

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 I²C-bus. This allows the host to communicate directly with other I²C-bus devices. SC18IS604 can operate as an I²C-bus master-transmitter or master-receiver. SC18IS604 controls all the I²C-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

The NXP community is for sharing ideas and tips, ask and answer technical questions, and receive input on just about any embedded design topic.

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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 I²C slave serial EEPROM and an I²C 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 I²C slave to be connected to the board.

The 3V3 power for the evaluation board should be supplied via this I²C interface header as well.

The SC18IS604-EVB evaluation board also has an I²C interface header (JP4) to allow other I²C slave devices to be connected to the SC18IS604-EVB evaluation board. These

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.

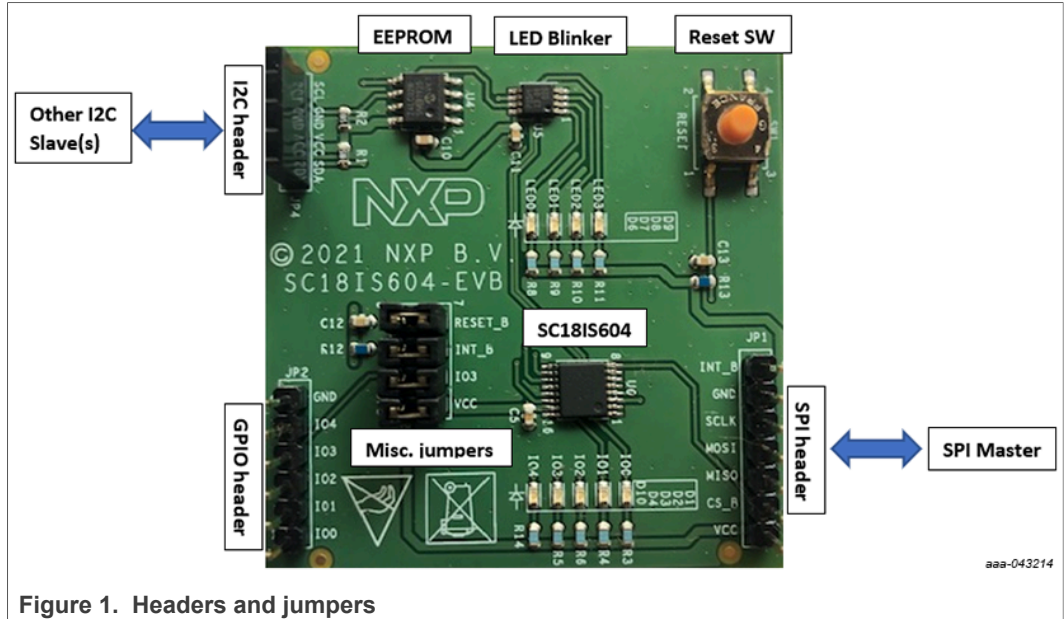


Figure 1. Headers and jumpers

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 |

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 0xFF // write to IOState register to set GPIO pins
```

4.4.5 I²C 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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