



Welcome to [E-XFL.COM](#)

What is "[Embedded - Microcontrollers](#)"?

"[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	Discontinued at Digi-Key
Core Processor	RXv2
Core Size	32-Bit Single-Core
Speed	120MHz
Connectivity	CANbus, EBI/EMI, Ethernet, I ² C, LINbus, MMC/SD, SCI, SPI, SSI, UART/USART, USB
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	127
Program Memory Size	4MB (4M x 8)
Program Memory Type	FLASH
EEPROM Size	64K x 8
RAM Size	552K x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 3.6V
Data Converters	A/D 29x12b; D/A 2x12b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	176-LQFP
Supplier Device Package	176-LFQFP (24x24)
Purchase URL	https://www.e-xfl.com/product-detail/renesas-electronics-america/r5f564mlgdfc-31

Table 1.4 Pin Functions (6/8)

Classifications	Pin Name	I/O	Description
USB 2.0 host/function module	VCC_USB, VCC_USBA	Input	Power supply pins
	VSS_USB, VSS1_USBA, VSS2_USBA	Input	Ground pins
	AVCC_USBA	Input	USBA analog power supply pin
	AVSS_USBA	Input	USBA analog ground pin. Short this pin with the PVSS_USBA pin.
	PVSS_USBA	Input	USBA PLL circuit ground pin. Short this pin with the AVSS_USBA pin.
	USBA_RREF	I/O	USBA reference current supply pin. Connect 2.2 k Ω ($\pm 1\%$) to the AVSS_USBA pin.
	USB0_DP, USBA_DP	I/O	Input or output USB transceiver D+ data.
	USB0_DM, USBA_DM	I/O	Input or output USB transceiver D- data.
	USB0_EXICEN, USBA_EXICEN	Output	Connect to the OTG power IC.
	USB0_ID, USBA_ID	Input	Connect to the OTG power IC.
	USB0_VBUSEN, USBA_VBUSEN	Output	USB VBUS power enable pins
	USB0_OVRCURA, USB0_OVRCURB, USBA_OVRCURA, USBA_OVRCURB	Input	USB overcurrent pins
	USB0_VBUS, USBA_VBUS	Input	USB cable connection/disconnection detection input pins
CAN module	CRX0, CRX1-DS, CRX2	Input	Input pins
	CTX0 to CTX2	Output	Output pins
Serial peripheral interface	RSPCKA-A/RSPCKA-B	I/O	Clock input/output pin
	MOSIA-A/MOSIA-B	I/O	Inputs or outputs data output from the master
	MISOA-A/MISOA-B	I/O	Inputs or outputs data output from the slave
	SSLA0-A/SSLA0-B	I/O	Input or output pin for slave selection
	SSLA1-A/SSLA1-B to SSLA3-A/SSLA3-B	Output	Output pin for slave selection
Quad serial peripheral interface	QSPCLK-A/-B	Output	QSPI clock output pin
	QSSL-A/-B	Output	QSPI slave output pin
	QMO-A/-B, QIO0-A/-B	I/O	Master transmit data/data 0
	QMI-A/-B, QIO1-A/-B	I/O	Master input data/data 1
	QIO2-A/-B, QIO3-A/-B	I/O	Data 2, data 3
Serial sound interface	SSISCK0, SSISCK1	I/O	SSI serial bit clock pins
	SSIWS0, SSIWS1	I/O	Word select pins
	SSITXD0, SSITXD1	Output	Serial data output pins
	SSIRXD0, SSIRXD1	Input	Serial data input pins
	SSIDATA0, SSIDATA1	I/O	Serial data input/output pins
	AUDIO_MCLK	Input	Master clock pin for audio

Table 1.4 Pin Functions (8/8)

Classifications	Pin Name	I/O	Description
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 pin)
	P40 to P47	I/O	8-bit input/output pins
	P50 to P56	I/O	7-bit input/output pins (176-pin devices have only P50 to P53)
	P60 to P67	I/O	8-bit input/output pins
	P70 to P77	I/O	8-bit input/output pins
	P80 to P83, P86, P87	I/O	6-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

Note: Note the following regarding pin names. For details, see section 1.5, Pin Assignments.

- We recommend using pins that have a letter ("-A", "-B", etc.) to indicate group membership appended to their names as groups. For the RSPI, QSPI, SDHI, and MMC interfaces, the AC portion of the electrical characteristics is measured for each group.
- Pins that have "-DS" appended to their names can be used as triggers for release from deep software standby.
- RIIC pin functions that have [FM+] appended to their names support fast-mode plus.

Table 1.5 List of Pin and Pin Functions (177-Pin TFLGA, 176-Pin LFBGA) (3/7)

Pin Number	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer	Communication	Memory Interface Camera Interface	Interrupt	S12ADC, R12DA
177-Pin TFLGA 176-Pin LFBGA				(MTU, GPT, TPU, TMR, PPG, RTC, CMTW, POE, CAC)	(ETHERC, SCiG, SCIh, RSPI, RIIC, CAN, USB, SSI)	(QSPI, SDHI, MMCIF, PDC)		
E14	TRDATA1	PG3	D27		ET1_ETXD0/ RMII1_TXD0			
E15		P67	CS7#/DQM1	MTIOC7C/ GTIOC1B-C	CRX2		IRQ15	
F1	VBATT							
F2	VCL							
F3		PJ3	EDACK1	MTIOC3C	ET0_EXOUT/ CTS6#/RTS6#/ CTS0#/RTS0#/ SS6#/SS0#			
F4	BSCANP							
F12		P66	CS6#/DQM0	MTIOC7D/ GTIOC2B-C	CTX2			
F13	TRSYNC	PG4	D28		ET1_ETXD1/ RMII1_TXD1			
F14		PA0	A0/BC0#/ DQM2	MTIOC4A/MTIOC6D/ GTIOC0B-C/TIOCA0/ CACREF/PO16	SSLA1-B/ ET0_TX_EN/ RMII0_TXD_EN			
F15	VSS							
G1	XCIN							
G2	XCOUT							
G3	MD/FINED							
G4	TRST#	PF4						
G12	TRCLK	PG5	D29		ET1_ETXD2			
G13	TRDATA2	PG6	D30		ET1_ETXD3			
G14		PA1	A1/DQM3	MTIOC0B/MTCLKC/ MTIOC7B/ GTIOC2A-C/TIOCB0/ PO17	SCK5/SSLA2-B/ ET0_WOL		IRQ11	
G15	VCC							
H1	XTAL	P37						
H2	VSS							
H3	RES#							
H4	UPSEL	P35					NMI	
H12		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/ SSDA5/SSLA0-B/ ET0_MDC		IRQ5-DS	
H13		PA3	A3	MTIOC0D/MTCLKD/ TIOC0D/TCLKB/PO19	RXD5/SMISO5/ SSCL5/ ET0_MDIO		IRQ6-DS	
H14		PA2	A2	MTIOC7A/ GTIOC1A-C/PO18	RXD5/SMISO5/ SSCL5/SSLA3-B			
H15	TRDATA3	PG7	D31		ET1_TX_ER			
J1	EXTAL	P36						
J2	VCC							
J3		P34		MTIOC0A/TMCI3/ PO12/POE10#	SCK6/SCK0/ ET0_LINKSTA		IRQ4	
J4	TMS	PF3						
J12		PA5	A5	MTIOC6B/ GTIOC0A-C/TIOCB1/ PO21	RSPCKA-B/ ET0_LINKSTA			
J13	VSS							
J14		PA7	A7	TIOCB2/PO23	MISOA-B/ ET0_WOL			

Table 1.6 List of Pin and Pin Functions (176-Pin LFQFP) (5/7)

