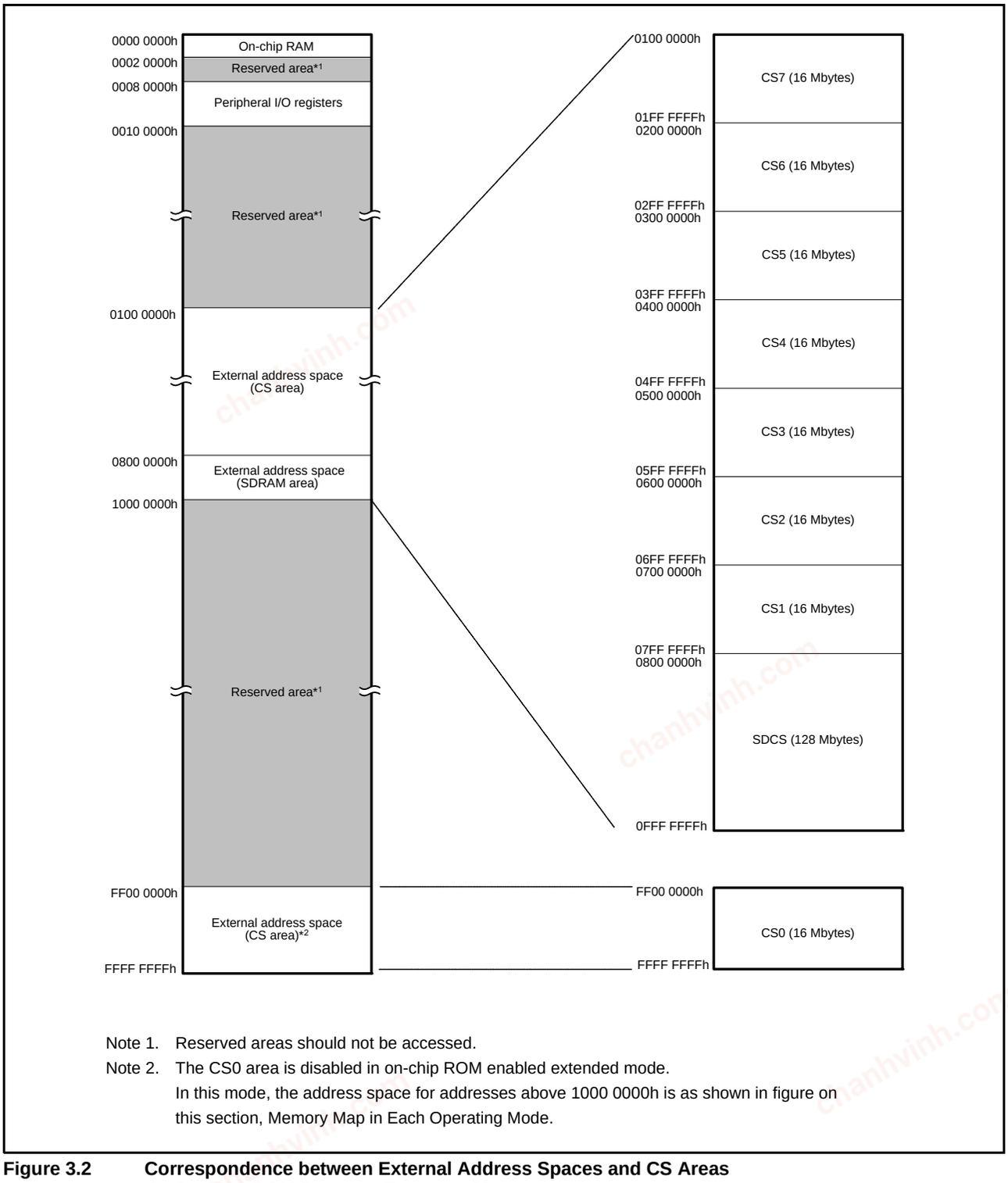
Note 3. Reserved areas should not be accessed.
Note 4. For details on the FCU, see section 46, ROM (Flash Memory for Code Storage) and section 47, E2 DataFlash Memory (Flash Memory for Data Storage) in the User's manual: Hardware.

Figure 3.1 Memory Map in Each Operating Mode

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3.2 External Address Space

The external address space is classified into CS areas (CS0 to CS7) and SDRAM area (SDCS).
Figure 3.2 shows the address ranges corresponding to the individual CS areas (CS0 to CS7) and SDRAM area (SDCS) in on-chip ROM disabled extended mode.



Note 1. Reserved areas should not be accessed.
Note 2. The CS0 area is disabled in on-chip ROM enabled extended mode.
In this mode, the address space for addresses above 1000 0000h is as shown in figure on this section, Memory Map in Each Operating Mode.

Figure 3.2 Correspondence between External Address Spaces and CS Areas (In On-Chip ROM Disabled Extended Mode)

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4. I/O Registers

4.1 I/O Register Addresses (Address Order)

Table 4.1 List of I/O Registers (Address Order) (1/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 0000h	SYSTEM	Mode monitor register	MDMONR	16	16	3 ICLK		Operating Modes	127
0008 0002h	SYSTEM	Mode status register	MDSR	16	16	3 ICLK			127
0008 0006h	SYSTEM	System control register 0	SYSCR0	16	16	3 ICLK			128
0008 0008h	SYSTEM	System control register 1	SYSCR1	16	16	3 ICLK			129
0008 000Ch	SYSTEM	Standby control register	SBYCR	16	16	3 ICLK		Low Power Consumption	269
0008 0010h	SYSTEM	Module stop control register A	MSTPCRA	32	32	3 ICLK			270
0008 0014h	SYSTEM	Module stop control register B	MSTPCRB	32	32	3 ICLK			271
0008 0018h	SYSTEM	Module stop control register C	MSTPCRC	32	32	3 ICLK			274
0008 0020h	SYSTEM	System clock control register	SCKCR	32	32	3 ICLK		Clock Generation Circuit	233
0008 0024h	SYSTEM	System clock control register 2	SCKCR2	16	16	3 ICLK			234
0008 0026h	SYSTEM	System clock control register 3	SCKCR3	16	16	3 ICLK			236
0008 0028h	SYSTEM	PLL control register	PLLCR	16	16	3 ICLK			237
0008 002Ah	SYSTEM	PLL control register 2	PLLCR2	8	8	3 ICLK			238
0008 0030h	SYSTEM	External bus clock control register	BCKCR	8	8	3 ICLK			239
0008 0032h	SYSTEM	Main clock oscillator control register	MOSCCR	8	8	3 ICLK			240
0008 0033h	SYSTEM	Sub-clock oscillator control register	SOSCCR	8	8	3 ICLK			241
0008 0034h	SYSTEM	Low-speed on-chip oscillator control register	LOCOCR	8	8	3 ICLK			242
0008 0035h	SYSTEM	IWDT-dedicated on-chip oscillator control register	ILOCOCR	8	8	3 ICLK			243
0008 0036h	SYSTEM	High-speed on-chip oscillator control register	HOCOCR	8	8	3 ICLK			243
0008 0040h	SYSTEM	Oscillation stop detection control register	OSTDCR	8	8	3 ICLK			245
0008 0041h	SYSTEM	Oscillation stop detection status register	OSTDSR	8	8	3 ICLK			246
0008 00A0h	SYSTEM	Operating power control register	OPCCR	8	8	3 ICLK		Low Power Consumption	275
0008 00A1h	SYSTEM	Sleep mode return clock source switching register	RSTCKCR	8	8	3 ICLK			277
0008 00A2h	SYSTEM	Main clock oscillator wait control register	MOSCWTCR	8	8	3 ICLK			278
0008 00A3h	SYSTEM	Sub-clock oscillator wait control register	SOSCWTCR	8	8	3 ICLK			279
0008 00A6h	SYSTEM	PLL wait control register	PLLWTCR	8	8	3 ICLK			280
0008 00C0h	SYSTEM	Reset status register 2	RSTSR2	8	8	3 ICLK		Resets	194
0008 00C2h	SYSTEM	Software reset register	SWRR	16	16	3 ICLK			195
0008 00E0h	SYSTEM	Voltage monitoring 1 circuit control register 1	LVD1CR1	8	8	3 ICLK		LVDA	213
0008 00E1h	SYSTEM	Voltage monitoring 1 circuit status register	LVD1SR	8	8	3 ICLK			214
0008 00E2h	SYSTEM	Voltage monitoring 2 circuit control register 1	LVD2CR1	8	8	3 ICLK			215
0008 00E3h	SYSTEM	Voltage monitoring 2 circuit status register	LVD2SR	8	8	3 ICLK			216
0008 03FEh	SYSTEM	Protect register	PRCR	16	16	3 ICLK		Register Write Protection Function	312
0008 1300h	BSC	Bus error status clear register	BERCLR	8	8	2 ICLK		Buses	408
0008 1304h	BSC	Bus error monitoring enable register	BEREN	8	8	2 ICLK			408
0008 1308h	BSC	Bus error status register 1	BERSR1	8	8	2 ICLK			409
0008 130Ah	BSC	Bus error status register 2	BERSR2	16	16	2 ICLK			409
0008 1310h	BSC	Bus priority control register	BUSPRI	16	16	2 ICLK			410
0008 2000h	DMAC0	DMA source address register	DMSAR	32	32	2 ICLK		DMACA	512
0008 2004h	DMAC0	DMA destination address register	DMDAR	32	32	2 ICLK			512
0008 2008h	DMAC0	DMA transfer count register	DMCRA	32	32	2 ICLK			513
0008 200Ch	DMAC0	DMA block transfer count register	DMCRB	16	16	2 ICLK			514
0008 2010h	DMAC0	DMA transfer mode register	DMTMD	16	16	2 ICLK			515
0008 2013h	DMAC0	DMA interrupt setting register	DMINT	8	8	2 ICLK			516
0008 2014h	DMAC0	DMA address mode register	DMAMD	16	16	2 ICLK			518
0008 2018h	DMAC0	DMA offset register	DMOFR	32	32	2 ICLK			521

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Table 4.1 List of I/O Registers (Address Order) (2/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 201Ch	DMAC0	DMA transfer enable register	DMCNT	8	8	2 ICLK		DMACA	521
0008 201Dh	DMAC0	DMA software start register	DMREQ	8	8	2 ICLK			522
0008 201Eh	DMAC0	DMA status register	DMSTS	8	8	2 ICLK			523
0008 201Fh	DMAC0	DMA activation source flag control register	DMCSL	8	8	2 ICLK			524
0008 2040h	DMAC1	DMA source address register	DMSAR	32	32	2 ICLK			512
0008 2044h	DMAC1	DMA destination address register	DMDAR	32	32	2 ICLK			512
0008 2048h	DMAC1	DMA transfer count register	DMCRA	32	32	2 ICLK			513
0008 204Ch	DMAC1	DMA block transfer count register	DMCRB	16	16	2 ICLK			514
0008 2050h	DMAC1	DMA transfer mode register	DMTMD	16	16	2 ICLK			515
0008 2053h	DMAC1	DMA interrupt setting register	DMINT	8	8	2 ICLK			516
0008 2054h	DMAC1	DMA address mode register	DMAMD	16	16	2 ICLK			518
0008 205Ch	DMAC1	DMA transfer enable register	DMCNT	8	8	2 ICLK			521
0008 205Dh	DMAC1	DMA software start register	DMREQ	8	8	2 ICLK			522
0008 205Eh	DMAC1	DMA status register	DMSTS	8	8	2 ICLK			523
0008 205Fh	DMAC1	DMA activation source flag control register	DMCSL	8	8	2 ICLK			524
0008 2080h	DMAC2	DMA source address register	DMSAR	32	32	2 ICLK			512
0008 2084h	DMAC2	DMA destination address register	DMDAR	32	32	2 ICLK			512
0008 2088h	DMAC2	DMA transfer count register	DMCRA	32	32	2 ICLK			513
0008 208Ch	DMAC2	DMA block transfer count register	DMCRB	16	16	2 ICLK			514
0008 2090h	DMAC2	DMA transfer mode register	DMTMD	16	16	2 ICLK			515
0008 2093h	DMAC2	DMA interrupt setting register	DMINT	8	8	2 ICLK			516
0008 2094h	DMAC2	DMA address mode register	DMAMD	16	16	2 ICLK			518
0008 209Ch	DMAC2	DMA transfer enable register	DMCNT	8	8	2 ICLK			521
0008 209Dh	DMAC2	DMA software start register	DMREQ	8	8	2 ICLK			522
0008 209Eh	DMAC2	DMA status register	DMSTS	8	8	2 ICLK			523
0008 209Fh	DMAC2	DMA activation source flag control register	DMCSL	8	8	2 ICLK			524
0008 20C0h	DMAC3	DMA source address register	DMSAR	32	32	2 ICLK			512
0008 20C4h	DMAC3	DMA destination address register	DMDAR	32	32	2 ICLK			512
0008 20C8h	DMAC3	DMA transfer count register	DMCRA	32	32	2 ICLK			513
0008 20CCh	DMAC3	DMA block transfer count register	DMCRB	16	16	2 ICLK			514
0008 20D0h	DMAC3	DMA transfer mode register	DMTMD	16	16	2 ICLK			515
0008 20D3h	DMAC3	DMA interrupt setting register	DMINT	8	8	2 ICLK			516
0008 20D4h	DMAC3	DMA address mode register	DMAMD	16	16	2 ICLK			518
0008 20DCh	DMAC3	DMA transfer enable register	DMCNT	8	8	2 ICLK			521
0008 20DDh	DMAC3	DMA software start register	DMREQ	8	8	2 ICLK			522
0008 20DEh	DMAC3	DMA status register	DMSTS	8	8	2 ICLK			523
0008 20DFh	DMAC3	DMA activation source flag control register	DMCSL	8	8	2 ICLK			524
0008 2200h	DMAC	DMACA module activation register	DMAST	8	8	2 ICLK			525
0008 2400h	DTC	DTC control register	DTCCR	8	8	2 ICLK		DTCa	621
0008 2404h	DTC	DTC vector base register	DTCVBR	32	32	2 ICLK			622
0008 2408h	DTC	DTC address mode register	DTCADMOD	8	8	2 ICLK			622
0008 240Ch	DTC	DTC module start register	DTCST	8	8	2 ICLK			623
0008 240Eh	DTC	DTC status register	DTCSTS	16	16	2 ICLK			624
0008 2800h	EXDMAC0	EXDMA source address register	EDMSAR	32	32	1, 2 BCLK		EXDMACa	549
0008 2804h	EXDMAC0	EXDMA destination address register	EDMDAR	32	32	1, 2 BCLK			549
0008 2808h	EXDMAC0	EXDMA transfer count register	EDMCRA	32	32	1, 2 BCLK			550
0008 280Ch	EXDMAC0	EXDMA block transfer count register	EDMCRB	16	16	1, 2 BCLK			552
0008 2810h	EXDMAC0	EXDMA transfer mode register	EDMTMD	16	16	1, 2 BCLK			553
0008 2812h	EXDMAC0	EXDMA output setting register	EDMOMD	8	8	1, 2 BCLK			554
0008 2813h	EXDMAC0	EXDMA interrupt setting register	EDMINT	8	8	1, 2 BCLK			555
0008 2814h	EXDMAC0	EXDMA address mode register	EDMAMD	32	32	1, 2 BCLK			557

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Table 4.1 List of I/O Registers (Address Order) (3/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 2818h	EXDMAC0	EXDMA offset register	EDMOFR	32	32	1, 2 BCLK		EXDMACa	561
0008 281Ch	EXDMAC0	EXDMA transfer enable register	EDMCNT	8	8	1, 2 BCLK			562
0008 281Dh	EXDMAC0	EXDMA software start register	EDMREQ	8	8	1, 2 BCLK			563
0008 281Eh	EXDMAC0	EXDMA status register	EDMSTS	8	8	1, 2 BCLK			564
0008 2820h	EXDMAC0	EXDMA external request sense mode register	EDMRMD	8	8	1, 2 BCLK			565
0008 2821h	EXDMAC0	EXDMA external request flag register	EDMERF	8	8	1, 2 BCLK			566
0008 2822h	EXDMAC0	EXDMA peripheral request flag register	EDMPRF	8	8	1, 2 BCLK			567
0008 2840h	EXDMAC1	EXDMA source address register	EDMSAR	32	32	1, 2 BCLK			549
0008 2844h	EXDMAC1	EXDMA destination address register	EDMDAR	32	32	1, 2 BCLK			549
0008 2848h	EXDMAC1	EXDMA transfer count register	EDMCRA	32	32	1, 2 BCLK			550
0008 284Ch	EXDMAC1	EXDMA block transfer count register	EDMCRB	16	16	1, 2 BCLK			552
0008 2850h	EXDMAC1	EXDMA transfer mode register	EDMTMD	16	16	1, 2 BCLK			553
0008 2852h	EXDMAC1	EXDMA output setting register	EDMOMD	8	8	1, 2 BCLK			554
0008 2853h	EXDMAC1	EXDMA interrupt setting register	EDMINT	8	8	1, 2 BCLK			555
0008 2854h	EXDMAC1	EXDMA address mode register	EDMAMD	32	32	1, 2 BCLK			557
0008 285Ch	EXDMAC1	EXDMA transfer enable register	EDMCNT	8	8	1, 2 BCLK			562
0008 285Dh	EXDMAC1	EXDMA software start register	EDMREQ	8	8	1, 2 BCLK			563
0008 285Eh	EXDMAC1	EXDMA status register	EDMSTS	8	8	1, 2 BCLK			564
0008 2860h	EXDMAC1	EXDMA external request sense mode register	EDMRMD	8	8	1, 2 BCLK			565
0008 2861h	EXDMAC1	EXDMA external request flag register	EDMERF	8	8	1, 2 BCLK			566
0008 2862h	EXDMAC1	EXDMA peripheral request flag register	EDMPRF	8	8	1, 2 BCLK			567
0008 2A00h	EXDMAC	EXDMA module start register	EDMAST	8	8	1, 2 BCLK			568
0008 2BE0h	EXDMAC	Cluster buffer register 0	CLSBR0	32	32	1, 2 BCLK			569
0008 2BE4h	EXDMAC	Cluster buffer register 1	CLSBR1	32	32	1, 2 BCLK			569
0008 2BE8h	EXDMAC	Cluster buffer register 2	CLSBR2	32	32	1, 2 BCLK			569
0008 2BECh	EXDMAC	Cluster buffer register 3	CLSBR3	32	32	1, 2 BCLK			569
0008 2BF0h	EXDMAC	Cluster buffer register 4	CLSBR4	32	32	1, 2 BCLK			569
0008 2BF4h	EXDMAC	Cluster buffer register 5	CLSBR5	32	32	1, 2 BCLK			569
0008 2BF8h	EXDMAC	Cluster buffer register 6	CLSBR6	32	32	1, 2 BCLK			569
0008 2BFCh	EXDMAC	Cluster buffer register 7	CLSBR7	32	32	1, 2 BCLK			569
0008 3002h	BSC	CS0 mode register	CS0MOD	16	16	1, 2 BCLK		Buses	389
0008 3004h	BSC	CS0 wait control register 1	CS0WCR1	32	32	1, 2 BCLK			391
0008 3008h	BSC	CS0 wait control register 2	CS0WCR2	32	32	1, 2 BCLK			394
0008 3012h	BSC	CS1 mode register	CS1MOD	16	16	1, 2 BCLK			389
0008 3014h	BSC	CS1 wait control register 1	CS1WCR1	32	32	1, 2 BCLK			391
0008 3018h	BSC	CS1 wait control register 2	CS1WCR2	32	32	1, 2 BCLK			394
0008 3022h	BSC	CS2 mode register	CS2MOD	16	16	1, 2 BCLK			389
0008 3024h	BSC	CS2 wait control register 1	CS2WCR1	32	32	1, 2 BCLK			391
0008 3028h	BSC	CS2 wait control register 2	CS2WCR2	32	32	1, 2 BCLK			394
0008 3032h	BSC	CS3 mode register	CS3MOD	16	16	1, 2 BCLK			389
0008 3034h	BSC	CS3 wait control register 1	CS3WCR1	32	32	1, 2 BCLK			391
0008 3038h	BSC	CS3 wait control register 2	CS3WCR2	32	32	1, 2 BCLK			394
0008 3042h	BSC	CS4 mode register	CS4MOD	16	16	1, 2 BCLK			389
0008 3044h	BSC	CS4 wait control register 1	CS4WCR1	32	32	1, 2 BCLK			391
0008 3048h	BSC	CS4 wait control register 2	CS4WCR2	32	32	1, 2 BCLK			394
0008 3052h	BSC	CS5 mode register	CS5MOD	16	16	1, 2 BCLK			389
0008 3054h	BSC	CS5 wait control register 1	CS5WCR1	32	32	1, 2 BCLK			391
0008 3058h	BSC	CS5 wait control register 2	CS5WCR2	32	32	1, 2 BCLK			394
0008 3062h	BSC	CS6 mode register	CS6MOD	16	16	1, 2 BCLK			389
0008 3064h	BSC	CS6 wait control register 1	CS6WCR1	32	32	1, 2 BCLK			391
0008 3068h	BSC	CS6 wait control register 2	CS6WCR2	32	32	1, 2 BCLK			394

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Table 4.1 List of I/O Registers (Address Order) (4/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 3072h	BSC	CS7 mode register	CS7MOD	16	16	1, 2 BCLK		Buses	389
0008 3074h	BSC	CS7 wait control register 1	CS7WCR1	32	32	1, 2 BCLK			391
0008 3078h	BSC	CS7 wait control register 2	CS7WCR2	32	32	1, 2 BCLK			394
0008 3802h	BSC	CS0 control register	CS0CR	16	16	1, 2 BCLK			384
0008 380Ah	BSC	CS0 recovery cycle register	CS0REC	16	16	1, 2 BCLK			385
0008 3812h	BSC	CS1 control register	CS1CR	16	16	1, 2 BCLK			384
0008 381Ah	BSC	CS1 recovery cycle register	CS1REC	16	16	1, 2 BCLK			385
0008 3822h	BSC	CS2 control register	CS2CR	16	16	1, 2 BCLK			384
0008 382Ah	BSC	CS2 recovery cycle register	CS2REC	16	16	1, 2 BCLK			385
0008 3832h	BSC	CS3 control register	CS3CR	16	16	1, 2 BCLK			384
0008 383Ah	BSC	CS3 recovery cycle register	CS3REC	16	16	1, 2 BCLK			385
0008 3842h	BSC	CS4 control register	CS4CR	16	16	1, 2 BCLK			384
0008 384Ah	BSC	CS4 recovery cycle register	CS4REC	16	16	1, 2 BCLK			385
0008 3852h	BSC	CS5 control register	CS5CR	16	16	1, 2 BCLK			384
0008 385Ah	BSC	CS5 recovery cycle register	CS5REC	16	16	1, 2 BCLK			385
0008 3862h	BSC	CS6 control register	CS6CR	16	16	1, 2 BCLK			384
0008 386Ah	BSC	CS6 recovery cycle register	CS6REC	16	16	1, 2 BCLK			385
0008 3872h	BSC	CS7 control register	CS7CR	16	16	1, 2 BCLK			384
0008 387Ah	BSC	CS7 recovery cycle register	CS7REC	16	16	1, 2 BCLK			385
0008 3880h	BSC	CS recovery cycle insertion enable register	CSRECEN	16	16	1, 2 BCLK			387
0008 3C00h	BSC	SDC control register	SDCCR	8	8	1, 2 BCLK			397
0008 3C01h	BSC	SDC mode register	SDCMOD	8	8	1, 2 BCLK			397
0008 3C02h	BSC	SDRAM access mode register	SDAMOD	8	8	1, 2 BCLK			398
0008 3C10h	BSC	SDRAM self-refresh control register	SDSELF	8	8	1, 2 BCLK			398
0008 3C14h	BSC	SDRAM refresh control register	SDRFCR	16	16	1, 2 BCLK			399
0008 3C16h	BSC	SDRAM auto-refresh control register	SDRFEN	8	8	1, 2 BCLK			400
0008 3C20h	BSC	SDRAM initialization sequence control register	SDICR	8	8	1, 2 BCLK			401
0008 3C24h	BSC	SDRAM initialization register	SDIR	16	16	1, 2 BCLK			402
0008 3C40h	BSC	SDRAM address register	SDADR	8	8	1, 2 BCLK			403
0008 3C44h	BSC	SDRAM timing register	SDTR	32	32	1, 2 BCLK			404
0008 3C48h	BSC	SDRAM mode register	SDMOD	16	16	1, 2 BCLK			406
0008 3C50h	BSC	SDRAM status register	SDSR	8	8	1, 2 BCLK			407
0008 6400h	MPU	Region-0 start page number register	RSPAGE0	32	32	1ICLK		MPU	492
0008 6404h	MPU	Region-0 end page number register	REPAGE0	32	32	1ICLK			493
0008 6408h	MPU	Region-1 start page number register	RSPAGE1	32	32	1ICLK			492
0008 640Ch	MPU	Region-1 end page number register	REPAGE1	32	32	1ICLK			493
0008 6410h	MPU	Region-2 start page number register	RSPAGE2	32	32	1ICLK			492
0008 6414h	MPU	Region-2 end page number register	REPAGE2	32	32	1ICLK			493
0008 6418h	MPU	Region-3 start page number register	RSPAGE3	32	32	1ICLK			492
0008 641Ch	MPU	Region-3 end page number register	REPAGE3	32	32	1ICLK			493
0008 6420h	MPU	Region-4 start page number register	RSPAGE4	32	32	1ICLK			492
0008 6424h	MPU	Region-4 end page number register	REPAGE4	32	32	1ICLK			493
0008 6428h	MPU	Region-5 start page number register	RSPAGE5	32	32	1ICLK			492
0008 642Ch	MPU	Region-5 end page number register	REPAGE5	32	32	1ICLK			493
0008 6430h	MPU	Region-6 start page number register	RSPAGE6	32	32	1ICLK			492
0008 6434h	MPU	Region-6 end page number register	REPAGE6	32	32	1ICLK			493
0008 6438h	MPU	Region-7 start page number register	RSPAGE7	32	32	1ICLK			492
0008 643Ch	MPU	Region-7 end page number register	REPAGE7	32	32	1ICLK			493
0008 6500h	MPU	Memory-protection enable register	MPEN	32	32	1ICLK			494
0008 6504h	MPU	Background access control register	MPBAC	32	32	1ICLK			495
0008 6508h	MPU	Memory-protection error status-clearing register	MPECLR	32	32	1ICLK			496

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Table 4.1 List of I/O Registers (Address Order) (5/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 650Ch	MPU	Memory-protection error status register	MPESTS	32	32	1ICLK		MPU	497
0008 6514h	MPU	Data memory-protection error address register	MPDEA	32	32	1ICLK			498
0008 6520h	MPU	Region search address register	MPSA	32	32	1ICLK			499
0008 6524h	MPU	Region search operation register	MPOPS	16	16	1ICLK			499
0008 6526h	MPU	Region invalidation operation register	MPOPI	16	16	1ICLK			500
0008 6528h	MPU	Instruction-hit region register	MHITI	32	32	1ICLK			501
0008 652Ch	MPU	Data-hit region register	MHITD	32	32	1ICLK			503
0008 7010h	ICU	Interrupt request register 016	IR016	8	8	2 ICLK		ICUb	323
0008 7015h	ICU	Interrupt request register 021	IR021	8	8	2 ICLK			323
0008 7017h	ICU	Interrupt request register 023	IR023	8	8	2 ICLK			323
0008 701Bh	ICU	Interrupt request register 027	IR027	8	8	2 ICLK			323
0008 701Ch	ICU	Interrupt request register 028	IR028	8	8	2 ICLK			323
0008 701Dh	ICU	Interrupt request register 029	IR029	8	8	2 ICLK			323
0008 701Eh	ICU	Interrupt request register 030	IR030	8	8	2 ICLK			323
0008 701Fh	ICU	Interrupt request register 031	IR031	8	8	2 ICLK			323
0008 7020h	ICU	Interrupt request register 032	IR032	8	8	2 ICLK			323
0008 7021h	ICU	Interrupt request register 033	IR033	8	8	2 ICLK			323
0008 7022h	ICU	Interrupt request register 034	IR034	8	8	2 ICLK			323
0008 7023h	ICU	Interrupt request register 035	IR035	8	8	2 ICLK			323
0008 7024h	ICU	Interrupt request register 036	IR036	8	8	2 ICLK			323
0008 7025h	ICU	Interrupt request register 037	IR037	8	8	2 ICLK			323
0008 7026h	ICU	Interrupt request register 038	IR038	8	8	2 ICLK			323
0008 7027h	ICU	Interrupt request register 039	IR039	8	8	2 ICLK			323
0008 7028h	ICU	Interrupt request register 040	IR040	8	8	2 ICLK			323
0008 7029h	ICU	Interrupt request register 041	IR041	8	8	2 ICLK			323
0008 702Ah	ICU	Interrupt request register 042	IR042	8	8	2 ICLK			323
0008 702Bh	ICU	Interrupt request register 043	IR043	8	8	2 ICLK			323
0008 702Ch	ICU	Interrupt request register 044	IR044	8	8	2 ICLK			323
0008 702Dh	ICU	Interrupt request register 045	IR045	8	8	2 ICLK			323
0008 702Eh	ICU	Interrupt request register 046	IR046	8	8	2 ICLK			323
0008 702Fh	ICU	Interrupt request register 047	IR047	8	8	2 ICLK			323
0008 7030h	ICU	Interrupt request register 048	IR048	8	8	2 ICLK			323
0008 7031h	ICU	Interrupt request register 049	IR049	8	8	2 ICLK			323
0008 7032hz	ICU	Interrupt request register 050	IR050	8	8	2 ICLK			323
0008 7033h	ICU	Interrupt request register 051	IR051	8	8	2 ICLK			323
0008 7034h	ICU	Interrupt request register 052	IR052	8	8	2 ICLK			323
0008 7035h	ICU	Interrupt request register 053	IR053	8	8	2 ICLK			323
0008 7036h	ICU	Interrupt request register 054	IR054	8	8	2 ICLK			323
0008 7037h	ICU	Interrupt request register 055	IR055	8	8	2 ICLK			323
0008 7038h	ICU	Interrupt request register 056	IR056	8	8	2 ICLK			323
0008 7039h	ICU	Interrupt request register 057	IR057	8	8	2 ICLK			323
0008 703Ah	ICU	Interrupt request register 058	IR058	8	8	2 ICLK			323
0008 703Bh	ICU	Interrupt request register 059	IR059	8	8	2 ICLK			323
0008 703Eh	ICU	Interrupt request register 062	IR062	8	8	2 ICLK			323
0008 7040h	ICU	Interrupt request register 064	IR064	8	8	2 ICLK			323
0008 7041h	ICU	Interrupt request register 065	IR065	8	8	2 ICLK			323
0008 7042h	ICU	Interrupt request register 066	IR066	8	8	2 ICLK			323
0008 7043h	ICU	Interrupt request register 067	IR067	8	8	2 ICLK			323
0008 7044h	ICU	Interrupt request register 068	IR068	8	8	2 ICLK			323
0008 7045h	ICU	Interrupt request register 069	IR069	8	8	2 ICLK			323
0008 7046h	ICU	Interrupt request register 070	IR070	8	8	2 ICLK			323

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Table 4.1 List of I/O Registers (Address Order) (6/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 7047h	ICU	Interrupt request register 071	IR071	8	8	2 ICLK		ICUb	323
0008 7048h	ICU	Interrupt request register 072	IR072	8	8	2 ICLK			323
0008 7049h	ICU	Interrupt request register 073	IR073	8	8	2 ICLK			323
0008 704Ah	ICU	Interrupt request register 074	IR074	8	8	2 ICLK			323
0008 704Bh	ICU	Interrupt request register 075	IR075	8	8	2 ICLK			323
0008 704Ch	ICU	Interrupt request register 076	IR076	8	8	2 ICLK			323
0008 704Dh	ICU	Interrupt request register 077	IR077	8	8	2 ICLK			323
0008 704Eh	ICU	Interrupt request register 078	IR078	8	8	2 ICLK			323
0008 704Fh	ICU	Interrupt request register 079	IR079	8	8	2 ICLK			323
0008 705Ah	ICU	Interrupt request register 090	IR090	8	8	2 ICLK			323
0008 705Bh	ICU	Interrupt request register 091	IR091	8	8	2 ICLK			323
0008 705Ch	ICU	Interrupt request register 092	IR092	8	8	2 ICLK			323
0008 705Dh	ICU	Interrupt request register 093	IR093	8	8	2 ICLK			323
0008 7062h	ICU	Interrupt request register 098	IR098	8	8	2 ICLK			323
0008 7066h	ICU	Interrupt request register 102	IR102	8	8	2 ICLK			323
0008 706Ah	ICU	Interrupt request register 106	IR106	8	8	2 ICLK			323
0008 706Bh	ICU	Interrupt request register 107	IR107	8	8	2 ICLK			323
0008 706Ch	ICU	Interrupt request register 108	IR108	8	8	2 ICLK			323
0008 706Dh	ICU	Interrupt request register 109	IR109	8	8	2 ICLK			323
0008 706Eh	ICU	Interrupt request register 110	IR110	8	8	2 ICLK			323
0008 706Fh	ICU	Interrupt request register 111	IR111	8	8	2 ICLK			323
0008 7070h	ICU	Interrupt request register 112	IR112	8	8	2 ICLK			323
0008 7072h	ICU	Interrupt request register 114	IR114	8	8	2 ICLK			323
0008 707Ah	ICU	Interrupt request register 122	IR122	8	8	2 ICLK			323
0008 707Bh	ICU	Interrupt request register 123	IR123	8	8	2 ICLK			323
0008 707Ch	ICU	Interrupt request register 124	IR124	8	8	2 ICLK			323
0008 707Dh	ICU	Interrupt request register 125	IR125	8	8	2 ICLK			323
0008 707Eh	ICU	Interrupt request register 126	IR126	8	8	2 ICLK			323
0008 707Fh	ICU	Interrupt request register 127	IR127	8	8	2 ICLK			323
0008 7080h	ICU	Interrupt request register 128	IR128	8	8	2 ICLK			323
0008 7081h	ICU	Interrupt request register 129	IR129	8	8	2 ICLK			323
0008 7082h	ICU	Interrupt request register 130	IR130	8	8	2 ICLK			323
0008 7083h	ICU	Interrupt request register 131	IR131	8	8	2 ICLK			323
0008 7084h	ICU	Interrupt request register 132	IR132	8	8	2 ICLK			323
0008 7085h	ICU	Interrupt request register 133	IR133	8	8	2 ICLK			323
0008 7086h	ICU	Interrupt request register 134	IR134	8	8	2 ICLK			323
0008 7087h	ICU	Interrupt request register 135	IR135	8	8	2 ICLK			323
0008 7088h	ICU	Interrupt request register 136	IR136	8	8	2 ICLK			323
0008 7089h	ICU	Interrupt request register 137	IR137	8	8	2 ICLK			323
0008 708Ah	ICU	Interrupt request register 138	IR138	8	8	2 ICLK			323
0008 708Bh	ICU	Interrupt request register 139	IR139	8	8	2 ICLK			323
0008 708Ch	ICU	Interrupt request register 140	IR140	8	8	2 ICLK			323
0008 708Dh	ICU	Interrupt request register 141	IR141	8	8	2 ICLK			323
0008 708Eh	ICU	Interrupt request register 142	IR142	8	8	2 ICLK			323
0008 708Fh	ICU	Interrupt request register 143	IR143	8	8	2 ICLK			323
0008 7090h	ICU	Interrupt request register 144	IR144	8	8	2 ICLK			323
0008 7091h	ICU	Interrupt request register 145	IR145	8	8	2 ICLK			323
0008 7092h	ICU	Interrupt request register 146	IR146	8	8	2 ICLK			323
0008 7093h	ICU	Interrupt request register 147	IR147	8	8	2 ICLK			323
0008 7094h	ICU	Interrupt request register 148	IR148	8	8	2 ICLK			323
0008 7095h	ICU	Interrupt request register 149	IR149	8	8	2 ICLK			323

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Table 4.1 List of I/O Registers (Address Order) (7/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 7096h	ICU	Interrupt request register 150	IR150	8	8	2 ICLK		ICUb	323
0008 7097h	ICU	Interrupt request register 151	IR151	8	8	2 ICLK			323
0008 7098h	ICU	Interrupt request register 152	IR152	8	8	2 ICLK			323
0008 7099h	ICU	Interrupt request register 153	IR153	8	8	2 ICLK			323
0008 709Ah	ICU	Interrupt request register 154	IR154	8	8	2 ICLK			323
0008 709Bh	ICU	Interrupt request register 155	IR155	8	8	2 ICLK			323
0008 709Ch	ICU	Interrupt request register 156	IR156	8	8	2 ICLK			323
0008 709Dh	ICU	Interrupt request register 157	IR157	8	8	2 ICLK			323
0008 709Eh	ICU	Interrupt request register 158	IR158	8	8	2 ICLK			323
0008 709Fh	ICU	Interrupt request register 159	IR159	8	8	2 ICLK			323
0008 70A0h	ICU	Interrupt request register 160	IR160	8	8	2 ICLK			323
0008 70A1h	ICU	Interrupt request register 161	IR161	8	8	2 ICLK			323
0008 70A2h	ICU	Interrupt request register 162	IR162	8	8	2 ICLK			323
0008 70A3h	ICU	Interrupt request register 163	IR163	8	8	2 ICLK			323
0008 70A4h	ICU	Interrupt request register 164	IR164	8	8	2 ICLK			323
0008 70A5h	ICU	Interrupt request register 165	IR165	8	8	2 ICLK			323
0008 70A6h	ICU	Interrupt request register 166	IR166	8	8	2 ICLK			323
0008 70A7h	ICU	Interrupt request register 167	IR167	8	8	2 ICLK			323
0008 70AAh	ICU	Interrupt request register 170	IR170	8	8	2 ICLK			323
0008 70ABh	ICU	Interrupt request register 171	IR171	8	8	2 ICLK			323
0008 70ACh	ICU	Interrupt request register 172	IR172	8	8	2 ICLK			323
0008 70ADh	ICU	Interrupt request register 173	IR173	8	8	2 ICLK			323
0008 70AEh	ICU	Interrupt request register 174	IR174	8	8	2 ICLK			323
0008 70AFh	ICU	Interrupt request register 175	IR175	8	8	2 ICLK			323
0008 70B0h	ICU	Interrupt request register 176	IR176	8	8	2 ICLK			323
0008 70B1h	ICU	Interrupt request register 177	IR177	8	8	2 ICLK			323
0008 70B2h	ICU	Interrupt request register 178	IR178	8	8	2 ICLK			323
0008 70B3h	ICU	Interrupt request register 179	IR179	8	8	2 ICLK			323
0008 70B4h	ICU	Interrupt request register 180	IR180	8	8	2 ICLK			323
0008 70B5h	ICU	Interrupt request register 181	IR181	8	8	2 ICLK			323
0008 70B6h	ICU	Interrupt request register 182	IR182	8	8	2 ICLK			323
0008 70B7h	ICU	Interrupt request register 183	IR183	8	8	2 ICLK			323
0008 70B8h	ICU	Interrupt request register 184	IR184	8	8	2 ICLK			323
0008 70B9h	ICU	Interrupt request register 185	IR185	8	8	2 ICLK			323
0008 70BAh	ICU	Interrupt request register 186	IR186	8	8	2 ICLK			323
0008 70BBh	ICU	Interrupt request register 187	IR187	8	8	2 ICLK			323
0008 70BCh	ICU	Interrupt request register 188	IR188	8	8	2 ICLK			323
0008 70BDh	ICU	Interrupt request register 189	IR189	8	8	2 ICLK			323
0008 70BEh	ICU	Interrupt request register 190	IR190	8	8	2 ICLK			323
0008 70BFh	ICU	Interrupt request register 191	IR191	8	8	2 ICLK			323
0008 70C0h	ICU	Interrupt request register 192	IR192	8	8	2 ICLK			323
0008 70C1h	ICU	Interrupt request register 193	IR193	8	8	2 ICLK			323
0008 70C2h	ICU	Interrupt request register 194	IR194	8	8	2 ICLK			323
0008 70C3h	ICU	Interrupt request register 195	IR195	8	8	2 ICLK			323
0008 70C4h	ICU	Interrupt request register 196	IR196	8	8	2 ICLK			323
0008 70C5h	ICU	Interrupt request register 197	IR197	8	8	2 ICLK			323
0008 70C6h	ICU	Interrupt request register 198	IR198	8	8	2 ICLK			323
0008 70C7h	ICU	Interrupt request register 199	IR199	8	8	2 ICLK			323
0008 70C8h	ICU	Interrupt request register 200	IR200	8	8	2 ICLK			323
0008 70C9h	ICU	Interrupt request register 201	IR201	8	8	2 ICLK			323
0008 70CAh	ICU	Interrupt request register 202	IR202	8	8	2 ICLK			323

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Table 4.1 List of I/O Registers (Address Order) (8/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 70CBh	ICU	Interrupt request register 203	IR203	8	8	2 ICLK		ICUb	323
0008 70D6h	ICU	Interrupt request register 214	IR214	8	8	2 ICLK			323
0008 70D7h	ICU	Interrupt request register 215	IR215	8	8	2 ICLK			323
0008 70D8h	ICU	Interrupt request register 216	IR216	8	8	2 ICLK			323
0008 70D9h	ICU	Interrupt request register 217	IR217	8	8	2 ICLK			323
0008 70DAh	ICU	Interrupt request register 218	IR218	8	8	2 ICLK			323
0008 70DBh	ICU	Interrupt request register 219	IR219	8	8	2 ICLK			323
0008 70DCh	ICU	Interrupt request register 220	IR220	8	8	2 ICLK			323
0008 70DDh	ICU	Interrupt request register 221	IR221	8	8	2 ICLK			323
0008 70DEh	ICU	Interrupt request register 222	IR222	8	8	2 ICLK			323
0008 70DFh	ICU	Interrupt request register 223	IR223	8	8	2 ICLK			323
0008 70E0h	ICU	Interrupt request register 224	IR224	8	8	2 ICLK			323
0008 70E1h	ICU	Interrupt request register 225	IR225	8	8	2 ICLK			323
0008 70E2h	ICU	Interrupt request register 226	IR226	8	8	2 ICLK			323
0008 70E3h	ICU	Interrupt request register 227	IR227	8	8	2 ICLK			323
0008 70E4h	ICU	Interrupt request register 228	IR228	8	8	2 ICLK			323
0008 70E5h	ICU	Interrupt request register 229	IR229	8	8	2 ICLK			323
0008 70E6h	ICU	Interrupt request register 230	IR230	8	8	2 ICLK			323
0008 70E7h	ICU	Interrupt request register 231	IR231	8	8	2 ICLK			323
0008 70E8h	ICU	Interrupt request register 232	IR232	8	8	2 ICLK			323
0008 70E9h	ICU	Interrupt request register 233	IR233	8	8	2 ICLK			323
0008 70EAh	ICU	Interrupt request register 234	IR234	8	8	2 ICLK			323
0008 70EBh	ICU	Interrupt request register 235	IR235	8	8	2 ICLK			323
0008 70ECh	ICU	Interrupt request register 236	IR236	8	8	2 ICLK			323
0008 70EDh	ICU	Interrupt request register 237	IR237	8	8	2 ICLK			323
0008 70EEh	ICU	Interrupt request register 238	IR238	8	8	2 ICLK			323
0008 70EFh	ICU	Interrupt request register 239	IR239	8	8	2 ICLK			323
0008 70F0h	ICU	Interrupt request register 240	IR240	8	8	2 ICLK			323
0008 70F1h	ICU	Interrupt request register 241	IR241	8	8	2 ICLK			323
0008 70F2h	ICU	Interrupt request register 242	IR242	8	8	2 ICLK			323
0008 70F3h	ICU	Interrupt request register 243	IR243	8	8	2 ICLK			323
0008 70F4h	ICU	Interrupt request register 244	IR244	8	8	2 ICLK			323
0008 70F5h	ICU	Interrupt request register 245	IR245	8	8	2 ICLK			323
0008 70F6h	ICU	Interrupt request register 246	IR246	8	8	2 ICLK			323
0008 70F7h	ICU	Interrupt request register 247	IR247	8	8	2 ICLK			323
0008 70F8h	ICU	Interrupt request register 248	IR248	8	8	2 ICLK			323
0008 70F9h	ICU	Interrupt request register 249	IR249	8	8	2 ICLK			323
0008 70FAh	ICU	Interrupt request register 250	IR250	8	8	2 ICLK			323
0008 70FBh	ICU	Interrupt request register 251	IR251	8	8	2 ICLK			323
0008 70FCh	ICU	Interrupt request register 252	IR252	8	8	2 ICLK			323
0008 70FDh	ICU	Interrupt request register 253	IR253	8	8	2 ICLK			323
0008 711Bh	ICU	DTC activation enable register 027	DTCER027	8	8	2 ICLK			327
0008 711Ch	ICU	DTC activation enable register 028	DTCER028	8	8	2 ICLK			327
0008 711Dh	ICU	DTC activation enable register 029	DTCER029	8	8	2 ICLK			327
0008 711Eh	ICU	DTC activation enable register 030	DTCER030	8	8	2 ICLK			327
0008 711Fh	ICU	DTC activation enable register 031	DTCER031	8	8	2 ICLK			327
0008 7121h	ICU	DTC activation enable register 033	DTCER033	8	8	2 ICLK			327
0008 7122h	ICU	DTC activation enable register 034	DTCER034	8	8	2 ICLK			327
0008 7124h	ICU	DTC activation enable register 036	DTCER036	8	8	2 ICLK			327
0008 7125h	ICU	DTC activation enable register 037	DTCER037	8	8	2 ICLK			327
0008 7127h	ICU	DTC activation enable register 039	DTCER039	8	8	2 ICLK			327

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Table 4.1 List of I/O Registers (Address Order) (9/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 7128h	ICU	DTC activation enable register 040	DTCER040	8	8	2 ICLK		ICUb	327
0008 712Ah	ICU	DTC activation enable register 042	DTCER042	8	8	2 ICLK			327
0008 712Bh	ICU	DTC activation enable register 043	DTCER043	8	8	2 ICLK			327
0008 712Dh	ICU	DTC activation enable register 045	DTCER045	8	8	2 ICLK			327
0008 712Eh	ICU	DTC activation enable register 046	DTCER046	8	8	2 ICLK			327
0008 7140h	ICU	DTC activation enable register 064	DTCER064	8	8	2 ICLK			327
0008 7141h	ICU	DTC activation enable register 065	DTCER065	8	8	2 ICLK			327
0008 7142h	ICU	DTC activation enable register 066	DTCER066	8	8	2 ICLK			327
0008 7143h	ICU	DTC activation enable register 067	DTCER067	8	8	2 ICLK			327
0008 7144h	ICU	DTC activation enable register 068	DTCER068	8	8	2 ICLK			327
0008 7145h	ICU	DTC activation enable register 069	DTCER069	8	8	2 ICLK			327
0008 7146h	ICU	DTC activation enable register 070	DTCER070	8	8	2 ICLK			327
0008 7147h	ICU	DTC activation enable register 071	DTCER071	8	8	2 ICLK			327
0008 7148h	ICU	DTC activation enable register 072	DTCER072	8	8	2 ICLK			327
0008 7149h	ICU	DTC activation enable register 073	DTCER073	8	8	2 ICLK			327
0008 714Ah	ICU	DTC activation enable register 074	DTCER074	8	8	2 ICLK			327
0008 714Bh	ICU	DTC activation enable register 075	DTCER075	8	8	2 ICLK			327
0008 714Ch	ICU	DTC activation enable register 076	DTCER076	8	8	2 ICLK			327
0008 714Dh	ICU	DTC activation enable register 077	DTCER077	8	8	2 ICLK			327
0008 714Eh	ICU	DTC activation enable register 078	DTCER078	8	8	2 ICLK			327
0008 714Fh	ICU	DTC activation enable register 079	DTCER079	8	8	2 ICLK			327
0008 7162h	ICU	DTC activation enable register 098	DTCER098	8	8	2 ICLK			327
0008 7166h	ICU	DTC activation enable register 102	DTCER102	8	8	2 ICLK			327
0008 717Eh	ICU	DTC activation enable register 126	DTCER126	8	8	2 ICLK			327
0008 717Fh	ICU	DTC activation enable register 127	DTCER127	8	8	2 ICLK			327
0008 7180h	ICU	DTC activation enable register 128	DTCER128	8	8	2 ICLK			327
0008 7181h	ICU	DTC activation enable register 129	DTCER129	8	8	2 ICLK			327
0008 7182h	ICU	DTC activation enable register 130	DTCER130	8	8	2 ICLK			327
0008 7183h	ICU	DTC activation enable register 131	DTCER131	8	8	2 ICLK			327
0008 7184h	ICU	DTC activation enable register 132	DTCER132	8	8	2 ICLK			327
0008 7185h	ICU	DTC activation enable register 133	DTCER133	8	8	2 ICLK			327
0008 7186h	ICU	DTC activation enable register 134	DTCER134	8	8	2 ICLK			327
0008 7187h	ICU	DTC activation enable register 135	DTCER135	8	8	2 ICLK			327
0008 7188h	ICU	DTC activation enable register 136	DTCER136	8	8	2 ICLK			327
0008 7189h	ICU	DTC activation enable register 137	DTCER137	8	8	2 ICLK			327
0008 718Ah	ICU	DTC activation enable register 138	DTCER138	8	8	2 ICLK			327
0008 718Bh	ICU	DTC activation enable register 139	DTCER139	8	8	2 ICLK			327
0008 718Ch	ICU	DTC activation enable register 140	DTCER140	8	8	2 ICLK			327
0008 718Dh	ICU	DTC activation enable register 141	DTCER141	8	8	2 ICLK			327
0008 718Eh	ICU	DTC activation enable register 142	DTCER142	8	8	2 ICLK			327
0008 718Fh	ICU	DTC activation enable register 143	DTCER143	8	8	2 ICLK			327
0008 7190h	ICU	DTC activation enable register 144	DTCER144	8	8	2 ICLK			327
0008 7191h	ICU	DTC activation enable register 145	DTCER145	8	8	2 ICLK			327
0008 7194h	ICU	DTC activation enable register 148	DTCER148	8	8	2 ICLK			327
0008 7195h	ICU	DTC activation enable register 149	DTCER149	8	8	2 ICLK			327
0008 7196h	ICU	DTC activation enable register 150	DTCER150	8	8	2 ICLK			327
0008 7197h	ICU	DTC activation enable register 151	DTCER151	8	8	2 ICLK			327
0008 7198h	ICU	DTC activation enable register 152	DTCER152	8	8	2 ICLK			327
0008 7199h	ICU	DTC activation enable register 153	DTCER153	8	8	2 ICLK			327
0008 719Ah	ICU	DTC activation enable register 154	DTCER154	8	8	2 ICLK			327
0008 719Bh	ICU	DTC activation enable register 155	DTCER155	8	8	2 ICLK			327

