

**DETECT-IT!**

QSG-YDETECT-IT-RL78

**RL78/I1D detector boards kit**

Rev.1.30

24 Feb, 2015

Quick Start Guide

**1. Introduction**

This quick start guide assists the user to connect and use rapidly the detector solution kit Detect it!. The detector demonstrators consists of different boards: glass break detector demonstrator, monoxide carbon detector demonstrator, motion detector demonstrator, smoke detector demonstrator.

All the boards contain into the Detect it! kit are preprogrammed and ready for quick demonstration.

Please check the content of the kit using the content list written on the box, and notify your supplier if any part is missing.

Update about the content of the kit can be find on the Detect it!kit dedicated web page : [www.renesas.eu/detector/](http://www.renesas.eu/detector/)

**2. Boards layout**

You will find below picture of each board with short explanation of the main parts. For more details, please refer to the Detect it! user manual.

The name of each board is written, on the PCB. Please look at the PCB to identify each board.

**2.1 Glass Break detector board layout**

Please check the name of the board you are looking "GLASSBREAK\_SENSOR\_I1D"

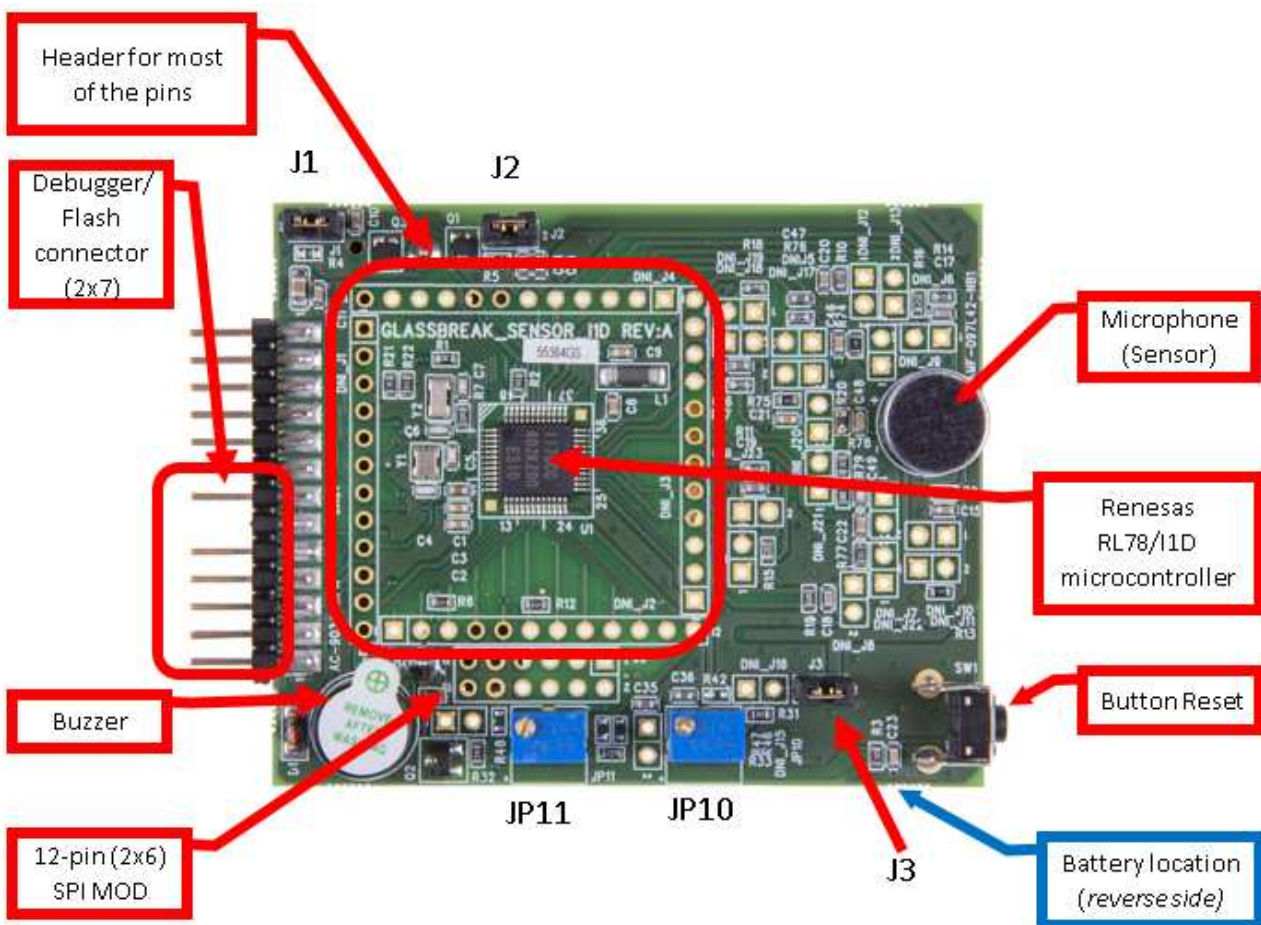


Figure Glass break detector top view

### 2.2 CO detector board layout

Please check the name of the board you are looking "CO\_SENSOR\_I1D"