Pin Number	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, GPT, TPU, TMR, PPG, RTC, CMTW, POE, CAC)	Communication (ETHERC, SCIG, SCIh, RSPI, RIIC, CAN, USB, SSI)	Memory Interface Camera Interface (QSPI, SDHI, MMCIF, PDC)	Interrupt	S12ADC, R12DA
111	TRDATA3	PG7	D31		ET1_TX_ER			
112		PA2	A2	MTIOC7A/ GTIOC1A-C/PO18	RXD5/SMISO5/ SSCL5/SSLA3-B			
113	TRDATA2	PG6	D30		ET1_ETXD3			
114		PA1	A1/DQM3	MTIOC0B/MTCLKC/ MTIOC7B/ GTIOC2A-C/TIOC0B/ PO17	SCK5/SSLA2-B/ ET0_WOL		IRQ11	
115	VCC							
116	TRCLK	PG5	D29		ET1_ETXD2			
117	VSS							
118		PA0	A0/BC0#/ DQM2	MTIOC4A/MTIOC6D/ GTIOC0B-C/TIOCA0/ CACREF/PO16	SSLA1-B/ ET0_TX_EN/ RMII0_TXD_EN			
119	TRSYNC	PG4	D28		ET1_ETXD1/ RMII1_TXD1			
120		P67	CS7#/DQM1	MTIOC7C/ GTIOC1B-C	CRX2		IRQ15	
121	TRDATA1	PG3	D27		ET1_ETXD0/ RMII1_TXD0			
122		P66	CS6#/DQM0	MTIOC7D/ GTIOC2B-C	CTX2			
123	TRDATA0	PG2	D26		ET1_TX_CLK			
124		P65	CS5#/CKE					
125		PE7	D15[A15/D15]	MTIOC6A/ GTIOC3A-E/TOC1		MMC_RES#-B/ SDHI_WP-B	IRQ7	AN105
126		PE6	D14[A14/D14]	MTIOC6C/ GTIOC3B-E/TIC1		MMC_CD-B/ SDHI_CD-B	IRQ6	AN104
127	VCC							
128		P70	SDCLK					
129	VSS							
130		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ GTIOC0A-A	ET0_RX_CLK/ REF50CK0		IRQ5	AN103
131		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ GTIOC1A-A/PO28	ET0_ERXD2			AN102
132		PE3	D11[A11/D11]	MTIOC4B/ GTIOC2A-A/PO26/ POE8#/TOC3	CTS12#/RTS12#/ SS12#/ ET0_ERXD3	MMC_D7-B		AN101
133		PE2	D10[A10/D10]	MTIOC4A/ GTIOC0B-A/PO23/ TIC3	RXD12/SMISO12/ SSCL12/ RXDX12	MMC_D6-B	IRQ7-DS	AN100
134		PE1	D9[A9/D9]	MTIOC4C/MTIOC3B/ GTIOC1B-A/PO18	TXD12/SMOSI12/ SSDA12/TXDX12/ SIOX12	MMC_D5-B		ANEX1
135		PE0	D8[A8/D8]	MTIOC3D/ GTIOC2B-A	SCK12	MMC_D4-B		ANEX0
136		P64	CS4#/WE#					
137		P63	CS3#/CAS#					
138		P62	CS2#/RAS#					
139		P61	CS1#/SDCS#					
140	VSS							
141		P60	CS0#		ET1_TX_EN/ RMII1_TXD_EN			
142	VCC							

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

Pin Number	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, GPT, TPU, TMR, PPG, RTC, CMTW, POE, CAC)	Communication (ETHERC, SClg, SCIh, RSPI, RIIC, CAN, USB, SSI)	Memory Interface Camera Interface (QSPI, SDHI, MMCIF, PDC)	Interrupt	S12ADC, R12DA
C8		PD5	D5[A5/D5]	MTIC5W/MTIOC8C/ POE10#		MMC_CLK-B/ SDHI_CLK-B/ QSPCLK-B	IRQ5	AN113
C9		PE5	D13[A13/ D13]	MTIOC4C/MTIOC2B/ GTIOC0A-A	ET0_RX_CLK/ REF50CK0		IRQ5	AN103
C10		PE4	D12[A12/ D12]	MTIOC4D/MTIOC1A/ GTIOC1A-A/PO28	ET0_ERXD2			AN102
D1	XCIN							
D2	XCOU							
D3	MD/FINED							
D4	VBATT							
D5		P45					IRQ13- DS	AN005
D6		P46					IRQ14- DS	AN006
D7		PE6	D14[A14/ D14]	MTIOC6C/GTIOC3B- E/TIC1		MMC_CD-B/ SDHI_CD-B	IRQ6	AN104
D8		PE7	D15[A15/ D15]	MTIOC6A/GTIOC3A- E/TOC1		MMC_RES#-B/ SDHI_WP-B	IRQ7	AN105
D9		PA1	A1	MTIOC0B/MTCLKC/ MTIOC7B/GTIOC2A- C/TIOC0B/PO17	SCK5/SSLA2-B/ ET0_WOL		IRQ11	
D10		PA0	A0/BC0#	MTIOC4A/MTIOC6D/ GTIOC0B-C/TIOCA0/ CACREF/PO16	SSLA1-B/ ET0_TX_EN/ RMII0_TXD_EN			
E1	XTAL	P37						
E2	VSS							
E3	RES#							
E4	TRST#	P34		MTIOC0A/TMC13/ PO12/POE10#	SCK6/SCK0/ ET0_LINKSTA		IRQ4	
E5		P41					IRQ9-DS	AN001
E6		PA2	A2	MTIOC7A/GTIOC1A- C/PO18	RXD5/SMISO5/ SSCL5/SSLA3-B			
E7		PA6	A6	MTIC5V/MTCLKB/ GTETR-C/TIOCA2/ TMC13/PO22/POE10#	CTS5#/RTS5#/SS5#/ MOSIA-B/ ET0_EXOUT			
E8		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/ SSDA5/SSLA0-B/ ET0_MDC		IRQ5-DS	
E9		PA5	A5	MTIOC6B/TIOC0B1/ GTIOC0A-C/PO21	RSPCKA-B/ ET0_LINKSTA			
E10		PA3	A3	MTIOC0D/MTCLKD/ TIOC0D/TCLKB/PO19	RXD5/SMISO5/ SSCL5/ET0_MDIO		IRQ6-DS	
F1	EXTAL	P36						
F2	VCC							
F3	UPSEL	P35					NMI	
F4		P32		MTIOC0C/TIOCC0/ TMO3/PO10/ RTCOU/RTIC2/ POE0#/POE10#	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/ SSDA0/CTX0/ USB0_VBUSEN		IRQ2-DS	
F5		P12		TMC11	RXD2/SMISO2/ SSCL2/SCLO[FM+]		IRQ2	

