To our customers,

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

April 1st, 2010
Renesas Electronics Corporation

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

User's Manual

Connection of SH2-DSP ASIC E10A Emulator

HS0760KCM01H HS0760KCM02H HS0760KCI01H HS0760KCI02H with User System

Renesas Electronics
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Rev.A

1. Connecting the E10A Emulator with the User System

To connect the E10A emulator (hereafter referred to as the emulator), the H-UDI port connector must be installed to 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 SH2-DSP ASIC E10A Emulator User's Manual and hardware manual for the related MCU.

Table 1.1 shows the type numbers of the emulator, the corresponding connector types, and the use of AUD function.

Table 1.1 Type Number, AUD Function, and Connector Type

Type Number	Connector	AUD Function
HS0760KCM02H, HS0760KCI02H	36-pin connector	Available
HS0760KCM01H, HS0760KCI01H	14-pin connector	Not available

The H-UDI port connector has the 36-pin and 14-pin types as described below. Use them according to the purpose of the usage.

- 36-pin type (with AUD function)
  The AUD trace function is supported. A large amount of trace information can be acquired in realtime.
- 14-pin type (without AUD function)
  The user cannot use the AUD trace function because only the H-UDI function is supported. For tracing, only the internal trace function is supported. Since the 14-pin type connector is smaller than the 36-pin type, the area where the connector is installed on the user system can be reduced.

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

Connector	Type Number	Manufacturer	Specifications
36-pin connector	DX10M-36S	Hirose Electric Co., Ltd.	Screw type
	DX10M-36SE, DX10G1M-36SE		Lock-pin type
14-pin connector	2514-6002	Sumitomo 3M Limited	14-pin straight type

Note: When the 36-pin connector is used, do not connect any components under the H-UDI connector. When the 14-pin 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

Figures 3.1 and 3.2 show the pin arrangement of the 36-pin and 14-pin H-UDI port connectors, respectively.

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	Note	Pin No.	Signal	Input/ Output*1	Note
1	AUDCK	Output		19	TMS	Input	
2	GND	——		20	GND	——	
3	AUDATA0	Output		21*2	/TRST	Input	
4	GND	——		22	GND	——	
5	AUDATA1	Output		23	TDI	Input	
6	GND	——		24	GND	——	
7	AUDATA2	Output		25	TDO	Output	
8	GND	——		26	GND	——	
9	AUDATA3	Output		27*2	/ASEBRKAK	Output	
10	GND	——		28	GND	——	
11*2	/AUDSYNC	Output		29	NC	——	
12	GND	——		30	GND	——	
13*2	/ASEBRK	Input		31*2	/RESET	Output	User reset
14	GND	——		32	GND	——	
15	NC	——		33*3	GND	Output	
16	GND	——		34	GND	——	
17	TCK	Input		35	NC	——	
18	GND	——		36	GND	——	

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 or not the user system is connected.

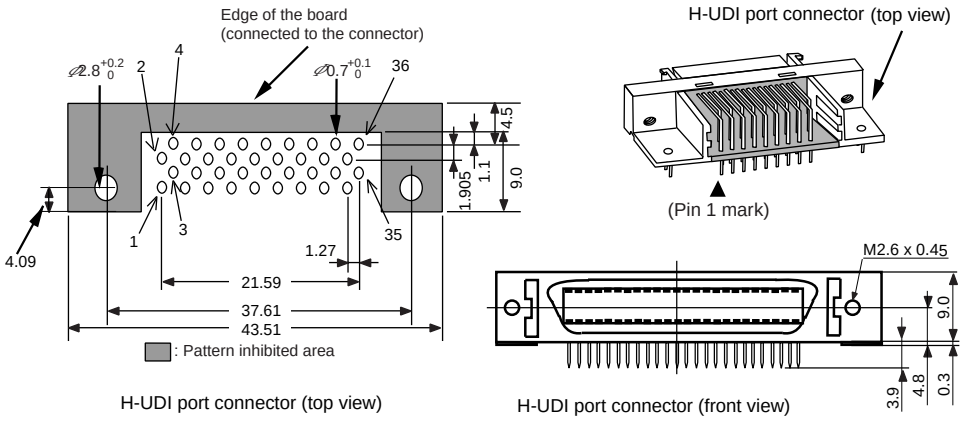

Figure 3.1 Pin Arrangement of the H-UDI Port Connector (36 Pins)

Pin No.	Signal	Input/ Output*1	Note
1	TCK	Input	
2*2	/TRST	Input	
3	TDO	Output	
4*2	/ASEBRKAK	Output	
5	TMS	Input	
6	TDI	Input	
7*2	/RESET	Output	User reset
11*2	/ASEBRK	—	
8 to 10 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 or not the user system is connected.

