

78K0R/Kx3 Microcontroller Sample Program Operation Manual (D/A Conversion (Normal Mode) (D/A Converter), C 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.

ZUD-CC-07-0225-E
January, 2008

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

- **The information in this document is current as of January, 2008. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC Electronics products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".
 The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.
 - "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.
 - "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).
 - "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

- (1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
- (2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

CONTENTS

1. OVERVIEW.....	4
2. RESOURCES USED	5
3. SOFTWARE CONFIGURATION.....	6
4. FUNCTION EXPLANATIONS	7
5. FLOWCHARTS.....	9

1. OVERVIEW

This manual explains the sample program functions of the D/A converter (normal mode) for the 78K0R/Kx3.

In this sample program, D/A conversion is performed, triggered by a write operation to the DACS0 register.

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 normal 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	Not used	
Others	Not used	

3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline	Remark
K0R_def.h ^{Note}	Definition file	
K0R_init.c ^{Note}	Initialization processing	
K0R_ext.h	External declaration	
K0R_main.c	Main processing	
K0R_sfr_set.c	D/A converter processing (normal output mode)	

Note These files are commonly used by the sample programs.

4. FUNCTION EXPLANATIONS

[File name]

K0R_main.c

Function

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

Function explanations

Function name	main
Processing	Main routine
Argument	–
Return value	–
Description	Executes initialization processing and then performs D/A conversion processing.
Remark	–

[File name]

K0R_sfr_set.c

Functions

Function Name	Processing Outline	Argument	Return Value
SDA_NINI	Initializes D/A converter processing.	None	None
SDA_NOUT	Starts D/A converter processing operation.	None	None
SDA_NSTP	Stops D/A converter processing operation.	None	None

Function explanations

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

Function name	SDA_NOUT
Processing	D/A converter starts conversion processing.
Argument	–
Return value	–
Description	Performs D/A conversion, triggered by the interrupt request signal (INTTM04) of timer channel 4.
Remark	–

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

5. FLOWCHARTS



