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April 1st, 2010
Renesas Electronics Corporation

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H8S/2200 Series

Asynchronous SCI

Introduction

Transmits and receives 1-byte data asynchronously between the H8S/2215 and H8S/2215.

Target Device

H8S/2215

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1. Specifications

1. As shown in figure 1, this function sends and receives 1-byte data in the asynchronous mode between an H8S/2215 and H8S/2215.
2. This function transfers 8-bit data at 38400 bps with 1 stop bit and non-parity.
3. Communication is controlled by RTS and CTS.

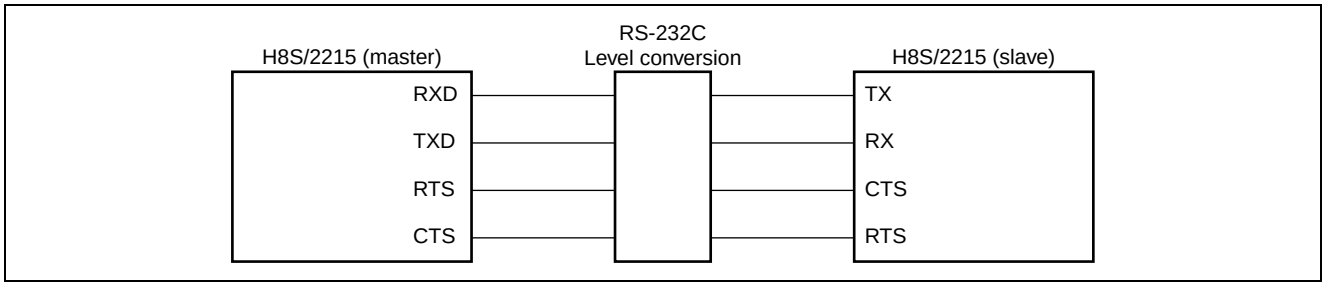


Figure 1 Block Diagram of Asynchronous SCI by H8S/2215

2. Description of Functions

1. This sample task uses SCI0 for transmitting and receiving data. Port 7 is used as communication control pins (RTS and CTS).
   A. The transmission block diagram of SCI used by this sample task is shown in figure 2.
      This task uses the following SCI functions to transmit data to H8S/2215:
      - Function that performs data communication in the asynchronous mode in 8-bit data units for synchronization. (asynchronous mode)
      - Function that generates an interrupt at completion of transmission (TEI interrupt)