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

Pin Number	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, GPT, TPU, TMR, PPG, RTC, CMTW, POE, CAC)	Communication (ETHERC, SCIG, SCIh, RSPI, RIIC, CAN, USB, SSI)	Memory Interface Camera Interface (QSPI, SDHI, MMCIF, PDC)	Interrupt	S12ADC, R12DA
F6		PB3	A11	MTIOC0A/MTIOC4A/ TIOC03/TCLKD/ TMO0/PO27/POE11#	SCK6/ET0_RX_ER/ RMII0_RX_ER			
F7		PB2	A10	TIOCC3/TCLKC/ PO26	CTS6#/RTS6#SS6#/ ET0_RX_CLK/ REF50CK0			
F8		PB0	A8	MTIC5W/TIOCA3/ PO24	RXD6/SMISO6/ SSCL6/ET0_ERXD1/ RMII0_RXD1		IRQ12	
F9		PA7	A7	TIOCB2/PO23	MISOA-B/ET0_WOL			
F10	VSS							
G1		P33	EDREQ1	MTIOC0D/TIOC0D/ TMR13/PO11/POE4#/ POE11#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/ SSCL0/CRX0		IRQ3-DS	
G2	TMS	P31		MTIOC4D/TMCI2/ PO9/RTIC1	CTS1#/RTS1#/SS1#		IRQ1-DS	
G3	TDI	P30		MTIOC4B/TMR13/ PO8/RTIC0/POE8#	RXD1/SMISO1/SSCL1		IRQ0-DS	
G4	TCK	P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1			
G5		P53*1	BCLK					
G6		P52	RD#		RXD2/SMISO2/SSCL2			
G7		PB5	A13	MTIOC2A/MTIOC1B/ TIOCB4/TMR11/PO29/ POE4#	SCK9/RTS9#/ ET0_ETXD0/ RMII0_TXD0			
G8		PB4	A12	TIOCA4/PO28	CTS9#/ET0_TX_EN/ RMII0_TXD_EN			
G9		PB1	A9	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	TXD6/SMOSI6/ SSDA6/ET0_ERXD0/ RMII0_RXD0		IRQ4-DS	
G10	VCC							
H1	TDO	P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1			
H2		P25	CS5#/ EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/ SSCL3/SSIDATA1			ADTRG0#
H3		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/ TMO2/PO14/ RTCOUT	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/ SSCL3/SCL2-DS/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB		IRQ6	ADTRG0#
H4		P15		MTIOC0B/MTCLKB/ GTETR-B/TIOCB2/ TCLKB/TMCI2/PO13	RXD1/SCK3/SMISO1/ SSCL1/CRX1-DS/ SSIWS1		IRQ5	
H5		P55	WAIT#/ EDREQ0	MTIOC4D/TMO3	CRX1/ET0_EXOUT		IRQ10	
H6		P54	ALE/ EDACK0	MTIOC4B/TMCI1	CTS2#/RTS2#/SS2#/ CTX1/ET0_LINKSTA			
H7	UB	PC7	A23/CS0#	MTIOC3A/MTCLKB/ GTIOC3A-D/TMO2/ TOC0/PO31/CACREF	TXD8/MISOA-A/ ET0_COL		IRQ14	
H8		PC6	A22/CS1#	MTIOC3C/MTCLKA/ GTIOC3B-D/TMCI2/ TIC0/PO30	RXD8/MOSIA-A/ ET0_ETXD3		IRQ13	

Table 1.10 List of Pin and Pin Functions (100-Pin LFQFP) (3/4)

Pin Number	Power Supply Clock System Control	I/O Port	Bus EXDMAC	Timer (MTU, GPT, TPU, TMR, PPG, RTC, CMTW, POE, CAC)	Communication (ETHERC, SCIG, SCIh, RSPI, RIIC, CAN, USB, SSI)	Memory Interface Camera Interface (QSPI, SDHI, MMCIF, PDC)	Interrupt	S12ADC, R12DA
57		PB3	A11	MTIOC0A/MTIOC4A/ TIOC0D3/TCLKD/ TMO0/PO27/POE11#	SCK6/ET0_RX_ER/ RMII0_RX_ER			
58		PB2	A10	TIOC0C3/TCLKC/ PO26	CTS6#/RTS6#SS6#/ ET0_RX_CLK/ REF50CK0			
59		PB1	A9	MTIOC0C/MTIOC4C/ TIOC0B3/TMCI0/PO25	TXD6/SMOSI6/ SSDA6/ET0_ERXD0/ RMII0_RXD0		IRQ4-DS	
60	VCC							
61		PB0	A8	MTIC5W/TIOCA3/ PO24	RXD6/SMISO6/ SSCL6/ET0_ERXD1/ RMII0_RXD1		IRQ12	
62	VSS							
63		PA7	A7	TIOC0B2/PO23	MISOA-B/ET0_WOL			
64		PA6	A6	MTIC5V/MTCLKB/ GTETRIG-C/TIOCA2/ TMCI3/PO22/POE10#	CTS5#/RTS5#SS5#/ MOSIA-B/ ET0_EXOUT			
65		PA5	A5	MTIOC6B/TIOC0B1/ GTIOC0A-C/PO21	RSPCKA-B/ ET0_LINKSTA			
66		PA4	A4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/ SSDA5/SSLA0-B/ ET0_MDC		IRQ5-DS	
67		PA3	A3	MTIOC0D/MTCLKD/ TIOC0D0/TCLKB/PO19	RXD5/SMISO5/ SSCL5/ET0_MDIO		IRQ6-DS	
68		PA2	A2	MTIOC7A/ GTIOC1A-C/PO18	RXD5/SMISO5/ SSCL5/SSLA3-B			
69		PA1	A1	MTIOC0B/MTCLKC/ MTIOC7B/ GTIOC2A-C/TIOC0B/ PO17	SCK5/SSLA2-B/ ET0_WOL		IRQ11	
70		PA0	A0/BC0#	MTIOC4A/MTIOC6D/ GTIOC0B-C/TIOCA0/ CACREF/PO16	SSLA1-B/ ET0_TX_EN/ RMII0_TXD_EN			
71		PE7	D15[A15/D15]	MTIOC6A/ GTIOC3A-E/TOC1		MMC_RES#-B/ SDHI_WP-B	IRQ7	AN105
72		PE6	D14[A14/D14]	MTIOC6C/GTIOC3B- E/TIC1		MMC_CD-B/ SDHI_CD-B	IRQ6	AN104
73		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ GTIOC0A-A	ET0_RX_CLK/ REF50CK0		IRQ5	AN103
74		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ GTIOC1A-A/PO28	ET0_ERXD2			AN102
75		PE3	D11[A11/D11]	MTIOC4B/ GTIOC2A-A/PO26/ POE8#/TOC3	CTS12#/RTS12#/ SS12#/ET0_ERXD3	MMC_D7-B		AN101
76		PE2	D10[A10/D10]	MTIOC4A/ GTIOC0B-A/PO23/ TIC3	RXD12/SMISO12/ SSCL12/RXD12	MMC_D6-B	IRQ7-DS	AN100
77		PE1	D9[A9/D9]	MTIOC4C/MTIOC3B/ GTIOC1B-A/PO18	TXD12/SMOSI12/ SSDA12/TXD12/ SIOX12	MMC_D5-B		ANEX1
78		PE0	D8[A8/D8]	MTIOC3D/ GTIOC2B-A	SCK12	MMC_D4-B		ANEX0
79		PD7	D7[A7/D7]	MTIC5U/POE0#		MMC_D1-B/ SDHI_D1-B/ QIO1-B/ QMI-B	IRQ7	AN107
80		PD6	D6[A6/D6]	MTIC5V/MTIOC8A/ POE4#		MMC_D0-B/ SDHI_D0-B/ QIO0-B/ QMO-B	IRQ6	AN106

