H8S/2200 Series

Duplex Transmission

Introduction

Transmits and receives 1-byte data, synchronizing with a clock between the H8S/2215 (master) and H8S/2215 (slave).

Target Device

H8S/2215

Contents

1. Specifications

1. As shown in figure 1, this function transmits and receives 1-byte data between an H8S/2215 and H8S/2215.
2. Data is transmitted and received in the clock synchronous format. The master H8S/2215 provides the clock to the slave H8S/2215.
3. The H8S/2215 transmits data to and receives data from the H8S/2215 simultaneously.

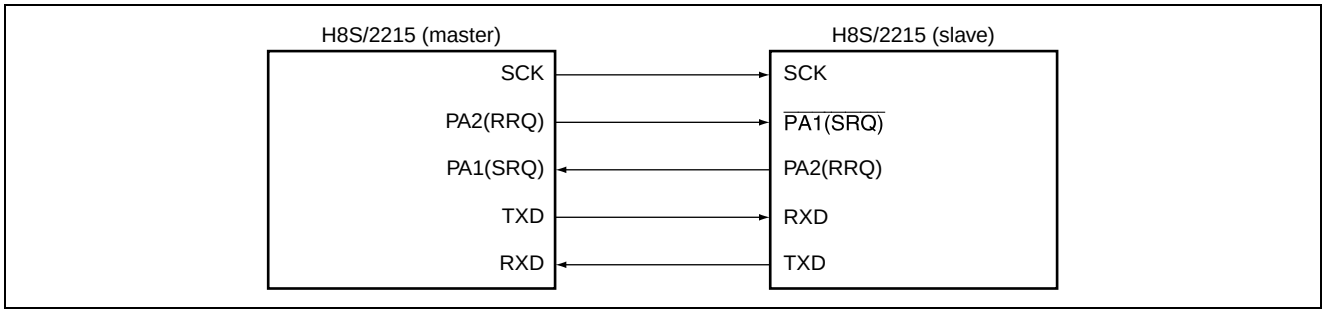


Figure 1 Block Diagram of Clock Synchronous SCI by H8S/2215

2. Description of Functions

1. This sample task transmits and receives data, using SCI1. Port A is used for the communication control pins (RRQ and SRQ).
   A. The block diagram of SCI to be used by the sample task is shown in figure 2. This sample task uses the following functions of SCI to perform transmission and reception simultaneously.
      - Function that performs serial data communication, synchronizing with the clock (clock synchronous mode)
      - Function that performs transmission and reception simultaneously (duplex transmission function)
      - Function that generates an interrupt at completion of reception (RXI interrupt)

