

R0E000010ACB20

R20UT2740EJ0100

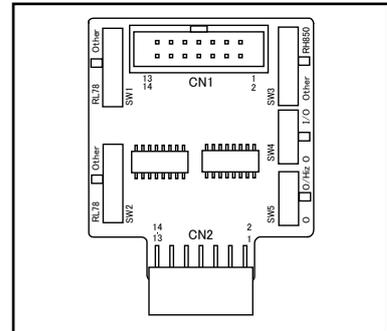
Rev.1.00

Isolator for the E1 Emulator of RH850 and RL78

Dec 01, 2013

1. Preface

The R0E000010ACB20 is an isolator for the E1 emulator of RH850 and RL78. This product is used for a debugging environment where there is a GND gap between the user system and emulator system.



Package Components

Before using this product, check if your R0E000010ACB20 contains all of these items.

Table 1.1 Package Components

Item	Qty.
R0E000010ACB20 (Isolator for the E1 emulator)	1
R0E000010ACB20 User's Manual (English) (This manual)	1
R0E000010ACB20 User's Manual (Japanese)	1

Note: Please handle this product as precision equipment for transportation.

Important

CAUTION

Caution on Isolation Voltage:



This product is intended to isolate a small and electrically safe GND gap between the user system and emulator system. In any case isolation voltage must be maintained within SELV limits i.e. less than 42.4VAC, or 60VDC.

The isolator must never be used as an element of a safety isolation system. The part could be expected to function correctly at higher voltage across the isolation barrier; but then the circuitry on both sides of the barrier must be regarded as operating at an unsafe voltage and further isolation/insulation systems must form a barrier between these circuits and any user-accessible circuitry according to safety standard requirements.

Caution to Be Taken for Disposal:



Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

European Union regulatory notices:



The WEEE (Waste Electrical and Electronic Equipment) regulations put responsibilities on producers for the collection and recycling or disposal of electrical and electronic waste. Return of WEEE under these regulations is applicable in the European Union only. This equipment (including all accessories) is not intended for household use. After use the equipment cannot be disposed of as household waste, and the WEEE must be treated, recycled and disposed of in an environmentally sound manner. Renesas Electronics Europe GmbH can take back end of life equipment, register for this service at "<http://www.renesas.eu/weee>".

Cautions to Be Taken for Handling the Isolator:



- Take full care not to touch any parts or cause short circuits on this product.
- Protect this product from excessive physical shock.
- Do not modify this product. Modifying the product will void your warranty.

Cautions for Use Temperature:



The isolator is to be used in an environment with a maximum ambient temperature of 35°C. Care should be taken that this temperature is not exceeded.

 **CAUTION****Cautions to Be Taken for Connecting the Isolator:**

- Always switch OFF the power before connecting or disconnecting this product.
- This product has some switches. Make settings depending on debugging interface you use. Before changing settings power off this product and other connected devices.
- To connect this product to the user system align the #1 pin of the connector to the right position.
- To connect this product to the emulator align the #1 pin of the connector to the right position.

Cautions to Be Taken for Power Supply When Connecting:

- This product needs the power supply from both user system and E1 emulator.
- Do not change the voltage of the user system after turning on the power.
- When an attempt to connect the emulator debugger to the user system has failed, turn off the user system and then unplug and plug the USB cable of the emulator before trying again.

Cautions to Be Taken for Power Supply When Disconnecting:

- Turn off the power supply of the user system promptly when you disconnect the user system from the emulator debugger. If the power supply of a user system continues being ON, a user program will carry out a reset start. Moreover, you may fail to reconnect the emulator debugger to the user system.
- When an attempt to reconnect to the user system has failed, turn off the user system and then unplug and plug the USB cable of the emulator before trying again.

European Union regulatory notices

This product complies with the following EU Directive.