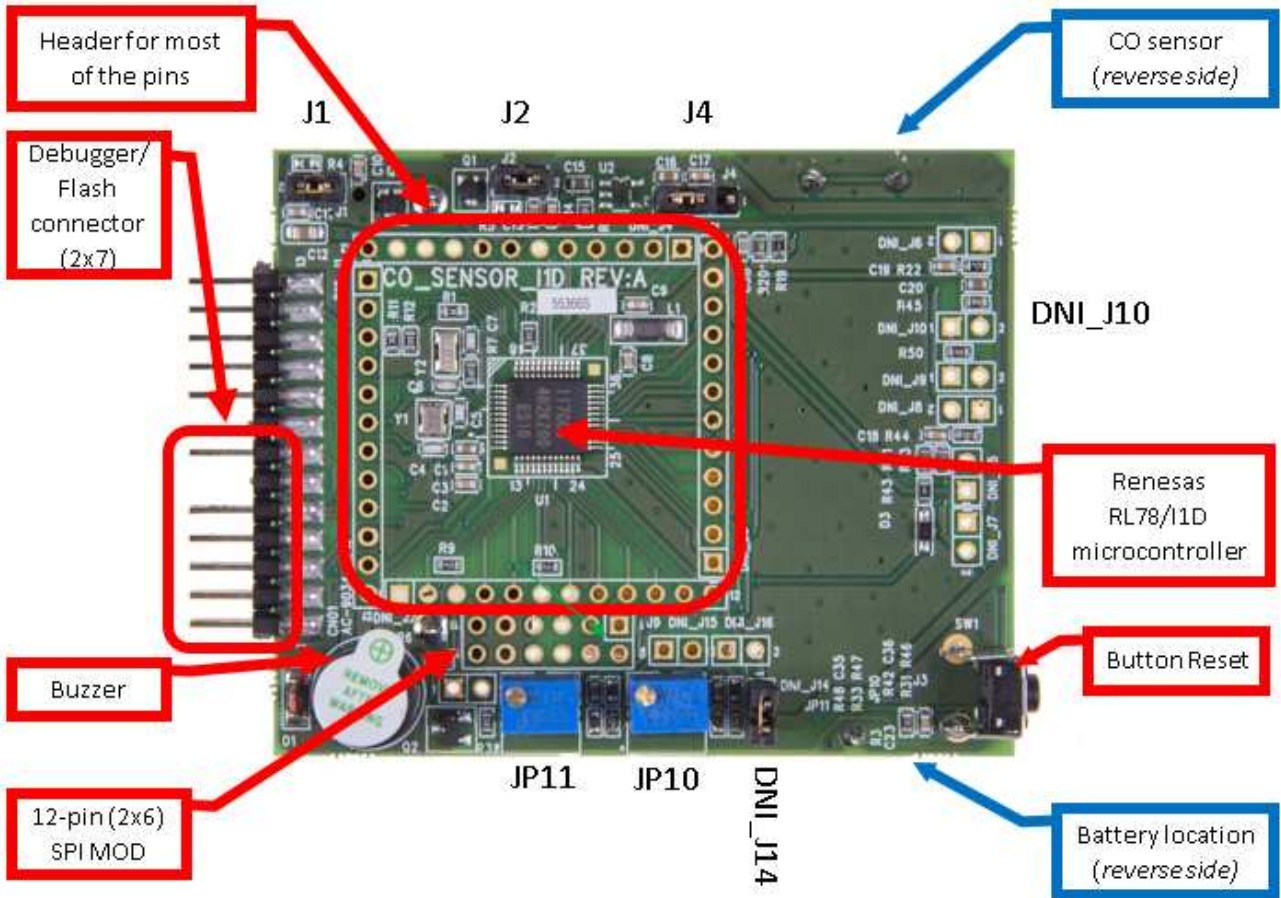


Figure CO detector top view

### 2.3 Motion detector board layout

Please check the name of the board you are looking "MOTION\_SENSOR\_I1D"

