RL78/G1D Group

RL78/G1D Solution Kit – USB Dongle Hardware Manual

R01AN2957EU0100
Rev.1.00
July 31, 2016

Introduction

This document represents RL78/G1D Solution Kit's USB Dongle. The document describes hardware platform information such as USB connection, Device driver installation, RL78/G1D-SK Bluetooth® module interface and its Bluetooth® connectivity, and schematics.

Target Device

RL78/G1D Group (R5F11AGJ)

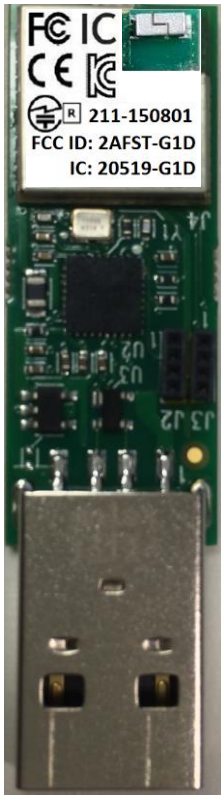
This Solution Kit's USB Dongle includes RL78/G1D-SK Bluetooth® module and RL78/G1C (R5F10KBCANA) device for USB to UART interface. The RL78/G1D-SK has Renesas' Intelligent Bluetooth® low energy technology device with part number starting with R5F11A (256 KB program flash memory, 20 KB RAM and 8 KB data flash memory). For detail of the RL78/G1D device, refer to Electrical Specifications of RL78/G1D User's Manual: Hardware, R01UH0515EJ0110 [1].

Contents

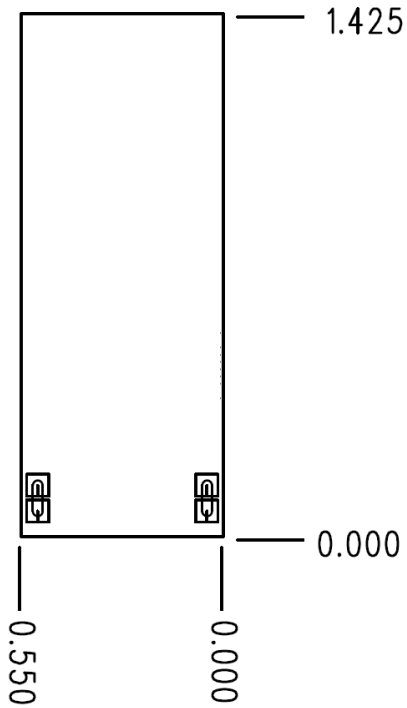
1. Overview

RL78/G1D-SK USB Dongle has two sections: Bluetooth® module (RL78/G1D-SK) and USB interface. You can use This dongle like USB to Bluetooth® module. Using USB 5 volt power supply, the step down 3.0 voltage from the dongle provides RL78/G1D-SK module and USB interface device, RL78/G1C. Thus, no external power supply is required. In addition, there are two on board programming connectors: J2 and J3 for USB interface device and RL78/G1D-SK module respectively. You can reprogram or debug through those J2 and J3 connector using RL78/G1D PMOD™ Adapter board explained detail in section 4.

Figure 1 shows top view of the USB Dongle module and its dimension.



RL78/G1D-SK
USB Dongle



Dimension (board only)

Figure 1 RL78/G1D-SK USB Dongle

1.1 Specification Outline

The specification of RL78/G1D-SK USB Dongle is described as below Table 1.

Table 1 RL78/G1D-SK USB Dongle Specification

Item	Content
Dimension	1.425 x 0.55 inch (board only)
Operation Power Supply Voltage	5.0 V (USB power supply)
Maximum Power Supply Current	100 mA
Operating Ambient Temperature/Humidity	0°C to +60°C, 10% to 80% RH (non condensing)
Storage Temperature	–15°C to +60°C, 10% to 80% RH (non condensing)

2. RL78/G1D-SK USB Dongle interface

The USB Dongle has USB A-Type male connector. The USB interface device, RL78/G1C and RL78/G1D-SK module connects with 2-wire UART interface. Thus, RL78/G1D-SK module has to be programmed firmware with Modem configuration support 2-wire UART option for testing with Renesas GUI tool [4]. For embedded mode configuration, use Tara Term terminal application via UART to test with RL78/G1D-SK module. Refer detail to the documents: Bluetooth® Low Energy Protocol Stack User's Manual, R01UW0095EJ0117 [2] and RL78/G1D Solution Kit-PMOD Module Hardware Manual, R01AN2919EU0100_RL78G1D [3].