Table 4.1 List of I/O Registers (Address Order) (14 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
0008 8022h	WDT	WDT Control Register	WDTCCR	16	16	2, 3 PCLKB	2 ICLK	WDTA
0008 8024h	WDT	WDT Status Register	WDTSR	16	16	2, 3 PCLKB	2 ICLK	WDTA
0008 8026h	WDT	WDT Reset Control Register	WDTRCR	8	8	2, 3 PCLKB	2 ICLK	WDTA
0008 8030h	IWDT	IWDT Refresh Register	IWDTRR	8	8	2, 3 PCLKB	2 ICLK	IWDTa
0008 8032h	IWDT	IWDT Control Register	IWDTCR	16	16	2, 3 PCLKB	2 ICLK	IWDTa
0008 8034h	IWDT	IWDT Status Register	IWDTSR	16	16	2, 3 PCLKB	2 ICLK	IWDTa
0008 8036h	IWDT	IWDT Reset Control Register	IWDTRCR	8	8	2, 3 PCLKB	2 ICLK	IWDTa
0008 8038h	IWDT	IWDT Count Stop Control Register	IWDCSTPR	8	8	2, 3 PCLKB	2 ICLK	IWDTa
0008 8040h	DA	D/A Data Register 0	DADR0	16	16	2, 3 PCLKB	2 ICLK	R12DA
0008 8042h	DA	D/A Data Register 1	DADR1	16	16	2, 3 PCLKB	2 ICLK	R12DA
0008 8044h	DA	D/A Control Register	DACR	8	8	2, 3 PCLKB	2 ICLK	R12DA
0008 8045h	DA	DADRM Format Select Register	DADPR	8	8	2, 3 PCLKB	2 ICLK	R12DA
0008 8046h	DA	D/A A/D Synchronous Start Control Register	DAADSCR	8	8	2, 3 PCLKB	2 ICLK	R12DA
0008 8048h	DA	D/A Output Amplifier Control Register	DAAMPCR	8	8	2, 3 PCLKB	2 ICLK	R12DA
0008 8100h	TPUA	Timer Start Register	TSTR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8101h	TPUA	Timer Synchronous Register	TSYR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8108h	TPU0	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8109h	TPU1	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 810Ah	TPU2	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 810Bh	TPU3	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 810Ch	TPU4	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 810Dh	TPU5	Noise Filter Control Register	NFCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8110h	TPU0	Timer Control Register	TCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8111h	TPU0	Timer Mode Register	TMDR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8112h	TPU0	Timer I/O Control Register H	TIORH	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8113h	TPU0	Timer I/O Control Register L	TIORL	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8114h	TPU0	Timer Interrupt Enable Register	TIER	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8115h	TPU0	Timer Status Register	TSR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8116h	TPU0	Timer Counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8118h	TPU0	Timer General Register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 811Ah	TPU0	Timer General Register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 811Ch	TPU0	Timer General Register C	TGRC	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 811Eh	TPU0	Timer General Register D	TGRD	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8120h	TPU1	Timer Control Register	TCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8121h	TPU1	Timer Mode Register	TMDR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8122h	TPU1	Timer I/O Control Register	TIOR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8124h	TPU1	Timer Interrupt Enable Register	TIER	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8125h	TPU1	Timer Status Register	TSR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8126h	TPU1	Timer Counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8128h	TPU1	Timer General Register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 812Ah	TPU1	Timer General Register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8130h	TPU2	Timer Control Register	TCR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8131h	TPU2	Timer Mode Register	TMDR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8132h	TPU2	Timer I/O Control Register	TIOR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8134h	TPU2	Timer Interrupt Enable Register	TIER	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8135h	TPU2	Timer Status Register	TSR	8	8	2, 3 PCLKB	2 ICLK	TPUa
0008 8136h	TPU2	Timer Counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8138h	TPU2	Timer General Register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 813Ah	TPU2	Timer General Register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	TPUa
0008 8140h	TPU3	Timer Control Register	TCR	8	8	2, 3 PCLKB	2 ICLK	TPUa

Table 4.1 List of I/O Registers (Address Order) (29 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
0008 B13Ah	ELC	Event Link Setting Register 42	ELSR42	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B13Bh	ELC	Event Link Setting Register 43	ELSR43	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B13Ch	ELC	Event Link Setting Register 44	ELSR44	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B13Dh	ELC	Event Link Setting Register 45	ELSR45	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B13Fh	ELC	Event Link Option Setting Register F	ELOPF	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B141h	ELC	Event Link Option Setting Register H	ELOPH	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B142h	ELC	Event Link Option Setting Register I	ELOPI	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B143h	ELC	Event Link Option Setting Register J	ELOPJ	8	8	2, 3 PCLKB	2 ICLK	ELC
0008 B300h	SCI12	Serial Mode Register	SMR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B301h	SCI12	Bit Rate Register	BRR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B302h	SCI12	Serial Control Register	SCR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B303h	SCI12	Transmit Data Register	TDR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B304h	SCI12	Serial Status Register	SSR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B305h	SCI12	Receive Data Register	RDR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B306h	SMCI12	Smart Card Mode Register	SCMR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B307h	SCI12	Serial Extended Mode Register	SEMR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B308h	SCI12	Noise Filter Setting Register	SNFR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B309h	SCI12	I ² C Mode Register 1	SIMR1	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Ah	SCI12	I ² C Mode Register 2	SIMR2	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Bh	SCI12	I ² C Mode Register 3	SIMR3	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Ch	SCI12	I ² C Status Register	SISR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Dh	SCI12	SPI Mode Register	SPMR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Eh	SCI12	Transmit Data Register H	TDRH	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Fh	SCI12	Transmit Data Register L	TDRL	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B30Eh	SCI12	Transmit Data Register HL	TDRHL	16	16	4, 5 PCLKB	2 ICLK	SCIh
0008 B310h	SCI12	Receive Data Register H	RDRH	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B311h	SCI12	Receive Data Register L	RDRL	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B310h	SCI12	Receive Data Register HL	RDRHL	16	16	4, 5 PCLKB	2 ICLK	SCIh
0008 B312h	SCI12	Modulation Duty Register	MDDR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B320h	SCI12	Extended Serial Module Enable Register	ESMER	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B321h	SCI12	Control Register 0	CR0	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B322h	SCI12	Control Register 1	CR1	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B323h	SCI12	Control Register 2	CR2	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B324h	SCI12	Control Register 3	CR3	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B325h	SCI12	Port Control Register	PCR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B326h	SCI12	Interrupt Control Register	ICR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B327h	SCI12	Status Register	STR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B328h	SCI12	Status Clear Register	STCR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B329h	SCI12	Control Field 0 Data Register	CF0DR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Ah	SCI12	Control Field 0 Compare Enable Register	CF0CR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Bh	SCI12	Control Field 0 Receive Data Register	CF0RR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Ch	SCI12	Primary Control Field 1 Data Register	PCF1DR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Dh	SCI12	Secondary Control Field 1 Data Register	SCF1DR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Eh	SCI12	Control Field 1 Compare Enable Register	CF1CR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B32Fh	SCI12	Control Field 1 Receive Data Register	CF1RR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B330h	SCI12	Timer Control Register	TCR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B331h	SCI12	Timer Mode Register	TMR	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B332h	SCI12	Timer Prescaler Register	TPRE	8	8	2, 3 PCLKB	2 ICLK	SCIh
0008 B333h	SCI12	Timer Count Register	TCNT	8	8	2, 3 PCLKB	2 ICLK	SCIh

Table 4.1 List of I/O Registers (Address Order) (32 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
0008 C068h	PORT8	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C069h	PORT9	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Ah	PORTA	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Bh	PORTB	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Ch	PORTC	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Dh	PORTD	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Eh	PORTE	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C06Fh	PORTF	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C070h	PORTG	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C072h	PORTJ	Port Mode Register	PMR	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C080h	PORT0	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C081h	PORT0	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C082h	PORT1	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C083h	PORT1	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C084h	PORT2	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C085h	PORT2	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C086h	PORT3	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C087h	PORT3	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C088h	PORT4	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C089h	PORT4	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Ah	PORT5	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Bh	PORT5	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Ch	PORT6	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Dh	PORT6	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Eh	PORT7	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C08Fh	PORT7	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C090h	PORT8	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C091h	PORT8	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C092h	PORT9	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C093h	PORT9	Open-Drain Control Register 1	ODR1	8	8	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C094h	PORTA	Open-Drain Control Register 0	ODR0	8	8	2, 3 PCLKB	2 ICLK	I/O Ports