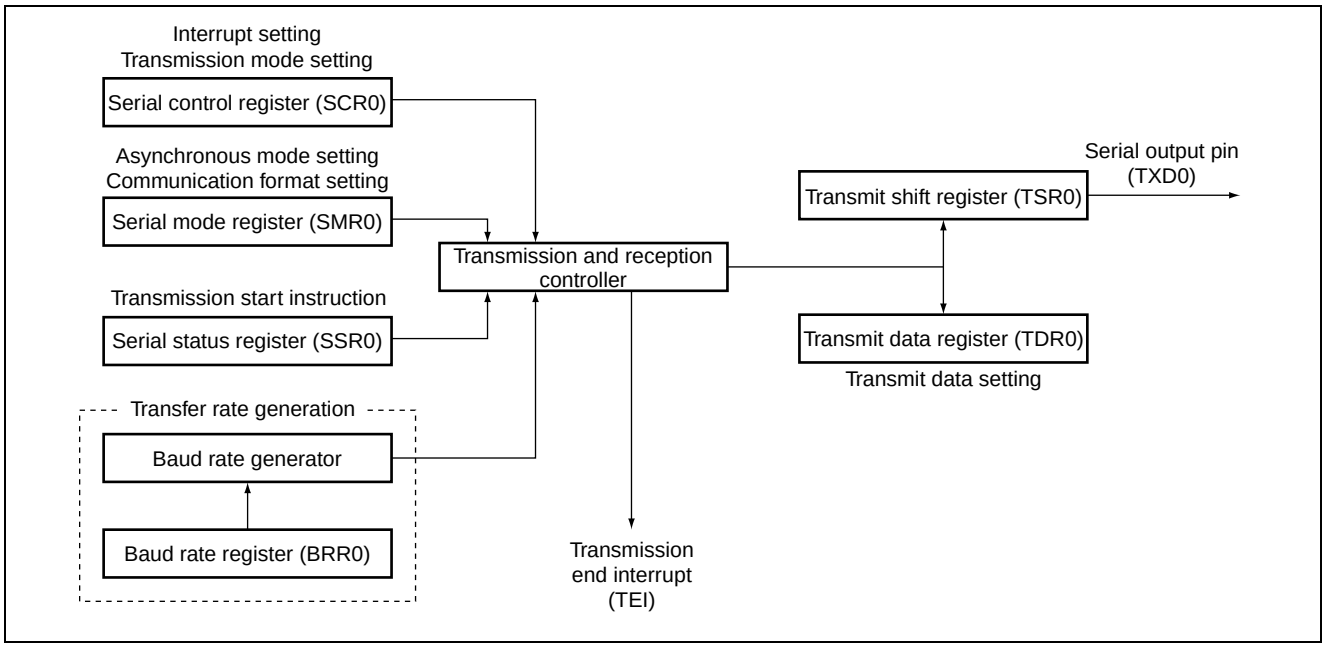


Figure 2 Block Diagram of SCI Transmission

B. The reception block diagram of SCI used by this sample task is shown in figure 3.
This task uses the following SCI functions to receive data from an H8S/2215:

- Function that performs data communication in the asynchronous mode in 8-bit data units for synchronization. (Asynchronous mode)
- Function that causes an interrupt at completion of reception (RXI interrupt)

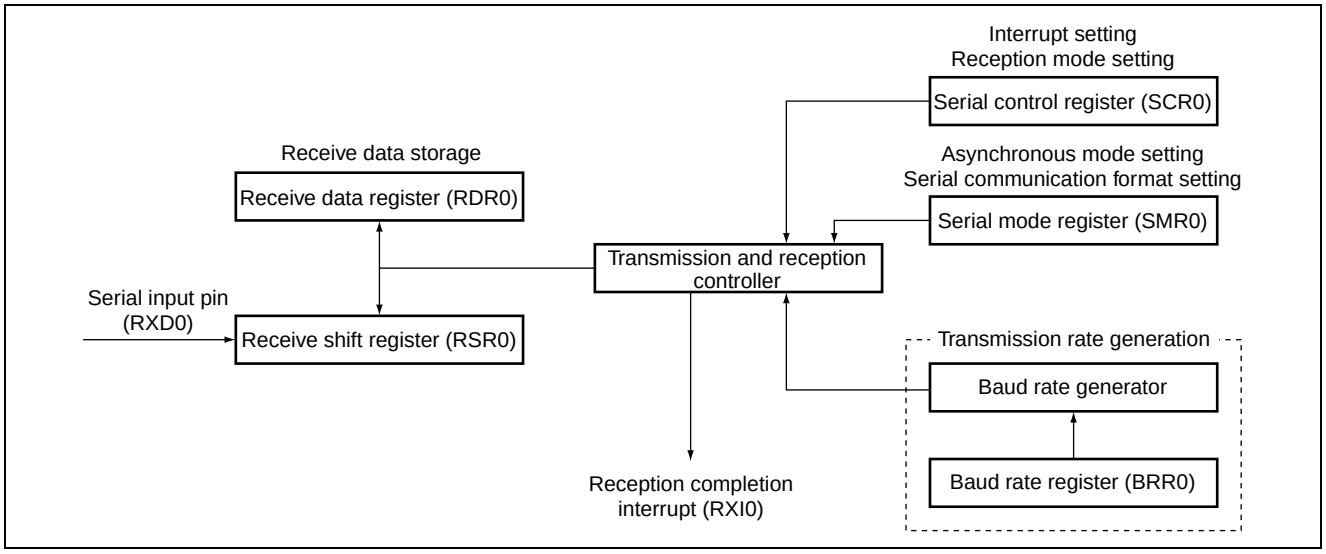


Figure 3 Block Diagram of SCI Reception

2. Function allocation of this sample task is shown in table 1. This sample task allocates H8S/2215 functions as shown in table 1 to interface with an H8S/2215.