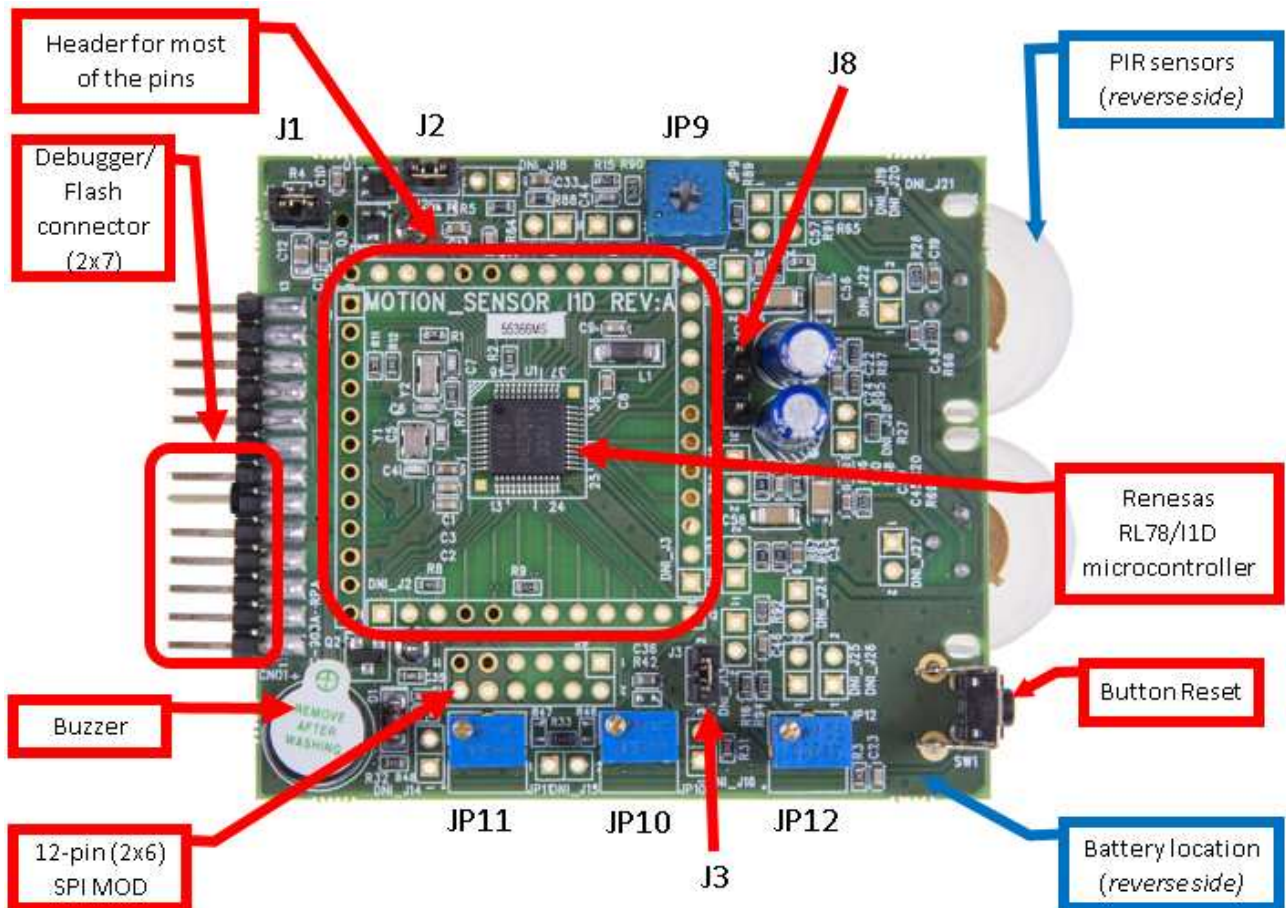


Figure Motion detector top view

## 2.4 Smoke detector board layout

Please check the name of the board you are looking “SMOKE\_SENSOR\_I1D”

