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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	Discontinued at Digi-Key
Core Processor	RX
Core Size	32-Bit Single-Core
Speed	100MHz
Connectivity	CANbus, EBI/EMI, Ethernet, I ² C, LINbus, SCI, SPI, USB
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	78
Program Memory Size	2MB (2M 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, 14x12b; D/A 1x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	100-LQFP
Supplier Device Package	100-LFQFP (14x14)
Purchase URL	https://www.e-xfl.com/product-detail/renesas-electronics-america/r5f563neddfp-v0

Table 1.3 List of Products (2/8)

Group	Part No.	Package	ROM Capacity	RAM Capacity	E2 Data Flash	Operating Frequency (Max.)	Operating Temp. Range
RX63N (D version)	R5F563NDDDLK	PTLG0145KA-A	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBCDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBDDLK	PTLG0145KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NACDLK	PTLG0145KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NADDLK	PTLG0145KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NFHDFB	PLQP0144KA-A	2 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NFDDFB	PLQP0144KA-A	2 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NKHDFB	PLQP0144KA-A*1	2 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NKDDFB	PLQP0144KA-A	2 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NECDFB	PLQP0144KA-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NEDDFB	PLQP0144KA-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NJHDFB	PLQP0144KA-A*1	1.5 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NJDDFB	PLQP0144KA-A*1	1.5 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NGHDFB	PLQP0144KA-A*1	1.5 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NGDDFB	PLQP0144KA-A*1	1.5 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDCDFB	PLQP0144KA-A	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDDDFB	PLQP0144KA-A	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NYHDFB	PLQP0144KA-A	1 Mbyte	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NYDDFB	PLQP0144KA-A	1 Mbyte	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NWHDFB	PLQP0144KA-A	1 Mbyte	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NWDDFB	PLQP0144KA-A	1 Mbyte	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBCDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBDDFB	PLQP0144KA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NACDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NADDFB	PLQP0144KA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NECDLJ	PTLG0100JA-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NEDDLJ	PTLG0100JA-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDCDLJ	PTLG0100JA-A*1	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDDDLJ	PTLG0100JA-A*1	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBCDLJ	PTLG0100JA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NBDDLJ	PTLG0100JA-A	1 Mbyte	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NACDLJ	PTLG0100JA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NADDLJ	PTLG0100JA-A	768 Kbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NFHDFP	PLQP0100KB-A	2 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NFDDFP	PLQP0100KB-A	2 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NKHDFP	PLQP0100KB-A*1	2 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NKDDFP	PLQP0100KB-A	2 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NECDFP	PLQP0100KB-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NEDDFP	PLQP0100KB-A	2 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NJHDFP	PLQP0100KB-A*1	1.5 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NJDDFP	PLQP0100KB-A*1	1.5 Mbytes	256 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NGHDFP	PLQP0100KB-A*1	1.5 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NGDDFP	PLQP0100KB-A*1	1.5 Mbytes	192 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDCDFP	PLQP0100KB-A	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C
	R5F563NDDDFP	PLQP0100KB-A	1.5 Mbytes	128 Kbytes	32 Kbytes	100 MHz	-40 to +85°C

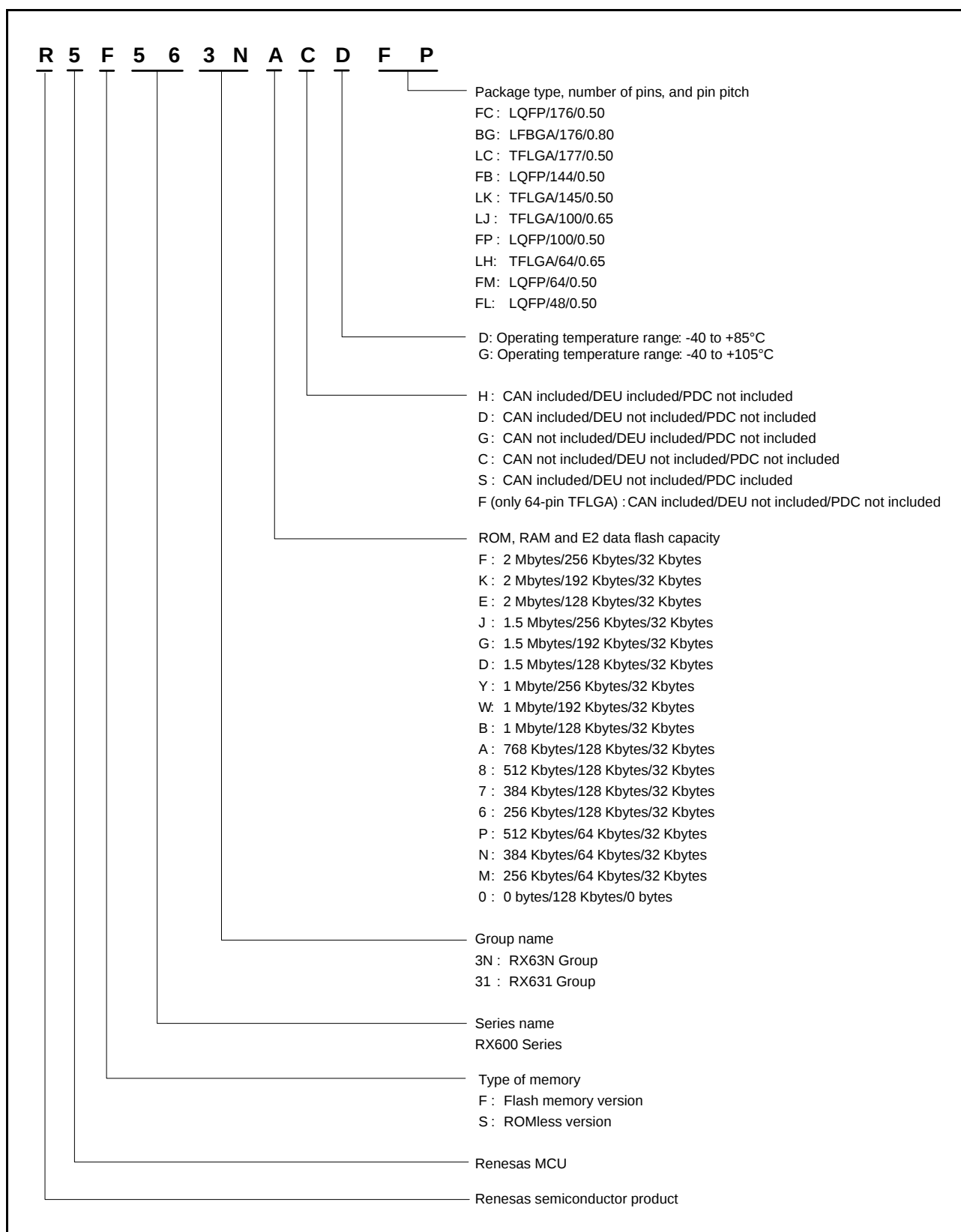
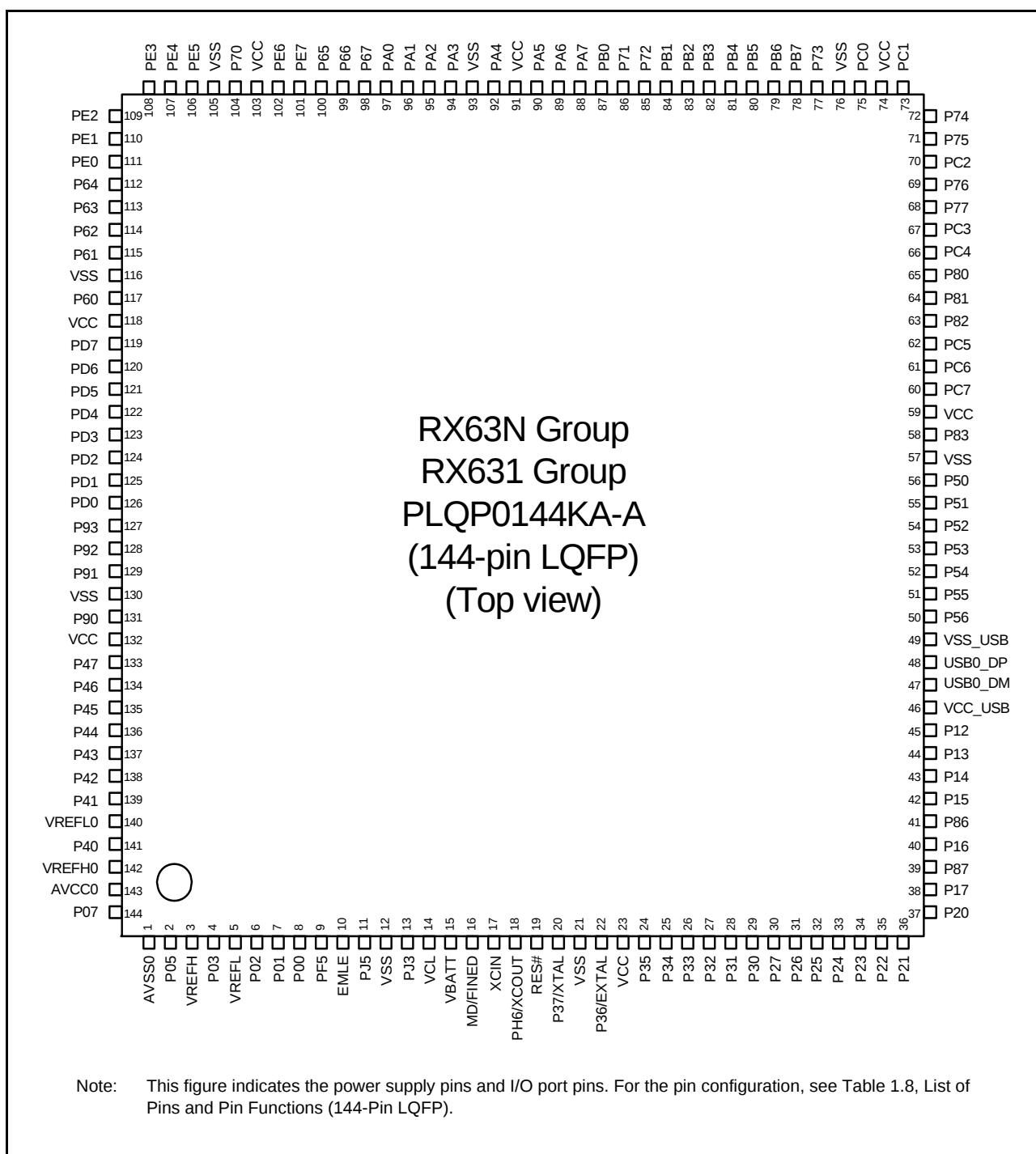