Environmental Compliance and Certification:

- Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EC

2. Specifications

Table 2.1 Product Specifications

Item	Specification	Remark
Supported Emulator	E1 emulator	
Power supply	User system side Supply from the user system (UVCC) Voltage: 3.0 V to 5.5 V	Supply from the user system (UVCC) needs to be 100 mA (max).
	E1 emulator side Supply from the emulator's power supply facility Voltage: 3.3 V or 5.0 V	
Acceptable GND gap voltage	less than 42.4VAC, or 60VDC	
Applicable MCU Families	RH850 Family RL78 Family	Isolator's switch settings vary depending on the target MCU you use. See 4.6 Switch Settings for Each MCU for switch setting.
Device for isolation	ACSL-6420-00TE (Avago Technologies US Inc.) IL261-3E (NVE Corporation)	
LED indication	LED1: Illuminated when power is supplied from the emulator LED2: Illuminated when power is supplied from the user system	This isolator is only usable when both LEDs are illuminated.
Operating temperature	5 to 35°C (no condensation)	
Storage temperature	-10 to 60°C (no condensation)	

3. Notes on Usage

Note on Power-Supply Voltage:

When you use an emulator with this isolator connected, power-supply voltage of the MCU on your system should be between 3.0 V and 5.5 V. Power-supply voltage less than 3.0 V is not supported

Notes on Using This Product with RH850 in LPD1pin mode:

(1) When using this product in LPD1pin mode, it is necessary to start up in 1wireUART by the Renesas Flash Programmer first, following the procedures below.

- 1) Set the switches to 1wireUART referring to Section 4.1 of this manual.
- 2) Connect this product to the emulator and the user system referring to Section 4.2.
- 3) Turn on them referring to Section 4.3.
- 4) Start the Renesas Flash Programmer.
- 5) Choose [Microcontroller] menu -> [Set Option Bytes] command.
- 6) Choose [Microcontroller] menu -> [Set Project], and open [Project Settings] dialog box. Choose [Other Settings] tab and set the value of OPBT0 to LPD1pin mode. (For details see the user's manual of the microcontroller.) Click [OK] and close [Project Settings] dialog box.
- 7) Click the start button on the main window and rewrite option bytes.
- 8) Exit the Renesas Flash Programmer.
- 9) Shut down the power supply referring to Section 4.4.

(2) Notes on Starting up the CubeSuite+.

Be sure to set [Set OPJTAG in LPD connection before connecting] to [No]. If [Yes] is selected, the debug tool starts up the microcontroller in serial programming mode, and the CubeSuite+ does not start up.

(3) Notes on Exiting the CubeSuite+

Set [Set OPJTAG in JTAG connection before disconnecting] to [No]. If [Yes] is selected, it is necessary to repeat the procedure (1) described above next time the CubeSuite+ is started up.

Note on LPD data output (LPDO) with RH850 in LPD4pin mode:

When you use an emulator with this isolator connected, do not make terminal processing (pull-up or pull-down) of LPD data output (LPDO) on your system.

4. Usage

4.1 Setting Switches (SW1- SW5)

To configure the circuit of this product depending on the communication method of the MCU you use, set switches SW 1 through SW5. For details, see 4.6 Switch Settings for Each MCU.

4.2 Setup

Confirm both the user system and the emulator are switched OFF before installing this product. Do not connect the USB cable to the emulator. To connect this product to the user system or the emulator, be sure to align the #1 pin of the connector to the right position.