Table 4.1 List of I/O Registers (Address Order) (37 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK $\geq$ PCLK	ICLK < PCLK	
0008 C282h	SYSTEM	Deep Standby Interrupt Enable Register 0	DPSIER0	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C283h	SYSTEM	Deep Standby Interrupt Enable Register 1	DPSIER1	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C284h	SYSTEM	Deep Standby Interrupt Enable Register 2	DPSIER2	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C285h	SYSTEM	Deep Standby Interrupt Enable Register 3	DPSIER3	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C286h	SYSTEM	Deep Standby Interrupt Flag Register 0	DPSIFR0	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C287h	SYSTEM	Deep Standby Interrupt Flag Register 1	DPSIFR1	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C288h	SYSTEM	Deep Standby Interrupt Flag Register 2	DPSIFR2	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C289h	SYSTEM	Deep Standby Interrupt Flag Register 3	DPSIFR3	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C28Ah	SYSTEM	Deep Standby Interrupt Edge Register 0	DPSIEGR0	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C28Bh	SYSTEM	Deep Standby Interrupt Edge Register 1	DPSIEGR1	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C28Ch	SYSTEM	Deep Standby Interrupt Edge Register 2	DPSIEGR2	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C28Dh	SYSTEM	Deep Standby Interrupt Edge Register 3	DPSIEGR3	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
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	Resets
0008 C293h	SYSTEM	Main Clock Oscillator Forced Oscillation Control Register	MOFCR	8	8	4, 5 PCLKB	2, 3 ICLK	Clock Generation Circuit
0008 C294h	SYSTEM	High-Speed On-Chip Oscillator Power Supply Control Register	HOCOPCR	8	8	4, 5 PCLKB	2, 3 ICLK	Clock Generation Circuit
0008 C296h	FLASH	Flash P/E Protect Register	FWEPROR	8	8	2 ICLK		Flash
0008 C297h	SYSTEM	Voltage Monitoring Circuit Control Register	LVCMPCR	8	8	4, 5 PCLKB	2, 3 ICLK	LVDA
0008 C298h	SYSTEM	Voltage Detection Level Select Register	LVDLVL	8	8	4, 5 PCLKB	2, 3 ICLK	LVDA
0008 C29Ah	SYSTEM	Voltage Monitoring 1 Circuit Control Register 0	LVD1CR0	8	8	4, 5 PCLKB	2, 3 ICLK	LVDA
0008 C29Bh	SYSTEM	Voltage Monitoring 2 Circuit Control Register 0	LVD2CR0	8	8	4, 5 PCLKB	2, 3 ICLK	LVDA

Table 4.1 List of I/O Registers (Address Order) (38 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
0008 C2A0h to 0008 C2BFh	SYSTEM	Deep Standby Backup Registers 0 to 31	DPSBKR0 to 31	8	8	4, 5 PCLKB	2, 3 ICLK	Low Power Consumption
0008 C400h	RTC	64-Hz Counter	R64CNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C402h	RTC	Second Counter	RSECCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C402h	RTC	Binary Counter 0	BCNT0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C404h	RTC	Minute Counter	RMINCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C404h	RTC	Binary Counter 1	BCNT1	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C406h	RTC	Hour Counter	RHRCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C406h	RTC	Binary Counter 2	BCNT2	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C408h	RTC	Day-of-Week Counter	RWKCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C408h	RTC	Binary Counter 3	BCNT3	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C40Ah	RTC	Date Counter	RDAYCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C40Ch	RTC	Month Counter	RMONCNT	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C40Eh	RTC	Year Counter	RYRCNT	16	16	2, 3 PCLKB	2 ICLK	RTCd
0008 C410h	RTC	Second Alarm Register	RSECAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C410h	RTC	Binary Counter 0 Alarm Register	BCNT0AR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C412h	RTC	Minute Alarm Register	RMINAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C412h	RTC	Binary Counter 1 Alarm Register	BCNT1AR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C414h	RTC	Hour Alarm Register	RHRAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C414h	RTC	Binary Counter 2 Alarm Register	BCNT2AR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C416h	RTC	Day-of-Week Alarm Register	RWKAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C416h	RTC	Binary Counter 3 Alarm Register	BCNT3AR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C418h	RTC	Date Alarm Register	RDAYAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C418h	RTC	Binary Counter 0 Alarm Enable Register	BCNT0AER	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Ah	RTC	Month Alarm Register	RMONAR	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Ah	RTC	Binary Counter 1 Alarm Enable Register	BCNT1AER	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Ch	RTC	Year Alarm Register	RYRAR	16	16	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Ch	RTC	Binary Counter 2 Alarm Enable Register	BCNT2AER	16	16	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Eh	RTC	Year Alarm Enable Register	RYRAREN	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C41Eh	RTC	Binary Counter 3 Alarm Enable Register	BCNT3AER	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C422h	RTC	RTC Control Register 1	RCR1	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C424h	RTC	RTC Control Register 2	RCR2	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C426h	RTC	RTC Control Register 3	RCR3	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C428h	RTC	RTC Control Register 4	RCR4	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C42Ah	RTC	Frequency Register H	RFRH	16	16	2, 3 PCLKB	2 ICLK	RTCd
0008 C42Ch	RTC	Frequency Register L	RFRL	16	16	2, 3 PCLKB	2 ICLK	RTCd
0008 C42Eh	RTC	Time Error Adjustment Register	RADJ	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C440h	RTC	Time Capture Control Register 0	RTCCR0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C442h	RTC	Time Capture Control Register 1	RTCCR1	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C444h	RTC	Time Capture Control Register 2	RTCCR2	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C452h	RTC	Second Capture Register 0	RSECCP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C452h	RTC	BCNT0 Capture Register 0	BCNT0CP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C454h	RTC	Minute Capture Register 0	RMINCP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C454h	RTC	BCNT1 Capture Register 0	BCNT1CP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C456h	RTC	Hour Capture Register 0	RHRCP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C456h	RTC	BCNT2 Capture Register 0	BCNT2CP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C45Ah	RTC	Date Capture Register 0	RDAYCP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C45Ah	RTC	BCNT3 Capture Register 0	BCNT3CP0	8	8	2, 3 PCLKB	2 ICLK	RTCd
0008 C45Ch	RTC	Month Capture Register 0	RMONCP0	8	8	2, 3 PCLKB	2 ICLK	RTCd

Table 4.1 List of I/O Registers (Address Order) (62 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
000D 0103h	RSPI0	RSPI Status Register	SPSR	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 0104h	RSPI0	RSPI Data Register	SPDR	32	16, 32	3, 4 PCLKA	2 ICLK	RSPIa
000D 0108h	RSPI0	RSPI Sequence Control Register	SPSCR	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 0109h	RSPI0	RSPI Sequence Status Register	SPSSR	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Ah	RSPI0	RSPI Bit Rate Register	SPBR	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Bh	RSPI0	RSPI Data Control Register	SPDCR	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Ch	RSPI0	RSPI Clock Delay Register	SPCKD	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Dh	RSPI0	RSPI Slave Select Negation Delay Register	SSLND	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Eh	RSPI0	RSPI Next-Access Delay Register	SPND	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 010Fh	RSPI0	RSPI Control Register 2	SPCR2	8	8	3, 4 PCLKA	2 ICLK	RSPIa
000D 0110h	RSPI0	RSPI Command Register 0	SPCMD0	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 0112h	RSPI0	RSPI Command Register 1	SPCMD1	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 0114h	RSPI0	RSPI Command Register 2	SPCMD2	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 0116h	RSPI0	RSPI Command Register 3	SPCMD3	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 0118h	RSPI0	RSPI Command Register 4	SPCMD4	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 011Ah	RSPI0	RSPI Command Register 5	SPCMD5	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 011Ch	RSPI0	RSPI Command Register 6	SPCMD6	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 011Eh	RSPI0	RSPI Command Register 7	SPCMD7	16	16	3, 4 PCLKA	2 ICLK	RSPIa
000D 0400h	USBA	System Configuration Control Register	SYSCFG	16	16	3, 4 PCLKB	2 ICLK	USBA
000D 0402h	USBA	CPU Bus Wait Register	BUSWAIT	16	16	3, 4 PCLKB	2 ICLK	USBA
000D 0404h	USBA	System Configuration Status Register	SYSSTS0	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0406h	USBA	PLL Status Register	PLLSTA	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0408h	USBA	Device State Control Register 0	DVSTCTR0	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0414h	USBA	CFIFO Port Register	CFIFO	32	8,16,32	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0418h	USBA	D0FIFO Port Register	D0FIFO	32	8,16,32	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 041Ch	USBA	D1FIFO Port Register	D1FIFO	32	8,16,32	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0420h	USBA	CFIFO Port Select Register	CFIFOSEL	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0422h	USBA	CFIFO Port Control Register	CFIFOCTR	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA
000D 0428h	USBA	D0FIFO Port Select Register	D0FIFOSEL	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/PCLKB) ^{*5}	USBA