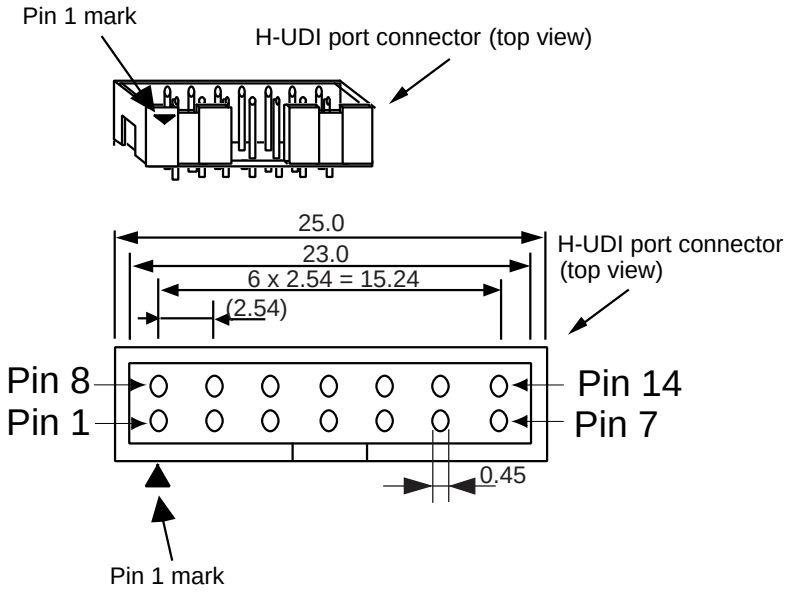

Figure 3.2 Pin Arrangement of the H-UDI Port Connector (14 Pins)

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

4.1 Recommended Circuit (36-Pin Type)

Figure 4.1 shows a recommended circuit between the H-UDI port connector (36 pins) 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 /ASEMD0 pin differs depending on whether the emulator is used or not. In addition, the /ASEMD0 pin must be switched on the board because it is not controlled by the emulator.
   (1) When the emulator is used: /ASEMD = low (ASE mode)
   (2) When the emulator is not used: /ASEMD = high (MCU mode)
3. The reset signal in the user system is input to the /RESET pin 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 for reference.
7. For processing of pins in cases where the emulator is not used, refer to the hardware manual for the related MCU.

