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April 1st, 2010
Renesas Electronics Corporation

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78K0R/Kx3 Microcontroller Sample Program Operation Manual (One-Shot Pulse Output (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

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CONTENTS

1. OVERVIEW.....4

2. RESOURCES USED5

3. SOFTWARE CONFIGURATION.....6

4. FUNCTION EXPLANATIONS7

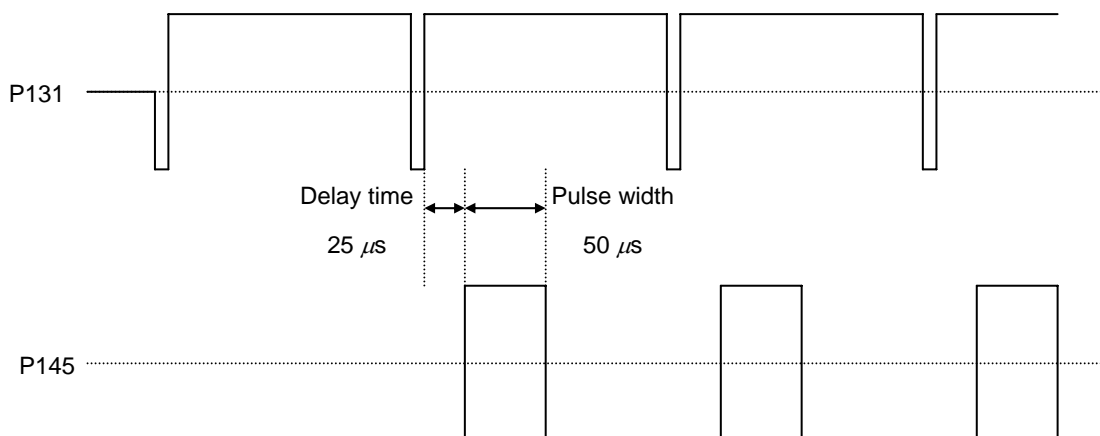
5. FLOWCHARTS.....9

1. OVERVIEW

This manual explains the sample program functions of one-shot pulse output for the 78K0R/Kx3 microcontroller.

In this sample program, timer channel 6 is used as the master and timer channel 7 is used as the slave, and a one-shot pulse is output.

The one-shot pulse is output to output pin TO07 (P145) with an output delay time of 25 μ s and a pulse width of 50 μ s, triggered by detection of the rising edge of input TIO6 (P131).



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 (1/2), 4 MHz (0.25 μ s)
	Timer mode register 06 (TMR06)	Operation clock: CK01, 8 MHz Master channel
	Timer mode register 07 (TMR07)	Operation clock: CK01, 8 MHz Slave channel
	Timer data register 06 (TDR06)	Output delay time: 25 μ s
	Timer data register 07 (TDR07)	Pulse width: 50 μ s
	Timer output mode register 0 (TOM0)	Channel 6: Toggle mode Channel 7: Combination operation mode with channel 6
	Timer output level register 0 (TOL0)	Slave channel: Positive logic output Master channel: Toggle mode
	Timer output register 0 (TO0)	Channels 6 and 7 timer output value is "0".
	Timer output enable register 0 (TOE0)	Enables TO07 output operation by counting operation.
	Timer channel start register 0 (TS00)	
	Timer channel stop register 0 (TT0)	
	Port mode register (P13)	
	Port register (P13)	
	Port mode register (P14)	
	Port register (P14)	
I/O	Input: TIO6 (P131) Output: TO07 (P145)	
Interrupt	Timer channels 6, 7	
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	One-shot pulse output

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 one-shot pulse output main processing.
Remark	—

[File name]

K0R_sfr_set.asm

Functions

Function Name	Processing Outline	Argument	Return Value
STM_OINI	Initializes one-shot pulse output.	None	None
STM_OSTT	Starts one-shot pulse output operation.	None	None
STM_OSTP	Stops one-shot pulse output operation.	None	None

