

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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## **Regarding the change of names mentioned in the document, such as Hitachi Electric and Hitachi XX, to Renesas Technology Corp.**

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The semiconductor operations of Mitsubishi Electric and Hitachi were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Hitachi, Hitachi, Ltd., Hitachi Semiconductors, and other Hitachi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

# Connection of SH7616 E10A Emulator

HS7616KCM01H HS7616KCI01H with User System

# 1. Connecting the E10A Emulator with the User System

To connect the E10A emulator (hereinafter referred to as the emulator), the H-UDI port connector must be installed on the user system to connect the user system interface cable. When designing the user system, refer to the recommended circuit between the H-UDI port connector and the MCU. In addition, read the E10A emulator user's manual and hardware manual of the related MCU.

## 2. Installing the H-UDI Port Connector on the User System

Table 2.1 shows the recommended H-UDI port connector for the emulator.

**Table 2.1 Recommended H-UDI Port Connector**

<b>Connector</b>	<b>Type Number</b>	<b>Manufacturer</b>	<b>Specifications</b>
14-pin connector	2514-6002	Sumitomo 3M Limited	14-pin straight type

**Note:** When the connector is used, do not install any components within 3 mm of the H-UDI port connector.

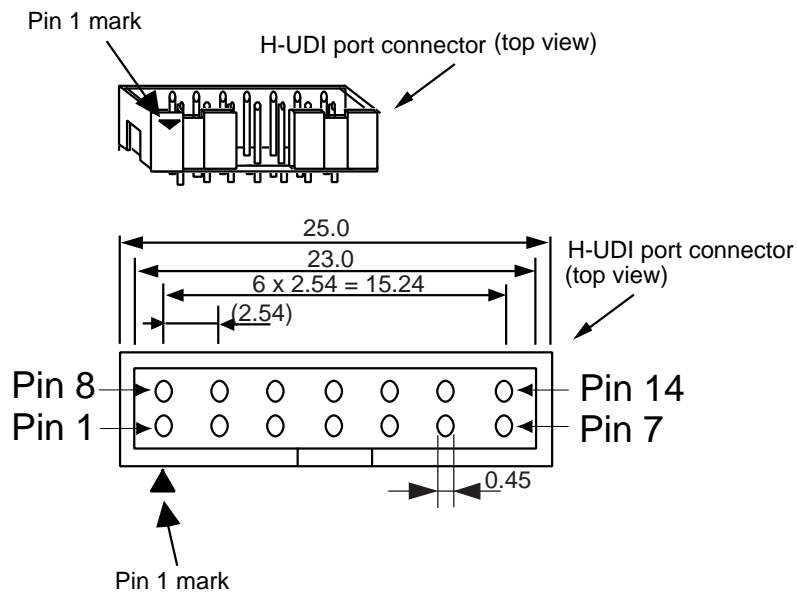
### 3. Pin Arrangement of the H-UDI Port Connector

Figure 3.1 shows the pin arrangement of the H-UDI port connector.

Note: Note that the pin number assignment of the H-UDI port connector shown below differs from that of the connector manufacturer.

Pin No.	Signal	Input/Output*1	MCU Pin No.
1	TCK	Input	30
2*2	/TRST	Input	32
3	TDO	Output	28
4 and 11	Not connected	—	—
5	TMS	Input	31
6	TDI	Input	29
7*2	/RES	Output	8
8 to 10 and 12 to 13	GND	—	—
14*3	GND	Output	—

- Notes: 1. Input to or output from the user system.  
2. The slash (/) means that the signal is active-low.  
3. The emulator monitors the GND signal of the user system and detects whether the user system is connected or not.



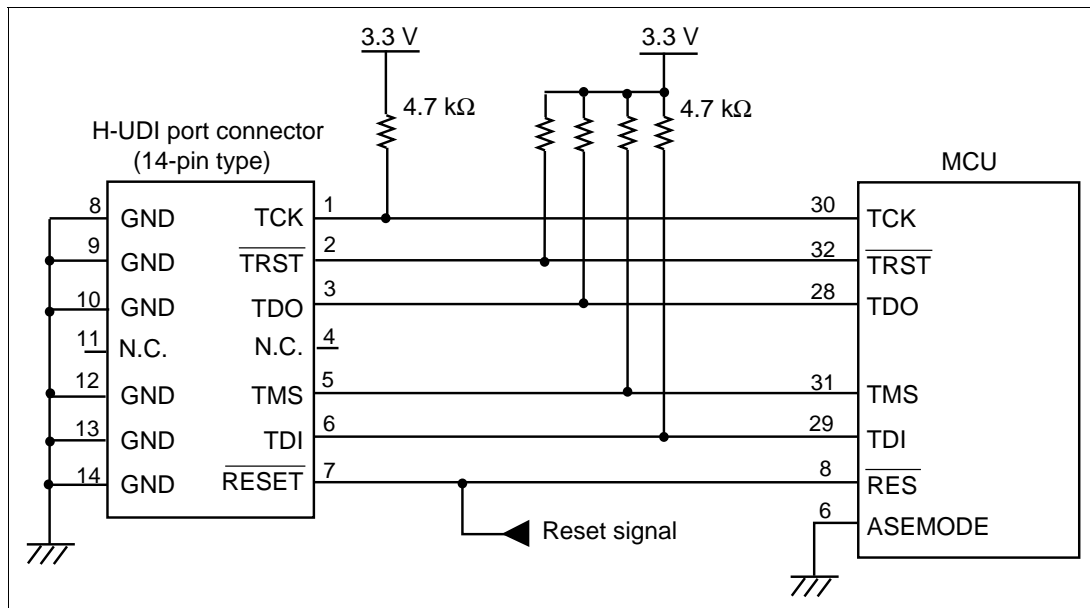
**Figure 3.1 Pin Arrangement of the H-UDI Port Connector**



## 4. Recommended Circuit between the H-UDI Port Connector and the MCU

Figure 4.1 shows a recommended circuit between the H-UDI port connector and the MCU.

- Notes:
1. Do not connect anything to the N.C. pin of the H-UDI port connector.
  2. Note that the processing of the /ASEMODE pin differs depending on whether the emulator is used or not. In addition, the /ASEMODE pin must be switched on the board because it is not controlled by the emulator.
    - (1) When the emulator is used: /ASEMODE = low (ASE mode)
    - (2) When the emulator is not used: /ASEMODE = high (user mode)
  3. The reset signal in the user system is input to the /RES pin (pin 8) of the MCU. Connect this signal to the H-UDI port connector as the output from the user system.
  4. When a joined resistance is used for pull-up, it may be affected by a noise. Separate TCK from other resistances.
  5. The pattern between the H-UDI port connector and the MCU must be as short as possible. Do not connect the signal lines to other components on the board.
  6. The resistance values shown in figure 4.1 are recommended.
  7. For the pin processing in cases where the emulator is not in use, refer to the hardware manual of the related MCU.



**Figure 4.1 Recommended Circuit for Connection between the H-UDI Port Connector and the MCU**