Table 1 Assignment of Functions

Elements	Description
RXD0	Receives data from the console.
TXD0	Transmits data to the console.
SMR0	Sets SCI to the asynchronous mode and set the transfer format.
SCR0	Enables transmission and reception interrupts and set SCI to the transmission and reception mode.
SSR0	Instructs start of transmission by TDRE.
RDR0	Stores data received from the console.
TDR0	Set data to be transmitted to the console.
BRR0	Set the transfer rate.

3. Principles of Operation

The principles of operations used of this task are shown in figure 4. This task performs hardware and software processing at timing shown in figure 4 to interface with an H8S/2215.

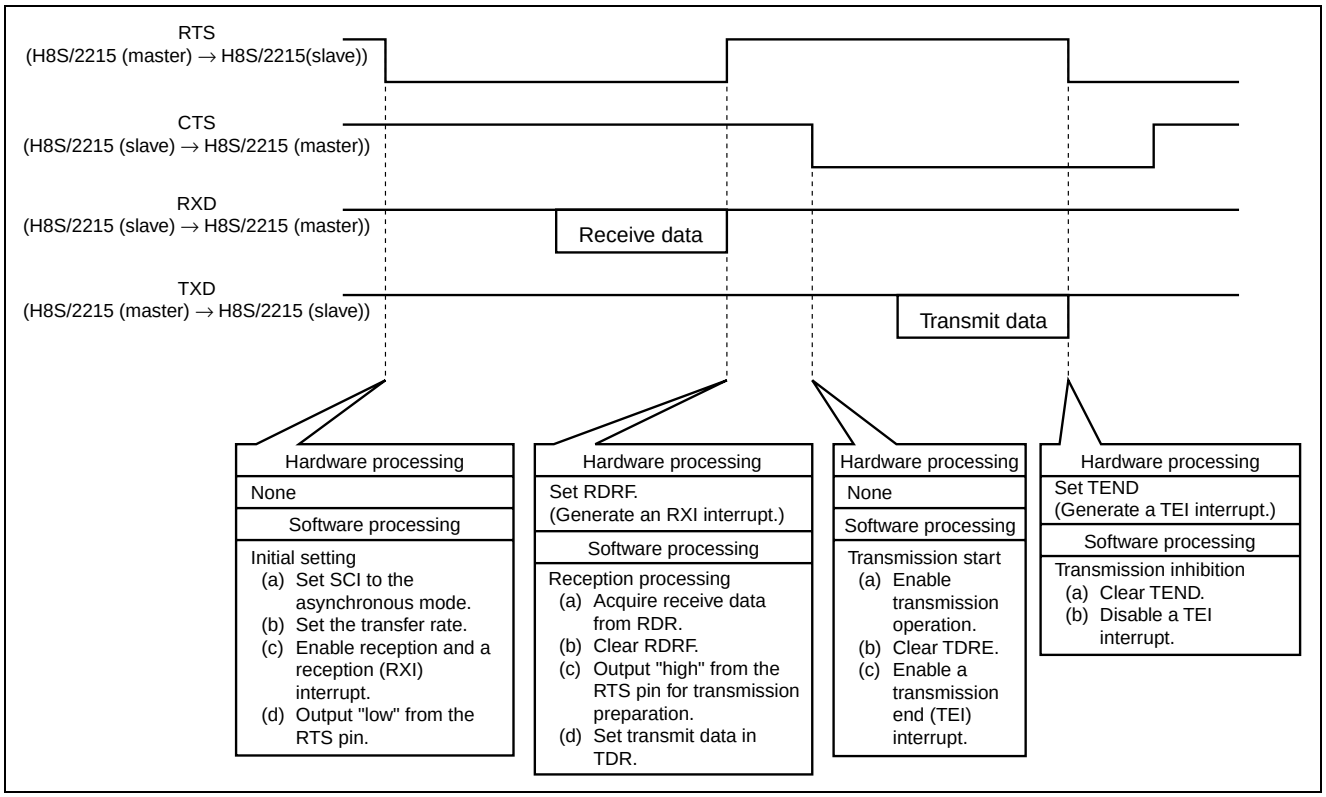


Figure 4 Principles of Operations Used at Asynchronous SCI

4. Description of Software

1. Description of Modules

Module Name	Label Name	Function
