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"[Embedded - Microcontrollers](#)" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "[Embedded - Microcontrollers](#)"

Details

Product Status	Not For New Designs
Core Processor	RX
Core Size	32-Bit Single-Core
Speed	100MHz
Connectivity	EBI/EMI, I ² C, LINbus, SCI, SPI
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	69
Program Memory Size	512KB (512K x 8)
Program Memory Type	FLASH
EEPROM Size	32K x 8
RAM Size	48K x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 5.5V
Data Converters	A/D 12x10b, 8x12b; D/A 2x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	112-LQFP
Supplier Device Package	112-LQFP (20x20)
Purchase URL	https://www.e-xfl.com/product-detail/renesas-electronics-america/r5f563teddfh-v0

1. Overview

1.1 Outline of Specifications

Table 1.1 lists the specifications in outline, and Table 1.2 lists the functions of products.

Table 1.1 shows an outline of the maximum specifications, and the available peripheral modules and number of channels differ according to the number of pins on the package and the ROM capacity. For details, see Table 1.2, Comparison of Functions for Different Packages.

Table 1.1 Outline of Specifications (1/7)

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 operation 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: $32 \times 32 \rightarrow 64$ bits - On-chip divider: $32 / 32 \rightarrow 32$ bits - Barrel shifter: 32 bits - Memory protection unit (MPU)
	FPU	- Single precision floating point (32 bits) - Data types and floating-point exceptions in conformance with the IEEE754 standard
Memory	ROM	- Capacity: 512 Kbytes, 384 Kbytes, 256 Kbytes, 64 Kbytes, 48 Kbytes, 32 Kbytes 100 MHz, no-wait access - On-board programming: Programs can be modified through SCI or USB while the MCU is mounted on the board. - Off-board programming: Programs can be modified using parallel programmer. (only in 144-, 120-, 112- and 100-pin versions)
	RAM	- Capacity: 48 Kbytes, 32 Kbytes, 24 Kbytes, 8 Kbytes 100 MHz, no-wait access
	E ² data flash	- Capacity: 32 Kbytes, 8 Kbytes - Programming/erasing: 100,000 times - On-board programming: - Programs can be modified through SCI or USB while the MCU is mounted on the board. - Programming from the user program is possible.
MCU operating modes		[144-, 120-, 112- and 100-pin versions] Single-chip mode, on-chip ROM enabled extended mode, on-chip ROM disabled extended mode (switchable by software) [64- and 48-pin versions] Single-chip mode

1.2 List of Products

Table 1.3 is a list of products, and Figure 1.1 shows how to read the product part number.

Table 1.3 List of Products (1/4)

Group	Part No.	Order Part No.	Package	On-chip ROM Capacity	On-chip RAM Capacity	Option	Operating Voltage	Operating Temperature
RX63T	R5F563TEADFB	R5F563TEADFB#V0	PLQP0144KA-A	512 Kbytes	48 Kbytes	CAN module included	VCC/ PLLVC 4.0 to 5.5V VCC_USB 3.0 to 3.6V AVCC/ AVCC0 4.0 to 5.5V	-40 to +85°C (D Version)
	R5F563TEADFB	R5F563TEADFB#V1	PLQP0144KA-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFA	R5F563TEADFA#V0	PLQP0120KA-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFA	R5F563TEADFA#V1	PLQP0120KA-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFH	R5F563TEADFH#V0	PLQP0112JA-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFH	R5F563TEADFH#V1	PLQP0112JA-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFP	R5F563TEADFP#V0	PLQP0100KB-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TEADFP	R5F563TEADFP#V1	PLQP0100KB-A	512 Kbytes	48 Kbytes	CAN module included		
	R5F563TCADFB	R5F563TCADFB#V0	PLQP0144KA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFB	R5F563TCADFB#V1	PLQP0144KA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFA	R5F563TCADFA#V0	PLQP0120KA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFA	R5F563TCADFA#V1	PLQP0120KA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFH	R5F563TCADFH#V0	PLQP0112JA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFH	R5F563TCADFH#V1	PLQP0112JA-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFP	R5F563TCADFP#V0	PLQP0100KB-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TCADFP	R5F563TCADFP#V1	PLQP0100KB-A	384 Kbytes	32 Kbytes	CAN module included		
	R5F563TBADFB	R5F563TBADFB#V0	PLQP0144KA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFB	R5F563TBADFB#V1	PLQP0144KA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFA	R5F563TBADFA#V0	PLQP0120KA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFA	R5F563TBADFA#V1	PLQP0120KA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFH	R5F563TBADFH#V0	PLQP0112JA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFH	R5F563TBADFH#V1	PLQP0112JA-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFP	R5F563TBADFP#V0	PLQP0100KB-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TBADFP	R5F563TBADFP#V1	PLQP0100KB-A	256 Kbytes	24 Kbytes	CAN module included		
	R5F563TEDDFB	R5F563TEDDFB#V0	PLQP0144KA-A	512 Kbytes	48 Kbytes	CAN module not included		
	R5F563TEDDFA	R5F563TEDDFA#V0	PLQP0120KA-A	512 Kbytes	48 Kbytes	CAN module not included		
	R5F563TEDDFH	R5F563TEDDFH#V0	PLQP0112JA-A	512 Kbytes	48 Kbytes	CAN module not included		
	R5F563TEDDFP	R5F563TEDDFP#V0	PLQP0100KB-A	512 Kbytes	48 Kbytes	CAN module not included		

1.3 Block Diagram

Figure 1.2 shows a block diagram.

