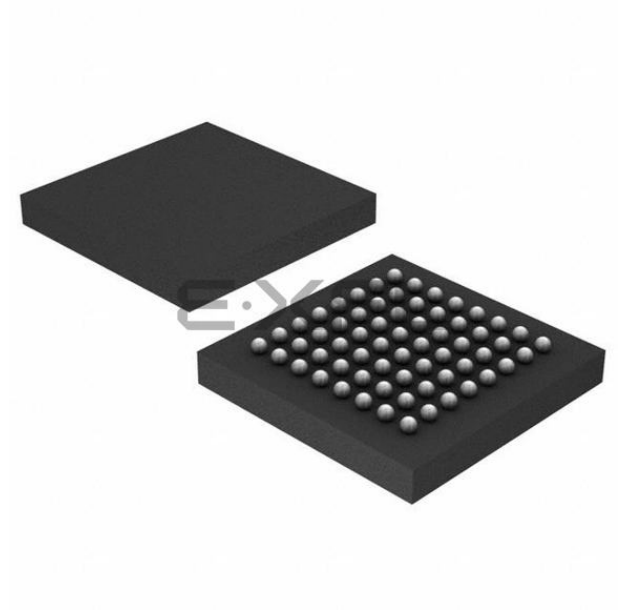

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What is "Embedded - Microcontrollers"?

"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	Active
Core Processor	78K/0R
Core Size	16-Bit
Speed	20MHz
Connectivity	3-Wire SIO, I²C, LINbus, UART/USART
Peripherals	DMA, LVD, POR, PWM, WDT
Number of I/O	50
Program Memory Size	32KB (32K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	1.5K x 8
Voltage - Supply (Vcc/Vdd)	1.8V ~ 5.5V
Data Converters	A/D 12x10b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	64-VFBGA
Supplier Device Package	-
Purchase URL	https://www.e-xfl.com/product-detail/renesas-electronics-america/upd78f1007f1-an1-a

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3.1.1 78K0R/KF3-L

(1) Port functions (1/2): 78K0R/KF3-L

Function Name	I/O	Function	After Reset	Alternate Function
P02	I/O	Port 0. 5-bit I/O port. Input of P03 and P04 can be set to TTL input buffer. Output of P02 to P04 can be set to N-ch open-drain output (V_{DD} tolerance). Input/output can be specified in 1-bit units. Use of an on-chip pull-up resistor can be specified by a software setting.	Input port	SO10/TxD1
P03				SI10/RxD1/SDA10
P04				SCK10/SCL10
P05				TI05/TO05
P06				TI06/TO06
P10	I/O	Port 1. 8-bit I/O port. Input of P10 and P11 can be set to TTL input buffer. Output of P10 and P12 can be set to N-ch open-drain output (V_{DD} tolerance). Input/output can be specified in 1-bit units. Use of an on-chip pull-up resistor can be specified by a software setting.	Input port	SCK00
P11				SI00/RxD0
P12				SO00/TxD0
P13				TxD3
P14				RxD3
P15				RTCDIV/RTCCL
P16				TI01/TO01/INTP5
P17				TI02/TO02
P20 to P27	I/O	Port 2. 8-bit I/O port. Input/output can be specified in 1-bit units.	Digital input port	ANI0 to ANI7
P30	I/O	Port 3. 2-bit I/O port. Input/output can be specified in 1-bit units. Use of an on-chip pull-up resistor can be specified by a software setting.	Input port	RTC1HZ/INTP3
P31				TI03/TO03/INTP4
P40[Note 1]	I/O	Port 4. 8-bit I/O port. Input/output can be specified in 1-bit units. Use of an on-chip pull-up resistor can be specified by a software setting.	Input port	TOOL0
P41				TOOL1
P42				TI04/TO04
P43				SCK01
P44				SI01
P45				SO01
P46, P47				–
P50	I/O	Port 5. 6-bit I/O port. Input/output can be specified in 1-bit units. Use of an on-chip pull-up resistor can be specified by a software setting.	Input port	INTP1/SCK40[Note 2]
P51				INTP2/SI40/RxD4[Note 2]
P52				TO00/SO40/TxD4[Note 2]
P53				TI00/SCK41[Note 2]
P54				TI07/TO07/SI41[Note 2]