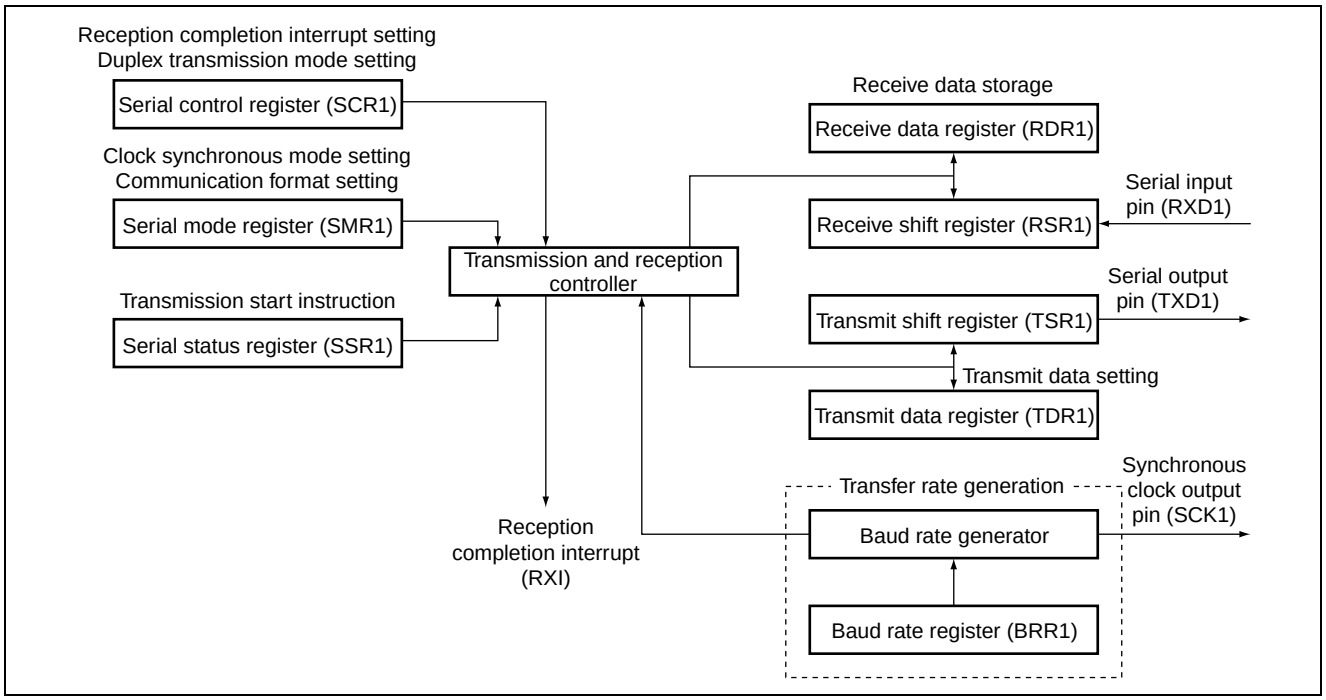


Figure 2 SCI Block Diagram

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 perform duplex transmission of data with an H8S/2215.

Table 1 Assignment of Functions

Elements	Description
SCK1	Transmits the synchronizing clock.
RXD1	Receives data from an H8S/2215(slave).
TXD1	Transmit data to an H8S/2215(slave).
SMR1	Sets SCI to the clock synchronous mode.
SCR1	Enables a reception interrupt and sets SCI to the transmission and reception mode.
SSR1	Instructs transmission start by the TDRE bit.
RDR1	Sets data received from an H8S/2215(slave).
TDR1	Sets data to be transmitted to an H8S/2215(slave).
BRR1	Set the transfer rate.
PADDR	Set I/O of port A.
PADR	Performs transmission through RRQ and reception through SRQ.

3. Principles of Operation

The principles of operations used of this task are shown in figure 3. This task performs software and hardware processing at the timing shown in figure 3 to interface with an H8S/2215(slave).

