

## RL78/G10

R01AN1898EJ0110

Rev. 1.10

Nov. 1, 2014

### The Notes of Assembly Language Programming

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#### Introduction

This application note explains about notes of assembly language programming for RL78/G10 through comparison with RL78/G12. Refer to the User's Manual: Hardware for more detail about functions.

#### Target Device

RL78/G10

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## 1. The Major Differences

RL78/G10 is greatly different from RL78/G12 in the following points.

- (1) CPU core is RL78-S1 core. Access to special functional registers (SFR) is permitted only 1-bit access and 8-bit access. 16-bit access is not permitted.
- (2) RL78/G10 does not have two or more register banks.
- (3) The external oscillator cannot be used with 10 pin products.
- (4) The selectable power-on reset circuit is built in instead of the voltage level detector circuit.

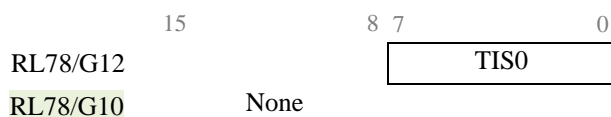
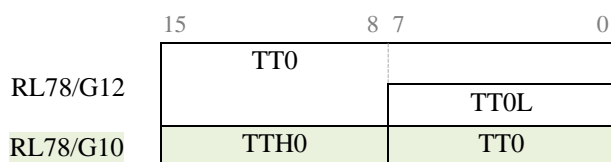
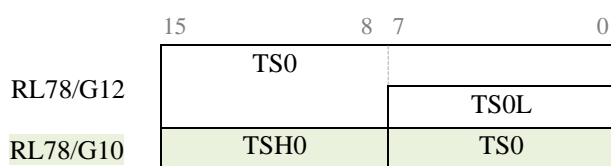
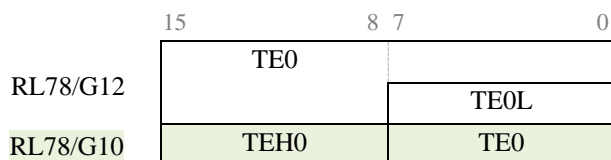
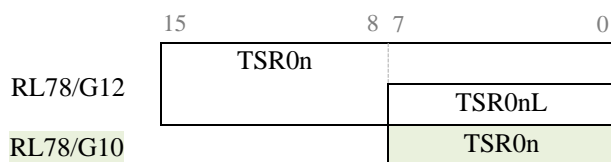
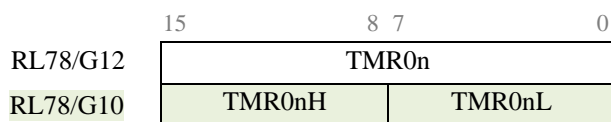
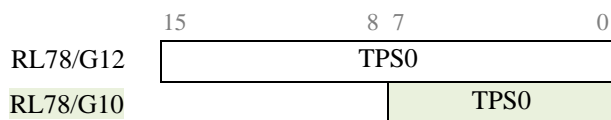
## 2. Details of difference

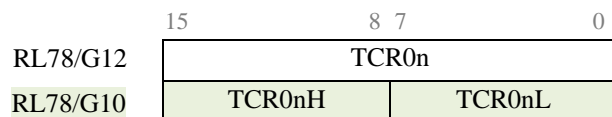
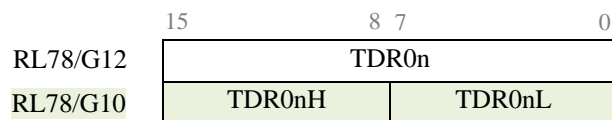
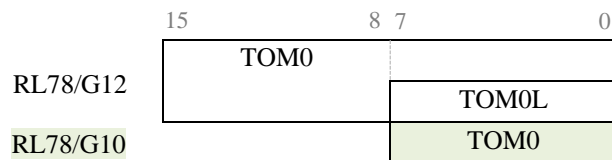
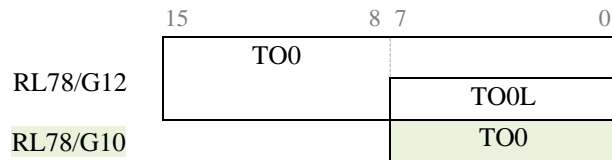
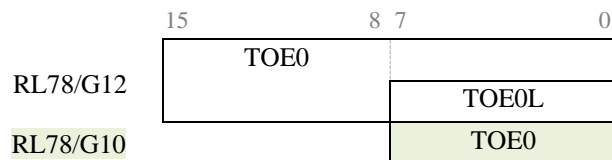
The differences listed in the preceding chapter are described in detail.

### 2.1 SFR Addressing

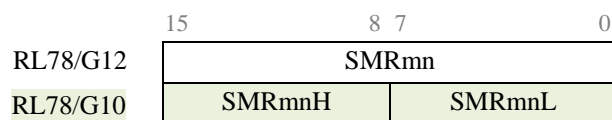
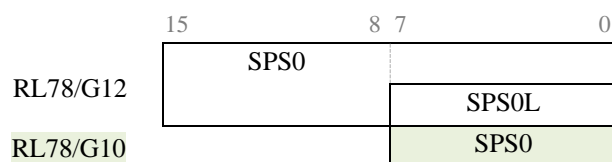
The maximum bit width which can be accessed is 8 bits, and differs from RL78/G12. Therefore, there are many different names of SFR from RL78/G12. As compared with RL78/G12, there are many SFRs that are changed into 8-bit SFR with the same name or are divided into two 8-bit SFRs.

