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Details

Product Status	Not For New Designs
Core Processor	RX
Core Size	32-Bit Single-Core
Speed	100MHz
Connectivity	CANbus, EBI/EMI, I ² C, LINbus, SCI, SPI, USB
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	133
Program Memory Size	512KB (512K x 8)
Program Memory Type	FLASH
EEPROM Size	32K x 8
RAM Size	128K x 8
Voltage - Supply (Vcc/Vdd)	2.7V ~ 3.6V
Data Converters	A/D 8x10b, 21x12b; D/A 2x10b
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/r5f56318cdfc-v0

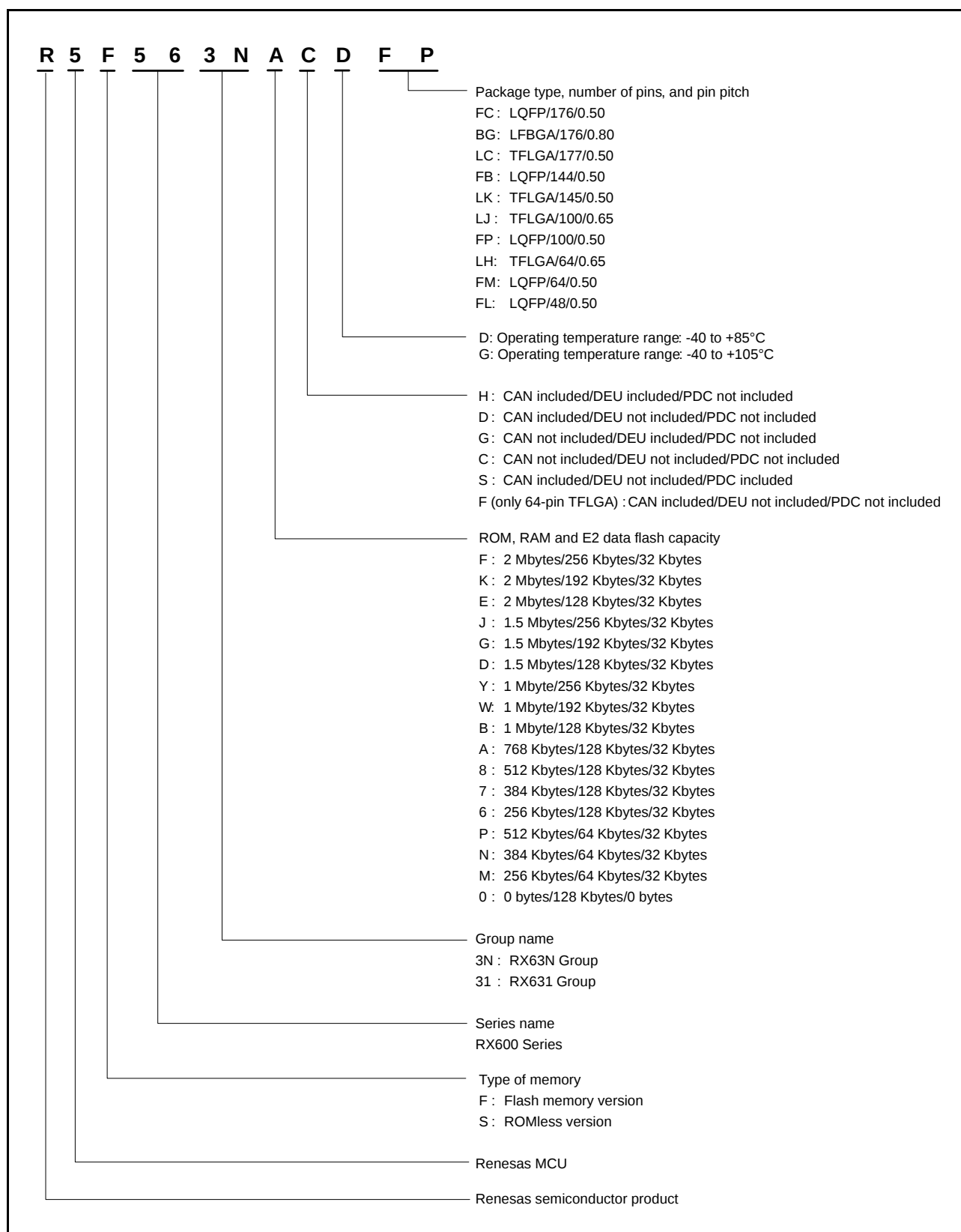


Figure 1.1 How to Read the Product Part No.

Table 1.4 Pin Functions (6/6)

Classifications	Pin Name	I/O	Description
Analog power supply	AVCC0	Input	Analog voltage supply pin for the 12-bit A/D converter. Connect this pin to VCC if the 12-bit A/D converter is not to be used.
	AVSS0	Input	Analog ground pin for the 12-bit A/D converter. Connect this pin to VSS if the 12-bit A/D converter is not to be used.
	VREFH0	Input	Analog reference voltage supply pin for the 12-bit A/D converter. Connect this pin to VCC if the 12-bit A/D converter is not to be used.
	VREFL0	Input	Analog reference ground pin for the 12-bit A/D converter. Connect this pin to VSS if the 12-bit A/D converter is not to be used.
	VREFH	Input	Reference voltage input pin for the 10-bit A/D converter and D/A converter. This is used as the analog power supply for the respective modules. Connect this pin to VCC if neither the 10-bit A/D converter nor the D/A converter is in use.
	VREFL	Input	Reference ground pin for the 10-bit A/D converter and D/A converter. This is used as the analog ground for the respective modules. Set this pin to the same potential as the VSS pin.
I/O ports	P00 to P03, P05, P07	I/O	6-bit input/output pins.
	P10 to P17	I/O	8-bit input/output pins.
	P20 to P27	I/O	8-bit input/output pins.
	P30 to P37	I/O	8-bit input/output pins. (P35 is an input pin)
	P40 to P47	I/O	8-bit input/output pins.
	P50 to P57	I/O	8-bit input/output pins.
	P60 to P67	I/O	8-bit input/output pins.
	P70 to P77	I/O	8-bit input/output pins.
	P80 to P87	I/O	8-bit input/output pins.
	P90 to P97	I/O	8-bit input/output pins.
	PA0 to PA7	I/O	8-bit input/output pins.
	PB0 to PB7	I/O	8-bit input/output pins.
	PC0 to PC7	I/O	8-bit input/output pins.
	PD0 to PD7	I/O	8-bit input/output pins.
	PE0 to PE7	I/O	8-bit input/output pins.
	PF0 to PF5	I/O	6-bit input/output pins.
	PG0 to PG7	I/O	8-bit input/output pins.
	PJ3, PJ5	I/O	2-bit input/output pins.

