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April 1st, 2010
Renesas Electronics Corporation

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78K0R/Kx3 Microcontroller

Sample Program

Operation Manual

(D/A Conversion (Real-Time Output Mode) (D/A Converter), 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 D/A converter (real-time output mode) for the 78K0R/Kx3.

In this sample program, D/A conversion is performed, triggered by the interrupt request signal (INTTM04) of timer channel 4.

2. RESOURCES USED

Resource	Description	Remark
Main clock specification	Internal high-speed oscillator used (8 MHz (TYP.))	Always oscillated
	High-speed system clock used (20 MHz)	Oscillated by initial processing. Supplied to CPU and peripheral hardware
Subclock	XT1 (32.768 kHz)	Oscillated by initial processing
Related hardware	Peripheral enable register 0 (PER0)	Controls supplying and stopping of the input clock supply.
	D/A converter mode register (DAM)	Sets real-time output mode.
	8-bit D/A conversion value setting register 0 (DACS0)	
	Port mode register 11 (PM11)	
	Port register 11 (P11)	
I/O	Analog output: ANO0 (P110)	
Interrupt	Timer channel 4 count end or capture end interrupt (INTTM04)	
Others	Not used	

3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline	Remark
K0R_vct.asm	Vector processing	
K0R_init.asm[Note 1]	Initialization processing	
K0R_main.asm	Main processing	
K0R_sfr_set.asm	D/A converter processing (real-time output mode)	
K0R_timer_int.asm[Note 2]	Timer array unit (interval timer)	

Notes 1. This file is commonly used by the sample programs.

2. This file generates an interrupt each time the interval timer counts 10 ms.

For details of this module, refer to Timer Array Unit Processing (Interval Timer/Square Wave 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 performs D/A conversion processing.
Remark	–

[File name]

K0R_sfr_set.asm

Functions

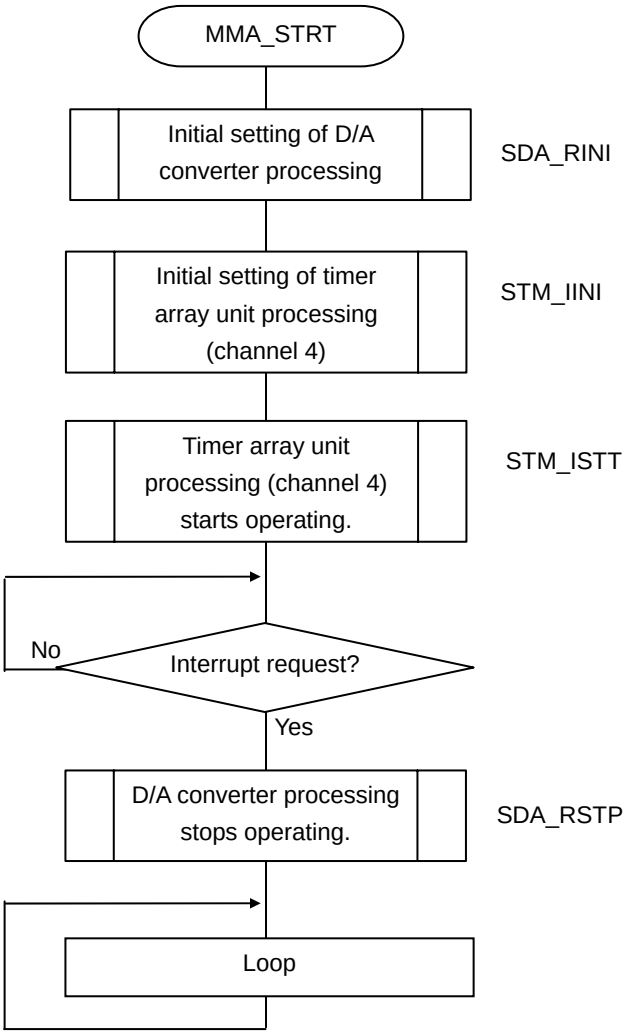
Function Name	Processing Outline	Argument	Return Value
SDA_RINI	Initializes D/A converter processing.	None	None
SDA_RSTP	Stops D/A converter processing operation.	None	None

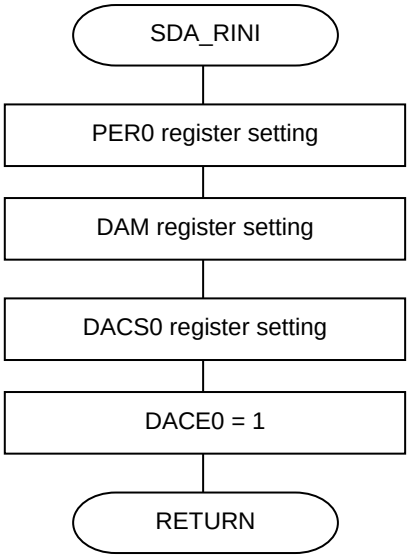
Function explanations

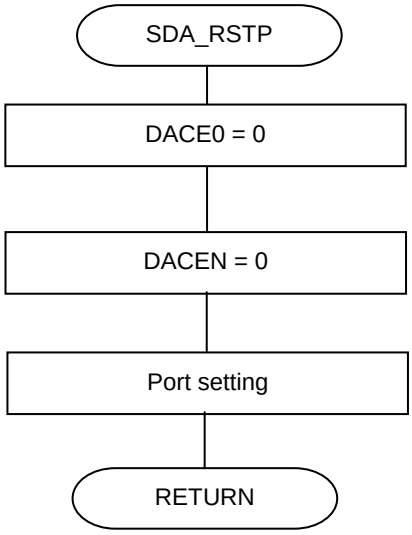
Function name	SDA_RINI
Processing	Initializes D/A converter processing.
Argument	–
Return value	–
Description	Initializes the D/A converter.
Remark	–

Function name	SDA_RSTP
Processing	Stops D/A converter processing operation.
Argument	–
Return value	–
Description	Stops D/A conversion operation.
Remark	–

5. FLOWCHARTS




SDA_RINI
PER0 register setting
Starts clock supply.
DAM register setting
Operation mode (= real-time output mode)
DACS0 register setting
Sets initial value of analog voltage.
DACE0 = 1
Enables D/A conversion operation.
RETURN


SDA_RSTP
DACE0 = 0
Stops D/A conversion operation.
DACEN = 0
Stops clock supply.
Port setting
RETURN