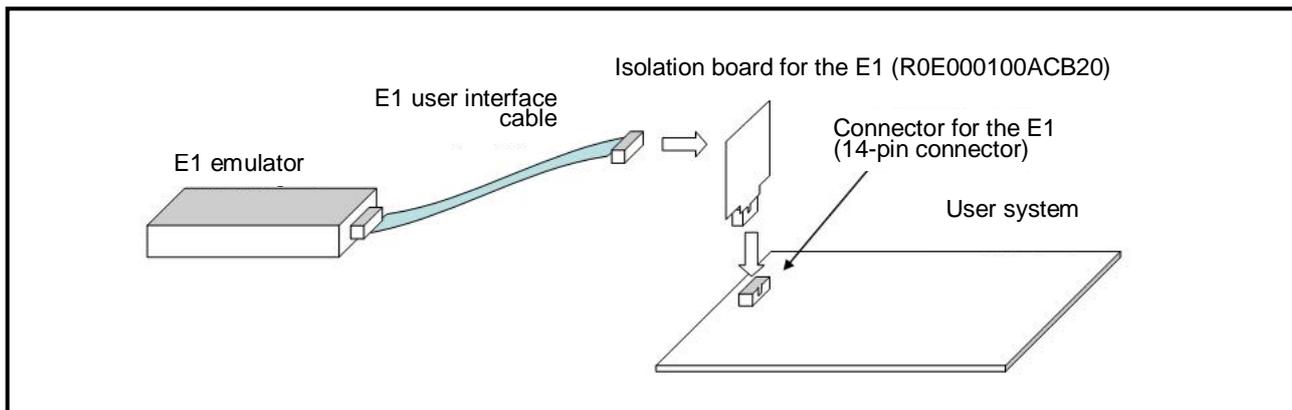


Figure 4.1 Mounting the R0E000010ACB20

4.3 Starting the Power Supply

Start the power supply following the procedure below.

- (1) Turn ON the emulator.

Connect the host machine and the E1 emulator with the USB cable, then, turn on the power for the E1 emulator.

- (2) Turn ON the user system.

Turn ON the user system.

- (3) Start the debugger (Power supply setting).

Start the debugger from the host PC, and set the initial settings so that power is supplied from the emulator. Select 3.3V for supply voltage regardless of the voltage used for the user system.

However, when you cannot choose 3.3V, choose 5.0V.

For the settings after the above, refer to the user's manual for the E1 emulator.

4.4 Shutdown the Power Supply

- (1) Shut down the power supply of the user system.

Shut down the power supply of the user system.

- (2) Shut down the power supply of the emulator.

Remove the USB cable between the host machine and E1 emulator, then, shut down the power supply of the emulator.

4.5 Connection Diagrams

Since isolator IC ACSL-6420-00TE is an open-drain output, it is pulled-up on this product. Figure 4.2 shows connection diagrams for each MCU family. The switches which are configurable according to MCU families are shown on the diagrams.