Figure 1.1 How to Read the Product Part No.

**Figure 1.7 Pin Assignment (144-Pin LQFP)**

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)

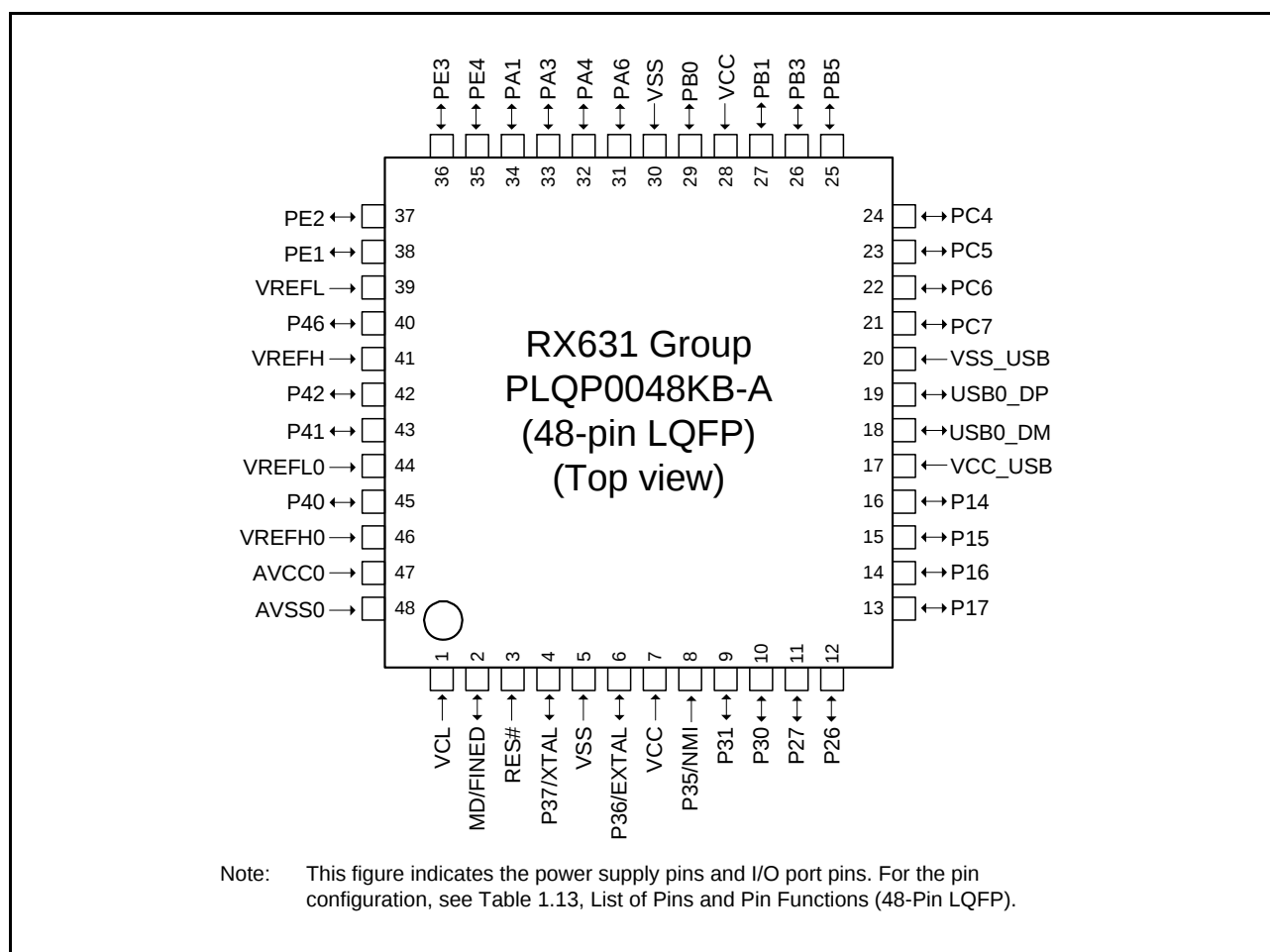


Figure 1.12 Pin Assignment (48-Pin LQFP)

