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April 1st, 2010
Renesas Electronics Corporation

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78K0R/Kx3 Microcontroller

Sample Program

Operation Manual

(Frequency Division Function

(Timer Array Unit), ASM Source)

This software is for reference only and NEC Electronics does not guarantee its operation.
Thoroughly evaluate this software on your set prior to use.

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1st Product Solution Group, Multipurpose Microcomputer Systems Division,
Microcomputer Operations Unit
NEC Electronics Corporation

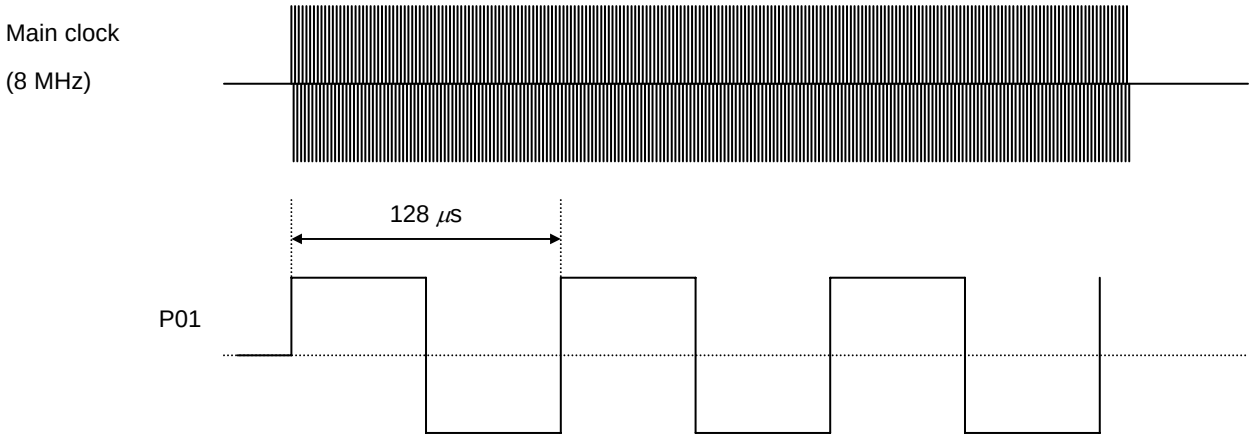
CONTENTS

1. OVERVIEW

This manual explains the sample program functions of the frequency division function for the 78K0R/Kx3 microcontroller.

In this sample program, timer channel 0 is used to operate the frequency division function.

P00 is used as an input pin and P01 as an output pin. The main clock (8 MHz) is input to P00, and a clock whose frequency is $1/2^{10}$ of the main clock is output from P01.



2. RESOURCES USED

Resource	Description	Remark
Main clock specification	Internal high-speed oscillator used (8 MHz (TYP.))	Supplied to CPU and peripheral hardware
	High-speed system clock used (20 MHz)	Oscillated by initial processing
Subclock	XT1 (32.768 kHz)	Oscillated by initial processing
Related hardware	Peripheral enable register 0 (PER0)	Controls the input clock of the timer array unit.
	Timer clock select register 0 (TPS0)	Operation clock: CK01, 8 MHz (0.125 μs)
	Timer mode register 00 (TMR00)	Operation clock: CK01, 8 MHz (0.125 μs)
	Timer data register 00 (TDR00)	Interval period: $8/2^{10}$ MHz (128 μs)
	Timer output mode register 0 (TOM0)	Channel 0 toggle operation mode
	Timer output level register 0 (TOL0)	Channel 0 positive logic output (active high)
	Timer output register 0 (TO0)	Channel 0 timer output value is “0”.
	Timer channel start register 0 (TS0)	
	Timer channel stop register 0 (TTO)	
	Port mode register (PM0)	
	Port register (P0)	
I/O	Input: TI00 (P00) Output: TO00 (P01)	
Interrupt	Timer channel 0	
Others	Not used	

3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline
K0R_vct.asm	Vector processing
K0R_init.asm	Initialization processing
K0R_main.asm	Main processing
K0R_sfr_set.asm	Frequency division function

4. FUNCTION EXPLANATIONS

[File name]

K0R_main.asm

Function

Function Name	Processing Outline	Argument	Return Value
MMA_STRT	Main routine	None	None