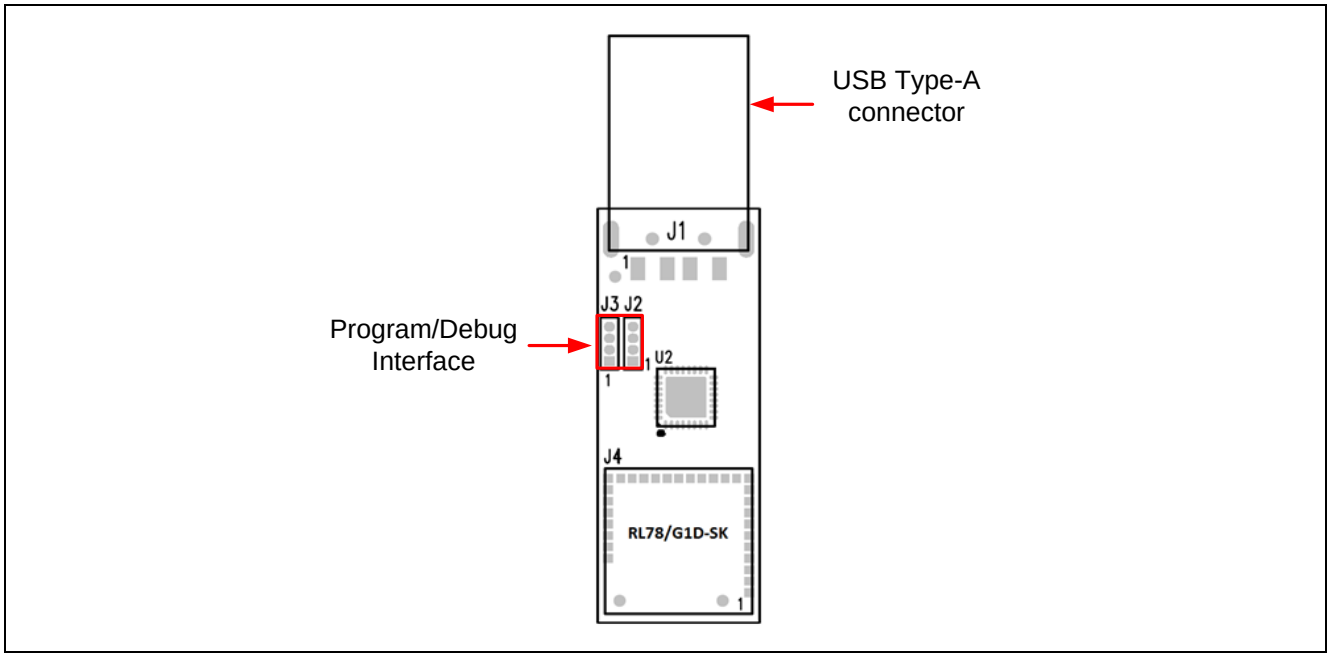


Figure 2 RL78/G1D-SK USB Dongle Top View

3. Operating RL78/G1D-SK USB Dongle

Before plugging in to the PC, install the USB Communication Device Class (CDC) driver for virtual COM port. To install the driver, manually select CDC_Demo.inf file from CD ROM or decompressed zip folder when install manager requests to get the inf file.

3.1 RL78/G1D-SK USB Dongle Driver Installation

If you receive the message box with No driver found as shown in Figure 3. Manually install the USB driver with following steps.

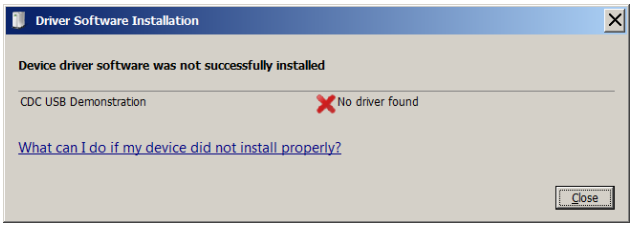


Figure 3 RL78/G1D-SK USB Dongle Driver Installation (No driver found)

Step 1. Open Device Manager and select CDC USB Demonstration. Then, right click to select Update Driver Software as shown in Figure 4.