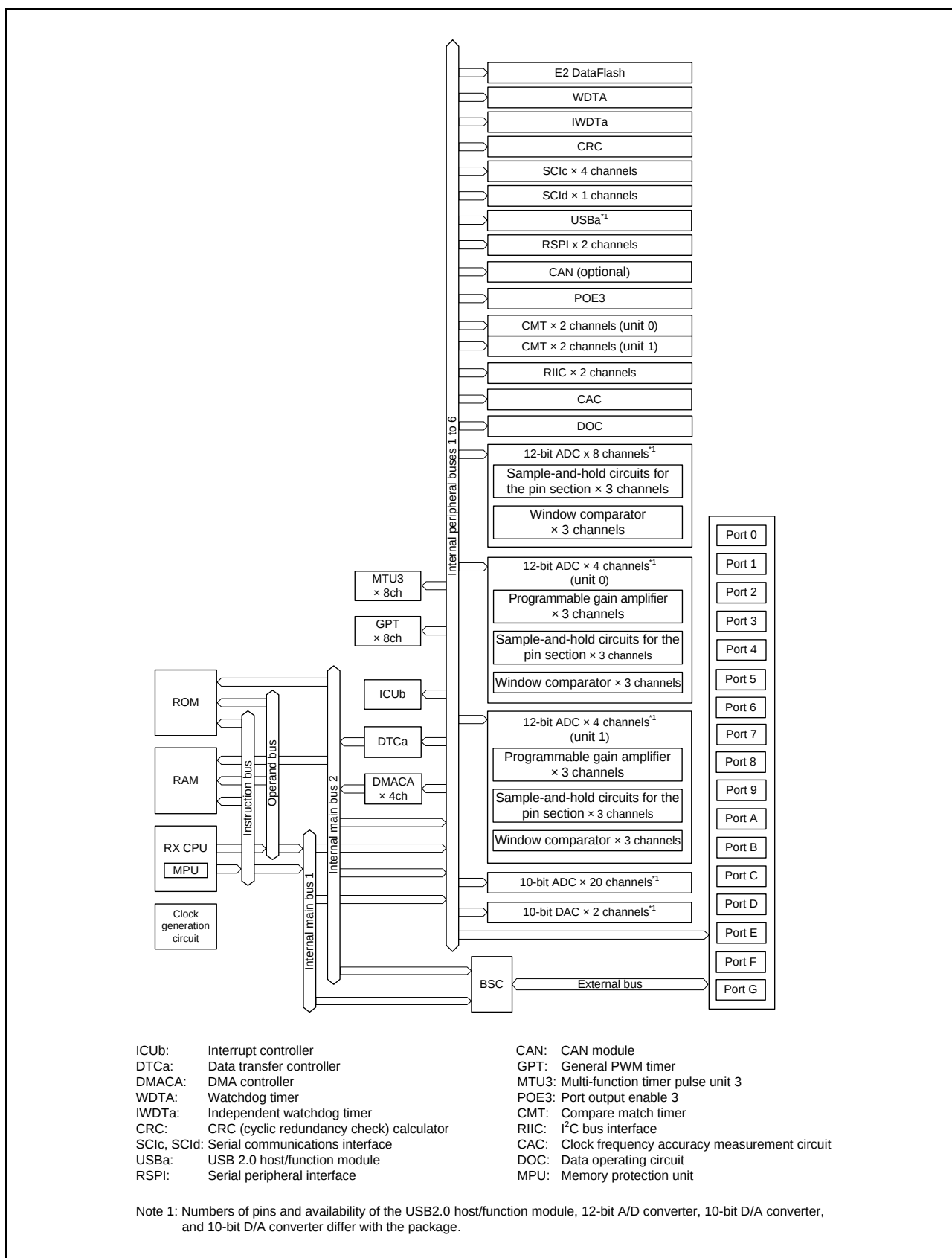


Figure 1.2 Block Diagram

Table 1.4 Pin Functions (2/5)

Classifications	Pin Name	I/O	Description
Interrupt	NMI	Input	Non-maskable interrupt request pin
	IRQ0 to IRQ7	Input	Maskable interrupt request pin
Multi-function timer pulse unit 3	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
	MTIOC6A, MTIOC6B MTIOC6C, MTIOC6D	I/O	The TGRA6 to TGRD6 input capture input/output compare output/ PWM output pins
	MTIOC7A, MTIOC7B MTIOC7C, MTIOC7D	I/O	The TGRA7 to TGRD7 input capture input/output compare output/ PWM output pins
	MTCLKA, MTCLKB MTCLKC, MTCLKD	Input	Input pins for external clock
Port output enable 3	POE0#, POE4# POE8#, POE10# POE11#, POE12#	Input	Input pins for request signals to place the MTU/GPT large-current pins in the high impedance state
General PWM timer	GTIOC0A, GTIOC0B	I/O	The GPT0.GTGRA and GPT0.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC1A, GTIOC1B	I/O	The GPT1.GTGRA and GPT1.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC2A, GTIOC2B	I/O	The GPT2.GTGRA and GPT2.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC3A, GTIOC3B	I/O	The GPT3.GTGRA and GPT3.GTGRB input capture input/output compare output/PWM output pins.
	GTETRGO	Input	External trigger input pin for the GPT0 to GPT3
	GTIOC4A, GTIOC4B	I/O	The GPT4.GTGRA and GPT4.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC5A, GTIOC5B	I/O	The GPT5.GTGRA and GPT5.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC6A, GTIOC6B	I/O	The GPT6.GTGRA and GPT6.GTGRB input capture input/output compare output/PWM output pins.
	GTIOC7A, GTIOC7B	I/O	The GPT7.GTGRA and GPT7.GTGRB input capture input/output compare output/PWM output pins.
	GTETRGI	Input	External trigger input pin for the GPT4 to GPT7

Table 1.4 Pin Functions (4/5)

Classifications	Pin Name	I/O	Description
USB 2.0 host/function module	VCC_USB	Input	Power supply pin for USB
	VSS_USB	Input	Ground pin for USB
	USB0_DP	I/O	USB internal transceiver D + input and output pins
	USB0_DM	I/O	USB internal transceiver D - input and output pins
	USB0_EXICEN	Output	Low power control signal for OTG chip
	USB0_VBUSEN	Output	Supply enable signal of VBUS (5 V) to OTG chip
	USB0_ID	Input	Mini AB connector ID input pin for use in OTG operation
	USB0_DPRPD	Output	D+ signal pull-down control pin for use during host operation
	USB0_DRPD	Output	D- signal pull-down control pin for use during host operation
	USB0_DPUPE	Output	D+ signal pull-up control pin for use during function operation
	USB0_VBUS	Input	Pin for monitoring USB cable connection
	USB0_OVRCURA, USB0_OVRCURB	Input	Pin for detecting external over current
CAN module	CRX1	Input	Input pins
	CTX1	Output	Output pins
Serial peripheral interface	RSPCKA, RSPCKB	I/O	Clock input/output pins
	MOSIA, MOSIB	I/O	Inputs or outputs data output from the master
	MISOA, MISOB	I/O	Inputs or outputs data output from the slave
	SSLA0, SSLB0	I/O	Input or output pins for slave selection
	SSLA1 to SSLA3 SSLB1 to SSLB3	Output	Output pins for slave selection
12-bit A/D converter	AN000 to AN007 AN100 to AN103	Input	Input pins for the analog signals to be processed by the A/D converter
	ADTRG0#, ADTRG1#	Input	Input pins for the external trigger signals that start the A/D conversion
	CVREFH	Input	Input pin for the high-level reference voltage to the comparator
	CVREFL	Input	Input pin for the low-level reference voltage to the comparator
10-bit A/D converter	AN0 to AN19	Input	Input pins for the analog signals to be processed by the 10-bit A/D converter
	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 10-bit A/D converter
Analog power supply	AVCC0	—	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	—	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	—	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
	VREFL0	—	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
	AVCC	—	Analog voltage supply pin for the 10-bit A/D converter and the 10-bit D/A converter. Connect this pin to the power supply of the system if the A/D converter and the D/A converter are not to be used.
	AVSS	—	Ground pin for the 10-bit A/D converter and 10-bit D/A converter. Connect this pin to the power-supply ground for the system (0 V).
	VREF	—	Reference-voltage input pin for the 10-bit A/D converter and the 10-bit D/A converter. Connect this pin to the power supply for the system if the A/D converter and the D/A converter are not to be used.