Main routine	ASCMN	Performs initial setting of SCI and controls transmission and reception.
Data reception completion	ASCRX	Starts up by an RXI interrupt to receive data.
Data transmission completion	ASCTE	Starts up by a TEI interrupt to report transmission completion.

2. Description of Arguments

Label Name	Function	Data Length	Used in	I/O
rcv_data	Sets data received from the console.	unsigned char	Data reception completion	Output
			Main routine	Input
rxendf	Flag indicating reception completion 1: Reception completed 0: Reception in progress	unsigned char	Data reception completion	Output
			Main routine	Input
txendf	Flag indicating transmission completion 1: Transmission completed 0: Transmission in progress	unsigned char	Data transmission completion	Output
			Main routine	Input

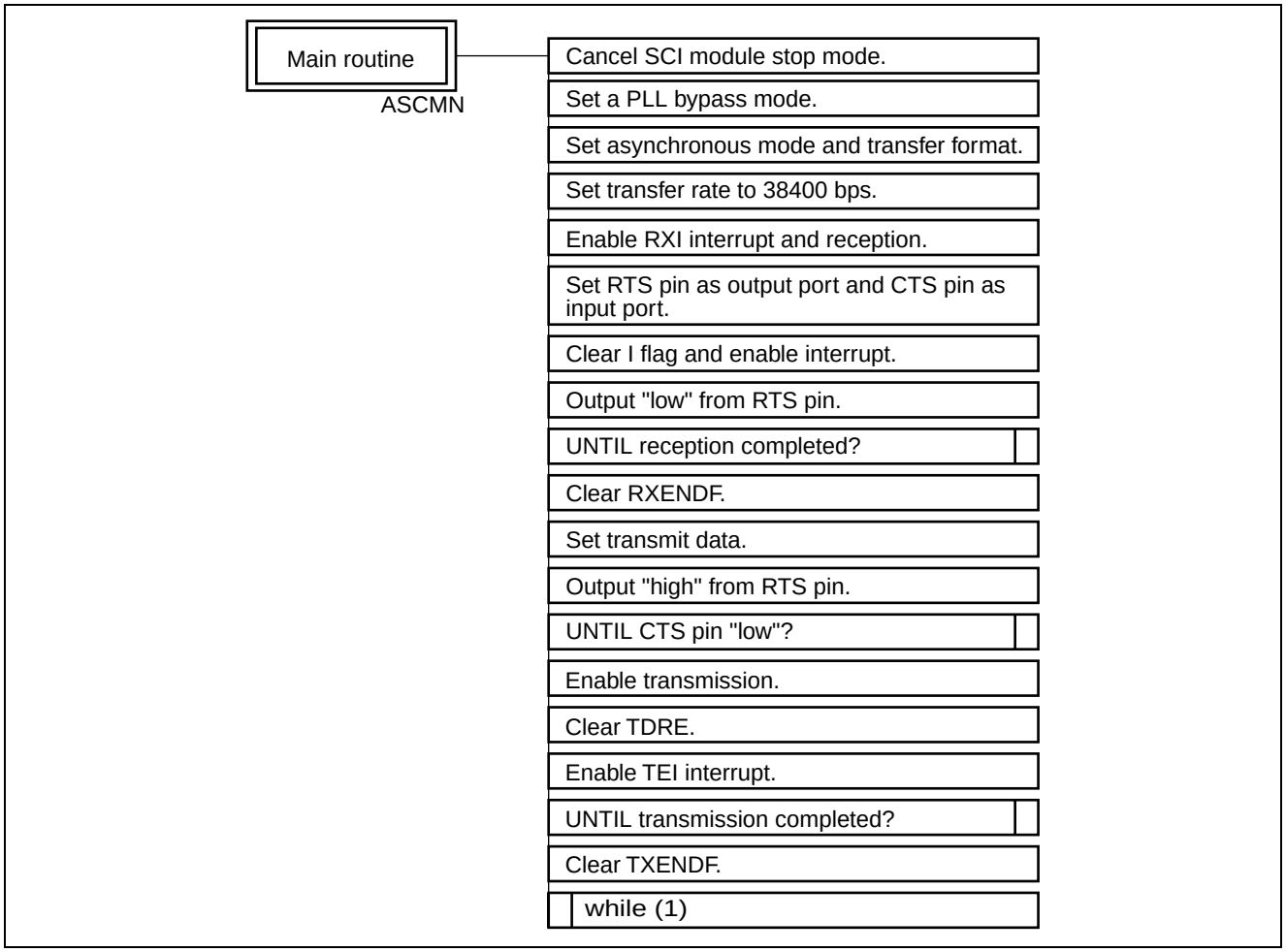
3. Description of Internal Registers Used

