

# **78K0R/Kx3 Microcontroller Sample Program Operation Manual (Master Transmission/Reception (Serial Interface IIC0), C Source)**

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## 1. OVERVIEW

This manual explains the sample program functions of a master operation by a single-master system with serial interface IIC0 for the 78K0R/Kx3.

In this sample program, a master operation by a single-master system is performed with serial interface IIC0.

The communication conditions are as follows.

- $f_{CLK} = 20$  MHz
- Transmission format
  - Number of transmit data: 1
  - Number of receive data: 2
  - Transmit data: A9H
  - Receive data: Any
- Slave address: A0H
- INTIIC0 (Interrupt of end of IIC0 communication servicing) is used.
- The following communication format is assumed.

ST + ADR/W + DT + ST + ADR/R + DT + DT + SP

ST: Start condition

SP: Stop condition

ADR/W: Slave address + W

ADR/R: Slave address + R

DT: Data

When this sample program is actually used, the transmission format must conform to the specifications of the product that is communicating.

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.<br>Supplied to CPU and peripheral hardware |
| Subclock                 | XT1 (32.768 kHz)                                   | Oscillated by initial processing   |
| Related hardware         | Slave address register 0 (SVA0)                    | Sets the slave address.  |
|                          | IIC shift register 0 (IIC0)                        |  |
|                          | Peripheral enable register 0 (PER0)                |  |
|                          | IIC function expansion register 0 (IICX0)          | Selects the transfer clock.  |
|                          | IIC clock select register 0 (IICCL0)               | Selects the transfer clock.  |
|                          | IIC flag register 0 (IICF0)                        | Sets IIC operation mode.   |
|                          | IIC control register 0 (IICC0)                     | Selects the transfer clock.  |
|                          | Port mode register 6 (PM6)                         |  |
|                          | Port register 6 (P6)                               |  |
| I/O                      | Clock output: SCL0 (P60)                           |  |
|                          | Data I/O: SDA0 (P61)                               |  |
| Interrupt                | INTIIC0: Interrupt of end of IIC0 communication    |  |
| Others                   | Not used   |  |

### 3. SOFTWARE CONFIGURATION

#### Files

| File Name                  | Processing Outline   | Remark |
|----------------------------|--|--------|
| K0R_def.h <sup>Note</sup>  | Definition file  |        |
| K0R_init.c <sup>Note</sup> | Initialization processing  |        |
| K0R_ext.h                  | External declaration   |        |
| K0R_main.c                 | Main processing  |        |
| K0R_sfr_set.c              | Serial interface IIC0 (master operation by single-master system) |        |

**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 |
|---------------|--------------------|----------|--------------|
| main          | Main routine       | None     | None         |

Function explanations

|               |   |
|---------------|---|
| Function name | main  |
| Processing    | Main routine  |
| Argument      | –   |
| Return value  | –   |
| Description   | Executes initialization processing and then starts communication operation. |
| Remark        | –   |

[File name]

K0R\_sfr\_set.c

Functions

| Function Name | Processing Outline   | Argument | Return Value |
|---------------|--|----------|--------------|
| IIC_SMMIN     | Initializes serial interface IIC0 (master operation by single-master system).                | None     | None         |
| IIC_SMMST     | Communication processing of serial interface IIC0 (master operation by single-master system) | None     | None         |
| IIC_SMMSP     | Communication end of serial interface IIC0 (master operation by single-master system)        | None     | None         |

Function explanations

|               |   |
|---------------|---|
| Function name | IIC_SMMIN   |
| Processing    | Initializes serial interface IIC0 (master operation by single-master system). |
| Argument      | –   |
| Return value  | –   |
| Description   | Executes initialization.  |
| Remark        | –   |

|               |  |
|---------------|--|
| Function name | IIC_SMMST  |
| Processing    | Communication processing of serial interface IIC0 (master operation by single-master system) |
| Argument      | –  |
| Return value  | –  |
| Description   | Executes communication processing.   |
| Remark        | –  |

|               |   |
|---------------|---|
| Function name | IIC_SMMSP   |
| Processing    | Communication end of serial interface IIC0 (master operation by single-master system) |
| Argument      | –   |
| Return value  | –   |
| Description   | Generates a stop condition.   |
| Remark        | –   |

5. FLOWCHARTS