Table 1.6 List of Pins and Pin Functions (120-Pin LQFP) (4/4)

Pin Number 120-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus	Timer (MTU3, GPT, POE3, CAC)	Communications (SClC, SClD, RSPI, RIIC, CAN, USB)	Interrupt	S12ADB, AD, DA
111		P82	WAIT#	MTIC5U	SCK12	IRQ3	
112		P81	A8	MTIC5V	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12		
113		P80	A9	MTIC5W	RXD12/SMISO12/ SSCL12/RXDX12	IRQ5	
114		P12	CS3#		USB0_DPRPD		
115		P11	ALE	MTCLKC		IRQ1-DS	
116		P10		MTCLKD		IRQ0-DS	
117					USB0_DPUPE		
118	VSS_USB						
119					USB0_DM		
120					USB0_DP		

Table 1.8 List of Pins and Pin Functions (100-Pin LQFP) (1/3)

Pin Number 100-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus	Timer (MTU3, GPT, POE3, CAC)	Communications (SCIc, SCId, RSPI, RIIC, CAN)	Interrupt	S12ADB, AD, DA
1		PE5	BCLK			IRQ0	
2	EMLE						
3	VSS						
4		P01	RD#		CTS0#/RTS0#/SS0#		
5	VCL						
6		P00	CS1#	CACREF			
7	MD/FINED						
8		PE4	A10	POE10#/MTCLKC		IRQ1	
9		PE3	A11	POE11#/MTCLKD		IRQ2-DS	
10	RES#						
11	XTAL						
12	VSS						
13	EXTAL						
14	VCC						
15		PE2		POE10#		NMI	
16		PE1	WR0#/WR#		CTS12#/RTS12#/ SS12#/SSLA3/SSLB3		
17		PE0	WR1#/BC1#/ WAIT#		SSLA2/SSLB2/CRX1	IRQ7	
18	TRST#	PD7		GTIOC0A	CTS0#/RTS0#/SS0#/ SSLA1/SSLB1/CTX1		
19	TMS	PD6		GTIOC0B	SSLA0/SSLB0		
20	TDI	PD5		GTIOC1A	RXD1/SMISO1/SSCL1	IRQ6	
21	TCK/FINEC	PD4		GTIOC1B	SCK1		
22	TDO	PD3		GTIOC2A	TXD1/SMOSI1/SSDA1		
23		PD2	CS2#	GTIOC2B	MOSIA/MOSIB		
24		PD1	CS0#	GTIOC3A	MISOA/MISOB		
25		PD0	A12	GTIOC3B	RSPCKA/RSPCKB		
26		PB7	A19		SCK12		
27		PB6	A18		RXD12/SMISO12/ SSCL12/RDX12/ CRX1	IRQ2	
28		PB5	A17		TXD12/SMOSI12/ SSDA12/TDX12/ SIOX12/CTX1		
29	PLLVCC						
30		PB4	A16	POE8#/GTETRG0		IRQ3-DS	
31	PLLVSS						
32		PB3	A15	MTIOC0A/CACREF	SCK0		
33		PB2		MTIOC0B	TXD0/SMOSI0/ SSDA0/SDA0		
34		PB1		MTIOC0C	RXD0/SMISO0/ SSCL0/SCL0	IRQ4	
35		PB0	A14	MTIOC0D	MOSIA/MOSIB		
36		PA5		MTIOC1A	RXD0/SMISO0/ SSCL0/ MISOA/MISOB		ADTRG1#

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).

4. I/O Registers

This section gives information on the on-chip I/O register addresses. The information is given as shown below. Notes on writing to registers are also given at the end.

(1) I/O register addresses (address order)

- Registers are listed from the lower allocation addresses.
- Registers are classified according to module symbols.
- The number of access cycles indicates the number of cycles based on the specified reference clock.
- Among the internal I/O register area, addresses not listed in the list of registers are reserved. Reserved addresses must not be accessed. Do not access these addresses; otherwise, the operation when accessing these bits and subsequent operations cannot be guaranteed.

(2) Notes on writing to I/O registers

When writing to an I/O register, the CPU starts executing the subsequent instruction before completing I/O register write. This may cause the subsequent instruction to be executed before the post-update I/O register value is reflected on the operation.

As described in the following examples, special care is required for the cases in which the subsequent instruction must be executed after the post-update I/O register value is actually reflected.

[Examples of cases requiring special care]

- The subsequent instruction must be executed while an interrupt request is disabled with the IENj bit in IERN of the ICU (interrupt request enable bit) cleared to 0.
- A WAIT instruction is executed immediately after the preprocessing for causing a transition to the low power consumption state.

In the above cases, after writing to an I/O register, wait until the write operation is completed using the following procedure and then execute the subsequent instruction.

- Write to an I/O register.
- Read the value from the I/O register to a general register.
- Execute the operation using the value read.
- Execute the subsequent instruction.