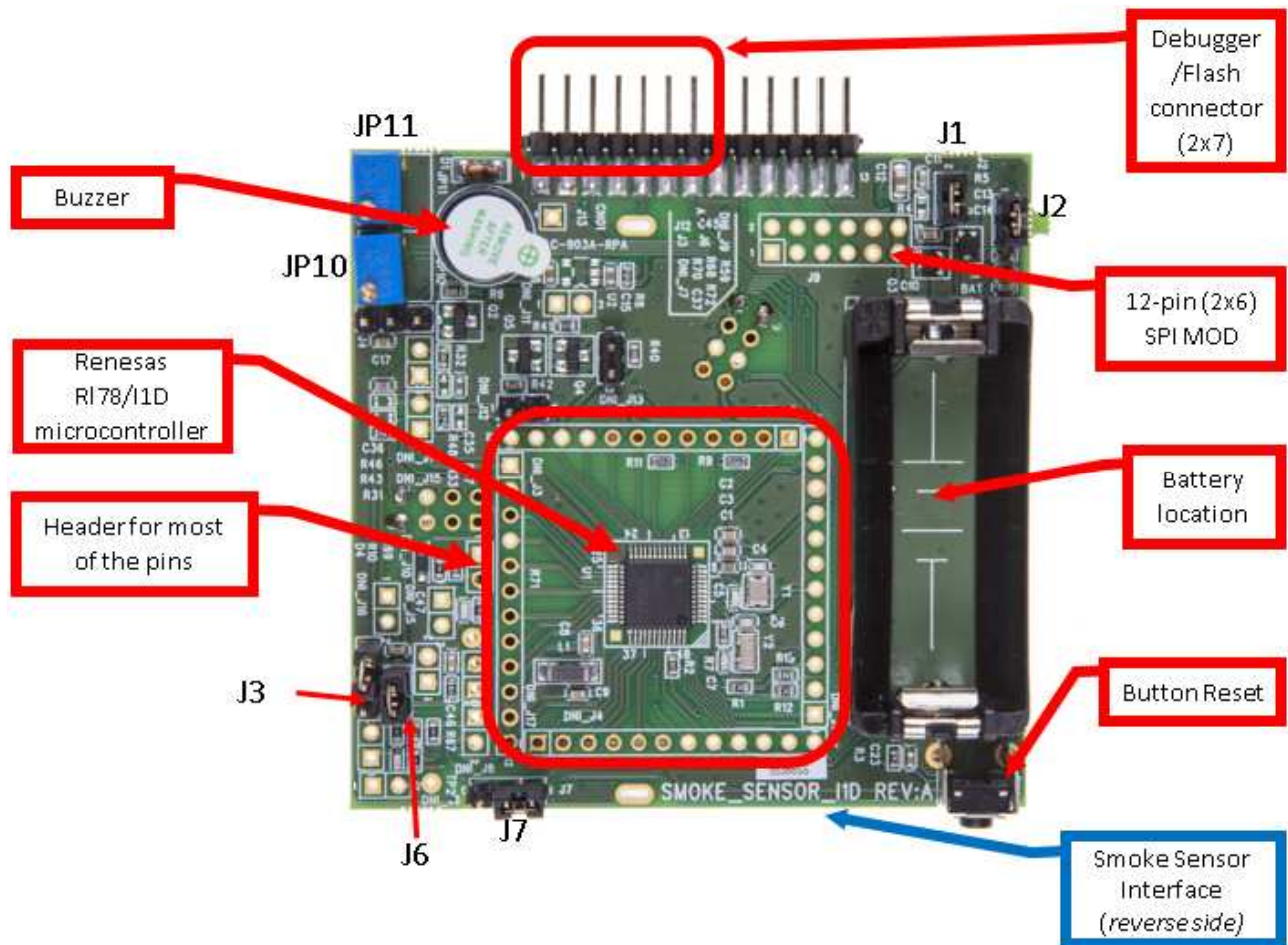


Figure Smoke detector top view

### 3. Initial board configuration

#### 3.1 Glass Break detector board

In order to start the demonstration of the Glass Break detector, please ensure that this initial configuration is done:

- J1 should be closed
- J2 should be closed
- J3 should be closed

#### 3.2 CO detector board

In order to start the demonstration of the CO detector, please ensure that this initial configuration is done:

- J1 should be closed
- J2 should be closed
- DN\_J10 should be open
- DN\_J14 can be closed or opened

#### 3.3 Motion detector board

In order to start the demonstration of the Motion detector, please ensure that this initial configuration is done:

- J1 should be closed
- J2 should be closed
- J3 should be closed
- J8 should be opened

### 3.4 Smoke detector board

In order to start the demonstration of the Smoke detector, please ensure that this initial configuration is done:

- J1 should be closed
- J2 should be closed
- J3 should be open
- J6 should be closed
- J7 (pins 1-2) should be closed
- Please check that IR photodiode and IR LED are in place

## 4. Starting up boards and quick tests

Please make sure you are equipped with a 3V Lithium battery CR123. Only one CR123 battery is provided with each kit.

Once the jumpers of each board are set, please follow the below steps.

### 4.1 Glass Break detector demonstration using battery

Step 1 / Insert the CR123 battery into the battery location of the Glass Break detector (this is on the reverse side of the board), please be careful about the polarity.

Step 2 / Press the reset button.

Step 3 / Try different noise:

To test for false Glass break event detection, a loud hand clap can be tried at a distance of 0.5 meter or greater distance from the Glass break microphone. If a loud hand clap is made less even closer or so distance, it is easier to induce a false detection event.

To test for true Glass break event detector, a specific test system can be used as a glass break sound simulator like Interlogix Model 5709C Shatter Series Tester. This glass break simulator has 3 different selectable sound simulations: (1) Plate glass, (2) Tempered glass, and (3) Laminated glass. Each of these glass break simulations has a different duration and frequency content. To use this unit, hold the Model 5709C output speaker in the direction of the Glass break sensor microphone within short distance. The alarm will sound if high frequency Glass break sound is detected. An easier method is to play some sound track emulating the typical glass break noise.

Step 4 / Stop the alarm by pressing the reset button.

Step 5 / Power off the detector by removing the battery.

For more information about the Glass Break detector operation, please refer to the user manual of the kit. The Glass Break detector demonstrator can be also demonstrated using the E1 debugger as power supply. For more information, please refer to the user manual of the detector kit provided into the CD-ROM.

### 4.2 CO detector demonstration using battery

Step 1 / Insert the CR123 battery into the battery location of the CO detector (this is on the reverse side of the board), please be careful about the polarity.

Step 2 / Press the reset button.

Step 3 / The CO detector is impossible to test without specific equipment. To test the CO sensor for gas concentration accuracy, a product available in the market was used. The Kidde Carbon Monoxide Alarm, Model KN-COPP-B-LPM, which has an LCD readout capable of showing CO gas concentration levels of 0-999ppm was the model used.

For measurement setup, a Zip-Loc™ style bag was used to contain the CO sensor board from Renesas, the Kidde CO alarm measuring unit and CO gas itself.

This way it is also possible to measure the DC output of trans-conductance amplifier output AMP00 and verify that the alarm threshold is triggered at appropriate level.

Step 4 / Stop the alarm by pressing the reset button.

Step 5 / Power off the detector by removing the battery.

For more information about the CO detector operation, please refer to the user manual of the kit. The CO detector demonstrator can be also demonstrated using the E1 debugger as power supply. For more information, please refer to the user manual of the detector kit provided into the CD-ROM.

### 4.3 Motion detector demonstration using battery

Step 1 / Insert the CR123 battery into the battery location of the Motion detector (this is on the reverse side of the board), please be careful about the polarity.