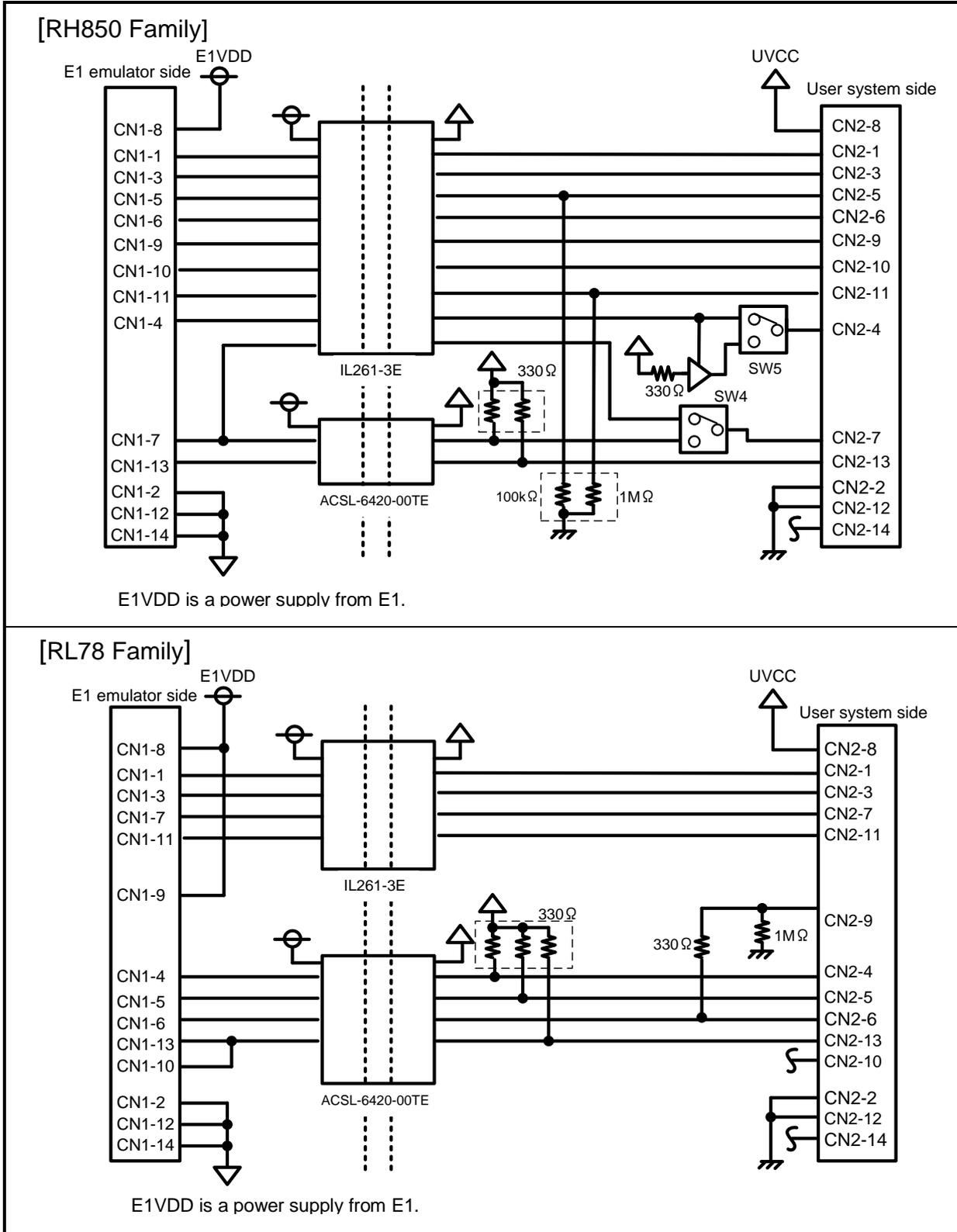


Figure 4.2 Connection Diagrams

4.6 Switch Settings for Each MCU

Table 4.1 Isolator Switch Setting

Switch setting No.	Settings of SW1 to SW5	Switch setting No.	Settings of SW1 to SW5
RL78 family Single wire serial (When using CubeSuite+ / Renesas Flash Programmer)	SW1 : RL78 SW2 : RL78 SW3 : Other SW4 : O SW5 : O	RH850 family 2WireUART (When using Renesas Flash Programmer)	SW1 : Other SW2 : Other SW3 : RH850 SW4 : O SW5 : O
RH850 family LPD4pin mode (When using CubeSuite+)	SW1 : Other SW2 : Other SW3 : RH850 SW4 : O SW5 : O/Hiz	RH850 family 1WireUART (When using Renesas Flash Programmer)	SW1 : Other SW2 : Other SW3 : RH850 SW4 : I/O SW5 : O
RH850 family LPD1pin mode (When using CubeSuite+)	SW1 : Other SW2 : Other SW3 : RH850 SW4 : I/O SW5 : O/Hiz		

* Do not use the isolator with settings other than the above.