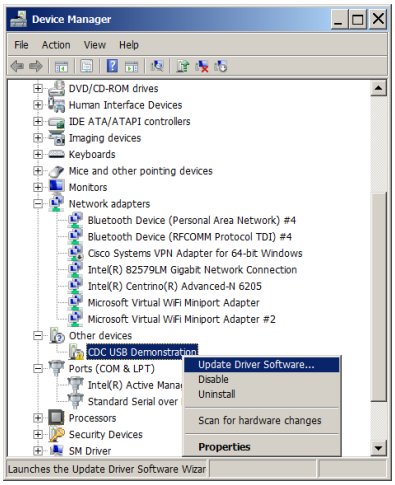


Figure 4 RL78/G1D-SK USB Dongle Driver Installation (Device Manager)

Step 2. Click Browse button to select the provided inf file. Then click "Next" button to install the driver. Figure 5 shows the Update Driver Software dialog box.

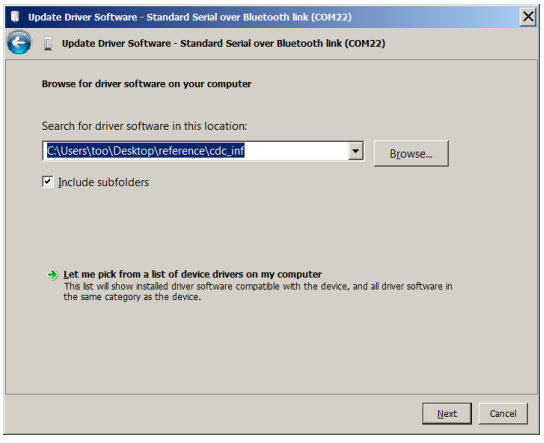


Figure 5 RL78/G1D-SK USB Dongle Driver Installation (Update Driver Software)

Step 3. If you get Windows Security message as shown in Figure 6, select “Install this software anyway” to continue installation.

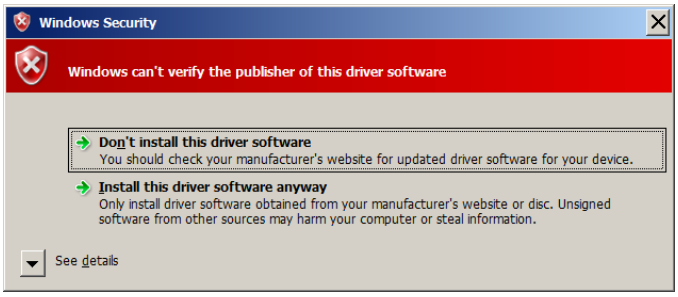


Figure 6 RL78/G1D-SK USB Dongle Driver Installation (Windows Security)

Step 4. When the driver is installed successfully, click “Close” button. Figure 7 shows Update Driver Software message box with successful installation.

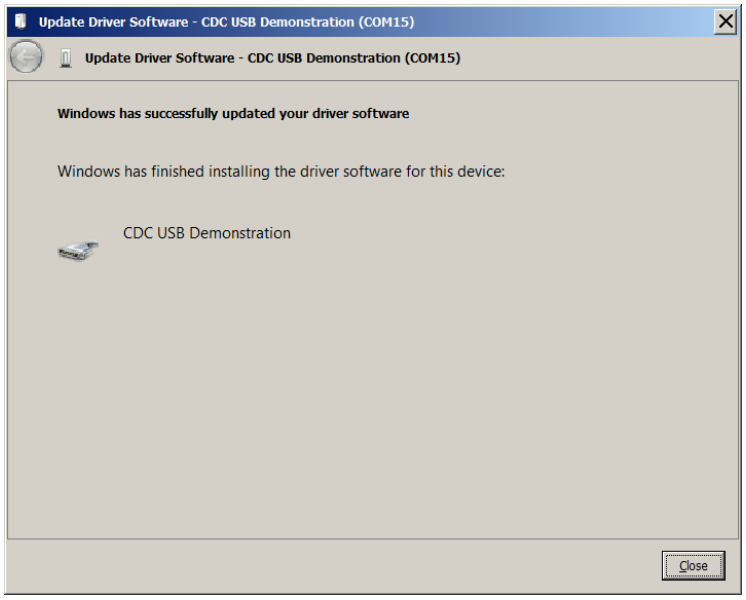
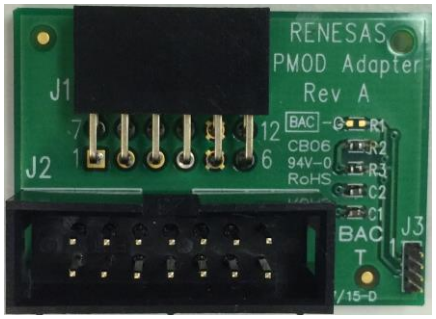