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

Pin Number 177-Pin TFLGA 176-Pin LFBGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timer (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SCIC, SCID, RSPI, RIIC, CAN, IEB, USB, and PDC)	Interrupt	S12AD, AD, DA
C14	VSS						
C15	SDCLK	P70					
D1		P01		TMC10	RXD6/SMISO6/SSCL6	IRQ9	AN019
D2		P02		TMC11	SCK6	IRQ10	AN020
D3		P03				IRQ11	DA0
D4		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
D5		P44				IRQ12-DS	AN004
D6		P93	A19/D19		CTS7#/RTS7#/SS7#		AN017
D7		P95	A21/D21				
D8	VSS						
D9		PD5	D5[A5/D5]	MTIC5W/POE2#	SSLC1	IRQ5	AN013
D10		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
D11		P61	CS1#/SDCS#				
D12		PE5	D13[A13/D13]	MTIOC4C/MTIOC2B/ TIOCB10	ET_RX_CLK/REF50CK/ RSPCKB	IRQ5	AN3
D13	VCC						
D14		PE7	D15[A15/D15]	TIOCB11	MISOB	IRQ7	AN5
D15		P65	CS5#/CKE				
E1		PJ5					
E2	EMLE						
E3		PF5				IRQ4	
E4	VSS						
E5*1	NC						
E12		PE6	D14[A14/D14]	TIOCA11	MOSIB	IRQ6	AN4
E13	TRDATA0	PG2	D26				
E14	TRDATA1	PG3	D27				
E15		P67	CS7#/DQM1		CRX2*3	IRQ15	
F1	VBATT						
F2	VCL						
F3		PJ3		MTIOC3C	CTS6#/RTS6#/CTS0#/ RTS0#/SS6#/SS0#		
F4	BSCANP						
F12		P66	CS6#/DQM0		CTX2*3		
F13	TRSYNC	PG4	D28				
F14		PA0	A0/BC0#/DQM2	MTIOC4A/TIOCA0/PO16	ET_TX_EN/ RMII_TXD_EN/SSLA1		
F15	VSS						
G1	XCIN						
G2	XCOUT						
G3	MD/FINED						
G4	TRST#	PF4					
G12	TRCLK	PG5	D29				
G13	TRDATA2	PG6	D30				
G14		PA1	A1/DQM3	MTIOC0B/MTCLKC/ TIOCB0/PO17	ET_WOL/SCK5/SSLA2	IRQ11	
G15	VCC						
H1	XTAL	P37					
H2	VSS						

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

Pin No. 145-pin TFLGA	Power Supply Clock System Control	I/O Port	Bus EXDMAC SDRAMC	Timers (MTU, TPU, TMR, PPG, RTC, POE)	Communications (ETHERC, SC1c, SC1d, RSPI, RIIC, CAN, IEB, USB, and PDC)	Interrupt	S12AD AD DA
A1	AVSS0						
A2		P07				IRQ15	ADTRG0#
A3		P40				IRQ8-DS	AN000
A4		P42				IRQ10-DS	AN002
A5		P45				IRQ13-DS	AN005
A6		P90	A16		TXD7/SMOSI7/SSDA7		AN014
A7		P92	A18		RXD7/SMISO7/SSCL7		AN016
A8		PD2	D2[A2/D2]	MTIOC4D/TIOCA8	MISOC/CRX0	IRQ2	AN010
A9		PD6	D6[A6/D6]	MTIC5V/POE1#	SSLC2	IRQ6	AN6
A10	VSS						
A11		P62	CS2#/RAS#				
A12		PE1	D9[A9/D9]	MTIOC4C/TIOCD9/ PO18	TXD12/SMOSI12/SSDA12/ TXDX12/SIOX12/SSLB2/ RSPCKB		ANEX1
A13		PE3	D11[A11/D11]	MTIOC4B/TIOCB9/ PO26/POE8#	CTS12#/RTS12#/SS12#/ MISOB/ET_ERXD3		AN1
B1	VREFH						
B2	AVCC0						
B3		P05				IRQ13	DA1
B4	VREFL0						
B5		P43				IRQ11-DS	AN003
B6		P47				IRQ15-DS	AN007
B7		P91	A17		SCK7		AN015
B8		PD0	D0[A0/D0]	TIOCA7		IRQ0	AN008
B9		PD4	D4[A4/D4]	POE3#	SSLC0	IRQ4	AN012
B10	VCC						
B11		P61	CS1#/SDCS#				
B12		PE2	D10[A10/D10]	MTIOC4A/TIOCA9/ PO23	RXD12/SMISO12/SSCL12/ RXDX12/SSLB3/MOSIB	IRQ7-DS	AN0
B13		PE4	D12[A12/D12]	MTIOC4D/MTIOC1A/ TIOCA10/PO28	SSLB0/ET_ERXD2		AN2
C1	VREFL						
C2		P02		TMC11	SCK6	IRQ10	AN020
C3	VREFH0						
C4		P41				IRQ9-DS	AN001
C5		P46				IRQ14-DS	AN006
C6	VSS						
C7		PD1	D1[A1/D1]	MTIOC4B/TIOCB7/ TCLKG	MOSIC/CTX0	IRQ1	AN009
C8		PD3	D3[A3/D3]	TIOCB8/TCLKH/POE8#	RSPCKC	IRQ3	AN011
C9		PD7	D7[A7/D7]	MTIC5U/POE0#	SSLC3	IRQ7	AN7
C10		P63	CS3#/CAS#				
C11		PE0	D8[A8/D8]	TIOCC9	SCK12/SSLB1		ANEX0
C12	SDCLK	P70					
C13	VSS						
D1		P00		TMRI0	TXD6/SMOSI6/SSDA6	IRQ8	AN018
D2		PF5				IRQ4	
D3		P03				IRQ11	DA0
D4		P01		TMC10	RXD6/SMISO6/SSCL6	IRQ9	AN019

Table 4.1 List of I/O Registers (Address Order) (2/50)