RX631 Group
PTLG0064JA-A (64-pin TFLGA)
(Top perspective view)

	A	B	C	D	E	F	G	H	
8	PE3	PE4	PA0	PA3	PB0	PB3	PB6	PB7	8
7	PE2	PE1	PE5	PA1	VSS	PB5	PC3	PC2	7
6	VREFL	P46	PE0	PA4	VCC	PB1	PC6	USB1_DP	6
5	VREFH	P44	P43	PA6	PC4	P15	VCC_USB	USB1_DM	5
4	VREFL0	P42	P41	P14	P16	PC5	VSS_USB	USB0_DP	4
3	VREFH0	P40	EMLE	P27	P30	P31	VCC_USB	USB0_DM	3
2	AVCC0	AVSS0	MD/FINED	RES#	VBATT	P35	P26	P17	2
1	P05	VCL	XCIN	XCOUT	VSS	VCC	EXTAL	XTAL	1
	A	B	C	D	E	F	G	H	

Figure 1.10 Pin Assignment (64-pin TFLGA)

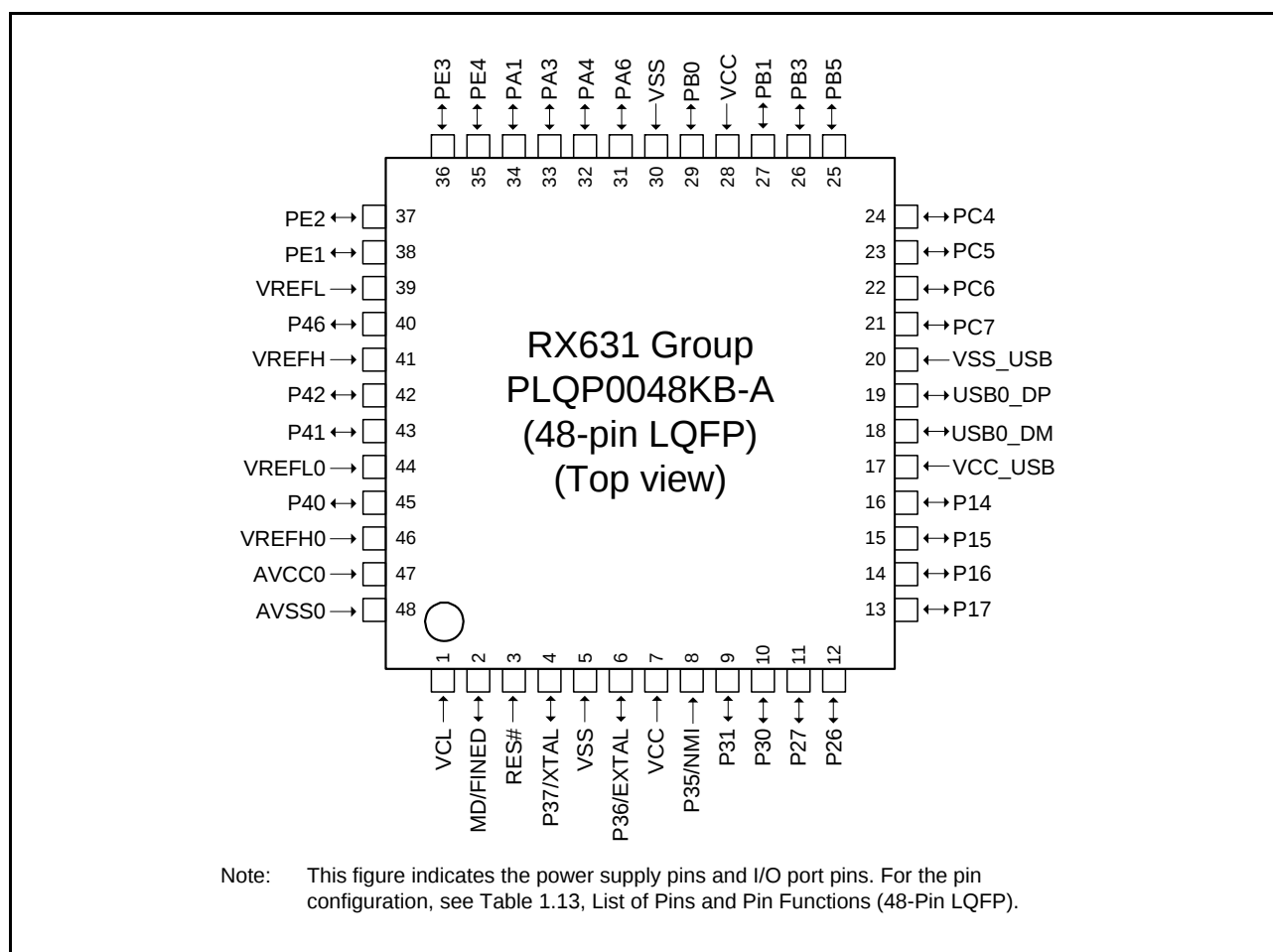
**Figure 1.12 Pin Assignment (48-Pin LQFP)**

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

Pin Number 176-Pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIC, SCID, RSPI, RIIC, CAN, IEB, USB, and PDC)	Interrupt	S12AD, AD, DA
1	AVSS0						
2		P05				IRQ13	DA1
3	VREFH						
4		P03				IRQ11	DA0
5	VREFL						
6		P02		TMCI1	SCK6	IRQ10	AN020
7		P01		TMCI0	RXD6/SMISO6/SSCL6	IRQ9	AN019
8		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
9		PF5				IRQ4	
10	EMLE						
11		PJ5					
12	VSS						
13		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
14	VCL						
15	VBATT						
16	NC						
17	TRST#	PF4					
18	MD/FINED						
19	XCIN						
20	XCOUT						
21	RES#						
22	XTAL	P37					
23	VSS						
24	EXTAL	P36					
25	VCC						
26		P35				NMI	
27		P34		MTIOC0A/TMCI3/PO12/ POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
28		P33		MTIOC0D/TIOC0D/ TMRI3/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/SSCL0/ CRX0/PCKO	IRQ3-DS	
29		P32		MTIOC0C/TIOCC0/TMO3/ PO10/RTCOU/RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/SSDA0/ CTX0/USB0_VBUSEN/ VSYNC	IRQ2-DS	
30	TMS	PF3					
31	TDI	PF2			RXD1/SMISO1/SSCL1		
32		P31		MTIOC4D/TMCI2/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
33		P30		MTIOC4B/TMRI3/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
34	TCK/FINEC	PF1			SCK1		
35	TDO	PF0			TXD1/SMOSI1/SSDA1		
36		P27	CS7#	MTIOC2B/TMCI3/PO7	SCK1/RSPCKB		
37		P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1/ MOSIB		
38		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD/HSYNC		ADTRG0#
39	VCC						
40		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN/ PIXCLK		

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

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SC1c, SC1d, RSPI, RIIC, CAN, IEB, USB, and PDC)	Interrupt	S12AD AD DA
L3		P16		MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14/RTCOU	TXD1/RXD3/SMOSI1/ SMISO3/SSDA1/SSCL3/ MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
L4		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMRI1/PO4	SCK3/USB0_VBUSEN/ PIXCLK		
L5		P13		MTIOC0B/TIOCA5/ TMO3/PO13	TXD2/SMOSI2/SSDA2/ SDA0[FM+]	IRQ3	ADTRG#
L6		P56	EDACK1	MTIOC3C/TIOCA1			
L7		P52	RD#		RXD2/SMISO2/SSCL2/ SSLB3		
L8	TRCLK	P83	EDACK1	MTIOC4C	CTS10#/RTS10#/SS10#/ ET_CRS/RMII_CRS_DV		
L9		PC5	A21/CS2#/ WAIT#	MTIOC3B/MTCLKD/ TIOCD6/TCLKF/TMRI2/ PO29	SCK8/RSPCKA/ ET_ETXD2		
L10		PC4	A20/CS3#	MTIOC3D/MTCLKC/ TIOCC6/TCLKE/TMCI1/ PO25/POE0#	SCK5/CTS8#/RTS8#/ SS8#/SSLA0/ET_TX_CLK		
L11		PC2	A18	MTIOC4B/TCLKA/PO21	RXD5/SMISO5/SSCL5/ SSLA3/IERXD/ET_RX_DV		
L12		P73	CS3#	PO16	ET_WOL		
L13	VSS						
M1		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD/PIXD6		
M2		P17		MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/TXD3/SMOSI3/ SSDA3/MISOA/SDA2-DS/ IETXD/PIXD3	IRQ7	ADTRG#
M3		P86		TIOCA0	PIXD1		
M4		P12		TMCI1	RXD2/SMISO2/SSCL2/ SCL0[FM+]	IRQ2	
M5	VCC_USB						
M6	VSS_USB						
M7		P50	WR0#/WR#		TXD2/SMOSI2/SSDA2/ SSLB1		
M8		PC6	A22/CS1#	MTIOC3C/MTCLKA/ TIOCA6/TMCI2/PO30	RXD8/SMISO8/SSCL8/ MOSIA/ET_ETXD3	IRQ13	
M9	TRDATA1	P81	EDACK0	MTIOC3D/PO27	RXD10/SMISO10/SSCL10/ ET_ETXD0/RMII_TXD0		
M10		P77	CS7#	PO23	TXD11/SMOSI11/SSDA11/ ET_RX_ER/RMII_RX_ER		
M11		PC0	A16	MTIOC3C/TCLKC/PO17	CTS5#/RTS5#/SS5#/ SSLA1/SCL3/ET_ERXD3	IRQ14	
M12		PC1	A17	MTIOC3A/TCLKD/PO18	SCK5/SSLA2/SDA3/ ET_ERXD2	IRQ12	
M13	VCC						
N1		P21		MTIOC1B/TIOCA3/ TMCI0/PO1	RXD0/SMISO0/SSCL0/ SCL1/USB0_EXICEN/ PIXD5	IRQ9	
N2		P20		MTIOC1A/TIOCB3/ TMRI0/PO0	TXD0/SMOSI0/SSDA0/ SDA1/USB0_ID/PIXD4	IRQ8	
N3		P87		TIOCA2	PIXD2		
N4		P14		MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMRI2/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
N5					USB0_DM		
N6					USB0_DP		