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Table 4.1 List of I/O Registers (Address Order) (10/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 719Ch	ICU	DTC activation enable register 156	DTCER156	8	8	2 ICLK		ICUb	327
0008 719Dh	ICU	DTC activation enable register 157	DTCER157	8	8	2 ICLK			327
0008 719Eh	ICU	DTC activation enable register 158	DTCER158	8	8	2 ICLK			327
0008 719Fh	ICU	DTC activation enable register 159	DTCER159	8	8	2 ICLK			327
0008 71A0h	ICU	DTC activation enable register 160	DTCER160	8	8	2 ICLK			327
0008 71A1h	ICU	DTC activation enable register 161	DTCER161	8	8	2 ICLK			327
0008 71A2h	ICU	DTC activation enable register 162	DTCER162	8	8	2 ICLK			327
0008 71A3h	ICU	DTC activation enable register 163	DTCER163	8	8	2 ICLK			327
0008 71A4h	ICU	DTC activation enable register 164	DTCER164	8	8	2 ICLK			327
0008 71A5h	ICU	DTC activation enable register 165	DTCER165	8	8	2 ICLK			327
0008 71AAh	ICU	DTC activation enable register 170	DTCER170	8	8	2 ICLK			327
0008 71ABh	ICU	DTC activation enable register 171	DTCER171	8	8	2 ICLK			327
0008 71ADh	ICU	DTC activation enable register 173	DTCER173	8	8	2 ICLK			327
0008 71AEh	ICU	DTC activation enable register 174	DTCER174	8	8	2 ICLK			327
0008 71B0h	ICU	DTC activation enable register 176	DTCER176	8	8	2 ICLK			327
0008 71B1h	ICU	DTC activation enable register 177	DTCER177	8	8	2 ICLK			327
0008 71B3h	ICU	DTC activation enable register 179	DTCER179	8	8	2 ICLK			327
0008 71B4h	ICU	DTC activation enable register 180	DTCER180	8	8	2 ICLK			327
0008 71B7h	ICU	DTC activation enable register 183	DTCER183	8	8	2 ICLK			327
0008 71B8h	ICU	DTC activation enable register 184	DTCER184	8	8	2 ICLK			327
0008 71BBh	ICU	DTC activation enable register 187	DTCER187	8	8	2 ICLK			327
0008 71BCh	ICU	DTC activation enable register 188	DTCER188	8	8	2 ICLK			327
0008 71BFh	ICU	DTC activation enable register 191	DTCER191	8	8	2 ICLK			327
0008 71C0h	ICU	DTC activation enable register 192	DTCER192	8	8	2 ICLK			327
0008 71C3h	ICU	DTC activation enable register 195	DTCER195	8	8	2 ICLK			327
0008 71C4h	ICU	DTC activation enable register 196	DTCER196	8	8	2 ICLK			327
0008 71C6h	ICU	DTC activation enable register 198	DTCER198	8	8	2 ICLK			327
0008 71C7h	ICU	DTC activation enable register 199	DTCER199	8	8	2 ICLK			327
0008 71C8h	ICU	DTC activation enable register 200	DTCER200	8	8	2 ICLK			327
0008 71C9h	ICU	DTC activation enable register 201	DTCER201	8	8	2 ICLK			327
0008 71CAh	ICU	DTC activation enable register 202	DTCER202	8	8	2 ICLK			327
0008 71CBh	ICU	DTC activation enable register 203	DTCER203	8	8	2 ICLK			327
0008 71D6h	ICU	DTC activation enable register 214	DTCER214	8	8	2 ICLK			327
0008 71D7h	ICU	DTC activation enable register 215	DTCER215	8	8	2 ICLK			327
0008 71D9h	ICU	DTC activation enable register 217	DTCER217	8	8	2 ICLK			327
0008 71DAh	ICU	DTC activation enable register 218	DTCER218	8	8	2 ICLK			327
0008 71DCh	ICU	DTC activation enable register 220	DTCER220	8	8	2 ICLK			327
0008 71DDh	ICU	DTC activation enable register 221	DTCER221	8	8	2 ICLK			327
0008 71DFh	ICU	DTC activation enable register 223	DTCER223	8	8	2 ICLK			327
0008 71E0h	ICU	DTC activation enable register 224	DTCER224	8	8	2 ICLK			327
0008 71E2h	ICU	DTC activation enable register 226	DTCER226	8	8	2 ICLK			327
0008 71E3h	ICU	DTC activation enable register 227	DTCER227	8	8	2 ICLK			327
0008 71E5h	ICU	DTC activation enable register 229	DTCER229	8	8	2 ICLK			327
0008 71E6h	ICU	DTC activation enable register 230	DTCER230	8	8	2 ICLK			327
0008 71E8h	ICU	DTC activation enable register 232	DTCER232	8	8	2 ICLK			327
0008 71E9h	ICU	DTC activation enable register 233	DTCER233	8	8	2 ICLK			327
0008 71EBh	ICU	DTC activation enable register 235	DTCER235	8	8	2 ICLK			327
0008 71ECh	ICU	DTC activation enable register 236	DTCER236	8	8	2 ICLK			327
0008 71EEh	ICU	DTC activation enable register 238	DTCER238	8	8	2 ICLK			327
0008 71EFh	ICU	DTC activation enable register 239	DTCER239	8	8	2 ICLK			327
0008 71F1h	ICU	DTC activation enable register 241	DTCER241	8	8	2 ICLK			327

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Table 4.1 List of I/O Registers (Address Order) (11/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 71F2h	ICU	DTC activation enable register 242	DTCER242	8	8	2 ICLK		ICUb	327
0008 71F4h	ICU	DTC activation enable register 244	DTCER244	8	8	2 ICLK			327
0008 71F5h	ICU	DTC activation enable register 245	DTCER245	8	8	2 ICLK			327
0008 71F7h	ICU	DTC activation enable register 247	DTCER247	8	8	2 ICLK			327
0008 71F8h	ICU	DTC activation enable register 248	DTCER248	8	8	2 ICLK			327
0008 71FAh	ICU	DTC activation enable register 250	DTCER250	8	8	2 ICLK			327
0008 71FBh	ICU	DTC activation enable register 251	DTCER251	8	8	2 ICLK			327
0008 7202h	ICU	Interrupt request enable register 02	IER02	8	8	2 ICLK			324
0008 7203h	ICU	Interrupt request enable register 03	IER03	8	8	2 ICLK			324
0008 7204h	ICU	Interrupt request enable register 04	IER04	8	8	2 ICLK			324
0008 7205h	ICU	Interrupt request enable register 05	IER05	8	8	2 ICLK			324
0008 7206h	ICU	Interrupt request enable register 06	IER06	8	8	2 ICLK			324
0008 7207h	ICU	Interrupt request enable register 07	IER07	8	8	2 ICLK			324
0008 7208h	ICU	Interrupt request enable register 08	IER08	8	8	2 ICLK			324
0008 7209h	ICU	Interrupt request enable register 09	IER09	8	8	2 ICLK			324
0008 720Bh	ICU	Interrupt request enable register 0B	IER0B	8	8	2 ICLK			324
0008 720Ch	ICU	Interrupt request enable register 0C	IER0C	8	8	2 ICLK			324
0008 720Dh	ICU	Interrupt request enable register 0D	IER0D	8	8	2 ICLK			324
0008 720Eh	ICU	Interrupt request enable register 0E	IER0E	8	8	2 ICLK			324
0008 720Fh	ICU	Interrupt request enable register 0F	IER0F	8	8	2 ICLK			324
0008 7210h	ICU	Interrupt request enable register 10	IER10	8	8	2 ICLK			324
0008 7211h	ICU	Interrupt request enable register 11	IER11	8	8	2 ICLK			324
0008 7212h	ICU	Interrupt request enable register 12	IER12	8	8	2 ICLK			324
0008 7213h	ICU	Interrupt request enable register 13	IER13	8	8	2 ICLK			324
0008 7214h	ICU	Interrupt request enable register 14	IER14	8	8	2 ICLK			324
0008 7215h	ICU	Interrupt request enable register 15	IER15	8	8	2 ICLK			324
0008 7216h	ICU	Interrupt request enable register 16	IER16	8	8	2 ICLK			324
0008 7217h	ICU	Interrupt request enable register 17	IER17	8	8	2 ICLK			324
0008 7218h	ICU	Interrupt request enable register 18	IER18	8	8	2 ICLK			324
0008 7219h	ICU	Interrupt request enable register 19	IER19	8	8	2 ICLK			324
0008 721Ah	ICU	Interrupt request enable register 1A	IER1A	8	8	2 ICLK			324
0008 721Bh	ICU	Interrupt request enable register 1B	IER1B	8	8	2 ICLK			324
0008 721Ch	ICU	Interrupt request enable register 1C	IER1C	8	8	2 ICLK			324
0008 721Dh	ICU	Interrupt request enable register 1D	IER1D	8	8	2 ICLK			324
0008 721Eh	ICU	Interrupt request enable register 1E	IER1E	8	8	2 ICLK			324
0008 721Fh	ICU	Interrupt request enable register 1F	IER1F	8	8	2 ICLK			324
0008 72E0h	ICU	Software interrupt activation register	SWINTR	8	8	2 ICLK			327
0008 72F0h	ICU	Fast interrupt set register	FIR	16	16	2 ICLK			326
0008 7300h	ICU	Interrupt source priority register 000	IPR000	8	8	2 ICLK			325
0008 7301h	ICU	Interrupt source priority register 001	IPR001	8	8	2 ICLK			325
0008 7302h	ICU	Interrupt source priority register 002	IPR002	8	8	2 ICLK			325
0008 7303h	ICU	Interrupt source priority register 003	IPR003	8	8	2 ICLK			325
0008 7304h	ICU	Interrupt source priority register 004	IPR004	8	8	2 ICLK			325
0008 7305h	ICU	Interrupt source priority register 005	IPR005	8	8	2 ICLK			325
0008 7306h	ICU	Interrupt source priority register 006	IPR006	8	8	2 ICLK			325
0008 7307h	ICU	Interrupt source priority register 007	IPR007	8	8	2 ICLK			325
0008 7320h	ICU	Interrupt source priority register 032	IPR032	8	8	2 ICLK			325
0008 7321h	ICU	Interrupt source priority register 033	IPR033	8	8	2 ICLK			325
0008 7322h	ICU	Interrupt source priority register 034	IPR034	8	8	2 ICLK			325
0008 7323h	ICU	Interrupt source priority register 035	IPR035	8	8	2 ICLK			325
0008 7324h	ICU	Interrupt source priority register 036	IPR036	8	8	2 ICLK			325

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Table 4.1 List of I/O Registers (Address Order) (12/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 7325h	ICU	Interrupt source priority register 037	IPR037	8	8	2 ICLK		ICUb	325
0008 7326h	ICU	Interrupt source priority register 038	IPR038	8	8	2 ICLK			325
0008 7327h	ICU	Interrupt source priority register 039	IPR039	8	8	2 ICLK			325
0008 732Ah	ICU	Interrupt source priority register 042	IPR042	8	8	2 ICLK			325
0008 732Dh	ICU	Interrupt source priority register 045	IPR045	8	8	2 ICLK			325
0008 7330h	ICU	Interrupt source priority register 048	IPR048	8	8	2 ICLK			325
0008 7334h	ICU	Interrupt source priority register 052	IPR052	8	8	2 ICLK			325
0008 7338h	ICU	Interrupt source priority register 056	IPR056	8	8	2 ICLK			325
0008 733Eh	ICU	Interrupt source priority register 062	IPR062	8	8	2 ICLK			325
0008 7340h	ICU	Interrupt source priority register 064	IPR064	8	8	2 ICLK			325
0008 7341h	ICU	Interrupt source priority register 065	IPR065	8	8	2 ICLK			325
0008 7342h	ICU	Interrupt source priority register 066	IPR066	8	8	2 ICLK			325
0008 7343h	ICU	Interrupt source priority register 067	IPR067	8	8	2 ICLK			325
0008 7344h	ICU	Interrupt source priority register 068	IPR068	8	8	2 ICLK			325
0008 7345h	ICU	Interrupt source priority register 069	IPR069	8	8	2 ICLK			325
0008 7346h	ICU	Interrupt source priority register 070	IPR070	8	8	2 ICLK			325
0008 7347h	ICU	Interrupt source priority register 071	IPR071	8	8	2 ICLK			325
0008 7348h	ICU	Interrupt source priority register 072	IPR072	8	8	2 ICLK			325
0008 7349h	ICU	Interrupt source priority register 073	IPR073	8	8	2 ICLK			325
0008 734Ah	ICU	Interrupt source priority register 074	IPR074	8	8	2 ICLK			325
0008 734Bh	ICU	Interrupt source priority register 075	IPR075	8	8	2 ICLK			325
0008 734Ch	ICU	Interrupt source priority register 076	IPR076	8	8	2 ICLK			325
0008 734Dh	ICU	Interrupt source priority register 077	IPR077	8	8	2 ICLK			325
0008 734Eh	ICU	Interrupt source priority register 078	IPR078	8	8	2 ICLK			325
0008 734Fh	ICU	Interrupt source priority register 079	IPR079	8	8	2 ICLK			325
0008 735Ah	ICU	Interrupt source priority register 090	IPR090	8	8	2 ICLK			325
0008 735Bh	ICU	Interrupt source priority register 091	IPR091	8	8	2 ICLK			325
0008 735Ch	ICU	Interrupt source priority register 092	IPR092	8	8	2 ICLK			325
0008 735Dh	ICU	Interrupt source priority register 093	IPR093	8	8	2 ICLK			325
0008 7362h	ICU	Interrupt source priority register 098	IPR098	8	8	2 ICLK			325
0008 7366h	ICU	Interrupt source priority register 102	IPR102	8	8	2 ICLK			325
0008 736Ah	ICU	Interrupt source priority register 106	IPR106	8	8	2 ICLK			325
0008 736Bh	ICU	Interrupt source priority register 107	IPR107	8	8	2 ICLK			325
0008 736Ch	ICU	Interrupt source priority register 108	IPR108	8	8	2 ICLK			325
0008 736Dh	ICU	Interrupt source priority register 109	IPR109	8	8	2 ICLK			325
0008 736Eh	ICU	Interrupt source priority register 110	IPR110	8	8	2 ICLK			325
0008 736Fh	ICU	Interrupt source priority register 111	IPR111	8	8	2 ICLK			325
0008 7370h	ICU	Interrupt source priority register 112	IPR112	8	8	2 ICLK			325
0008 7372h	ICU	Interrupt source priority register 114	IPR114	8	8	2 ICLK			325
0008 737Ah	ICU	Interrupt source priority register 122	IPR122	8	8	2 ICLK			325
0008 737Eh	ICU	Interrupt source priority register 126	IPR126	8	8	2 ICLK			325
0008 7382h	ICU	Interrupt source priority register 130	IPR130	8	8	2 ICLK			325
0008 7384h	ICU	Interrupt source priority register 132	IPR132	8	8	2 ICLK			325
0008 7386h	ICU	Interrupt source priority register 134	IPR134	8	8	2 ICLK			325
0008 738Ah	ICU	Interrupt source priority register 138	IPR138	8	8	2 ICLK			325
0008 738Ch	ICU	Interrupt source priority register 140	IPR140	8	8	2 ICLK			325
0008 738Eh	ICU	Interrupt source priority register 142	IPR142	8	8	2 ICLK			325
0008 7392h	ICU	Interrupt source priority register 146	IPR146	8	8	2 ICLK			325
0008 7394h	ICU	Interrupt source priority register 148	IPR148	8	8	2 ICLK			325
0008 7396h	ICU	Interrupt source priority register 150	IPR150	8	8	2 ICLK			325
0008 7398h	ICU	Interrupt source priority register 152	IPR152	8	8	2 ICLK			325

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Table 4.1 List of I/O Registers (Address Order) (13/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 739Ch	ICU	Interrupt source priority register 156	IPR156	8	8	2 ICLK		ICUb	325
0008 73A0h	ICU	Interrupt source priority register 160	IPR160	8	8	2 ICLK			325
0008 73A1h	ICU	Interrupt source priority register 161	IPR161	8	8	2 ICLK			325
0008 73A4h	ICU	Interrupt source priority register 164	IPR164	8	8	2 ICLK			325
0008 73A6h	ICU	Interrupt source priority register 166	IPR166	8	8	2 ICLK			325
0008 73AAh	ICU	Interrupt source priority register 170	IPR170	8	8	2 ICLK			325
0008 73ADh	ICU	Interrupt source priority register 173	IPR173	8	8	2 ICLK			325
0008 73B0h	ICU	Interrupt source priority register 176	IPR176	8	8	2 ICLK			325
0008 73B3h	ICU	Interrupt source priority register 179	IPR179	8	8	2 ICLK			325
0008 73B6h	ICU	Interrupt source priority register 182	IPR182	8	8	2 ICLK			325
0008 73B7h	ICU	Interrupt source priority register 183	IPR183	8	8	2 ICLK			325
0008 73B8h	ICU	Interrupt source priority register 184	IPR184	8	8	2 ICLK			325
0008 73B9h	ICU	Interrupt source priority register 185	IPR185	8	8	2 ICLK			325
0008 73BAh	ICU	Interrupt source priority register 186	IPR186	8	8	2 ICLK			325
0008 73BBh	ICU	Interrupt source priority register 187	IPR187	8	8	2 ICLK			325
0008 73BCh	ICU	Interrupt source priority register 188	IPR188	8	8	2 ICLK			325
0008 73BDh	ICU	Interrupt source priority register 189	IPR189	8	8	2 ICLK			325
0008 73BEh	ICU	Interrupt source priority register 190	IPR190	8	8	2 ICLK			325
0008 73BFh	ICU	Interrupt source priority register 191	IPR191	8	8	2 ICLK			325
0008 73C0h	ICU	Interrupt source priority register 192	IPR192	8	8	2 ICLK			325
0008 73C1h	ICU	Interrupt source priority register 193	IPR193	8	8	2 ICLK			325
0008 73C2h	ICU	Interrupt source priority register 194	IPR194	8	8	2 ICLK			325
0008 73C3h	ICU	Interrupt source priority register 195	IPR195	8	8	2 ICLK			325
0008 73C4h	ICU	Interrupt source priority register 196	IPR196	8	8	2 ICLK			325
0008 73C5h	ICU	Interrupt source priority register 197	IPR197	8	8	2 ICLK			325
0008 73C6h	ICU	Interrupt source priority register 198	IPR198	8	8	2 ICLK			325
0008 73C7h	ICU	Interrupt source priority register 199	IPR199	8	8	2 ICLK			325
0008 73C8h	ICU	Interrupt source priority register 200	IPR200	8	8	2 ICLK			325
0008 73C9h	ICU	Interrupt source priority register 201	IPR201	8	8	2 ICLK			325
0008 73CAh	ICU	Interrupt source priority register 202	IPR202	8	8	2 ICLK			325
0008 73CBh	ICU	Interrupt source priority register 203	IPR203	8	8	2 ICLK			325
0008 73D6h	ICU	Interrupt source priority register 214	IPR214	8	8	2 ICLK			325
0008 73D9h	ICU	Interrupt source priority register 217	IPR217	8	8	2 ICLK			325
0008 73DCh	ICU	Interrupt source priority register 220	IPR220	8	8	2 ICLK			325
0008 73DFh	ICU	Interrupt source priority register 223	IPR223	8	8	2 ICLK			325
0008 73E2h	ICU	Interrupt source priority register 226	IPR226	8	8	2 ICLK			325
0008 73E5h	ICU	Interrupt source priority register 229	IPR229	8	8	2 ICLK			325
0008 73E8h	ICU	Interrupt source priority register 232	IPR232	8	8	2 ICLK			325
0008 73EBh	ICU	Interrupt source priority register 235	IPR235	8	8	2 ICLK			325
0008 73EEh	ICU	Interrupt source priority register 238	IPR238	8	8	2 ICLK			325
0008 73F1h	ICU	Interrupt source priority register 241	IPR241	8	8	2 ICLK			325
0008 73F4h	ICU	Interrupt source priority register 244	IPR244	8	8	2 ICLK			325
0008 73F7h	ICU	Interrupt source priority register 247	IPR247	8	8	2 ICLK			325
0008 73FAh	ICU	Interrupt source priority register 250	IPR250	8	8	2 ICLK			325
0008 73FDh	ICU	Interrupt source priority register 253	IPR253	8	8	2 ICLK			325
0008 7400h	ICU	DMAC activation request select register 0	DMRSR0	8	8	2 ICLK			328
0008 7404h	ICU	DMAC activation request select register 1	DMRSR1	8	8	2 ICLK			328
0008 7408h	ICU	DMAC activation request select register 2	DMRSR2	8	8	2 ICLK			328
0008 740Ch	ICU	DMAC activation request select register 3	DMRSR3	8	8	2 ICLK			328
0008 7500h	ICU	IRQ control register 0	IRQCR0	8	8	2 ICLK			329
0008 7501h	ICU	IRQ control register 1	IRQCR1	8	8	2 ICLK			329

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Table 4.1 List of I/O Registers (Address Order) (14/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 7502h	ICU	IRQ control register 2	IRQCR2	8	8	2 ICLK		ICUb	329
0008 7503h	ICU	IRQ control register 3	IRQCR3	8	8	2 ICLK			329
0008 7504h	ICU	IRQ control register 4	IRQCR4	8	8	2 ICLK			329
0008 7505h	ICU	IRQ control register 5	IRQCR5	8	8	2 ICLK			329
0008 7506h	ICU	IRQ control register 6	IRQCR6	8	8	2 ICLK			329
0008 7507h	ICU	IRQ control register 7	IRQCR7	8	8	2 ICLK			329
0008 7508h	ICU	IRQ control register 8	IRQCR8	8	8	2 ICLK			329
0008 7509h	ICU	IRQ control register 9	IRQCR9	8	8	2 ICLK			329
0008 750Ah	ICU	IRQ control register 10	IRQCR10	8	8	2 ICLK			329
0008 750Bh	ICU	IRQ control register 11	IRQCR11	8	8	2 ICLK			329
0008 750Ch	ICU	IRQ control register 12	IRQCR12	8	8	2 ICLK			329
0008 750Dh	ICU	IRQ control register 13	IRQCR13	8	8	2 ICLK			329
0008 750Eh	ICU	IRQ control register 14	IRQCR14	8	8	2 ICLK			329
0008 750Fh	ICU	IRQ control register 15	IRQCR15	8	8	2 ICLK			329
0008 7510h	ICU	IRQ pin digital filter enable register 0	IRQFLTE0	8	8	2 ICLK			330
0008 7511h	ICU	IRQ pin digital filter enable register 1	IRQFLTE1	8	8	2 ICLK			331
0008 7514h	ICU	IRQ pin digital filter setting register 0	IRQFLTC0	16	16	2 ICLK			332
0008 7516h	ICU	IRQ pin digital filter setting register 1	IRQFLTC1	16	16	2 ICLK			333
0008 7580h	ICU	Non-maskable interrupt status register	NMISR	8	8	2 ICLK			334
0008 7581h	ICU	Non-maskable interrupt enable register	NMIER	8	8	2 ICLK			336
0008 7582h	ICU	Non-maskable interrupt status clear register	NMICLR	8	8	2 ICLK			337
0008 7583h	ICU	NMI pin interrupt control register	NMICR	8	8	2 ICLK			338
0008 7590h	ICU	NMI pin digital filter enable register	NMIFLTE	8	8	2 ICLK			338
0008 7594h	ICU	NMI pin digital filter setting register	NMIFLTC	16	16	2 ICLK			339
0008 8000h	CMT	Compare match timer start register 0	CMSTR0	16	16	2, 3 PCLKB	2 ICLK	CMT	1025
0008 8002h	CMT0	Compare match timer control register	CMCR	16	16	2, 3 PCLKB	2 ICLK		1026
0008 8004h	CMT0	Compare match timer counter	CMCNT	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8006h	CMT0	Compare match timer constant register	CMCOR	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8008h	CMT1	Compare match timer control register	CMCR	16	16	2, 3 PCLKB	2 ICLK		1026
0008 800Ah	CMT1	Compare match timer counter	CMCNT	16	16	2, 3 PCLKB	2 ICLK		1027
0008 800Ch	CMT1	Compare match timer constant register	CMCOR	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8010h	CMT	Compare match timer start register 1	CMSTR1	16	16	2, 3 PCLKB	2 ICLK		1025
0008 8012h	CMT2	Compare match timer control register	CMCR	16	16	2, 3 PCLKB	2 ICLK		1026
0008 8014h	CMT2	Compare match timer counter	CMCNT	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8016h	CMT2	Compare match timer constant register	CMCOR	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8018h	CMT3	Compare match timer control register	CMCR	16	16	2, 3 PCLKB	2 ICLK		1026
0008 801Ah	CMT3	Compare match timer counter	CMCNT	16	16	2, 3 PCLKB	2 ICLK		1027
0008 801Ch	CMT3	Compare match timer constant register	CMCOR	16	16	2, 3 PCLKB	2 ICLK		1027
0008 8020h	WDT	WDT refresh register	WDTRR	8	8	2, 3 PCLKB	2 ICLK	WDTA	1071
0008 8022h	WDT	WDT control register	WDTCR	16	16	2, 3 PCLKB	2 ICLK		1072
0008 8024h	WDT	WDT status register	WDTSR	16	16	2, 3 PCLKB	2 ICLK		1075
0008 8026h	WDT	WDT reset control register	WDTRCR	8	8	2, 3 PCLKB	2 ICLK		1076
0008 8030h	IWDT	IWDT refresh register	IWDTRR	8	8	2, 3 PCLKB	2 ICLK	IWDTa	1086
0008 8032h	IWDT	IWDT control register	IWDTCR	16	16	2, 3 PCLKB	2 ICLK		1087
0008 8034h	IWDT	IWDT status register	IWDTSR	16	16	2, 3 PCLKB	2 ICLK		1090
0008 8036h	IWDT	IWDT reset control register	IWDTRCR	8	8	2, 3 PCLKB	2 ICLK		1091
0008 8038h	IWDT	IWDT count stop control register	IWDTCSTPR	8	8	2, 3 PCLKB	2 ICLK		1091
0008 80C0h	DA	D/A data register 0	DADR0	16	16	2, 3 PCLKB	2 ICLK	DAa	1711
0008 80C2h	DA	D/A data register 1	DADR1	16	16	2, 3 PCLKB	2 ICLK		1711
0008 80C4h	DA	D/A control register	DACR	8	8	2, 3 PCLKB	2 ICLK		1712
0008 80C5h	DA	DADRm format select register	DADPR	8	8	2, 3 PCLKB	2 ICLK		1713

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Table 4.1 List of I/O Registers (Address Order) (15/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 80C6h	DA	D/A A/D synchronous start control register	DAADSCR	8	8	2, 3 PCLKB	2 ICLK	DAa	1714
0008 8100h	TPUA	Timer start register	TSTR	8	8	2, 3 PCLKB	2 ICLK	TPUa	926
0008 8101h	TPUA	Timer synchronous register	TSYR	8	8	2, 3 PCLKB	2 ICLK		927
0008 8108h	TPU0	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 8109h	TPU1	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 810Ah	TPU2	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 810Bh	TPU3	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 810Ch	TPU4	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 810Dh	TPU5	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 8110h	TPU0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8111h	TPU0	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8112h	TPU0	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		911
0008 8113h	TPU0	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		911
0008 8114h	TPU0	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8115h	TPU0	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8116h	TPU0	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8118h	TPU0	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 811Ah	TPU0	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 811Ch	TPU0	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		925
0008 811Eh	TPU0	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		925
0008 8120h	TPU1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8121h	TPU1	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8122h	TPU1	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 8124h	TPU1	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8125h	TPU1	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8126h	TPU1	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8128h	TPU1	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 812Ah	TPU1	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 8130h	TPU2	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8131h	TPU2	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8132h	TPU2	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 8134h	TPU2	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8135h	TPU2	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8136h	TPU2	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8138h	TPU2	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 813Ah	TPU2	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 8140h	TPU3	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8141h	TPU3	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8142h	TPU3	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		911
0008 8143h	TPU3	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		911
0008 8144h	TPU3	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8145h	TPU3	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8146h	TPU3	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8148h	TPU3	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 814Ah	TPU3	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 814Ch	TPU3	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		925
0008 814Eh	TPU3	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		925
0008 8150h	TPU4	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8151h	TPU4	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8152h	TPU4	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 8154h	TPU4	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921

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Table 4.1 List of I/O Registers (Address Order) (16/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 8155h	TPU4	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	TPUa	922
0008 8156h	TPU4	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8158h	TPU4	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 815Ah	TPU4	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 8160h	TPU5	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8161h	TPU5	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8162h	TPU5	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 8164h	TPU5	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8165h	TPU5	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8166h	TPU5	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8168h	TPU5	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 816Ah	TPU5	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 8170h	TPUB	Timer start register	TSTR	8	8	2, 3 PCLKB	2 ICLK		926
0008 8171h	TPUB	Timer synchronous register	TSYR	8	8	2, 3 PCLKB	2 ICLK		927
0008 8178h	TPU6	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 8179h	TPU7	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 817Ah	TPU8	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 817Bh	TPU9	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 817Ch	TPU10	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 817Dh	TPU11	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK		928
0008 8180h	TPU6	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8181h	TPU6	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8182h	TPU6	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		911
0008 8183h	TPU6	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		911
0008 8184h	TPU6	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8185h	TPU6	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8186h	TPU6	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8188h	TPU6	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 818Ah	TPU6	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 818Ch	TPU6	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		925
0008 818Eh	TPU6	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		925
0008 8190h	TPU7	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 8191h	TPU7	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 8192h	TPU7	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 8194h	TPU7	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 8195h	TPU7	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 8196h	TPU7	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 8198h	TPU7	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 819Ah	TPU7	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 81A0h	TPU8	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 81A1h	TPU8	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 81A2h	TPU8	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 81A4h	TPU8	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 81A5h	TPU8	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 81A6h	TPU8	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 81A8h	TPU8	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 81AAh	TPU8	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 81B0h	TPU9	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 81B1h	TPU9	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 81B2h	TPU9	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		911
0008 81B3h	TPU9	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		911

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Table 4.1 List of I/O Registers (Address Order) (17/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 81B4h	TPU9	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	TPUa	921
0008 81B5h	TPU9	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 81B6h	TPU9	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 81B8h	TPU9	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 81BAh	TPU9	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 81BCh	TPU9	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		925
0008 81BEh	TPU9	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		925
0008 81C0h	TPU10	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 81C1h	TPU10	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 81C2h	TPU10	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 81C4h	TPU10	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 81C5h	TPU10	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 81C6h	TPU10	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 81C8h	TPU10	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 81CAh	TPU10	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 81D0h	TPU11	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		905
0008 81D1h	TPU11	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		910
0008 81D2h	TPU11	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		911
0008 81D4h	TPU11	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		921
0008 81D5h	TPU11	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		922
0008 81D6h	TPU11	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		924
0008 81D8h	TPU11	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		925
0008 81DAh	TPU11	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		925
0008 81E6h	PPG0	PPG output control register	PCR	8	8	2, 3 PCLKB	2 ICLK	PPG	984
0008 81E7h	PPG0	PPG output mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		986
0008 81E8h	PPG0	Next data enable register H	NDERH	8	8	2, 3 PCLKB	2 ICLK		975
0008 81E9h	PPG0	Next data enable register L	NDERL	8	8	2, 3 PCLKB	2 ICLK		975
0008 81EAh	PPG0	Output data register H	PODRH	8	8	2, 3 PCLKB	2 ICLK		977
0008 81EBh	PPG0	Output data register L	PODRL	8	8	2, 3 PCLKB	2 ICLK		977
0008 81ECh*1	PPG0	Next data register H	NDRH	8	8	2, 3 PCLKB	2 ICLK		980
0008 81EDh*2	PPG0	Next data register L	NDRL	8	8	2, 3 PCLKB	2 ICLK		980
0008 81EEh*1	PPG0	Next data register H	NDRH2	8	8	2, 3 PCLKB	2 ICLK		980
0008 81EFh*2	PPG0	Next data register L	NDRL2	8	8	2, 3 PCLKB	2 ICLK		980
0008 81F0h	PPG1	PPG trigger select register	PTRSLR	8	8	2, 3 PCLKB	2 ICLK		974
0008 81F6h	PPG1	PPG output control register	PCR	8	8	2, 3 PCLKB	2 ICLK		984
0008 81F7h	PPG1	PPG output mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		986
0008 81F8h	PPG1	Next data enable register H	NDERH	8	8	2, 3 PCLKB	2 ICLK		975
0008 81F9h	PPG1	Next data enable register L	NDERL	8	8	2, 3 PCLKB	2 ICLK		975
0008 81FAh	PPG1	Output data register H	PODRH	8	8	2, 3 PCLKB	2 ICLK		977
0008 81FBh	PPG1	Output data register L	PODRL	8	8	2, 3 PCLKB	2 ICLK		977
0008 81FCh*3	PPG1	Next data register H	NDRH	8	8	2, 3 PCLKB	2 ICLK		980
0008 81FDh*4	PPG1	Next data register L	NDRL	8	8	2, 3 PCLKB	2 ICLK		980
0008 81FEh*3	PPG1	Next data register H	NDRH2	8	8	2, 3 PCLKB	2 ICLK		980
0008 81FFh*4	PPG1	Next data register L	NDRL2	8	8	2, 3 PCLKB	2 ICLK		980

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Table 4.1 List of I/O Registers (Address Order) (18/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 8200h	TMR0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	TMR	1007
0008 8201h	TMR1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8202h	TMR0	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK		1010
0008 8203h	TMR1	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK		1010
0008 8204h	TMR0	Time constant register A	TCORA	8	8	2, 3 PCLKB	2 ICLK		1006
0008 8205h	TMR1	Time constant register A	TCORA	8	8*5	2, 3 PCLKB	2 ICLK		1006
0008 8206h	TMR0	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8207h	TMR1	Time constant register B	TCORB	8	8*5	2, 3 PCLKB	2 ICLK		1007
0008 8208h	TMR0	Timer counter	TCNT	8	8	2, 3 PCLKB	2 ICLK		1006
0008 8209h	TMR1	Timer counter	TCNT	8	8*5	2, 3 PCLKB	2 ICLK		1006
0008 820Ah	TMR0	Timer counter control register	TCCR	8	8	2, 3 PCLKB	2 ICLK		1008
0008 820Bh	TMR1	Timer counter control register	TCCR	8	8*5	2, 3 PCLKB	2 ICLK		1008
0008 8210h	TMR2	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8211h	TMR3	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8212h	TMR2	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK		1010
0008 8213h	TMR3	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK		1010
0008 8214h	TMR2	Time constant register A	TCORA	8	8	2, 3 PCLKB	2 ICLK		1006
0008 8215h	TMR3	Time constant register A	TCORA	8	8*5	2, 3 PCLKB	2 ICLK		1006
0008 8216h	TMR2	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8217h	TMR3	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK		1007
0008 8218h	TMR2	Timer counter	TCNT	8	8	2, 3 PCLKB	2 ICLK		1006
0008 8219h	TMR3	Timer counter	TCNT	8	8*5	2, 3 PCLKB	2 ICLK		1006
0008 821Ah	TMR2	Timer counter control register	TCCR	8	8	2, 3 PCLKB	2 ICLK		1008
0008 821Bh	TMR3	Timer counter control register	TCCR	8	8*5	2, 3 PCLKB	2 ICLK		1008
0008 8280h	CRC	CRC control register	CRCCR	8	8	2, 3 PCLKB	2 ICLK	CRC	1646
0008 8281h	CRC	CRC data input register	CRCDIR	8	8	2, 3 PCLKB	2 ICLK		1646
0008 8282h	CRC	CRC data output register	CRCDOR	16	16	2, 3 PCLKB	2 ICLK		1646
0008 8300h	RIIC0	I²C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK	RIIC	1403
0008 8301h	RIIC0	I²C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK		1405
0008 8302h	RIIC0	I²C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK		1408
0008 8303h	RIIC0	I²C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK		1409
0008 8304h	RIIC0	I²C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK		1411
0008 8305h	RIIC0	I²C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK		1413
0008 8306h	RIIC0	I²C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK		1415
0008 8307h	RIIC0	I²C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK		1416
0008 8308h	RIIC0	I²C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK		1417
0008 8309h	RIIC0	I²C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK		1420
0008 830Ah	RIIC0	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK		1423
0008 830Bh	RIIC0	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK		1424
0008 830Ch	RIIC0	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK		1423
0008 830Dh	RIIC0	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK		1424
0008 830Eh	RIIC0	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK		1423
0008 830Fh	RIIC0	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK		1424
0008 8310h	RIIC0	I²C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK		1425
0008 8311h	RIIC0	I²C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK		1426
0008 8312h	RIIC0	I²C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8313h	RIIC0	I²C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8320h	RIIC1	I²C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK		1403
0008 8321h	RIIC1	I²C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK		1405
0008 8322h	RIIC1	I²C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK		1408
0008 8323h	RIIC1	I²C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK		1409

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Table 4.1 List of I/O Registers (Address Order) (19/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 8324h	RIIC1	I²C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK	RIIC	1411
0008 8325h	RIIC1	I²C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK		1413
0008 8326h	RIIC1	I²C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK		1415
0008 8327h	RIIC1	I²C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK		1416
0008 8328h	RIIC1	I²C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK		1417
0008 8329h	RIIC1	I²C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK		1420
0008 832Ah	RIIC1	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK		1423
0008 832Bh	RIIC1	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK		1424
0008 832Ch	RIIC1	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK		1423
0008 832Dh	RIIC1	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK		1424
0008 832Eh	RIIC1	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK		1423
0008 832Fh	RIIC1	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK		1424
0008 8330h	RIIC1	I²C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK		1425
0008 8331h	RIIC1	I²C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK		1426
0008 8332h	RIIC1	I²C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8333h	RIIC1	I²C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8340h	RIIC2	I²C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK		1403
0008 8341h	RIIC2	I²C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK		1405
0008 8342h	RIIC2	I²C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK		1408
0008 8343h	RIIC2	I²C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK		1409
0008 8344h	RIIC2	I²C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK		1411
0008 8345h	RIIC2	I²C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK		1413
0008 8346h	RIIC2	I²C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK		1415
0008 8347h	RIIC2	I²C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK		1416
0008 8348h	RIIC2	I²C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK		1417
0008 8349h	RIIC2	I²C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK		1420
0008 834Ah	RIIC2	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK		1423
0008 834Bh	RIIC2	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK		1424
0008 834Ch	RIIC2	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK		1423
0008 834Dh	RIIC2	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK		1424
0008 834Eh	RIIC2	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK		1423
0008 834Fh	RIIC2	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK		1424
0008 8350h	RIIC2	I²C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK		1425
0008 8351h	RIIC2	I²C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK		1426
0008 8352h	RIIC2	I²C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8353h	RIIC2	I²C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8360h	RIIC3	I²C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK		1403
0008 8361h	RIIC3	I²C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK		1405
0008 8362h	RIIC3	I²C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK		1408
0008 8363h	RIIC3	I²C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK		1409
0008 8364h	RIIC3	I²C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK		1411
0008 8365h	RIIC3	I²C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK		1413
0008 8366h	RIIC3	I²C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK		1415
0008 8367h	RIIC3	I²C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK		1416
0008 8368h	RIIC3	I²C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK		1417
0008 8369h	RIIC3	I²C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK		1420
0008 836Ah	RIIC3	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK		1423
0008 836Bh	RIIC3	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK		1424
0008 836Ch	RIIC3	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK		1423
0008 836Dh	RIIC3	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK		1424
0008 836Eh	RIIC3	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK		1423

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Table 4.1 List of I/O Registers (Address Order) (20/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 836Fh	RIIC3	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK	RIIC	1424
0008 8370h	RIIC3	I2C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK		1425
0008 8371h	RIIC3	I2C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK		1426
0008 8372h	RIIC3	I2C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8373h	RIIC3	I2C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK		1428
0008 8380h	RSPI0	RSPI control register	SPCR	8	8	2, 3 PCLKB	2 ICLK	RSPI	1526
0008 8381h	RSPI0	RSPI slave select polarity register	SSLP	8	8	2, 3 PCLKB	2 ICLK		1527
0008 8382h	RSPI0	RSPI pin control register	SPPCR	8	8	2, 3 PCLKB	2 ICLK		1528
0008 8383h	RSPI0	RSPI status register	SPSR	8	8	2, 3 PCLKB	2 ICLK		1529
0008 8384h	RSPI0	RSPI data register	SPDR	32	16, 32	2, 3 PCLKB	2 ICLK		1531
0008 8388h	RSPI0	RSPI sequence control register	SPSCR	8	8	2, 3 PCLKB	2 ICLK		1534
0008 8389h	RSPI0	RSPI sequence status register	SPSSR	8	8	2, 3 PCLKB	2 ICLK		1535
0008 838Ah	RSPI0	RSPI bit rate register	SPBR	8	8	2, 3 PCLKB	2 ICLK		1536
0008 838Bh	RSPI0	RSPI data control register	SPDCR	8	8	2, 3 PCLKB	2 ICLK		1537
0008 838Ch	RSPI0	RSPI clock delay register	SPCKD	8	8	2, 3 PCLKB	2 ICLK		1538
0008 838Dh	RSPI0	RSPI slave select negation delay register	SSLND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 838Eh	RSPI0	RSPI next-access delay register	SPND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 838Fh	RSPI0	RSPI control register 2	SPCR2	8	8	2, 3 PCLKB	2 ICLK		1540
0008 8390h	RSPI0	RSPI command register 0	SPCMD0	16	16	2, 3 PCLKB	2 ICLK		1541
0008 8392h	RSPI0	RSPI command register 1	SPCMD1	16	16	2, 3 PCLKB	2 ICLK		1541
0008 8394h	RSPI0	RSPI command register 2	SPCMD2	16	16	2, 3 PCLKB	2 ICLK		1541
0008 8396h	RSPI0	RSPI command register 3	SPCMD3	16	16	2, 3 PCLKB	2 ICLK		1541
0008 8398h	RSPI0	RSPI command register 4	SPCMD4	16	16	2, 3 PCLKB	2 ICLK		1541
0008 839Ah	RSPI0	RSPI command register 5	SPCMD5	16	16	2, 3 PCLKB	2 ICLK		1541
0008 839Ch	RSPI0	RSPI command register 6	SPCMD6	16	16	2, 3 PCLKB	2 ICLK		1541
0008 839Eh	RSPI0	RSPI command register 7	SPCMD7	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83A0h	RSPI1	RSPI control register	SPCR	8	8	2, 3 PCLKB	2 ICLK		1526
0008 83A1h	RSPI1	RSPI slave select polarity register	SSLP	8	8	2, 3 PCLKB	2 ICLK		1527
0008 83A2h	RSPI1	RSPI pin control register	SPPCR	8	8	2, 3 PCLKB	2 ICLK		1528
0008 83A3h	RSPI1	RSPI status register	SPSR	8	8	2, 3 PCLKB	2 ICLK		1529
0008 83A4h	RSPI1	RSPI data register	SPDR	32	16, 32	2, 3 PCLKB	2 ICLK		1531
0008 83A8h	RSPI1	RSPI sequence control register	SPSCR	8	8	2, 3 PCLKB	2 ICLK		1534
0008 83A9h	RSPI1	RSPI sequence status register	SPSSR	8	8	2, 3 PCLKB	2 ICLK		1535
0008 83AAh	RSPI1	RSPI bit rate register	SPBR	8	8	2, 3 PCLKB	2 ICLK		1536
0008 83ABh	RSPI1	RSPI data control register	SPDCR	8	8	2, 3 PCLKB	2 ICLK		1537
0008 83ACh	RSPI1	RSPI clock delay register	SPCKD	8	8	2, 3 PCLKB	2 ICLK		1538
0008 83ADh	RSPI1	RSPI slave select negation delay register	SSLND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 83AEh	RSPI1	RSPI next-access delay register	SPND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 83AFh	RSPI1	RSPI control register 2	SPCR2	8	8	2, 3 PCLKB	2 ICLK		1540
0008 83B0h	RSPI1	RSPI command register 0	SPCMD0	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83B2h	RSPI1	RSPI command register 1	SPCMD1	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83B4h	RSPI1	RSPI command register 2	SPCMD2	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83B6h	RSPI1	RSPI command register 3	SPCMD3	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83B8h	RSPI1	RSPI command register 4	SPCMD4	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83BAh	RSPI1	RSPI command register 5	SPCMD5	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83BCh	RSPI1	RSPI command register 6	SPCMD6	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83BEh	RSPI1	RSPI command register 7	SPCMD7	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83C0h	RSPI2	RSPI control register	SPCR	8	8	2, 3 PCLKB	2 ICLK		1526
0008 83C1h	RSPI2	RSPI slave select polarity register	SSLP	8	8	2, 3 PCLKB	2 ICLK		1527
0008 83C2h	RSPI2	RSPI pin control register	SPPCR	8	8	2, 3 PCLKB	2 ICLK		1528
0008 83C3h	RSPI2	RSPI status register	SPSR	8	8	2, 3 PCLKB	2 ICLK		1529

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Table 4.1 List of I/O Registers (Address Order) (21/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 83C4h	RSPI2	RSPI data register	SPDR	32	16, 32	2, 3 PCLKB	2 ICLK	RSPI	1531
0008 83C8h	RSPI2	RSPI sequence control register	SPSCR	8	8	2, 3 PCLKB	2 ICLK		1534
0008 83C9h	RSPI2	RSPI sequence status register	SPSSR	8	8	2, 3 PCLKB	2 ICLK		1535
0008 83CAh	RSPI2	RSPI bit rate register	SPBR	8	8	2, 3 PCLKB	2 ICLK		1536
0008 83CBh	RSPI2	RSPI data control register	SPDCR	8	8	2, 3 PCLKB	2 ICLK		1537
0008 83CCh	RSPI2	RSPI clock delay register	SPCKD	8	8	2, 3 PCLKB	2 ICLK		1538
0008 83CDh	RSPI2	RSPI slave select negation delay register	SSLND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 83CEh	RSPI2	RSPI next-access delay register	SPND	8	8	2, 3 PCLKB	2 ICLK		1539
0008 83CFh	RSPI2	RSPI control register 2	SPCR2	8	8	2, 3 PCLKB	2 ICLK		1540
0008 83D0h	RSPI2	RSPI command register 0	SPCMD0	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83D2h	RSPI2	RSPI command register 1	SPCMD1	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83D4h	RSPI2	RSPI command register 2	SPCMD2	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83D6h	RSPI2	RSPI command register 3	SPCMD3	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83D8h	RSPI2	RSPI command register 4	SPCMD4	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83DAh	RSPI2	RSPI command register 5	SPCMD5	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83DCh	RSPI2	RSPI command register 6	SPCMD6	16	16	2, 3 PCLKB	2 ICLK		1541
0008 83DEh	RSPI2	RSPI command register 7	SPCMD7	16	16	2, 3 PCLKB	2 ICLK		1541
0008 8600h	MTU3	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	MTU2a	723
0008 8601h	MTU4	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8602h	MTU3	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		726
0008 8603h	MTU4	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		726
0008 8604h	MTU3	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		728
0008 8605h	MTU3	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		728
0008 8606h	MTU4	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		728
0008 8607h	MTU4	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		728
0008 8608h	MTU3	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		740
0008 8609h	MTU4	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		740
0008 860Ah	MTU	Timer output master enable register	TOER	8	8	2, 3 PCLKB	2 ICLK		751
0008 860Dh	MTU	Timer gate control register	TGCR	8	8	2, 3 PCLKB	2 ICLK		757
0008 860Eh	MTU	Timer output control register 1	TOCR1	8	8	2, 3 PCLKB	2 ICLK		752
0008 860Fh	MTU	Timer output control register 2	TOCR2	8	8	2, 3 PCLKB	2 ICLK		754
0008 8610h	MTU3	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		747
0008 8612h	MTU4	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		747
0008 8614h	MTU	Timer cycle data register	TCDR	16	16	2, 3 PCLKB	2 ICLK		759
0008 8616h	MTU	Timer dead time data register	TDDR	16	16	2, 3 PCLKB	2 ICLK		758
0008 8618h	MTU3	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		747
0008 861Ah	MTU3	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		747
0008 861Ch	MTU4	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		747
0008 861Eh	MTU4	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		747
0008 8620h	MTU	Timer subcounter	TCNTS	16	16	2, 3 PCLKB	2 ICLK		758
0008 8622h	MTU	Timer cycle buffer register	TCBR	16	16	2, 3 PCLKB	2 ICLK		759
0008 8624h	MTU3	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		747
0008 8626h	MTU3	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		747
0008 8628h	MTU4	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		747
0008 862Ah	MTU4	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		747
0008 862Ch	MTU3	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		742
0008 862Dh	MTU4	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		742
0008 8630h	MTU	Timer interrupt skipping set register	TITCR	8	8	2, 3 PCLKB	2 ICLK		759
0008 8631h	MTU	Timer interrupt skipping counter	TITCNT	8	8	2, 3 PCLKB	2 ICLK		761
0008 8632h	MTU	Timer buffer transfer set register	TBTER	8	8	2, 3 PCLKB	2 ICLK		762
0008 8634h	MTU	Timer dead time enable register	TDER	8	8	2, 3 PCLKB	2 ICLK		763