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

Table 4.1 List of I/O Registers (Address Order) (10/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 719Ch	ICU	DTC activation enable register 156	DTCER156	8	8	2	ICLK	ICUb
0008 719Dh	ICU	DTC activation enable register 157	DTCER157	8	8	2	ICLK	
0008 719Eh	ICU	DTC activation enable register 158	DTCER158	8	8	2	ICLK	
0008 719Fh	ICU	DTC activation enable register 159	DTCER159	8	8	2	ICLK	
0008 71A0h	ICU	DTC activation enable register 160	DTCER160	8	8	2	ICLK	
0008 71A1h	ICU	DTC activation enable register 161	DTCER161	8	8	2	ICLK	
0008 71A2h	ICU	DTC activation enable register 162	DTCER162	8	8	2	ICLK	
0008 71A3h	ICU	DTC activation enable register 163	DTCER163	8	8	2	ICLK	
0008 71A4h	ICU	DTC activation enable register 164	DTCER164	8	8	2	ICLK	
0008 71A5h	ICU	DTC activation enable register 165	DTCER165	8	8	2	ICLK	
0008 71AAh	ICU	DTC activation enable register 170	DTCER170	8	8	2	ICLK	
0008 71ABh	ICU	DTC activation enable register 171	DTCER171	8	8	2	ICLK	
0008 71ADh	ICU	DTC activation enable register 173	DTCER173	8	8	2	ICLK	
0008 71AEh	ICU	DTC activation enable register 174	DTCER174	8	8	2	ICLK	
0008 71B0h	ICU	DTC activation enable register 176	DTCER176	8	8	2	ICLK	
0008 71B1h	ICU	DTC activation enable register 177	DTCER177	8	8	2	ICLK	
0008 71B3h	ICU	DTC activation enable register 179	DTCER179	8	8	2	ICLK	
0008 71B4h	ICU	DTC activation enable register 180	DTCER180	8	8	2	ICLK	
0008 71B7h	ICU	DTC activation enable register 183	DTCER183	8	8	2	ICLK	
0008 71B8h	ICU	DTC activation enable register 184	DTCER184	8	8	2	ICLK	
0008 71BBh	ICU	DTC activation enable register 187	DTCER187	8	8	2	ICLK	
0008 71BCh	ICU	DTC activation enable register 188	DTCER188	8	8	2	ICLK	
0008 71BFh	ICU	DTC activation enable register 191	DTCER191	8	8	2	ICLK	
0008 71C0h	ICU	DTC activation enable register 192	DTCER192	8	8	2	ICLK	
0008 71C3h	ICU	DTC activation enable register 195	DTCER195	8	8	2	ICLK	
0008 71C4h	ICU	DTC activation enable register 196	DTCER196	8	8	2	ICLK	
0008 71C6h	ICU	DTC activation enable register 198	DTCER198	8	8	2	ICLK	
0008 71C7h	ICU	DTC activation enable register 199	DTCER199	8	8	2	ICLK	
0008 71C8h	ICU	DTC activation enable register 200	DTCER200	8	8	2	ICLK	
0008 71C9h	ICU	DTC activation enable register 201	DTCER201	8	8	2	ICLK	
0008 71CAh	ICU	DTC activation enable register 202	DTCER202	8	8	2	ICLK	
0008 71CBh	ICU	DTC activation enable register 203	DTCER203	8	8	2	ICLK	
0008 71CEh	ICU	DTC activation enable register 206	DTCER206	8	8	2	ICLK	
0008 71CFh	ICU	DTC activation enable register 207	DTCER207	8	8	2	ICLK	
0008 71D0h	ICU	DTC activation enable register 208	DTCER208	8	8	2	ICLK	
0008 71D6h	ICU	DTC activation enable register 214	DTCER214	8	8	2	ICLK	
0008 71D7h	ICU	DTC activation enable register 215	DTCER215	8	8	2	ICLK	
0008 71D9h	ICU	DTC activation enable register 217	DTCER217	8	8	2	ICLK	
0008 71DAh	ICU	DTC activation enable register 218	DTCER218	8	8	2	ICLK	
0008 71DCh	ICU	DTC activation enable register 220	DTCER220	8	8	2	ICLK	
0008 71DDh	ICU	DTC activation enable register 221	DTCER221	8	8	2	ICLK	
0008 71DFh	ICU	DTC activation enable register 223	DTCER223	8	8	2	ICLK	
0008 71E0h	ICU	DTC activation enable register 224	DTCER224	8	8	2	ICLK	
0008 71E2h	ICU	DTC activation enable register 226	DTCER226	8	8	2	ICLK	
0008 71E3h	ICU	DTC activation enable register 227	DTCER227	8	8	2	ICLK	
0008 71E5h	ICU	DTC activation enable register 229	DTCER229	8	8	2	ICLK	
0008 71E6h	ICU	DTC activation enable register 230	DTCER230	8	8	2	ICLK	
0008 71E8h	ICU	DTC activation enable register 232	DTCER232	8	8	2	ICLK	
0008 71E9h	ICU	DTC activation enable register 233	DTCER233	8	8	2	ICLK	
0008 71EBh	ICU	DTC activation enable register 235	DTCER235	8	8	2	ICLK	
0008 71ECh	ICU	DTC activation enable register 236	DTCER236	8	8	2	ICLK	

Table 4.1 List of I/O Registers (Address Order) (18/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 8200h	TMR0	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	TMR
0008 8201h	TMR1	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8202h	TMR0	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8203h	TMR1	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8204h	TMR0	Time constant register A	TCORA	8	8	2, 3 PCLKB	2 ICLK	
0008 8205h	TMR1	Time constant register A	TCORA	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 8206h	TMR0	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK	
0008 8207h	TMR1	Time constant register B	TCORB	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 8208h	TMR0	Timer counter	TCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 8209h	TMR1	Timer counter	TCNT	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 820Ah	TMR0	Timer counter control register	TCCR	8	8	2, 3 PCLKB	2 ICLK	
0008 820Bh	TMR1	Timer counter control register	TCCR	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 8210h	TMR2	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8211h	TMR3	Timer control register	TCR	8	8	2, 3 PCLKB	2 ICLK	
0008 8212h	TMR2	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8213h	TMR3	Timer control/status register	TCSR	8	8	2, 3 PCLKB	2 ICLK	
0008 8214h	TMR2	Time constant register A	TCORA	8	8	2, 3 PCLKB	2 ICLK	
0008 8215h	TMR3	Time constant register A	TCORA	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 8216h	TMR2	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK	
0008 8217h	TMR3	Time constant register B	TCORB	8	8	2, 3 PCLKB	2 ICLK	
0008 8218h	TMR2	Timer counter	TCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 8219h	TMR3	Timer counter	TCNT	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 821Ah	TMR2	Timer counter control register	TCCR	8	8	2, 3 PCLKB	2 ICLK	
0008 821Bh	TMR3	Timer counter control register	TCCR	8	8 ⁵	2, 3 PCLKB	2 ICLK	
0008 8280h	CRC	CRC control register	CRCCR	8	8	2, 3 PCLKB	2 ICLK	CRC
0008 8281h	CRC	CRC data input register	CRCDIR	8	8	2, 3 PCLKB	2 ICLK	
0008 8282h	CRC	CRC data output register	CRCDOR	16	16	2, 3 PCLKB	2 ICLK	
0008 8300h	RIIC0	I ² C bus control register 1	ICCR1	8	8	2, 3 PCLKB	2 ICLK	RIIC
0008 8301h	RIIC0	I ² C bus control register 2	ICCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8302h	RIIC0	I ² C bus mode register 1	ICMR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8303h	RIIC0	I ² C bus mode register 2	ICMR2	8	8	2, 3 PCLKB	2 ICLK	
0008 8304h	RIIC0	I ² C bus mode register 3	ICMR3	8	8	2, 3 PCLKB	2 ICLK	
0008 8305h	RIIC0	I ² C bus function enable register	ICFER	8	8	2, 3 PCLKB	2 ICLK	
0008 8306h	RIIC0	I ² C bus status enable register	ICSER	8	8	2, 3 PCLKB	2 ICLK	
0008 8307h	RIIC0	I ² C bus interrupt enable register	ICIER	8	8	2, 3 PCLKB	2 ICLK	
0008 8308h	RIIC0	I ² C bus status register 1	ICSR1	8	8	2, 3 PCLKB	2 ICLK	
0008 8309h	RIIC0	I ² C bus status register 2	ICSR2	8	8	2, 3 PCLKB	2 ICLK	
0008 830Ah	RIIC0	Slave address register L0	SARL0	8	8	2, 3 PCLKB	2 ICLK	
0008 830Ah	RIIC0	Timeout Internal Counter L	TMOCNTL	8	8	2, 3 PCLKB	2 ICLK	
0008 830Bh	RIIC0	Slave address register U0	SARU0	8	8	2, 3 PCLKB	2 ICLK	
0008 830Bh	RIIC0	Timeout Internal Counter U	TMOCNTU	8	8	2, 3 PCLKB	2 ICLK	
0008 830Ch	RIIC0	Slave address register L1	SARL1	8	8	2, 3 PCLKB	2 ICLK	
0008 830Dh	RIIC0	Slave address register U1	SARU1	8	8	2, 3 PCLKB	2 ICLK	
0008 830Eh	RIIC0	Slave address register L2	SARL2	8	8	2, 3 PCLKB	2 ICLK	
0008 830Fh	RIIC0	Slave address register U2	SARU2	8	8	2, 3 PCLKB	2 ICLK	
0008 8310h	RIIC0	I ² C bus bit rate low-level register	ICBRL	8	8	2, 3 PCLKB	2 ICLK	
0008 8311h	RIIC0	I ² C bus bit rate high-level register	ICBRH	8	8	2, 3 PCLKB	2 ICLK	
0008 8312h	RIIC0	I ² C bus transmit data register	ICDRT	8	8	2, 3 PCLKB	2 ICLK	

