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April 1st, 2010
Renesas Electronics Corporation

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78K0R/Kx3 Microcontroller Sample Program Operation Manual (CSI Consecutive Transmission (DMA Controller), 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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NEC Electronics Corporation

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1. OVERVIEW

This manual explains the sample program functions of the DMA controller (CSI consecutive transmission) for the 78K0R/Kx3.

In this sample program, a DMA controller (CSI consecutive transmission) operation is performed.

The outline of the processing is as follows.

- Consecutive transmission of CSI00
- DMA channel 0 is used for DMA transfer.
- DMA start source: INTCSI00 (software trigger (STG0) only for the first start source)
- Interrupt of CSI00 is assigned to IFC03 to IFC00 (bits 3 to 0 of the DMC0 register) = 0110B
- Transfers FF100H to FF1FFH (256 bytes) of the RAM to the transmit buffer (SIO00) of CSI.

3-wire serial I/O processing (master transmission (single-transmission mode))

In this sample program, 3-wire serial I/O processing (master transmission (single-transmission mode)) is used, but a detailed explanation is omitted. For details, refer to the description of 3-Wire Serial I/O Processing (Master Transmission (Single-Transmission Mode)).

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	DMA SFR address register 0 (DSA0)	
	DMA RAM address register 0 (DRA0)	
	DMA byte count register 0 (DBC0)	
	DMA mode control register 0 (DMC0)	
	Port mode register 1 (PM1)	
	Port register 1 (P1)	
I/O	Output: SO00 (P12), $\overline{\text{SCK00}}$ (P10)	
Interrupt	End of DMA0 transfer interrupt (INTDMA0)	
Others	Refer to 3-Wire Serial I/O Processing (Master Transmission (Single-Transmission Mode)).	

3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline	Remark
K0R_vct.asm	Vector processing, reset processing	
K0R_init.asm ^{Note}	Initialization processing	
K0R_main.asm	Main processing	
K0R_sfr_set.asm	DMA controller processing (CSI consecutive transmission)	
K0R_csi_tr.asm	3-wire serial I/O processing (master transmission (single-transmission mode))	Explained in detail in 3-Wire Serial I/O Processing (Master Transmission (Single-Transmission Mode)).

Note This file is commonly used by the sample programs.

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 a CSI transmission operation by DMA transfer.
Remark	–

[File name]

K0R_sfr_set.asm

Functions

Function Name	Processing Outline	Argument	Return Value
DMA_CSIN	Initializes DMA controller (CSI consecutive transmission).	None	None
DMA_CSST	Starts DMA controller (CSI consecutive transmission).	None	None
DMA_CSBK	End processing (forcible abortion) of DMA controller (CSI consecutive transmission)	None	None
DMA_CSIT	Transfer end interrupt of DMA controller (CSI consecutive transmission)	None	None