Function explanations

Function name	MMA_STRT
Processing	Main routine
Argument	–
Return value	–
Description	Executes initialization processing and then starts frequency division function.
Remark	–

[File name]

K0R_sfr_set.asm

Functions

Function Name	Processing Outline	Argument	Return Value
STM_FINI	Initializes frequency division function.	None	None
STM_FSTT	Starts frequency division function operation.	None	None
STM_FSTP	Stops frequency division function operation.	None	None

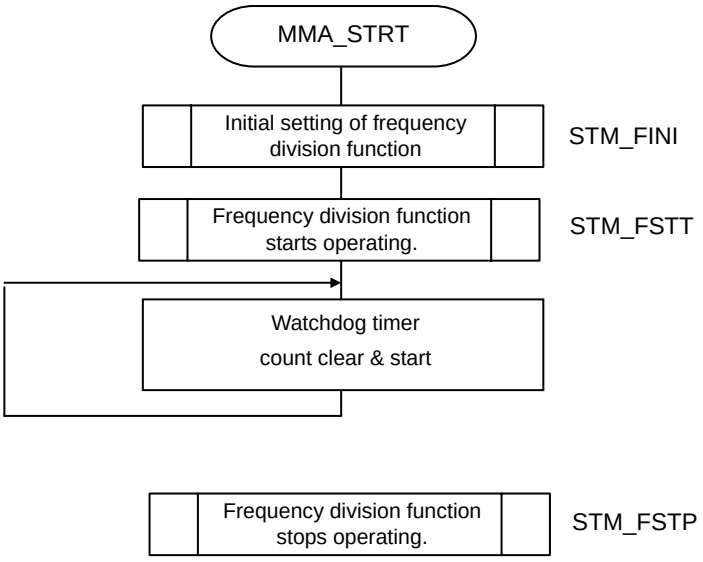
Function explanations

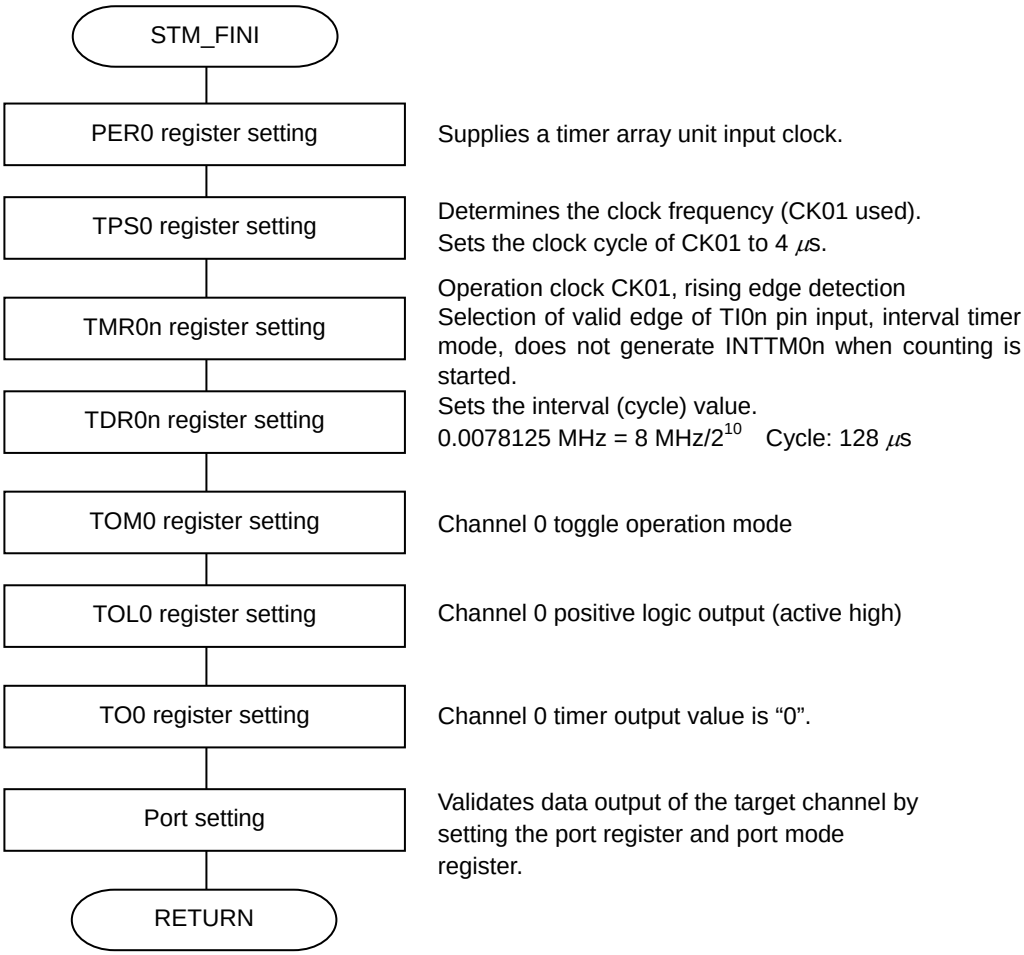
Function name	STM_FINI
Processing	Initializes frequency division function.
Argument	–
Return value	–
Description	Initializes the timer array unit. • Supplies a timer array unit input clock. Initializes timer channel 0. • Operation mode: Operation clock CK01, selection of the valid edge of the TI00 pin input, rising edge detection, interval timer mode • Output mode: Toggle operation mode • Sets the interval (cycle) value to 9 ($8/2^{10}$ MHz). Sets the ports. • Sets P00 (TI00) to the input mode. • Sets P01 (TO00) to the input mode.
Remark	–