Register Name	Function	Used in
SMR0	Sets the SCI mode (asynchronous), a transfer format, and the selected clock to the baud rate generator (ϕ clock input).	Main routine
SCR0	Enables interrupts (RXI and TEI) and SCI transmission and reception.	Main routine
SSR0	Clears TDRE (b7) to instruct transmission to start.	Main routine
RDR0	Sets data received from the console.	Data reception completion
TDR0	Sets data to be transmitted to the console.	Main routine
BRR0	Sets the transfer rate.	Main routine
P7DDR	Sets I/O of port 7.	Main routine
P7DR	Operates the RTS and CTS pins.	Main routine
MSTPCR	Cancels the SCI module stop mode.	Main routine

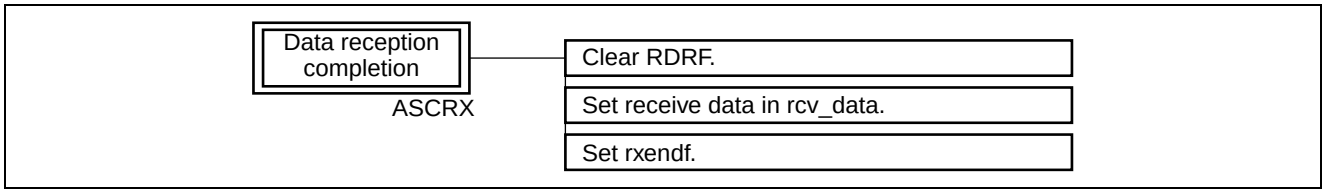
4. RAM Usage
   This sample task uses only arguments.

5. PAD

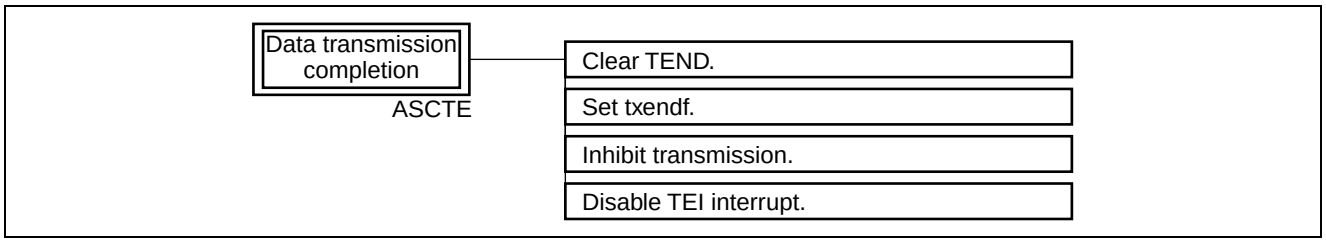
1. Main Routine



2. Data Reception Completion



3. Data Transmission Completion



Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Mar.16.04	—	First edition issued

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