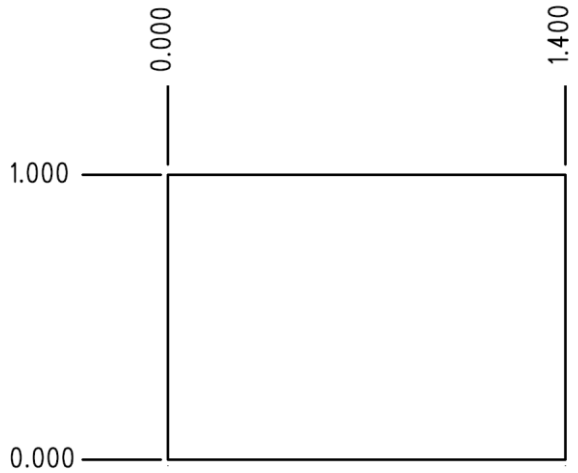
Figure 7 RL78/G1D-SK USB Dongle Driver Installation (complete Installation)

4. RL78/G1D PMOD Adaptor

Using with Renesas E1 programmer/debugger, program or debug to Solution Kit demo boards such as PMOD module. This RL78/G1D PMOD adaptor is an interposer board to USB Dongle and Target Board. The adaptor has a 4-pin connector (J3) with 1-millimeter pitch male header to interface with USB Dongle board. Connect 14-pin connector (J2) with E1 Programmer/Debugger to the target USB Dongle either RL78/G1C device or RL78/G1D-SK module. Figure 8 shows the PMOD Adaptor and its dimension. This Adaptor also support to RL78/G1D Solution Kit-PMOD module for programming through 0.1-inch right angle female 14-pin connector (J1).



PMOD Adaptor



Dimension

Figure 8 PMOD Adaptor Top View

4.1 Function outline of PMOD Adaptor

Below are PMOD adaptor functions for Solution Kit.

(1) **Programming**

Using E1 programmer/debugger and Renesas Flash Project tool, you can program to the target device like RL78/G1D Solution Kit- PMOD module via J1 connector and RL78/G1D Solution Kit- USB dongle via J3 connector.