[Instruction examples]

- Byte-size I/O registers

```
MOV.L #SFR_ADDR, R1
MOV.B #SFR_DATA, [R1]
CMP [R1].UB, R1
;; Next process
```

- Word-size I/O registers

```
MOV.L #SFR_ADDR, R1
MOV.W #SFR_DATA, [R1]
CMP [R1].W, R1
;; Next process
```

Table 4.1 List of I/O Registers (Address Order) (18/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK ≥ PCLK	ICLK < PCLK		
0008 90E0h	S12AD	Comparator Operating Mode Selection Register 0	ADCMPPMD0	16	16	2, 3 PCLKB	2 ICLK	S12ADB	
0008 90E2h	S12AD	Comparator Operating-Mode Selection Register 1	ADCMPPMD1	16	16	2, 3 PCLKB	2 ICLK		
0008 90E4h	S12AD	Comparator Filter-Mode Register	ADCMPPNR0	16	16	2, 3 PCLKB	2 ICLK		
0008 90E8h	S12AD	Comparator Detection Flag Register	ADCMPPFR	8	8	2, 3 PCLKB	2 ICLK		
0008 90EAh	S12AD	Comparator Interrupt Selection Register	ADCMPPSEL	16	16	2, 3 PCLKB	2 ICLK		
0008 90FCh	S12AD	A/D Group Scan Priority Control Register	ADGSPMR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9100h	S12AD1	A/D Control Register	ADCSR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9104h	S12AD1	A/D Channel Select Register A	ADANSA	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9108h	S12AD1	A/D-Converted Value Addition Mode Select Register (ADADS)	ADADS	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 910Ch	S12AD1	A/D-Converted Value Addition Count Select Register	ADADC	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 910Eh	S12AD1	A/D Control Extended Register	ADCER	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9110h	S12AD1	A/D Start Trigger Select Register	ADSTRGR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9114h	S12AD1	A/D Channel Select Register B	ADANSB	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9118h	S12AD1	A/D Data-Doubling Register	ADDBLDR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 911Eh	S12AD1	A/D Self-Diagnosis Data Register	ADRD	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9120h	S12AD1	A/D Data Register 0	ADDR0	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9122h	S12AD1	A/D Data Register 1	ADDR1	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9124h	S12AD1	A/D Data Register 2	ADDR2	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9126h	S12AD1	A/D Data Register 3	ADDR3	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9160h	S12AD1	A/D Sampling State Register 0	ADSSTR0	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9166h	S12AD1	A/D Sample and Hold Circuit Control Register	ADSHCR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9173h	S12AD1	A/D Sampling State Register 1	ADSSTR1	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9174h	S12AD1	A/D Sampling State Register 2	ADSSTR2	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9175h	S12AD1	A/D Sampling State Register 3	ADSSTR3	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9180h	S12AD1	A/D Group Scan Priority Control Register	ADGSPCR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9184h	S12AD1	A/D Data-Doubling Register A	ADDBLDRA	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9186h	S12AD1	A/D Data-Doubling Register B	ADDBLDRB	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 918Ah	S12AD1	A/D Programmable Gain Amplifier Register	ADPG	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 91E0h	S12AD1	Comparator Operating Mode Selection Register 0	ADCMPPMD0	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 91E2h	S12AD1	Comparator Operating-Mode Selection Register 1	ADCMPPMD1	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 91E4h	S12AD1	Comparator Filter-Mode Register	ADCMPPNR0	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 91E8h	S12AD1	Comparator Detection Flag Register	ADCMPPFR	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 91EAh	S12AD1	Comparator Interrupt Selection Register	ADCMPPSEL	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 9800h	AD	A/D Control Register	ADCSR	16	16	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.

Table 4.1 List of I/O Registers (Address Order) (25/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK $\geq$ PCLK	ICLK $<$ PCLK		
0008 C14Ch	MPC	P14 Pin Function Control Register	P14PFS	8	8	2, 3 PCLKB	2 ICLK	MPC	Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C150h	MPC	P20 Pin Function Control Register	P20PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C151h	MPC	P21 Pin Function Control Register	P21PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C152h	MPC	P22 Pin Function Control Register	P22PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C153h	MPC	P23 Pin Function Control Register	P23PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C154h	MPC	P24 Pin Function Control Register	P24PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C155h	MPC	P25 Pin Function Control Register	P25PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 112, 100, 64, or 48 pins.
0008 C156h	MPC	P26 Pin Function Control Register	P26PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 112, 100, 64, or 48 pins.
0008 C158h	MPC	P30 Pin Function Control Register	P30PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C159h	MPC	P31 Pin Function Control Register	P31PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 48 pins.
0008 C15Ah	MPC	P32 Pin Function Control Register	P32PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 48 pins.
0008 C15Bh	MPC	P33 Pin Function Control Register	P33PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 48 pins.
0008 C15Ch	MPC	P34 Pin Function Control Register	P34PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C15Dh	MPC	P35 Pin Function Control Register	P35PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C160h	MPC	P40 Pin Function Control Register	P40PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C161h	MPC	P41 Pin Function Control Register	P41PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C162h	MPC	P42 Pin Function Control Register	P42PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C163h	MPC	P43 Pin Function Control Register	P43PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C164h	MPC	P44 Pin Function Control Register	P44PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C165h	MPC	P45 Pin Function Control Register	P45PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 48 pins.
0008 C166h	MPC	P46 Pin Function Control Register	P46PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 48 pins.
0008 C167h	MPC	P47 Pin Function Control Register	P47PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C168h	MPC	P50 Pin Function Control Register	P50PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C169h	MPC	P51 Pin Function Control Register	P51PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C16Ah	MPC	P52 Pin Function Control Register	P52PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C16Bh	MPC	P53 Pin Function Control Register	P53PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C16Ch	MPC	P54 Pin Function Control Register	P54PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C16Dh	MPC	P55 Pin Function Control Register	P55PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C16Eh	MPC	P56 Pin Function Control Register	P56PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C16Fh	MPC	P57 Pin Function Control Register	P57PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C170h	MPC	P60 Pin Function Control Register	P60PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C171h	MPC	P61 Pin Function Control Register	P61PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C172h	MPC	P62 Pin Function Control Register	P62PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C173h	MPC	P63 Pin Function Control Register	P63PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.