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

Pin No. 144-pin LQFP	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SC1c, SC1d, RSPI, RIIC, CAN, IEB, USB, and PDC)	Interrupt	S12AD AD DA
1	AVSS0						
2		P05				IRQ13	DA1
3	VREFH						
4		P03				IRQ11	DA0
5	VREFL						
6		P02		TMC11	SCK6	IRQ10	AN020
7		P01		TMC10	RXD6/SMISO6/SSCL6	IRQ9	AN019
8		P00		TMR10	TXD6/SMOSI6/SSDA6	IRQ8	AN018
9		PF5				IRQ4	
10	EMLE						
11		PJ5					
12	VSS						
13		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
14	VCL						
15	VBATT						
16	MD/FINED						
17	XCIN						
18	XCOUT						
19	RES#						
20	XTAL	P37					
21	VSS						
22	EXTAL	P36					
23	VCC						
24		P35				NMI	
25	TRST#	P34		MTIOC0A/TMC13/ PO12/POE2#	SCK6/SCK0/ USB0_DPRPD	IRQ4	
26		P33		MTIOC0D/TIOC0D/ TMR13/PO11/POE3#	RXD6/RXD0/SMISO6/ SMISO0/SSCL6/ SSCL0/CRX0/PCKO	IRQ3-DS	
27		P32		MTIOC0C/TIOC0C/ TMO3/PO10/RTCOUT/ RTCIC2	TXD6/TXD0/SMOSI6/ SMOSI0/SSDA6/ SSDA0/CTX0/ USB0_VBUSEN/ VSYNC	IRQ2-DS	
28	TMS	P31		MTIOC4D/TMC12/PO9/ RTCIC1	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
29	TDI	P30		MTIOC4B/TMR13/PO8/ RTCIC0/POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
30	TCK/FINEC	P27	CS7#	MTIOC2B/TMC13/PO7	SCK1/RSPCKB		
31	TDO	P26	CS6#	MTIOC2A/TMO1/PO6	TXD1/CTS3#/RTS3#/ SMOSI1/SS3#/SSDA1/ MOSIB		
32		P25	CS5#/EDACK1	MTIOC4C/MTCLKB/ TIOCA4/PO5	RXD3/SMISO3/SSCL3/ USB0_DPRPD/HSYNC		ADTRG0#
33		P24	CS4#/EDREQ1	MTIOC4A/MTCLKA/ TIOCB4/TMR11/PO4	SCK3/USB0_VBUSEN/ PIXCLK		
34		P23	EDACK0	MTIOC3D/MTCLKD/ TIOC3D/PO3	TXD3/CTS0#/RTS0#/ SMOSI3/SS0#/SSDA3/ USB0_DPUPE/PIXD7		
35		P22	EDREQ0	MTIOC3B/MTCLKC/ TIOCC3/TMO0/PO2	SCK0/USB0_DRPD/ PIXD6		

Table 1.12 List of Pins and Pin Functions (64-Pin LQFP) (2/3)

Pin Number 64-Pin LQFP	Power Supply Clock System Control	I/O Port	Timer (MTU2a, TPUa, TMR, PPG, RTCa, POE2a)	Timer Communications (SClC, SClD, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12ADa, DAa
32		PC2	MTIOC4B/TCLKA/ PO21	RXD5/SMISO5/SSCL5/ SSLA3/IERXD		
33		PB7/ PC1	MTIOC3B/TIOCB5/ PO31	TXD9/SMOSI9/SSDA9		
34		PB6/ PC0	MTIOC3D/TIOCA5/ PO30	RXD9/SMISO9/SSCL9		
35		PB5	MTIOC2A/MTIOC1B/ TIOCB4/TMRI1/PO29/ POE1#	SCK9		
36		PB3	MTIOC0A/MTIOC4A/ TIOCD3/TCLKD/TMO0/ PO27/POE3#	SCK6		
37		PB1	MTIOC0C/MTIOC4C/ TIOCB3/TMCI0/PO25	TXD6/SMOSI6/SSDA6	IRQ4-DS	
38	VCC					
39		PB0	MTIC5W/TIOCA3/PO24	RXD6/SMISO6/SSCL6/ RSPCKA	IRQ12	
40	VSS					
41		PA6	MTIC5V/MTCLKB/ TIOCA2/TMCI3/PO22/ POE2#	CTS5#/RTS5#/SS5#/ MOSIA		
42		PA4	MTIC5U/MTCLKA/ TIOCA1/TMRI0/PO20	TXD5/SMOSI5/SSDA5/ SSLA0	IRQ5-DS	
43		PA3	MTIOC0D/MTCLKD/ TIOCD0/TCLKB/PO19	RXD5/SMISO5/SSCL5	IRQ6-DS	
44		PA1	MTIOC0B/MTCLKC/ TIOCB0/PO17	SCK5/SSLA2/SCL2	IRQ11	
45		PA0	MTIOC4A/TIOCA0/ PO16	SSLA1		
46		PE5	MTIOC4C/MTIOC2B	RSPCKB	IRQ5	AN013
47		PE4	MTIOC4D/MTIOC1A/ PO28	SSLB0		AN012
48		PE3	MTIOC4B/PO26/POE8#	CTS12#/RTS12#/ SS12#/MISOB		AN011
49		PE2	MTIOC4A/PO23	RXD12/SMISO12/ SSCL12/RXDX12/ SSLB3/MOSIB	IRQ7-DS	AN010
50		PE1	MTIOC4C/PO18	TXD12/SMOSI12/SSDA12/ TXDX12/SIOX12/SSLB2/ RSPCKB		AN009
51		PE0		SCK12/SSLB1		AN008
52	VREFL					
53		P46			IRQ14-DS	AN006
54	VREFH					
55		P44			IRQ12-DS	AN004
56		P43			IRQ11-DS	AN003
57		P42			IRQ10-DS	AN002
58		P41			IRQ9-DS	AN001
59	VREFL0					
60		P40			IRQ8-DS	AN000

Table 1.13 List of Pins and Pin Functions (48-Pin LQFP) (1/2)