Function name	STM_FSTT
Processing	Starts frequency division function operation.
Argument	–
Return value	–
Description	Starts timer channel 0 operation. • Enables output. • Starts operation.
Remark	–

Function name	STM_FSTP
Processing	Stops frequency division function operation.
Argument	–
Return value	–
Description	Stops timer channel 0 operation. • Stops operation. • Disables output.
Remark	–

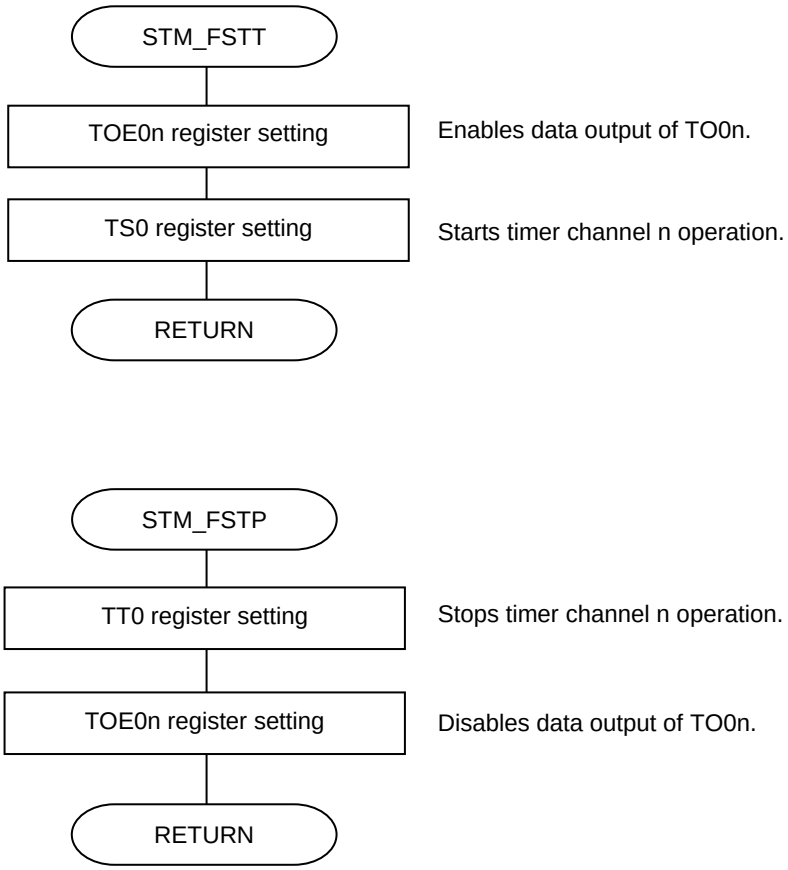
5. FLOWCHARTS





Remark n = 0 to 7 can be set.

n = 0 for this sample program.



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