Table 4.1 List of I/O Registers (Address Order) (27/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK ≥ PCLK	ICLK < PCLK		
0008 C1A3h	MPC	PC3 Pin Function Control Register	PC3PFS	8	8	2, 3 PCLKB	2 ICLK	MPC	Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C1A4h	MPC	PC4 Pin Function Control Register	PC4PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C1A5h	MPC	PC5 Pin Function Control Register	PC5PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 120, 112, 100, 64, or 48 pins.
0008 C1A8h	MPC	PD0 Pin Function Control Register	PD0PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1A9h	MPC	PD1 Pin Function Control Register	PD1PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1AAh	MPC	PD2 Pin Function Control Register	PD2PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1ABh	MPC	PD3 Pin Function Control Register	PD3PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1ACh	MPC	PD4 Pin Function Control Register	PD4PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1ADh	MPC	PD5 Pin Function Control Register	PD5PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1AEh	MPC	PD6 Pin Function Control Register	PD6PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1AFh	MPC	PD7 Pin Function Control Register	PD7PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1B0h	MPC	PE0 Pin Function Control Register	PE0PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1B1h	MPC	PE1 Pin Function Control Register	PE1PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1B2h	MPC	PE2 Pin Function Control Register	PE2PFS	8	8	2, 3 PCLKB	2 ICLK		
0008 C1B3h	MPC	PE3 Pin Function Control Register	PE3PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1B4h	MPC	PE4 Pin Function Control Register	PE4PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1B5h	MPC	PE5 Pin Function Control Register	PE5PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 64 or 48 pins.
0008 C1BAh	MPC	PF2 Pin Function Control Register	PF2PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1B8h	MPC	PF3 Pin Function Control Register	PF3PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C0h	MPC	PG0 Pin Function Control Register	PG0PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C1h	MPC	PG1 Pin Function Control Register	PG1PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C2h	MPC	PG2 Pin Function Control Register	PG2PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C3h	MPC	PG3 Pin Function Control Register	PG3PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C4h	MPC	PG4 Pin Function Control Register	PG4PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C5h	MPC	PG5 Pin Function Control Register	PG5PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 100, 64, or 48 pins.
0008 C1C6h	MPC	PG6 Pin Function Control Register	PG6PFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 112, 100, 64, or 48 pins.
0008 C1D0h	MPC	USB0_DPUPE Pin Function Control Register	UDPUPEPFS	8	8	2, 3 PCLKB	2 ICLK		Not present in versions with 112, 100, 64, or 48 pins.
0008 C280h	SYSTEM	Deep Standby Control Register	DPSBYCR	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption	
0008 C282h	SYSTEM	Deep Standby Interrupt Enable Register 0	DPSIER0	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C284h	SYSTEM	Deep Standby Interrupt Enable Register 2	DPSIER2	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C286h	SYSTEM	Deep Standby Interrupt Flag Register 0	DPSIFR0	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C288h	SYSTEM	Deep Standby Interrupt Flag Register 2	DPSIFR2	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C28Ah	SYSTEM	Deep Standby Interrupt Edge Register 0	DPSIEGR0	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C28Ch	SYSTEM	Deep Standby Interrupt Edge Register 2	DPSIEGR2	8	8	4, 5 PCLKB	2, 3 ICLK		
0008 C290h	SYSTEM	Reset Status Register 0	RSTSR0	8	8	4, 5 PCLKB	2, 3 ICLK	Resets	
0008 C291h	SYSTEM	Reset Status Register 1	RSTSR1	8	8	4, 5 PCLKB	2, 3 ICLK		

Table 4.1 List of I/O Registers (Address Order) (35/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK ≥ PCLK	ICLK < PCLK		
000C 1308h	MTU0	Timer General Register A	TGRA	16	16, 32	4, 5 PCLKA	2, 3 ICLK	MTU3	
000C 130Ah	MTU0	Timer General Register B	TGRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 130Ch	MTU0	Timer General Register C	TGRC	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 130Eh	MTU0	Timer General Register D	TGRD	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1320h	MTU0	Timer General Register E	TGRE	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1322h	MTU0	Timer General Register F	TGRF	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1324h	MTU0	Timer Interrupt Enable Register 2	TIER2	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1325h	MTU0	Timer Status Register 2	TSR2	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1326h	MTU0	Timer Buffer Operation Transfer Mode Register	TBTM	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1380h	MTU1	Timer Control Register	TCR	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1381h	MTU1	Timer Mode Register 1	TMDR1	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1382h	MTU1	Timer I/O Control Register	TIOR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1384h	MTU1	Timer Interrupt Enable Register	TIER	8	8, 16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1385h	MTU1	Timer Status Register	TSR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1386h	MTU1	Timer Counter	TCNT	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1388h	MTU1	Timer General Register A	TGRA	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 138Ah	MTU1	Timer General Register B	TGRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1390h	MTU1	Timer Input Capture Control Register	TICCR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1400h	MTU2	Timer Control Register	TCR	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1401h	MTU2	Timer Mode Register 1	TMDR1	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1402h	MTU2	Timer I/O Control Register	TIOR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1404h	MTU2	Timer Interrupt Enable Register	TIER	8	8, 16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1405h	MTU2	Timer Status Register	TSR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1406h	MTU2	Timer Counter	TCNT	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1408h	MTU2	Timer General Register A	TGRA	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 140Ah	MTU2	Timer General Register B	TGRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A00h	MTU6	Timer Control Register	TCR	8	8, 16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A01h	MTU7	Timer Control Register	TCR	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A02h	MTU6	Timer Mode Register 1	TMDR1	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1A03h	MTU7	Timer Mode Register 1	TMDR1	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A04h	MTU6	Timer I/O Control Register H	TIORH	8	8, 16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A05h	MTU6	Timer I/O Control Register L	TIORL	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A06h	MTU7	Timer I/O Control Register H	TIORH	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1A07h	MTU7	Timer I/O Control Register L	TIORL	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A08h	MTU6	Timer Interrupt Enable Register	TIER	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1A09h	MTU7	Timer Interrupt Enable Register	TIER	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A0Ah	MTU	Timer Output Master Enable Register B	TOERB	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A0Eh	MTU	Timer Output Control Register 1B	TOCR1B	8	8, 16	4, 5 PCLKA	2, 3 ICLK		
000C 1A0Fh	MTU	Timer Output Control Register 2B	TOCR2B	8	8	4, 5 PCLKA	2, 3 ICLK		
000C 1A10h	MTU6	Timer Counter	TCNT	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A12h	MTU7	Timer Counter	TCNT	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A14h	MTU	Timer Cycle Data Register B	TCDRB	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A16h	MTU	Timer Dead Time Data Register B	TDDRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A18h	MTU6	Timer General Register A	TGRA	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A1Ah	MTU6	Timer General Register B	TGRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A1Ch	MTU7	Timer General Register A	TGRA	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A1Eh	MTU7	Timer General Register B	TGRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A20h	MTU	Timer Subcounter B	TCNTSB	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A22h	MTU	Timer Cycle Buffer Register B	TCBRB	16	16	4, 5 PCLKA	2, 3 ICLK		
000C 1A24h	MTU6	Timer General Register C	TGRC	16	16, 32	4, 5 PCLKA	2, 3 ICLK		
000C 1A26h	MTU6	Timer General Register D	TGRD	16	16	4, 5 PCLKA	2, 3 ICLK		