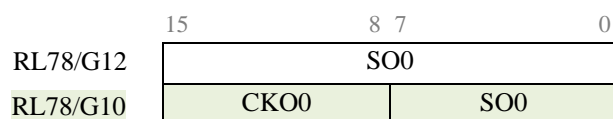
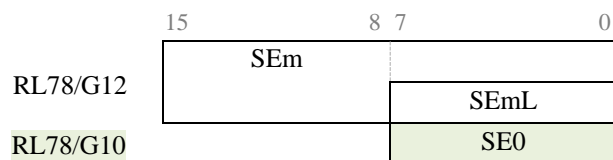
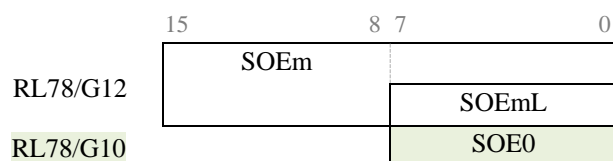
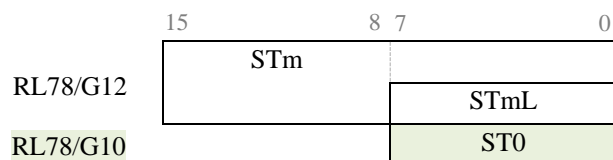
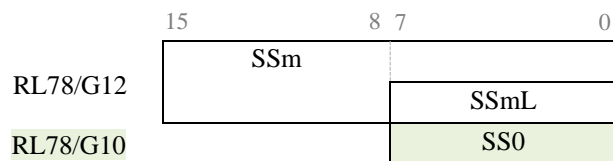
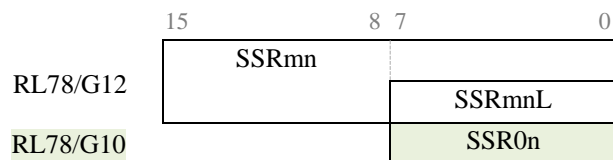
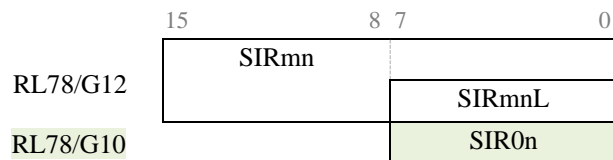
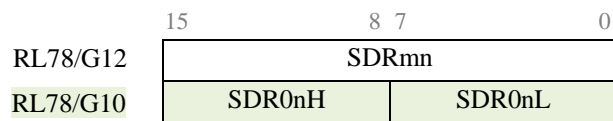
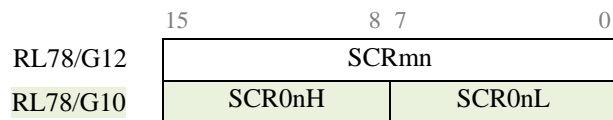
Followings are examples of SFR of the timer array unit.

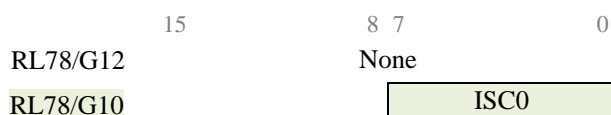
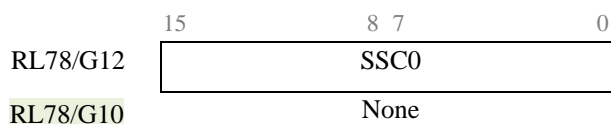
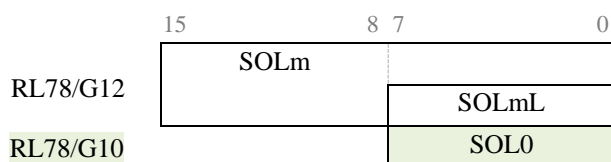




Followings are examples of SFR of the serial array unit.







## 2.2 Restriction of a Register Bank Function

Since the register bank is single, be careful when using interrupt functions. In RL78/G12, since the register bank is switched at the head of the interrupt handler, a register bank can be used freely. However, in RL78/G10, it is necessary that the register to be used is saved to the stack in advance and returned just before executing RETI command.

## 2.3 Unsupported External Oscillator (10-pin product)

External oscillator is unavailable for the 10-pin product. It is recommended to use high-speed on-chip oscillator (HOCO).

## 2.4 Selectable Power-on Reset Circuit

The voltage level detector circuit is not built but the selectable power-on reset circuit is built. Therefore, note that setup of the option byte also differs greatly from RL78/G12's setup.

### 3. Related Application Note

The application note relevant to this application note is shown below.

- RL78/G10 Initialization (R01AN1454J) Application Note



#### 4. Documents for Reference

RL78/G10 User's Manual: Hardware (R01UH0384E)

RL78/G12 User's Manual: Hardware (R01UH0200J)

RL78 Family User's Manual: Software (R01US0015E)

(The latest versions of the documents are available on the Renesas Electronics Website.)

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## Revision History: RL78/G10 The Notes of Assembly Language Programming

Rev.	Date	Description	
		Page	Summary
1.00	July 16, 2014	—	First edition issued
1.10	Nov. 1, 2014	3	Term changing: from “resonator” to “oscillator”.

## 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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