Table 4.1 List of I/O Registers (Address Order) (31/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 C095h	PORTA	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	I/O Ports
0008 C096h	PORTB	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C097h	PORTB	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C098h	PORTC	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C099h	PORTC	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Ah	PORTD	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Bh	PORTD	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Ch	PORTE	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Dh	PORTE	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Eh	PORTF	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C09Fh	PORTF	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C0A0h	PORTG	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C0A1h	PORTG	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C0A4h	PORTJ	Open drain control register 0	ODR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C0A5h	PORTJ	Open drain control register 1	ODR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C0C0h	PORT0	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C1h	PORT1	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C2h	PORT2	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C3h	PORT3	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C4h	PORT4	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C5h	PORT5	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C6h	PORT6	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C7h	PORT7	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C8h	PORT8	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0C9h	PORT9	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CAh	PORTA	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CBh	PORTB	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CCh	PORTC	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CDh	PORTD	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CEh	PORTE	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0CFh	PORTF	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0D0h	PORTG	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0D2h	PORTJ	Pull-up control register	PCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0E0h	PORT0	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	MPC
0008 C0E2h	PORT2	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0E5h	PORT5	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0E9h	PORT9	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0EAh	PORTA	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0EBh	PORTB	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0ECh	PORTC	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0EDh	PORTD	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0EEh	PORTE	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C0F0h	PORTG	Drive ability control register	DSCR	8	8	2, 3 PCLKB	2 ICLK	
0008 C100h	MPC	CS output enable register	PFCSE	8	8	2, 3 PCLKB	2 ICLK	
0008 C102h	MPC	CS output pin select register 0	PFCSS0	8	8	2, 3 PCLKB	2 ICLK	
0008 C103h	MPC	CS output pin select register 1	PFCSS1	8	8	2, 3 PCLKB	2 ICLK	
0008 C104h	MPC	Address output enable register 0	PFAOE0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C105h	MPC	Address output enable register 1	PFAOE1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C106h	MPC	External bus control register 0	PFBCR0	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C107h	MPC	External bus control register 1	PFBCR1	8	8, 16	2, 3 PCLKB	2 ICLK	
0008 C10Eh	MPC	Ethernet control register 1	PFENET	8	8	2, 3 PCLKB	2 ICLK	

Table 4.1 List of I/O Registers (Address Order) (35/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
0008 C344h	ICU	Group 1 interrupt enable register	GEN01	32	32	1 to 2PCLKB	2 ICLK	ICUb
0008 C348h	ICU	Group 2 interrupt enable register	GEN02	32	32	1 to 2PCLKB	2 ICLK	
0008 C34Ch	ICU	Group 3 interrupt enable register	GEN03	32	32	1 to 2PCLKB	2 ICLK	
0008 C350h	ICU	Group 4 interrupt enable register	GEN04	32	32	1 to 2PCLKB	2 ICLK	
0008 C354h	ICU	Group 5 interrupt enable register	GEN05	32	32	1 to 2PCLKB	2 ICLK	
0008 C358h	ICU	Group 6 interrupt enable register	GEN06	32	32	1 to 2PCLKB	2 ICLK	
0008 C370h	ICU	Group 12 interrupt enable register	GEN12	32	32	1 to 2PCLKB	2 ICLK	
0008 C380h	ICU	Group 0 interrupt clear register	GCR00	32	32	1 to 2PCLKB	2 ICLK	
0008 C384h	ICU	Group 1 interrupt clear register	GCR01	32	32	1 to 2PCLKB	2 ICLK	
0008 C388h	ICU	Group 2 interrupt clear register	GCR02	32	32	1 to 2PCLKB	2 ICLK	
0008 C38Ch	ICU	Group 3 interrupt clear register	GCR03	32	32	1 to 2PCLKB	2 ICLK	
0008 C390h	ICU	Group 4 interrupt clear register	GCR04	32	32	1 to 2PCLKB	2 ICLK	
0008 C394h	ICU	Group 5 interrupt clear register	GCR05	32	32	1 to 2PCLKB	2 ICLK	
0008 C398h	ICU	Group 6 interrupt clear register	GCR06	32	32	1 to 2PCLKB	2 ICLK	
0008 C3C0h	ICU	Unit select register	SEL	32	32	1 to 2PCLKB	2 ICLK	
0008 C400h	RTC	64-Hz counter	R64CNT	8	8	2, 3 PCLKB	2 ICLK	RTCa
0008 C402h	RTC	Second counter	RSECCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C404h	RTC	Minute counter	RMINCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C406h	RTC	Hour counter	RHRCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C408h	RTC	Day-of-week counter	RWKCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C40Ah	RTC	Date counter	RDAYCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C40Ch	RTC	Month counter	RMONCNT	8	8	2, 3 PCLKB	2 ICLK	
0008 C40Eh	RTC	Year counter	RYRCNT	16	16	2, 3 PCLKB	2 ICLK	
0008 C410h	RTC	Second alarm register	RSECAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C412h	RTC	Minute alarm register	RMINAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C414h	RTC	Hour alarm register	RHRAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C416h	RTC	Day-of-week alarm register	RWKAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C418h	RTC	Date alarm register	RDAYAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C41Ah	RTC	Month alarm register	RMONAR	8	8	2, 3 PCLKB	2 ICLK	
0008 C41Ch	RTC	Year alarm register	RYRAR	16	16	2, 3 PCLKB	2 ICLK	
0008 C41Eh	RTC	Year alarm enable register	RYRAREN	8	8	2, 3 PCLKB	2 ICLK	
0008 C422h	RTC	RTC control register 1	RCR1	8	8	2, 3 PCLKB	2 ICLK	
0008 C424h	RTC	RTC control register 2	RCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 C426h	RTC	RTC control register 3	RCR3	8	8	2, 3 PCLKB	2 ICLK	
0008 C428h	RTC	RTC control register 4	RCR4	8	8	2, 3 PCLKB	2 ICLK	
0008 C42Ah	RTC	Frequency register H	RFRH	16	16	2, 3 PCLKB	2 ICLK	
0008 C42Ch	RTC	Frequency register L	RFRL	16	16	2, 3 PCLKB	2 ICLK	
0008 C42Eh	RTC	Time error adjustment register	RADJ	8	8	2, 3 PCLKB	2 ICLK	
0008 C440h	RTC	Time capture control register 0	RTCCR0	8	8	2, 3 PCLKB	2 ICLK	
0008 C442h	RTC	Time capture control register 1	RTCCR1	8	8	2, 3 PCLKB	2 ICLK	
0008 C444h	RTC	Time capture control register 2	RTCCR2	8	8	2, 3 PCLKB	2 ICLK	
0008 C452h	RTC	Second capture register 0	RSECCP0	8	8	2, 3 PCLKB	2 ICLK	
0008 C454h	RTC	Minute capture register 0	RMINCP0	8	8	2, 3 PCLKB	2 ICLK	