Pin Number 48-Pin LQFP	Power Supply Clock System Control	I/O Port	Timer (MTU2a, TPUa, TMR, PPG, POE2a)	Communications (SC1c, SC1d, RSPI, RIIC, CAN, IEB, USB)	Interrupt	S12ADa, DAa
1	VCL					
2	MD/FINED					
3	RES#					
4	XTAL	P37				
5	VSS					
6	EXTAL	P36				
7	VCC					
8		P35			NMI	
9		P31	MTIOC4D/TMC12/PO9	CTS1#/RTS1#/SS1#/ SSLB0/USB0_DPUPE	IRQ1-DS	
10		P30	MTIOC4B/TMR13/PO8/ POE8#	RXD1/SMISO1/SSCL1/ MISOB/USB0_DRPD	IRQ0-DS	
11	FINEC	P27	MTIOC2B/TMC13/PO7	SCK1/RSPCKB		
12		P26	MTIOC2A/TMO1/PO6	TXD1/SMOSI1/SSDA1/ MOSIB/USB0_VBUSEN		
13		P17	MTIOC3A/MTIOC3B/ TIOCB0/TCLKD/TMO1/ PO15/POE8#	SCK1/MISOA/SDA2-DS/ IETXD	IRQ7	
14		P16	MTIOC3C/MTIOC3D/ TIOCB1/TCLKC/TMO2/ PO14	TXD1/SMOSI1/SSDA1/ MOSIA/SCL2-DS/IERXD/ USB0_VBUS/ USB0_VBUSEN/ USB0_OVRCURB	IRQ6	ADTRG0#
15		P15	MTIOC0B/MTCLKB/ TIOCB2/TCLKB/TMC12/ PO13	RXD1/SMISO1/SSCL1/ CRX1-DS	IRQ5	
16		P14	MTIOC3A/MTCLKA/ TIOCB5/TCLKA/TMR12/ PO15	CTS1#/RTS1#/SS1#/ CTX1/USB0_DPUPE/ USB0_OVRCURA	IRQ4	
17	VCC_USB					
18				USB0_DM		
19				USB0_DP		
20	VSS_USB					
21		PC7	MTIOC3A/MTCLKB/ TMO2 /PO31	TXD8/SMOSI8/SSDA8/ MISOA	IRQ14	
22		PC6	MTIOC3C/MTCLKA/ TMC12/PO30	RXD8/SMISO8/SSCL8/ MOSIA/USB0_EXICEN	IRQ13	
23		PC5	MTIOC3B/MTCLKD/ TMR12/PO29	SCK8/RSPCKA/USB0_ID		
24		PC4	MTIOC3D/MTCLKC/ TMC11/PO25/POE0#	SCK5/CTS8#/RTS8#/SS8#/ /SSLA0/ USB0_DPRPD		
25		PB5/ PC3	MTIOC2A/MTIOC1B/ TIOCB4/TMR11/PO29/ POE1#			
26		PB3/ PC2	MTIOC0A/MTIOC4A/ TIOC3D/TCLKD/TMO0/ PO27/POE3#	SCK6		
27		PB1/ PC1	MTIOC0C/MTIOC4C/ TIOCB3/TMC10/PO25	TXD6/SMOSI6/SSDA6	IRQ4-DS	
28	VCC					

Table 4.1 List of I/O Registers (Address Order) (6/50)

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

Table 4.1 List of I/O Registers (Address Order) (12/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 7322h	ICU	Interrupt source priority register 034	IPR034	8	8	2	ICLK	ICUb
0008 7323h	ICU	Interrupt source priority register 035	IPR035	8	8	2	ICLK	
0008 7324h	ICU	Interrupt source priority register 036	IPR036	8	8	2	ICLK	
0008 7325h	ICU	Interrupt source priority register 037	IPR037	8	8	2	ICLK	
0008 7326h	ICU	Interrupt source priority register 038	IPR038	8	8	2	ICLK	
0008 7327h	ICU	Interrupt source priority register 039	IPR039	8	8	2	ICLK	
0008 732Ah	ICU	Interrupt source priority register 042	IPR042	8	8	2	ICLK	
0008 732Dh	ICU	Interrupt source priority register 045	IPR045	8	8	2	ICLK	
0008 7330h	ICU	Interrupt source priority register 048	IPR048	8	8	2	ICLK	
0008 7334h	ICU	Interrupt source priority register 052	IPR052	8	8	2	ICLK	
0008 7338h	ICU	Interrupt source priority register 056	IPR056	8	8	2	ICLK	
0008 733Eh	ICU	Interrupt source priority register 062	IPR062	8	8	2	ICLK	
0008 7340h	ICU	Interrupt source priority register 064	IPR064	8	8	2	ICLK	
0008 7341h	ICU	Interrupt source priority register 065	IPR065	8	8	2	ICLK	
0008 7342h	ICU	Interrupt source priority register 066	IPR066	8	8	2	ICLK	
0008 7343h	ICU	Interrupt source priority register 067	IPR067	8	8	2	ICLK	
0008 7344h	ICU	Interrupt source priority register 068	IPR068	8	8	2	ICLK	
0008 7345h	ICU	Interrupt source priority register 069	IPR069	8	8	2	ICLK	
0008 7346h	ICU	Interrupt source priority register 070	IPR070	8	8	2	ICLK	
0008 7347h	ICU	Interrupt source priority register 071	IPR071	8	8	2	ICLK	
0008 7348h	ICU	Interrupt source priority register 072	IPR072	8	8	2	ICLK	
0008 7349h	ICU	Interrupt source priority register 073	IPR073	8	8	2	ICLK	
0008 734Ah	ICU	Interrupt source priority register 074	IPR074	8	8	2	ICLK	
0008 734Bh	ICU	Interrupt source priority register 075	IPR075	8	8	2	ICLK	
0008 734Ch	ICU	Interrupt source priority register 076	IPR076	8	8	2	ICLK	
0008 734Dh	ICU	Interrupt source priority register 077	IPR077	8	8	2	ICLK	
0008 734Eh	ICU	Interrupt source priority register 078	IPR078	8	8	2	ICLK	
0008 734Fh	ICU	Interrupt source priority register 079	IPR079	8	8	2	ICLK	
0008 735Ah	ICU	Interrupt source priority register 090	IPR090	8	8	2	ICLK	
0008 735Bh	ICU	Interrupt source priority register 091	IPR091	8	8	2	ICLK	
0008 735Ch	ICU	Interrupt source priority register 092	IPR092	8	8	2	ICLK	
0008 735Dh	ICU	Interrupt source priority register 093	IPR093	8	8	2	ICLK	
0008 7362h	ICU	Interrupt source priority register 098	IPR098	8	8	2	ICLK	
0008 7366h	ICU	Interrupt source priority register 102	IPR102	8	8	2	ICLK	
0008 736Ah	ICU	Interrupt source priority register 106	IPR106	8	8	2	ICLK	
0008 736Bh	ICU	Interrupt source priority register 107	IPR107	8	8	2	ICLK	
0008 736Ch	ICU	Interrupt source priority register 108	IPR108	8	8	2	ICLK	
0008 736Dh	ICU	Interrupt source priority register 109	IPR109	8	8	2	ICLK	
0008 736Eh	ICU	Interrupt source priority register 110	IPR110	8	8	2	ICLK	
0008 736Fh	ICU	Interrupt source priority register 111	IPR111	8	8	2	ICLK	
0008 7370h	ICU	Interrupt source priority register 112	IPR112	8	8	2	ICLK	
0008 7372h	ICU	Interrupt source priority register 114	IPR114	8	8	2	ICLK	
0008 737Ah	ICU	Interrupt source priority register 122	IPR122	8	8	2	ICLK	
0008 737Eh	ICU	Interrupt source priority register 126	IPR126	8	8	2	ICLK	
0008 7382h	ICU	Interrupt source priority register 130	IPR130	8	8	2	ICLK	
0008 7384h	ICU	Interrupt source priority register 132	IPR132	8	8	2	ICLK	
0008 7386h	ICU	Interrupt source priority register 134	IPR134	8	8	2	ICLK	
0008 738Ah	ICU	Interrupt source priority register 138	IPR138	8	8	2	ICLK	
0008 738Ch	ICU	Interrupt source priority register 140	IPR140	8	8	2	ICLK	
0008 738Eh	ICU	Interrupt source priority register 142	IPR142	8	8	2	ICLK	
0008 7392h	ICU	Interrupt source priority register 146	IPR146	8	8	2	ICLK	