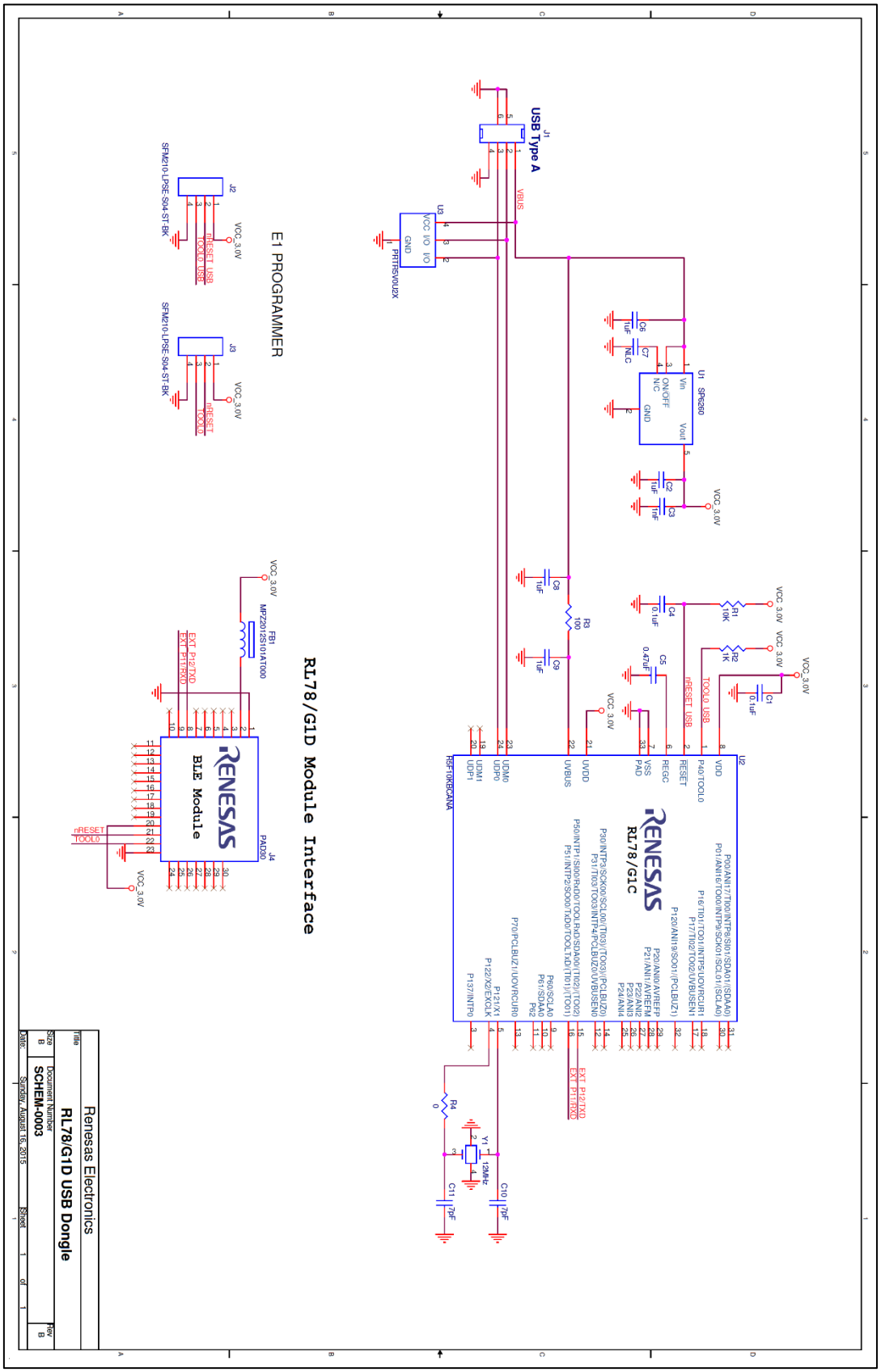
(2) **Debugging**

The same E1 programmer/debugger tool can use for debugging to the target device like RL78/G1D and RL78/G1C device through J1 and J3.