Table 4.1 List of I/O Registers (Address Order) (64 / 67)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access Cycles		Related Function
						ICLK ≥ PCLK	ICLK < PCLK	
000D 044Ch	USBA	Frame Number Register	FRMNUM	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 044Eh	USBA	μFrame Number Register	UFRMNUM	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0450h	USBA	USB Address Register	USBADDR	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0454h	USBA	USB Request Type Register	USBREQ	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0456h	USBA	USB Request Value Register	USBVAL	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0458h	USBA	USB Request Index Register	USBINDX	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 045Ah	USBA	USB Request Length Register	USBLENG	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 045Ch	USBA	DCP Configuration Register	DCPCFG	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 045Eh	USBA	DCP Maximum Packet Size Register	DCPMAXP	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0460h	USBA	DCP Control Register	DCPCTR	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0464h	USBA	Pipe Window Select Register	PIPESEL	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 0468h	USBA	Pipe Configuration Register	PIPECFG	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 046Ah	USBA	Pipe Buffer Register	PIPEBUF	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 046Ch	USBA	Pipe Maximum Packet Size Register	PIPEMAXP	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA
000D 046Eh	USBA	Pipe Cycle Control Register	PIPEPERI	16	16	(3 + BUSWAIT) PCLKA or more	Rounded up to the nearest integer greater than 1 + (3 + BUSWAIT) × (frequency ratio of ICLK/ PCLKB) ^{*5}	USBA