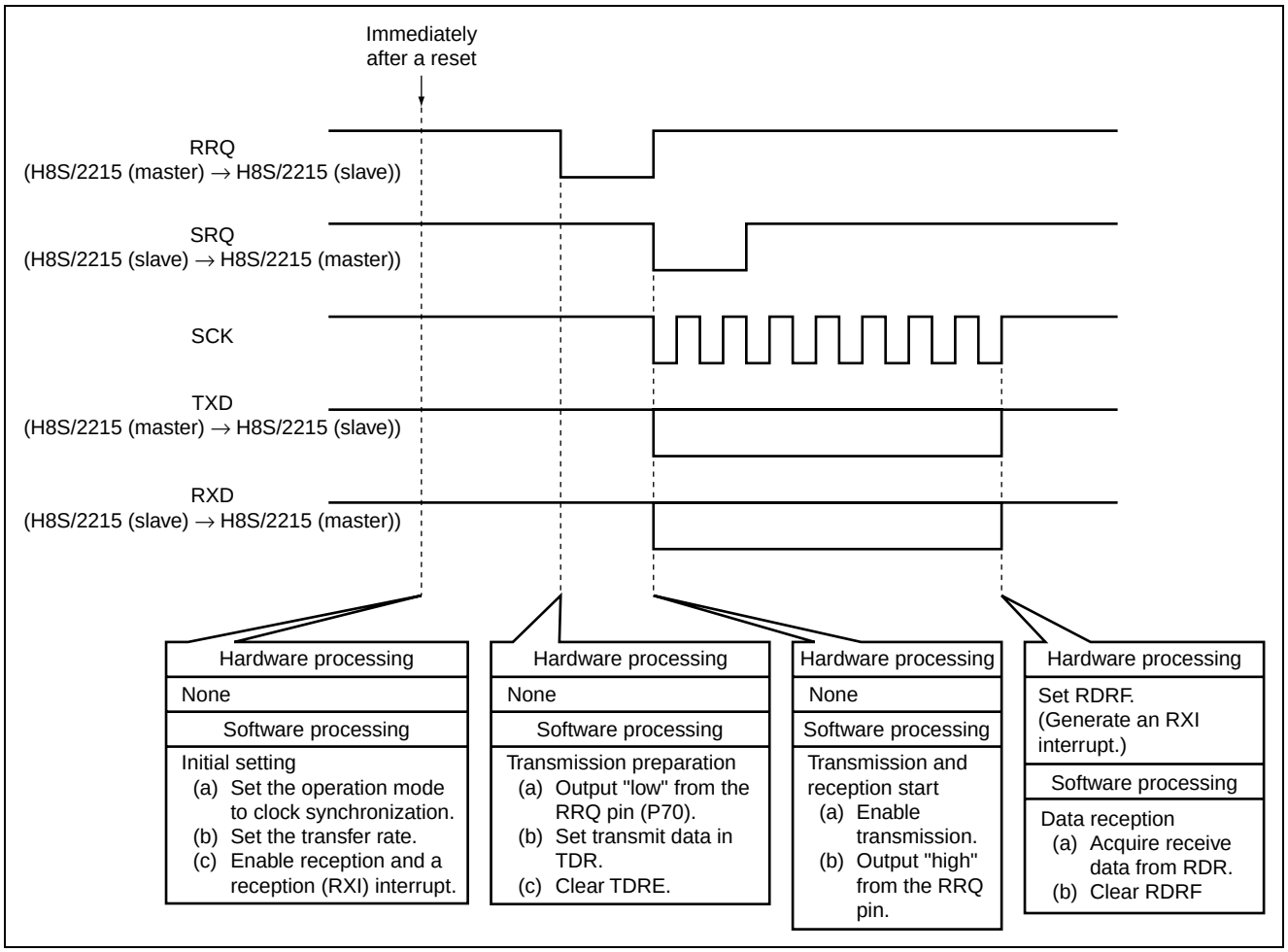


Figure 3 Principles of Operations Used for Duplex Transmission

4. Description of Software

1. Description of Modules

Module Name	Label Name	Function
Main routine	simtrmn	Performs initial setting of SCI and controls transmission and reception.
Data reception completion	rxend	Starts up by an RXI interrupt and receives data.

2. Description of Argument

Label Name	Function	Data Length	Used in	I/O
revend	Flag indicating reception completion 1: Reception completed 0: Reception in progress	unsigned char	Data reception completion Main routine	Output Input

3. Description of Internal Registers Used

Register Name	Function	Used in
SMR1	Sets the SCI mode (clock synchronous), the transfer format, and selected clock to the baud rate generator (ϕ clock input).	Main routine
SCR1	Enables an interrupt (RXI) and SCI transmission and reception.	Main routine
SSR1	Clears TDRE to instruct transmission to start.	Main routine
RDR1	Sets data received from an H8S/2215(slave).	Data reception completion
TDR1	Sets data to be transmitted to an H8S/2215(slave).	Main routine
BRR1	Sets the transfer rate.	Main routine
PADDR	Sets I/O of port A.	Main routine
PADR	Operates the RRQ and SRQ pins.	Main routine
MSTPCR	Cancels the SCI module stop mode.	Main routine

