UM11665

SC18IS604-EVB evaluation board

Rev. 1.0 — 19 August 2021

User manual

Document information

Information	Content
Keywords	SC18IS604, SC18IS600, SPI to I^{2}C, I^{2}C Controller, I^{2}C bridge, SPI bridge
Abstract	SC18IS604 is designed to serve as an interface between the standard SPI of a host and the serial I^{2}C-bus. This allows the host to communicate directly with other I^{2}C-bus devices.

Revision history

Rev	Date	Description
v.1.0	20210819	Initial version

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1   Introduction

SC18IS604 is designed to serve as an interface between the standard SPI of a host (microcontroller, microprocessor, chip set, etc.) and the serial I^2C-bus. This allows the host to communicate directly with other I^2C-bus devices. SC18IS604 can operate as an I^2C-bus master-transmitter or master-receiver. SC18IS604 controls all the I^2C-bus specific sequences, protocol, arbitration and timing.

This document is intended to help the users to quickly setup, configure and operate the SC18IS604-EVB evaluation board in the users' hardware platform.

2   Finding kit resources and information on the NXP web site

NXP Semiconductors provides online resources for this evaluation board and its supported device(s) on http://www.nxp.com.

The information page for SC18IS604-EVB evaluation board is at http://www.nxp.com/SC18IS604-EVB. The information page provides overview information, documentation, parametrics, ordering information and a **Getting Started** tab. The **Getting Started** tab provides quick-reference information applicable to using the SC18IS604-EVB evaluation board, including the downloadable assets referenced in this document.

2.1   Collaborate in the NXP community

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The NXP community is at http://community.nxp.com.

3   Getting ready

Working with the SC18IS604-EVB evaluation board requires the kit contents.

3.1   Kit contents

• Assembled and tested evaluation board in an anti-static bag
• Quick Start Guide

4   Getting to know the hardware

The SC18IS604-EVB board is designed to be connected to an external SPI master via a 7-pin male (JP1) header. The SC18IS604-EVB evaluation board has an on-board I^2C slave serial EEPROM and an I^2C slave LED blinker, which can be directly accessed by the external SPI master via SC18IS604. The external SPI master can write, read, and program the serial EEPROM/LED blinker without requiring an I^2C slave to be connected to the board.

The 3V3 power for the evaluation board should be supplied via this I^2C interface header as well.

The SC18IS604-EVB evaluation board also has an I^2C interface header (JP4) to allow other I^2C slave devices to be connected to the SC18IS604-EVB evaluation board. These

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I²C slave devices can be accessed directly by the SPI master via the SC18IS604 SPI to I²C bridge.

4.1 Headers and jumpers

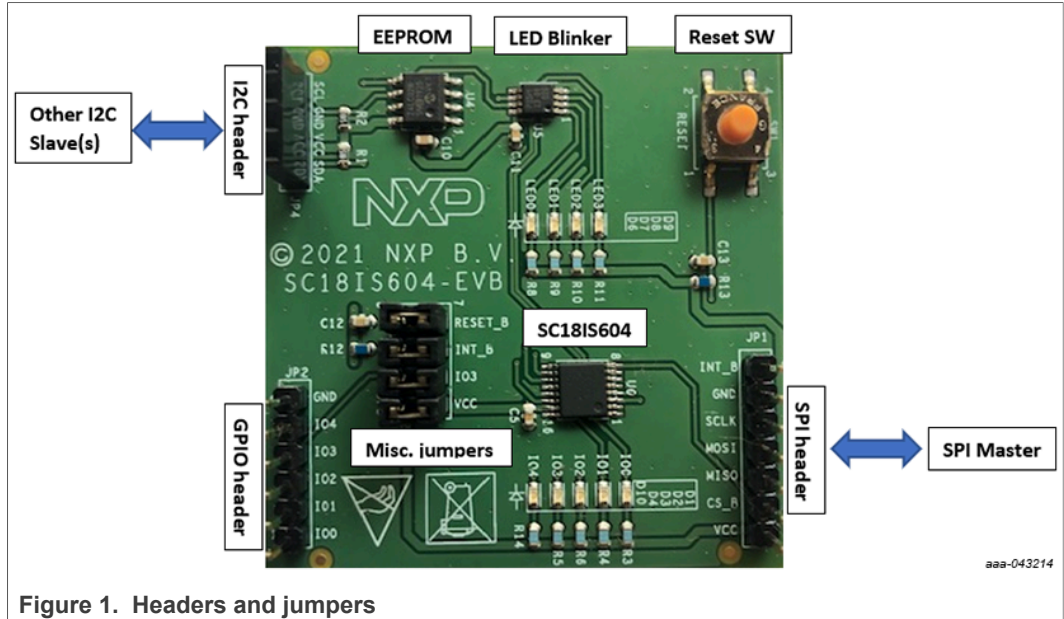Please refer to Figure 1 to find the location of connectors and jumpers on the SC18IS604-EVB evaluation board.