Table 4.1 List of I/O Registers (Address Order) (39/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK $\geq$ PCLK	ICLK<PCLK	
000A 003Ah	USB0	BEMP interrupt enable register	BEMPENB	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	USBa
000A 003Ch	USB0	SOF output configuration register	SOFCFG	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 0040h	USB0	Interrupt status register 0	INTSTS0	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 0042h	USB0	Interrupt status register 1	INTSTS1	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 0046h	USB0	BRDY interrupt status register	BRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 0048h	USB0	NRDY interrupt status register	NRDYSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 004Ah	USB0	BEMP interrupt status register	BEMPSTS	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 004Ch	USB0	Frame number register	FRMNUM	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	USBa
000A 004Eh	USB0	Device state changing register	DVCHGR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	
000A 0050h	USB0	USB address register	USBADDR	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ^{*6}	

Table 4.1 List of I/O Registers (Address Order) (42/50)

Address	Module Symbol	Register Name	Register Symbol	Number of Bits	Access Size	Number of Access States		Related Function
						ICLK≥PCLK	ICLK<PCLK	
000A 0090h	USB0	Pipe 1 transaction counter enable register	PIPE1TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 0092h	USB0	Pipe 1 transaction counter register	PIPE1TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 0094h	USB0	Pipe 2 transaction counter enable register	PIPE2TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 0096h	USB0	Pipe 2 transaction counter register	PIPE2TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	USBa
000A 0098h	USB0	Pipe 3 transaction counter enable register	PIPE3TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 009Ah	USB0	Pipe 3 transaction counter register	PIPE3TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 009Ch	USB0	Pipe 4 transaction counter enable register	PIPE4TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 009Eh	USB0	Pipe 4 transaction counter register	PIPE4TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 00A0h	USB0	Pipe 5 transaction counter enable register	PIPE5TRE	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	
000A 00A2h	USB0	Pipe 5 transaction counter register	PIPE5TRN	16	16	9 PCLKB or more	Rounded up to the nearest integer greater than 1 + 9/ (frequency ratio of ICLK/ PCLKB) ¹⁶	

Table 5.6 DC Characteristics (4)

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

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

Note 1. This is the total power consumption of the chip as a whole (including the power consumed by the output buffers).

Note 2. Contact a Renesas sales office or agent regarding further details of the conditions of measurement.

Table 5.7 Permissible Output Currents

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

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

Caution: To protect the LSI's reliability, the output current values should not exceed the values in this table.

Note 1. This is the value when normal driving ability is set with a pin for which normal driving ability is selectable.

Note 2. This is the value when high driving ability is set with a pin for which normal driving ability is selectable or the value of the pin to which high driving ability is fixed.

5.3 AC Characteristics

Table 5.8 Operation Frequency Value (High-Speed Operating Mode)

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

Note 1. The ICLK and PCLKA frequencies must be the same and at least 12.5 MHz if the Ethernet controller is in use

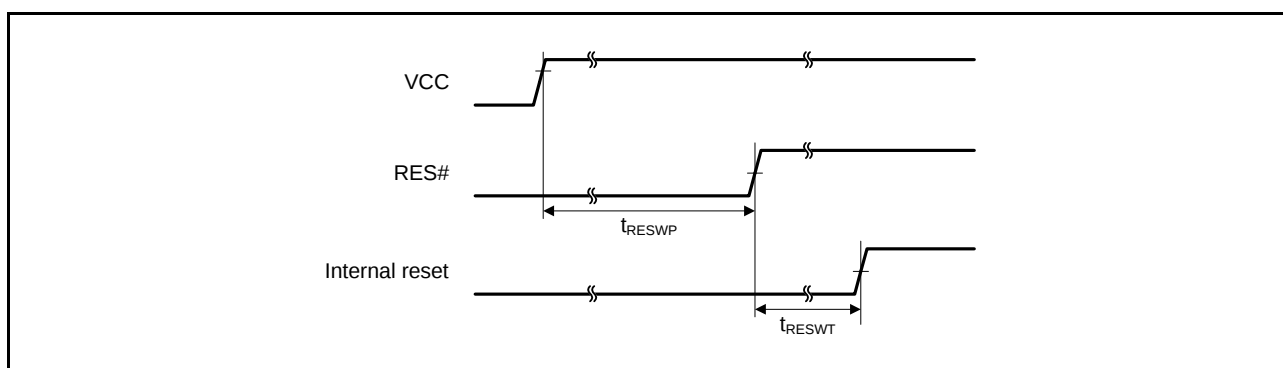
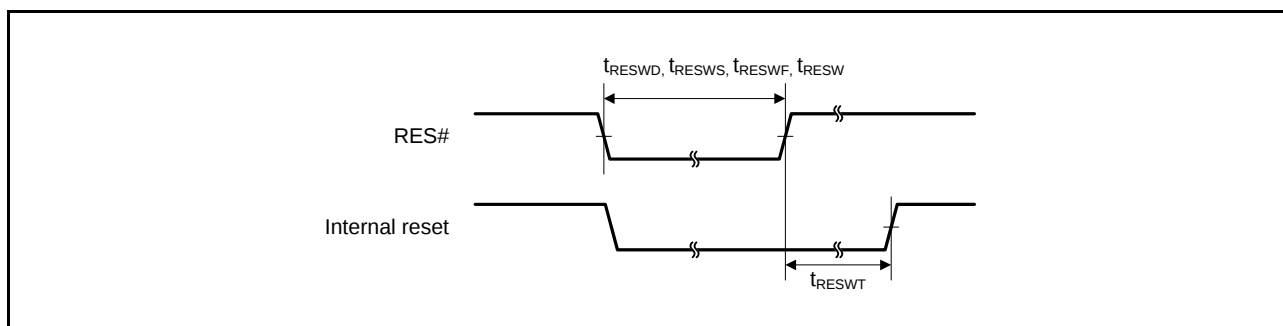
Note 2. The PCLKB must run at a frequency of at least 24 MHz if the USB is in use.

Note 3. The FCLK must run at a frequency of at least 4 MHz when changing the ROM or E2 DataFlash memory contents.