Step 2 / Press the reset button.

Step 3 / The motion detector is easy to test. The sensor board will detect a motion of a human from distance of 4m. The sensor board can be fine-tuned with the potentiometers (Please refer to user manual and schematics for more information). Once the motion is detected, an alarm will sound.

Step 4 / Stop the alarm by pressing the reset button.

Step 5 / Power off the detector by removing the battery.

For more information about the Motion detector operation, please refer to the user manual of the kit. The Motion detector demonstrator can be also demonstrated using the E1 debugger as power supply. For more information, please refer to the user manual of the detector kit provided into the CD-ROM.

### 4.4 Smoke detector demonstration using battery

Step 1 / Insert the CR123 battery into the battery location of the Smoke detector (this is on the reverse side of the board), please be careful about the polarity.

Step 2 / Press the reset button.

Step 3 / If you have some “Smoke Check” and “Smoke-In-a-Can” brand spray cans available, then the Smoke sensor works well with “Smoke Check” and “Smoke-In-a-Can” brand spray cans. After about 0.5 to 1 second of Smoke spray the alarm acts within 3 seconds and turns on alarm for multiple cycles of 6 seconds ON and 3 seconds OFF.

If you do not have such type of spray cans, then it is possible to put an obstacle in the infrared beam, to replace the “smoke” spray. After about 0.5 to 1 second of the presence of the obstacle, the alarm acts within 3 seconds and turns on alarm for multiple cycles of 6 seconds ON and 3 seconds OFF.

Step 4 / Stop the alarm by pressing the reset button.

Step 5 / Power off the detector by removing the battery.

For more information about the Smoke detector operation, please refer to the user manual of the kit. The Smoke detector demonstrator can be also demonstrated using the E1 debugger as power supply. For more information, please refer to the user manual of the detector kit provided into the CD-ROM.

## 5. Next Step

After you have completed this quick start procedure, please review documentation that came with the kit, especially the resources available on the CD-ROM.

The CD-ROM contains more information about the detector kits, please refer to it in case of any problems or for more information about the kit.

Please find the content of the kit here :

### Table CD ROM content list

CD ROM folder	Description of resources
Samples Programs	IAR Samples programs for each demonstrators boards <ul style="list-style-type: none"> <li>• IAR samples program for Glass Break demonstrator</li> <li>• IAR samples program for CO demonstrator</li> <li>• IAR samples program for Motion demonstrator</li> <li>• IAR samples program for Smoke demonstrator</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>• User manual of the Detect it! kit</li> <li>• User manual of the microcontroller RL78/I1D</li> <li>• Quick start guide of the Detect it! Kit</li> <li>• Datasheets of the various sensors and crystals used.</li> </ul> For each demonstrator boards : <ul style="list-style-type: none"> <li>• Schematics</li> <li>• Gerber files</li> <li>• Bill of Material</li> </ul>
Acroread	PDF reader
Application Leading Tool	Latest version of Code generator tool provided by Renesas for RL78 series including RL78/I1D
Renesas Flash Programmer	Latest version of Flash Programmer tool provided by Renesas for all MCU
Videos	<ul style="list-style-type: none"> <li>• Detect it! Kit Promotion video</li> <li>• Detect it! Kit Technical video</li> </ul>

## 6. Support

In case of issues to operate the board, please check if there is any update available on Renesas website :

[www.renesas.eu/detector/](http://www.renesas.eu/detector/)

Or contact your local office.

[www.renesas.com](http://www.renesas.com)

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## Revision History

Rev.	Date	Description	
		Page	Summary
1.00	15/09/2014	9	First version of quick start guide
1.10	08/01/2015	10	Small corrections for first release
1.30	24/02/2015	10	Small corrections for improvements



## General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

### 1. Handling of Unused Pins

Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

- The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

### 2. Processing at Power-on

The state of the product is undefined at the moment when power is supplied.

- The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.

In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.

In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

### 3. Prohibition of Access to Reserved Addresses

Access to reserved addresses is prohibited.

- The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

### 4. Clock Signals

After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

- When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

### 5. Differences between Products

Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

- The characteristics of an MPU or MCU in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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