Figure 1. Headers and jumpers

4.2 Jumper settings

Table 1. Jumper settings

JP5 Misc. Header	Jumper on/off	Comment
1 - 2	ON	Pull out and insert current meter if SC18IS604 current is to be measured
3 - 4	ON	Route GPIO 3 to JP2
5 - 6	ON	Enable pull-up on -INT
7 - 8	ON	Enable pull-up on -RESET

Table 2. JP1 - SPI header

JP1 – SPI Header	Function
1	-INT
2	GROUND
3	SCLK
4	MOSI
5	MISO
6	-CS
7	VCC

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Table 3. JP4 - I2C header

JP4 – I2C Header	Function
1	SCL
2	GROUND
3	VCC
4	SDA

Table 4. JP2 - GPIO

JP2 – GPIO	Function
1	GPIO0
2	GPIO1
3	GPIO2
4	GPIO3
5	GPIO4
6	GROUND

4.3 Schematic, board layout and bill of materials

The schematic, board layout and bill of materials for the SC18IS604-EVB evaluation board are available at http://www.nxp.com/SC18IS604-EVB.

4.4 Sample control sequences from SPI master

4.4.1 Register read

```
0x21 0x00 0xFF // Read register 0x00 where 0xFF is an SPI dummy byte
```

4.4.2 Register write

```
0x20 0x00 0xAA // Write register 0x00 with AA
```

4.4.3 GPIO as input

```
0x20 0x00 0x00 // program GPIOs as inputs
0x21 0x01 0xFF // read IOState register
```

4.4.4 GPIO as output

```
0x20 0x00 0xAA // program GPIOs as output (push-pull)0x21 0x01
0x20 0x01 0xXX // write to IOState register to set GPIO pins
```

4.4.5 I^{2}C clock configuration

```
0x20 0x02 0x05 // Set I2C clock to 375KHz
```

4.4.6 Device ID read

```
0x50 0xFE // Read device ID into buffer
0x06 0xff 0xff …… 0xff // read 16 bytes from buffer, return data 0x53
                       // 0x43 0x31 0x38 0x49 0x53.. 0x2E 0x30 0x2E 0x32
```

4.4.7 On-board EEPROM write and read

```
0x00 0x04 0xA0 0x00 0xAA 0x77 0xCC // write AA 77 CC to EEPROM
0x00 0x01 0xA0 0x00
0x01 0x03 0xA1              // read 3 bytes from EEPROM
0x06 0xFF 0xFF 0xFF 0xFF    // read 4 bytes from buffer, the last three bytes should be AA, 77, CC
```

4.4.8 Blinking on-board LEDs

```
0x00 0x06 0xC4 0x11 0x97 0x80 0x00 0x00 0xAA // write 6 control bytes to I2C blinker at address 0xC4
```

5   Errata list

Table 5. Errata list

Date	Errata Description	Demo Impact	Solution
-	None	None	None

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