Table 4.1 List of I/O Registers (Address Order) (39/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK $\geq$ PCLK	ICLK $<$ PCLK		
000C 21A6h	GPT1	A/D Converter Start Request Timing Buffer Register A	GTADTBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK	GPT	
000C 21A8h	GPT1	A/D Converter Start Request Timing Double-Buffer Register A	GTADTDBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21ACh	GPT1	A/D Converter Start Request Timing Register B	GTADTRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21AEh	GPT1	A/D Converter Start Request Timing Buffer Register B	GTADTBRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21B0h	GPT1	A/D Converter Start Request Timing Double-Buffer Register B	GTADTDBRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21B4h	GPT1	General PWM Timer Output Negate Control Register	GTONCR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21B6h	GPT1	General PWM Timer Dead Time Control Register	GTDTCR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21B8h	GPT1	General PWM Timer Dead Time Value Register U	GTDVU	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21BAh	GPT1	General PWM Timer Dead Time Value Register D	GTDVD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21BCh	GPT1	General PWM Timer Dead Time Buffer Register U	GTDBU	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21BEh	GPT1	General PWM Timer Dead Time Buffer Register D	GTDBD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21C0h	GPT1	General PWM Timer Output Protection Function Status Register	GTSOS	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 21C2h	GPT1	General PWM Timer Output Protection Function Temporary Release Register	GTSOTR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2200h	GPT2	General PWM Timer I/O Control Register	GTIOR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2202h	GPT2	General PWM Timer Interrupt Output Setting Register	GTINTAD	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2204h	GPT2	General PWM Timer Control Register	GTCR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2206h	GPT2	General PWM Timer Buffer Enable Register	GTBER	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2208h	GPT2	General PWM Timer Count Direction Register	GTUDC	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 220Ah	GPT2	General PWM Timer Interrupt and A/D Converter Start Request Skipping Setting Register	GTITC	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 220Ch	GPT2	General PWM Timer Status Register	GTST	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 220Eh	GPT2	General PWM Timer Counter	GTCNT	16	16	2 to 5 PCLKA	2, 3 ICLK		
000C 2210h	GPT2	General PWM Timer Compare Capture Register A	GTCCRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2212h	GPT2	General PWM Timer Compare Capture Register B	GTCCRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2214h	GPT2	General PWM Timer Compare Capture Register C	GTCCRC	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2216h	GPT2	General PWM Timer Compare Capture Register D	GTCCRD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2218h	GPT2	General PWM Timer Compare Capture Register E	GTCCRE	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 221Ah	GPT2	General PWM Timer Compare Capture Register F	GTCCRF	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 221Ch	GPT2	General PWM Timer Cycle Setting Register	GTPR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 221Eh	GPT2	General PWM Timer Cycle Setting Buffer Register	GTPBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2220h	GPT2	General PWM Timer Cycle Setting Double-Buffer Register	GTPDBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2224h	GPT2	A/D Converter Start Request Timing Register A	GTADTRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2226h	GPT2	A/D Converter Start Request Timing Buffer Register A	GTADTBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2228h	GPT2	A/D Converter Start Request Timing Double-Buffer Register A	GTADTDBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 222Ch	GPT2	A/D Converter Start Request Timing Register B	GTADTRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 222Eh	GPT2	A/D Converter Start Request Timing Buffer Register B	GTADTBRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		

Table 4.1 List of I/O Registers (Address Order) (41/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK ≥ PCLK	ICLK < PCLK		
000C 22BAh	GPT3	General PWM Timer Dead Time Value Register D	GTDVD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK	GPT	
000C 22BCh	GPT3	General PWM Timer Dead Time Buffer Register U	GTDBU	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 22BEh	GPT3	General PWM Timer Dead Time Buffer Register D	GTDBD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 22C0h	GPT3	General PWM Timer Output Protection Function Status Register	GTSOS	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 22C2h	GPT3	General PWM Timer Output Protection Function Temporary Release Register	GTSOTR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		
000C 2318h	GPT0	GTIOCA Rising Output Delay Register	GTDLYRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 231Ah	GPT0	GTIOCB Rising Output Delay Register	GTDLYRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 231Ch	GPT1	GTIOCA Rising Output Delay Register	GTDLYRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 231Eh	GPT1	GTIOCB Rising Output Delay Register	GTDLYRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2320h	GPT2	GTIOCA Rising Output Delay Register	GTDLYRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2322h	GPT2	GTIOCB Rising Output Delay Register	GTDLYRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2324h	GPT3	GTIOCA Rising Output Delay Register	GTDLYRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2326h	GPT3	GTIOCB Rising Output Delay Register	GTDLYRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2328h	GPT0	GTIOCA Falling Output Delay Register	GTDLYFA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 232Ah	GPT0	GTIOCB Falling Output Delay Register	GTDLYFB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 232Ch	GPT1	GTIOCA Falling Output Delay Register	GTDLYFA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 232Eh	GPT1	GTIOCB Falling Output Delay Register	GTDLYFB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2330h	GPT2	GTIOCA Falling Output Delay Register	GTDLYFA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2332h	GPT2	GTIOCB Falling Output Delay Register	GTDLYFB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2334h	GPT3	GTIOCA Falling Output Delay Register	GTDLYFA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2336h	GPT3	GTIOCB Falling Output Delay Register	GTDLYFB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2800h	GPTB	General PWM Timer Software Start Register	GTSTR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2804h	GPTB	General PWM Timer Hardware Source Start Control Register	GTHSCR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2806h	GPTB	General PWM Timer Hardware Source Clear Control Register	GTHCCR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2808h	GPTB	General PWM Timer Hardware Start Source Select Register	GTHSSR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 280Ah	GPTB	General PWM Timer Hardware Stop/Clear Source Select Register	GTHPSR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 280Ch	GPTB	General PWM Timer Write-Protection Register	GTWP	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 280Eh	GPTB	General PWM Timer Sync Register	GTSYNC	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2810h	GPTB	General PWM Timer External Trigger Input Interrupt Register	GTETINT	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2814h	GPTB	General PWM Timer Buffer Operation Disable Register	GTBDR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2818h	GPTB	General PWM Timer Start Write-Protection Register	GTSWP	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2880h	GPTB	LOCO Count Control Register	LCCR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.
000C 2882h	GPTB	LOCO Count Status Register	LCST	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64, or 48 pins.