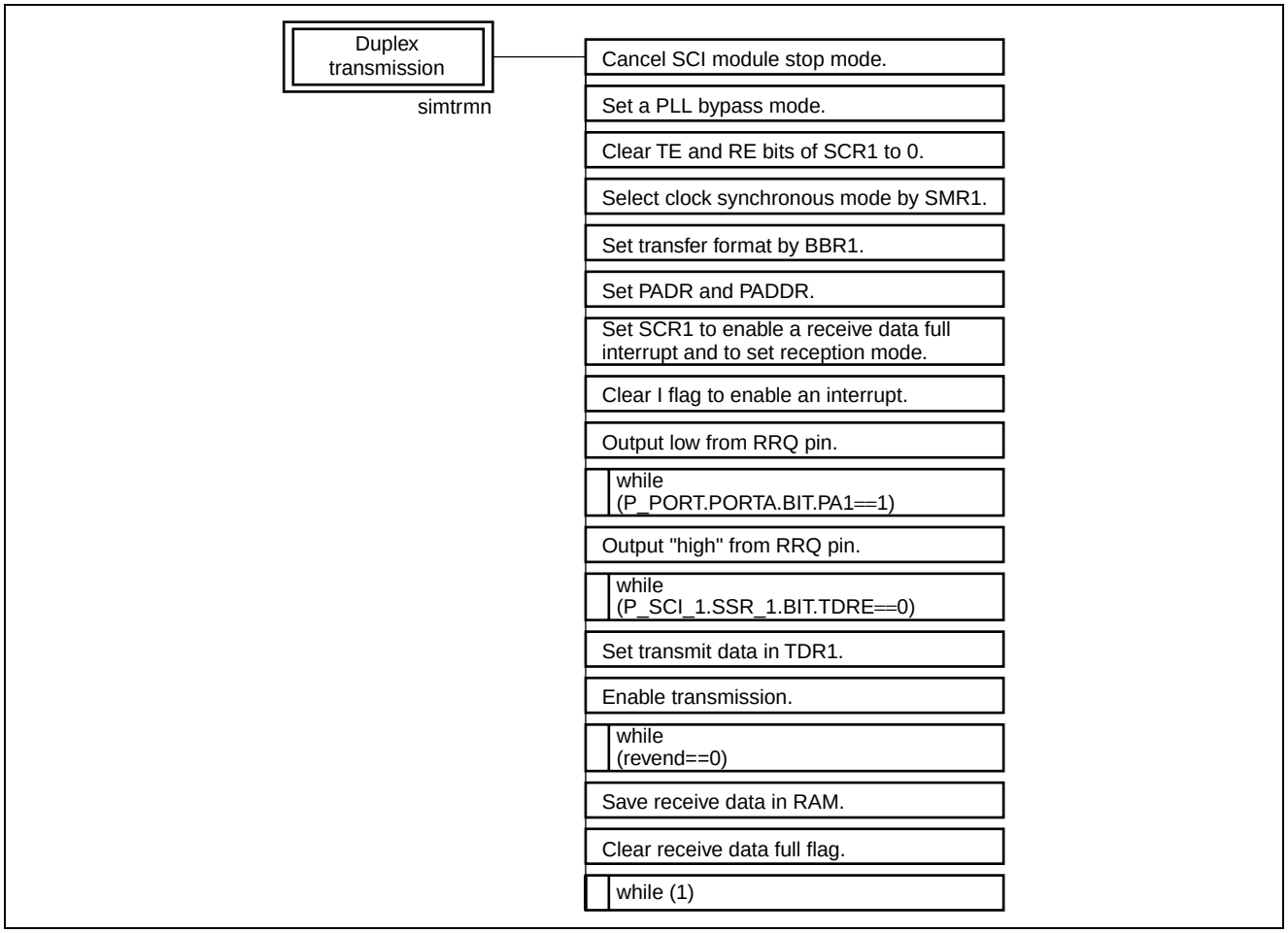
4. RAM Usage

Table below describes RAM usage in this sample task.

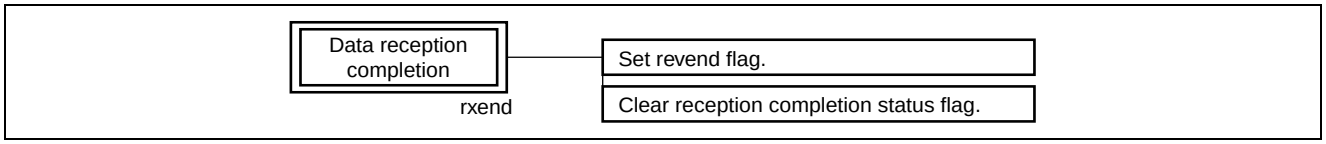
Label Name	Function	Data Length	Used in
rvdata	Sets received data.	unsigned char	Main routine
trdata	Sets data to be transmitted.	unsigned char	Main routine

5. PAD

1. Main Routine



2. Data Reception Completion



Revision Record

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

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