Table 5.9 Operation Frequency Value (Low-Speed Operating Mode 1)

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

**Figure 5.1** Reset Input Timing at Power-On**Figure 5.2** Reset Input Timing

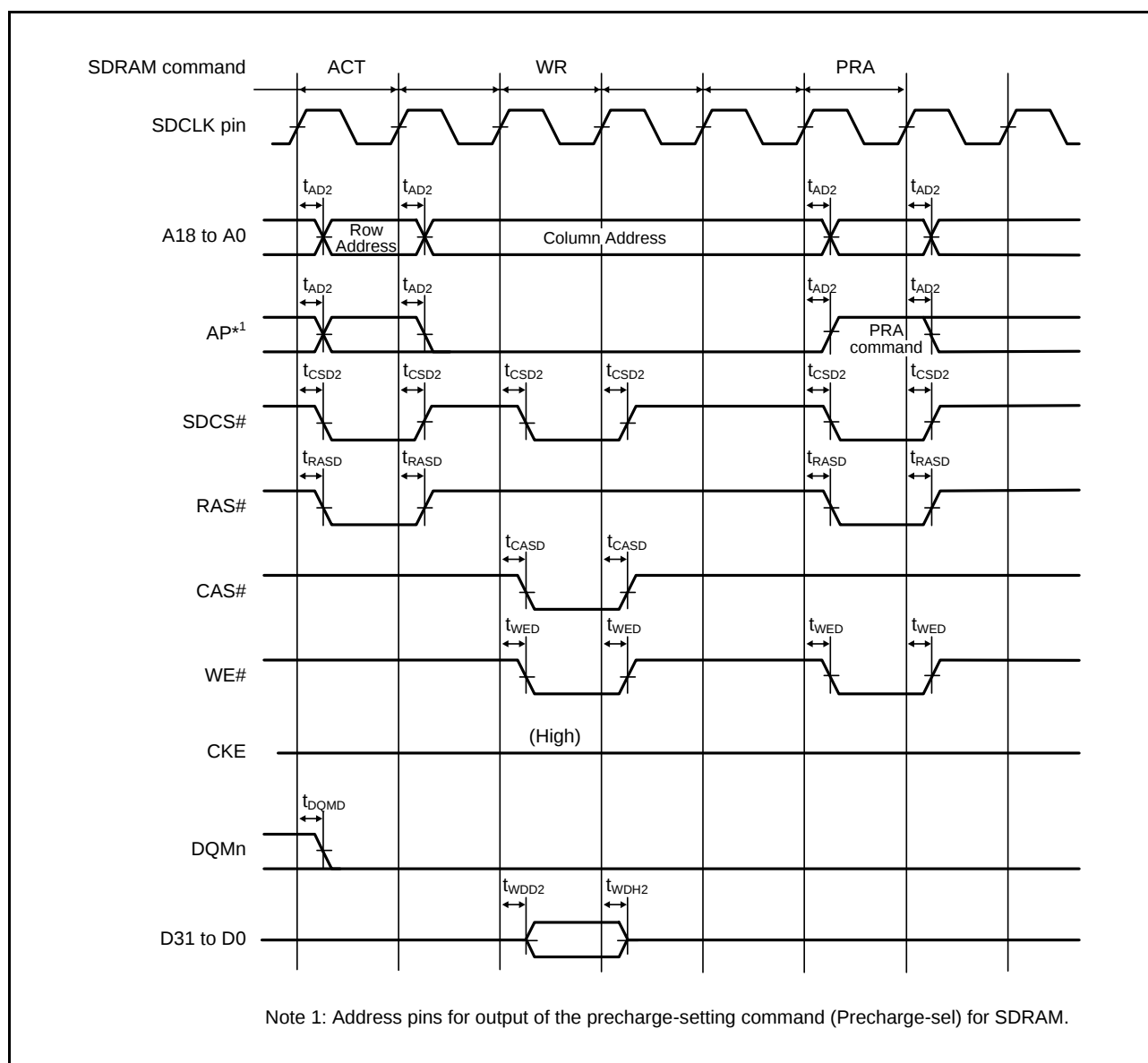


Figure 5.25 SDRAM Space Single Write Bus Timing

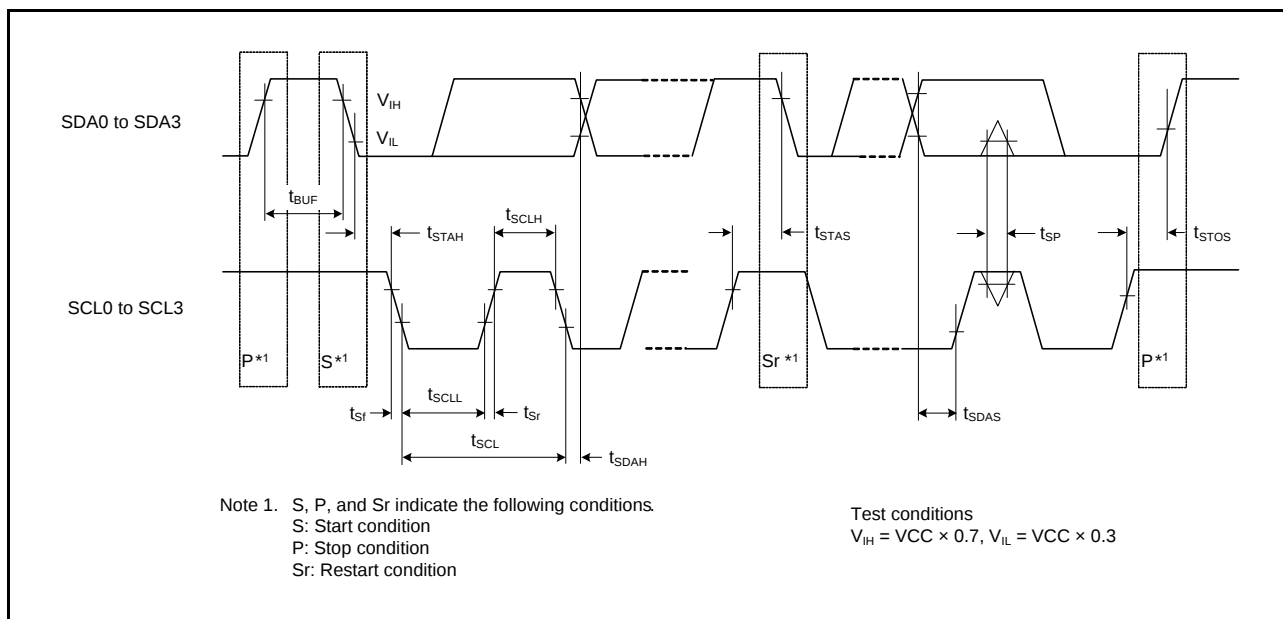


Figure 5.47 IIC Bus Interface Input/Output Timing and Simple IIC Bus Interface Input/Output Timing