Table 4.1 List of I/O Registers (Address Order) (44/48)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Module Name	Remarks
						ICLK $\geq$ PCLK	ICLK $<$ PCLK		
000C 299Eh	GPT5	General PWM Timer Cycle Setting Buffer Register	GTPBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK	GPT	Not present in versions with 64 or 48 pins.
000C 29A0h	GPT5	General PWM Timer Cycle Setting Double-Buffer Register	GTPDBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29A4h	GPT5	A/D Converter Start Request Timing Register A	GTADTRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29A6h	GPT5	A/D Converter Start Request Timing Buffer Register A	GTADTBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29A8h	GPT5	A/D Converter Start Request Timing Double-Buffer Register A	GTADTDBRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29ACh	GPT5	A/D Converter Start Request Timing Register B	GTADTRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29AEh	GPT5	A/D Converter Start Request Timing Buffer Register B	GTADTBRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29B0h	GPT5	A/D Converter Start Request Timing Double-Buffer Register B	GTADTDBRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29B4h	GPT5	General PWM Timer Output Negate Control Register	GTONCR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29B6h	GPT5	General PWM Timer Dead Time Control Register	GTDTCR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29B8h	GPT5	General PWM Timer Dead Time Value Register U	GTDVU	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29BAh	GPT5	General PWM Timer Dead Time Value Register D	GTDVD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29BCh	GPT5	General PWM Timer Dead Time Buffer Register U	GTDBU	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29BEh	GPT5	General PWM Timer Dead Time Buffer Register D	GTDBD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29C0h	GPT5	General PWM Timer Output Protection Function Status Register	GTSOS	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 29C2h	GPT5	General PWM Timer Output Protection Function Temporary Release Register	GTSOTR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A00h	GPT6	General PWM Timer I/O Control Register	GTIOR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A02h	GPT6	General PWM Timer Interrupt Output Setting Register	GTINTAD	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A04h	GPT6	General PWM Timer Control Register	GTCR	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A06h	GPT6	General PWM Timer Buffer Enable Register	GTBER	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A08h	GPT6	General PWM Timer Count Direction Register	GTUDC	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A0Ah	GPT6	General PWM Timer Interrupt, A/D Converter Start Request Skipping Setting Register	GTITC	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A0Ch	GPT6	General PWM Timer Status Register	GTST	16	8, 16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A0Eh	GPT6	General PWM Timer Counter	GTCNT	16	16	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A10h	GPT6	General PWM Timer Compare Capture Register A	GTCCRA	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A12h	GPT6	General PWM Timer Compare Capture Register B	GTCCRB	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A14h	GPT6	General PWM Timer Compare Capture Register C	GTCCRC	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A16h	GPT6	General PWM Timer Compare Capture Register D	GTCCRD	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A18h	GPT6	General PWM Timer Compare Capture Register E	GTCCRE	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A1Ah	GPT6	General PWM Timer Compare Capture Register F	GTCCRF	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A1Ch	GPT6	General PWM Timer Cycle Setting Register	GTPR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A1Eh	GPT6	General PWM Timer Cycle Setting Buffer Register	GTPBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.
000C 2A20h	GPT6	General PWM Timer Cycle Setting Double-Buffer Register	GTPDBR	16	16, 32	2 to 5 PCLKA	2, 3 ICLK		Not present in versions with 64 or 48 pins.

Table 5.4 DC Characteristics (3)

Note: Common standard values for conditions not given in the table are listed as "Condition 1" to "Condition 3" below.

Condition 1: VCC = PLLVCC = VCC_USB = 2.7 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 3.0 to 3.6 V, VREFH0 = 3.0 V to AVCC0

Condition 2: VCC = PLLVCC = VCC_USB = 2.7 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 4.0 to 5.5 V, VREFH0 = 4.0 V to AVCC0

Condition 3: VCC = PLLVCC = 4.0 to 5.5 V, VCC_USB = 3.0 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 4.0 to 5.5 V, VREFH0 = 4.0 V to AVCC0

The following relation applies when the USB is in use under condition 1 or condition 2: Vcc = PLLVcc = Vcc_USB = 3.0 to 3.6 V.

T_a = T_{opr}, T_a is common to conditions 1 to 3.

Item			Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Supply current *1	During operation	Max. *2	I _{CC} *3	—	—	70	mA	ICLK = 100 MHz PCLKA = 100 MHz PCLKB = 50 MHz PCLKC = 100 MHz PCLKD = 50 MHz FCLK = 50 MHz
		Normal *4		—	40	—		
		Increased by BGO operation *5		—	15	—		
	Sleep mode				40	55		
	All-module-clock-stop mode *6				20	30		
	During standby	Software standby mode		—	0.10	3	mA	
		Deep software standby mode		—	20	60	μA	
	Analog power supply current	During 12-bit A/D conversion (per unit)		AI _{CC0}	—	1.5	4.2	mA
Programmable gain amplifier (per channel)		—	1		1.5	mA		
Window comparator (per channel)		—	0.5		0.7	mA		
Waiting for 12-bit A/D conversion (all units)		—	0.1		8	μA		
During 10-bit A/D conversion (per channel)		AI _{CC}	—	0.9	1.4	mA		
During D/A conversion (per unit)				0.1	4	μA		
Waiting for 10-bit A/D, D/A conversion (all units)			—	0.1	4	μA		
Reference power supply current	During 12-bit A/D conversion (per unit)		AI _{REFH0}	—	1.6	2.5	mA	
	Waiting for 12-bit A/D conversion (all units)			—	0.1	1.5	μA	
	During 10-bit A/D conversion (per channel)		AI _{REF}	—	0.2	0.3	mA	
	During D/A conversion (per unit)				1	1.5	mA	
	Waiting for 10-bit A/D, D/A conversion (all units)			—	0.1	1.2	μA	
VCC rising gradient			SV _{CC}	—	—	20	ms/ V	

Note 1. Supply current values are with all output pins unloaded.

Note 2. Measured with clocks supplied to the peripheral functions. This does not include the BGO operation.

Note 3. I_{CC} depends on f (ICLK) as follows. (ICLK: PCLK = 8:4)

I_{CC} max = 0.6 × f + 10 (max)

I_{CC} typ = 0.3 × f + 10 (normal)

I_{CC} max = 0.45 × f + 10 (sleep mode)

Note 4. Measured with clocks not supplied to the peripheral functions. This does not include the BGO operation.

Note 5. Incremented if data is written to or erased from the on-chip ROM or on-chip data-flash memory for data storage during the program execution.

Note 6. The values are for reference.

Table 5.6 Permissible Power Consumption (G version product only)

Note: Common standard values for conditions not given in the table are listed as "Condition 1" to "Condition 3" below.