P55 PCLBUZ1/INTP792 217.18 0.96 15 re-7(221
P54

5.2.2 Port 1

	78K0R/KC3-L (μPD78F100y: y = 0 to 3)		78K0R/KC3-L (48-pin) (μPD78F100y: y = 1 to 3)	78K0R/KD3-L (μPD78F100y: y = 4 to 6)	78K0R/KE3-L (μPD78F100y: y = 7 to 9)
	40-pin	44-pin			
P10/TI02/TO02	√		√	√	√
P11/TO00/TI03/TO03	√		√	√	√
P12/TI04/TO04/RTCDIV/RTCCL	P12/TI04/TO04[Note 1]	√	√	√	√
P13/TI05/TO05	√		√	√	√
P14/TI06/TO06	–[Note 2]		–[Note 2]	–[Note 2]	√
P15/TI07/TO07	–[Note 2]		–[Note 2]	–[Note 2]	√
P16	–		–	–	√
P17	–		–	–	√

Notes 1. 40-pin product of the 78K0R/KC3-L does not have a RTCDIV/RTCCL pin.

2. TI06/TO06 and TI07/TO07 are shared with P50 and P51, respectively, in products other than the 78K0R/KE3-L.

Remark √: Mounted

Port 1 is an I/O port with an output latch. Port 1 can be set to the input mode or output mode in 1-bit units using port mode register 1 (PM1). When the P10 to P17 pins are used as an input port, use of an on-chip pull-up resistor can be specified in 1-bit units by pull-up resistor option register 1 (PU1).

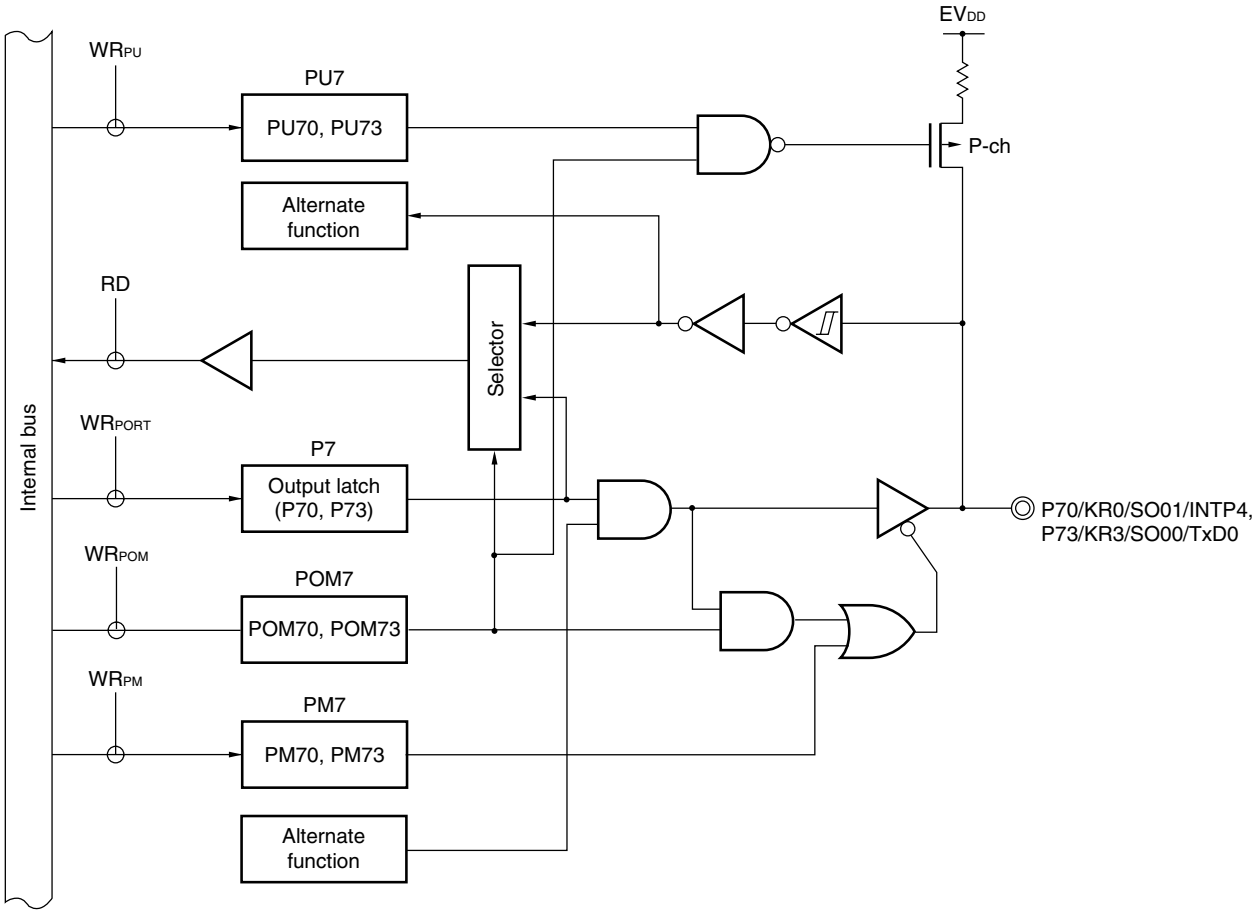
This port can also be used for timer I/O and real-time counter clock output.