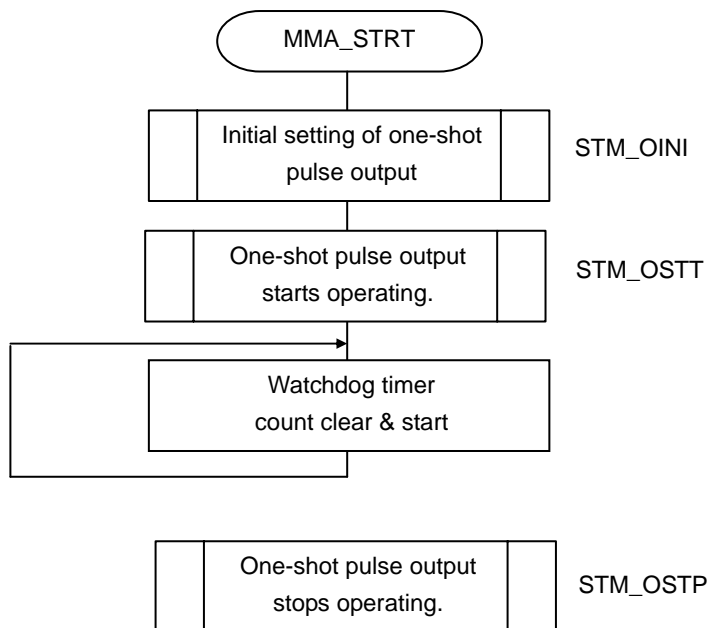
Function explanations

Function name	STM_OINI
Processing	Initializes one-shot pulse output.
Argument	–
Return value	–
Description	<p>Sets P131 to the input mode.</p> <p>Sets P145 to the output mode.</p> <p>Initializes the timer array unit.</p> <ul style="list-style-type: none"> • Supplies a timer array unit input clock. • Sets the clock frequency to 0.25 μs. <p>Initializes timer channel 6 (master).</p> <ul style="list-style-type: none"> • Operation mode: Operation clock CK01, master channel, selection of the valid edge of the start trigger TI06 pin input, rising edge detection, one-count mode • Output mode: Toggle operation mode • Sets the output delay time to 25 μs ($100 \times 0.25 \mu$s). <p>Initializes timer channel 7 (slave).</p> <ul style="list-style-type: none"> • Operation mode: Operation clock CK01, slave channel, selection of INTTM07 of the start trigger master channel, one-count mode • Output mode: Combination operation mode • Sets the pulse width to 50 μs ($200 \times 0.25 \mu$s). • Enables output. <p>Sets P145 to the output mode.</p>
Remark	–

Function name	STM_OSTT
Processing	Starts one-shot pulse output operation.
Argument	–
Return value	–
Description	<p>Enables the output operation of timer channel 7 (slave).</p> <p>Starts operation of timer channels 6 and 7.</p>
Remark	–

Function name	STM_OSTP
Processing	Stops one-shot pulse output operation.
Argument	–
Return value	–
Description	<p>Stops operation of timer channels 6 and 7.</p> <p>Disables the output operation of timer channel 7 (slave).</p>
Remark	–