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Table 4.1 List of I/O Registers (Address Order) (22/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 8636h	MTU	Timer output level buffer register	TOLBR	8	8	2, 3 PCLKB	2 ICLK	MTU2a	756
0008 8638h	MTU3	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK		743
0008 8639h	MTU4	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK		743
0008 8640h	MTU4	Timer A/D converter start request control register	TADCR	16	16	2, 3 PCLKB	2 ICLK		745
0008 8644h	MTU4	Timer A/D converter start request cycle set register A	TADCORA	16	16	2, 3 PCLKB	2 ICLK		746
0008 8646h	MTU4	Timer A/D converter start request cycle set register B	TADCORB	16	16	2, 3 PCLKB	2 ICLK		746
0008 8648h	MTU4	Timer A/D converter start request cycle set buffer register A	TADCOBRA	16	16	2, 3 PCLKB	2 ICLK		746
0008 864Ah	MTU4	Timer A/D converter start request cycle set buffer register B	TADCOBRB	16	16	2, 3 PCLKB	2 ICLK		746
0008 8660h	MTU	Timer waveform control register	TWCR	8	8, 16	2, 3 PCLKB	2 ICLK		764
0008 8680h	MTU	Timer start register	TSTR	8	8, 16	2, 3 PCLKB	2 ICLK		749
0008 8681h	MTU	Timer synchronous register	TSYR	8	8, 16	2, 3 PCLKB	2 ICLK		749
0008 8684h	MTU	Timer read/write enable register	TRWER	8	8, 16	2, 3 PCLKB	2 ICLK		750
0008 8690h	MTU0	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8691h	MTU1	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8692h	MTU2	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8693h	MTU3	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8694h	MTU4	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8695h	MTU5	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK		765
0008 8700h	MTU0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8701h	MTU0	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		726
0008 8702h	MTU0	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK		728
0008 8703h	MTU0	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK		728
0008 8704h	MTU0	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		740
0008 8705h	MTU0	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		742
0008 8706h	MTU0	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		747
0008 8708h	MTU0	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		747
0008 870Ah	MTU0	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		747
0008 870Ch	MTU0	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK		747
0008 870Eh	MTU0	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK		747
0008 8720h	MTU0	Timer general register E	TGRE	16	16	2, 3 PCLKB	2 ICLK		747
0008 8722h	MTU0	Timer general register F	TGRF	16	16	2, 3 PCLKB	2 ICLK		747
0008 8724h	MTU0	Timer interrupt enable register2	TIER2	8	8	2, 3 PCLKB	2 ICLK		740
0008 8726h	MTU0	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK		743
0008 8780h	MTU1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8781h	MTU1	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8782h	MTU1	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		728
0008 8784h	MTU1	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		740
0008 8785h	MTU1	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		742
0008 8786h	MTU1	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		747
0008 8788h	MTU1	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		747
0008 878Ah	MTU1	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK		747
0008 8790h	MTU1	Timer input capture control register	TICCR	8	8	2, 3 PCLKB	2 ICLK		744
0008 8800h	MTU2	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8801h	MTU2	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK		723
0008 8802h	MTU2	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK		728
0008 8804h	MTU2	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		740
0008 8805h	MTU2	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK		742
0008 8806h	MTU2	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK		747
0008 8808h	MTU2	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK		747

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Table 4.1 List of I/O Registers (Address Order) (23/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 880Ah	MTU2	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	MTU2a	747
0008 8880h	MTU5	Timer counter U	TCNTU	16	16	2, 3 PCLKB	2 ICLK		747
0008 8882h	MTU5	Timer general register U	TGRU	16	16	2, 3 PCLKB	2 ICLK		747
0008 8884h	MTU5	Timer control register U	TCRU	8	8	2, 3 PCLKB	2 ICLK		723
0008 8886h	MTU5	Timer I/O control register U	TIORU	8	8	2, 3 PCLKB	2 ICLK		728
0008 8890h	MTU5	Timer counter V	TCNTV	16	16	2, 3 PCLKB	2 ICLK		747
0008 8892h	MTU5	Timer general register V	TGRV	16	16	2, 3 PCLKB	2 ICLK		747
0008 8894h	MTU5	Timer control register V	TCRV	8	8	2, 3 PCLKB	2 ICLK		723
0008 8896h	MTU5	Timer I/O control register V	TIORV	8	8	2, 3 PCLKB	2 ICLK		728
0008 88A0h	MTU5	Timer counter W	TCNTW	16	16	2, 3 PCLKB	2 ICLK		747
0008 88A2h	MTU5	Timer general register W	TGRW	16	16	2, 3 PCLKB	2 ICLK		747
0008 88A4h	MTU5	Timer control register W	TCRW	8	8	2, 3 PCLKB	2 ICLK		723
0008 88A6h	MTU5	Timer I/O control register W	TIORW	8	8	2, 3 PCLKB	2 ICLK		728
0008 88B2h	MTU5	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK		747
0008 88B4h	MTU5	Timer start register	TSTR	8	8	2, 3 PCLKB	2 ICLK		747
0008 88B6h	MTU5	Timer compare match clear register	TCNTCMPCLR	8	8	2, 3 PCLKB	2 ICLK		739
0008 8900h	POE	Input level control/status register 1	ICSR1	16	16	2, 3 PCLKB	2 ICLK	POE2a	887
0008 8902h	POE	Output level control/status register 1	OCSR1	16	16	2, 3 PCLKB	2 ICLK		889
0008 8908h	POE	Input level control/status register 2	ICSR2	16	16	2, 3 PCLKB	2 ICLK		890
0008 890Ah	POE	Software port output enable register	SPOER	8	8	2, 3 PCLKB	2 ICLK		891
0008 890Bh	POE	Port output enable control register 1	POECR1	8	8	2, 3 PCLKB	2 ICLK		892
0008 890Ch	POE	Port output enable control register 2	POECR2	8	8	2, 3 PCLKB	2 ICLK		892
0008 890Eh	POE	Input level control/status register 3	ICSR3	16	16	2, 3 PCLKB	2 ICLK		893
0008 9000h	S12AD	A/D control register	ADCSR	8	8	2, 3 PCLKB	2 ICLK	S12ADa	1655
0008 9004h	S12AD	A/D channel select register 0	ADANS0	16	16	2, 3 PCLKB	2 ICLK		1657
0008 9006h	S12AD	A/D channel select register 1	ADANS1	16	16	2, 3 PCLKB	2 ICLK		1657
0008 9008h	S12AD	A/D-converted value addition mode select register 0	ADADS0	16	16	2, 3 PCLKB	2 ICLK		1658
0008 900Ah	S12AD	A/D-converted value addition mode select register 1	ADADS1	16	16	2, 3 PCLKB	2 ICLK		1658
0008 900Ch	S12AD	A/D-converted value addition count select register	ADADC	8	8	2, 3 PCLKB	2 ICLK		1659
0008 900Eh	S12AD	A/D control extended register	ADCER	16	16	2, 3 PCLKB	2 ICLK		1660
0008 9010h	S12AD	A/D start trigger select register	ADSTRGR	8	8	2, 3 PCLKB	2 ICLK		1661
0008 9012h	S12AD	A/D conversion extended input control register	ADEXICR	16	16	2, 3 PCLKB	2 ICLK		1662
0008 901Ah	S12AD	A/D temperature sensor data register	ADTSDR	16	16	2, 3 PCLKB	2 ICLK		1663
0008 901Ch	S12AD	A/D internal reference voltage data register	ADOCDR	16	16	2, 3 PCLKB	2 ICLK		1664
0008 9020h	S12AD	A/D data register 0	ADDR0	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9022h	S12AD	A/D data register 1	ADDR1	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9024h	S12AD	A/D data register 2	ADDR2	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9026h	S12AD	A/D data register 3	ADDR3	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9028h	S12AD	A/D data register 4	ADDR4	16	16	2, 3 PCLKB	2 ICLK		1665
0008 902Ah	S12AD	A/D data register 5	ADDR5	16	16	2, 3 PCLKB	2 ICLK		1665
0008 902Ch	S12AD	A/D data register 6	ADDR6	16	16	2, 3 PCLKB	2 ICLK		1665
0008 902Eh	S12AD	A/D data register 7	ADDR7	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9030h	S12AD	A/D data register 8	ADDR8	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9032h	S12AD	A/D data register 9	ADDR9	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9034h	S12AD	A/D data register 10	ADDR10	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9036h	S12AD	A/D data register 11	ADDR11	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9038h	S12AD	A/D data register 12	ADDR12	16	16	2, 3 PCLKB	2 ICLK		1665
0008 903Ah	S12AD	A/D data register 13	ADDR13	16	16	2, 3 PCLKB	2 ICLK		1665
0008 903Ch	S12AD	A/D data register 14	ADDR14	16	16	2, 3 PCLKB	2 ICLK		1665
0008 903Eh	S12AD	A/D data register 15	ADDR15	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9040h	S12AD	A/D data register 16	ADDR16	16	16	2, 3 PCLKB	2 ICLK		1665

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Table 4.1 List of I/O Registers (Address Order) (24/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 9042h	S12AD	A/D data register 17	ADDR17	16	16	2, 3 PCLKB	2 ICLK	S12ADa	1665
0008 9044h	S12AD	A/D data register 18	ADDR18	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9046h	S12AD	A/D data register 19	ADDR19	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9048h	S12AD	A/D data register 20	ADDR20	16	16	2, 3 PCLKB	2 ICLK		1665
0008 9060h	S12AD	A/D sampling state register01	ADSSTR01	16	16	2, 3 PCLKB	2 ICLK		1666
0008 9070h	S12AD	A/D sampling state register 23	ADSSTR23	16	16	2, 3 PCLKB	2 ICLK		1667
0008 9800h	AD	A/D data register A	ADDRA	16	16	2, 3 PCLKB	2 ICLK	ADb	1685
0008 9802h	AD	A/D data register B	ADDRB	16	16	2, 3 PCLKB	2 ICLK		1685
0008 9804h	AD	A/D data register C	ADDRC	16	16	2, 3 PCLKB	2 ICLK		1685
0008 9806h	AD	A/D data register D	ADDRD	16	16	2, 3 PCLKB	2 ICLK		1685
0008 9808h	AD	A/D data register E	ADDRE	16	16	2, 3 PCLKB	2 ICLK		1685
0008 980Ah	AD	A/D data register F	ADDRF	16	16	2, 3 PCLKB	2 ICLK		1685
0008 980Ch	AD	A/D data register G	ADDRG	16	16	2, 3 PCLKB	2 ICLK		1685
0008 980Eh	AD	A/D data register H	ADDRH	16	16	2, 3 PCLKB	2 ICLK		1685
0008 9810h	AD	A/D control/status register	ADCSR	8	8	2, 3 PCLKB	2 ICLK		1686
0008 9811h	AD	A/D control register	ADCR	8	8	2, 3 PCLKB	2 ICLK		1687
0008 9812h	AD	A/D control register 2	ADCR2	8	8	2, 3 PCLKB	2 ICLK		1688
0008 9813h	AD	A/D sampling state register	ADSSTR	8	8	2, 3 PCLKB	2 ICLK		1688
0008 981Fh	AD	A/D self-diagnostic register	ADDIAGR	8	8	2, 3 PCLKB	2 ICLK		1689
0008 A000h	SCI0	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1289
0008 A001h	SCI0	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A002h	SCI0	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A003h	SCI0	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A004h	SCI0	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A005h	SCI0	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A006h	SCI0	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A007h	SCI0	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A008h	SCI0	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A009h	SCI0	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A00Ah	SCI0	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A00Bh	SCI0	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A00Ch	SCI0	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A00Dh	SCI0	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A020h	SCI1	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A021h	SCI1	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A022h	SCI1	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A023h	SCI1	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A024h	SCI1	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A025h	SCI1	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A026h	SCI1	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A027h	SCI1	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A028h	SCI1	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A029h	SCI1	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A02Ah	SCI1	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A02Bh	SCI1	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A02Ch	SCI1	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A02Dh	SCI1	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A040h	SCI2	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A041h	SCI2	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A042h	SCI2	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A043h	SCI2	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288

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Table 4.1 List of I/O Registers (Address Order) (25/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 A044h	SCI2	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1296
0008 A045h	SCI2	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A046h	SCI2	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A047h	SCI2	Serial extended mode register	SEM	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A048h	SCI2	Noise filter setting register	SNFR2	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A049h	SCI2	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A04Ah	SCI2	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A04Bh	SCI2	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A04Ch	SCI2	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A04Dh	SCI2	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A060h	SCI3	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A061h	SCI3	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A062h	SCI3	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A063h	SCI3	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A064h	SCI3	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A065h	SCI3	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A066h	SCI3	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A067h	SCI3	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A068h	SCI3	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A069h	SCI3	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A06Ah	SCI3	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A06Bh	SCI3	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A06Ch	SCI3	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A06Dh	SCI3	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A080h	SCI4	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A081h	SCI4	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A082h	SCI4	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A083h	SCI4	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A084h	SCI4	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A085h	SCI4	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A086h	SCI4	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A087h	SCI4	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A088h	SCI4	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A089h	SCI4	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A08Ah	SCI4	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A08Bh	SCI4	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A08Ch	SCI4	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A08Dh	SCI4	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A0A0h	SCI5	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A0A1h	SCI5	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A0A2h	SCI5	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A0A3h	SCI5	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0A4h	SCI5	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A0A5h	SCI5	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0A6h	SCI5	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A0A7h	SCI5	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A0A8h	SCI5	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A0A9h	SCI5	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A0AAh	SCI5	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A0ABh	SCI5	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A0ACh	SCI5	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316

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Table 4.1 List of I/O Registers (Address Order) (26/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 A0ADh	SCI5	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1317
0008 A0C0h	SCI6	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A0C1h	SCI6	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A0C2h	SCI6	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A0C3h	SCI6	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0C4h	SCI6	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A0C5h	SCI6	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0C6h	SCI6	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A0C7h	SCI6	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A0C8h	SCI6	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A0C9h	SCI6	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A0CAh	SCI6	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A0CBh	SCI6	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A0CCh	SCI6	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A0CDh	SCI6	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A0E0h	SCI7	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A0E1h	SCI7	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A0E2h	SCI7	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A0E3h	SCI7	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0E4h	SCI7	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A0E5h	SCI7	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A0E6h	SCI7	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A0E7h	SCI7	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A0E8h	SCI7	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A0E9h	SCI7	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A0EAh	SCI7	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A0EBh	SCI7	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A0ECh	SCI7	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A0EDh	SCI7	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A100h	SCI8	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A101h	SCI8	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A102h	SCI8	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A103h	SCI8	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A104h	SCI8	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A105h	SCI8	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A106h	SCI8	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A107h	SCI8	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A108h	SCI8	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A109h	SCI8	I^2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A10Ah	SCI8	I^2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A10Bh	SCI8	I^2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A10Ch	SCI8	I^2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A10Dh	SCI8	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A120h	SCI9	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A121h	SCI9	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A122h	SCI9	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A123h	SCI9	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A124h	SCI9	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A125h	SCI9	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A126h	SCI9	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A127h	SCI9	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309

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Table 4.1 List of I/O Registers (Address Order) (27/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 A128h	SCI9	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1311
0008 A129h	SCI9	I2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A12Ah	SCI9	I2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A12Bh	SCI9	I2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A12Ch	SCI9	I2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A12Dh	SCI9	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A140h	SCI10	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A141h	SCI10	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A142h	SCI10	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A143h	SCI10	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A144h	SCI10	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A145h	SCI10	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A146h	SCI10	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A147h	SCI10	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A148h	SCI10	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A149h	SCI10	I2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A14Ah	SCI10	I2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A14Bh	SCI10	I2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A14Ch	SCI10	I2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A14Dh	SCI10	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A160h	SCI11	Serial mode register	SMR	8	8	2, 3 PCLKB	2 ICLK		1289
0008 A161h	SCI11	Bit rate register	BRR	8	8	2, 3 PCLKB	2 ICLK		1301
0008 A162h	SCI11	Serial control register	SCR	8	8	2, 3 PCLKB	2 ICLK		1292
0008 A163h	SCI11	Transmit data register	TDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A164h	SCI11	Serial status register	SSR	8	8	2, 3 PCLKB	2 ICLK		1296
0008 A165h	SCI11	Receive data register	RDR	8	8	2, 3 PCLKB	2 ICLK		1288
0008 A166h	SCI11	Smart card mode register	SCMR	8	8	2, 3 PCLKB	2 ICLK		1300
0008 A167h	SCI11	Serial extended mode register	SEMR	8	8	2, 3 PCLKB	2 ICLK		1309
0008 A168h	SCI11	Noise filter setting register	SNFR	8	8	2, 3 PCLKB	2 ICLK		1311
0008 A169h	SCI11	I2C mode register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK		1312
0008 A16Ah	SCI11	I2C mode register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK		1313
0008 A16Bh	SCI11	I2C mode register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK		1314
0008 A16Ch	SCI11	I2C status register	SISR	8	8	2, 3 PCLKB	2 ICLK		1316
0008 A16Dh	SCI11	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 A800h	IEB	IEBus control register	IECTR	8	8	3 to 4 PCLKB	2, 3 ICLK	IEB	1609
0008 A801h	IEB	IEBus command register	IECMR	8	8	3 to 4 PCLKB	2, 3 ICLK		1610
0008 A802h	IEB	IEBus master control register	IEMCR	8	8	3 to 4 PCLKB	2, 3 ICLK		1611
0008 A803h	IEB	IEBus master unit address register 1	IEAR1	8	8	3 to 4 PCLKB	2, 3 ICLK		1612
0008 A804h	IEB	IEBus master unit address register 2	IEAR2	8	8	3 to 4 PCLKB	2, 3 ICLK		1612
0008 A805h	IEB	IEBus slave address setting register 1	IESA1	8	8	3 to 4 PCLKB	2, 3 ICLK		1613
0008 A806h	IEB	IEBus slave address setting register 2	IESA2	8	8	3 to 4 PCLKB	2, 3 ICLK		1613
0008 A807h	IEB	IEBus transmit message length register	IETBFL	8	8	3 to 4 PCLKB	2, 3 ICLK		1614
0008 A809h	IEB	IEBus reception master address register 1	IEMA1	8	8	3 to 4 PCLKB	2, 3 ICLK		1614
0008 A80Ah	IEB	IEBus reception master address register 2	IEMA2	8	8	3 to 4 PCLKB	2, 3 ICLK		1615
0008 A80Bh	IEB	IEBus receive control field register	IERCTL	8	8	3 to 4 PCLKB	2, 3 ICLK		1615

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Table 4.1 List of I/O Registers (Address Order) (28/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 A80Ch	IEB	IEBus receive message length register	IERBFL	8	8	3 to 4 PCLKB	2, 3 ICLK	IEB	1616
0008 A80Eh	IEB	IEBus lock address register 1	IELA1	8	8	3 to 4 PCLKB	2, 3 ICLK		1616
0008 A80Fh	IEB	IEBus lock address register 2	IELA2	8	8	3 to 4 PCLKB	2, 3 ICLK		1616
0008 A810h	IEB	IEBus general flag register	IEFLG	8	8	3 to 4 PCLKB	2, 3 ICLK		1617
0008 A811h	IEB	IEBus transmit status register	IETSR	8	8	3 to 4 PCLKB	2, 3 ICLK		1619
0008 A812h	IEB	IEBus transmit interrupt enable register	IEIET	8	8	3 to 4 PCLKB	2, 3 ICLK		1621
0008 A814h	IEB	IEBus receive status register	IERSR	8	8	3 to 4 PCLKB	2, 3 ICLK		1622
0008 A815h	IEB	IEBus receive interrupt enable register	IEIER	8	8	3 to 4 PCLKB	2, 3 ICLK		1625
0008 A818h	IEB	IEBus clock select register	IECKSR	8	8	3 to 4 PCLKB	2, 3 ICLK		1626
0008 A900h to 0008 A91Fh	IEB	IEBus transmit data buffer register 001 to 032	IETB001 to 032	8	8	3 to 4 PCLKB	2, 3 ICLK		1628
0008 AA00h to 0008 AA1Fh	IEB	IEBus receive data buffer register 001 to 032	IERB001 to 032	8	8	3 to 4 PCLKB	2, 3 ICLK		1628
0008 B300h	SCI12	Serial mode register	SMR12	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1289
0008 B301h	SCI12	Bit rate register	BRR12	8	8	2, 3 PCLKB	2 ICLK		1301
0008 B302h	SCI12	Serial control register	SCR12	8	8	2, 3 PCLKB	2 ICLK		1292
0008 B303h	SCI12	Transmit data register	TDR12	8	8	2, 3 PCLKB	2 ICLK		1288
0008 B304h	SCI12	Serial status register	SSR12	8	8	2, 3 PCLKB	2 ICLK		1296
0008 B305h	SCI12	Receive data register	RDR12	8	8	2, 3 PCLKB	2 ICLK		1288
0008 B306h	SCI12	Smart card mode register	SCMR12	8	8	2, 3 PCLKB	2 ICLK		1300
0008 B307h	SCI12	Serial extended mode register	SEMR12	8	8	2, 3 PCLKB	2 ICLK		1309
0008 B308h	SCI12	Noise filter setting register	SNFR12	8	8	2, 3 PCLKB	2 ICLK		1311
0008 B309h	SCI12	I^2C mode register 1	SIMR112	8	8	2, 3 PCLKB	2 ICLK		1312
0008 B30Ah	SCI12	I^2C mode register 2	SIMR212	8	8	2, 3 PCLKB	2 ICLK		1313
0008 B30Bh	SCI12	I^2C mode register 3	SIMR312	8	8	2, 3 PCLKB	2 ICLK		1314
0008 B30Ch	SCI12	I^2C status register	SISR12	8	8	2, 3 PCLKB	2 ICLK		1316
0008 B30Dh	SCI12	SPI mode register	SPMR	8	8	2, 3 PCLKB	2 ICLK		1317
0008 B320h	SCI12	Extended serial module enable register	ESMER	8	8	2, 3 PCLKB	2 ICLK		1318
0008 B321h	SCI12	Control register 0	CR0	8	8	2, 3 PCLKB	2 ICLK		1319
0008 B322h	SCI12	Control register 1	CR1	8	8	2, 3 PCLKB	2 ICLK		1320
0008 B323h	SCI12	Control register 2	CR2	8	8	2, 3 PCLKB	2 ICLK		1321
0008 B324h	SCI12	Control register 3	CR3	8	8	2, 3 PCLKB	2 ICLK		1322
0008 B325h	SCI12	Port control register	PCR	8	8	2, 3 PCLKB	2 ICLK		1322
0008 B326h	SCI12	Interrupt control register	ICR	8	8	2, 3 PCLKB	2 ICLK		1323
0008 B327h	SCI12	Status register	STR	8	8	2, 3 PCLKB	2 ICLK		1324
0008 B328h	SCI12	Status clear register	STCR	8	8	2, 3 PCLKB	2 ICLK		1325
0008 B329h	SCI12	Control field 0 data register	CF0DR	8	8	2, 3 PCLKB	2 ICLK		1325
0008 B32Ah	SCI12	Control field 0 compare enable register	CF0CR	8	8	2, 3 PCLKB	2 ICLK		1326
0008 B32Bh	SCI12	Control field 0 receive data register	CF0RR	8	8	2, 3 PCLKB	2 ICLK		1326
0008 B32Ch	SCI12	Primary control field 1 data register	PCF1DR	8	8	2, 3 PCLKB	2 ICLK		1326
0008 B32Dh	SCI12	Secondary control field 1 data register	SCF1DR	8	8	2, 3 PCLKB	2 ICLK		1327
0008 B32Eh	SCI12	Control field 1 compare enable register	CF1CR	8	8	2, 3 PCLKB	2 ICLK		1327
0008 B32Fh	SCI12	Control field 1 receive data register	CF1RR	8	8	2, 3 PCLKB	2 ICLK		1327
0008 B330h	SCI12	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1328
0008 B331h	SCI12	Timer mode register	TMR	8	8	2, 3 PCLKB	2 ICLK		1328
0008 B332h	SCI12	Timer prescaler register	TPRE	8	8	2, 3 PCLKB	2 ICLK		1329

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Table 4.1 List of I/O Registers (Address Order) (29/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 B333h	SCI12	Timer count register	TCNT	8	8	2, 3 PCLKB	2 ICLK	SCIc, SCId	1329
0008 C000h	PORT0	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports	653
0008 C001h	PORT1	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C002h	PORT2	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C003h	PORT3	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C004h	PORT4	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C005h	PORT5	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C006h	PORT6	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C007h	PORT7	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C008h	PORT8	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C009h	PORT9	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Ah	PORTA	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Bh	PORTB	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Ch	PORTC	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Dh	PORTD	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Eh	PORTE	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C00Fh	PORTF	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C010h	PORTG	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C012h	PORTJ	Port direction register	PDR	8	8	2, 3 PCLKB	2 ICLK		653
0008 C020h	PORT0	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C021h	PORT1	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C022h	PORT2	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C023h	PORT3	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C024h	PORT4	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C025h	PORT5	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C026h	PORT6	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C027h	PORT7	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C028h	PORT8	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C029h	PORT9	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Ah	PORTA	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Bh	PORTB	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Ch	PORTC	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Dh	PORTD	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Eh	PORTE	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C02Fh	PORTF	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C030h	PORTG	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C032h	PORTJ	Port output data register	PODR	8	8	2, 3 PCLKB	2 ICLK		654
0008 C040h	PORT0	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C041h	PORT1	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C042h	PORT2	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C043h	PORT3	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C044h	PORT4	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C045h	PORT5	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C046h	PORT6	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C047h	PORT7	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C048h	PORT8	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C049h	PORT9	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C04Ah	PORTA	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C04Bh	PORTB	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C04Ch	PORTC	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C04Dh	PORTD	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655

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Table 4.1 List of I/O Registers (Address Order) (30/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C04Eh	PORTE	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports	655
0008 C04Fh	PORTF	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C050h	PORTG	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C052h	PORTJ	Port input data register	PIDR	8	8	2, 3 PCLKB	2 ICLK		655
0008 C060h	PORT0	Port input data register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C061h	PORT1	Port input data register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C062h	PORT2	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C063h	PORT3	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C064h	PORT4	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C065h	PORT5	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C066h	PORT6	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C067h	PORT7	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C068h	PORT8	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C069h	PORT9	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Ah	PORTA	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Bh	PORTB	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Ch	PORTC	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Dh	PORTD	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Eh	PORTE	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C06Fh	PORTF	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C070h	PORTG	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C072h	PORTJ	Port mode register	PMR	8	8	2, 3 PCLKB	2 ICLK		656
0008 C080h	PORT0	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C081h	PORT0	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C082h	PORT1	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C083h	PORT1	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C084h	PORT2	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C085h	PORT2	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C086h	PORT3	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C087h	PORT3	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C088h	PORT4	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C089h	PORT4	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C08Ah	PORT5	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C08Bh	PORT5	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C08Ch	PORT6	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C08Dh	PORT6	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C08Eh	PORT7	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C08Fh	PORT7	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C090h	PORT8	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C091h	PORT8	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C092h	PORT9	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C093h	PORT9	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C094h	PORTA	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C095h	PORTA	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C096h	PORTB	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C097h	PORTB	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C098h	PORTC	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C099h	PORTC	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C09Ah	PORTD	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C09Bh	PORTD	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C09Ch	PORTE	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657

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Table 4.1 List of I/O Registers (Address Order) (31/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C09Dh	PORTE	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	I/O Ports	658
0008 C09Eh	PORTF	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C09Fh	PORTF	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C0A0h	PORTG	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C0A1h	PORTG	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C0A4h	PORTJ	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK		657
0008 C0A5h	PORTJ	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK		658
0008 C0C0h	PORT0	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C1h	PORT1	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C2h	PORT2	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C3h	PORT3	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C4h	PORT4	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C5h	PORT5	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C6h	PORT6	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C7h	PORT7	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C8h	PORT8	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0C9h	PORT9	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CAh	PORTA	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CBh	PORTB	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CCh	PORTC	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CDh	PORTD	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CEh	PORTE	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0CFh	PORTF	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0D0h	PORTG	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0D2h	PORTJ	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK		659
0008 C0E0h	PORT0	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0E2h	PORT2	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0E5h	PORT5	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0E9h	PORT9	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0EAh	PORTA	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0EBh	PORTB	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0ECh	PORTC	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0EDh	PORTD	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0EEh	PORTE	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C0F0h	PORTG	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK		660
0008 C100h	MPC	CS output enable register	PFCSE	8	8	2, 3 PCLKB	2 ICLK	MPC	703
0008 C102h	MPC	CS output pin select register 0	PFCSS0	8	8	2, 3 PCLKB	2 ICLK		704
0008 C103h	MPC	CS output pin select register 1	PFCSS1	8	8	2, 3 PCLKB	2 ICLK		705
0008 C104h	MPC	Address output enable register 0	PFAOE0	8	8, 16	2, 3 PCLKB	2 ICLK		706
0008 C105h	MPC	Address output enable register 1	PFAOE1	8	8, 16	2, 3 PCLKB	2 ICLK		707
0008 C106h	MPC	External bus control register 0	PFBCR0	8	8, 16	2, 3 PCLKB	2 ICLK		708
0008 C107h	MPC	External bus control register 1	PFBCR1	8	8, 16	2, 3 PCLKB	2 ICLK		709
0008 C10Eh	MPC	Ethernet control resister 1	PFENET	8	8	2, 3 PCLKB	2 ICLK		710
0008 C114h	MPC	USB0 control register	PFUSB0	8	8	2, 3 PCLKB	2 ICLK		711
0008 C115h	MPC	USB1 control register	PFUSB1	8	8	2, 3 PCLKB	2 ICLK		712
0008 C11Fh	MPC	Write-protect register	PWPR	8	8	2, 3 PCLKB	2 ICLK		679
0008 C140h	MPC	P00 pin function control register	P00PFS	8	8	2, 3 PCLKB	2 ICLK		680
0008 C141h	MPC	P01 pin function control register	P01PFS	8	8	2, 3 PCLKB	2 ICLK		680
0008 C142h	MPC	P02 pin function control register	P02PFS	8	8	2, 3 PCLKB	2 ICLK		680
0008 C143h	MPC	P03 pin function control register	P03PFS	8	8	2, 3 PCLKB	2 ICLK		680
0008 C145h	MPC	P05 pin function control register	P05PFS	8	8	2, 3 PCLKB	2 ICLK		680

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Table 4.1 List of I/O Registers (Address Order) (32/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C147h	MPC	P07 pin function control register	P07PFS	8	8	2, 3 PCLKB	2 ICLK	MPC	680
0008 C148h	MPC	P10 pin function control register	P10PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C149h	MPC	P11 pin function control register	P11PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Ah	MPC	P12 pin function control register	P12PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Bh	MPC	P13 pin function control register	P13PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Ch	MPC	P14 pin function control register	P14PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Dh	MPC	P15 pin function control register	P15PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Eh	MPC	P16 pin function control register	P16PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C14Fh	MPC	P17 pin function control register	P17PFS	8	8	2, 3 PCLKB	2 ICLK		681
0008 C150h	MPC	P20 pin function control register	P20PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C151h	MPC	P21 pin function control register	P21PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C152h	MPC	P22 pin function control register	P22PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C153h	MPC	P23 pin function control register	P23PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C154h	MPC	P24 pin function control register	P24PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C155h	MPC	P25 pin function control register	P25PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C156h	MPC	P26 pin function control register	P26PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C157h	MPC	P27 pin function control register	P27PFS	8	8	2, 3 PCLKB	2 ICLK		683
0008 C158h	MPC	P30 pin function control register	P30PFS	8	8	2, 3 PCLKB	2 ICLK		685
0008 C159h	MPC	P31 pin function control register	P31PFS	8	8	2, 3 PCLKB	2 ICLK		685
0008 C15Ah	MPC	P32 pin function control register	P32PFS	8	8	2, 3 PCLKB	2 ICLK		685
0008 C15Bh	MPC	P33 pin function control register	P33PFS	8	8	2, 3 PCLKB	2 ICLK		685
0008 C15Ch	MPC	P34 pin function control register	P34PFS	8	8	2, 3 PCLKB	2 ICLK		685
0008 C160h	MPC	P40 pin function control register	P40PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C161h	MPC	P41 pin function control register	P41PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C162h	MPC	P42 pin function control register	P42PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C163h	MPC	P43 pin function control register	P43PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C164h	MPC	P44 pin function control register	P44PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C165h	MPC	P45 pin function control register	P45PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C166h	MPC	P46 pin function control register	P46PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C167h	MPC	P47 pin function control register	P47PFS	8	8	2, 3 PCLKB	2 ICLK		686
0008 C168h	MPC	P50 pin function control register	P50PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C169h	MPC	P51 pin function control register	P51PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C16Ah	MPC	P52 pin function control register	P52PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C16Ch	MPC	P54 pin function control register	P54PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C16Dh	MPC	P55 pin function control register	P55PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C16Eh	MPC	P56 pin function control register	P56PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C16Fh	MPC	P57 pin function control register	P57PFS	8	8	2, 3 PCLKB	2 ICLK		687
0008 C170h	MPC	P60 pin function control register	P60PFS	8	8	2, 3 PCLKB	2 ICLK		689
0008 C171h	MPC	P61 pin function control register	P61PFS	8	8	2, 3 PCLKB	2 ICLK		689
0008 C176h	MPC	P66 pin function control register	P66PFS	8	8	2, 3 PCLKB	2 ICLK		689
0008 C177h	MPC	P67 pin function control register	P67PFS	8	8	2, 3 PCLKB	2 ICLK		689
0008 C178h	MPC	P70 pin function control register	P70PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C179h	MPC	P71 pin function control register	P71PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Ah	MPC	P72 pin function control register	P72PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Bh	MPC	P73 pin function control register	P73PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Ch	MPC	P74 pin function control register	P74PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Dh	MPC	P75 pin function control register	P75PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Eh	MPC	P76 pin function control register	P76PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C17Fh	MPC	P77 pin function control register	P77PFS	8	8	2, 3 PCLKB	2 ICLK		690
0008 C180h	MPC	P80 pin function control register	P80PFS	8	8	2, 3 PCLKB	2 ICLK		691
0008 C181h	MPC	P81 pin function control register	P81PFS	8	8	2, 3 PCLKB	2 ICLK		691

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Table 4.1 List of I/O Registers (Address Order) (33/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C182h	MPC	P82 pin function control register	P82PFS	8	8	2, 3 PCLKB	2 ICLK	MPC	691
0008 C183h	MPC	P83 pin function control register	P83PFS	8	8	2, 3 PCLKB	2 ICLK		691
0008 C186h	MPC	P86 pin function control register	P86PFS	8	8	2, 3 PCLKB	2 ICLK		691
0008 C187h	MPC	P87 pin function control register	P87PFS	8	8	2, 3 PCLKB	2 ICLK		691
0008 C188h	MPC	P90 pin function control register	P90PFS	8	8	2, 3 PCLKB	2 ICLK		692
0008 C189h	MPC	P91 pin function control register	P91PFS	8	8	2, 3 PCLKB	2 ICLK		692
0008 C18Ah	MPC	P92 pin function control register	P92PFS	8	8	2, 3 PCLKB	2 ICLK		692
0008 C18Bh	MPC	P93 pin function control register	P93PFS	8	8	2, 3 PCLKB	2 ICLK		692
0008 C190h	MPC	PA0 pin function control register	PA0PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C191h	MPC	PA1 pin function control register	PA1PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C192h	MPC	PA2 pin function control register	PA2PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C193h	MPC	PA3 pin function control register	PA3PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C194h	MPC	PA4 pin function control register	PA4PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C195h	MPC	PA5 pin function control register	PA5PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C196h	MPC	PA6 pin function control register	PA6PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C197h	MPC	PA7 pin function control register	PA7PFS	8	8	2, 3 PCLKB	2 ICLK		693
0008 C198h	MPC	PB0 pin function control register	PB0PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C199h	MPC	PB1 pin function control register	PB1PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Ah	MPC	PB2 pin function control register	PB2PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Bh	MPC	PB3 pin function control register	PB3PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Ch	MPC	PB4 pin function control register	PB4PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Dh	MPC	PB5 pin function control register	PB5PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Eh	MPC	PB6 pin function control register	PB6PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C19Fh	MPC	PB7 pin function control register	PB7PFS	8	8	2, 3 PCLKB	2 ICLK		694
0008 C1A0h	MPC	PC0 pin function control register	PC0PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A1h	MPC	PC1 pin function control register	PC1PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A2h	MPC	PC2 pin function control register	PC2PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A3h	MPC	PC3 pin function control register	PC3PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A4h	MPC	PC4 pin function control register	PC4PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A5h	MPC	PC5 pin function control register	PC5PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A6h	MPC	PC6 pin function control register	PC6PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A7h	MPC	PC7 pin function control register	PC7PFS	8	8	2, 3 PCLKB	2 ICLK		696
0008 C1A8h	MPC	PD0 pin function control register	PD0PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1A9h	MPC	PD1 pin function control register	PD1PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1AAh	MPC	PD2 pin function control register	PD2PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1ABh	MPC	PD3 pin function control register	PD3PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1ACh	MPC	PD4 pin function control register	PD4PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1ADh	MPC	PD5 pin function control register	PD5PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1AEh	MPC	PD6 pin function control register	PD6PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1AFh	MPC	PD7 pin function control register	PD7PFS	8	8	2, 3 PCLKB	2 ICLK		698
0008 C1B0h	MPC	PE0 pin function control register	PE0PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B1h	MPC	PE1 pin function control register	PE1PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B2h	MPC	PE2 pin function control register	PE2PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B3h	MPC	PE3 pin function control register	PE3PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B4h	MPC	PE4 pin function control register	PE4PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B5h	MPC	PE5 pin function control register	PE5PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B6h	MPC	PE6 pin function control register	PE6PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B7h	MPC	PE7 pin function control register	PE7PFS	8	8	2, 3 PCLKB	2 ICLK		699
0008 C1B8h	MPC	PF0 pin function control register	PF0PFS	8	8	2, 3 PCLKB	2 ICLK		701
0008 C1B9h	MPC	PF1 pin function control register	PF1PFS	8	8	2, 3 PCLKB	2 ICLK		701
0008 C1BAh	MPC	PF2 pin function control register	PF2PFS	8	8	2, 3 PCLKB	2 ICLK		701

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Table 4.1 List of I/O Registers (Address Order) (34/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C1BDh	MPC	PF5 pin function control register	PF5PFS	8	8	2, 3 PCLKB	2 ICLK	MPC	701
0008 C1D3h	MPC	PJ3 pin function control register	PJ3PFS	8	8	2, 3 PCLKB	2 ICLK		701
0008 C280h	SYSTEM	Deep standby control register	DPSBYCR	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption	281
0008 C282h	SYSTEM	Deep standby interrupt enable register 0	DPSIER0	8	8	4, 5 PCLKB	2, 3 ICLK		283
0008 C283h	SYSTEM	Deep standby interrupt enable register 1	DPSIER1	8	8	4, 5 PCLKB	2, 3 ICLK		284
0008 C284h	SYSTEM	Deep standby interrupt enable register 2	DPSIER2	8	8	4, 5 PCLKB	2, 3 ICLK		285
0008 C285h	SYSTEM	Deep standby interrupt enable register 3	DPSIER3	8	8	4, 5 PCLKB	2, 3 ICLK		286
0008 C286h	SYSTEM	Deep standby interrupt flag register 0	DPSIFR0	8	8	4, 5 PCLKB	2, 3 ICLK		287
0008 C287h	SYSTEM	Deep standby interrupt flag register 1	DPSIFR1	8	8	4, 5 PCLKB	2, 3 ICLK		288
0008 C288h	SYSTEM	Deep standby interrupt flag register 2	DPSIFR2	8	8	4, 5 PCLKB	2, 3 ICLK		289
0008 C289h	SYSTEM	Deep standby interrupt flag register 3	DPSIFR3	8	8	4, 5 PCLKB	2, 3 ICLK		291
0008 C28Ah	SYSTEM	Deep standby interrupt edge register 0	DPSIEGR0	8	8	4, 5 PCLKB	2, 3 ICLK		292
0008 C28Bh	SYSTEM	Deep standby interrupt edge register 1	DPSIEGR1	8	8	4, 5 PCLKB	2, 3 ICLK		293
0008 C28Ch	SYSTEM	Deep standby interrupt edge register 2	DPSIEGR2	8	8	4, 5 PCLKB	2, 3 ICLK		294
0008 C28Dh	SYSTEM	Deep standby interrupt edge register 3	DPSIEGR3	8	8	4, 5 PCLKB	2, 3 ICLK		294
0008 C290h	SYSTEM	Reset status register 0	RSTSR0	8	8	4, 5 PCLKB	2, 3 ICLK	Resets	192
0008 C291h	SYSTEM	Reset status register 1	RSTSR1	8	8	4, 5 PCLKB	2, 3 ICLK		194
0008 C293h	SYSTEM	Main clock oscillator forced oscillation control register	MOFCR	8	8	4, 5 PCLKB	2, 3 ICLK	Clock Generation Circuit	247
0008 C294h	SYSTEM	High-speed on-chip oscillator power supply control register	HOCOPCR	8	8	4, 5 PCLKB	2, 3 ICLK		248
0008 C296h	FLASH	Flash write erase protection register	FWEPROR	8	8	4, 5 PCLKB	2, 3 ICLK	ROM	1727
0008 C297h	SYSTEM	Voltage monitoring circuit control register	LVCMPCR	8	8	4, 5 PCLKB	2, 3 ICLK	LVDA	217
0008 C298h	SYSTEM	Voltage detection level select register	LVDLVLR	8	8	4, 5 PCLKB	2, 3 ICLK		218
0008 C29Ah	SYSTEM	Voltage monitoring 1 circuit control register 0	LVD1CR0	8	8	4, 5 PCLKB	2, 3 ICLK		219
0008 C29Bh	SYSTEM	Voltage monitoring 2 circuit control register 0	LVD2CR0	8	8	4, 5 PCLKB	2, 3 ICLK		221
0008 C2A0h to 0008 C2BFh	SYSTEM	Deep standby backup register 0 to 31	DPSBKR0 to 31	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption	295
0008 C300h	ICU	Group 0 interrupt source register	GRP00	32	32	1 to 2PCLKB	2 ICLK	ICUb	340
0008 C304h	ICU	Group 1 interrupt source register	GRP01	32	32	1 to 2PCLKB	2 ICLK		340
0008 C308h	ICU	Group 2 interrupt source register	GRP02	32	32	1 to 2PCLKB	2 ICLK		340
0008 C30Ch	ICU	Group 3 interrupt source register	GRP03	32	32	1 to 2PCLKB	2 ICLK		340
0008 C310h	ICU	Group 4 interrupt source register	GRP04	32	32	1 to 2PCLKB	2 ICLK		340
0008 C314h	ICU	Group 5 interrupt source register	GRP05	32	32	1 to 2PCLKB	2 ICLK		340
0008 C318h	ICU	Group 6 interrupt source register	GRP06	32	32	1 to 2PCLKB	2 ICLK		340
0008 C330h	ICU	Group 12 interrupt source register	GRP12	32	32	1 to 2PCLKB	2 ICLK		340
0008 C340h	ICU	Group 0 interrupt enable register	GEN00	32	32	1 to 2PCLKB	2 ICLK		343
0008 C344h	ICU	Group 1 interrupt enable register	GEN01	32	32	1 to 2PCLKB	2 ICLK		343
0008 C348h	ICU	Group 2 interrupt enable register	GEN02	32	32	1 to 2PCLKB	2 ICLK		343
0008 C34Ch	ICU	Group 3 interrupt enable register	GEN03	32	32	1 to 2PCLKB	2 ICLK		343
0008 C350h	ICU	Group 4 interrupt enable register	GEN04	32	32	1 to 2PCLKB	2 ICLK		343
0008 C354h	ICU	Group 5 interrupt enable register	GEN05	32	32	1 to 2PCLKB	2 ICLK		343
0008 C358h	ICU	Group 6 interrupt enable register	GEN06	32	32	1 to 2PCLKB	2 ICLK		343
0008 C370h	ICU	Group 12 interrupt enable register	GEN12	32	32	1 to 2PCLKB	2 ICLK		343
0008 C380h	ICU	Group 0 interrupt clear register	GCR00	32	32	1 to 2PCLKB	2 ICLK		345
0008 C384h	ICU	Group 1 interrupt clear register	GCR01	32	32	1 to 2PCLKB	2 ICLK	ICUb	345
0008 C388h	ICU	Group 2 interrupt clear register	GCR02	32	32	1 to 2PCLKB	2 ICLK		345
0008 C38Ch	ICU	Group 3 interrupt clear register	GCR03	32	32	1 to 2PCLKB	2 ICLK		345
0008 C390h	ICU	Group 4 interrupt clear register	GCR04	32	32	1 to 2PCLKB	2 ICLK		345
0008 C394h	ICU	Group 5 interrupt clear register	GCR05	32	32	1 to 2PCLKB	2 ICLK		345
0008 C398h	ICU	Group 6 interrupt clear register	GCR06	32	32	1 to 2PCLKB	2 ICLK		345
0008 C3C0h	ICU	Unit select register	SEL	32	32	1 to 2PCLKB	2 ICLK		347

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Table 4.1 List of I/O Registers (Address Order) (35/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0008 C400h	RTC	64-Hz counter	R64CNT	8	8	2, 3 PCLKB	2 ICLK	RTCa	1033
0008 C402h	RTC	Second counter	RSECCNT	8	8	2, 3 PCLKB	2 ICLK		1034
0008 C404h	RTC	Minute counter	RMINCNT	8	8	2, 3 PCLKB	2 ICLK		1034
0008 C406h	RTC	Hour counter	RHRCNT	8	8	2, 3 PCLKB	2 ICLK		1035
0008 C408h	RTC	Day-of-week counter	RWKCNT	8	8	2, 3 PCLKB	2 ICLK		1036
0008 C40Ah	RTC	Date counter	RDAYCNT	8	8	2, 3 PCLKB	2 ICLK		1037
0008 C40Ch	RTC	Month counter	RMONCNT	8	8	2, 3 PCLKB	2 ICLK		1037
0008 C40Eh	RTC	Year counter	RYRCNT	16	16	2, 3 PCLKB	2 ICLK		1038
0008 C410h	RTC	Second alarm register	RSECAR	8	8	2, 3 PCLKB	2 ICLK		1038
0008 C412h	RTC	Minute alarm register	RMINAR	8	8	2, 3 PCLKB	2 ICLK		1039
0008 C414h	RTC	Hour alarm register	RHRAR	8	8	2, 3 PCLKB	2 ICLK		1040
0008 C416h	RTC	Day-of-week alarm register	RWKAR	8	8	2, 3 PCLKB	2 ICLK		1041
0008 C418h	RTC	Date alarm register	RDAYAR	8	8	2, 3 PCLKB	2 ICLK		1042
0008 C41Ah	RTC	Month alarm register	RMONAR	8	8	2, 3 PCLKB	2 ICLK		1043
0008 C41Ch	RTC	Year alarm register	RYRAR	16	16	2, 3 PCLKB	2 ICLK		1044
0008 C41Eh	RTC	Year alarm enable register	RYRAREN	8	8	2, 3 PCLKB	2 ICLK		1044
0008 C422h	RTC	RTC control register 1	RCR1	8	8	2, 3 PCLKB	2 ICLK		1045
0008 C424h	RTC	RTC control register 2	RCR2	8	8	2, 3 PCLKB	2 ICLK		1046
0008 C426h	RTC	RTC control register 3	RCR3	8	8	2, 3 PCLKB	2 ICLK		1048
0008 C428h	RTC	RTC control register 4	RCR4	8	8	2, 3 PCLKB	2 ICLK		1049
0008 C42Ah	RTC	Frequency register H	RFRH	16	16	2, 3 PCLKB	2 ICLK		1050
0008 C42Ch	RTC	Frequency register L	RFRL	16	16	2, 3 PCLKB	2 ICLK		1050
0008 C42Eh	RTC	Time error adjustment register	RADJ	8	8	2, 3 PCLKB	2 ICLK		1051
0008 C440h	RTC	Time capture control register 0	RTCCR0	8	8	2, 3 PCLKB	2 ICLK		1052
0008 C442h	RTC	Time capture control register 1	RTCCR1	8	8	2, 3 PCLKB	2 ICLK		1052
0008 C444h	RTC	Time capture control register 2	RTCCR2	8	8	2, 3 PCLKB	2 ICLK		1052
0008 C452h	RTC	Second capture register 0	RSECCP0	8	8	2, 3 PCLKB	2 ICLK		1053
0008 C454h	RTC	Minute capture register 0	RMINCP0	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C456h	RTC	Hour capture register 0	RHRCP0	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C45Ah	RTC	Date capture register 0	RDAYCP0	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C45Ch	RTC	Month capture register 0	RMONCP0	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C462h	RTC	Second capture register 1	RSECCP1	8	8	2, 3 PCLKB	2 ICLK		1053
0008 C464h	RTC	Minute capture register 1	RMINCP1	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C466h	RTC	Hour capture register 1	RHRCP1	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C46Ah	RTC	Date capture register 1	RDAYCP1	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C46Ch	RTC	Month capture register 1	RMONCP1	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C472h	RTC	Second capture register 2	RSECCP2	8	8	2, 3 PCLKB	2 ICLK		1053
0008 C474h	RTC	Minute capture register 2	RMINCP2	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C476h	RTC	Hour capture register 2	RHRCP2	8	8	2, 3 PCLKB	2 ICLK		1054
0008 C47Ah	RTC	Date capture register 2	RDAYCP2	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C47Ch	RTC	Month capture register 2	RMONCP2	8	8	2, 3 PCLKB	2 ICLK		1055
0008 C500h	TEMPS	Temperature sensor control register	TSCR	8	8	2, 3 PCLKB	2 ICLK	Temperature Sensor	1719
0008 C880h	SYSTEM	Counter-clock extension register 1	SCK1	8	8	2, 3 PCLKB	2 ICLK	MCK	262
0008 C890h	SYSTEM	Counter-clock extension register 2	SCK2	8	8	2, 3 PCLKB	2 ICLK		262
0009 0200h to 0009 03FFh	CAN0	Mailbox registers 0 to 31	MB0 to 31	128	8, 16, 32	2, 3 PCLKB	2 ICLK	CAN	1479
0009 0400h to 0009 041Fh	CAN0	Mask registerer 0 to 7	MKR0 to 7	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1476
0009 0420h	CAN0	FIFO received ID compare register 0	FIDCR0	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477
0009 0424h	CAN0	FIFO received ID compare register 1	FIDCR1	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477