Reset signal generation sets port 1 to input mode.

Figures 5-3 and 5-4 show block diagrams of port 1.

Caution To use P10/TI02/TO02, P11/TI03/TO03, P12/TI04/TO04/RTCDIV/RTCCL, P13/TI05/TO05, P14/TI06/TO06, or P15/TI07/TO07 as a general-purpose port, set bits 2 to 7 (TO02 to TO07) of timer output register 0 (TO0) and bits 2 to 7 (TOE02 to TOE07) of timer output enable register 0 (TOE0) to "0", which is the same as their default status setting.

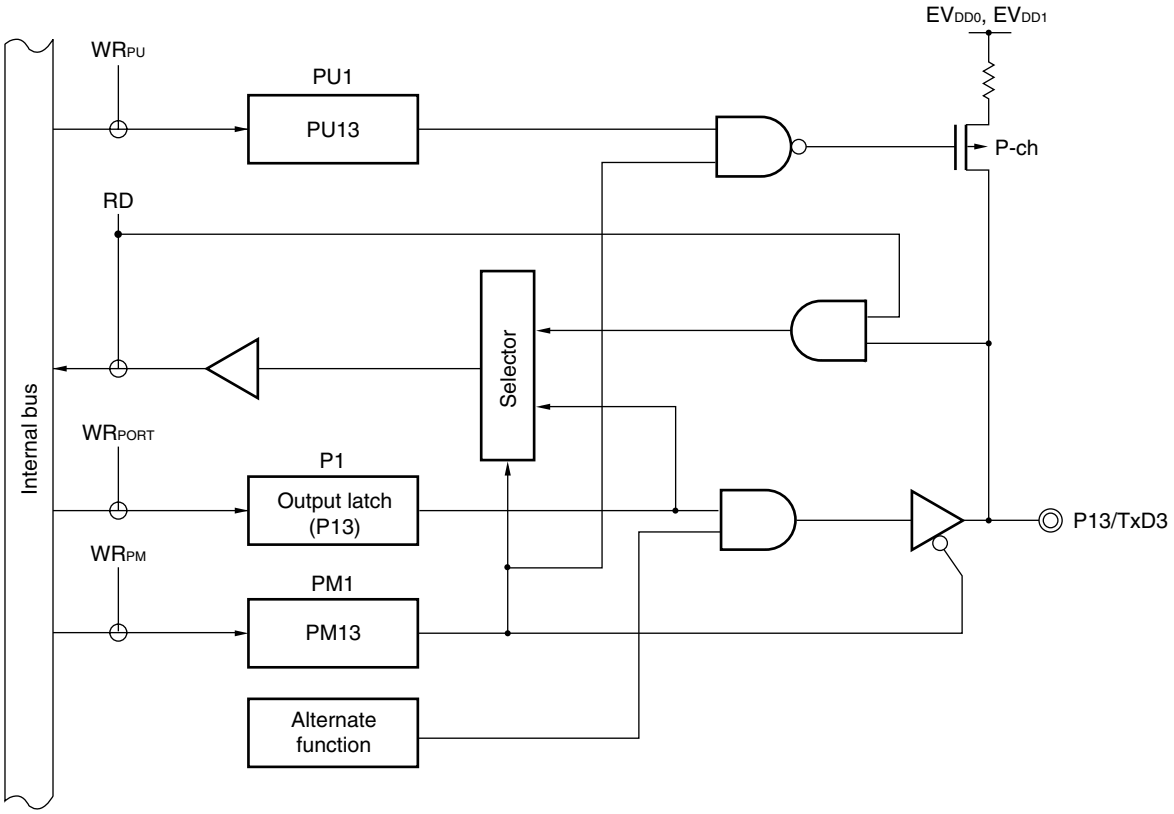
Figure 5-15. Block Diagram of P70 and P73