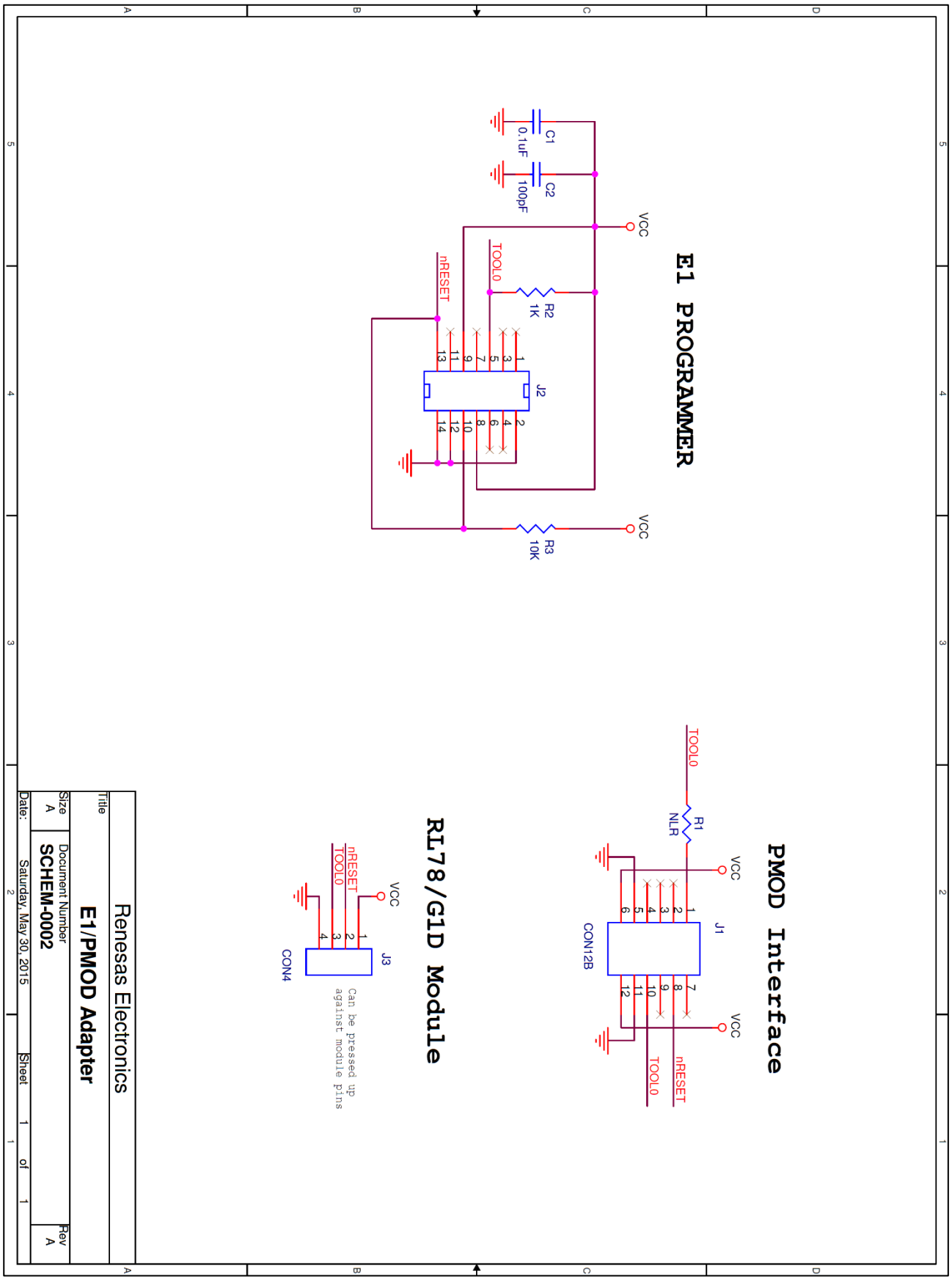
Refer detail to respective documents in Renesas website for E1 programming and debugging.

5. Circuit Diagrams

5.1 RL78/G1D-SK USB Dongle



5.2 RL78/G1D PMOD Adaptor



Appendix A - References

[1] RL78/G1D User's Manual: Hardware, R01UH0515EJ0110 Rev.1.10, Sep 25, 2015

[2] Bluetooth® Low Energy Protocol Stack User's Manual, R01UW0095EJ0117 Rev.1.17, Apr 17, 2015

[3] RL78/G1D Solution Kit-PMOD Module Hardware Manual, R01AN2919EU0100_RL78G1D Rev.1.00, July 31, 2016

[4] Bluetooth® Low Energy Protocol Stack GUI Tool Manual, R01AN2469EJ0090 Rev. 0.90, May 29, 2015

Appendix B - Conformity Assessment

FCC/IC Regulatory

Since this module is not sold to general end users directly, there is no user manual of module.
For the details about this module, please refer to the specification sheet of module.
This module should be installed in the host device according to the interface specification (installation procedure).
The following information must be indicated on the host device of this module;

Contains FCC ID: 2AFST-G1D

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Contains IC: 20519-G1D

The following statements must be described on the user manual of the host device of this module;

[for FCC]
FCC CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE). But it is desirable that it should be installed and operated keeping the radiator at least 20cm or more away from person's body.

[for IC]

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1) l'appareil ne doit pas produire de brouillage; 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE). But it is desirable that it should be installed and operated keeping the radiator at least 20cm or more away from person's body.
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R&TTE Directive

We hereby declare that this product is in compliance with the essential requirements and other EC relevant provisions of
Directive 1999/5/EC.

Declaration of Conformity (DoC) can be available upon request. Contact to local Renesas Sale office.

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MSIP-CRM-R5E-G1D
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Japan Radio Law

Contains MIC ID: R1507226
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Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	July 31, 2016	—	First edition issued

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   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.
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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.

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