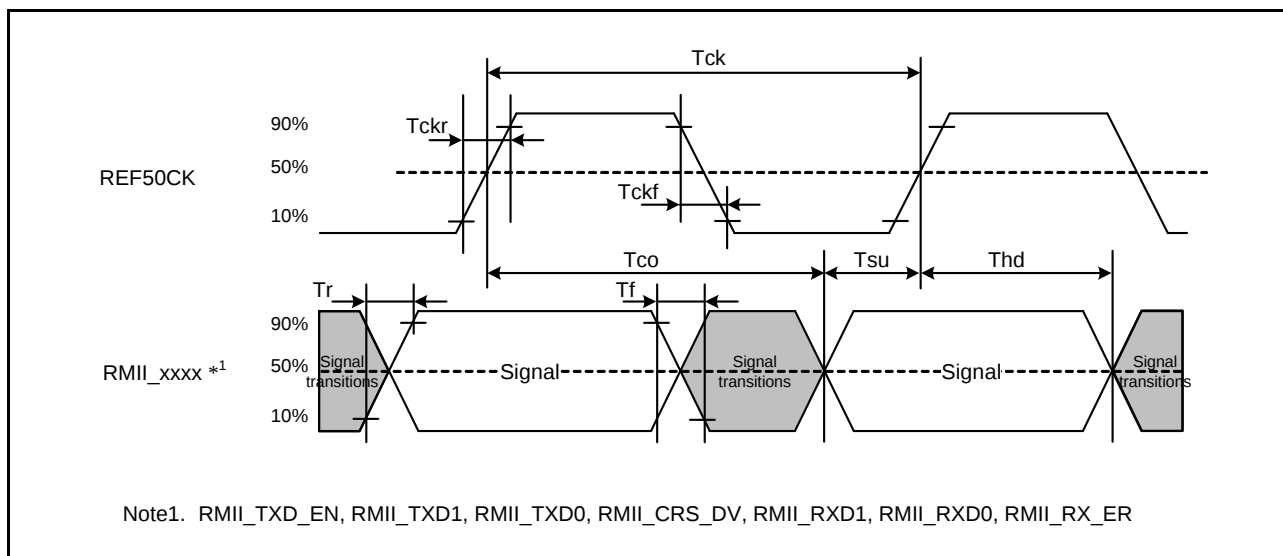


Figure 5.48 REF50CK and RMII Signal Timing

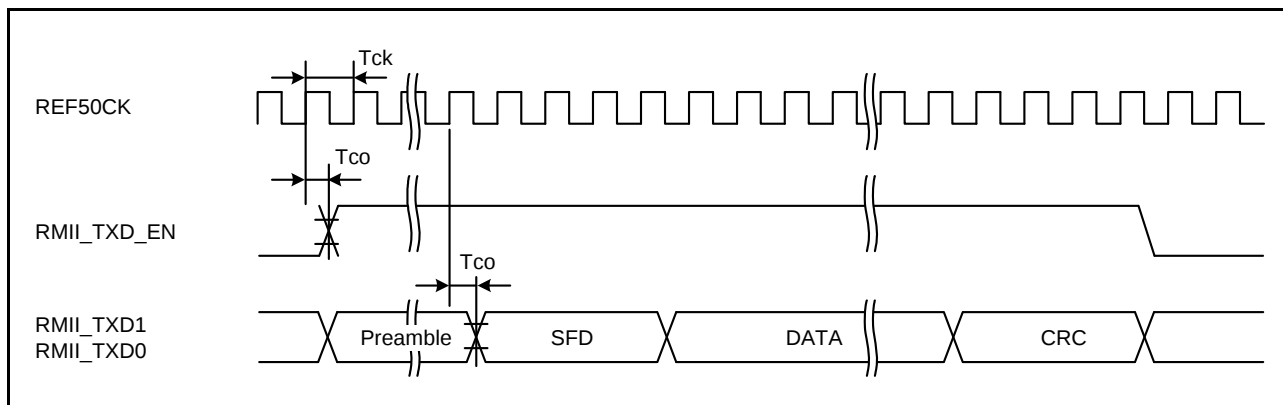


Figure 5.49 RMII Transmission Timing

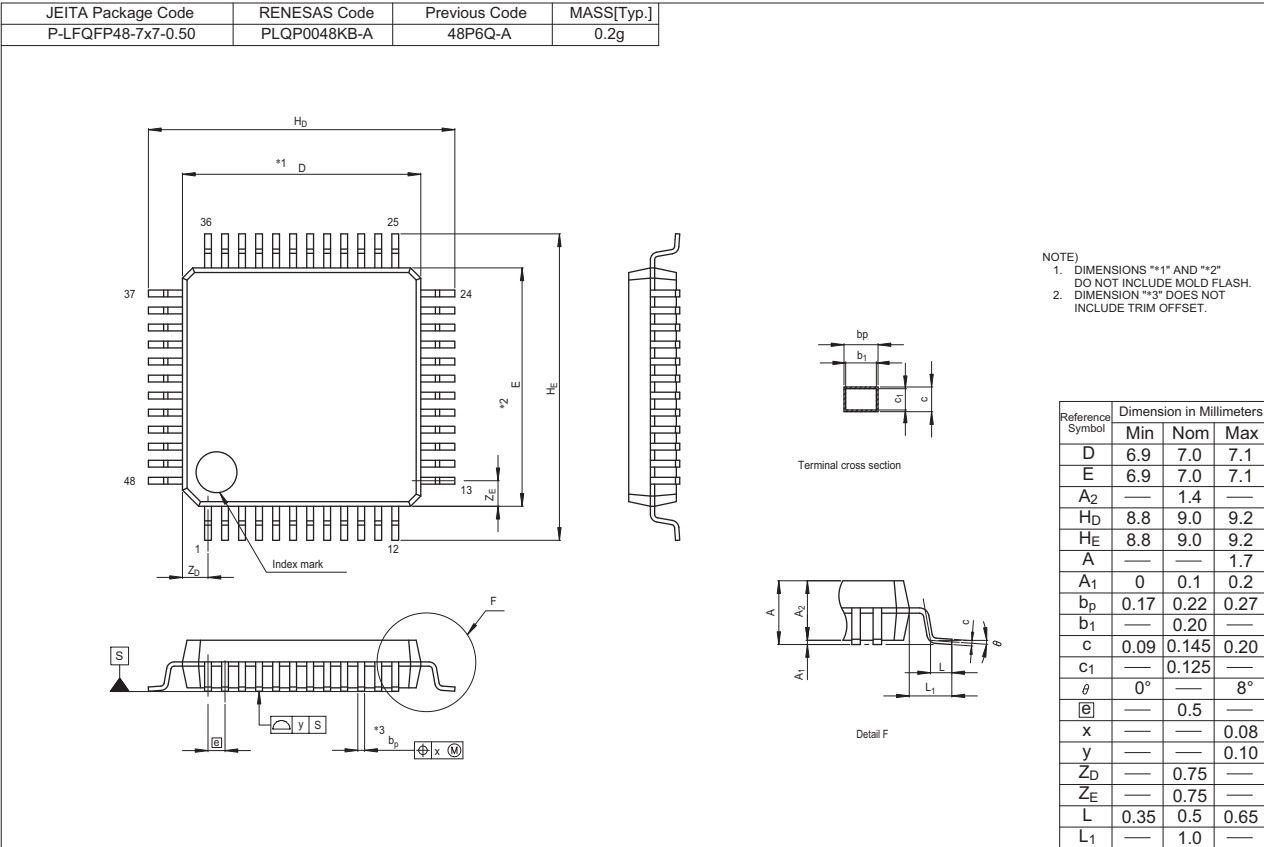


Figure J 48-pin LQFP (PLQP0048KB-A)