4.7 External Dimensions

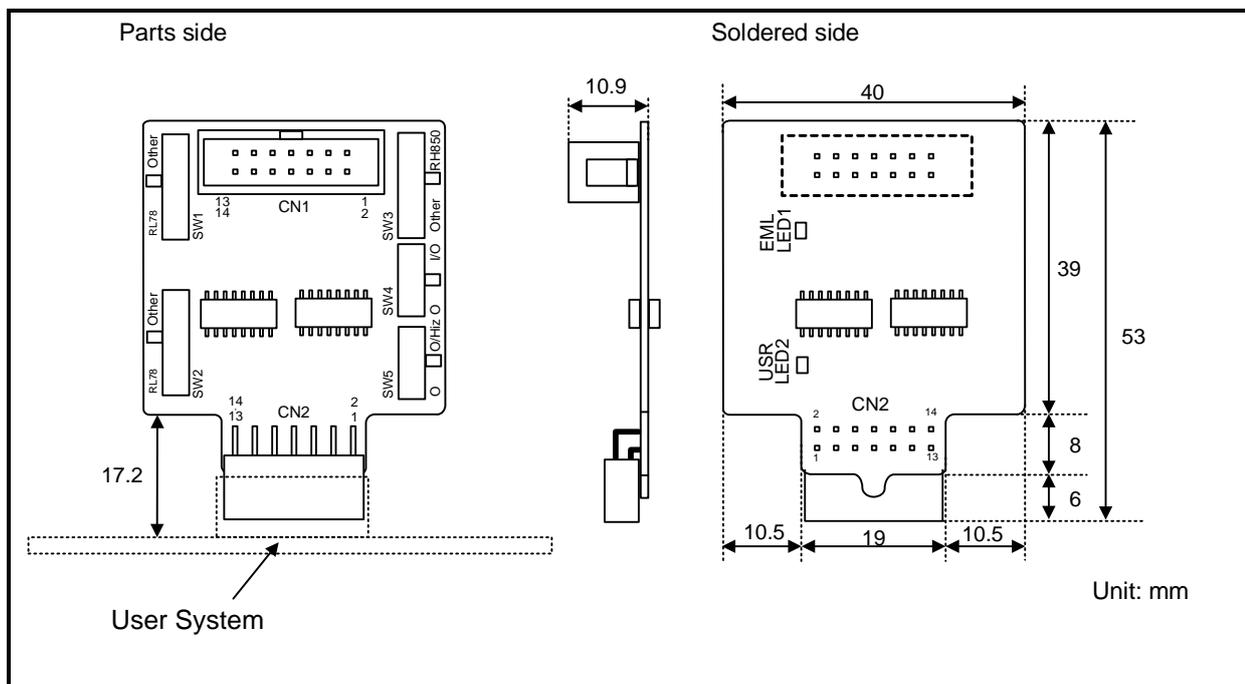


Figure 4.3 External Dimensions

5. Warranty

This product comes with a one-year warranty after purchase.

- (1) Should the product break down or be damaged while you're using it under normal condition based on its user's manual, it will be replaced free of cost.
- (2) However, if the following failure or damage occurs to the product under warranty, the product will be replaced at cost.
 - a) Failure or damage attributable to the misuse or abuse of the product or its use under other abnormal conditions.
 - b) Failure or damage attributable to improper handling of the product after purchase, such as dropping of the product when it is transported or moved.
 - c) Failure or damage to the product caused by other pieces of equipment connected to it.
 - d) Failure or damage attributable to fire, earthquakes, thunderbolts, floods, or other natural disasters or abnormal voltages, etc.
 - e) Failure or damage attributable to modifications, repairs, adjustments, or other acts made to the product by other than Renesas Electronics Corporation.
- (3) This product is accessories product. We cannot accept any request for repair.

Precautions

This product is only intended for use in a laboratory environment under ambient temperature and humidity conditions. A safe separation distance should be used between this and any sensitive equipment. Its use outside the laboratory, classroom, study area or similar such area invalidates conformity with the protection requirements of the Electromagnetic Compatibility Directive and could lead to prosecution.

The product generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off or on, you are encouraged to try to correct the interference by one or more of the following measures;

- ensure attached cables do not lie across the equipment
- reorient the receiving antenna
- increase the distance between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that which the receiver is connected
- power down the equipment when not in use
- consult the dealer or an experienced radio/TV technician for help

NOTE: It is recommended that wherever possible shielded interface cables are used.

The product is potentially susceptible to certain EMC phenomena. To mitigate against them it is recommended that the following measures be undertaken;

- The user is advised that mobile phones should not be used within 10m of the product when in use.
- The user is advised to take ESD precautions when handling the equipment.

This product does not represent an ideal reference design for an end product and does not fulfil the regulatory standards for an end product.

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