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Table 4.1 List of I/O Registers (Address Order) (36/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0009 0428h	CAN0	Mask invalid register	MKIVLR	32	8, 16, 32	2, 3 PCLKB	2 ICLK	CAN	1478
0009 042Ch	CAN0	Mailbox interrupt enable register	MIER	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1483
0009 0820h to 0009 083Fh	CAN0	Message control registers 0 to 31	MCTL0 to 31	8	8	2, 3 PCLKB	2 ICLK		1484
0009 0840h	CAN0	Control register	CTLR	16	8, 16	2, 3 PCLKB	2 ICLK		1470
0009 0842h	CAN0	Status register	STR	16	8, 16	2, 3 PCLKB	2 ICLK		1493
0009 0844h	CAN0	Bit configuration register	BCR	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1474
0009 0848h	CAN0	Receive FIFO control register	RFCR	8	8	2, 3 PCLKB	2 ICLK		1487
0009 0849h	CAN0	Receive FIFO pointer control register	RFPCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 084Ah	CAN0	Transmit FIFO control register	TFCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 084Bh	CAN0	Transmit FIFO pointer control register	TFPCR	8	8	2, 3 PCLKB	2 ICLK		1492
0009 084Ch	CAN0	Error interrupt enable register	EIER	8	8	2, 3 PCLKB	2 ICLK		1499
0009 084Dh	CAN0	Error interrupt factor judge register	EIFR	8	8	2, 3 PCLKB	2 ICLK		1500
0009 084Eh	CAN0	Receive error count register	RECR	8	8	2, 3 PCLKB	2 ICLK		1502
0009 084Fh	CAN0	Transmit error count register	TECR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 0850h	CAN0	Error code store register	ECSR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 0851h	CAN0	Channel search support register	CSSR	8	8	2, 3 PCLKB	2 ICLK		1497
0009 0852h	CAN0	Mailbox search status register	MSSR	8	8	2, 3 PCLKB	2 ICLK		1496
0009 0853h	CAN0	Mailbox search mode register	MSMR	8	8	2, 3 PCLKB	2 ICLK		1495
0009 0854h	CAN0	Time stamp register	TSR	16	16	2, 3 PCLKB	2 ICLK		1504
0009 0856h	CAN0	Acceptance filter support register	AFSR	16	16	2, 3 PCLKB	2 ICLK		1498
0009 0858h	CAN0	Test control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1505
0009 1200h to 0009 13FFh	CAN1	Mailbox registers 0 to 31	MB0 to 31	128	8, 16, 32	2, 3 PCLKB	2 ICLK		1479
0009 1400h to 0009 141Fh	CAN1	Mask register 0 to 7	MKR0 to 7	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1476
0009 1420h	CAN1	FIFO received ID compare register 0	FIDCR0	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477
0009 1424h	CAN1	FIFO received ID compare register 1	FIDCR1	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477
0009 1428h	CAN1	Mask invalid register	MKIVLR	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1478
0009 142Ch	CAN1	Mailbox interrupt enable register	MIER	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1483
0009 1820h to 0009 183Fh	CAN1	Message control registers 0 to 31	MCTL0 to 31	8	8	2, 3 PCLKB	2 ICLK		1484
0009 1840h	CAN1	Control register	CTLR	16	8, 16	2, 3 PCLKB	2 ICLK		1470
0009 1842h	CAN1	Status register	STR	16	8, 16	2, 3 PCLKB	2 ICLK		1493
0009 1844h	CAN1	Bit configuration register	BCR	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1474
0009 1848h	CAN1	Receive FIFO control register	RFCR	8	8	2, 3 PCLKB	2 ICLK		1487
0009 1849h	CAN1	Receive FIFO pointer control register	RFPCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 184Ah	CAN1	Transmit FIFO control register	TFCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 184Bh	CAN1	Transmit FIFO pointer control register	TFPCR	8	8	2, 3 PCLKB	2 ICLK		1492
0009 184Ch	CAN1	Error interrupt enable register	EIER	8	8	2, 3 PCLKB	2 ICLK		1499
0009 184Dh	CAN1	Error interrupt factor judge register	EIFR	8	8	2, 3 PCLKB	2 ICLK		1500
0009 184Eh	CAN1	Receive error count register	RECR	8	8	2, 3 PCLKB	2 ICLK		1502
0009 184Fh	CAN1	Transmit error count register	TECR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 1850h	CAN1	Error code store register	ECSR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 1851h	CAN1	Channel search support register	CSSR	8	8	2, 3 PCLKB	2 ICLK		1497
0009 1852h	CAN1	Mailbox search status register	MSSR	8	8	2, 3 PCLKB	2 ICLK		1496
0009 1853h	CAN1	Mailbox search mode register	MSMR	8	8	2, 3 PCLKB	2 ICLK		1495
0009 1854h	CAN1	Time stamp register	TSR	16	8, 16	2, 3 PCLKB	2 ICLK		1504
0009 1856h	CAN1	Acceptance filter support register	AFSR	16	8, 16	2, 3 PCLKB	2 ICLK		1498
0009 1858h	CAN1	Test control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1505

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Table 4.1 List of I/O Registers (Address Order) (37/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
0009 2200h to 0009 23FFh	CAN2	Mailbox registers 0 to 31	MB0 to 31	128	8, 16, 32	2, 3 PCLKB	2 ICLK	CAN	1479
0009 2400h to 0009 241Fh	CAN2	Mask register 0 to 7	MKR0 to 7	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1476
0009 2420h	CAN2	FIFO received ID compare register 0	FIDCR0	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477
0009 2424h	CAN2	FIFO received ID compare register 1	FIDCR1	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1477
0009 2428h	CAN2	Mask invalid register	MKIVLR	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1478
0009 242Ch	CAN2	Mailbox interrupt enable register	MIER	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1483
0009 2820h to 0009 283Fh	CAN2	Message control registers 0 to 31	MCTL0 to 31	8	8	2, 3 PCLKB	2 ICLK		1484
0009 2840h	CAN2	Control register	CTLR	16	8, 16	2, 3 PCLKB	2 ICLK		1470
0009 2842h	CAN2	Status register	STR	16	8, 16	2, 3 PCLKB	2 ICLK		1493
0009 2844h	CAN2	Bit configuration register	BCR	32	8, 16, 32	2, 3 PCLKB	2 ICLK		1474
0009 2848h	CAN2	Receive FIFO control register	RFCR	8	8	2, 3 PCLKB	2 ICLK		1487
0009 2849h	CAN2	Receive FIFO pointer control register	RFPCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 284Ah	CAN2	Transmit FIFO control register	TFCR	8	8	2, 3 PCLKB	2 ICLK		1490
0009 284Bh	CAN2	Transmit FIFO pointer control register	TFPCR	8	8	2, 3 PCLKB	2 ICLK		1492
0009 284Ch	CAN2	Error interrupt enable register	EIER	8	8	2, 3 PCLKB	2 ICLK		1499
0009 284Dh	CAN2	Error interrupt factor judge register	EIFR	8	8	2, 3 PCLKB	2 ICLK		1500
0009 284Eh	CAN2	Receive error count register	RECR	8	8	2, 3 PCLKB	2 ICLK		1502
0009 284Fh	CAN2	Transmit error count register	TECR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 2850h	CAN2	Error code store register	ECSR	8	8	2, 3 PCLKB	2 ICLK		1503
0009 2851h	CAN2	Channel search support register	CSSR	8	8	2, 3 PCLKB	2 ICLK		1497
0009 2852h	CAN2	Mailbox search status register	MSSR	8	8	2, 3 PCLKB	2 ICLK		1496
0009 2853h	CAN2	Mailbox search mode register	MSMR	8	8	2, 3 PCLKB	2 ICLK		1495
0009 2854h	CAN2	Time stamp register	TSR	16	16	2, 3 PCLKB	2 ICLK		1504
0009 2856h	CAN2	Acceptance filter support register	AFSR	16	16	2, 3 PCLKB	2 ICLK		1498
0009 2858h	CAN2	Test control register	TCR	8	8	2, 3 PCLKB	2 ICLK		1505
000A 0000h	USB0	System configuration control register	SYSCFG	16	16	3 to 4 PCLKB	2, 3 ICLK	USBa	1167
000A 0004h	USB0	System configuration status register 0	SYSSTS0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1169
000A 0008h	USB0	Device state control register 0	DVSTCTR0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1170
000A 0014h	USB0	CFIFO port register	CFIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 0018h	USB0	D0FIFO port register	D0FIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 001Ch	USB0	D1FIFO port register	D1FIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 0020h	USB0	CFIFO port select register	CFIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175
000A 0022h	USB0	CFIFO port control register	CFIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK		1179
000A 0028h	USB0	D0FIFO port select register	D0FIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175

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Table 4.1 List of I/O Registers (Address Order) (38/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 002Ah	USB0	D0FIFO port control register	D0FIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK	USBa	1179
000A 002Ch	USB0	D1FIFO port select register	D1FIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175
000A 002Eh	USB0	D1FIFO port control register	D1FIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK		1179
000A 0030h	USB0	Interrupt enable register 0	INTENB0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1181
000A 0032h	USB0	Interrupt enable register 1	INTENB1	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1182
000A 0036h	USB0	BRDY interrupt enable register	BRDYENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1183
000A 0038h	USB0	NRDY interrupt enable register	NRDYENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1184
000A 003Ah	USB0	BEMP interrupt enable register	BEMPENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1185
000A 003Ch	USB0	SOF output configuration register	SOFCFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1186
000A 0040h	USB0	Interrupt status register 0	INTSTS0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1187

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Table 4.1 List of I/O Registers (Address Order) (39/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0042h	USB0	Interrupt status register 1	INTSTS1	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1190
000A 0046h	USB0	BRDY interrupt status register	BRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1193
000A 0048h	USB0	NRDY interrupt status register	NRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1194
000A 004Ah	USB0	BEMP interrupt status register	BEMPSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1195
000A 004Ch	USB0	Frame number register	FRMNUM	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1196
000A 004Eh	USB0	Device state changing register	DVCHGR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1197
000A 0050h	USB0	USB address register	USBADDR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1198
000A 0054h	USB0	USB request type register	USBREQ	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1199

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Table 4.1 List of I/O Registers (Address Order) (40/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0056h	USB0	USB request value register	USBVAL	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1200
000A 0058h	USB0	USB request index register	USBINDX	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1201
000A 005Ah	USB0	USB request length register	USBLENG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1202
000A 005Eh	USB0	DCP maximum packet size register	DCPMAXP	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1204
000A 0060h	USB0	DCP control register	DCPCTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1205
000A 0064h	USB0	Pipe window select register	PIPESEL	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1209
000A 0068h	USB0	Pipe configuration register	PIPECFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1210
000A 006Ch	USB0	Pipe maximum packet size register	PIPEMAXP	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1212

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Table 4.1 List of I/O Registers (Address Order) (41/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 006Eh	USB0	Pipe cycle control register	PIPEPERI	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1213
000A 0070h	USB0	Pipe 1 control register	PIPE1CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0072h	USB0	Pipe 2 control register	PIPE2CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0074h	USB0	Pipe 3 control register	PIPE3CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0076h	USB0	Pipe 4 control register	PIPE4CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0078h	USB0	Pipe 5 control register	PIPE5CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 007Ah	USB0	Pipe 6 control register	PIPE6CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 007Ch	USB0	Pipe 7 control register	PIPE7CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214

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Table 4.1 List of I/O Registers (Address Order) (42/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 007Eh	USB0	Pipe 8 control register	PIPE8CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1214
000A 0080h	USB0	Pipe 9 control register	PIPE9CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0090h	USB0	Pipe 1 transaction counter enable register	PIPE1TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 0092h	USB0	Pipe 1 transaction counter register	PIPE1TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 0094h	USB0	Pipe 2 transaction counter enable register	PIPE2TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 0096h	USB0	Pipe 2 transaction counter register	PIPE2TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 0098h	USB0	Pipe 3 transaction counter enable register	PIPE3TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 009Ah	USB0	Pipe 3 transaction counter register	PIPE3TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223

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Table 4.1 List of I/O Registers (Address Order) (43/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 009Ch	USB0	Pipe 4 transaction counter enable register	PIPE4TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1222
000A 009Eh	USB0	Pipe 4 transaction counter register	PIPE4TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 00A0h	USB0	Pipe 5 transaction counter enable register	PIPE5TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 00A2h	USB0	Pipe 5 transaction counter register	PIPE5TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 00D0h	USB0	Device address 0 configuration register	DEVADD0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1224
000A 00D2h	USB0	Device address 1 configuration register	DEVADD1	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1224
000A 00D4h	USB0	Device address 2 configuration register	DEVADD2	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1224
000A 00D6h	USB0	Device address 3 configuration register	DEVADD3	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1224

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Table 4.1 List of I/O Registers (Address Order) (44/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 00D8h	USB0	Device address 4 configuration register	DEVADD4	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1224
000A 00DAh	USB0	Device address 5 configuration register	DEVADD5	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1224
000A 0200h	USB1	System configuration control register	SYSCFG	16	16	3 to 4 PCLKB	2, 3 ICLK		1167
000A 0204h	USB1	System configuration status register 0	SYSSTS0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1169
000A 0208h	USB1	Device state control register 0	DVSTCTR0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1170
000A 0214h	USB1	CFIFO port register	CFIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 0218h	USB1	D0FIFO port register	D0FIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 021Ch	USB1	D1FIFO port register	D1FIFO	16	8, 16	3 to 4 PCLKB	2, 3 ICLK		1173
000A 0220h	USB1	CFIFO port select register	CFIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175
000A 0222h	USB1	CFIFO port control register	CFIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK		1179
000A 0228h	USB1	D0FIFO port select register	D0FIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175
000A 022Ah	USB1	D0FIFO port control register	D0FIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK		1179
000A 022Ch	USB1	D1FIFO port select register	D1FIFOSEL	16	16	3 to 4 PCLKB	2, 3 ICLK		1175
000A 022Eh	USB1	D1FIFO port control register	D1FIFOCTR	16	16	3 to 4 PCLKB	2, 3 ICLK		1179
000A 0230h	USB1	Interrupt enable register 0	INTENB0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1181
000A 0236h	USB1	BRDY interrupt enable register	BRDYENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1183

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Table 4.1 List of I/O Registers (Address Order) (45/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0238h	USB1	NRDY interrupt enable register	NRDYENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1184
000A 023Ah	USB1	BEMP interrupt enable register	BEMPENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1185
000A 023Ch	USB1	SOF output configuration register	SOFCFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1186
000A 0240h	USB1	Interrupt status register 0	INTSTS0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1187
000A 0246h	USB1	BRDY interrupt status register	BRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1193
000A 0248h	USB1	NRDY interrupt status register	NRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1194
000A 024Ah	USB1	BEMP interrupt status register	BEMPSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1195
000A 024Ch	USB1	Frame number register	FRMNUM	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1196

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Table 4.1 List of I/O Registers (Address Order) (46/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 024Eh	USB1	Device state changing register	DVCHGR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1197
000A 0250h	USB1	USB address register	USBADDR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1198
000A 0254h	USB1	USB request type register	USBREQ	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1199
000A 0256h	USB1	USB request value register	USBVAL	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1200
000A 0258h	USB1	USB request index register	USBINDX	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1201
000A 025Ah	USB1	USB request length register	USBLENG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1202
000A 025Ch	USB1	DCP configuration register	DCPCFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1203
000A 025Eh	USB1	DCP maximum packet size register	DCPMAXP	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1204

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Table 4.1 List of I/O Registers (Address Order) (47/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0260h	USB1	DCP control register	DCPCTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1204
000A 0264h	USB1	Pipe window select register	PIPESEL	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1209
000A 0268h	USB1	Pipe configuration register	PIPECFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1210
000A 026Ch	USB1	Pipe maximum packet size register	PIPEMAXP	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1212
000A 026Eh	USB1	Pipe cycle control register	PIPEPERI	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1213
000A 0270h	USB1	Pipe 1 control register	PIPE1CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0272h	USB1	Pipe 2 control register	PIPE2CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0274h	USB1	Pipe 3 control register	PIPE3CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214

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Table 4.1 List of I/O Registers (Address Order) (48/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0276h	USB1	Pipe 4 control register	PIPE4CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1214
000A 0278h	USB1	Pipe 5 control register	PIPE5CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 027Ah	USB1	Pipe 6 control register	PIPE6CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 027Ch	USB1	Pipe 7 control register	PIPE7CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 027Eh	USB1	Pipe 8 control register	PIPE8CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0280h	USB1	Pipe 9 control register	PIPE9CTR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1214
000A 0290h	USB1	Pipe 1 transaction counter enable register	PIPE1TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 0292h	USB1	Pipe 1 transaction counter register	PIPE1TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223

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Table 4.1 List of I/O Registers (Address Order) (49/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0294h	USB1	Pipe 2 transaction counter enable register	PIPE2TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1222
000A 0296h	USB1	Pipe 2 transaction counter register	PIPE2TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 0298h	USB1	Pipe 3 transaction counter enable register	PIPE3TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 029Ah	USB1	Pipe 3 transaction counter register	PIPE3TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 029Ch	USB1	Pipe 4 transaction counter enable register	PIPE4TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 029Eh	USB1	Pipe 4 transaction counter register	PIPE4TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223
000A 02A0h	USB1	Pipe 5 transaction counter enable register	PIPE5TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1222
000A 02A2h	USB1	Pipe 5 transaction counter register	PIPE5TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1223

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Table 4.1 List of I/O Registers (Address Order) (50/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000A 0400h	USB	Deep standby USB transceiver control/pin monitor register	DPUSR0R	32	32	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6	USBa	1225
000A 0404h	USB	Deep standby USB suspend/resume interrupt register	DPUSR1R	32	32	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB)*6		1226
000C 0000h	EDMAC	EDMAC mode register	EDMR	32	32	5, 6PCLKA	—	EDMAC	1133
000C 0008h	EDMAC	EDMAC transmit request register	EDTRR	32	32	5, 6PCLKA	—		1134
000C 0010h	EDMAC	EDMAC receive request register	EDRRR	32	32	5, 6PCLKA	—		1135
000C 0018h	EDMAC	Transmit descriptor list start address register	TDLAR	32	32	5, 6PCLKA	—		1136
000C 0020h	EDMAC	Receive descriptor list start address register	RDLAR	32	32	5, 6PCLKA	—		1137
000C 0028h	EDMAC	ETHERC/EDMAC status register	EESR	32	32	5, 6PCLKA	—		1138
000C 0030h	EDMAC	ETHERC/EDMAC status interrupt permission register	EESIPR	32	32	5, 6PCLKA	—		1141
000C 0038h	EDMAC	Transmit/receive status copy enable register	TRSCER	32	32	5, 6PCLKA	—		1143
000C 0040h	EDMAC	Receive missed-frame counter register	RMFCR	32	32	5, 6PCLKA	—		1144
000C 0048h	EDMAC	Transmit FIFO threshold register	TFTR	32	32	5, 6PCLKA	—		1145
000C 0050h	EDMAC	FIFO depth register	FDR	32	32	5, 6PCLKA	—		1146
000C 0058h	EDMAC	Receiving method control register	RMCR	32	32	5, 6PCLKA	—		1147
000C 0064h	EDMAC	Transmit FIFO underrun counter	TFUCR	32	32	5, 6PCLKA	—		1148
000C 0068h	EDMAC	Receive FIFO overflow counter	RFOCR	32	32	5, 6PCLKA	—		1148
000C 006Ch	EDMAC	Independent output signal setting register	IOSR	32	32	5, 6PCLKA	—		1149
000C 0070h	EDMAC	Flow control start FIFO threshold setting register	FCFTR	32	32	5, 6PCLKA	—		1150
000C 0078h	EDMAC	Receive data padding insert register	RPADIR	32	32	5, 6PCLKA	—		1151
000C 007Ch	EDMAC	Transmit interrupt setting register	TRIMD	32	32	5, 6PCLKA	—		1152
000C 00C8h	EDMAC	Receive buffer write address register	RBWAR	32	32	5, 6PCLKA	—		1152
000C 00CCh	EDMAC	Receive descriptor fetch address register	RDFAR	32	32	5, 6PCLKA	—		1153
000C 00D4h	EDMAC	Transmit buffer read address register	TBRAR	32	32	5, 6PCLKA	—		1153
000C 00D8h	EDMAC	Transmit descriptor fetch address register	TDFAR	32	32	5, 6PCLKA	—		1154
000C 0100h	ETHERC	ETHERC mode register	ECMR	32	32	5, 6PCLKA	—	ETHERC	1102
000C 0108h	ETHERC	Receive frame length register	RFLR	32	32	5, 6PCLKA	—		1104
000C 0110h	ETHERC	ETHERC status register	ECSR	32	32	5, 6PCLKA	—		1105
000C 0118h	ETHERC	ETHERC interrupt permission register	ECSIPR	32	32	5, 6PCLKA	—		1106
000C 0120h	ETHERC	PHY interface register	PIR	32	32	5, 6PCLKA	—		1107
000C 0128h	ETHERC	PHY status register	PSR	32	32	5, 6PCLKA	—		1108
000C 0140h	ETHERC	Random number generation counter upper limit setting register	RDMLR	32	32	5, 6PCLKA	—		1108
000C 0150h	ETHERC	IPG register	IPGR	32	32	5, 6PCLKA	—		1109
000C 0154h	ETHERC	Automatic PAUSE frame register	APR	32	32	5, 6PCLKA	—		1110
000C 0158h	ETHERC	Manual PAUSE frame register	MPR	32	32	5, 6PCLKA	—		1111
000C 0160h	ETHERC	PAUSE Frame receive counter register	RFCF	32	32	5, 6PCLKA	—		1111
000C 0164h	ETHERC	Automatic PAUSE frame retransmit count register	TPAUSER	32	32	5, 6PCLKA	—		1112
000C 0168h	ETHERC	PAUSE frame retransmit counter register	TPAUSECR	32	32	5, 6PCLKA	—		1112
000C 016Ch	ETHERC	Broadcast frame receive count setting register	BCFRR	32	32	5, 6PCLKA	—		1113
000C 01C0h	ETHERC	MAC address high register	MAHR	32	32	5, 6PCLKA	—		1114
000C 01C8h	ETHERC	MAC address low register	MALR	32	32	5, 6PCLKA	—		1114

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Table 4.1 List of I/O Registers (Address Order) (51/51)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function	Reference Section
						ICLK≥PCLK	ICLK<PCLK		
000C 01D0h	ETHERC	Transmit retry over counter register	TROCR	32	32	5, 6PCLKA	—	ETHERC	1115
000C 01D4h	ETHERC	Delayed collision detect counter register	CDCR	32	32	5, 6PCLKA	—		1115
000C 01D8h	ETHERC	Lost carrier counter register	LCCR	32	32	5, 6PCLKA	—		1116
000C 01DCh	ETHERC	Carrier not detect counter register	CNDCR	32	32	5, 6PCLKA	—		1116
000C 01E4h	ETHERC	CRC error frame receive counter register	CEFCR	32	32	5, 6PCLKA	—		1117
000C 01E8h	ETHERC	Frame receive error counter register	FRECR	32	32	5, 6PCLKA	—		1117
000C 01ECh	ETHERC	Too-short frame receive counter register	TSFRCR	32	32	5, 6PCLKA	—		1118
000C 01F0h	ETHERC	Too-long frame receive counter register	TLFRCR	32	32	5, 6PCLKA	—		1118
000C 01F4h	ETHERC	Residual-bit frame receive counter register	RFCR	32	32	5, 6PCLKA	—		1119
000C 01F8h	ETHERC	Multicast address frame receive counter register	MAFCR	32	32	5, 6PCLKA	—		1119
007F C402h	FLASH	Flash mode register	FMODR	8	8	2 to 4FCLK	2, 3 ICLK	ROM, E2 DataFlash Memory	1728, 1807
007F C410h	FLASH	Flash access status register	FASTAT	8	8	2 to 4FCLK	2, 3 ICLK	ROM, E2 DataFlash Memory	1729, 1808
007F C411h	FLASH	Flash access error interrupt enable register	FAEINT	8	8	2 to 4FCLK	2, 3 ICLK	ROM, E2 DataFlash Memory	1731, 1810
007F C412h	FLASH	Flash ready interrupt enable register	FRDYIE	8	8	2 to 4FCLK	2, 3 ICLK	ROM	1736
007F C440h	FLASH	E2 DataFlash read enable register 0	DFLRE0	16	16	2 to 4FCLK	2, 3 ICLK	E2 DataFlash Memory	1811
007F C442h	FLASH	E2 DataFlash read enable register 1	DFLRE1	16	16	2 to 4FCLK	2, 3 ICLK		1812
007F C450h	FLASH	E2 DataFlash programming/erasure enable register 0	DFLWE0	16	16	2 to 4FCLK	2, 3 ICLK		1813
007F C452h	FLASH	E2 DataFlash programming/erasure enable register 1	DFLWE1	16	16	2 to 4FCLK	2, 3 ICLK		1814
007F C454h	FLASH	FCU RAM enable register	FCURAME	16	16	2 to 4FCLK	2, 3 ICLK	ROM	1732
007F FFB0h	FLASH	Flash status register 0	FSTATR0	8	8	2 to 4FCLK	2, 3 ICLK		1733
007F FFB1h	FLASH	Flash status register 1	FSTATR1	8	8	2 to 4FCLK	2, 3 ICLK		1735
007F FFB2h	FLASH	Flash P/E mode entry register	FENTRYR	16	16	2 to 4FCLK	2, 3 ICLK		1737
007F FFB4h	FLASH	Flash protection register	FPROTR	16	16	2 to 4FCLK	2, 3 ICLK		1739
007F FFB6h	FLASH	Flash reset register	FRESETR	16	16	2 to 4FCLK	2, 3 ICLK		1740
007F FFBAh	FLASH	FCU command register	FCMDR	16	16	2 to 4FCLK	2, 3 ICLK		1741
007F FFC8h	FLASH	FCU processing switching register	FCPSR	16	16	2 to 4FCLK	2, 3 ICLK		1742
007F FFCAh	FLASH	E2 data flash blank check control register	DFLBCCNT	16	16	2 to 4FCLK	2, 3 ICLK	E2 DataFlash Memory	1816
007F FFCCh	FLASH	Flash P/E status registe	FPESTAT	16	16	2 to 4FCLK	2, 3 ICLK	ROM	1742
007F FFCEh	FLASH	E2 DataFlash blank check status register	DFLBCSTAT	16	16	2 to 4FCLK	2, 3 ICLK	E2 DataFlash Memory	1817
007F FFE8h	FLASH	Peripheral clock notification register	PCKAR	16	16	2 to 4FCLK	2, 3 ICLK	ROM	1743

Note 1. When the same output trigger is specified for pulse output groups 2 and 3 by the PPG0.PCR setting, the PPG0.NDRH address is 000881ECh. When different output triggers are specified, the PPG0.NDRH addresses for pulse output groups 2 and 3 are 000881EEh and 000881ECh, respectively.

Note 2. When the same output trigger is specified for pulse output groups 0 and 1 by the PPG0.PCR setting, the PPG0.NDRL address is 000881EDh. When different output triggers are specified, the PPG0.NDRL addresses for pulse output groups 0 and 1 are 000881EFh and 000881EDh, respectively.

Note 3. When the same output trigger is specified for pulse output groups 6 and 7 by the PPG1.PCR setting, the PPG1.NDRH address is 000881FCh. When different output triggers are specified, the PPG1.NDRH addresses for pulse output groups 6 and 7 are 000881FEh and 000881FCh, respectively.

Note 4. When the same output trigger is specified for pulse output groups 4 and 5 by the PPG1.PCR setting, the PPG1.NDRL address is 000881FDh. When different output triggers are specified, the PPG1.NDRL addresses for pulse output groups 4 and 5 are 000881FFh and 000881FDh, respectively.

Note 5. Odd addresses should not be accessed in 16-bit units. When accessing a register in 16-bit units, access the address of the TMR0 or TMR2 register. Table 27.4 lists register allocation for 16-bit access.

Note 6. When the register is accessed while the USB is operating, a delay may be generated in accessing.

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5. Electrical Characteristics

5.1 Absolute Maximum Ratings

Table 5.1 Absolute Maximum Ratings

Conditions: VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V

Item	Symbol	Value	Unit
Power supply voltage	VCC, VCC_USB	–0.3 to +4.6	V
Vbatt power supply voltage	V_{batt}	–0.3 to +4.6	V
Input voltage (except for ports for 5 V tolerant*1)	V_{in}	–0.3 to VCC + 0.3	V
Input voltage (ports for 5 V tolerant*1)	V_{in}	–0.3 to +5.8	V
Reference power supply voltage	VREFH	–0.3 to VCC + 0.3	V
Analog power supply voltage	AVCC*2	–0.3 to +4.6	V
Analog input voltage	V_{AN}	–0.3 to VCC + 0.3	V
Operating temperature	T_{opr}	–40 to +85	°C
Storage temperature	T_{stg}	–55 to +125	°C

Caution: Permanent damage to the LSI may result if absolute maximum ratings are exceeded.

Note 1. Ports 07, 12 to 17, 20, 21, 30 to 33, 67, and C0 to C3 are 5 V tolerant.

Note 2. Connect AVCC0 to VCC. When neither the A/D converter nor the D/A converter is in use, do not leave the AVCC0, VREFH/VREFH0, AVSS0, and VREFL/VREFL0 pins open. Connect the AVCC0 and VREFH/VREFH0 pins to VCC, and the AVSS0 and VREFL/VREFL0 pins to VSS, respectively.

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5.2 DC Characteristics

Table 5.2 DC Characteristics (1)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Schmitt trigger input voltage	IRQ input pin*1 MTU input pin*1 TMR input pin*1 SCI input pin*1 ADTRG# input pin*1 RES#, NMI	V_{IH}	VCC × 0.8	—	VCC + 0.3	V	
		V_{IL}	–0.3	—	VCC × 0.2		
		ΔV_T	VCC × 0.06	—	—		
	RIIC input pin (except for SMBus)	V_{IH}	VCC × 0.7	—	5.8		
		V_{IL}	–0.3	—	VCC × 0.3		
		ΔV_T	VCC × 0.05	—	—		
	Ports for 5 V tolerant*2	V_{IH}	VCC × 0.8	—	5.8		
		V_{IL}	–0.3	—	VCC × 0.2		
	Other input pins excluding ports for 5 V tolerant*3	V_{IH}	VCC × 0.8	—	VCC + 0.3		
		V_{IL}	–0.3	—	VCC × 0.2		
Input high voltage (except for Schmitt trigger input pin)	MD pin, EMLE	V_{IH}	VCC × 0.9	—	VCC + 0.3	V	
	EXTAL, RSPI, EXDMAC, WAIT#, TCK		VCC × 0.8	—	VCC + 0.3		
	ETHERC		2.3	—	VCC + 0.3		
	XCIN		—	—	VCC + 0.3		
	D0 to D31		VCC × 0.7	—	VCC + 0.3		
	RIIC (SMBus)		2.1	—	VCC + 0.3		
Input low voltage (except for Schmitt trigger input pin)	MD pin, EMLE	V_{IL}	–0.3	—	VCC × 0.1	V	
	EXTAL, RSPI, ETHERC, EXDMAC, WAIT#, TCK		–0.3	—	VCC × 0.2		
	XCIN		–0.3	—	—		
	D0 to D31		–0.3	—	VCC × 0.3		
	RIIC (SMBus)		–0.3	—	0.8		

Note 1. This does not include the pins, which are multiplexed as ports for 5 V tolerant.
Note 2. Ports 07, 12 to 17, 20, 21, 30 to 33, 67, and C0 to C3 are 5 V tolerant.
Note 3. For P32, P31, P30, input as follows when the Vbatt power supply is selected.
VIH Min. = Vbatt × 0.8, VIH Max. = Vbatt + 0.3, VIL Min. = –0.3, VIL Max. = Vbatt × 0.2

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Table 5.3 DC Characteristics (2)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Output high voltage	All output pins	V_{OH}	VCC – 0.5	—	—	V	I_{OH} = –1 mA
Output low voltage	All output pins (except for RIIC pins, and ETHERC)	V_{OL}	—	—	0.5	V	I_{OL} = 1.0 mA
	RIIC pins		—	—	0.4	V	I_{OL} = 3.0 mA
			—	—	0.6		I_{OL} = 6.0 mA
	RIIC pins (only P12 and P13 in channel 0)	V_{OL}	—	—	0.4	V	I_{OL} = 15.0 mA (ICFER.FMPE = 1)
			—	0.4	—		I_{OL} = 20.0 mA (ICFER.FMPE = 1)
	ETHERC	V_{OL}	—	—	0.4	V	I_{OL} = 1.0 mA
Input leakage current	RES#, MD pin, EMLE*1, NMI	$\lvert I_{in} \rvert$	—	—	1.0	µA	V_{in} = 0 V V_{in} = VCC
Three-state leakage current (off state)	Other than ports for 5 V tolerant	$\lvert I_{TSI} \rvert$	—	—	1.0	µA	V_{in} = 0 V V_{in} = VCC
	Ports for 5 V tolerant		—	—	5.0		Vin = 0 V Vin = 5.5 V
Input pull-up MOS current	Ports 0 to 2, 30 to 34, 36, 37, 4 to G, J3, J5	I_p	–10	—	–300	µA	VCC= 2.7 to 3.6 V V_{in} = 0 V
Input capacitance	All input pins (except for ports 12, 13, 16, 17, 20, 21, 4, C0, C1, and EMLE)	C_{in}	—	—	15	pF	V_{in} = 0 V f = 1 MHz T_a = 25°C
	Ports 12, 13, 16, 17, 20, 21, 4, C0, C1, EMLE		—	—	30		
Input pull-down MOS current	EMLE, BSCANP	I_p	10	—	300	µA	V_{in} = VCC

Note 1. The input leakage current value at the EMLE pin is only when V_{in} = 0 V.

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Table 5.4 DC Characteristics (3)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item				Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Supply current*1	High-speed operating mode	Max.*2		I_{CC}*3	—	—	100	mA	ICLK = 100 MHz PCLKA = 100MHz PCLKB = 50 MHz FCLK = 50 MHz BCLK = 50 MHz BCLK = 100MHz
		Normal *4	Peripheral function: clock signal supplied*4		—	52	—		
			Peripheral function: clock signal stopped*4		—	40	—		
		Sleep mode			—	25	65		
		All-module-clock-stop mode (reference value)			—	20	38		
		Increased by BGO operation*5			—	15	—		
	Low-speed operating mode 1*6				—	4	—		ICLK = 1 MHz
	Low-speed operating mode 2				—	1	—		ICLK = 32.768 kHz
	Software standby mode				—	0.2	6		
	Deep software standby mode	Power supplied to on-chip RAM and USB resume detecting unit			—	22	200	µA	
		Power not supplied to on-chip RAM and USB resume detecting unit	Power-on reset circuit and low-power consumption function disabled		—	21	60		
			Power-on reset circuit and low-power		—	6.2	28		
	Increased by RTC operation				—	3	—		
	RTC operation when VCC is off				—	1.7	—		Vbatt = 2.0 V
					—	3.3	—		Vbatt = 3.3 V
Analog power supply current*7	During 12-bit A/D conversion (including temperature sensor)			AI_{CC}	—	2.3	3.2	mA	
	During 10-bit A/D conversion				—	1.0	1.65	mA	
	During D/A conversion (per unit)				—	0.7	1.0	mA	
	Waiting for A/D, D/A conversion (all units)				—	25	35	µA	
	A/D, D/A converter in standby mode (all units)				—	0.1	4.0	µA	
Reference power supply current	During 12-bit A/D conversion			I_{REFH}	—	0.6	0.7	mA	
	Waiting for 12-bit A/D conversion (per unit)				—	0.5	0.6	mA	
	12-bit A/D converter in standby mode (per unit)				—	0.1	2.0	µA	
RAM standby voltage				VRAM	2.7	—	—	V	
VCC rising gradient				SrVCC	8.4	—	20000	µs/V	
VCC falling gradient*8				SfVCC	8.4	—	—	µs/V	

Note 1. Supply current values are with all output pins unloaded and all input pull-up MOSs in the off state.
Note 2. Measured with clocks supplied to the peripheral functions. This does not include the BGO operation.
Note 3. ICC depends on f (ICLK) as follows. (ICLK:PCLK:BCLK:BCLK pin = 8:4:4:2)
ICC Max. = 0.87 × f + 13 (max. operation in high-speed operating mode)
ICC Typ. = 0.35 × f + 5 (normal operation in high-speed operating mode)
ICC Typ. = 1.0 × f + 3 (low-speed operating mode 1)
ICC Max. = 0.48 × f + 12 (sleep mode)
Note 4. This does not include the BGO operation.
Note 5. This is the increase for programming or erasure of the ROM or flash memory for data storage during program execution.
Note 6. Supply of the clock signal to peripherals is stopped in this state. This does not include the BGO operation.
Note 7. The reference power supply current is included in the power supply current value for 10-bit A/D conversion and D/A conversion.
Note 8. When VBATT is used

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Table 5.5 DC Characteristics (4)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Permissible total power consumption*1	P_d	—	—	380	mW	*2

Note 1. This is the total power consumption of the chip as a whole (including the power consumed by the output buffers).
Note 2. Contact a Renesas sales office or agent regarding further details of the conditions of measurement.

Table 5.6 Permissible Output Currents

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit
Permissible output low current (average value per pin)	All output pins*1	Normal drive	I_{OL}	—	—	2.0	mA
	All output pins*2	High drive	I_{OL}			3.8	mA
Permissible output low current (max. value per pin)	All output pins*1	Normal drive	I_{OL}	—	—	4.0	mA
	All output pins*2	High drive	I_{OL}			7.6	mA
Permissible output low current (total)	Total of all output pins		ΣI_{OL}	—	—	80	mA
Permissible output high current (average value per pin)	All output pins (except for USB_DPUPE pin)*1	Normal drive	$-I_{OH}$	—	—	–2.0	mA
	USB_DPUPE pin*2	High drive	$-I_{OH}$	—	—	–3.8	mA
Permissible output high current (max. value per pin)	All output pins*1	Normal drive	$-I_{OH}$	—	—	–4.0	mA
	All output pins*2	High drive	$-I_{OH}$	—	—	–7.6	mA
Permissible output high current (total)	Total of all output pins		$\Sigma -I_{OH}$	—	—	–80	mA

Caution: To protect the LSI's reliability, the output current values should not exceed the values in this table.
Note 1. This is the value when normal driving ability is set with a pin for which normal driving ability is selectable.
Note 2. This is the value when high driving ability is set with a pin for which normal driving ability is selectable or the value of the pin to which high driving ability is fixed.

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5.3 AC Characteristics

Table 5.7 Operation Frequency Value (High-Speed Operating Mode)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit
Operation frequency	System clock (ICLK)		f	—*1	—	100	MHz
	Peripheral module clock (PCLKA)			—*1	—	100	
	Peripheral module clock (PCLKB)			—*2	—	50	
	FlashIF clock (FCLK)			—*3	—	50	
	External bus clock (BCLK)	Packages with 177 to 144 pins		—	—	100	
		Packages with 100 pins or less		—	—	50	
	BCLK pin output	Packages with 177 to 144 pins		—	—	50	
		Packages with 100 pins or less		—	—	25	
	SDRAM clock (SDCLK)	Packages with 177 to 144 pins only		—	—	50	
	SDCLK pin output	Packages with 177 to 144 pins only		—	—	50	
	USB clock (UCLK)			—	—	48	
	IEBUS clock (IECLK)			—	—	44.03	

Note 1. The ICLK and PCLKA frequencies must be the same and at least 12.5 MHz if the Ethernet controller is in use
Note 2. The PCLKB must run at a frequency of at least 24 MHz if the USB is in use.
Note 3. The FCLK must run at a frequency of at least 4 MHz when changing the ROM or E2 DataFlash memory contents.

Table 5.8 Operation Frequency Value (Low-Speed Operating Mode 1)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit
Operation frequency	System clock (ICLK)		f	—	—	1	MHz
	Peripheral module clock (PCLKA)			—	—	1	
	Peripheral module clock (PCLKB)			—	—	1	
	FlashIF clock (FCLK)			—	—	1	
	External bus clock (BCLK)	Packages with 177 to 144 pins		—	—	1	
		Packages with 100 pins or less		—	—	1	
	BCLK pin output	Packages with 177 to 144 pins		—	—	1	
		Packages with 100 pins or less		—	—	1	
	SDRAM clock (SDCLK)	Packages with 177 to 144 pins only		—	—	1	
	SDCLK pin output	Packages with 177 to 144 pins only		—	—	1	
	USB clock (UCLK)			—	—	1	
	IEBUS clock (IECLK)			—	—	1	

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Table 5.9 Operation Frequency Value (Low-Speed Operating Mode 2)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit
Operation frequency	System clock (ICLK)		f	32	—	143.75	kHz
	Peripheral module clock (PCLKA)			—	—	143.75	
	Peripheral module clock (PCLKB)			—	—	143.75	
	FlashIF clock (FCLK)			32	—	143.75	
	External bus clock (BCLK)	Packages with 177 to 144 pins		—	—	143.75	
		Packages with 100 pins or less		—	—	143.75	
	BCLK pin output	Packages with 177 to 144 pins		—	—	143.75	
		Packages with 100 pins or less		—	—	143.75	
	SDRAM clock (SDCLK)	Packages with 177 to 144 pins only		—	—	143.75	
	SDCLK pin output	Packages with 177 to 144 pins only		—	—	143.75	
	USB clock (UCLK)			—	—	143.75	
	IEBUS clock (IECLK)			—	—	143.75	

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5.4 Clock Timing

Table 5.10 Clock Timing (Except for Sub-Clock Related)

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BCLK pin output cycle time	Packages with 177 to 144 pins	t_{Bcyc}	20	—	—	ns	Figure 5.1
	Packages with 100 pins or less		40	—	—	ns	
BCLK pin output high pulse width		t_{CH}	5	—	—	ns	
BCLK pin output low pulse width		t_{CL}	5	—	—	ns	
BCLK pin output rising time		t_{Cr}	—	—	5	ns	
BCLK pin output falling time		t_{Cf}	—	—	5	ns	
SDCLK pin output cycle time	only 177 to 144 pin	t_{Bcyc}	20	—	—	ns	
SDCLK pin output high pulse width		t_{CH}	5	—	—	ns	
SDCLK pin output low pulse width		t_{CH}	5	—	—	ns	
SDCLK pin output rising time		t_{CH}	—	—	5	ns	
SDCLK pin output falling time		t_{CH}	—	—	5	ns	
EXTAL external clock input cycle time		t_{EXcyc}	50	—	—	ns	Figure 5.2
EXTAL external clock input high pulse width		t_{EXH}	20	—	—	ns	
EXTAL external clock input low pulse width		t_{EXL}	20	—	—	ns	
EXTAL external clock rising time		t_{EXr}	—	—	5	ns	
EXTAL external clock falling time		t_{EXf}	—	—	5	ns	
EXTAL external clock input wait time*1		t_{EXWT}	1	—	—	ms	
Main clock oscillator oscillation frequency		f_{MAIN}	4	—	16	MHz	
Main clock oscillation stabilization time (crystal)		$t_{MAINOSC}$	10	—	—	ms	Figure 5.3
Main clock oscillation stabilization wait time (crystal)		$t_{MAINOSCWT}$	20	—	—	ms	
LOCO clock cycle time		t_{cyc}	6.96	8	9.4	µs	
LOCO clock oscillation frequency		f_{LOCO}	106.25	125	143.75	kHz	
LOCO clock oscillation stabilization wait time		t_{LOCOWT}	—	—	20	µs	Figure 5.4
HOCO clock oscillator oscillation frequency		f_{HOCO}	45	50	55	MHz	
HOCO clock oscillation stabilization wait time 1*2		$t_{HOCOWT1}$	—	—	1.8	ms	Figure 5.5
HOCO clock oscillation stabilization wait time 2		$t_{HOCOWT2}$	—	—	2.0	ms	Figure 5.6
HOCO clock power supply settling time		t_{HOCOP}	—	—	1	ms	Figure 5.7
PLL circuit oscillation frequency		f_{PLL}	104	—	200	MHz	
PLL clock oscillation stabilization	PLL operation started after main clock oscillation has settled	t_{PLL1}	—	—	500	µs	Figure 5.8
PLL clock oscillation stabilization		t_{PLLWT1}	1.5	—	—	ms	
PLL clock oscillation stabilization	PLL operation started before main clock oscillation has settled	t_{PLL2}	10	—	—	ms	Figure 5.9
PLL clock oscillation stabilization		t_{PLLWT2}	20	—	—	ms	

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Note 1. This is the time until the clock is used after setting P36 and P37 as inputs, and then clearing the main clock oscillator stop bit (MOSCCR.MOSTP) to 0 (selecting operation).
Note 2. This is the time until the frequency of oscillation by the HOCO (fHOCO) reaches the range for guaranteed operation. after release from the reset state.

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Table 5.11 Clock Timing (Sub-Clock Related)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0, Vbatt = 2.0 to 3.6 V,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Sub-clock oscillator oscillation frequency	f_{SUB}	—	32.768	—	kHz	
Sub-clock oscillation stabilization time	t_{SUBOSC}	2	*1			Figure 5.10
Sub-clock oscillation stabilization wait offset time	$t_{SUBOSCWT0}$	1.8	—	2.6	s	

Note 1. When using a sub-clock, ask the manufacturer of the oscillator to evaluate its oscillation. Refer to the results of evaluation provided by the manufacturer for the oscillation stabilization time.