Function explanations

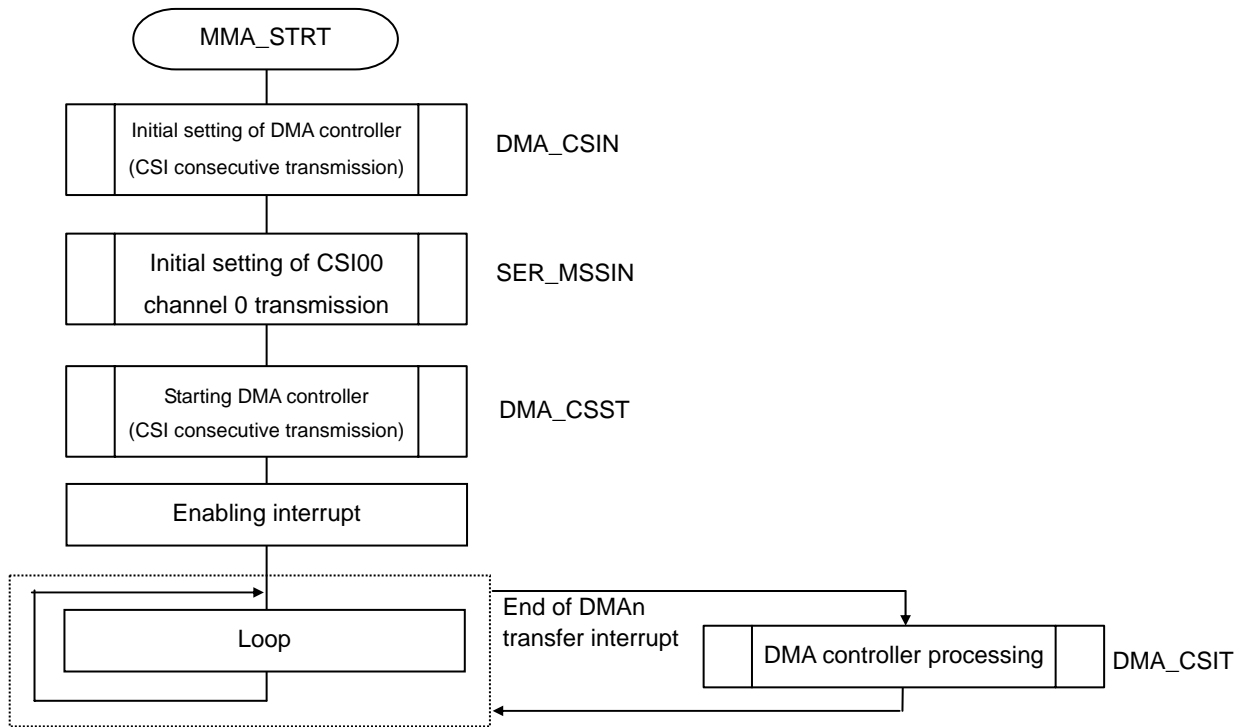
Function name	DMA_CSIN
Processing	Initializes DMA controller (CSI consecutive transmission).
Argument	–
Return value	–
Description	Executes initialization.
Remark	–

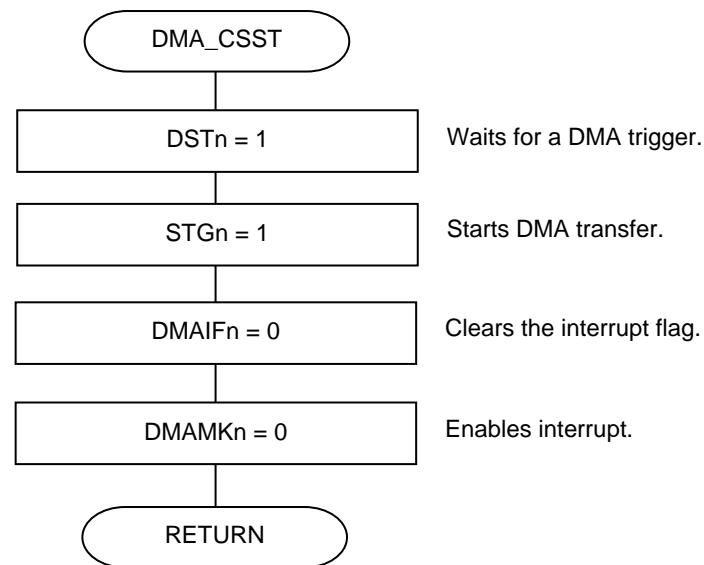
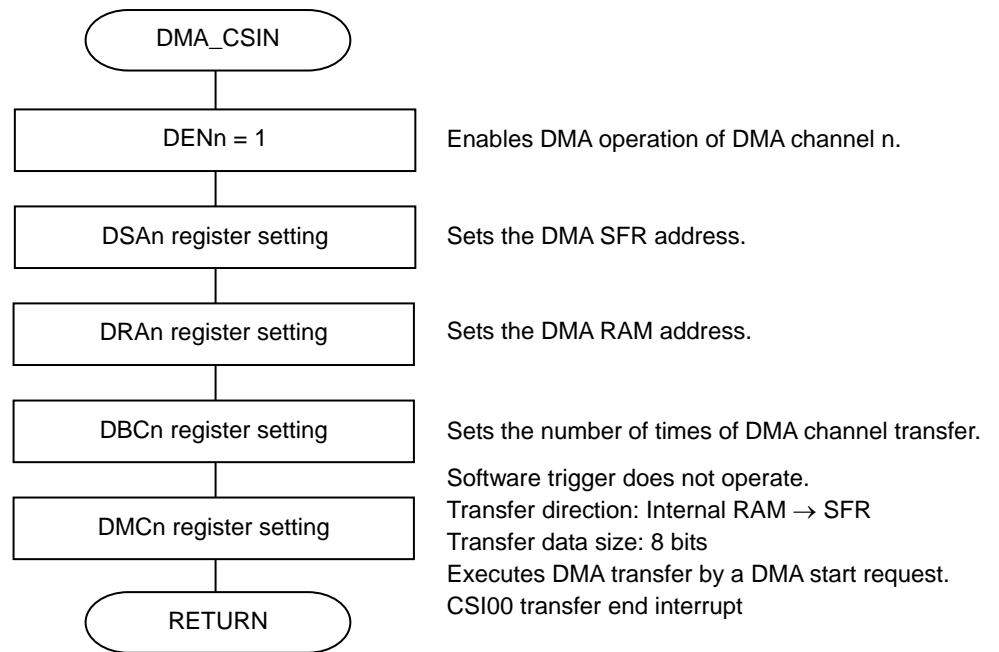
Function name	DMA_CSST
Processing	Starts DMA controller (CSI consecutive transmission).
Argument	–
Return value	–
Description	Starts DMA transfer operation.
Remark	–