Condition 1: VCC = PLLVCC = 2.7 to 3.6 V, VSS = PLLVSS = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = 3.0 to 3.6V, VREFH0 = 3.0 V to AVCC0, VREF = 3.0 V to AVCC

Condition 2: VCC = PLLVCC = 2.7 to 3.6 V, VSS = PLLVSS = AVSS0 = AVSS = VREFL0 = 0V
AVCC0 = AVCC = 4.0 to 5.5 V, VREFH0 = 4.0 V to AVCC0, VREF = 4.0 V to AVCC

Condition 3: VCC = PLLVCC = 4.0 to 5.5 V, VSS = PLLVSS = AVSS0 = AVSS = VREFL0 = 0V
AVCC0 = AVCC = 4.0 to 5.5V, VREFH0 = 4.0 V to AVCC0, VREF = 4.0 V to AVCC

Ta = -40 to +105°C. Ta is common to conditions 1 to 3.

Item	Symbol	Typ.	Max.	Unit	Test Conditions
Total permissible power consumption*1	Pd	—	345	mW	85°C < Ta ≤ 105°C

Note: • Please contact Renesas Electronics sales office for derating of operation under Ta = +85°C to +105°C. Derating is the systematic reduction of load for the sake of improved reliability.

Note 1. The total power consumption of the whole chip including output current.

5.5 A/D Conversion Characteristics

Table 5.19 10-Bit A/D Conversion Characteristics (1)

Note: Common standard values for conditions not given in the table are listed as “Condition 1” to “Condition 3” below.

Condition 1: VCC = PLLVCC = VCC_USB = 2.7 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 3.0 to 3.6 V, VREFH0 = 3.0 V to AVCC0

Condition 2: VCC = PLLVCC = VCC_USB = 2.7 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 4.0 to 5.5 V, VREFH0 = 4.0 V to AVCC0

Condition 3: VCC = PLLVCC = 4.0 to 5.5 V, VCC_USB = 3.0 to 3.6 V, VSS = PLLVSS = VSS_USB = AVSS0 = AVSS = VREFL0 = 0 V
AVCC0 = AVCC = VREF = 4.0 to 5.5 V, VREFH0 = 4.0 V to AVCC0

T_a = T_{opr}. T_a is common to conditions 1 to 3.

Item			Min.	Typ.	Max.	Unit	Test Conditions
Resolution			10	10	10	Bit	
Conversion time*1 (Operation at ADCLK = 100 MHz)	With 0.1-μF external capacitor	AN0 to AN7	0.5	—	—	μs	Sampling in 25 states
		Other channels	0.75	—	—	μs	Sampling in 50 states
	Without 0.1-μF external capacitor Permissible signal source impedance (max.) = 1 kΩ	AN0 to AN7	0.6	—	—	μs	Sampling in 35 states
		Other channels	0.75	—	—	μs	Sampling in 50 states
Analog input capacitance			—	—	6	pF	
Integral nonlinearity error			—	—	±3.0	LSB	
Offset error			—	—	±2.0	LSB	
Full-scale error			—	—	±3.0	LSB	
Quantization error			—	±0.5	—	LSB	
Absolute accuracy			—	—	±6.0	LSB	

Note 1. The conversion time includes the sampling time and the comparison time. As the test conditions, the number of sampling states is indicated.

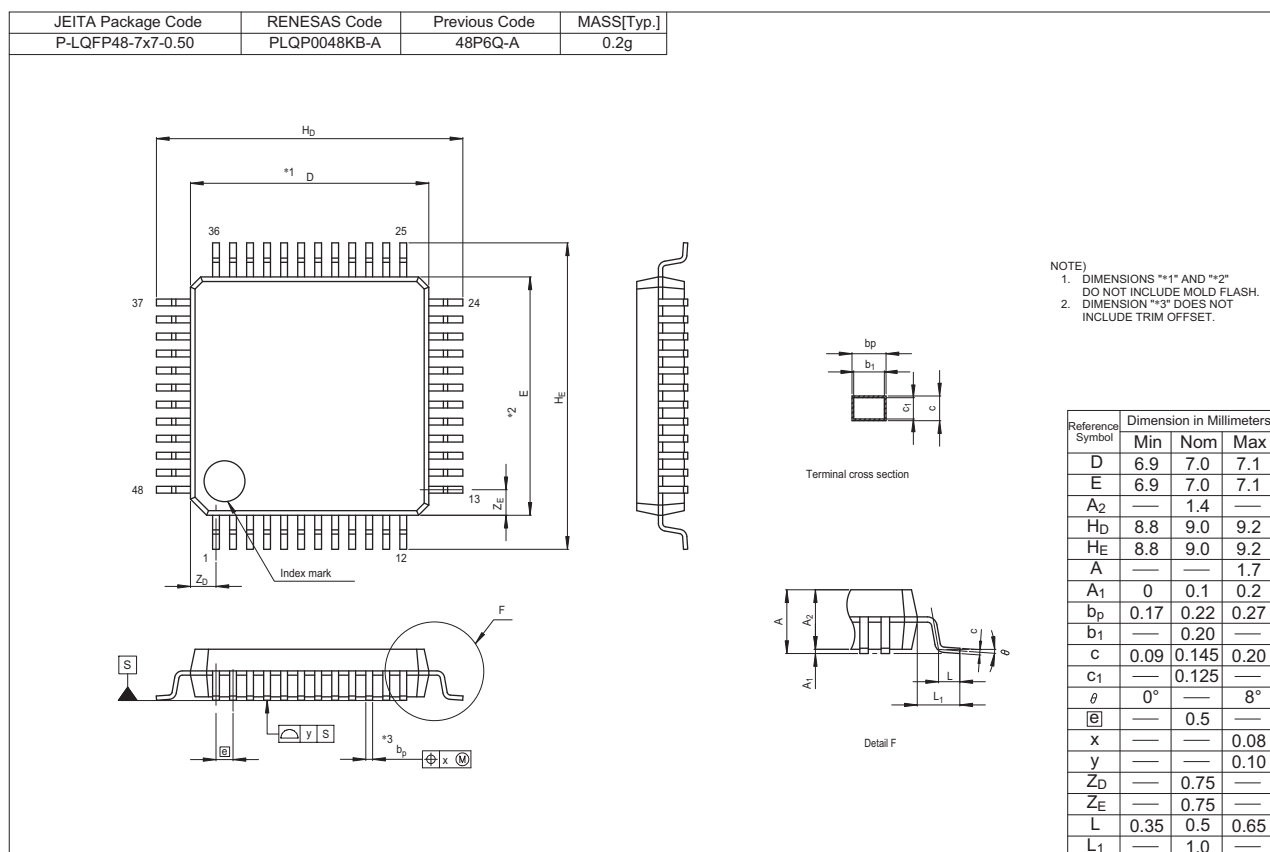


Figure F 48-Pin LQFP (PLQP0048KB-A)