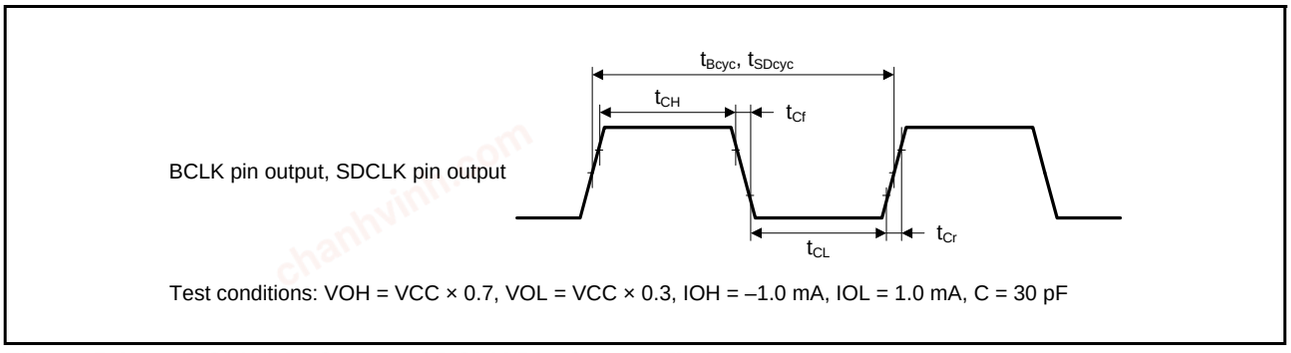


Figure 5.1 BCLK Pin Output, SDCLK Pin Output Timing

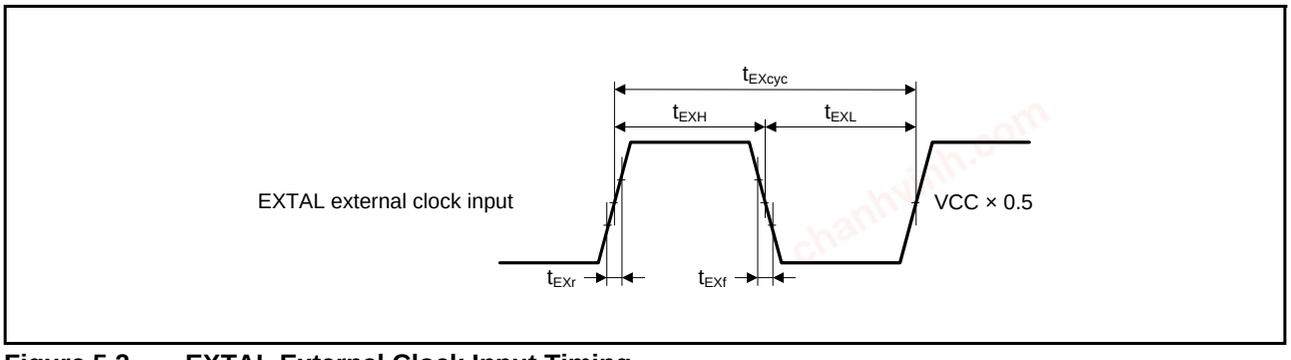


Figure 5.2 EXTAL External Clock Input Timing

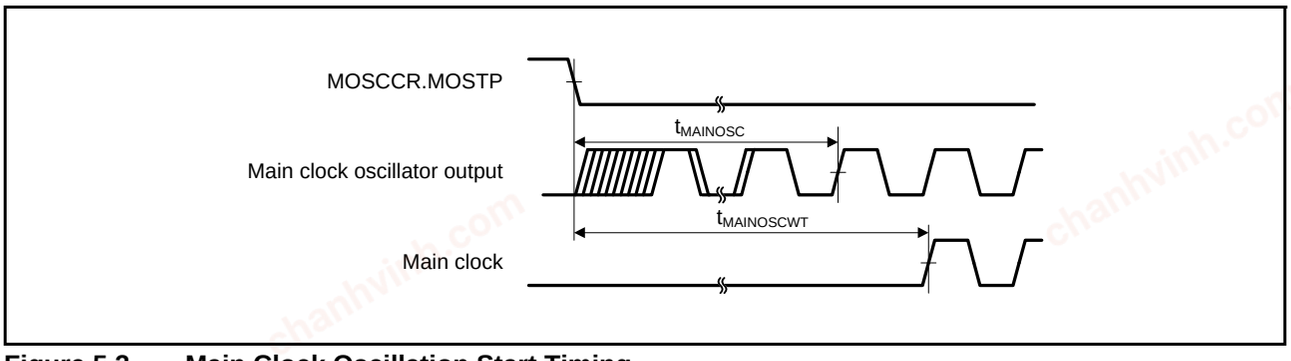


Figure 5.3 Main Clock Oscillation Start Timing

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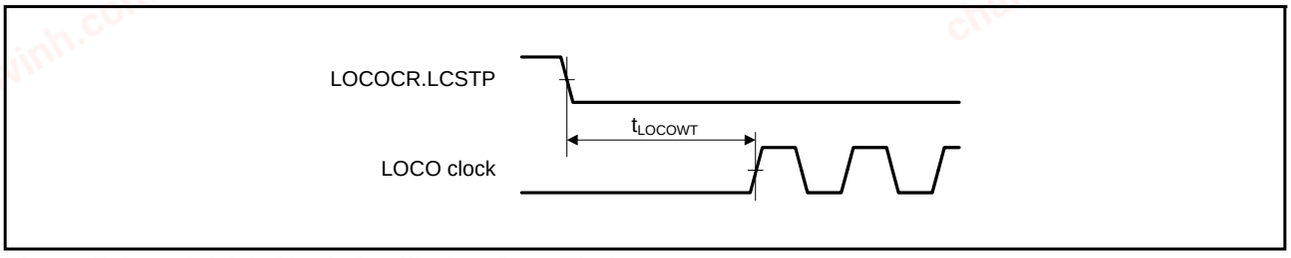


Figure 5.4 LOCO Clock Oscillation Start Timing

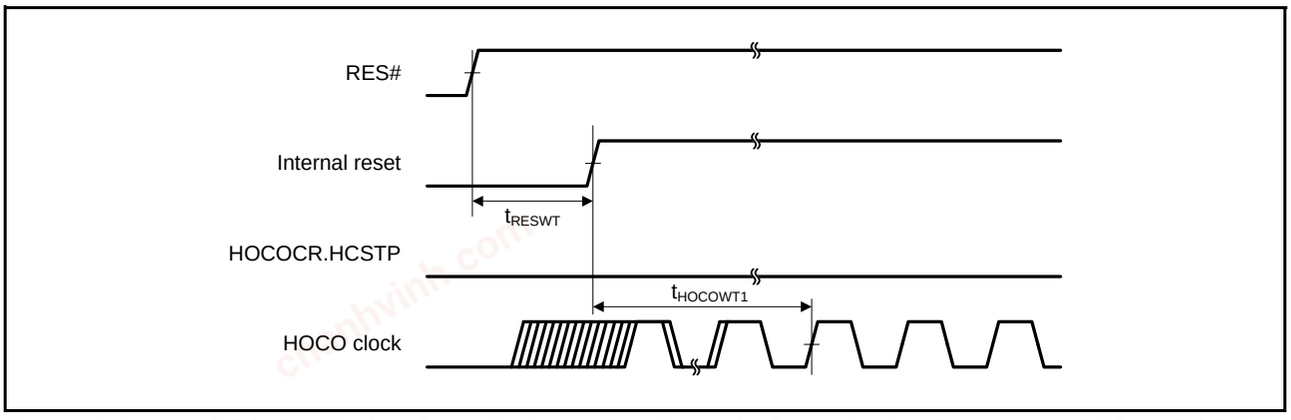


Figure 5.5 HOCO Oscillation Start Timing (After Reset is Canceled by Setting the OFS1.HOCOEN Bit to 0)

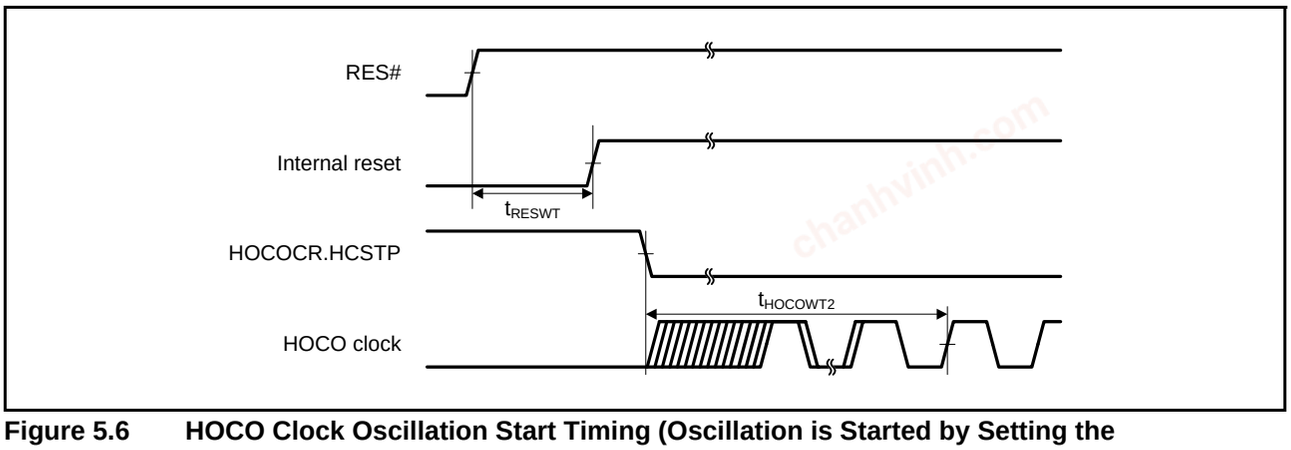


Figure 5.6 HOCO Clock Oscillation Start Timing (Oscillation is Started by Setting the HOCOCR.HCSTP Bit)

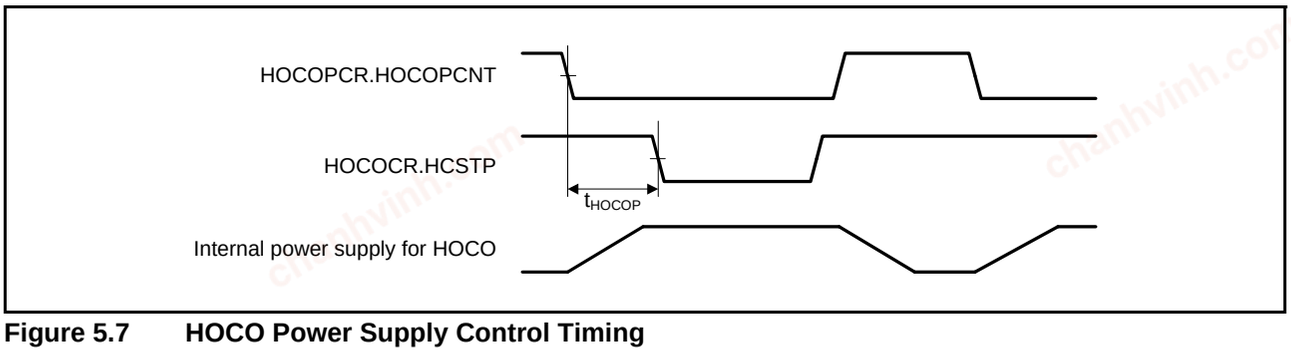


Figure 5.7 HOCO Power Supply Control Timing

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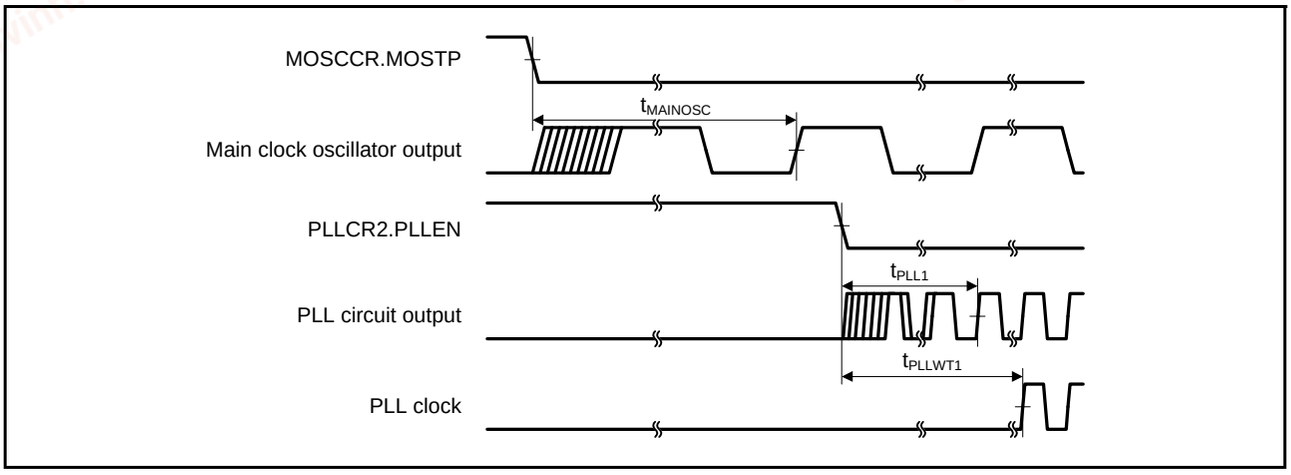


Figure 5.8 PLL Clock Oscillation Start Timing (PLL is Operated after Main Clock Oscillation Has Settled)

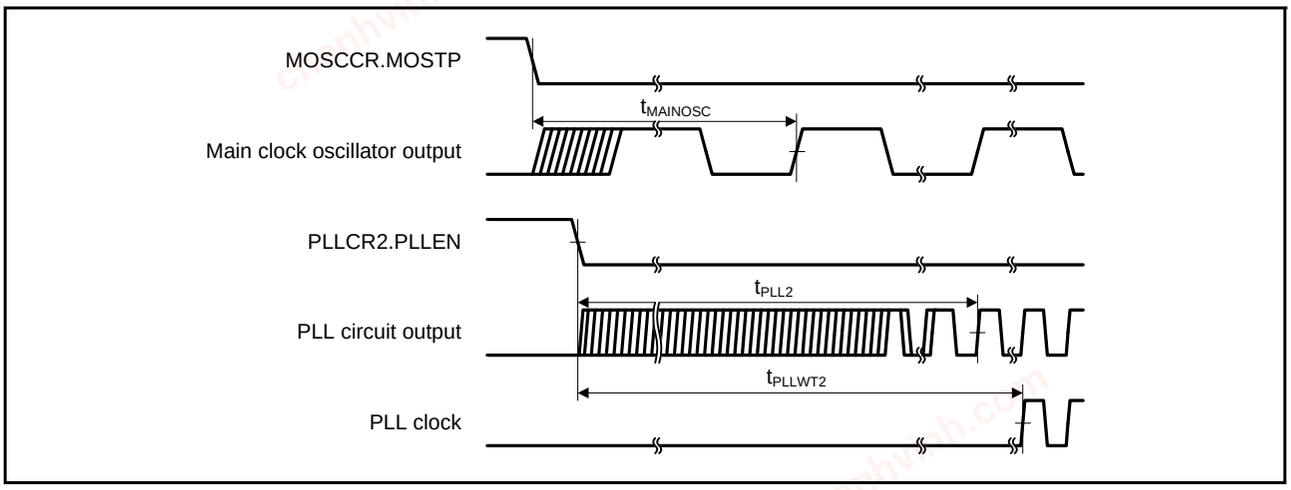


Figure 5.9 PLL Clock Oscillation Start Timing (PLL is Operated before Main Clock Oscillation Has Settled)

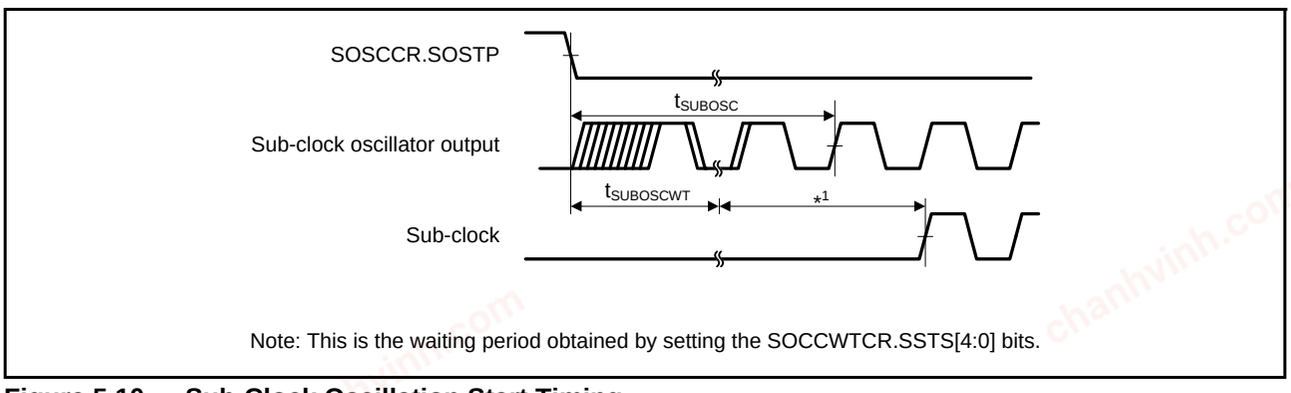


Figure 5.10 Sub-Clock Oscillation Start Timing

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5.4.1 Reset Timing

Table 5.12 Reset Timing

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
RES# pulse width	Power-on	t_{RESWP}	2	—	—	ms	Figure 5.11
	Deep software standby mode	t_{RESWD}	1	—	—	ms	Figure 5.12
	Software standby mode, low-speed operating mode 2	t_{RESWS}	1	—	—	ms	
	Programming or erasure of the ROM or E2 data-flash memory or blank checking of the E2 DataFlash memory	t_{RESW}	200	—	—	µs	
	Other than above	t_{RESW}	200	—	—	µs	
Wait time after RES# cancellation		t_{RESWT}	59	—	60	t_{cyc}	Figure 5.11
Internal reset time (independent watchdog timer reset, watchdog timer reset, software reset)		t_{RESW2}	112	—	120	t_{cyc}	

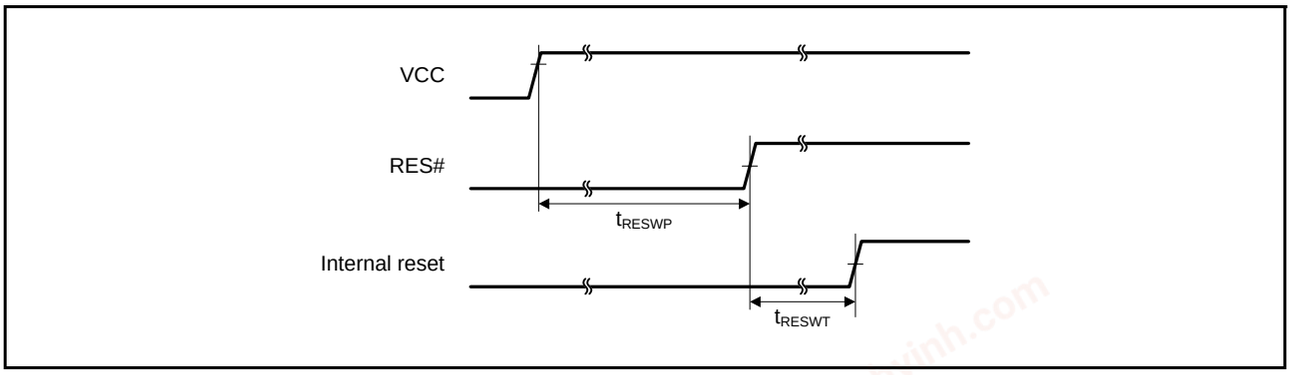


Figure 5.11 Reset Input Timing at Power-On

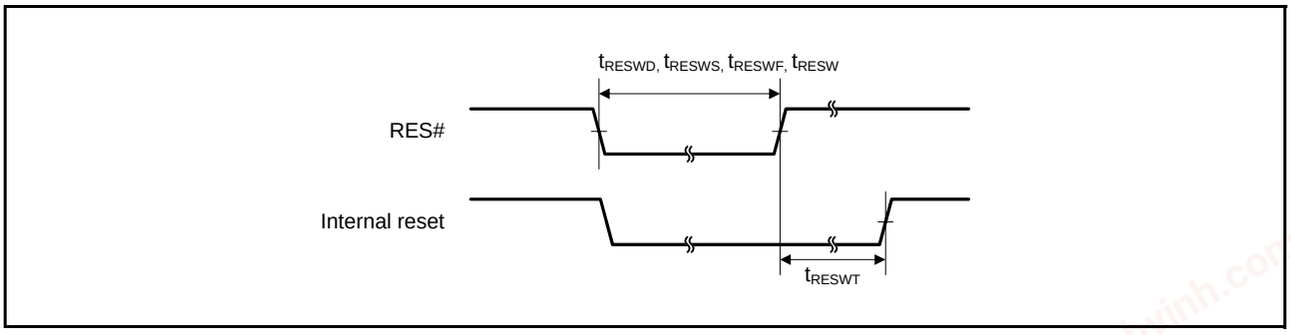


Figure 5.12 Reset Input Timing

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5.4.2 Timing of Recovery from Low Power Consumption Modes

Table 5.13 Timing of Recovery from Low Power Consumption Modes

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Recovery time after cancellation of software standby mode	Crystal resonator connected to main clock oscillator	Main clock oscillator operating	t_{SBYMC}	10	—	—	ms	Figure 5.13
		Main clock oscillator and PLL circuit operating	t_{SBYPC}	10	—	—	ms	
	External clock input to main clock oscillator	Main clock oscillator operating	t_{SBYEX}	1	—	—	ms	
		Main clock oscillator and PLL circuit operating	t_{SBYPE}	1	—	—	ms	
	Sub-clock oscillator operating		t_{SBYSC}	2	—	—	s	
	HOCO operating		t_{SBYHO}	—	—	2	ms	
	LOCO or IWDT-dedicated LOCO operating		t_{SBYLO}	—	—	800	µs	
Recovery time after cancellation of deep software standby mode			t_{DSBY}	—	—	1.0	ms	Figure 5.14
Wait time after cancellation of deep software standby mode			t_{DSBYWT}	45	—	46	t_{cyc}	

Note: • The wait time varies depending on the state in which each oscillator was when the WAIT instruction was executed. The recovery time when multiple oscillators are operating is the same period as that when the oscillator which requires the longest time of all operating oscillators to recover is operating alone.

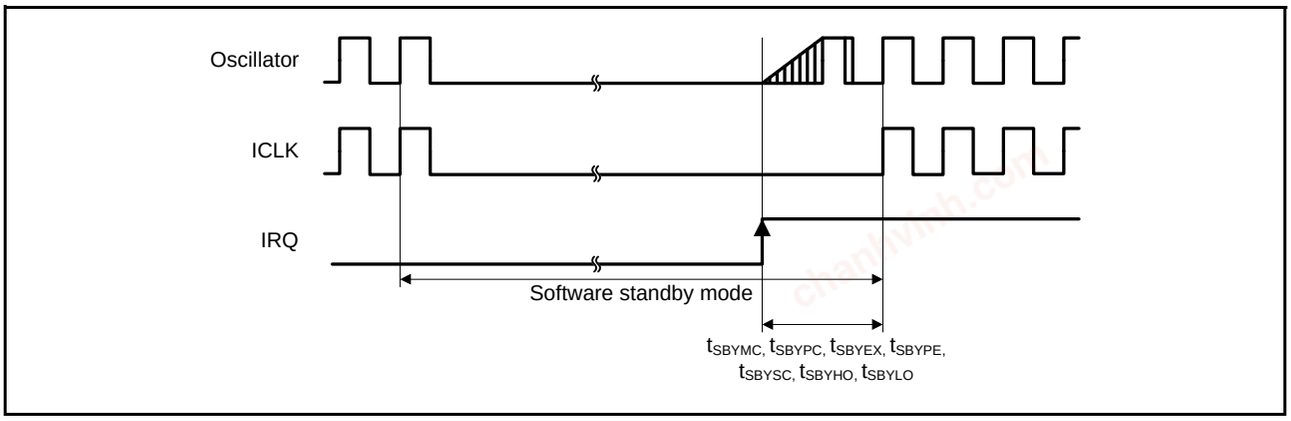


Figure 5.13 Software Standby Mode Cancellation Timing

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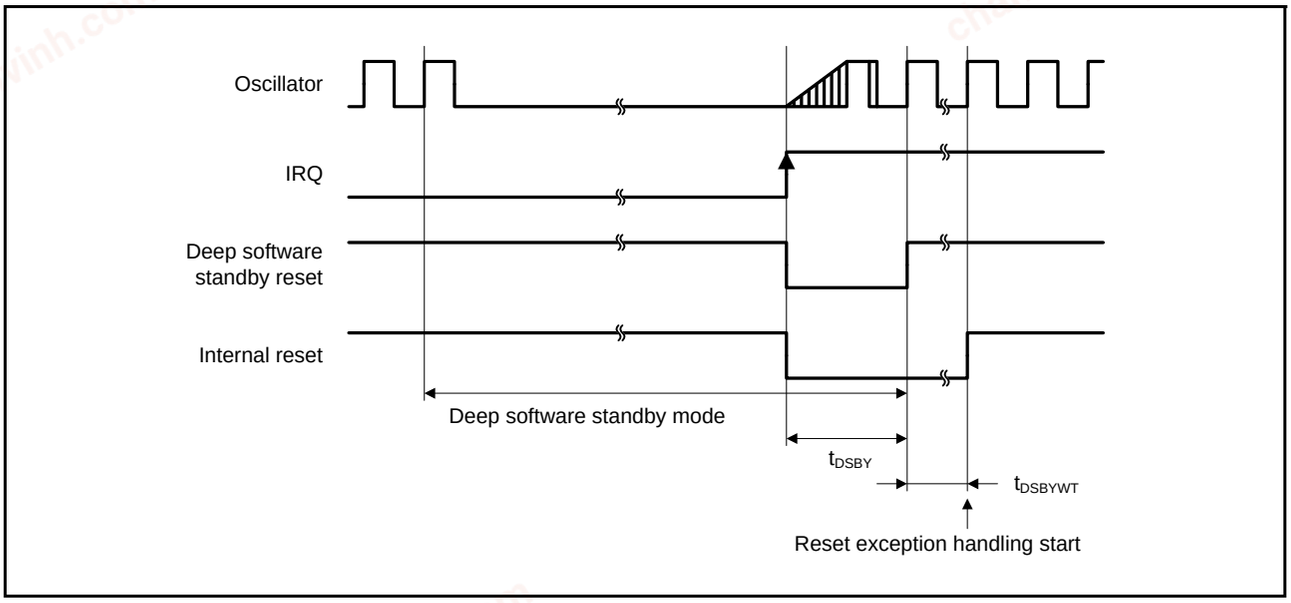


Figure 5.14 Deep Software Standby Mode Cancellation Timing

5.4.3 Control Signal Timing

Table 5.14 Control Signal Timing

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V, $T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
NMI pulse width	t_{NMIW}	200	—	—	ns	tc (PCLK) × 2 ≤ 200 ns Figure 5.15
		tc (PCLK) × 2				tc (PCLK) × 2 > 200 ns Figure 5.15
IRQ pulse width	t_{IRQW}	200	—	—	ns	tc (PCLK) × 2 ≤ 200 ns Figure 5.16
		tc (PCLK) × 2				tc (PCLK) × 2 > 200 ns Figure 5.16

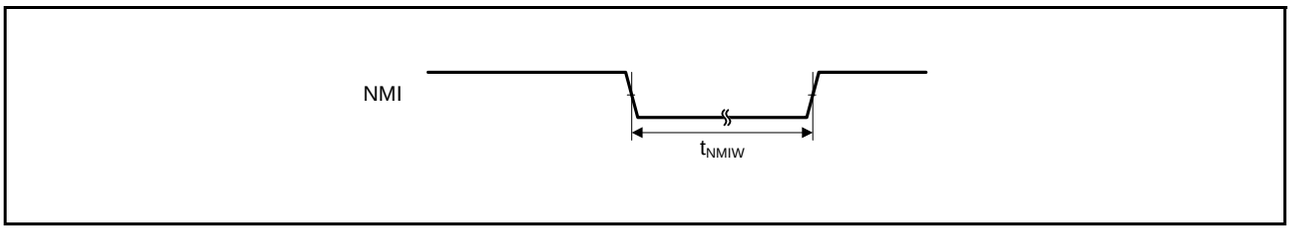


Figure 5.15 NMI Interrupt Input Timing

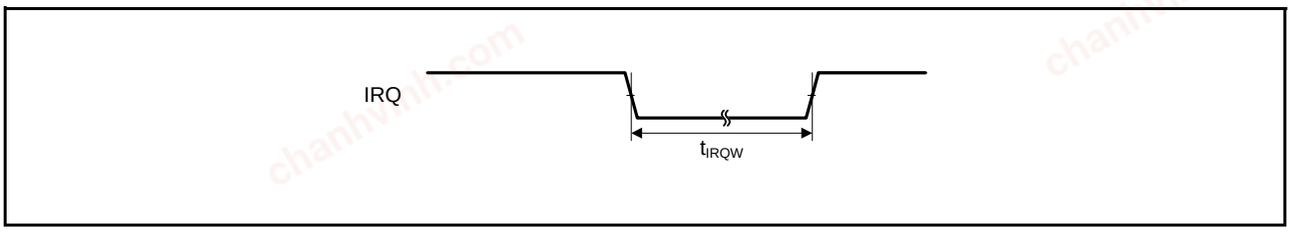


Figure 5.16 IRQ Interrupt Input Timing

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5.4.4 Bus Timing

Table 5.15 Bus Timing (packages with 177 to 144 pins)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V,
ICLK = 8 to 100 MHz, BCLK = 8 to 50 MHz, $T_a = T_{opr}$
Output load conditions: V_{OH} = VCC × 0.5, V_{OL} = VCC × 0.5, I_{OH} = -1.0 mA, I_{OL} = 1.0 mA, C = 30 pF
High drive output is selected by the drive capacity control register.

Item	Symbol	Min.	Max.	Unit	Test Conditions
Address delay time	t_{AD}	—	15	ns	Figure 5.17 to Figure 5.22
Byte control delay time	t_{BCD}	—	15	ns	
CS# delay time	t_{CSD}	—	15	ns	
ALE delay time	t_{ALED}	—	20	ns	
RD# delay time	t_{RSD}	—	15	ns	
Read data setup time	t_{RDS}	15	—	ns	
Read data hold time	t_{RDH}	0	—	ns	
WR# delay time	t_{WRD}	—	15	ns	
Write data delay time	t_{WDD}	—	15	ns	
Write data hold time	t_{WDH}	0	—	ns	
WAIT# setup time	t_{WTS}	15	—	ns	Figure 5.23
WAIT# hold time	t_{WTH}	0	—	ns	
Address delay time 2 (SDRAM)	t_{AD2}	1	15	ns	Figure 5.24 to Figure 5.30
CS# delay time 2 (SDRAM)	t_{CSD2}	1	15	ns	
DQM delay time (SDRAM)	t_{DQMD}	1	15	ns	
CKE delay time (SDRAM)	t_{CKED}	1	15	ns	
Read data setup time 2 (SDRAM)	t_{RDS2}	12	—	ns	
Read data hold time 2 (SDRAM)	t_{RDH2}	0	—	ns	
Write data delay time 2 (SDRAM)	t_{WDD2}	—	15	ns	
Write data hold time 2 (SDRAM)	t_{WDH2}	1	—	ns	
WE# delay time (SDRAM)	t_{WED}	1	15	ns	
RAS# delay time (SDRAM)	t_{RASD}	1	15	ns	
CAS# delay time (SDRAM)	t_{CASD}	1	15	ns	

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Table 5.16 Bus Timing (packages with 100 pins or less)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V,
ICLK = 8 to 100 MHz, BCLK = 8 to 50 MHz, $T_a = T_{opr}$
Output load conditions: V_{OH} = VCC × 0.5, V_{OL} = VCC × 0.5, I_{OH} = –1.0 mA, I_{OL} = 1.0 mA, C = 30 pF
High drive output is selected by the drive capacity control register.

Item	Symbol	Min.	Max.	Unit	Test Conditions
Address delay time	t_{AD}	—	20	ns	Figure 5.17 to Figure 5.22
Byte control delay time	t_{BCD}	—	20	ns	
CS# delay time	t_{CSD}	—	20	ns	
ALE delay time	t_{ALED}	—	20	ns	
RD# delay time	t_{RSD}	—	20	ns	
Read data setup time	t_{RDS}	15	—	ns	
Read data hold time	t_{RDH}	0	—	ns	
WR# delay time	t_{WRD}	—	20	ns	
Write data delay time	t_{WDD}	—	20	ns	
Write data hold time	t_{WDH}	0	—	ns	
WAIT# setup time	t_{WTS}	15	—	ns	Figure 5.23
WAIT# hold time	t_{WTH}	0	—	ns	

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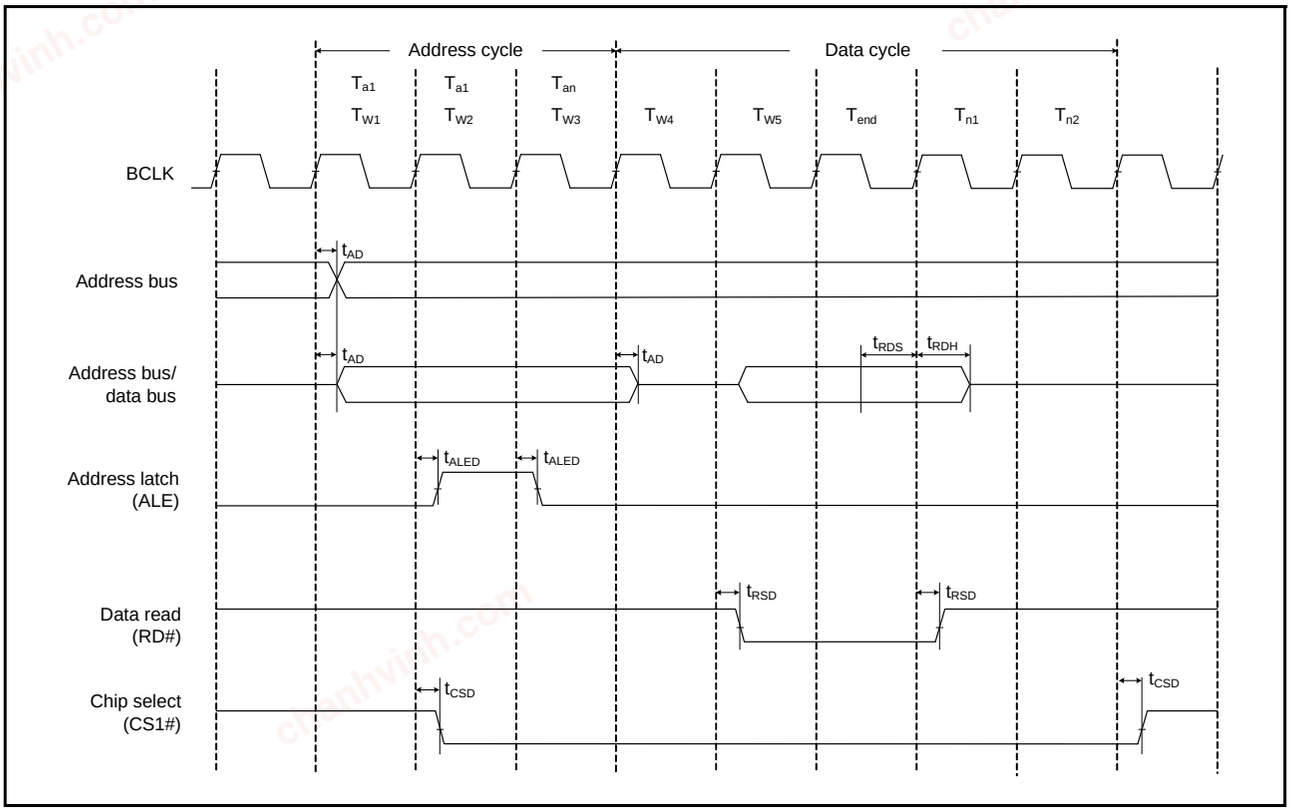


Figure 5.17 Address/Data Multiplexed Bus Read Access Timing

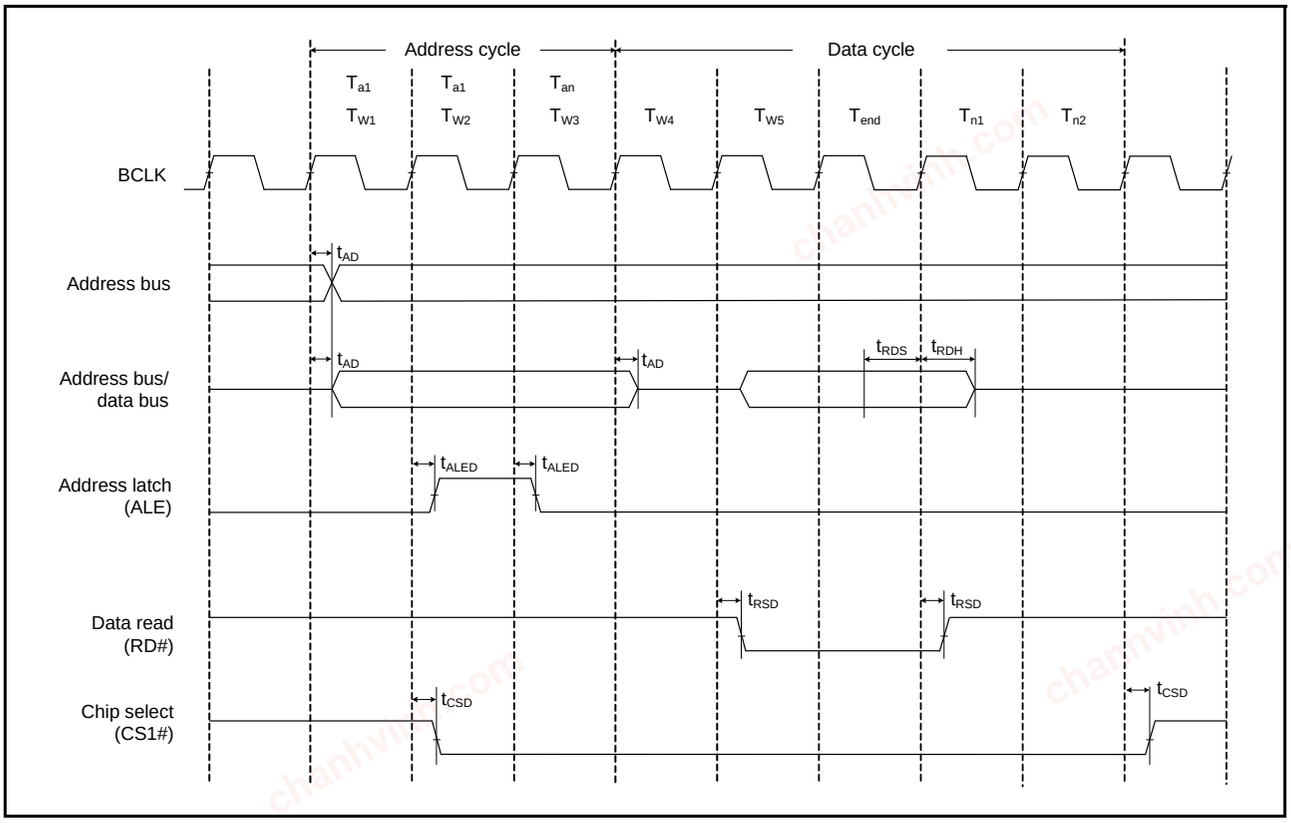


Figure 5.18 Address/Data Multiplexed Bus Write Access Timing

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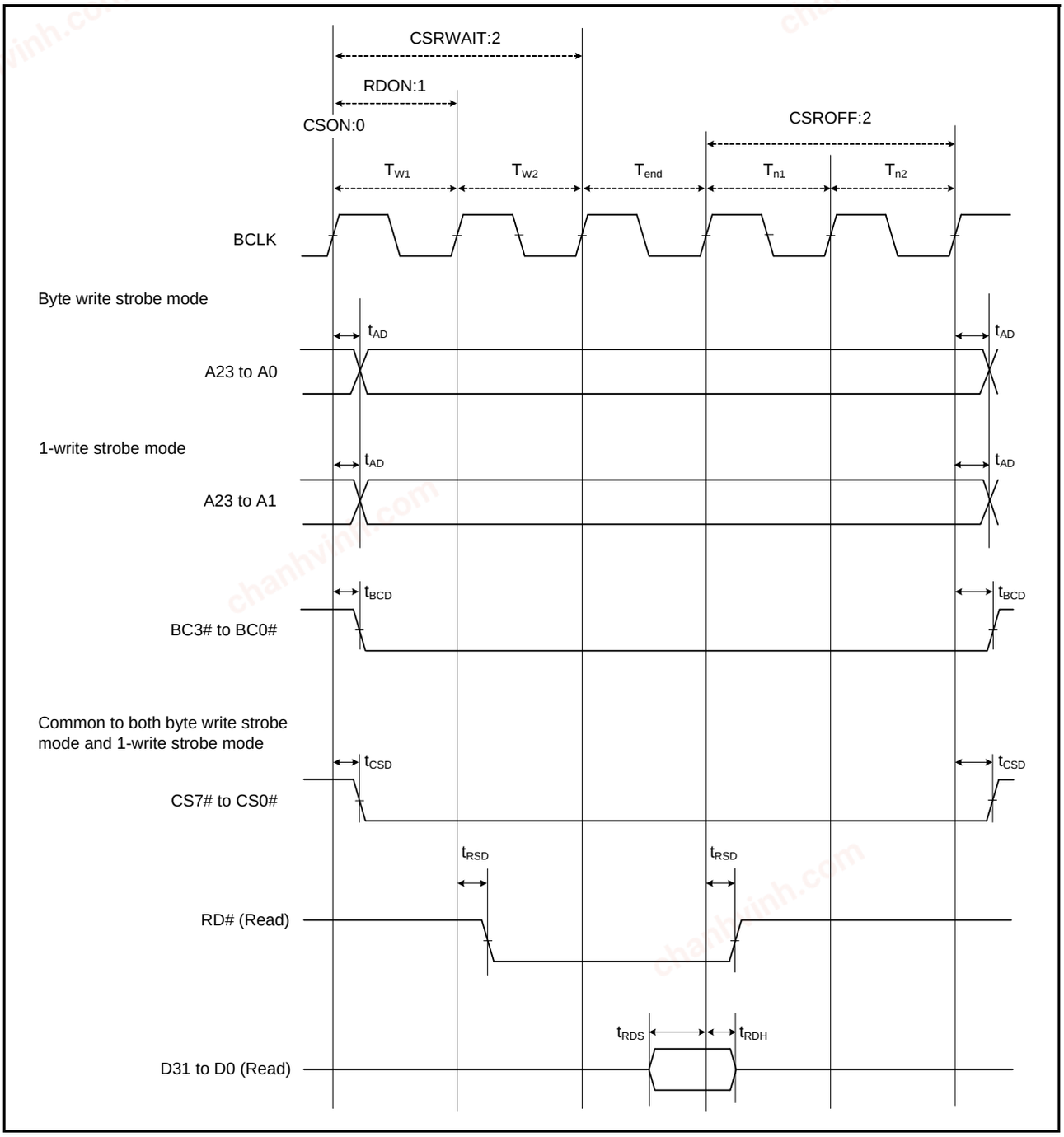
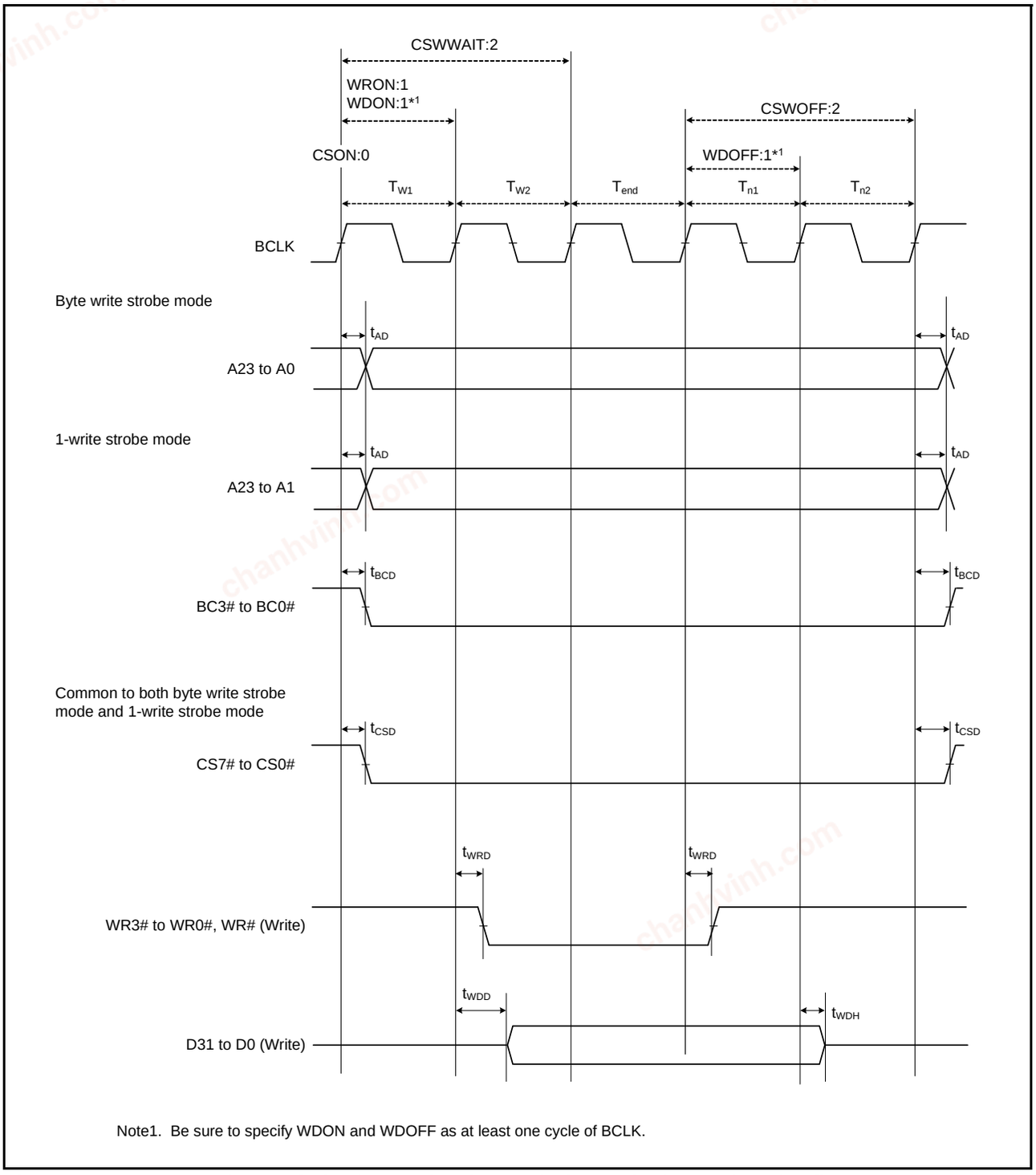


Figure 5.19 External Bus Timing/Normal Read Cycle (Bus Clock Synchronized)

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Note1. Be sure to specify WDON and WDOFF as at least one cycle of BCLK.

Figure 5.20 External Bus Timing/Normal Write Cycle (Bus Clock Synchronized)

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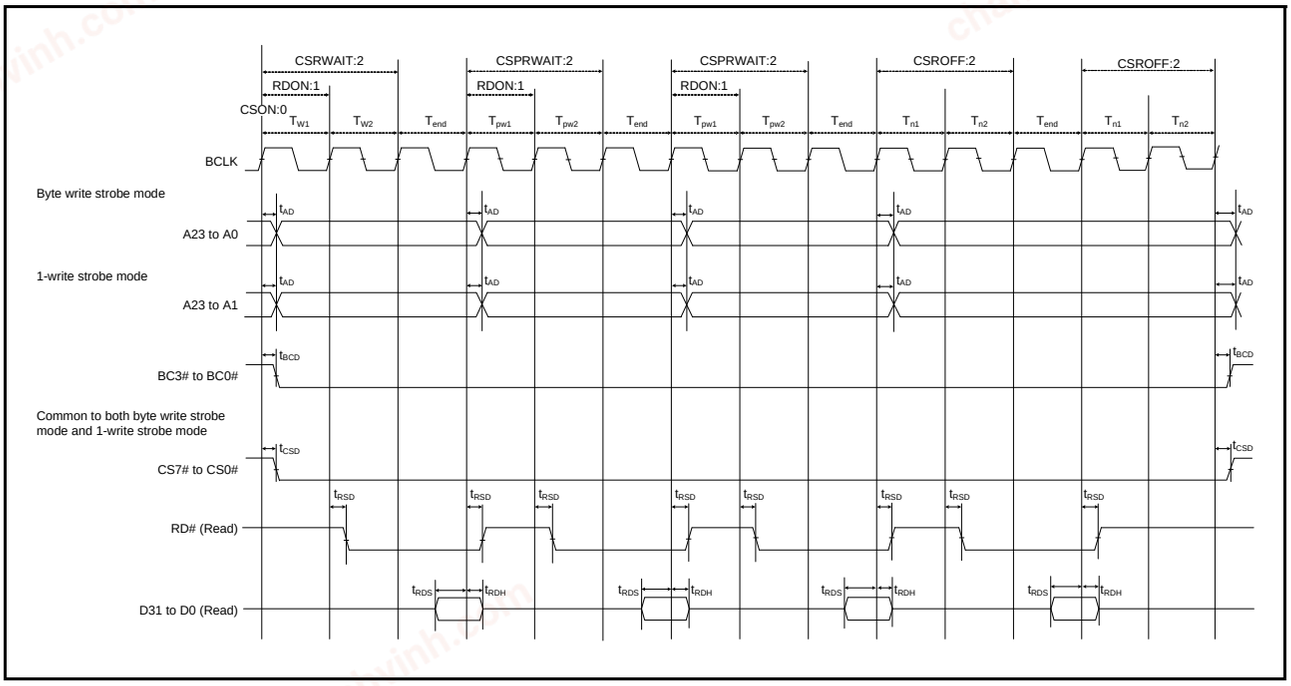
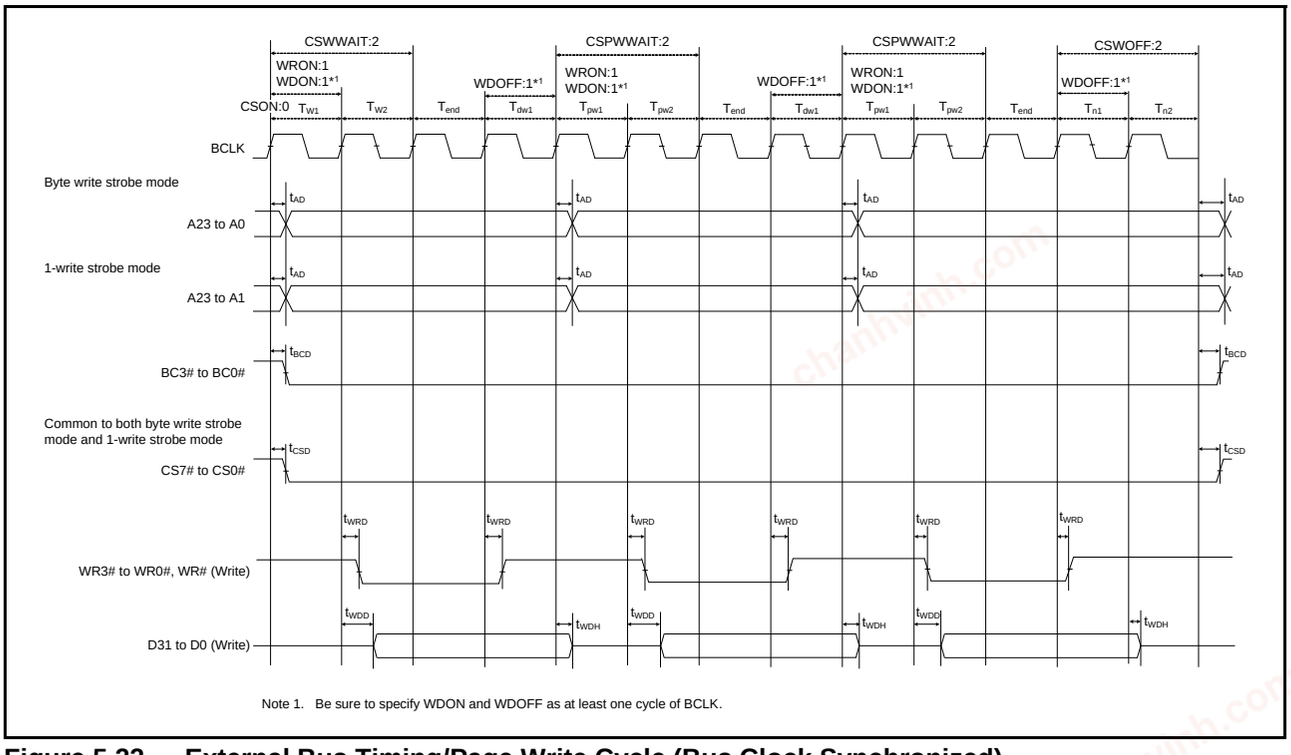


Figure 5.21 External Bus Timing/Page Read Cycle (Bus Clock Synchronized)



Note 1. Be sure to specify WDON and WDOFF as at least one cycle of BCLK.