Table 4.1 List of I/O Registers (Address Order) (15/50)

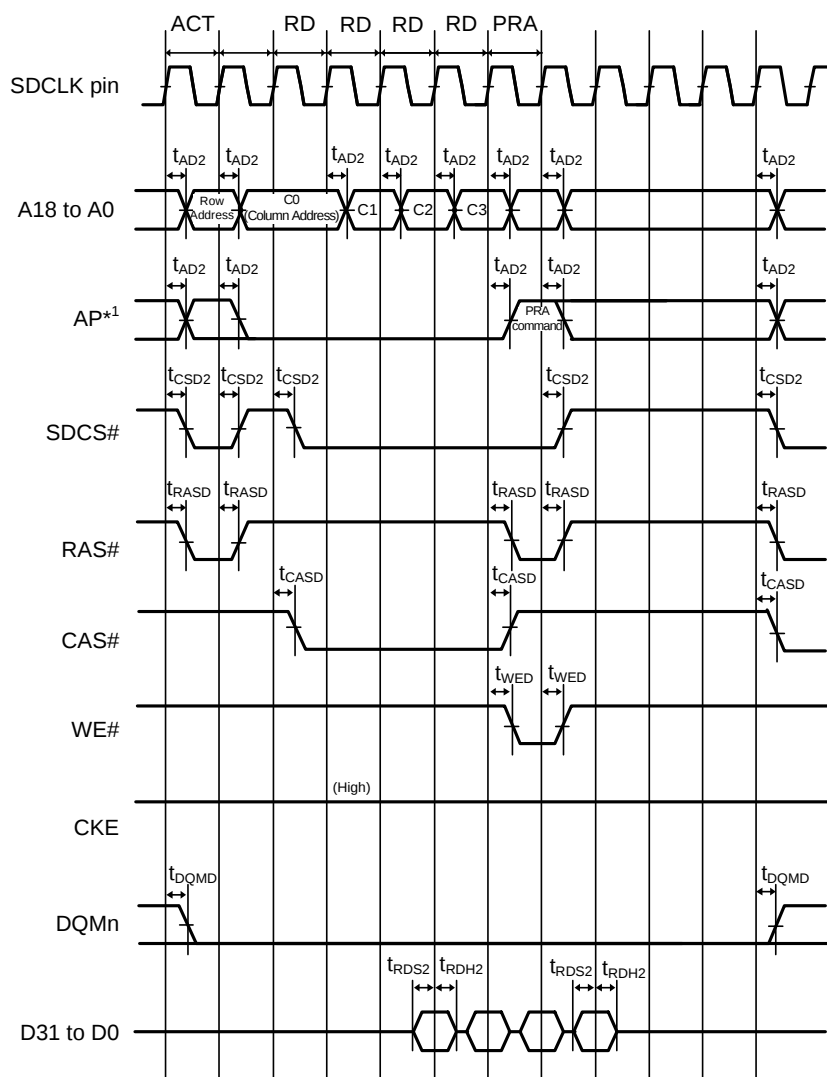
Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 8036h	IWDT	IWDT reset control register	IWDTRCR	8	8	2, 3 PCLKB	2 ICLK	IWDTa
0008 8038h	IWDT	IWDT count stop control register	IWDTCSTPR	8	8	2, 3 PCLKB	2 ICLK	
0008 80C0h	DA	D/A data register 0	DADR0	16	16	2, 3 PCLKB	2 ICLK	DAa
0008 80C2h	DA	D/A data register 1	DADR1	16	16	2, 3 PCLKB	2 ICLK	
0008 80C4h	DA	D/A control register	DACR	8	8	2, 3 PCLKB	2 ICLK	
0008 80C5h	DA	DADRM format select register	DADPR	8	8	2, 3 PCLKB	2 ICLK	
0008 80C6h	DA	D/A A/D synchronous start control register	DAADSCR	8	8	2, 3 PCLKB	2 ICLK	
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	
0008 8108h	TPU0	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8109h	TPU1	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 810Ah	TPU2	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 810Bh	TPU3	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 810Ch	TPU4	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 810Dh	TPU5	Noise filter control register	NFCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8110h	TPU0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8111h	TPU0	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8112h	TPU0	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK	
0008 8113h	TPU0	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK	
0008 8114h	TPU0	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8115h	TPU0	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8116h	TPU0	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8118h	TPU0	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 811Ah	TPU0	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	
0008 811Ch	TPU0	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK	
0008 811Eh	TPU0	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK	
0008 8120h	TPU1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8121h	TPU1	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8122h	TPU1	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK	
0008 8124h	TPU1	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8125h	TPU1	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8126h	TPU1	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8128h	TPU1	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 812Ah	TPU1	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	
0008 8130h	TPU2	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8131h	TPU2	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8132h	TPU2	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK	
0008 8134h	TPU2	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8135h	TPU2	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8136h	TPU2	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8138h	TPU2	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 813Ah	TPU2	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	
0008 8140h	TPU3	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8141h	TPU3	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8142h	TPU3	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK	
0008 8143h	TPU3	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK	
0008 8144h	TPU3	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8145h	TPU3	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8146h	TPU3	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8148h	TPU3	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 814Ah	TPU3	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	

Table 4.1 List of I/O Registers (Address Order) (19/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 8313h	RIIC0	I ² C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK	RIIC
0008 8320h	RIIC1	I ² C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8321h	RIIC1	I ² C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8322h	RIIC1	I ² C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8323h	RIIC1	I ² C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8324h	RIIC1	I ² C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK	
0008 8325h	RIIC1	I ² C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK	
0008 8326h	RIIC1	I ² C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK	
0008 8327h	RIIC1	I ² C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8328h	RIIC1	I ² C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8329h	RIIC1	I ² C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK	
0008 832Ah	RIIC1	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK	
0008 832Ah	RIIC1	Timeout Internal Counter L	TMOCNTL	8	8	2, 3 PCLKB	2 ICLK	
0008 832Bh	RIIC1	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK	
0008 832Bh	RIIC1	Timeout Internal Counter U	TMOCNTU	8	8	2, 3 PCLKB	2 ICLK	
0008 832Ch	RIIC1	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK	
0008 832Dh	RIIC1	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK	
0008 832Eh	RIIC1	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK	
0008 832Fh	RIIC1	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK	
0008 8330h	RIIC1	I ² C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK	
0008 8331h	RIIC1	I ² C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK	
0008 8332h	RIIC1	I ² C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK	
0008 8333h	RIIC1	I ² C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK	
0008 8340h	RIIC2	I ² C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8341h	RIIC2	I ² C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8342h	RIIC2	I ² C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8343h	RIIC2	I ² C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8344h	RIIC2	I ² C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK	
0008 8345h	RIIC2	I ² C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK	
0008 8346h	RIIC2	I ² C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK	
0008 8347h	RIIC2	I ² C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8348h	RIIC2	I ² C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8349h	RIIC2	I ² C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK	
0008 834Ah	RIIC2	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK	
0008 834Bh	RIIC2	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK	
0008 834Ch	RIIC2	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK	
0008 834Dh	RIIC2	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK	
0008 834Eh	RIIC2	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK	
0008 834Fh	RIIC2	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK	
0008 8350h	RIIC2	I ² C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK	
0008 8351h	RIIC2	I ² C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK	
0008 8352h	RIIC2	I ² C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK	
0008 8353h	RIIC2	I ² C bus receive data register	ICDRR	8	8	2, 3 PCLKB	2 ICLK	
0008 8360h	RIIC3	I ² C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8361h	RIIC3	I ² C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8362h	RIIC3	I ² C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8363h	RIIC3	I ² C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8364h	RIIC3	I ² C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK	
0008 8365h	RIIC3	I ² C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK	
0008 8366h	RIIC3	I ² C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK	
0008 8367h	RIIC3	I ² C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK	