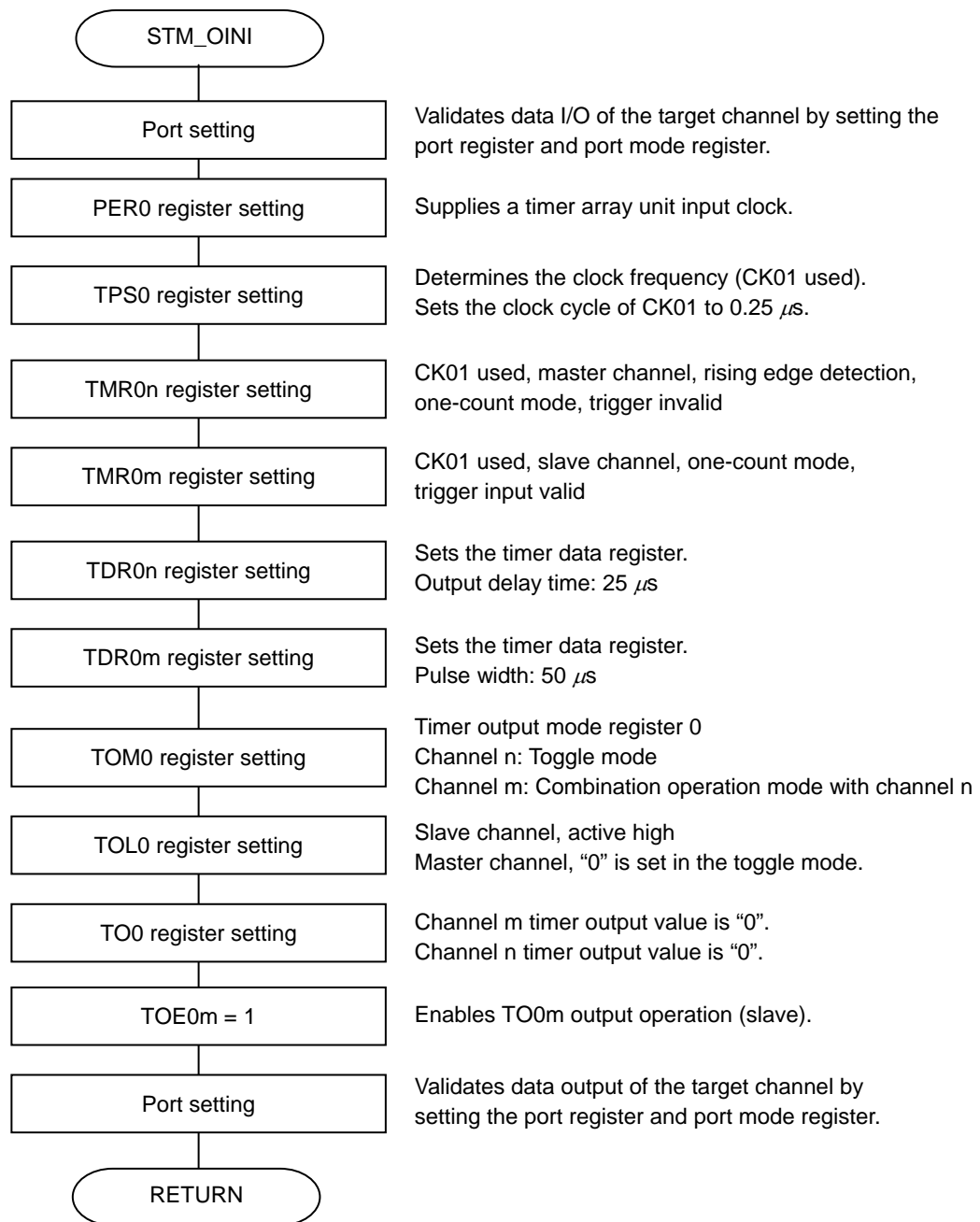
5. FLOWCHARTS



Remark $n = 0, 2, 4, 6$ can be set.

$m = n + 1$

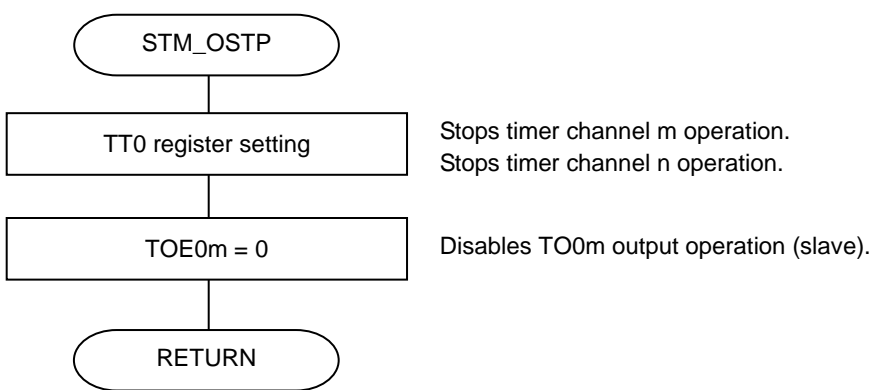
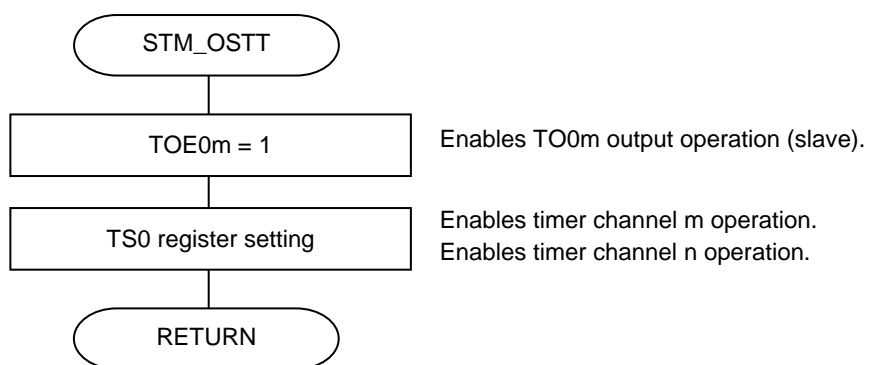
$n = 6, m = 7$ for this sample program.



Remark n = 0, 2, 4, 6 can be set.

m = n + 1

n = 6, m = 7 for this sample program.



Remark n = 0, 2, 4, 6 can be set.
m = n + 1
n = 6, m = 7 for this sample program.