Figure 5.22 External Bus Timing/Page Write Cycle (Bus Clock Synchronized)

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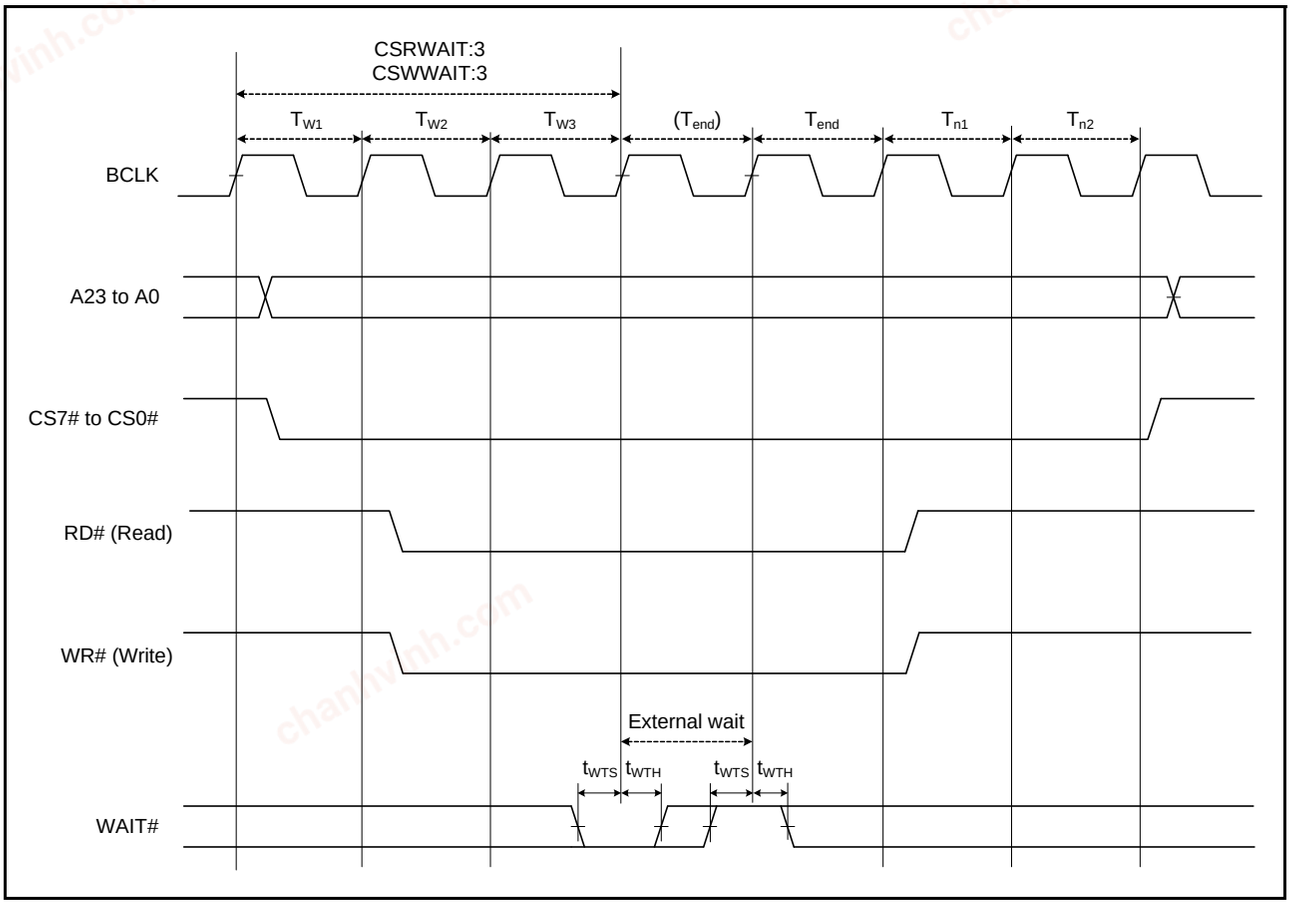
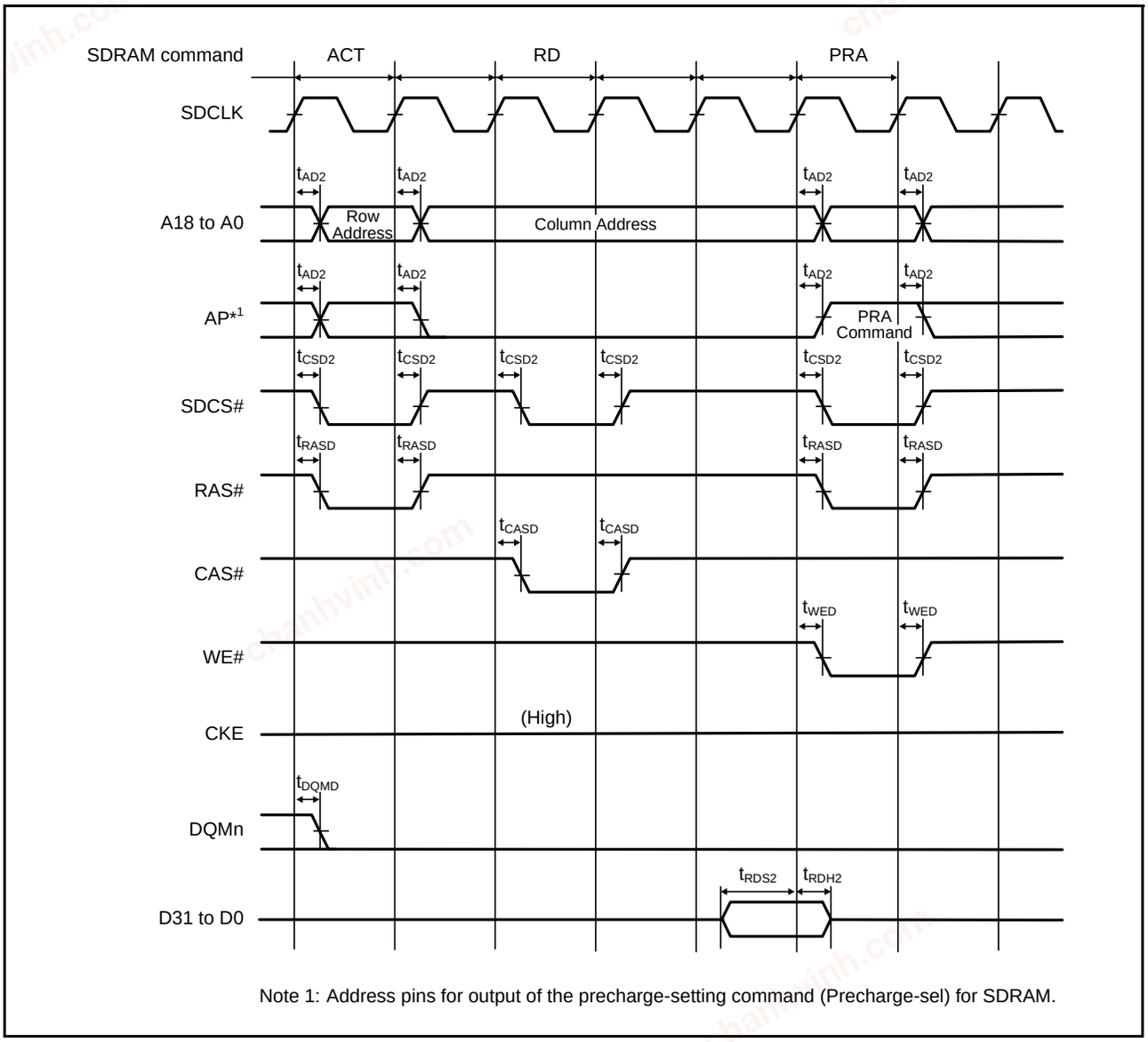


Figure 5.23 External Bus Timing/External Wait Control

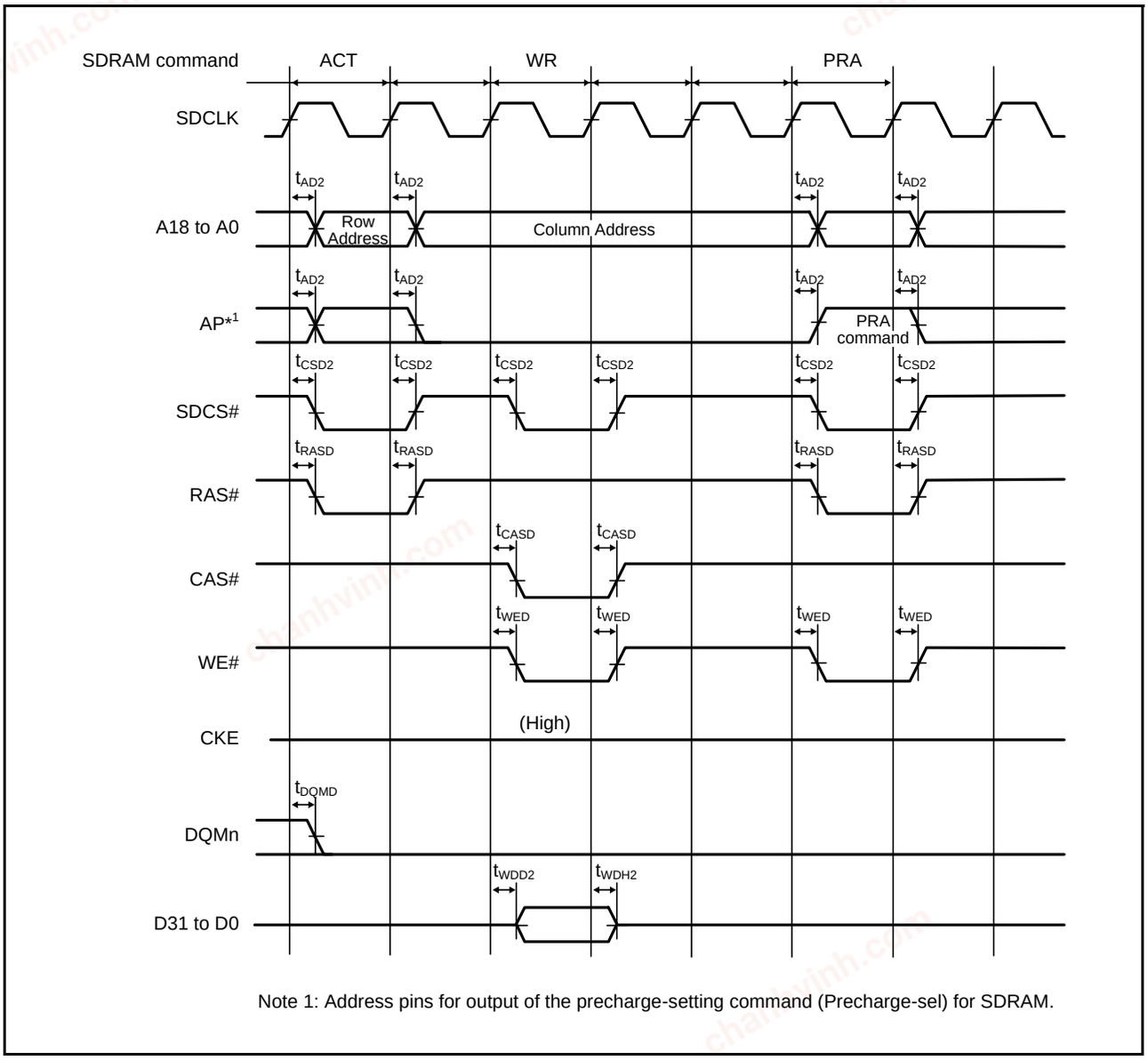
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.24 SDRAM Space Single Read Bus Timing

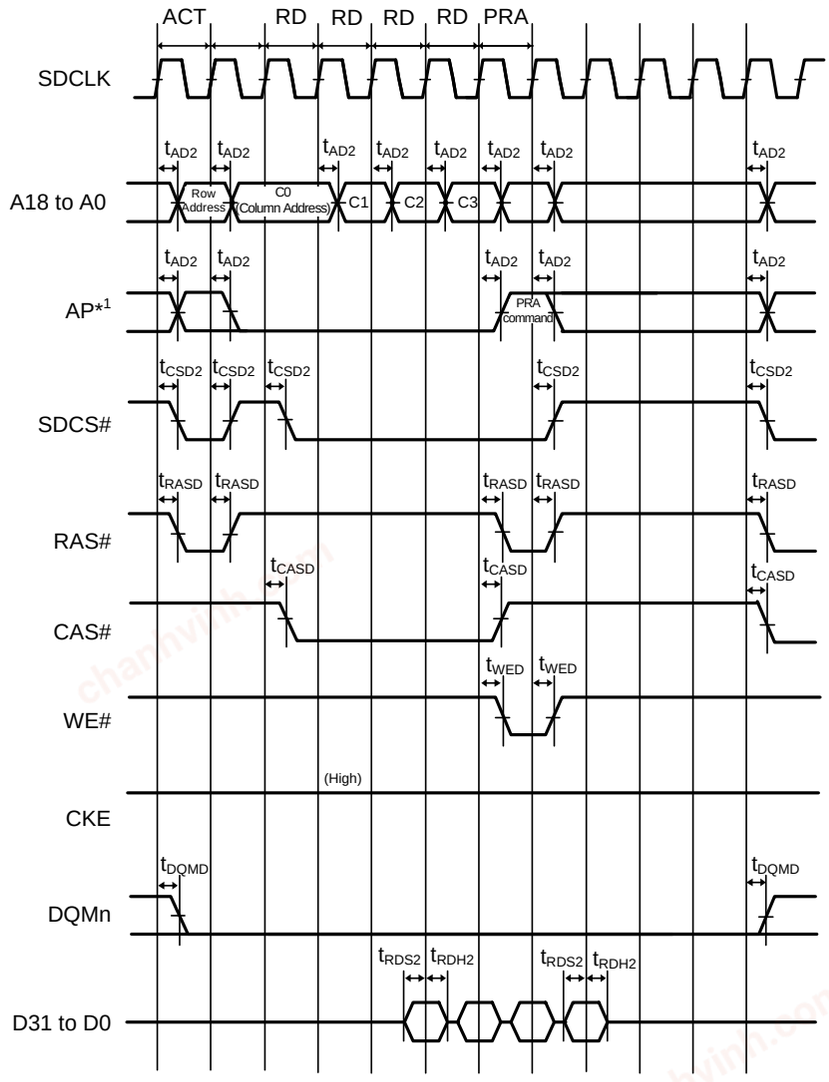
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.25 SDRAM Space Single Write Bus Timing

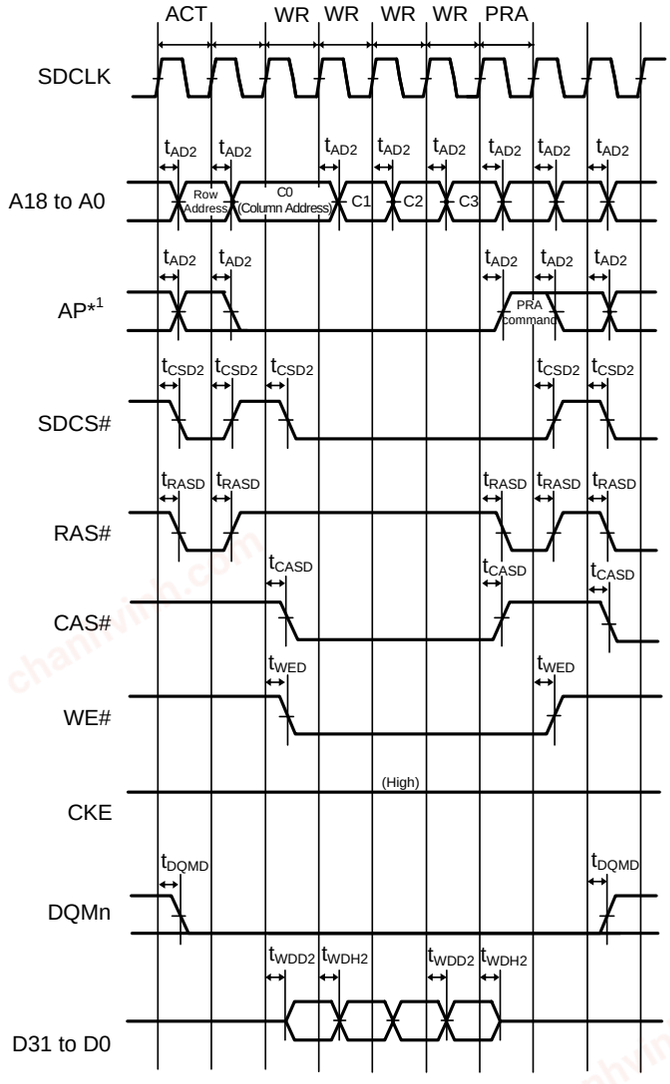
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.26 SDRAM Space Multiple Read Bus Timing

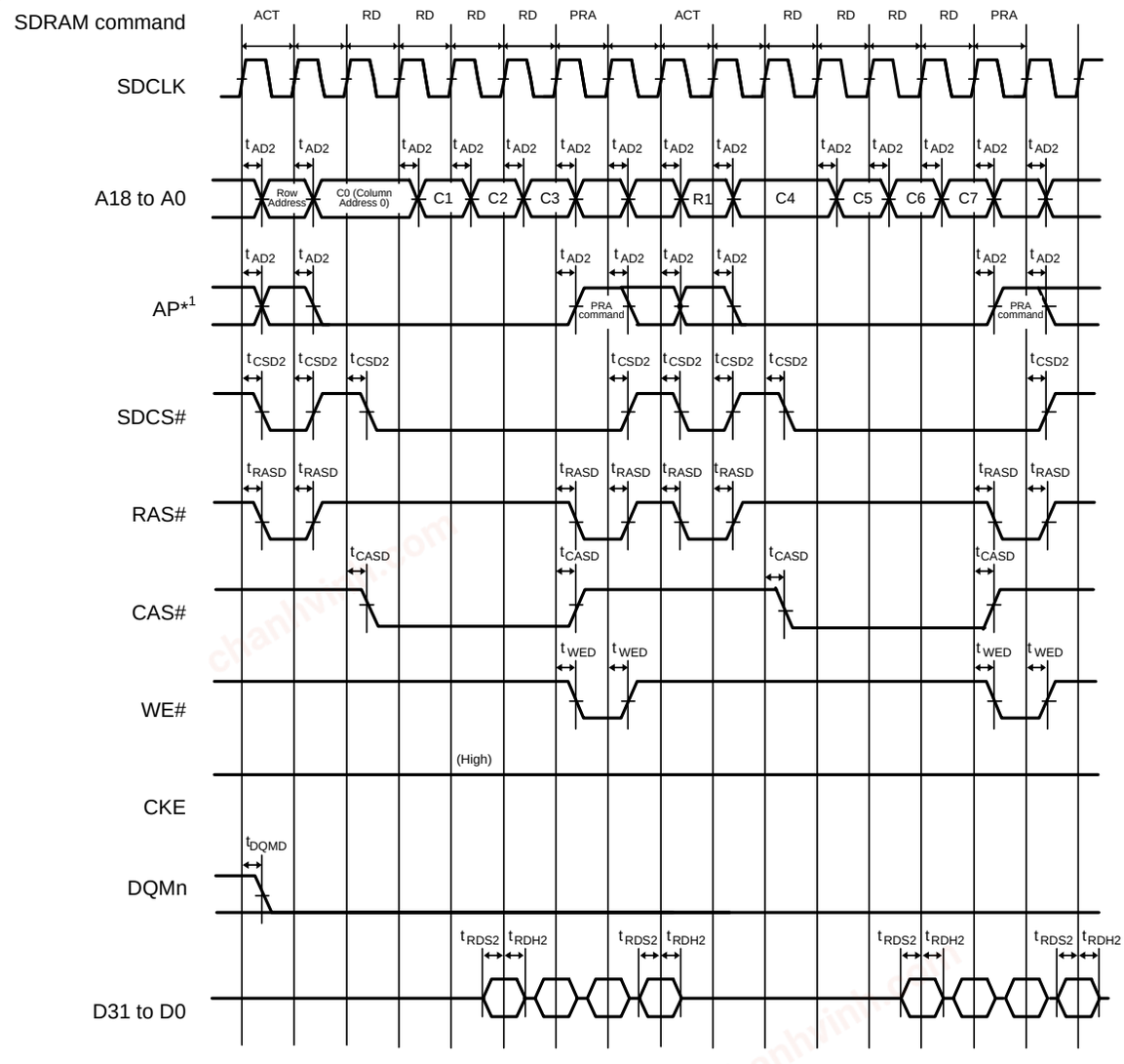
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.27 SDRAM Space Multiple Write Bus Timing

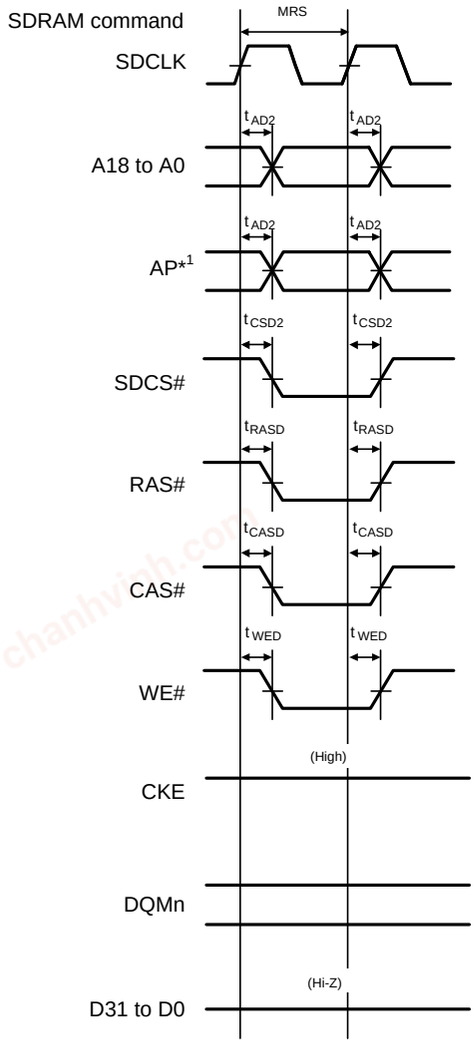
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.28 SDRAM Space Multiple Read Line Stride Bus Timing

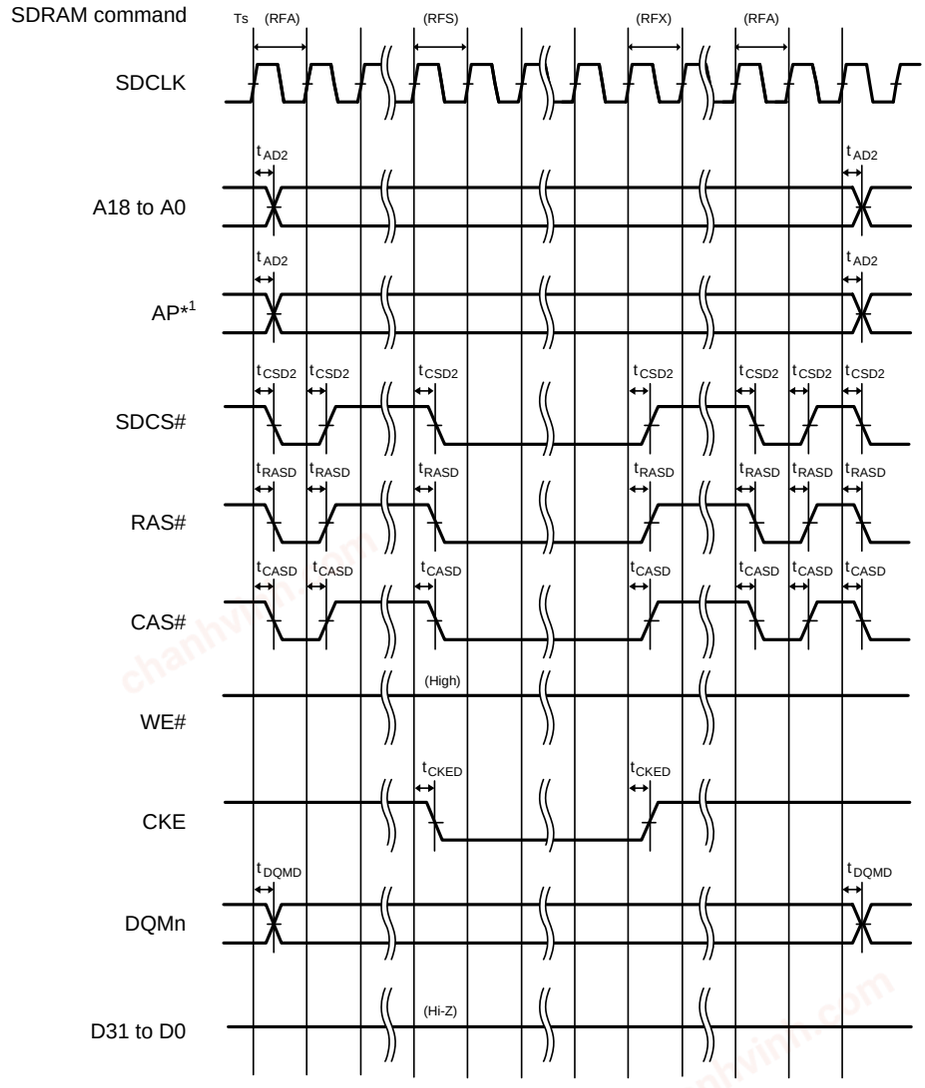
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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.29 SDRAM Space Mode Register Set Bus Timing

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Note 1: Address pins for output of the precharge-setting command (Precharge-sel) for SDRAM.

Figure 5.30 SDRAM Space Self-Refresh Bus Timing

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5.4.5 EXDMAC Timing

Table 5.17 EXDMAC Timing

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
ICLK = 8 to 100 MHz, PCLK = 8 to 50 MHz, BCLK = 8 to 100 MHz, SDCLK = 8 to 50 MHz, $T_a = T_{opr}$
High drive output is selected by the drive capacity control register

Item		Symbol	Min.	Max.	Unit	Test Conditions
EXDMAC	EDREQ setup time	t_{EDRQS}	20	—	ns	Figure 5.31
	EDREQ hold time	t_{EDRQH}	5	—	ns	Figure 5.32 and Figure 5.33
	EDACK delay time	t_{EDACD}	—	15	ns	

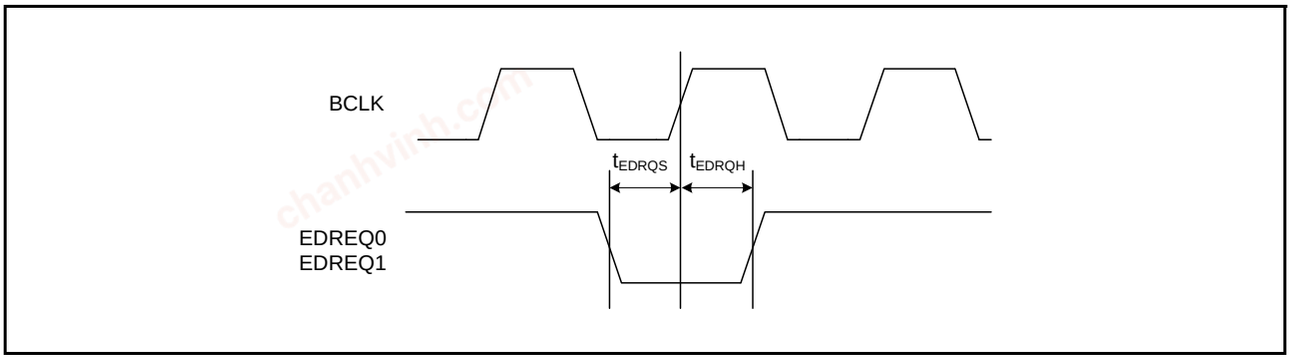


Figure 5.31 EDREQ0 and EDREQ1 Input Timing

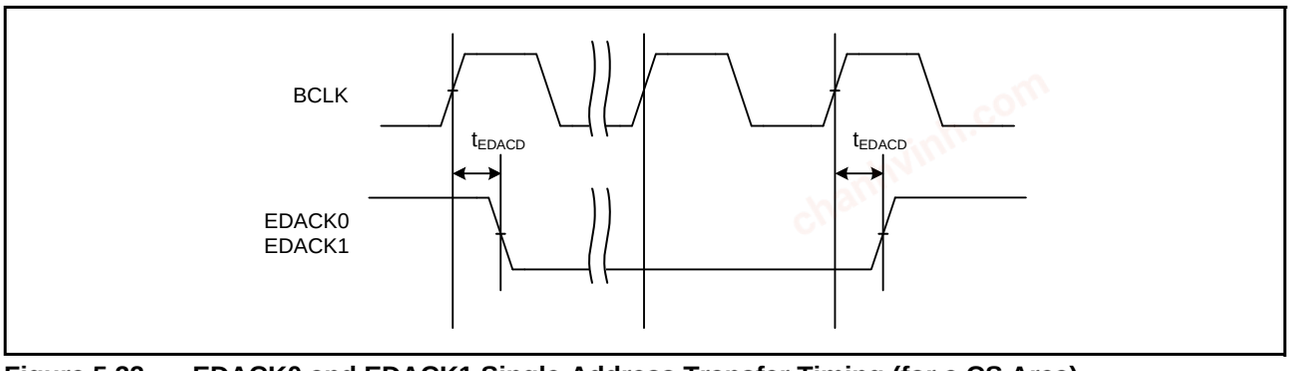


Figure 5.32 EDACK0 and EDACK1 Single-Address Transfer Timing (for a CS Area)

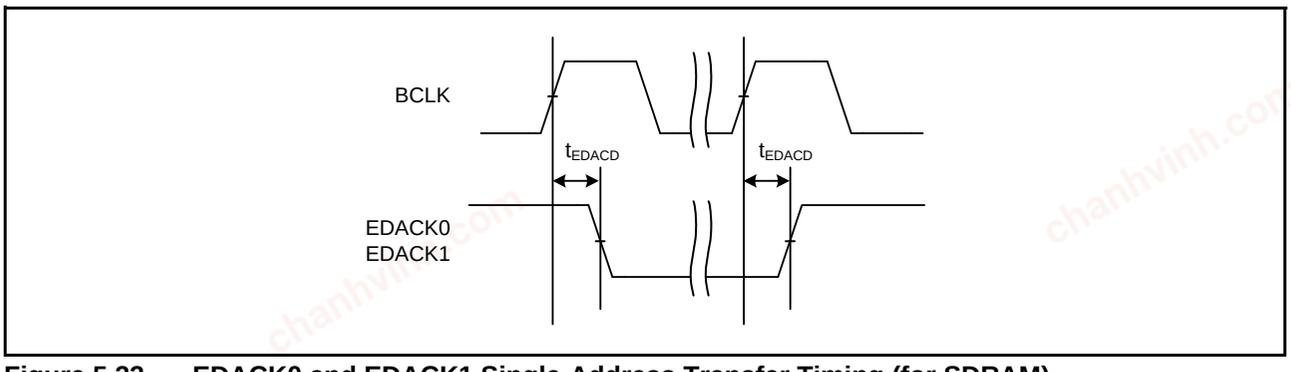


Figure 5.33 EDACK0 and EDACK1 Single-Address Transfer Timing (for SDRAM)

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5.4.6 Timing of On-Chip Peripheral Modules

Table 5.18 Timing of On-Chip Peripheral Modules (1)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item			Symbol	Min.	Max.	Unit*1	Test Conditions
I/O ports	Input data pulse width		t_{PRW}	1.5	—	t_{Pcyc}	Figure 5.34
MTU	Input capture input pulse width	Single-edge setting	t_{TICW}	1.5	—	t_{Pcyc}	Figure 5.35
		Both-edge setting		2.5	—		
	Timer clock pulse width	Single-edge setting	t_{TCKWH}, t_{TCKWL}	1.5	—	t_{Pcyc}	Figure 5.36
		Both-edge setting		2.5	—		
		Phase counting mode		2.5	—		
POE	POE# input pulse width		t_{POEW}	1.5	—	t_{Pcyc}	Figure 5.37
8-bit timer	Timer clock pulse width	Single-edge setting	t_{TMCWH}, t_{TMCWL}	1.5	—	t_{Pcyc}	Figure 5.38
		Both-edge setting		2.5	—		
SCI	Input clock cycle	Asynchronous	t_{Scyc}	4	—	t_{Pcyc}	Figure 5.39
		Clock synchronous		6	—		
	Input clock pulse width		t_{SCKW}	0.4	0.6	t_{Scyc}	
	Input clock rise time		t_{SCKr}	—	20	ns	
	Input clock fall time		t_{SCKf}	—	20	ns	
	Output clock cycle	Asynchronous	t_{Scyc}	16	—	t_{Pcyc}	
		Clock synchronous		4	—		
	Output clock pulse width		t_{SCKW}	0.4	0.6	t_{Scyc}	
	Output clock rise time		t_{SCKr}	—	20	ns	
	Output clock fall time		t_{SCKf}	—	20	ns	
	Transmit data delay time	Clock synchronous	t_{TXD}	—	40	ns	Figure 5.40
	Receive data setup time	Clock synchronous	t_{RXS}	40	—	ns	
	Receive data hold time	Clock synchronous	t_{RXH}	40	—	ns	
A/D converter	10-bit A/D converter trigger input pulse width		t_{TRGW}	1.5	—	t_{Pcyc}	Figure 5.41
	12-bit A/D converter trigger input pulse width			1.5	—		

Note 1. t_{Pcyc}: PCLK cycle

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Table 5.19 Timing of On-Chip Peripheral Modules (2)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V*1, VREFH/VREFH0 = 3.0 V to AVCC0*1,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V,
PCLK = 8 to 50 MHz,
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item				Symbol	Min.	Max.	Unit*2	Test Conditions
RSPI	RSPCK clock cycle	Master		t_{SPcyc}	2	4096	t_{Pcyc}	Figure 5.42 C = 30pF
		Slave			8	4096		
	RSPCK clock high pulse width	Master		t_{SPCKWH}	$(t_{SPcyc} - t_{SPCKR} - t_{SPCKF}) / 2 - 3$	—	ns	
		Slave			$(t_{SPcyc} - t_{SPCKR} - t_{SPCKF}) / 2$	—		
	RSPCK clock low pulse width	Master		t_{SPCKWL}	$(t_{SPcyc} - t_{SPCKR} - t_{SPCKF}) / 2 - 3$	—	ns	
		Slave			$(t_{SPcyc} - t_{SPCKR} - t_{SPCKF}) / 2$	—		
	RSPCK clock rise/ fall time	Output [packages with 177 to 144 pins]		t_{SPCKr}, t_{SPCKf}	—	5	ns	
		Output [packages with 100 pins or less]			—	10		
		Input			—	1	µs	
	Data input setup time	Master [packages with 177 to 144 pins]	VCC ≥ 3.0 V	t_{SU}	15	—	ns	Figure 5.43 to Figure 5.46 C = 30pF
			VCC < 3.0 V		20	—		
		Master [packages with 100 pins or less]			30	—		
		Slave			$20 - t_{Pcyc}$	—		
	Data input hold time	Master		t_H	0	—	ns	
		Slave			$20 + 2 \times t_{Pcyc}$	—		
	SSL setup time	Master		t_{LEAD}	1	8	t_{SPcyc}	
		Slave			4	—	t_{Pcyc}	
	SSL hold time	Master		t_{LAG}	1	8	t_{SPcyc}	
		Slave			4	—	t_{Pcyc}	

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Table 5.20 Timing of On-Chip Peripheral Modules (3)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V*1, VREFH/VREFH0 = 3.0 V to AVCC0*1,
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V,
PCLK = 8 to 50 MHz,
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item				Symbol	Min.	Max.	Unit*2	Test Conditions
RSPI	Data output delay time	Master	Packages with 177 to 144 pins	t_{OD}	—	18	ns	Figure 5.43 to Figure 5.46 C = 30pF
			Packages with 100 pins or less		—	30		
		Slave	Packages with 177 to 144 pins		—	$3 \times t_{Pcyc} + 40$		
			Packages with 100 pins or less		—	$3 \times t_{Pcyc} + 50$		
	Data output hold time	Master		t_{OH}	0	—	ns	
		Slave			0	—		
	Successive transmission delay time	Master		t_{TD}	$t_{SPcyc} + 2 \times t_{Pcyc}$	$8 \times t_{SPcyc} + 2 \times t_{Pcyc}$	ns	
		Slave			$4 \times t_{Pcyc}$	—		
	MOSI and MISO rise/fall time	Output	Packages with 177 to 144 pins	t_{Dr}, t_{Df}	—	5	ns	
			Packages with 100 pins or less		—	10		
		Input			—	1	µs	
	SSL rise/fall time	Output	Packages with 177 to 144 pins	t_{SSLr}, t_{SSLf}	—	5	ns	
			Packages with 100 pins or less		—	10		
		Input			—	1	µs	
	Slave access time			t_{SA}	—	4	t_{Pcyc}	Figure 5.45 and Figure 5.46 C = 30pF
	Slave output release time			t_{REL}	—	3	t_{Pcyc}	

Note 1. When operation at 3.0 V or a lower voltage is needed, please contact a Renesas sales office.
Note 2. t_{Pcyc}: PCLK cycle

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Table 5.21 Timing of On-Chip Peripheral Modules (4)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item		Symbol	Min.	Max.	Unit*1	Test Conditions
Simple SPI	SCK clock cycle output (master)	t_{SPcyc}	4	65536	t_{Pcyc}	Figure 5.42
	SCK clock cycle input (slave)		8	65536		
	SCK clock high pulse width	t_{SPCKWH}	0.4	0.6	t_{SPcyc}	
	SCK clock low pulse width	t_{SPCKWL}	0.4	0.6	t_{SPcyc}	
	SCK clock rise/fall time	t_{SPCKr}, t_{SPCKf}	—	20	ns	
	Data input setup time	t_{SU}	40	—	ns	Figure 5.43 to Figure 5.46
	Data input hold time	t_H	40	—	ns	
	SS input setup time	t_{LEAD}	1	—	t_{SPcyc}	
	SS input hold time	t_{LAG}	1	—	t_{SPcyc}	
	Data output delay time	t_{OD}	—	40	ns	
	Data output hold time	t_{OH}	–10	—	ns	
	Data rise/fall time	t_{Dr}, t_{Df}	—	20	ns	
	SS input rise/fall time	t_{SSLr}, t_{SSLf}	—	20	ns	
	Slave access time	t_{SA}	—	5	t_{Pcyc}	Figure 5.46
	Slave output release time	t_{REL}	—	5	t_{Pcyc}	

Note 1. t_{Pcyc}: PCLK cycle

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Table 5.22 Timing of On-Chip Peripheral Modules (5)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item		Symbol	Min.*1,*2	Max.*	Unit	Test Conditions
RIIC (Standard-mode, SMBus) ICFER.FMPE = 0	SCL input cycle time	t_{SCL}	$6(12) \times t_{IICcyc} + 1300$	—	ns	Figure 5.47
	SCL input high pulse width	t_{SCLH}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	SCL input low pulse width	t_{SCLL}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	SCL, SDA input rise time	t_{Sr}	—	1000	ns	
	SCL, SDA input fall time	t_{Sf}	—	300	ns	
	SCL, SDA input spike pulse removal time	t_{SP}	0	$1(4) \times t_{IICcyc}$	ns	
	SDA input bus free time	t_{BUF}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	Start condition input hold time	t_{STAH}	$t_{IICcyc} + 300$	—	ns	
	Restart condition input setup time	t_{STAS}	1000	—	ns	
	Stop condition input setup time	t_{STOS}	1000	—	ns	
	Data input setup time	t_{SDAS}	$t_{IICcyc} + 50$	—	ns	
	Data input hold time	t_{SDAH}	0	—	ns	
	SCL, SDA capacitive load	C_b	—	400	pF	
RIIC (Fast-mode)	SCL input cycle time	t_{SCL}	$6(12) \times t_{IICcyc} + 600$	—	ns	
	SCL input high pulse width	t_{SCLH}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	SCL input low pulse width	t_{SCLL}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	SCL, SDA input rise time	t_{Sr}	$20 + 0.1C_b$	300	ns	
	SCL, SDA input fall time	t_{Sf}	$20 + 0.1C_b$	300	ns	
	SCL, SDA input spike pulse removal time	t_{SP}	0	$1(4) \times t_{IICcyc}$	ns	
	SDA input bus free time	t_{BUF}	$3(6) \times t_{IICcyc} + 300$	—	ns	
	Start condition input hold time	t_{STAH}	$t_{IICcyc} + 300$	—	ns	
	Restart condition input setup time	t_{STAS}	300	—	ns	
	Stop condition input setup time	t_{STOS}	300	—	ns	
	Data input setup time	t_{SDAS}	$t_{IICcyc} + 50$	—	ns	
	Data input hold time	t_{SDAH}	0	—	ns	
	SCL, SDA capacitive load	C_b	—	400	pF	

Note: • t_{IICcyc}: RIIC internal reference clock (IICϕ) Cycle
Note 1. The value within parentheses is applicable when the value of the ICMR3.NF[1:0] bits is 11b while the digital filter is enabled by the setting ICFER.NFE = 1.
Note 2. Cb is the total capacitance of the bus lines.

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Table 5.23 Timing of On-Chip Peripheral Modules (6)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item		Symbol	Min.*, *2	Max.*	Unit	Test Conditions
RIIC (Fast-mode+) ICFER.FMPE = 1	SCL input cycle time	t_{SCL}	$6(12) \times t_{IICcyc} + 240$	—	ns	Figure 5.47
	SCL input high pulse width	t_{SCLH}	$3(6) \times t_{IICcyc} + 120$	—	ns	
	SCL input low pulse width	t_{SCLL}	$3(6) \times t_{IICcyc} + 120$	—	ns	
	SCL, SDA input rise time	t_{Sr}	—	120	ns	
	SCL, SDA input fall time	t_{Sf}	—	120	ns	
	SCL, SDA input spike pulse removal time	t_{SP}	0	$1(4) \times t_{IICcyc}$	ns	
	SDA input bus free time	t_{BUF}	$3(6) \times t_{IICcyc} + 120$	—	ns	
	Start condition input hold time	t_{STAH}	$t_{IICcyc} + 120$	—	ns	
	Restart condition input setup time	t_{STAS}	120	—	ns	
	Stop condition input setup time	t_{STOS}	120	—	ns	
	Data input setup time	t_{SDAS}	$t_{IICcyc} + 120$	—	ns	
	Data input hold time	t_{SDAH}	0	—	ns	
	SCL, SDA capacitive load	C_b	—	550	pF	
Simple IIC (Standard-mode)	SDA input rise time	t_{Sr}	—	1000	ns	
	SDA input fall time	t_{Sf}	—	300	ns	
	SDA input spike pulse removal time	t_{SP}	0	$4 \times t_{IICcyc}$	ns	
	Data input setup time	t_{SDAS}	250	—	ns	
	Data input hold time	t_{SDAH}	0	—	ns	
	SCL, SDA capacitive load	C_b	—	400	pF	
Simple IIC (Fast-mode)	SCL, SDA input rise time	t_{Sr}	$20 + 0.1C_b$	300	ns	
	SCL, SDA input fall time	t_{Sf}	$20 + 0.1C_b$	300	ns	
	SCL, SDA input spike pulse removal time	t_{SP}	0	$4 \times t_{IICcyc}$	ns	
	Data input setup time	t_{SDAS}	100	—	ns	
	Data input hold time	t_{SDAH}	0	—	ns	
	SCL, SDA capacitive load	C_b	—	400	pF	

Note: • t_{IICcyc}: RIIC internal reference clock (IICϕ) Cycle, t_{Pcyc}: PCLK cycle
Note 1. The value in parentheses is used when ICMR3.NF[1:0] are set to 11b while a digital filter is enabled with ICFER.NFE = 1.
Note 2. Cb indicates the total capacity of the bus line.

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Table 5.24 Timing of On-Chip Peripheral Modules (7)

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
ICLK = 12.5 to 100 MHz, $T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item		Symbol	Min.	Max.	Unit	Test Conditions
ETHERC(RMII)	REF50CK cycle time	T_{ck}	20	—	ns	Figure 5.48 to Figure 5.51
	REF50CK frequency Typ. 50 MHz	—	—	50 + 100ppm	MHz	
	REF50CK duty	—	35	65	%	
	REF50CK rise/fall time	$T_{ckr/ckf}$	0.5	3.5	ns	
	RMII_xxxx*1 output delay time	T_{co}	2.5	15.0	ns	
	RMII_xxxx*2 setup time	T_{su}	3	—	ns	
	RMII_xxxx*2 hold time	T_{hd}	1	—	ns	
	RMII_xxxx*1, *2 rise/fall time	Tr/Tf	0.5	6	ns	
	ET_WOL output delay time	t_{WOLd}	1	23.5	ns	Figure 5.52
ETHERC(MII)	ET_TX_CLK cycle time	t_{Tcyc}	40	—	ns	—
	ET_TX_EN output delay time	t_{TENd}	1	20	ns	Figure 5.53
	ET_ETXD0 to ET_ETXD3 output delay time	t_{MTDd}	1	20	ns	
	ET_CRS setup time	t_{CRSs}	10	—	ns	
	ET_CRS hold time	t_{CRSh}	10	—	ns	
	ET_COL setup time	t_{COLs}	10	—	ns	Figure 5.54
	ET_COL hold time	t_{COLh}	10	—	ns	
	ET_RX_CLK cycle time	t_{TRcyc}	40	—	ns	—
	ET_RX_DV setup time	t_{RDVs}	10		ns	Figure 5.55
	ET_RX_DV hold time	t_{RDVh}	10	—	ns	
	ET_ERXD0 to ET_ERXD3 setup time	t_{MRDs}	10	—	ns	
	ET_ERXD0 to ET_ERXD3 hold time	t_{MRDh}	10	—	ns	
	ET_RX_ER setup time	t_{RERs}	10	—	ns	Figure 5.56
	ET_RX_ER hold time	t_{RESh}	10	—	ns	
	ET_WOL output delay time	t_{WOLd}	1	23.5	ns	Figure 5.57

Note 1. RMII_TXD_EN, RMII_TXD1, RMII_TXD0.
Note 2. RMII_CRS_DV, RMII_RXD1, RMII_RXD0, RMII_RX_ER

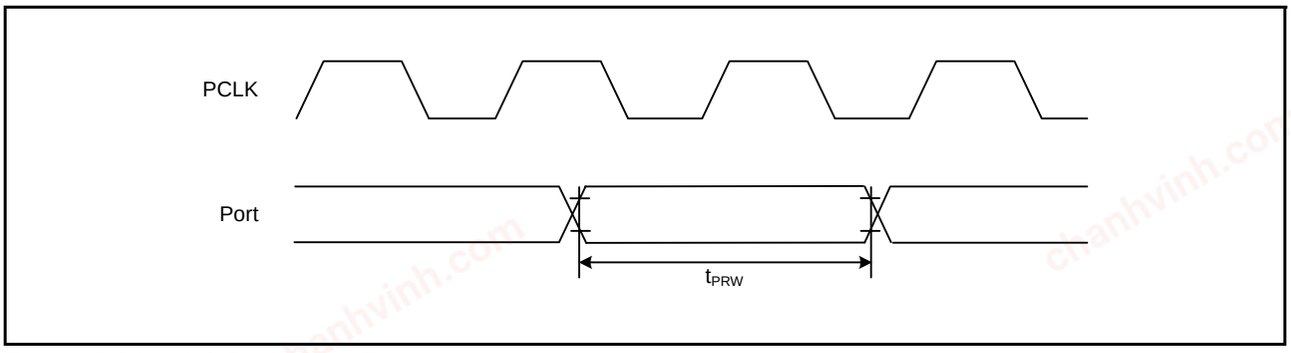


Figure 5.34 I/O Port Input Timing

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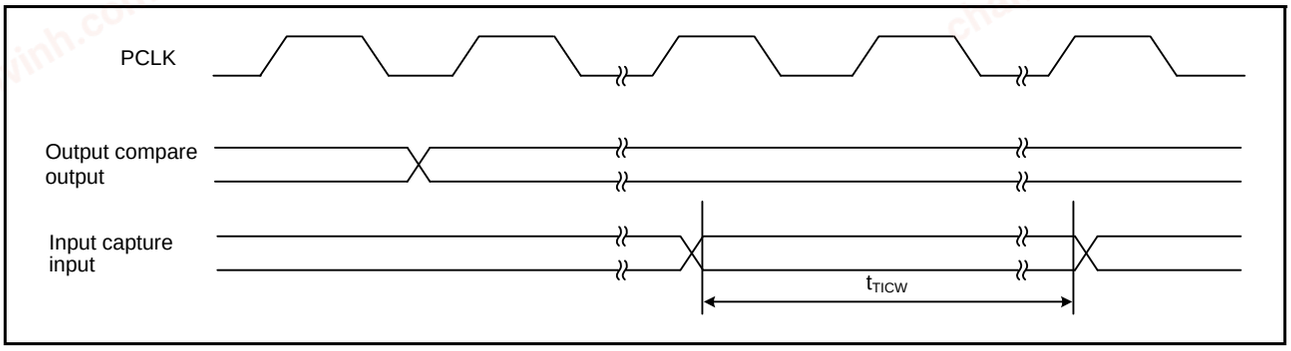


Figure 5.35 MTU Input/Output Timing

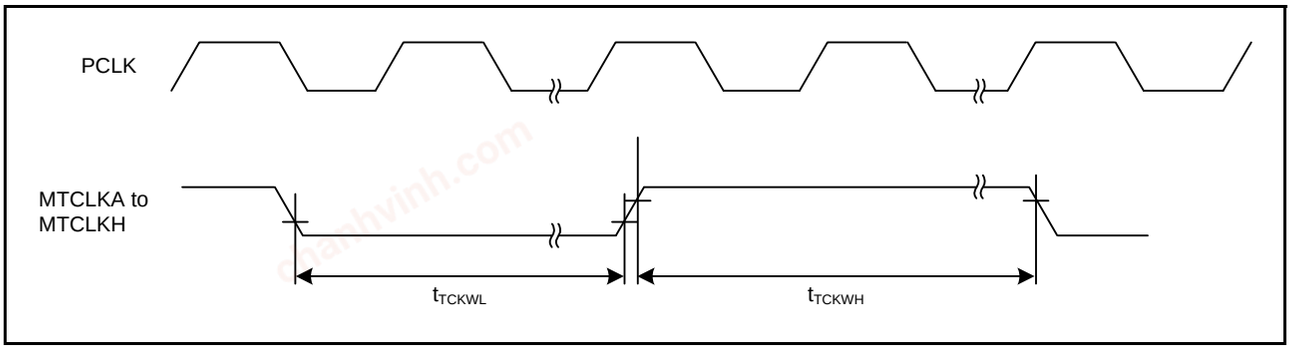


Figure 5.36 MTU Clock Input Timing

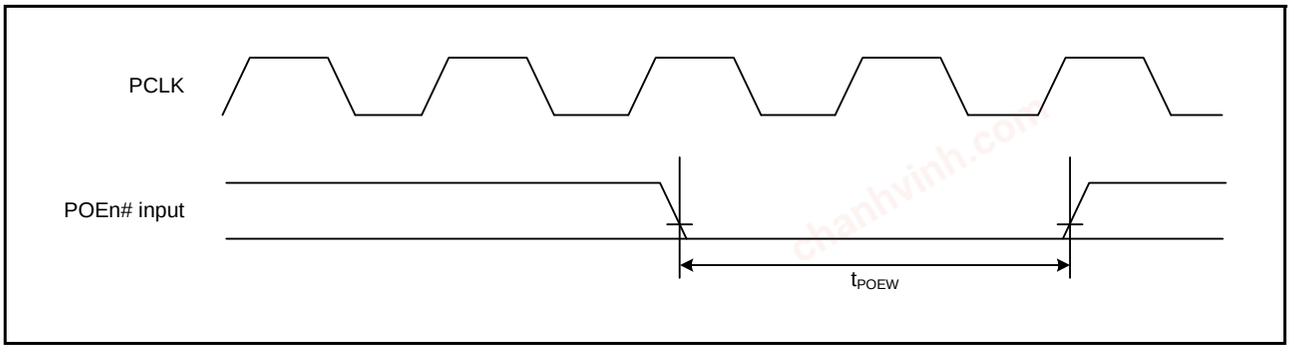


Figure 5.37 POE# Input Timing

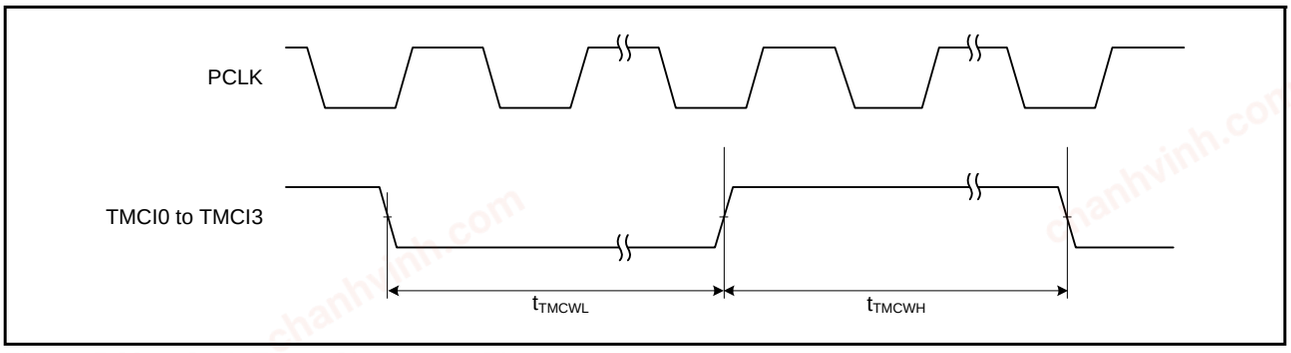


Figure 5.38 8-Bit Timer Clock Input Timing

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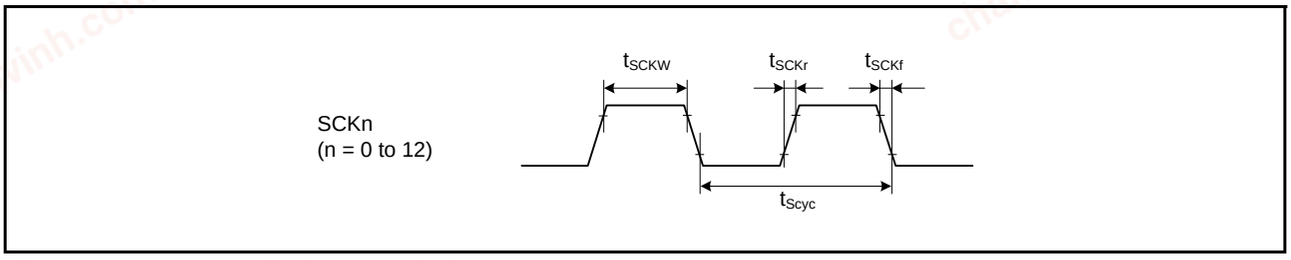