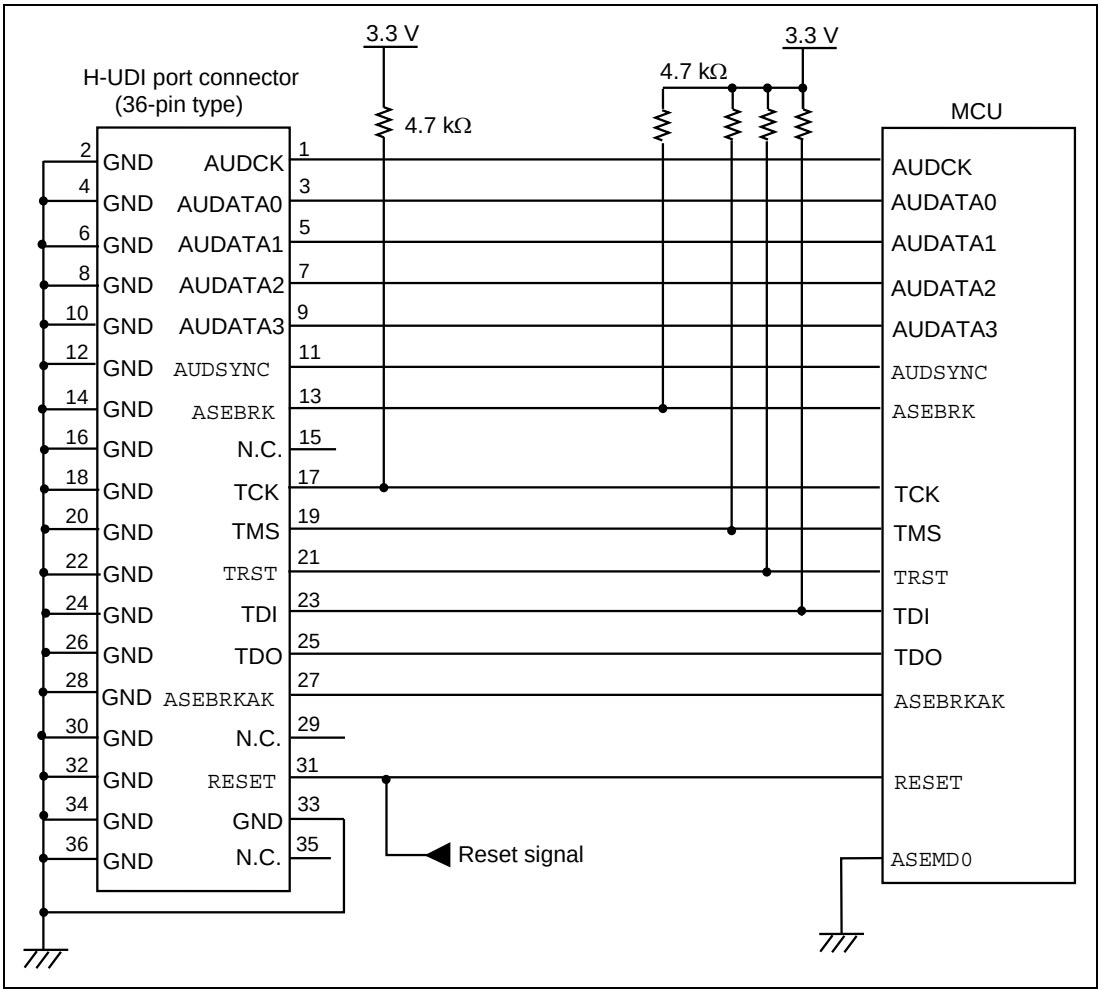

Figure 4.1 Recommended Circuit for Connection between the H-UDI Port Connector and the MCU when Using the Emulator (36-Pin Type)

4.2 Recommended Circuit (14-Pin Type)

Figure 4.2 shows a recommended circuit between the H-UDI port connector (14 pins) 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 /ASEMD0 pin differs depending on whether the emulator is used or not. In addition, the /ASEMD0 pin must be switched on the board because it is not controlled by the emulator.
   (1) When the emulator is used: /ASEMD = low (ASE mode)
   (2) When the emulator is not used: /ASEMD = high (MCU mode)
3. The reset signal in the user system is input to the /RESET pin 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 4.2 are for reference.
7. For processing of pins in cases where the emulator is not used, refer to the hardware manuals for the related MCU.

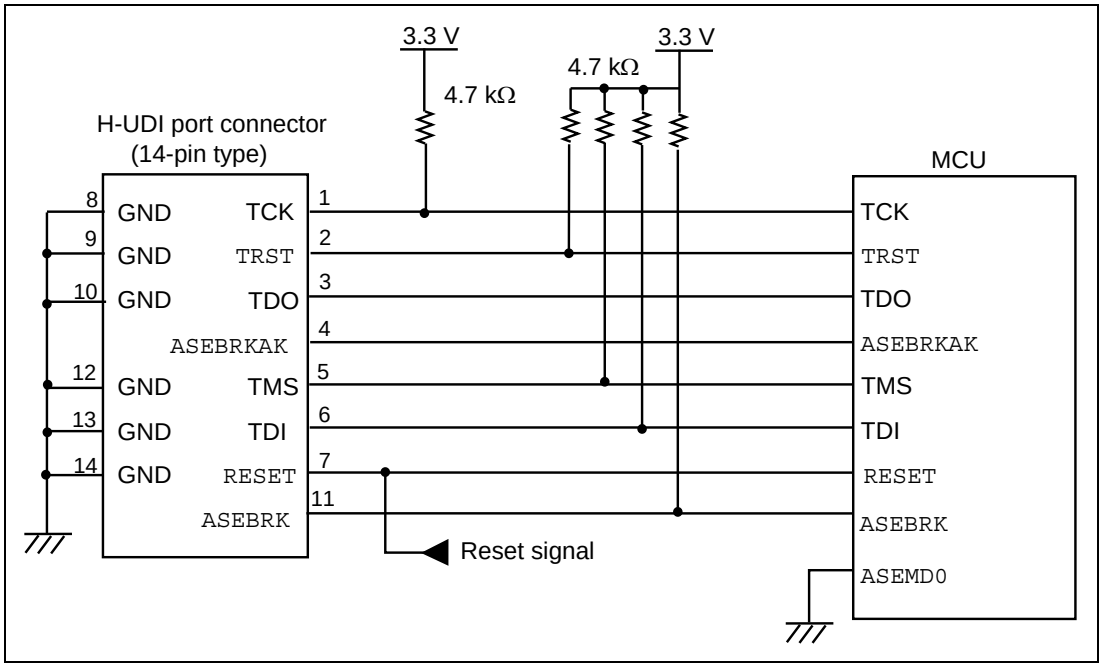

Figure 4.2 Recommended Circuit for Connection between the H-UDI Port Connector and the MCU when Using the Emulator (14-Pin Type)