Table 4.1 List of I/O Registers (Address Order) (22/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 862Ah	MTU4	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK	MTU2a
0008 862Ch	MTU3	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 862Dh	MTU4	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8630h	MTU	Timer interrupt skipping set register	TITCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8631h	MTU	Timer interrupt skipping counter	TITCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 8632h	MTU	Timer buffer transfer set register	TBTER	8	8	2, 3 PCLKB	2 ICLK	
0008 8634h	MTU	Timer dead time enable register	TDER	8	8	2, 3 PCLKB	2 ICLK	
0008 8636h	MTU	Timer output level buffer register	TOLBR	8	8	2, 3 PCLKB	2 ICLK	
0008 8638h	MTU3	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK	
0008 8639h	MTU4	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK	
0008 8640h	MTU4	Timer A/D converter start request control register	TADCR	16	16	2, 3 PCLKB	2 ICLK	
0008 8644h	MTU4	Timer A/D converter start request cycle set register A	TADCORA	16	16	2, 3 PCLKB	2 ICLK	
0008 8646h	MTU4	Timer A/D converter start request cycle set register B	TADCORB	16	16	2, 3 PCLKB	2 ICLK	
0008 8648h	MTU4	Timer A/D converter start request cycle set buffer register A	TADCOBRA	16	16	2, 3 PCLKB	2 ICLK	
0008 864Ah	MTU4	Timer A/D converter start request cycle set buffer register B	TADCOBRB	16	16	2, 3 PCLKB	2 ICLK	
0008 8660h	MTU	Timer waveform control register	TWCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8680h	MTU	Timer start register	TSTR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8681h	MTU	Timer synchronous register	TSYR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8684h	MTU	Timer read/write enable register	TRWER	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8690h	MTU0	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8691h	MTU1	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8692h	MTU2	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8693h	MTU3	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8694h	MTU4	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8695h	MTU5	Noise filter control register	NFCR	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 8700h	MTU0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8701h	MTU0	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8702h	MTU0	Timer I/O control register H	TIORH	8	8	2, 3 PCLKB	2 ICLK	
0008 8703h	MTU0	Timer I/O control register L	TIORL	8	8	2, 3 PCLKB	2 ICLK	
0008 8704h	MTU0	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8705h	MTU0	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8706h	MTU0	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8708h	MTU0	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 870Ah	MTU0	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	
0008 870Ch	MTU0	Timer general register C	TGRC	16	16	2, 3 PCLKB	2 ICLK	
0008 870Eh	MTU0	Timer general register D	TGRD	16	16	2, 3 PCLKB	2 ICLK	
0008 8720h	MTU0	Timer general register E	TGRE	16	16	2, 3 PCLKB	2 ICLK	
0008 8722h	MTU0	Timer general register F	TGRF	16	16	2, 3 PCLKB	2 ICLK	
0008 8724h	MTU0	Timer interrupt enable register2	TIER2	8	8	2, 3 PCLKB	2 ICLK	
0008 8726h	MTU0	Timer buffer operation transfer mode register	TBTM	8	8	2, 3 PCLKB	2 ICLK	
0008 8780h	MTU1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8781h	MTU1	Timer mode register	TMDR	8	8	2, 3 PCLKB	2 ICLK	
0008 8782h	MTU1	Timer I/O control register	TIOR	8	8	2, 3 PCLKB	2 ICLK	
0008 8784h	MTU1	Timer interrupt enable register	TIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8785h	MTU1	Timer status register	TSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8786h	MTU1	Timer counter	TCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 8788h	MTU1	Timer general register A	TGRA	16	16	2, 3 PCLKB	2 ICLK	
0008 878Ah	MTU1	Timer general register B	TGRB	16	16	2, 3 PCLKB	2 ICLK	
0008 8790h	MTU1	Timer input capture control register	TICCR	8	8	2, 3 PCLKB	2 ICLK	



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

Figure 5.26 SDRAM Space Multiple Read Bus Timing

Table 5.21 Timing of On-Chip Peripheral Modules (3)

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

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

Note 1. When operation at 3.0 V or a lower voltage is needed, please contact a Renesas sales office.

Note 2. t_{Pcyc} : PCLK cycle

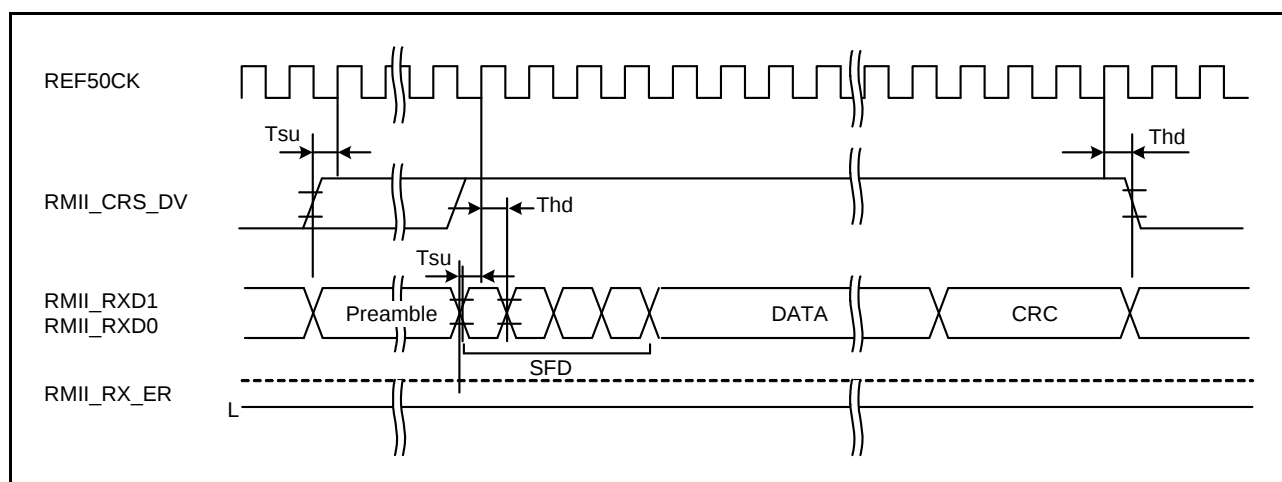


Figure 5.50 RMII Reception Timing (Normal Operation)

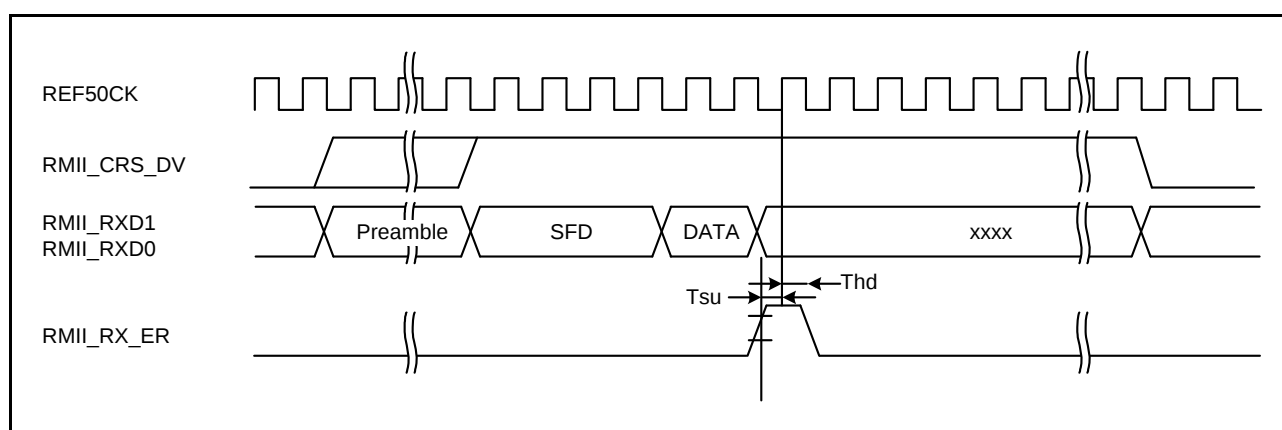


Figure 5.51 RMII Reception Timing (Error Occurrence)