Figure 5.39 SCK Clock Input Timing

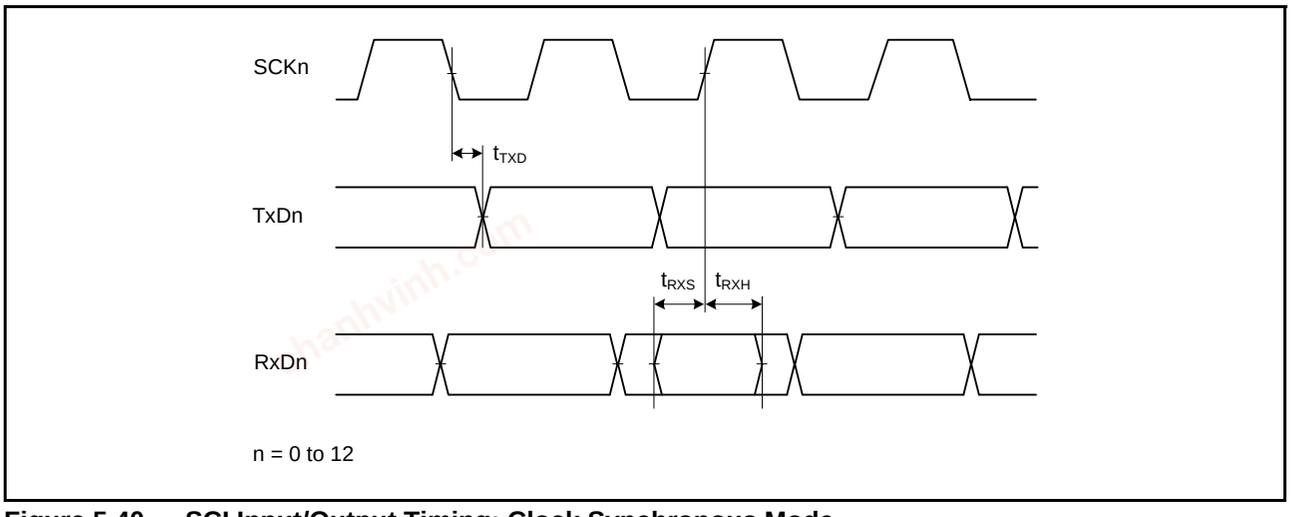


Figure 5.40 SCI Input/Output Timing: Clock Synchronous Mode

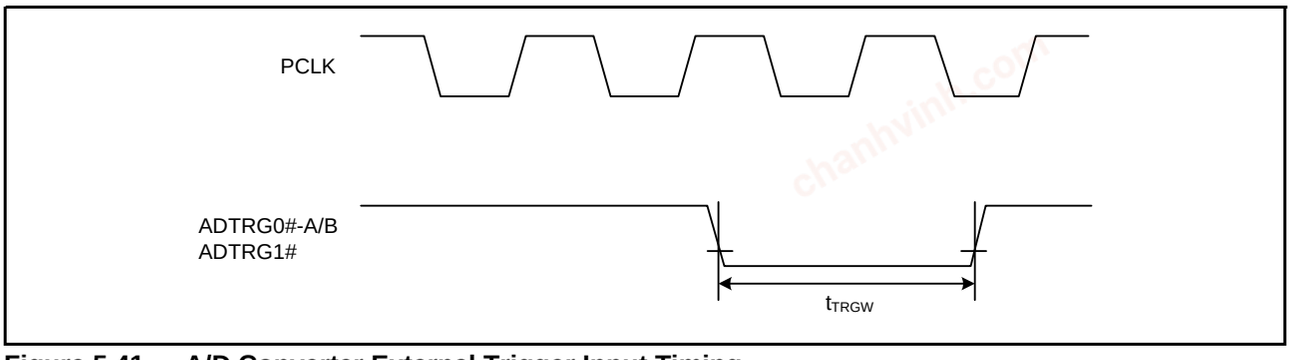


Figure 5.41 A/D Converter External Trigger Input Timing

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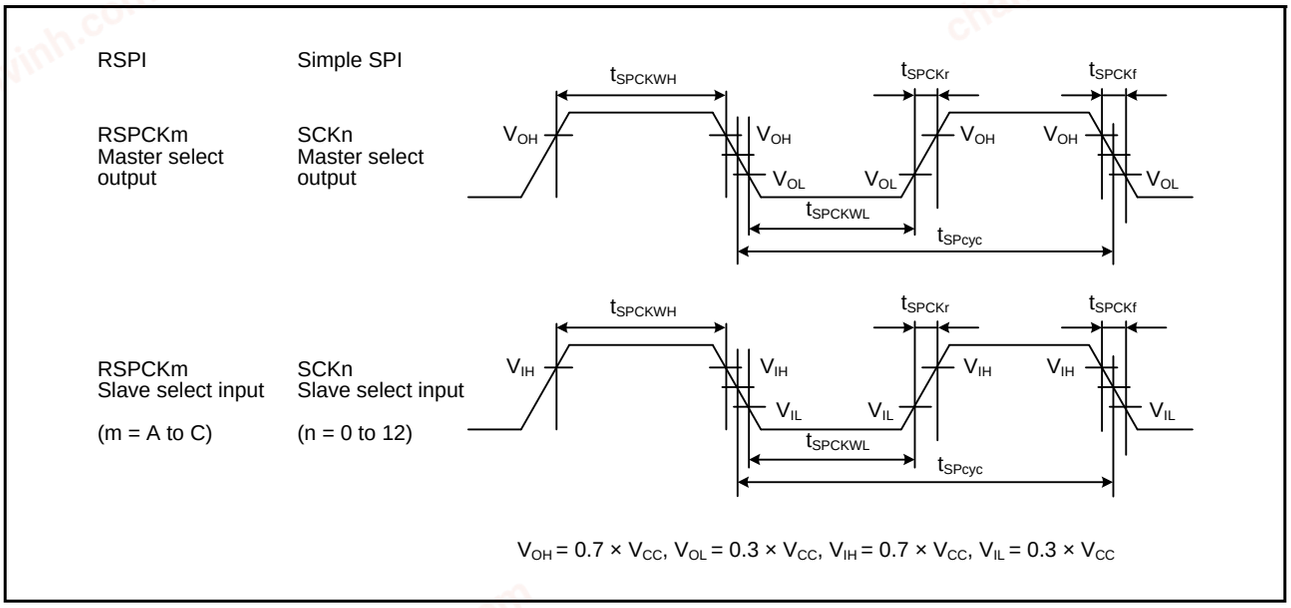


Figure 5.42 RSPI Clock Timing and Simple SPI Clock Timing

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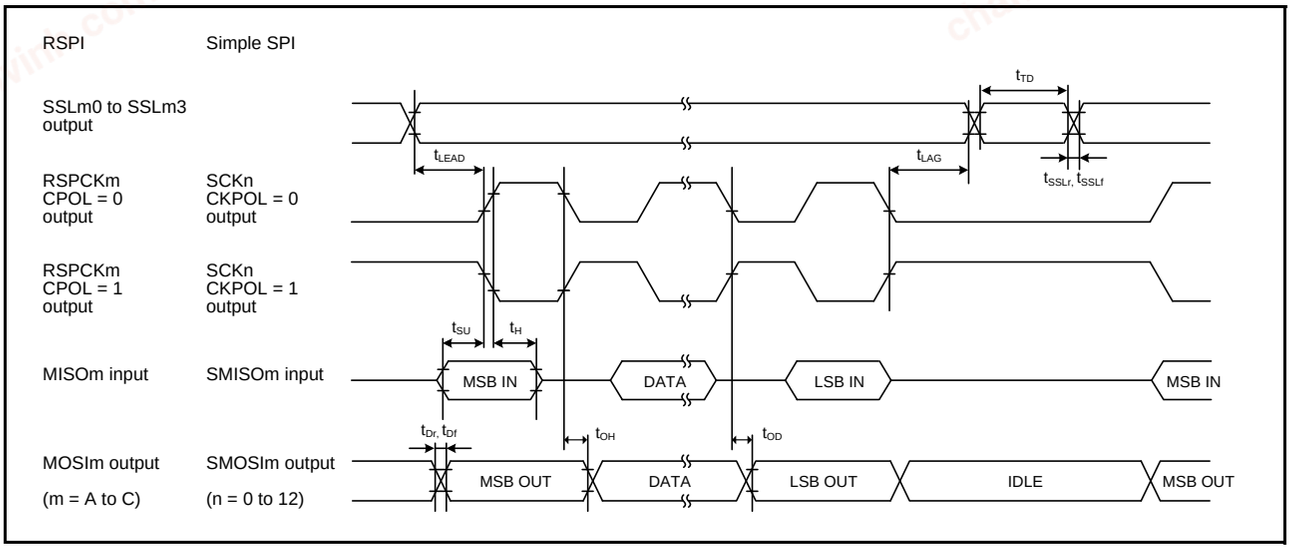


Figure 5.43 RSPI Timing (Master, CPHA = 0) and Simple SPI Timing (Master, CKPH = 1)

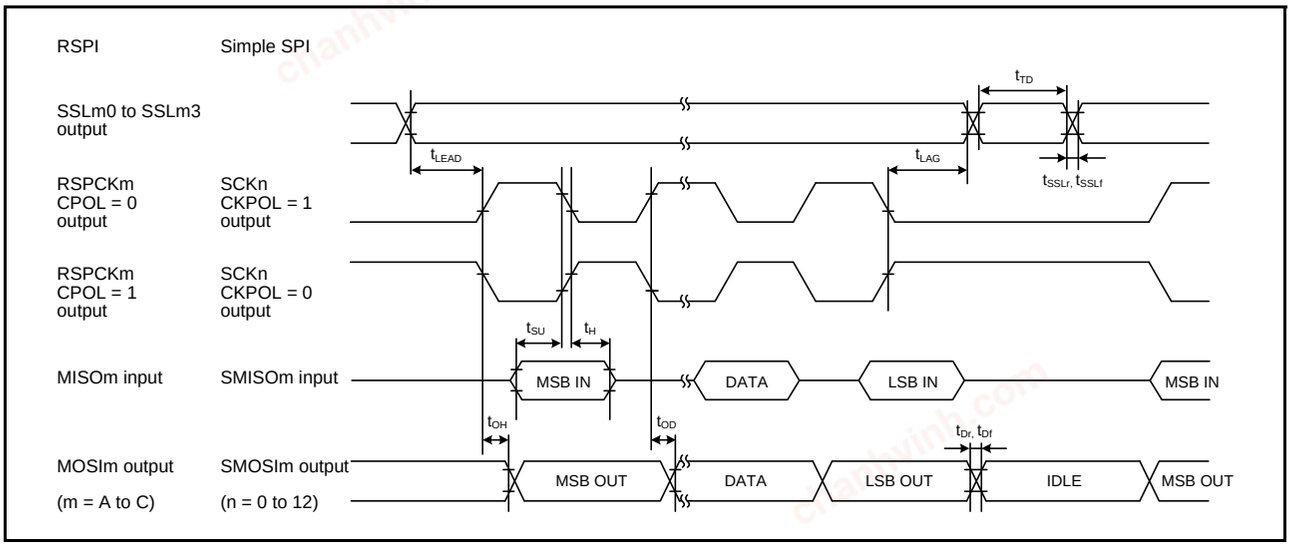


Figure 5.44 RSPI Timing (Master, CPHA = 1) and Simple SPI Timing (Master, CKPH = 0)

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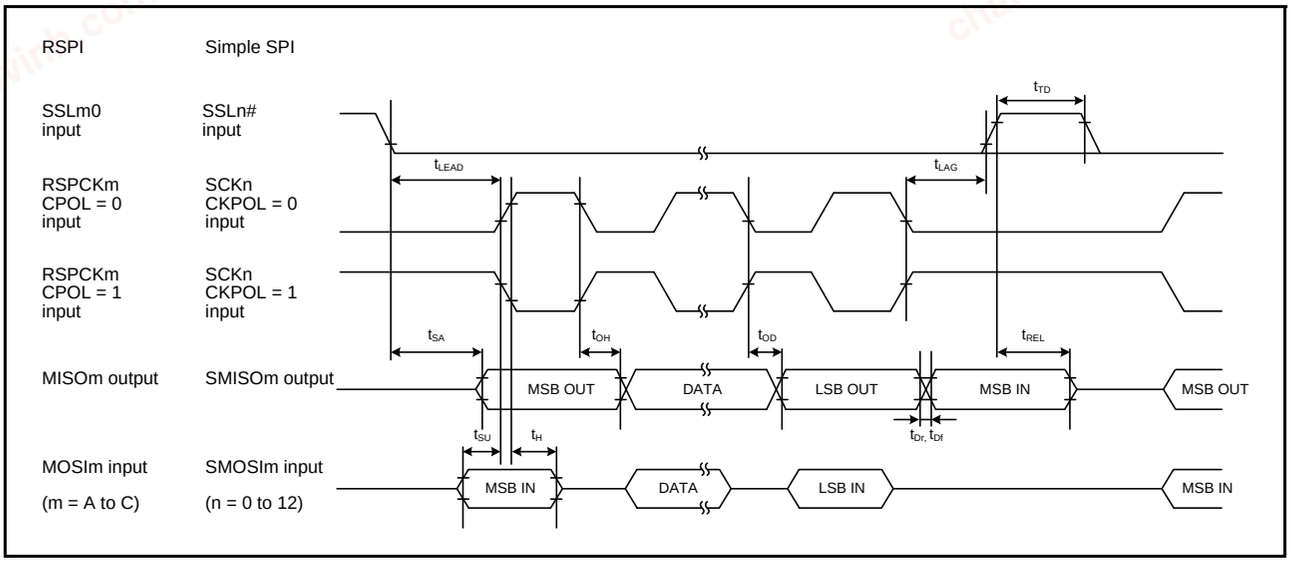


Figure 5.45 RSPI Timing (Slave, CPHA = 0) and Simple SPI Timing (Slave, CKPH = 1)

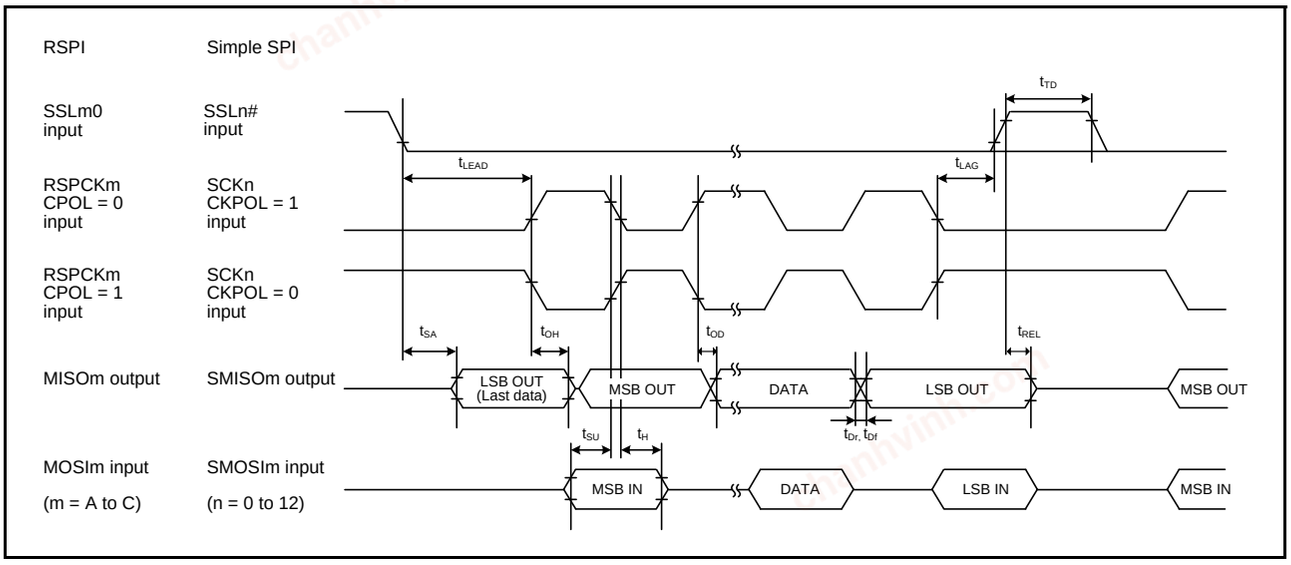
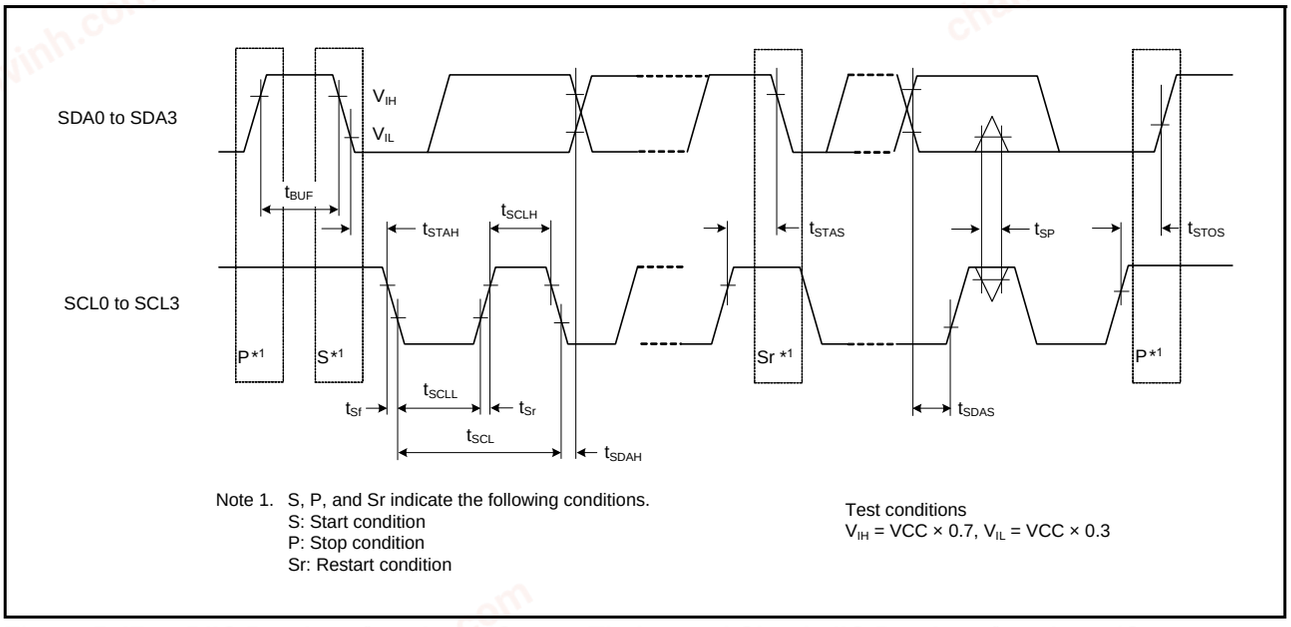


Figure 5.46 RSPI Timing (Slave, CPHA = 1) and Simple SPI Timing (Slave, CKPH = 0)

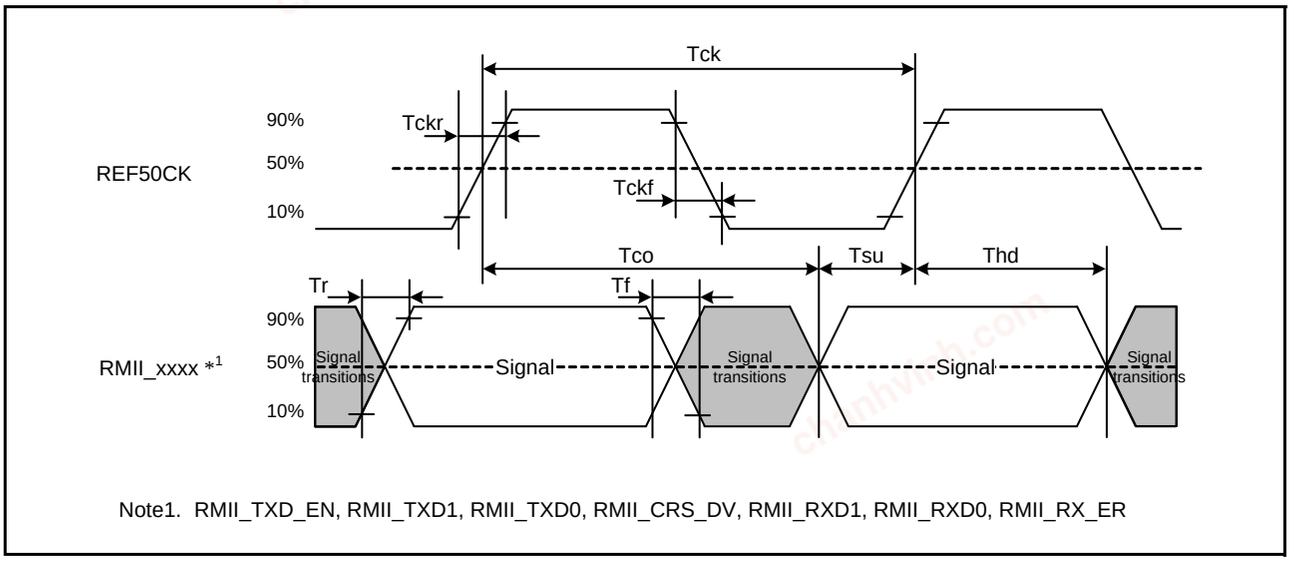
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Note 1. S, P, and Sr indicate the following conditions.
S: Start condition
P: Stop condition
Sr: Restart condition

Test conditions
V_{IH} = VCC × 0.7, V_{IL} = VCC × 0.3

Figure 5.47 RIIC Bus Interface Input/Output Timing and Simple IIC Bus Interface Input/Output Timing



Note1. RMII_TXD_EN, RMII_TXD1, RMII_TXD0, RMII_CRS_DV, RMII_RXD1, RMII_RXD0, RMII_RX_ER

Figure 5.48 REF50CK and RMII Signal Timing

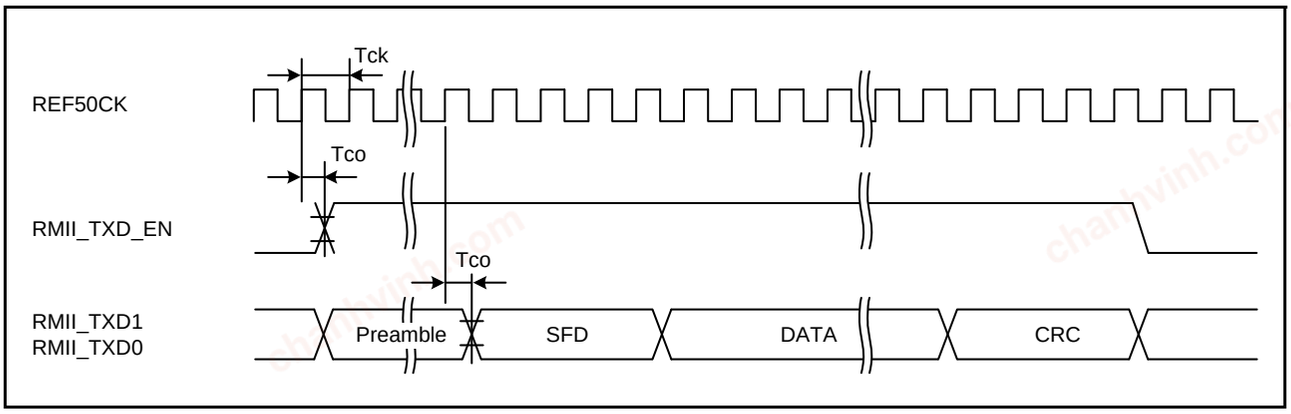


Figure 5.49 RMII Transmission Timing

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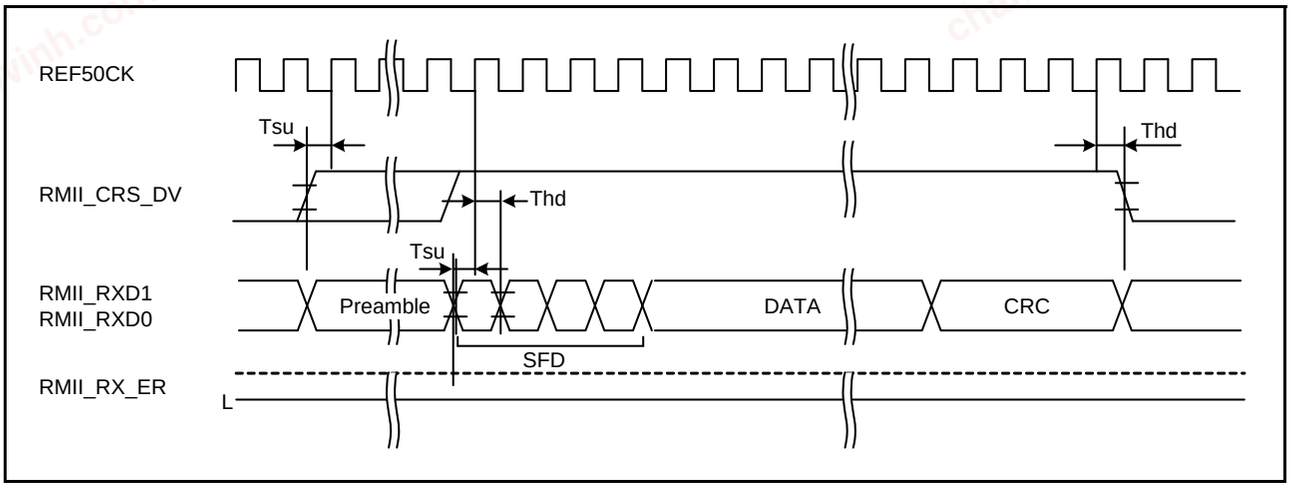


Figure 5.50 RMII Reception Timing (Normal Operation)

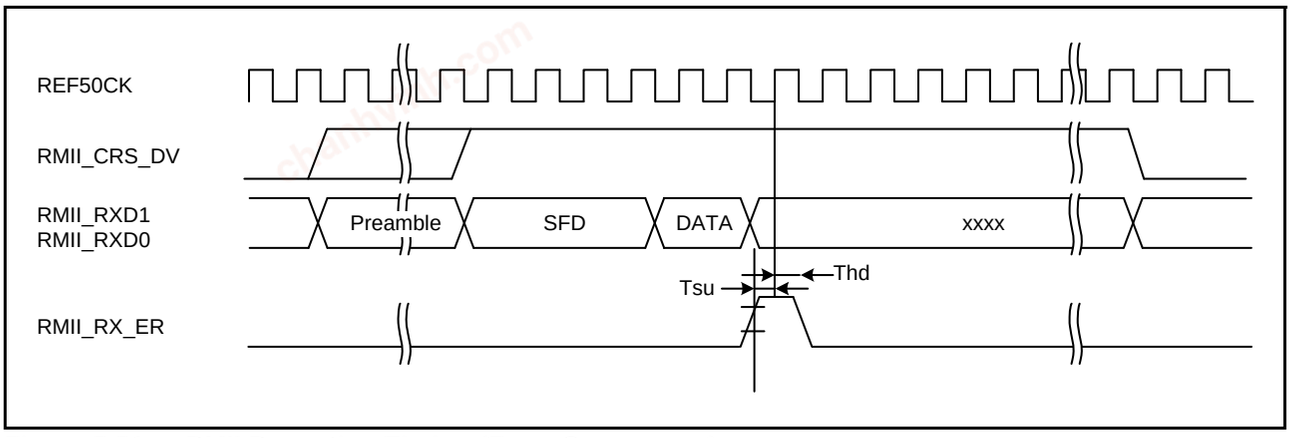


Figure 5.51 RMII Reception Timing (Error Occurrence)

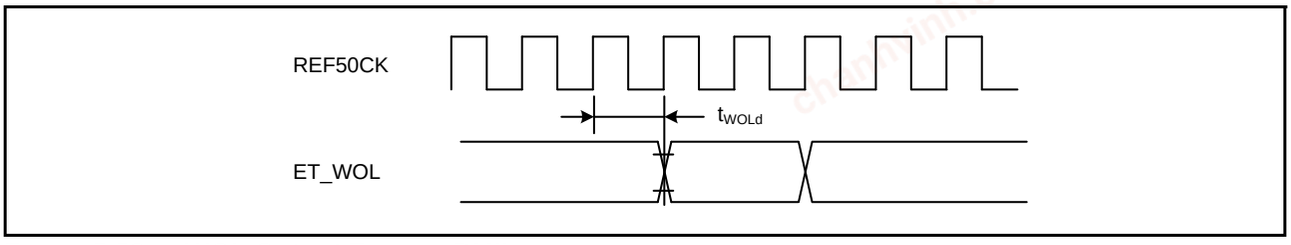


Figure 5.52 WOL Output Timing (RMII)

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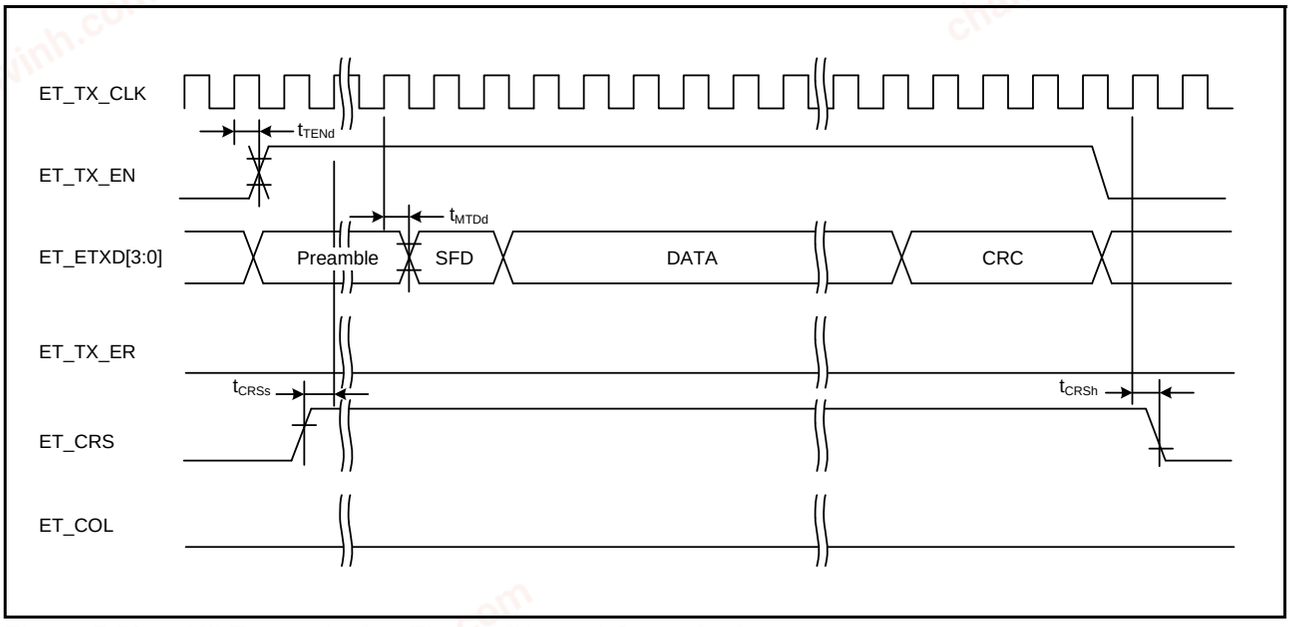


Figure 5.53 MII Transmission Timing (Normal Operation)

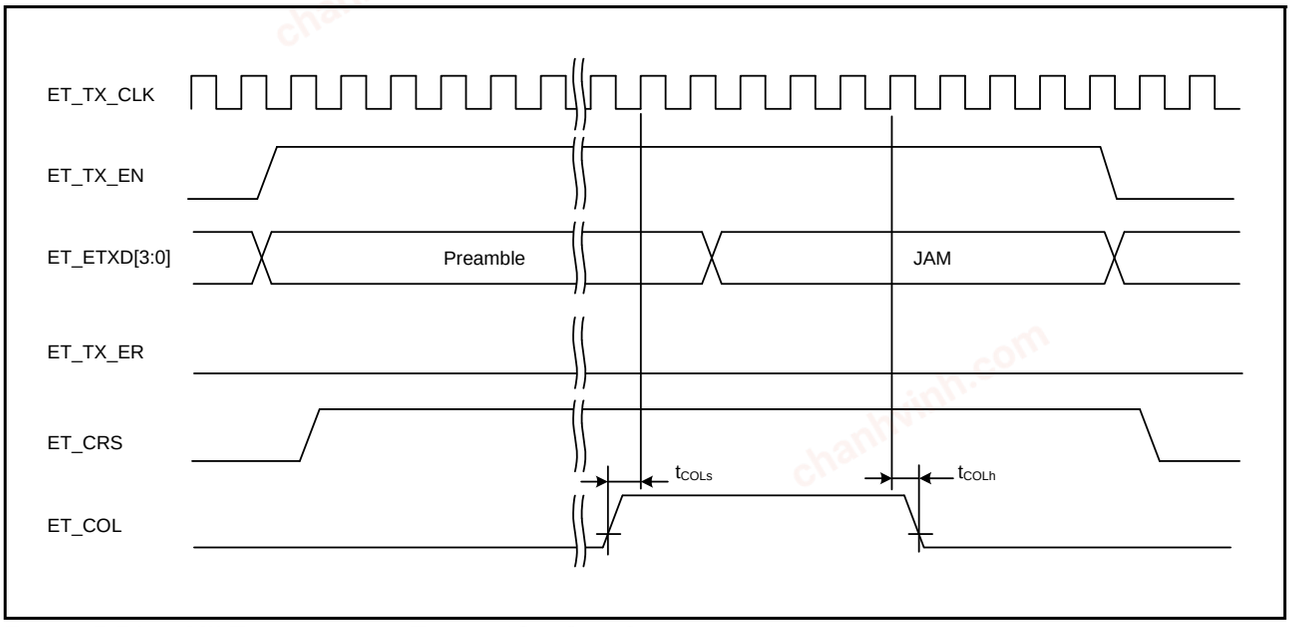
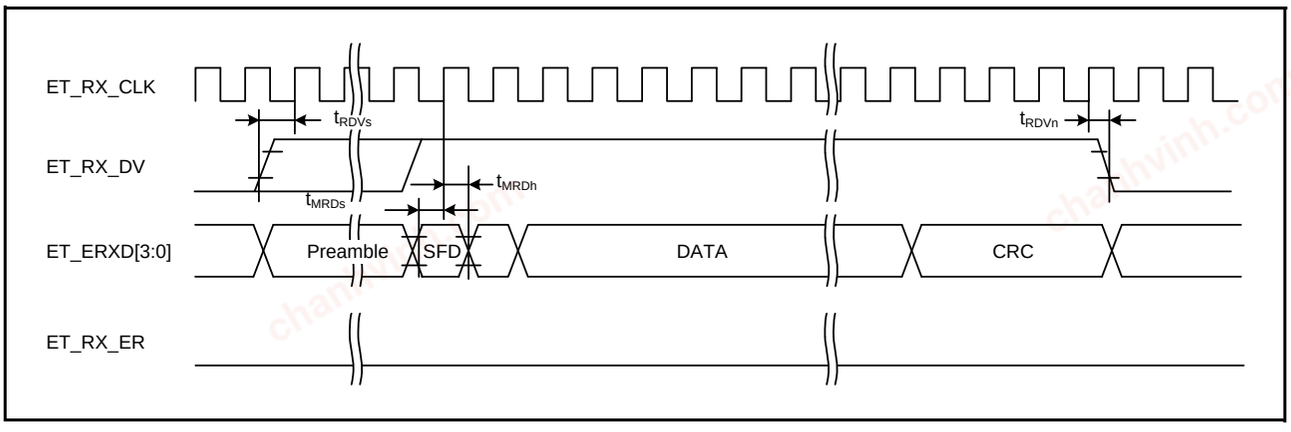


Figure 5.54 MII Transmission Timing (Conflict Occurrence)



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Figure 5.55 MII Reception Timing (Normal Operation)

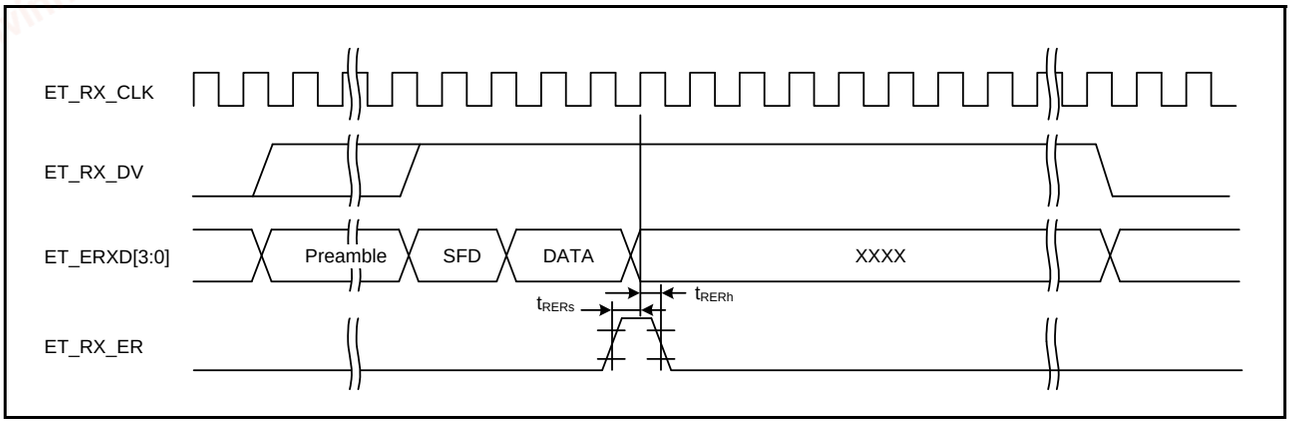


Figure 5.56 MII Reception Timing (Error Occurrence)

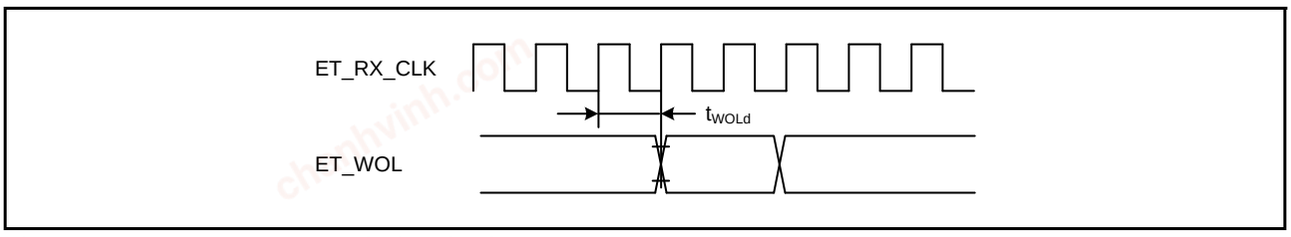


Figure 5.57 WOL Output Timing (MII)

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5.5 USB Characteristics

Table 5.25 On-Chip USB Full-Speed Characteristics (DP and DM Pin Characteristics)

Conditions: VCC = AVCC0 = VCC_USB = 3.0 to 3.6 V, VREFH/VREFH0 = 3.0 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 24 to 50 MHz
$T_a = T_{opr}$
High drive output is selected by the drive capacity control register.

Item		Symbol	Min.	Max.	Unit	Test Conditions	
Input characteristics	Input high level voltage	V_{IH}	2.0	—	V		
	Input low level voltage	V_{IL}	—	0.8	V		
	Differential input sensitivity	V_{DI}	0.2	—	V	| DP – DM |	
	Differential common mode range	V_{CM}	0.8	2.5	V		
Output characteristics	Output high level voltage	V_{OH}	2.8	3.6	V	I_{OH} = –200 µA	
	Output low level voltage	V_{OL}	0.0	0.3	V	I_{OL} = 2 mA	
	Cross-over voltage	V_{CRS}	1.3	2.0	V		Figure 5.58
	Rise time	t_{Lr}	4	20	ns		
	Fall time	t_{Lf}	4	20	ns		
	Rise/fall time ratio	t_{Lr} / t_{Lf}	90	111.11	%	t_{Lr} / t_{Lf}	
	Output resistance	Z_{DRV}	28	44	Ω	Rs = 22 Ω included	

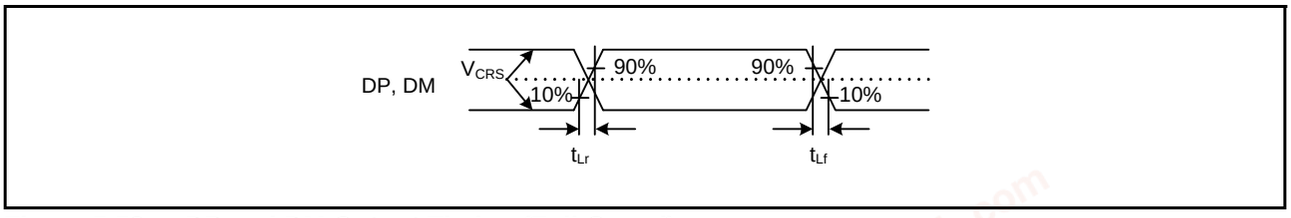


Figure 5.58 DP and DM Output Timing (Full-Speed)

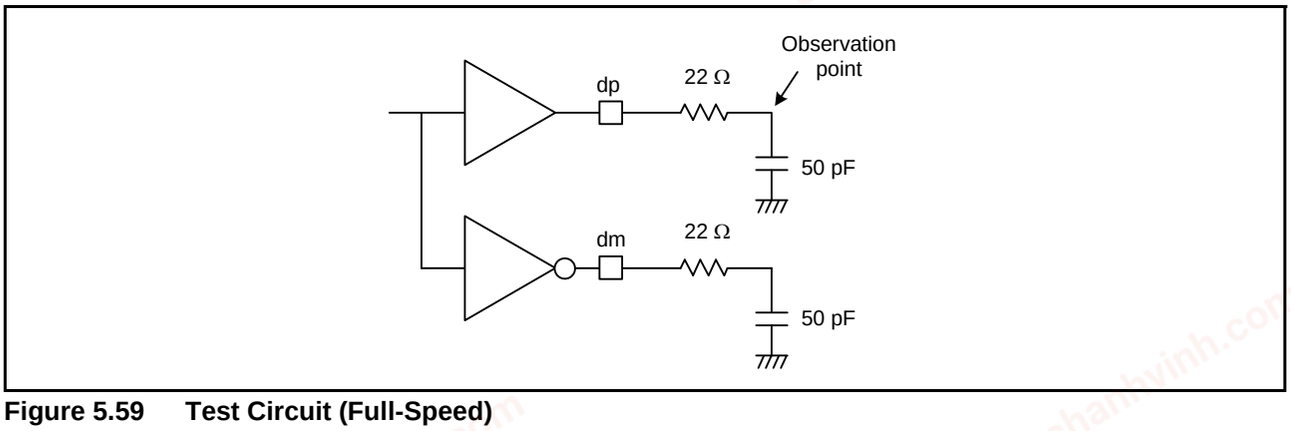


Figure 5.59 Test Circuit (Full-Speed)

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5.6 A/D Conversion Characteristics

Table 5.26 10-Bit A/D Conversion Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$

Item			Min.	Typ.	Max.	Unit	Test Conditions
Resolution			10	10	10	Bit	
Conversion time*1 (Operation at PCLK = 50 MHz)	With 0.1-µF external capacitor	When the capacitor is charged enough*2	3.0 (2.5)*3	—	—	µs	Sampling in 125 states
	Without 0.1-µF external capacitor	Permissible signal source impedance (max.) = 1.0 kΩ, VCC ≥ 3.0 V	1.5 (1.0)*3	—	—		Sampling in 50 states
		Permissible signal source impedance (max.) = 1.0 kΩ, VCC ≥ 2.7 V	3.5 (3.0)*3	—	—		Sampling in 150 states
		Permissible signal source impedance (max.) = 5.0 kΩ, VCC ≥ 3.0 V	2.0 (1.5)*3	—	—		Sampling in 75 states
		Permissible signal source impedance (max.) = 5.0 kΩ, VCC ≥ 2.7 V	4.0 (3.5)*3	—	—		Sampling in 175 states
Analog input capacitance			—	—	6.0	pF	
Offset error			—	±1.5	±3.0	LSB	
Full-scale error			—	±1.5	±3.0	LSB	
Quantization error			—	±0.5	—	LSB	
Absolute accuracy			—	±1.5	±3.0	LSB	
DNL differential nonlinearity error			—	±0.5	±1.0	LSB	
INL integral nonlinearity error			—	±1.5	±3.0	LSB	

Note: • The above specification values apply when there is no access to the external bus during A/D conversion. If access proceeds during A/D conversion, values may not fall within the above ranges.
Note 1. The conversion time includes the sampling time and the comparison time. As the test conditions, the number of sampling states is indicated.
Note 2. The scanning is not supported.
Note 3. The value in parentheses indicates the sampling time.

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Table 5.27 12-Bit A/D Conversion Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$

Item			Min.	Typ.	Max.	Unit	Test Conditions
Resolution			12	12	12	Bit	
Conversion time*1 (Operation at PCLK = 50 MHz)	AN0 to AN7	Permissible signal source impedance (max.) = 1.0 kΩ	1.0 (0.4)*2	—	—	µs	Sampling in 20 states
	Other channels	Permissible signal source impedance (max.) = 1.0 kΩ, AVCC ≥ 3.0 V	2.0 (1.4)*2	—	—	µs	Sampling in 70 states
		Permissible signal source impedance (max.) = 1.0 kΩ, AVCC ≥ 2.7 V	5.6 (5.0)*2	—	—	µs	Sampling in 250 states
Analog input capacitance			—	—	30	pF	
Offset error			—	±2.0	±7.5	LSB	
Full-scale error			—	±2.0	±7.5	LSB	
Quantization error			—	±0.5	—	LSB	
Absolute accuracy			—	±2.5	±8.0	LSB	
DNL differential nonlinearity error			—	±2.0	±4.0	LSB	
INL integral nonlinearity error			—	±2.0	±4.0	LSB	

Note: • The above specification values apply when there is no access to the external bus during A/D conversion. If access proceeds during A/D conversion, values may not fall within the above ranges.
Note 1. The conversion time includes the sampling time and the comparison time. As the test conditions, the number of sampling states is indicated.
Note 2. The value in parentheses indicates the sampling time.

Table 5.28 A/D Internal Reference Voltage Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
PCLK = 8 to 50 MHz
$T_a = T_{opr}$

Item	Min.	Typ.	Max.	Unit	Test Conditions
A/D Internal reference voltage	1.45	1.50	1.55	V	

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5.7 D/A Conversion Characteristics

Table 5.29 D/A Conversion Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to VCC
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
$T_a = T_{opr}$

Item	Min.	Typ.	Max.	Unit	Test Conditions
Resolution	10	10	10	Bit	
Conversion time	—	—	3.0	µs	20-pF capacitive load
Absolute accuracy	—	±2.0	±4.0	LSB	2-MΩ resistive load
	—	—	±3.0	LSB	4-MΩ resistive load
	—	—	±2.0	LSB	10-MΩ resistive load
RO output resistance	—	3.6	—	kΩ	

5.8 Temperature Sensor Characteristics

Table 5.30 Temperature Sensor Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to VCC
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
$T_a = T_{opr}$

Item	Min.	Typ.	Max.	Unit	Test Conditions
Relative accuracy	—	±1	—	°C	
Temperature slope	—	4.1	—	mV/°C	
Output voltage (@25°C)	—	1.26	—	V	
Temperature sensor start time	—	—	30	µs	
Sampling time	—	—	5	µs	

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5.9 Power-on Reset Circuit and Voltage Detection Circuit Characteristics

Table 5.31 Power-on Reset Circuit and Voltage Detection Circuit Characteristics

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
$T_a = T_{opr}$

Item			Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Voltage detection level	Power-on reset (POR)	Low power consumption function disabled	V_{POR}	2.5	2.6	2.7	V	Figure 5.60
		Low power consumption function enabled		2.0	2.35	2.7		
	Voltage detection circuit (LVD0)		V_{det0}	2.7	2.80	2.9		Figure 5.61
	Voltage detection circuit (LVD1)		V_{det1_A}	2.75	2.95	3.15		Figure 5.62
	Voltage detection circuit (LVD2)		V_{det2_A}	2.75	2.95	3.15		Figure 5.63
Internal reset time	Power-on reset time		t_{POR}	—	4.6	—	ms	Figure 5.60
	LVD0 reset time		t_{LVD0}	—	4.6	—		Figure 5.61
	LVD1 reset time		t_{LVD1}	—	0.9	—		Figure 5.62
	LVD2 reset time		t_{LVD2}	—	0.9	—		Figure 5.63
Minimum VCC down time			t_{VOFF}	200	—	—	µs	Figure 5.60 and Figure 5.61
Response delay time			t_{det}	—	—	200	µs	Figure 5.60 to Figure 5.63
LVD operation stabilization time (after LVD is enabled)			$Td_{(E-A)}$	—	—	3	µs	Figure 5.62 and Figure 5.63
Hysteresis width (LVD1 and LVD2)			V_{LVH}	—	80	—	mV	

Note: • The minimum VCC down time indicates the time when VCC is below the minimum value of voltage detection levels V_{POR}, V_{det1}, and V_{det2} for the POR/ LVD.