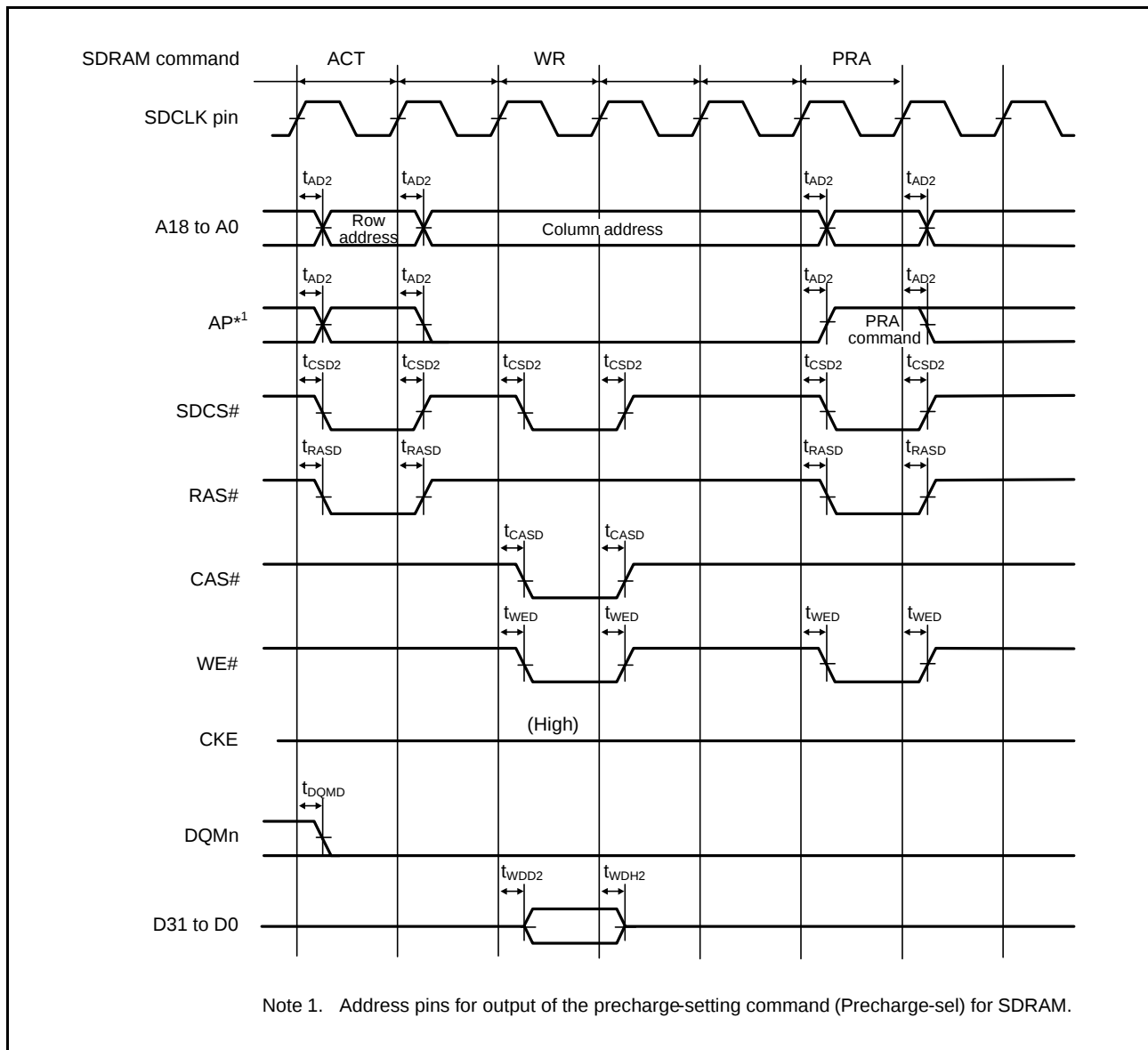


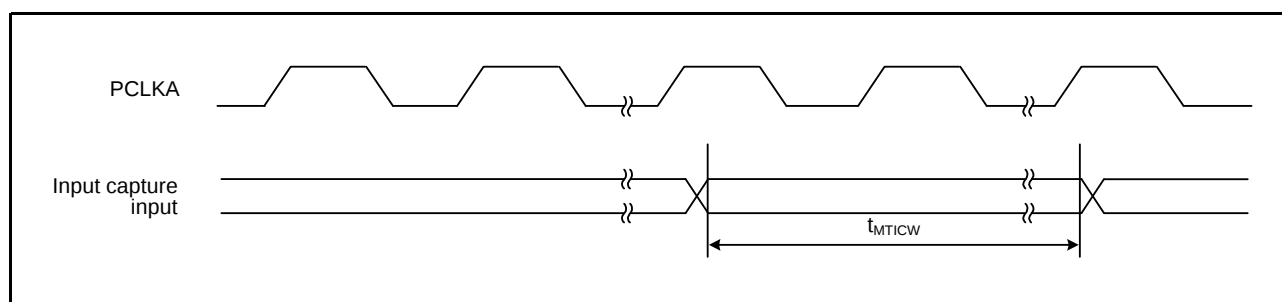
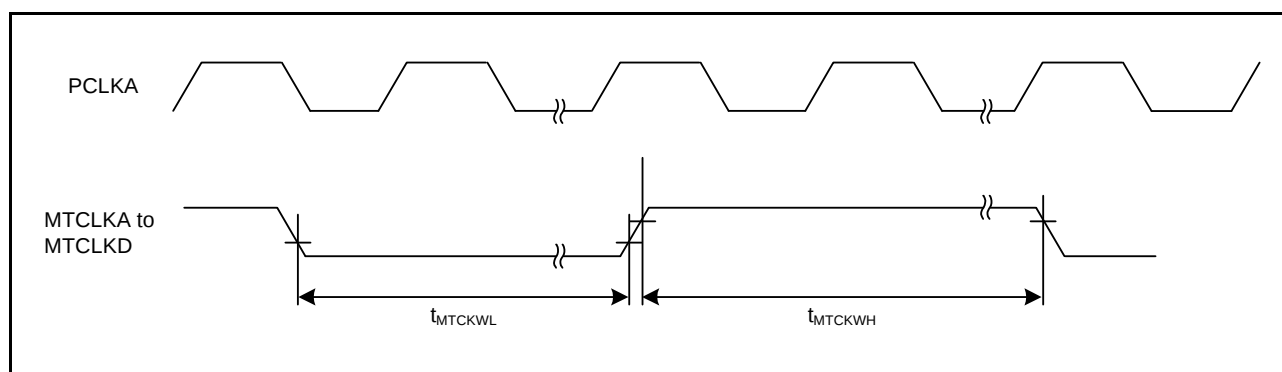
Figure 5.24 SDRAM Space Single Write Bus Timing

Table 5.27 MTU3 Timing

Conditions: $V_{CC} = AVCC0 = AVCC1 = V_{CC_USB} = V_{BATT} = 2.7$ to 3.6 V, $2.7 \leq V_{REFH0} \leq AVCC0$,
 $V_{CC_USBA} = AVCC_USBA = 3.0$ to 3.6 V,
 $V_{SS} = AVSS0 = AVSS1 = V_{REFL0} = V_{SS_USB} = V_{SS1_USBA} = V_{SS2_USBA} = PVSS_USBA = AVSS_USBA = 0$ V,
 $PCLKA = 8$ to 120 MHz, $PCLKB = 8$ to 60 MHz, $T_a = T_{opr}$
 Output load conditions: $V_{OH} = V_{CC} \times 0.5$, $V_{OL} = V_{CC} \times 0.5$, $C = 30$ pF
 High-drive output is selected by the driving ability control register.

Item			Symbol	Min.	Max.	Unit*1	Test Conditions
MTU3	Input capture input pulse width	Single-edge setting	t_{MTICW}	1.5	—	t_{PACyc}	Figure 5.38
		Both-edge setting		2.5	—		
	Timer clock pulse width	Single-edge setting	t_{MTCKWH} , t_{MTCKWL}	1.5	—	t_{PACyc}	Figure 5.39
		Both-edge setting		2.5	—		
		Phase counting mode		2.5	—		