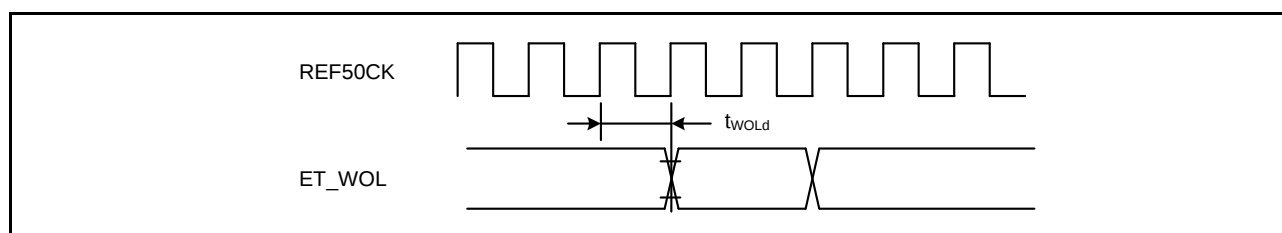


Figure 5.52 WOL Output Timing (RMII)

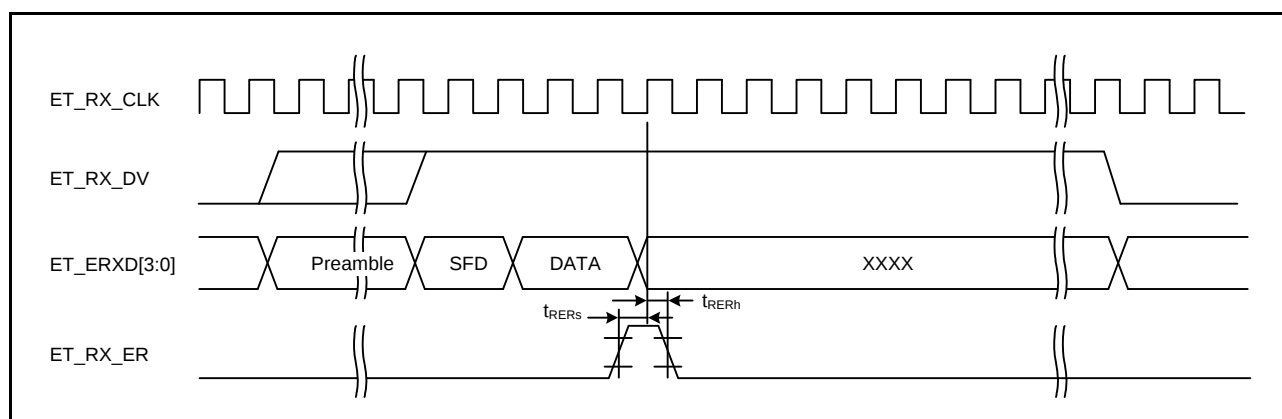


Figure 5.56 MII Reception Timing (Error Occurrence)

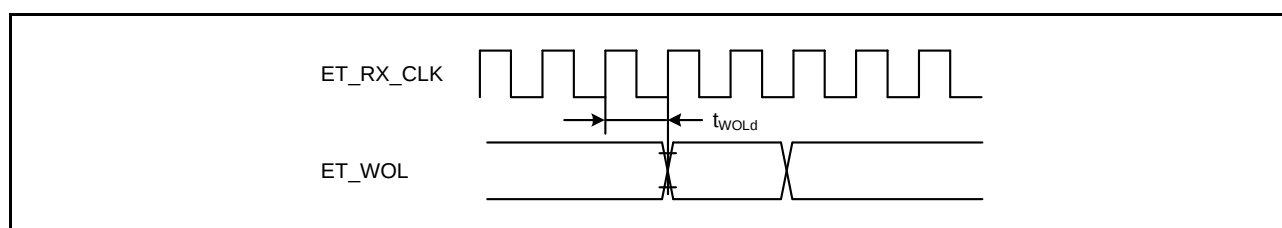


Figure 5.57 WOL Output Timing (MII)