P7: Port register 7
PU7: Pull-up resistor option register 7
POM7: Port output mode register 7
PM7: Port mode register 7
RD: Read signal
WR××: Write signal

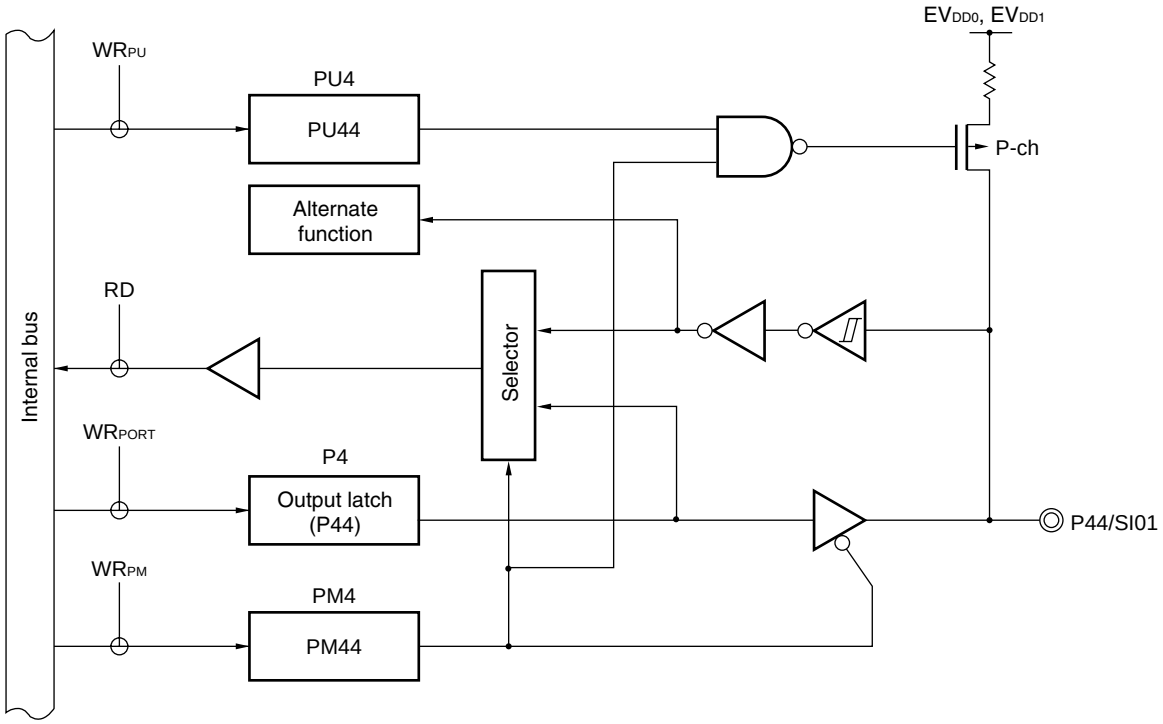
Remark With products not provided with an EV_{DD} or EV_{SS} pin, replace EV_{DD} with V_{DD}, or replace EV_{SS} with V_{SS}.

Figure 6-9. Block Diagram of P13



P1: Port register 1
PU1: Pull-up resistor option register 1
PM1: Port mode register 1
RD: Read signal
WR××: Write signal

Figure 6-19. Block Diagram of P44



P4: Port register 4
PU4: Pull-up resistor option register 4
PM4: Port mode register 4
RD: Read signal
WR××: Write signal

Figure 8-69. Example of Set Contents of Regist ers When PWM Function (Slave Channel) Is Used

(a) Timer mode register mp (TMRmp)

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
TMRmp	CKSmp															