Note 1. t_{PACyc} : PCLKA cycle

**Figure 5.38 MTU3 Input Capture Input Timing****Figure 5.39 MTU3 Clock Input Timing**

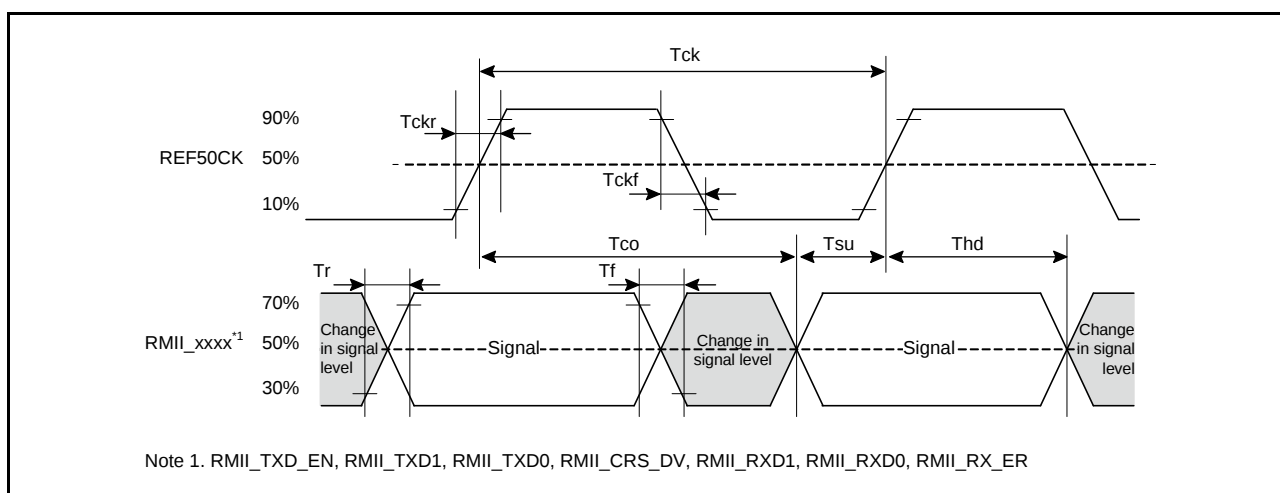


Figure 5.62 Timing with the REF50CK and RMII Signals

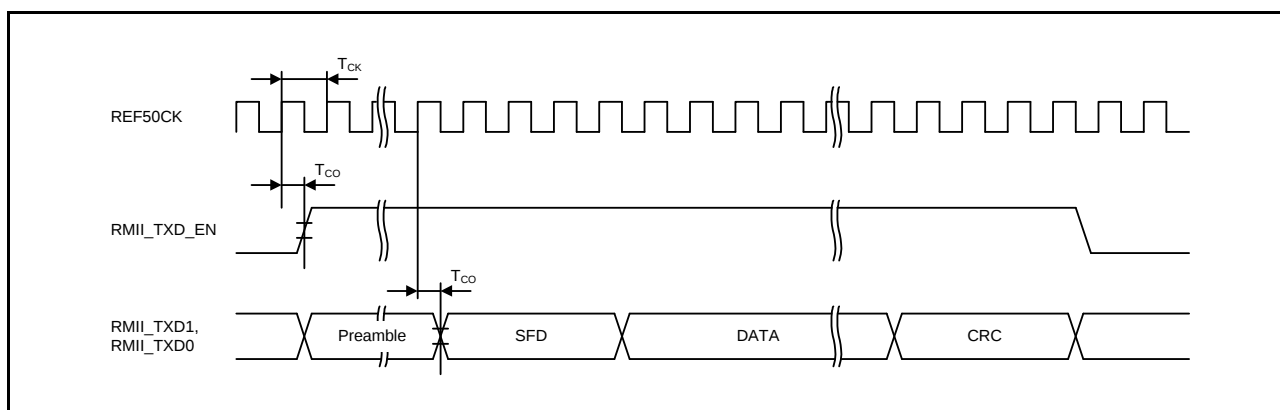


Figure 5.63 RMII Transmission Timing

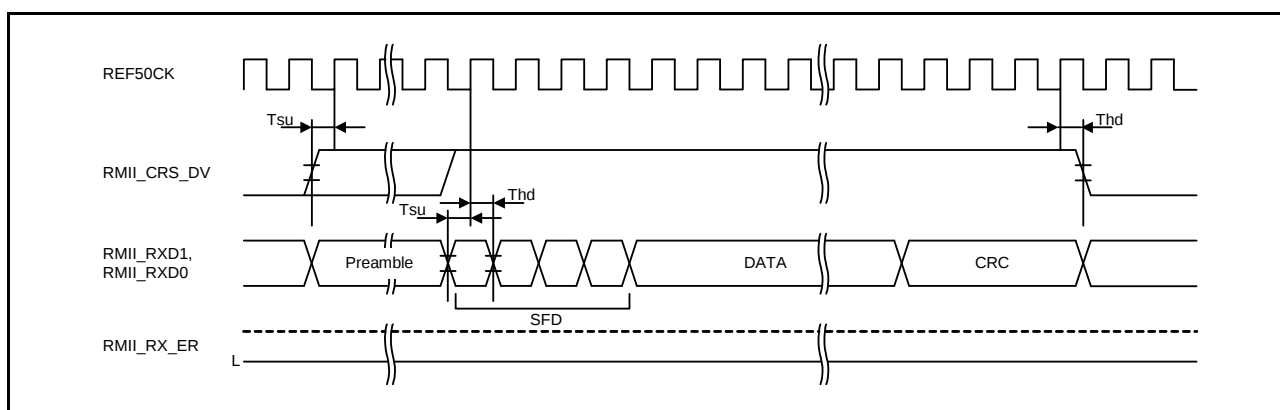


Figure 5.64 RMII Reception Timing (Normal Operation)

5.9 Oscillation Stop Detection Timing

Table 5.51 Oscillation Stop Detection Circuit Characteristics

Conditions: $V_{CC} = AVCC0 = AVCC1 = V_{CC_USB} = V_{BATT} = 2.7$ to 3.6 V, $2.7 \leq V_{REFH0} \leq AVCC0$,
 $V_{CC_USBA} = AVCC_USBA = 3.0$ to 3.6 V,
 $V_{SS} = AVSS0 = AVSS1 = V_{REFL0} = V_{SS_USB} = V_{SS1_USBA} = V_{SS2_USBA} = PV_{SS_USBA} = AV_{SS_USBA} = 0$ V,
 $T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Detection time	t_{dr}	—	—	1	ms	Figure 5.83

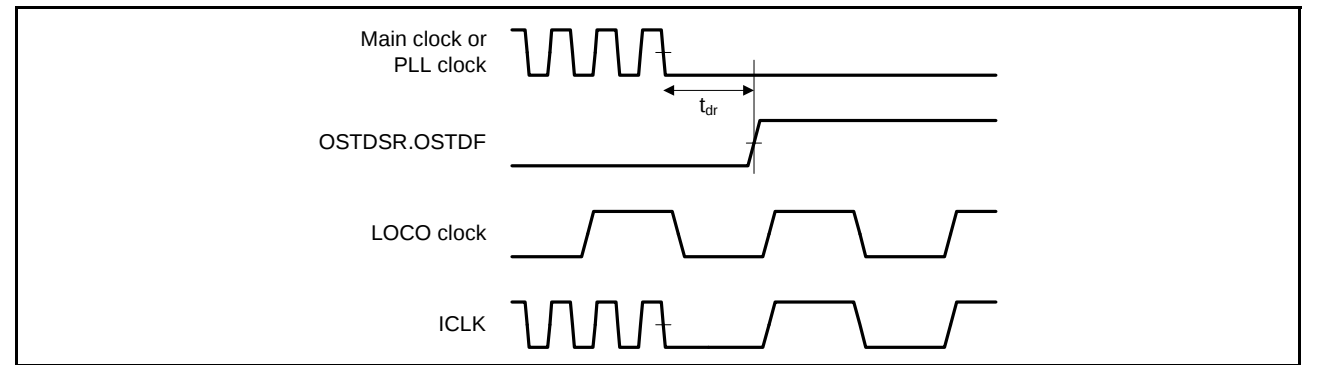


Figure 5.83 Oscillation Stop Detection Timing

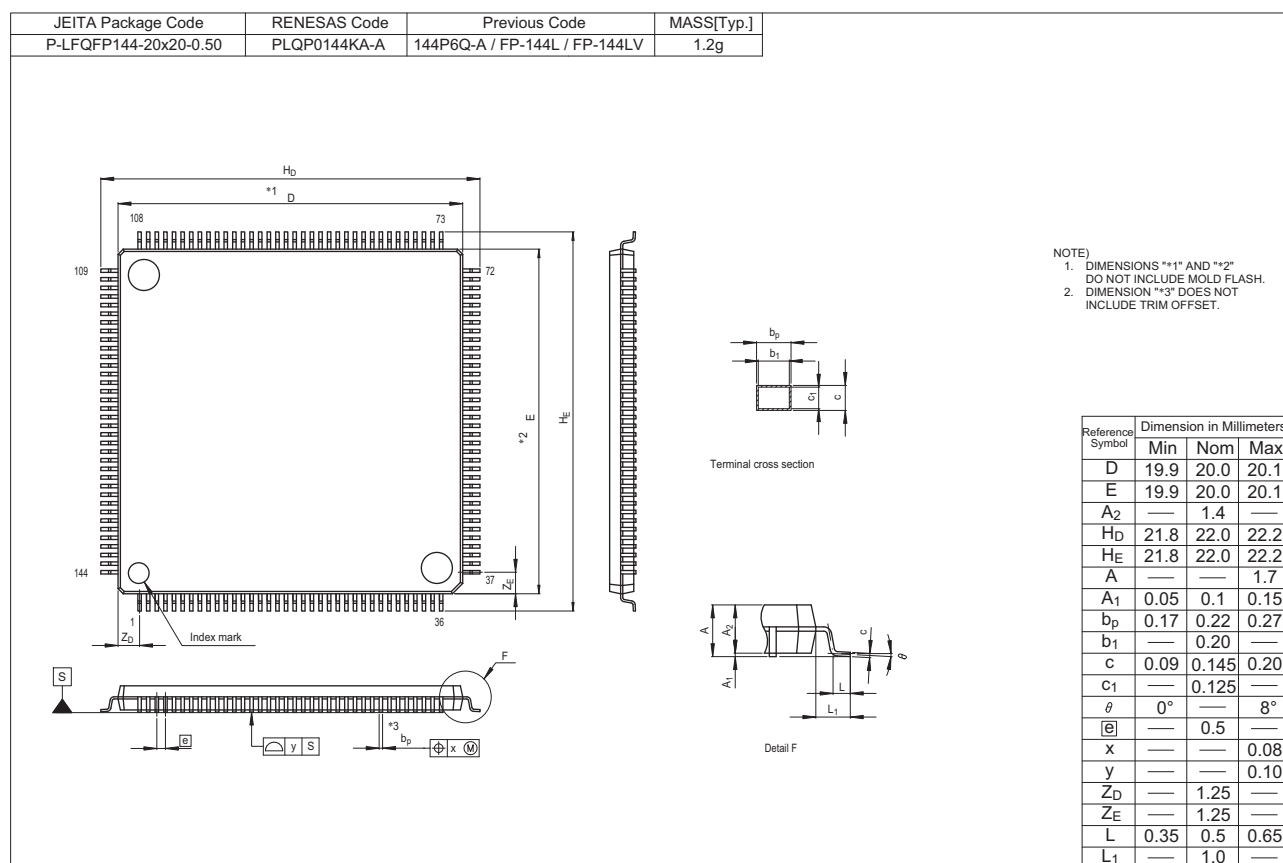


Figure E 144-Pin LFQFP (PLQP0144KA-A)

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.
"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.
Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.



SALES OFFICES

Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "<http://www.renesas.com/>" for the latest and detailed information.

Renesas Electronics America Inc.

2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited

9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

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: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.

Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.

Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited

Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.

13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.

80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.

Unit 1207, 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 India Pvt. Ltd.

No.777C, 100 Feet Road, HAL II Stage, Indiranagar, Bangalore, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.

12F., 234 Teheran-ro, Gangnam-Gu, Seoul, 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141