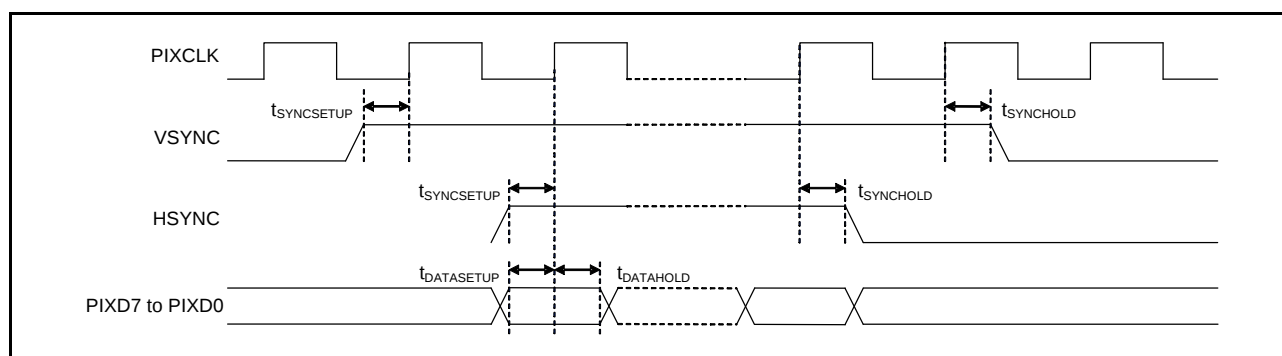


Figure 5.58 PDC Timing

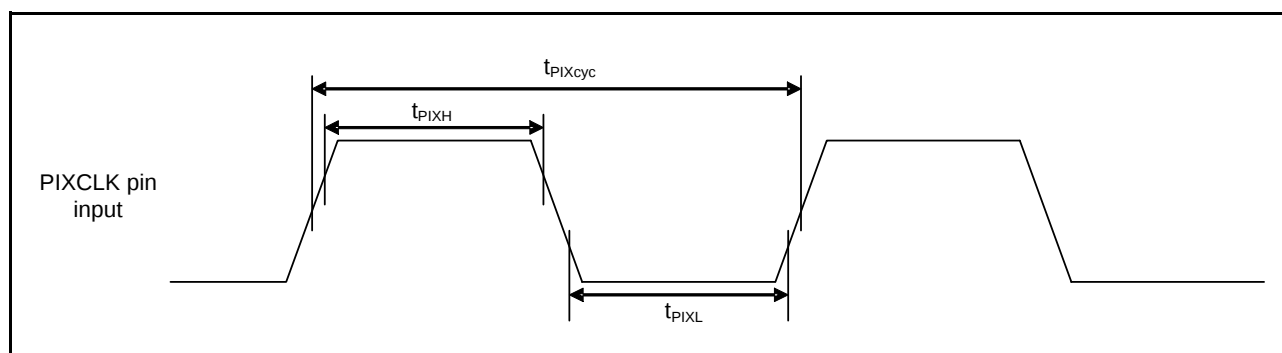
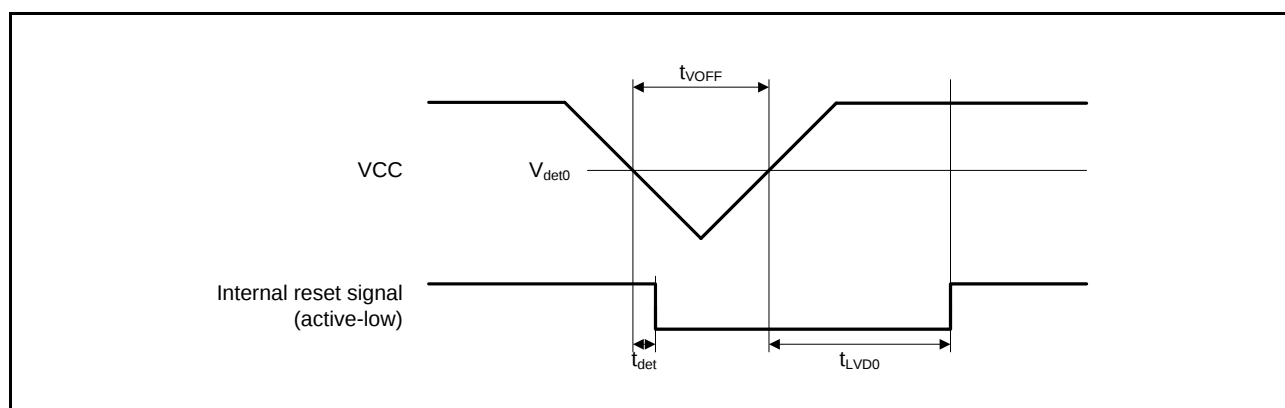
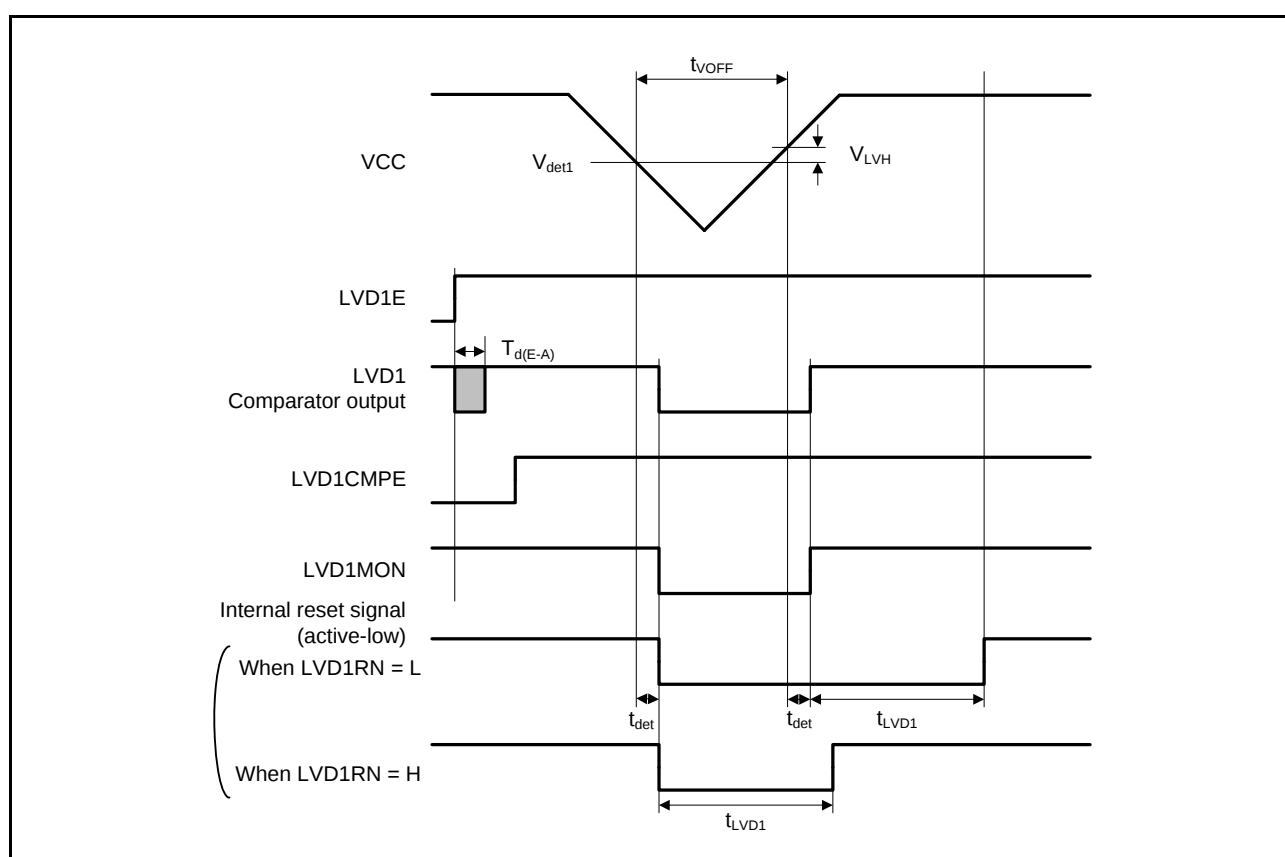


Figure 5.59 PDC Input Clock Characteristic

Figure 5.64 Voltage Detection Circuit Timing (V_{det0})Figure 5.65 Voltage Detection Circuit Timing (V_{det1})

5.9 Oscillation Stop Detection Timing

Table 5.34 Oscillation Stop Detection Circuit Characteristics

Conditions: $V_{CC} = AV_{CC0} = V_{REFH} = V_{CC_USB} = V_{BATT} = 2.7$ to 3.6 V, $V_{REFH0} = 2.7$ V to AV_{CC0}
 $V_{SS} = AV_{SS0} = V_{REFL}/V_{REFL0} = V_{SS_USB} = 0$ V
 $T_a = T_{opr}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Detection time	t_{dr}	—	—	1	ms	Figure 5.67

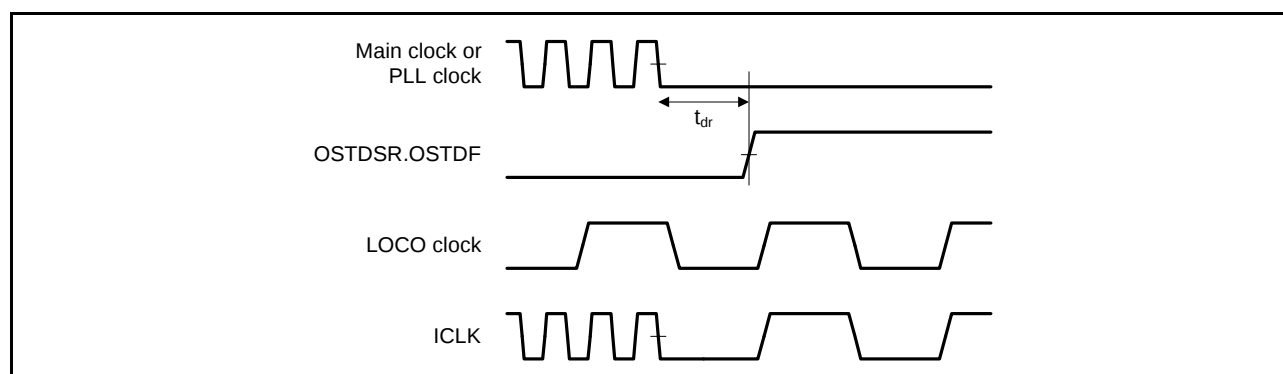


Figure 5.67 Oscillation Stop Detection Timing