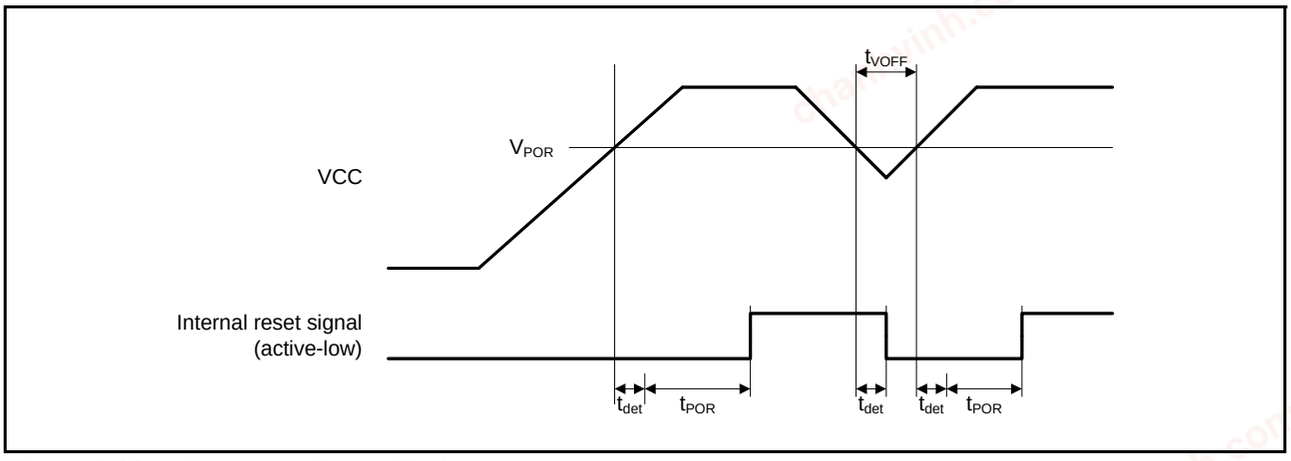


Figure 5.60 Power-on Reset Timing

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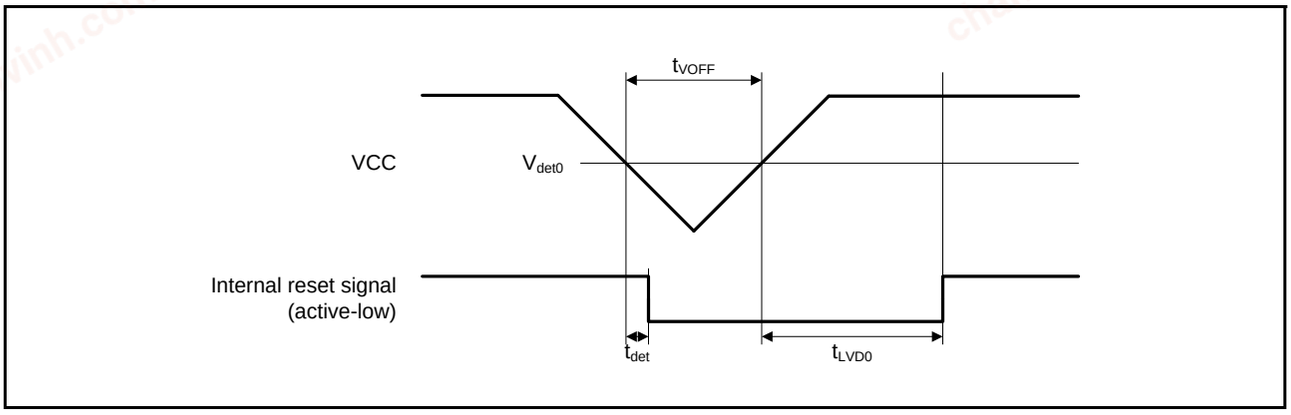


Figure 5.61 Voltage Detection Circuit Timing (V_{det0})

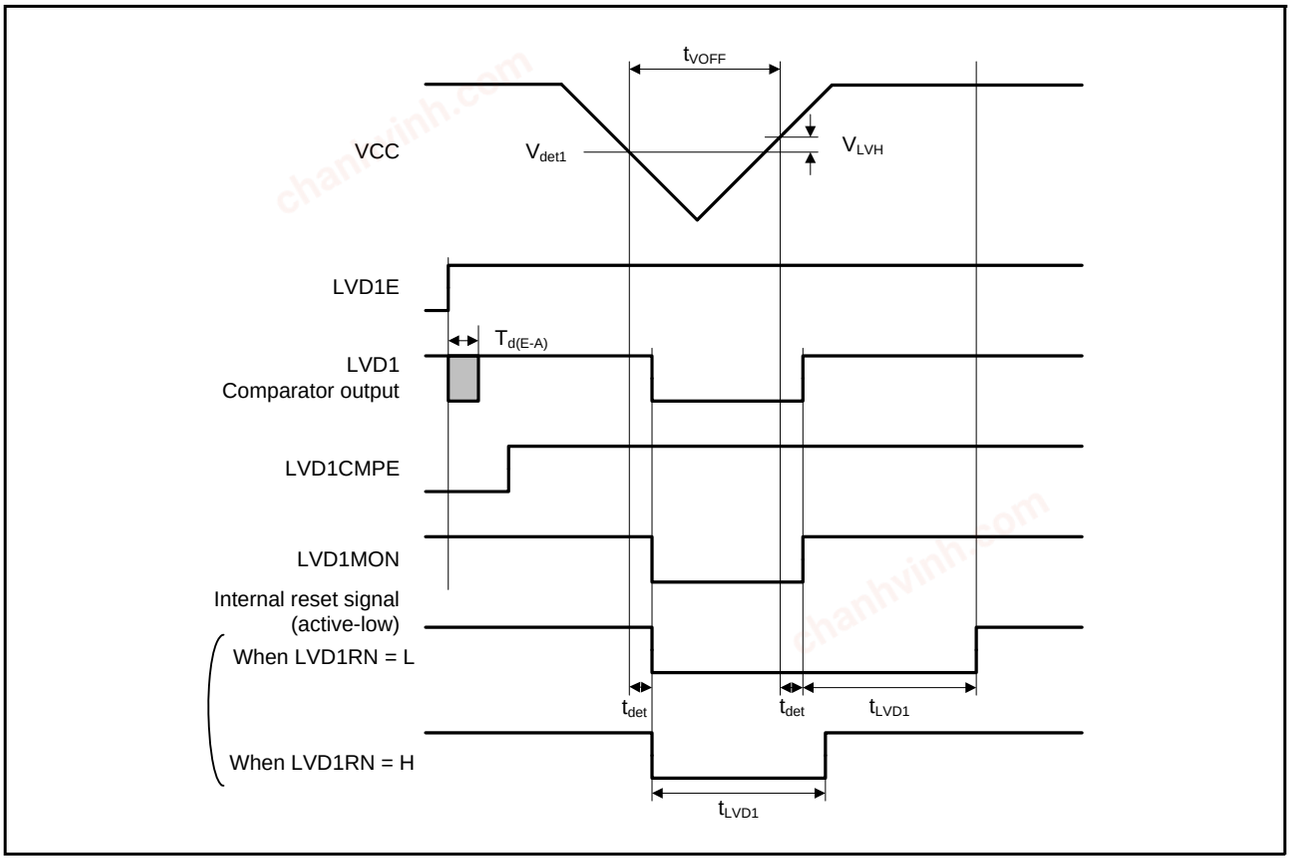


Figure 5.62 Voltage Detection Circuit Timing (V_{det1})

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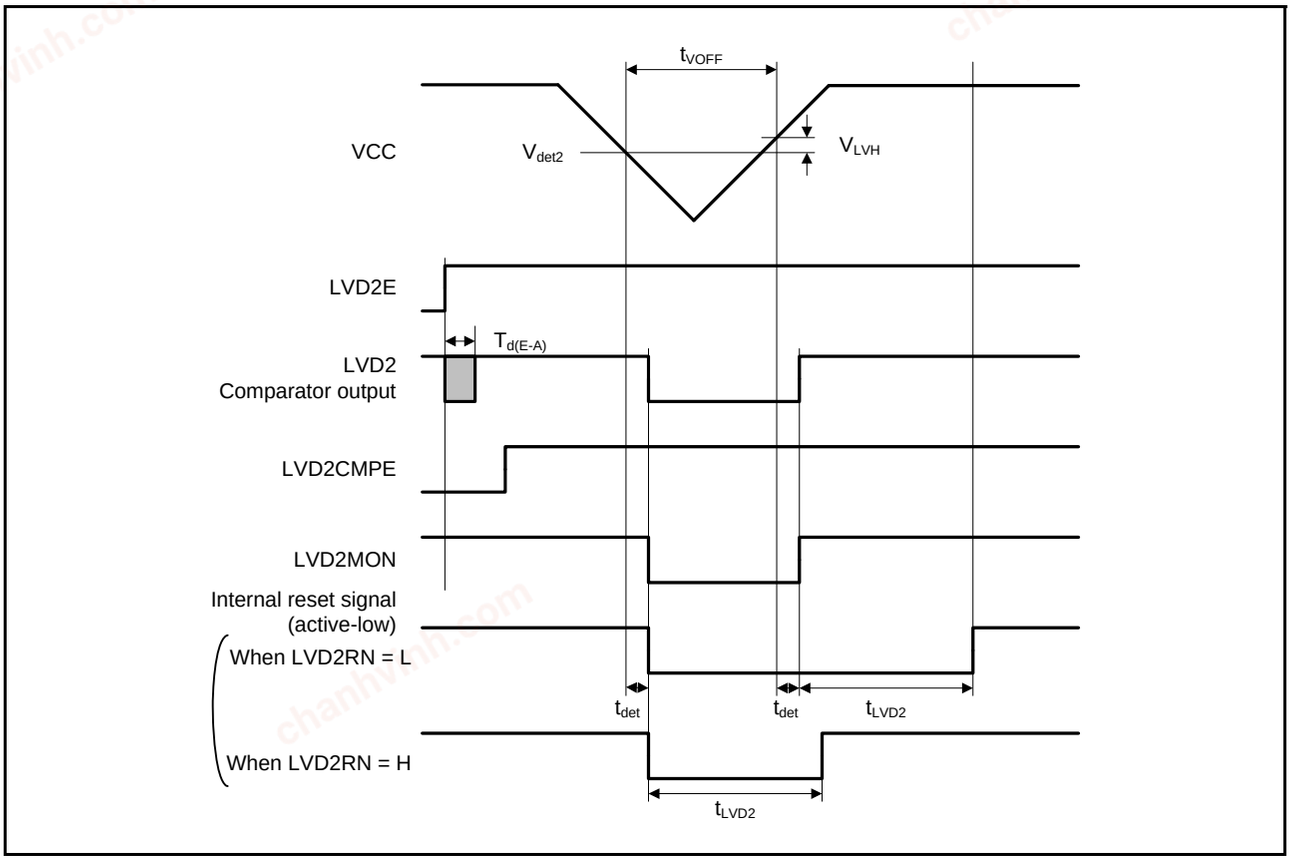


Figure 5.63 Voltage Detection Circuit Timing (V_{det2})

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5.10 Oscillation Stop Detection Timing

Table 5.32 Oscillation Stop Detection Circuit Characteristics

Conditions: VCC = AVCC0 = VCC_USB = Vbatt = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
$T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Detection time	t_{dr}	—	—	1	ms	Figure 5.64

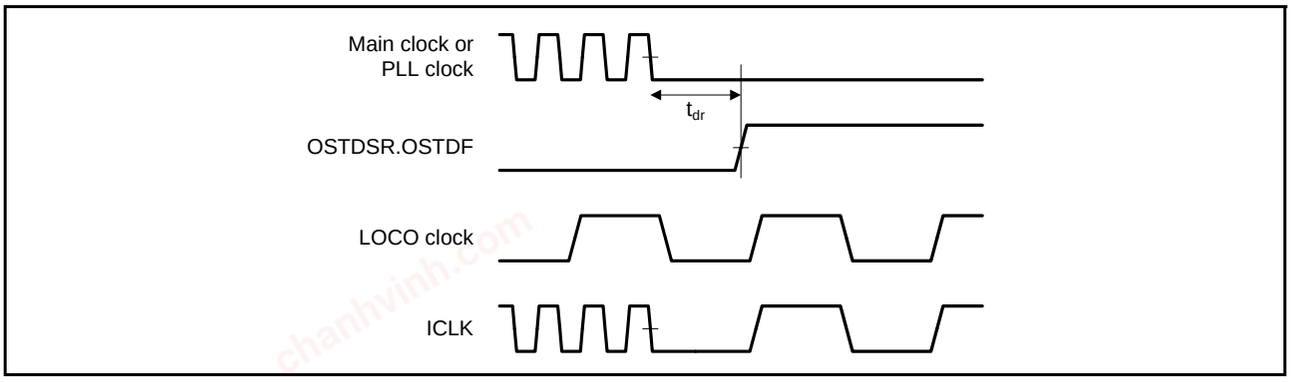


Figure 5.64 Oscillation Stop Detection Timing

5.11 Battery Backup Function Characteristics

Table 5.33 Battery Backup Function Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0, Vbatt = 2.3 to 3.6 V
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
$T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Voltage level for switching to battery backup	$V_{DETBATT}$	2.50	2.60	2.70	V	Figure 5.65
Lower-limit VBATT voltage for power supply switching due to VCC voltage drop	V_{BATTSW}	2.70	—	—		
VCC-off period for starting power supply switching	$t_{VOFFBATT}$	200	—	—	µs	

Note: • The VCC-off period for starting power supply switching indicates the period in which VCC is below the minimum value of the voltage level for switching to battery backup ($V_{DETBATT}$).

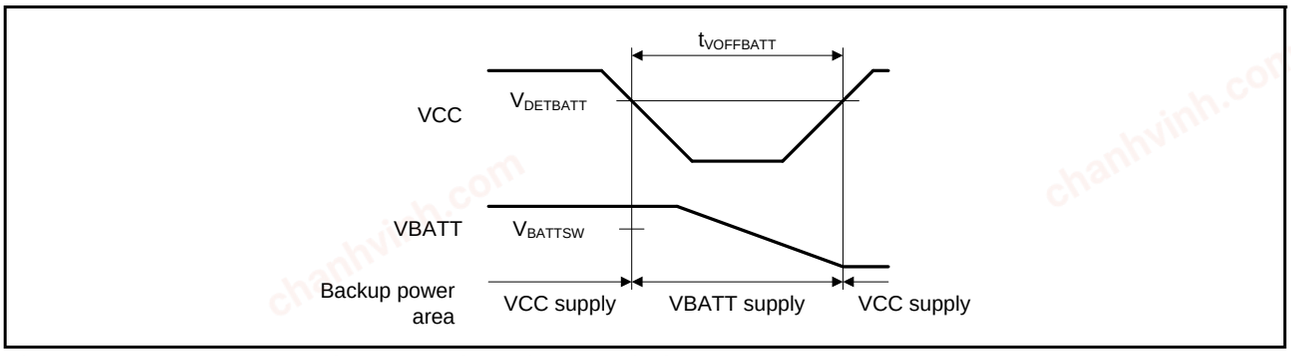


Figure 5.65 Battery Backup Function Characteristics

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5.12 ROM (Flash Memory for Code Storage) Characteristics

Table 5.34 ROM (Flash Memory for Code Storage) Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
Temperature range for the programming/erasure operation: $T_a = T_{opr}$

Item		Symbol	FCLK = 4 MHz			20 MHz ≤ FCLK ≤ 50 MHz			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Programming time $N_{PEC} \leq 100$ hours	128 bytes	t_{P128}	—	2.8	28	—	1	10	ms
	4 Kbytes	t_{P4K}	—	63	140	—	23	50	ms
	16 Kbytes	t_{P16K}	—	252	560	—	90	200	ms
Programming time $N_{PEC} > 100$ hours	128 bytes	t_{P128}	—	3.4	33.6	—	1.2	12	ms
	4 Kbytes	t_{P4K}	—	75.6	168	—	27.6	60	ms
	16 Kbytes	t_{P16K}	—	302.4	672	—	108	240	ms
Erasure time $N_{PEC} \leq 100$ hours	4 Kbytes	t_{E4K}	—	50	120	—	25	60	ms
	16 Kbytes	t_{E16K}	—	200	480	—	100	240	ms
Erasure time $N_{PEC} > 100$ hours	4 Kbytes	t_{E4K}	—	60	144	—	30	72	ms
	16 Kbytes	t_{E16K}	—	240	576	—	120	288	ms
Reprogram/erase cycle*1		N_{PEC}	1000*2	—	—	1000*2	—	—	Times
Suspend delay time during programming		t_{SPD}	—	—	400	—	—	120	µs
First suspend delay time during erasing (in suspend priority mode)		t_{SESD1}	—	—	300	—	—	120	µs
Second suspend delay time during erasing (in suspend priority mode)		t_{SESD2}	—	—	1.7	—	—	1.7	ms
Suspend delay time during erasing (in erasure priority mode)		t_{SEED}	—	—	1.7	—	—	1.7	ms
Data hold time*3		t_{DRP}	10	—	—	10	—	—	Year
FCU reset time		t_{FCUR}	35	—	—	35	—	—	µs

Note 1. Definition of reprogram/erase cycle:
The reprogram/erase cycle is the number of erasing for each block. When the reprogram/erase cycle is n times (n = 1000), erasing can be performed n times for each block. For instance, when 256-byte programming is performed 16 times for different addresses in 4-Kbyte block and then the entire block is erased, the reprogram/erase cycle is counted as one. However, programming the same address for several times as one erasing is not enabled (overwriting is prohibited).
Note 2. This indicates the minimum number that guarantees the characteristics after reprogramming. (The guaranteed value is in the range from one to the minimum number.)
Note 3. This indicates the characteristic when reprogram is performed within the specification range including the minimum number.

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5.13 E^2 Flash Characteristics

Table 5.35 E^2 Flash Characteristics

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6 V, VREFH/VREFH0 = 2.7 V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0 V
Temperature range for the programming/erasure operation: $T_a = T_{opr}$

Item		Symbol	FCLK = 4 MHz			20 MHz ≤ FCLK ≤ 50 MHz			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Programming time $N_{PEC} \leq 100$ hours	2 bytes	t_{DP2}	—	0.7	6	—	0.25	2	ms
Programming time $N_{PEC} > 100$ hours	2 bytes	t_{DP2}	—	0.7	6	—	0.25	2	ms
Erasure time $N_{PEC} \leq 100$ hours	32 bytes	t_{DE32}	—	4	40	—	2	20	ms
Erasure time $N_{PEC} > 100$ hours	32 bytes	t_{DE32}	—	7	40	—	4	20	ms
Blank check time	2 bytes	t_{DBC2}	—	—	100	—	—	30	µs
Reprogram/erase cycle*1		N_{DPEC}	100000*2	—	—	100000*2	—	—	Times
Suspend delay time during programming		t_{DSPD}	—	—	250	—	—	120	µs
First suspend delay time during erasing (in suspend priority mode)		t_{DSESD1}	—	—	250	—	—	120	µs
Second suspend delay time during erasing (in suspend priority mode)		t_{DSESD2}	—	—	500	—	—	300	µs
Suspend delay time during erasing (in erasure priority mode)		t_{DSEED}	—	—	500	—	—	300	µs
Data hold time*3		t_{DDRP}	10	—	—	10	—	—	Year

Note 1. Definition of reprogram/erase cycle:
The reprogram/erase cycle is the number of erasing for each block. When the reprogram/erase cycle is n times (n = 100000), erasing can be performed n times for each block. For instance, when 128-byte programming is performed 16 times for different addresses in 2-Kbyte block and then the entire block is erased, the reprogram/erase cycle is counted as one. However, programming the same address for several times as one erasing is not enabled (overwriting is prohibited).
Note 2. This indicates the minimum number that guarantees the characteristics after reprogramming. (The guaranteed value is in the range from one to the minimum number.)
Note 3. This indicates the characteristic when reprogram is performed within the specification range including the minimum number.

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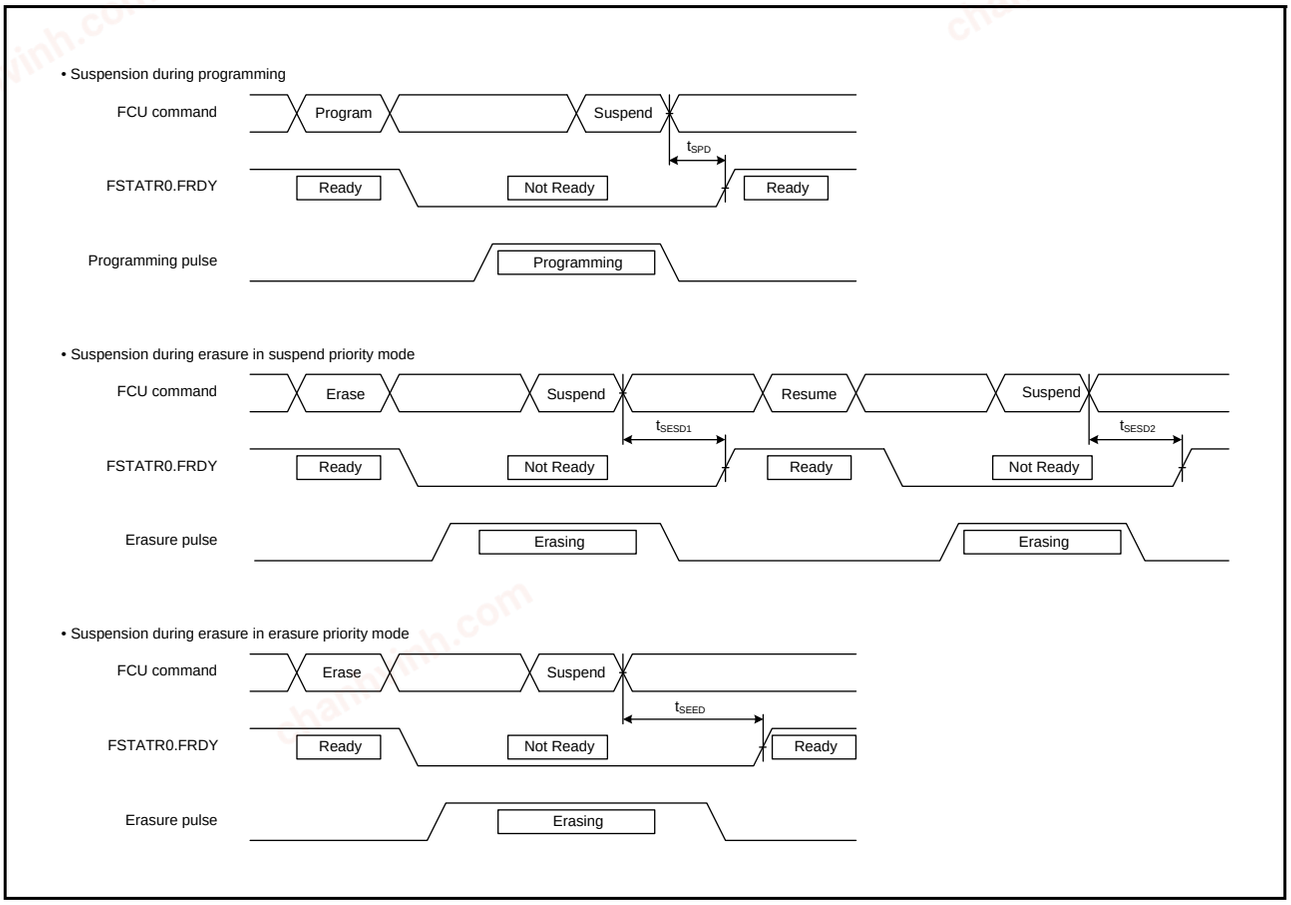


Figure 5.66 Flash Memory Program/Erase Suspend Timing

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5.14 Boundary Scan

Table 5.36 Boundary Scan

Conditions: VCC = AVCC0 = VCC_USB = 2.7 to 3.6V, VREFH/VREFH0 = 2.7V to AVCC0
VSS = AVSS0 = VREFL/VREFL0 = VSS_USB = 0V
$T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
TCK clock cycle time	t_{TCKcyc}	100	—	—	ns	Figure 5.67
TCK clock high pulse width	t_{TCKH}	45	—	—	ns	
TCK clock low pulse width	t_{TCKL}	45	—	—	ns	
TCK clock rise time	t_{TCKr}	—	—	5	ns	
TCK clock fall time	t_{TCKf}	—	—	5	ns	
TRST# pulse width	t_{TRSTW}	20	—	—	t_{TCKcyc}	Figure 5.68
TMS setup time	t_{TMSS}	20	—	—	ns	Figure 5.69
TMS hold time	t_{TMSH}	20	—	—	ns	
TDI setup time	t_{TDIS}	20	—	—	ns	
TDI hold time	t_{TDIH}	20	—	—	ns	
TDO data delay time	t_{TDOD}	—	—	40	ns	

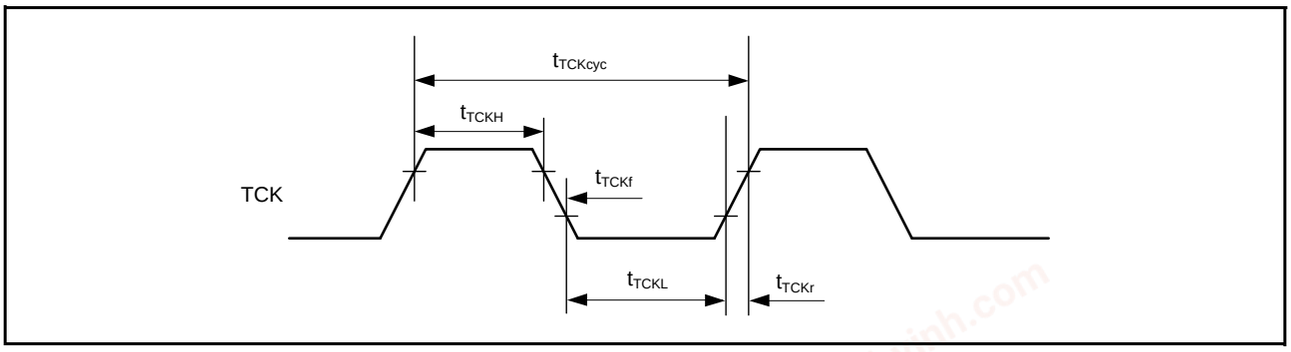


Figure 5.67 Boundary Scan TCK Timing

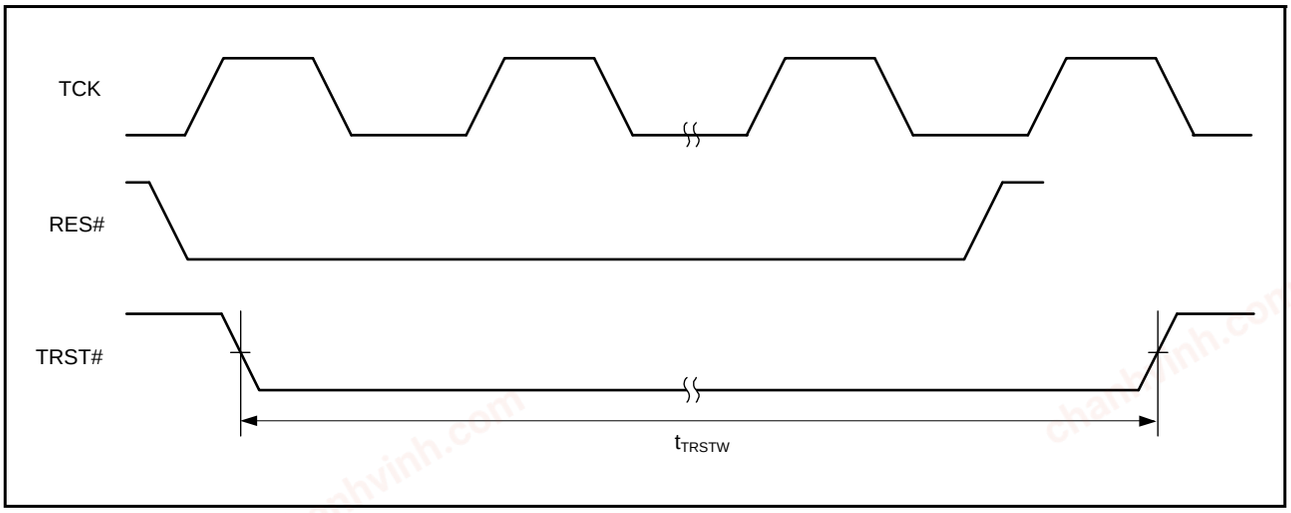


Figure 5.68 Boundary Scan TRST# Timing

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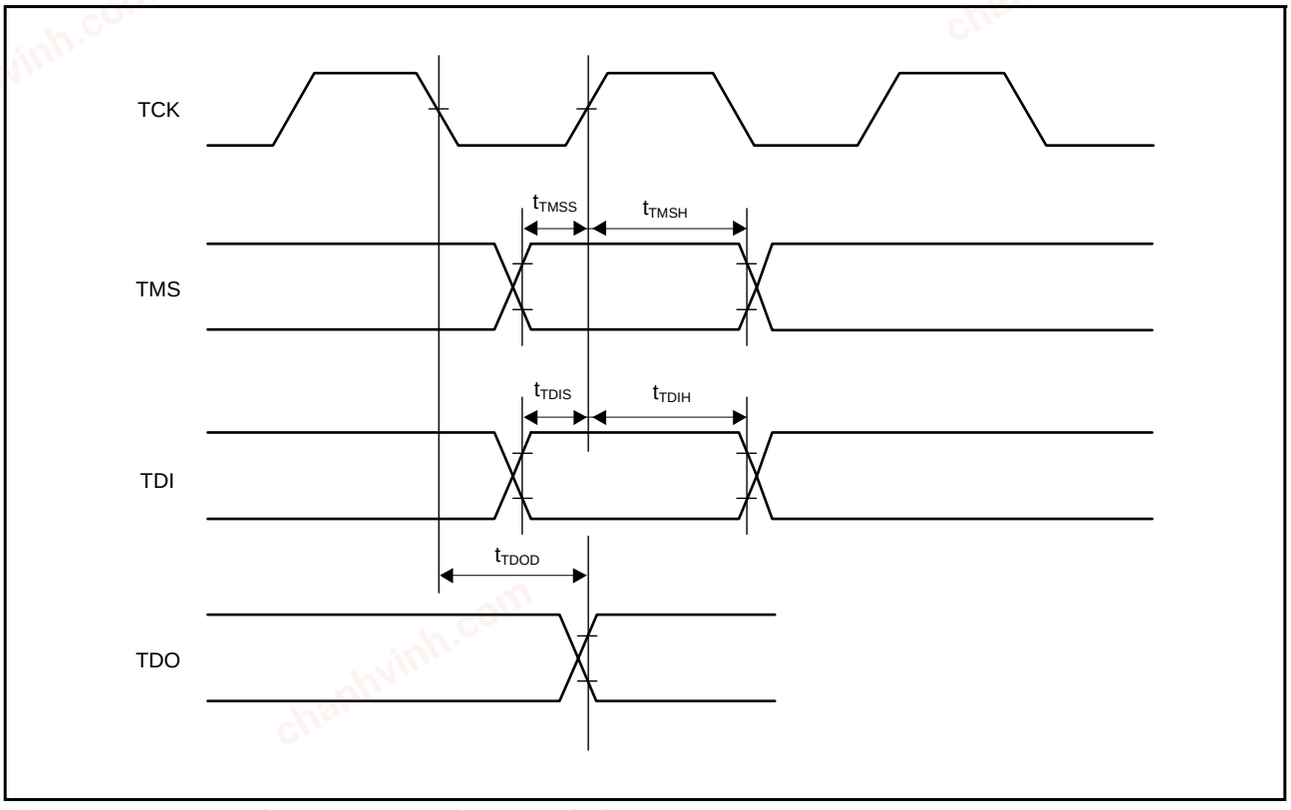


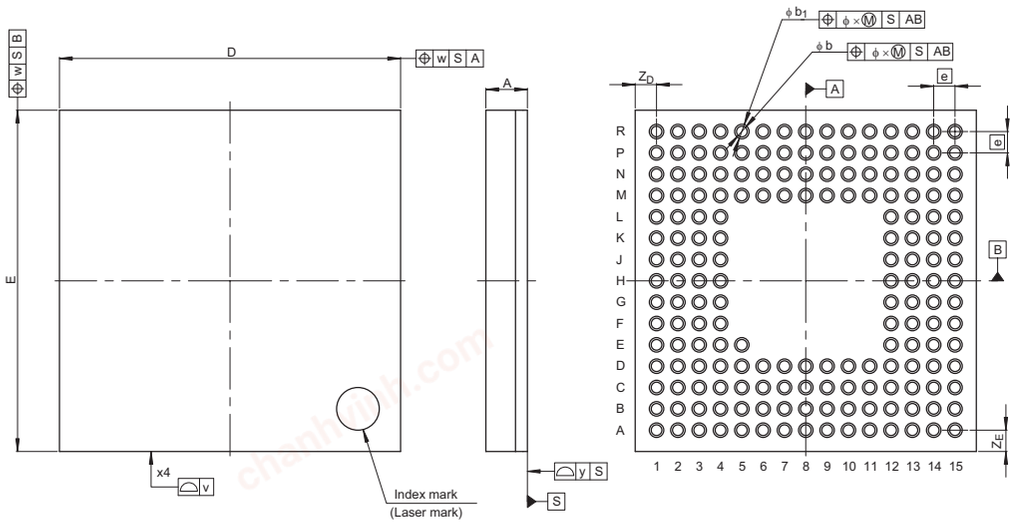
Figure 5.69 Boundary Scan Input/Output Timing

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Appendix 1.Package Dimensions

Information on the latest version of the package dimensions or mountings has been displayed in “Packages” on Renesas Electronics Corporation. website.

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TFLGA177-8x8-0.50	PTLG0177KA-A	177F0E-A	0.2g

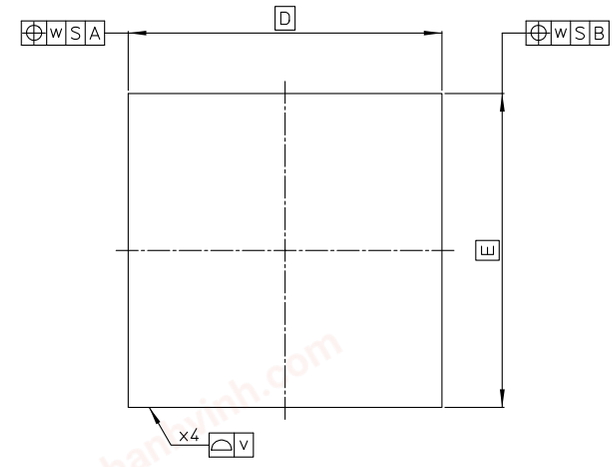


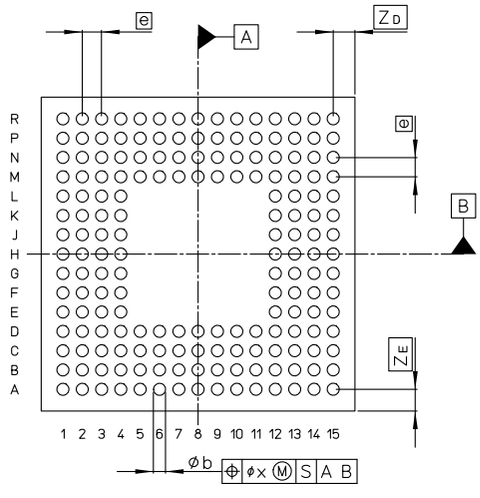
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	8.0	—
E	—	8.0	—
v	—	—	0.15
w	—	—	0.20
A	—	—	1.05
e	—	0.5	—
b	0.21	0.25	0.29
b_1	0.29	0.34	0.39
x	—	—	0.08
y	—	—	0.08
Z_D	—	0.5	—
Z_E	—	0.5	—

Figure A 177-pin TFLGA (PTLG0177KA-A)

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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-LFBGA176-13x13-0.80	PLBG0176GA-A	BP-176/BP-176V	0.45g



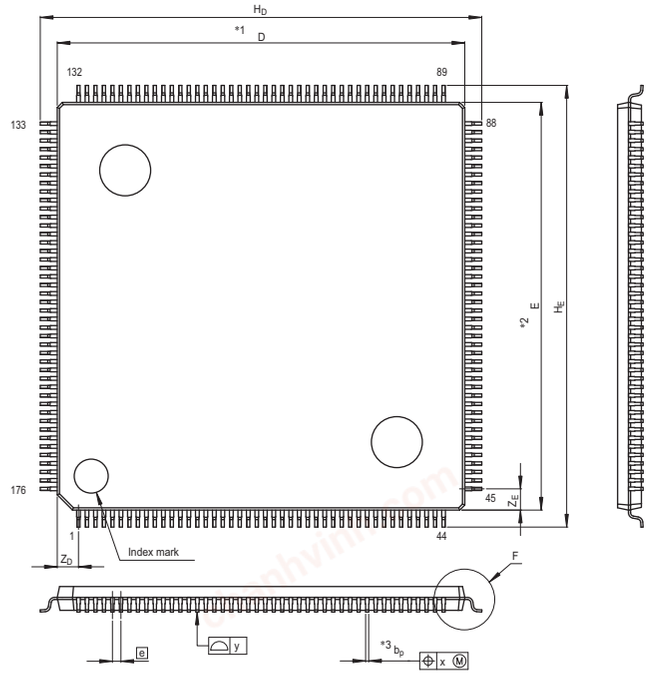


Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	13.0	—
E	—	13.0	—
v	—	—	0.15
w	—	—	0.20
A	—	—	1.40
A1	0.35	0.40	0.45
e	—	0.80	—
b	0.45	0.50	0.55
x	—	—	0.08
y	—	—	0.10
y1	—	—	0.2
SD	—	—	—
SE	—	—	—
ZD	—	0.90	—
ZE	—	0.90	—

Figure B 176-pin LFBGA (PLBG0176GA-A)

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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-LQFP176-24x24-0.50	PLQP0176KB-A	176P6Q-A / FP-176E / FP-176EV	1.8g



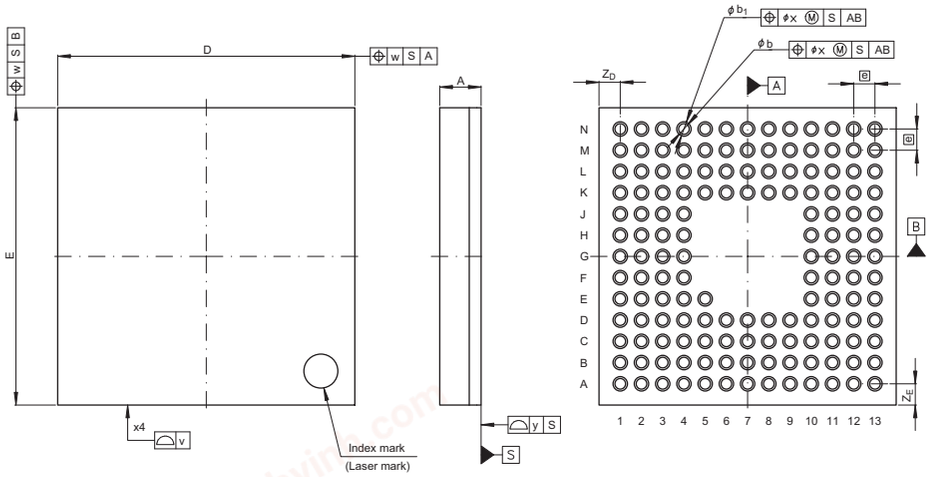
NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	23.9	24.0	24.1
E	23.9	24.0	24.1
A_2	—	1.4	—
H_D	25.8	26.0	26.2
H_E	25.8	26.0	26.2
A	—	—	1.7
A_1	0.05	0.1	0.15
b_p	0.15	0.20	0.25
b_1	—	0.18	—
c	0.09	0.145	0.20
c_1	—	0.125	—
θ	0°	—	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.10
Z_D	—	1.25	—
Z_E	—	1.25	—
L	0.35	0.5	0.65
L_1	—	1.0	—

Figure C 176-pin LQFP (PLQP0176KB-A)

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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TFLGA145-7x7-0.50	PTLG0145KA-A	145F0G	0.1g

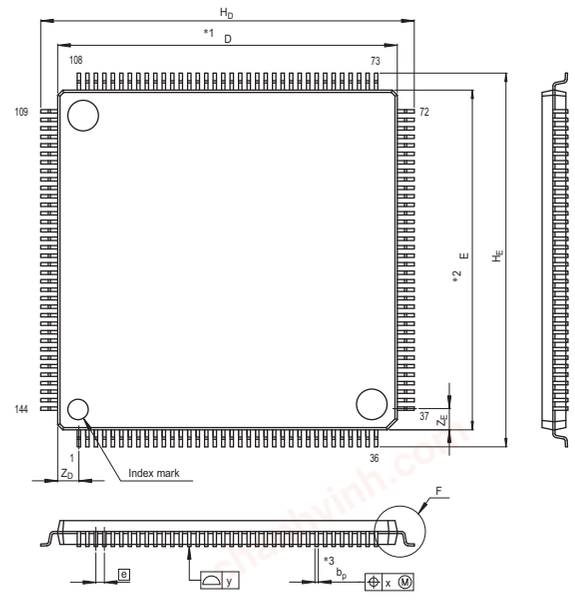


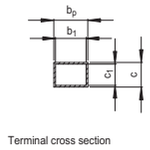
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	7.0	—
E	—	7.0	—
v	—	—	0.15
w	—	—	0.20
A	—	—	1.05
e	—	0.5	—
b	0.21	0.25	0.29
b_1	0.29	0.34	0.39
x	—	—	0.08
y	—	—	0.10
Z_D	—	0.5	—
Z_E	—	0.5	—

Figure D 145-pin TFLGA (PTLG0145KA-A)

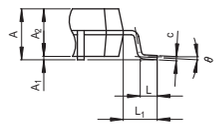
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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-LQFP144-20x20-0.50	PLQP0144KA-A	144P6Q-A / FP-144L / FP-144LV	1.2g





Terminal cross section



Detail F

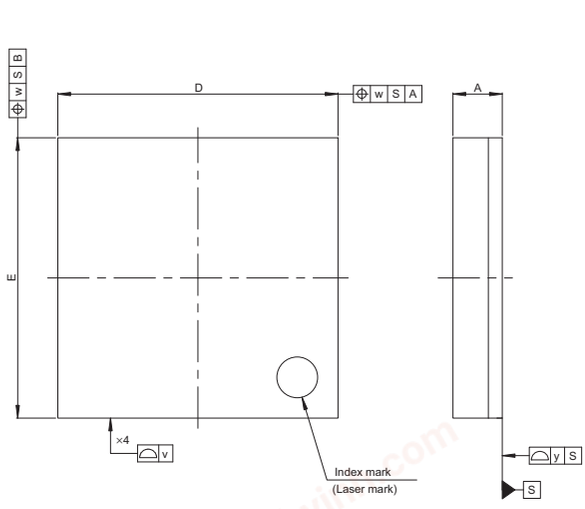
NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

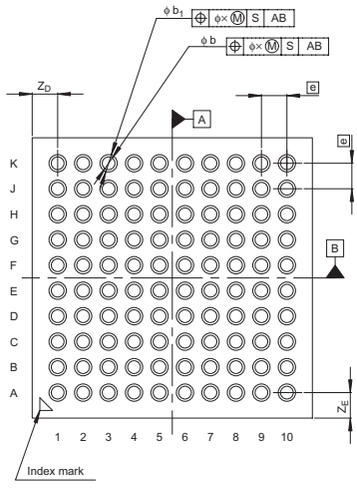
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	19.9	20.0	20.1
E	19.9	20.0	20.1
A_2	—	1.4	—
H_D	21.8	22.0	22.2
H_E	21.8	22.0	22.2
A	—	—	1.7
A_1	0.05	0.1	0.15
b_p	0.17	0.22	0.27
b_1	—	0.20	—
c	0.09	0.145	0.20
c_1	—	0.125	—
θ	0°	—	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.10
Z_D	—	1.25	—
Z_E	—	1.25	—
L	0.35	0.5	0.65
L_1	—	1.0	—

Figure E 144-pin LQFP (PLQP0144KA-A)

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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TFLGA100-5.5x5.5-0.50	PTLG0100KA-A	100F0M	0.1g



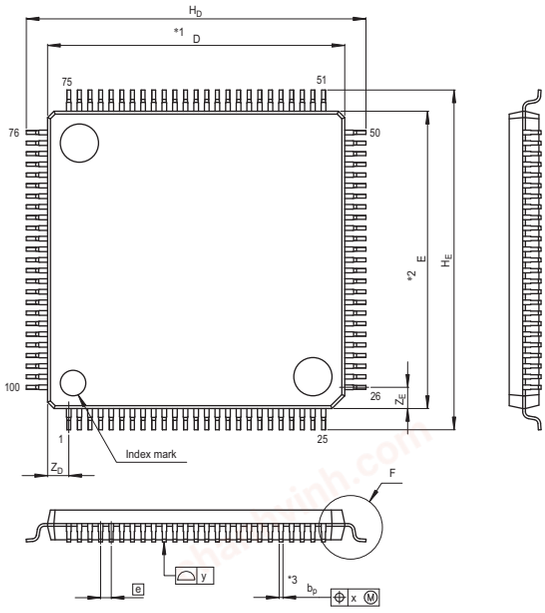


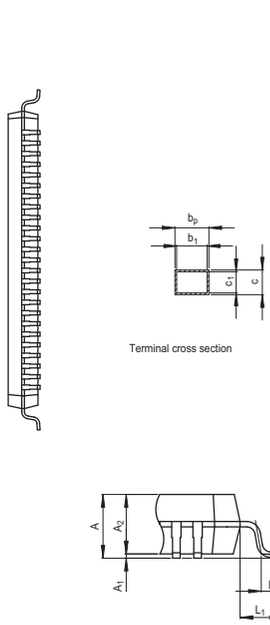
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	5.5	—
E	—	5.5	—
v	—	—	0.15
w	—	—	0.20
A	—	—	1.05
e	—	0.5	—
b	0.21	0.25	0.29
b_1	0.29	0.34	0.39
x	—	—	0.08
y	—	—	0.10
Z_D	—	0.5	—
Z_E	—	0.5	—

Figure F 100-pin TFLGA (PTLG0100KA-A)

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JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-LQFP100-14x14-0.50	PLQP0100KB-A	100P6Q-A / FP-100U / FP-100UV	0.6g





NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	13.9	14.0	14.1
E	13.9	14.0	14.1
A_2	—	1.4	—
H_D	15.8	16.0	16.2
H_E	15.8	16.0	16.2
A	—	—	1.7
A_1	0.05	0.1	0.15
b_p	0.15	0.20	0.25
b_1	—	0.18	—
c	0.09	0.145	0.20
c_1	—	0.125	—
θ	0°	—	8°
e	—	0.5	—
x	—	—	0.08
y	—	—	0.08
Z_D	—	1.0	—
Z_E	—	1.0	—
L	0.35	0.5	0.65
L_1	—	1.0	—

Figure G 100-pin LQFP (PLQP0100KB-A)

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REVISION HISTORY	RX63N Group, RX631 Group Datasheet

Rev.	Date	Description	
		Page	Summary
0.50	May 13, 2011	—	First Edition issued
0.90	Dec 27. 2011	All	
		—	Package added (177-pin TFLGA, 176-pin LFBGA, 145-pin TFLGA), module name changed
		—	Interrupt Controller (ICUb) module name changed
		1. Overview	
		2 to 6	Table 1.1 Outline of Specifications, Reset, Realtime clock, Temperature sensor, Power supply voltage, changed
		8 to 10	Table 1.3 List of Products, changed
		10	Figure 1.1 How to Read the Product Part No., changed
		12 to 17	Table 1.4 Pin Functions, BSCANP pin added
		18	Figure 1.3 Pin Assignment (176-Pin TFLGA), added
		19	Figure 1.4 Pin Assignment (176-Pin LFBGA), added
		20	Figure 1.5 Pin Assignment (176-Pin LQFP), pin 18 changed
		21	Figure 1.6 Pin Assignment (144-Pin TFLGA), added
		22	Figure 1.7 Pin Assignment (144-Pin LQFP), pin 16 changed
		23	Figure 1.8 Pin Assignment (100-Pin LQFP), pin 7 changed
		24 to 28	Table 1.5 List of Pins and Pin Functions (177-pin TFLGA, 176-pin LFBGA), added
		34 to 38	Table 1.7 List of Pins and Pin Functions (145-Pin TFLGA), added
		4. I/O Registers	
		56 to 99	Table 5.1 List of I/O Registers, changed
		Appendix 2. Package Dimensions	
		100	Figure A. 177-pin TFLGA (PTLG0177KA-A), added
		101	Figure B. 176-pin LFBGA (PLBG0176GA-A), added
		103	Figure D. 145-pin TFLGA (PTLG0145KA-A), added
		105	Figure F. 100-pin TFLGA (PTLG0100KA-A), added
1.00	Jun 06. 2012	1. Overview	
		2 to 6	Table1.1 Outline of Specifications: CPU, ROM, RAM, E2 DataFlash, clock generation circuit, temperature sensor, power supply voltage, changed. Low power consumption, deleted
		8 to 10	Table1.3 List of Products, changed
		11	Figure 1.2 Block Diagram, changed
		12	Table1.4 Pin Functions, description of VCC, changed
		24 to 28	Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA): SDRAMC, added to table header; BCLK in pin number line M8, moved to Power Supply Clock System Control column
		29 to 33	Table 1.6 List of Pin and Pin Functions (176-Pin LQFP): SDRAMC, added to table header; BCLK in pin number line 68, moved to Power Supply Clock System Control column
		34 to 38	Table 1.7 List of Pin and Pin Functions (145-Pin TFLGA): SDRAMC, added to table header; MOSIB, added to pin number line D13; T_ERXD1 in pin number line H12, changed to ET_ERXD1; PO8, added to pin number line J4; BCLK in pin number line K6, moved to Power Supply Clock System Control column
		39 to 43	Table 1.8 List of Pins and Pin Functions (144-Pin LQFP): SDRAMC, added to table header; PO8, added to pin number line 29; BCLK in pin number line 53, moved to Power Supply Clock System Control column; T_ERXD1 in pin number 87, changed to ET_ERXD1; MOSIB, added to pin number line 102
		44 to 47	Table 1.9 List of Pins and Pin Functions (100-Pin LQFP): BCLK in pin number line 41, moved to Power Supply Clock System Control column
		4. I/O Registers	
		57, 58	Table4.1, MPU registers, added
		5. Electrical Characteristics	
		105 to 163	Added

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General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this manual, refer to the relevant sections of the manual. If the descriptions under General Precautions in the Handling of MPU/MCU Products and in the body of the manual differ from each other, the description in the body of the manual takes precedence.

1. Handling of Unused Pins

   Handle unused pins in accord with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.

   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.

   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to one with a different part number, confirm that the change will not lead to problems.

   — The characteristics of MPU/MCU in the same group but having different part numbers may differ because of the differences in internal memory capacity and layout pattern. When changing to products of different part numbers, implement a system-evaluation test for each of the products.

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Renesas Electronics America Inc.
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
1 harbourFront Avenue, #06-10, keppel Bay Tower, Singapore 098632
Tel: +65-6213-0200, Fax: +65-6278-8001

Renesas Electronics Malaysia Sdn.Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.
11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

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