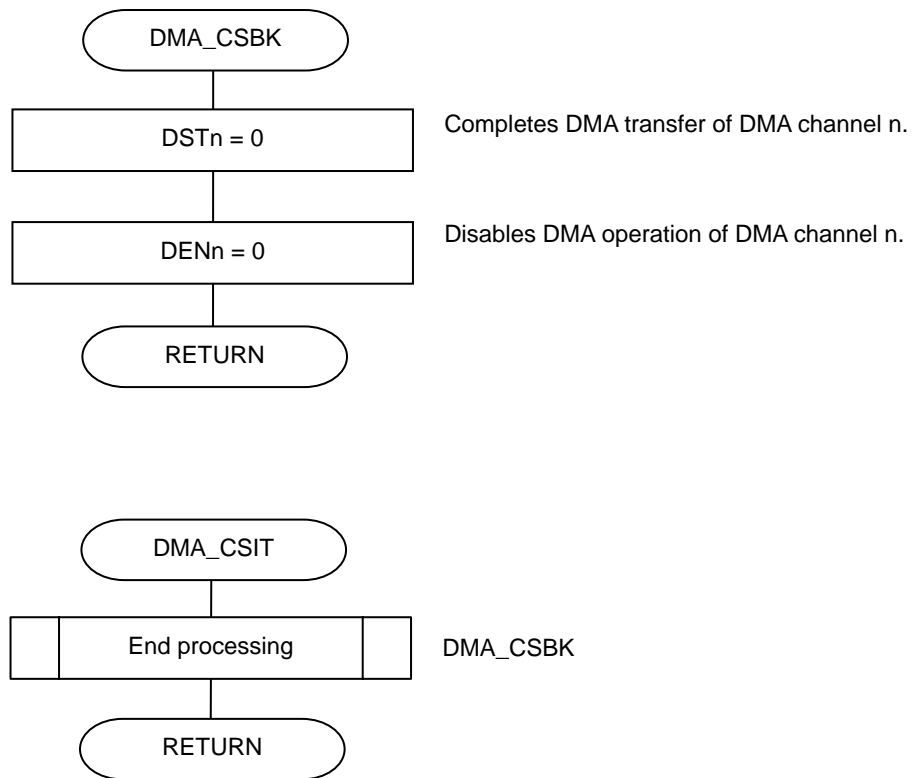
Function name	DMA_CSBK
Processing	End processing (forcible abortion) of DMA controller (CSI consecutive transmission)
Argument	–
Return value	–
Description	Ends (forcibly aborts) DMA transfer operation.
Remark	–

Function name	DMA_CSIT
Processing	Transfer end interrupt servicing of DMA controller (CSI consecutive transmission)
Argument	–
Return value	–
Description	Performs DMA controller end processing during transfer end interrupt.
Remark	–

5. FLOWCHARTS







Remark n: DMA channel number (n = 0, 1)
 n = 0 for this sample program.