
# NXP UM11855 Evaluation Board User Manual



Contents



## UM11855

### NVT4558-4858-EVB evaluation board

## Document information

| Information | Content |
|---|---|
| Keywords | NVT4858, NVT4558, Level Shifter, Level Translator, SD card, SIM card, NVT4858 user manual, NVT4757 user manual, NVT4858 evaluation board, NVT4858 evaluation board |
| Abstract | The NVT4858 is an SD 3.0 compliant dual voltage level translator with auto-direction control. The NVT4558 is a SIM SIO-7816 Smart Card compliant dual voltage level translator with auto-direction control. This document is intended to help the users to quickly setup, configure and operate the evaluation board in the users ' hardware platform. |

NXP Semiconductors

## Revision history

| Rev | Date | Description |
|---|---|---|
| v.1.0 | 20230310 | Initial version |

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## 1 Introduction

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The NVT4558/NVT4858 are dual supply translating transceivers with auto direction sensing, enabling bidirectional voltage level translation. VCCA on the host side can be supplied at any voltage between 1.08 V and 1.98 V and VCCB on the card side can be supplied at any voltage between 1.62 V and 3.6 V.

The NVT4858 supports SD 3.0 SDR104, SDR50, DDR50, SDR25, SDR12 and SD 2.0 High-Speed (50 MHz) and Default-Speed (25 MHz) modes. The NVT4558 is compliant with all ETSI, IMT-2000 and ISO-7816 SIM/ Smart card interface requirements

This document is intended to help the users to quickly setup, configure and operate the NVT4558-4858-EVB evaluation board in the users' hardware platform.

## 2 Finding kit resources and information on the NXP web site

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

The information page for NVT4558-4858-EVB evaluation board is at **http://www.nxp.com/NVT4558-4858-EVB**. The information page provides overview information, documentation, software and tools, parametrics, ordering information and a **Getting Started** tab. The **Getting Started** tab provides quick-reference information applicable to using the NVT4558-4858-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.

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

## 3 Getting ready

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Working with the NVT4558-4858-EVB evaluation board requires the kit contents.

### 3.1 Kit contents

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

As default, NVT4558-4858-EVB evaluation board is loaded with the NVT4858 (SD level shifter) as well as the NVT4558 (SIM level shifter) along with one SD card socket and one SIM card socket.

The demo board is designed to be a stand-alone board to allow the users to evaluate the performance of the NVT4858 or the NVT4558. There are four 100 mil headers, and the connections to all of the pins of the NVT4858 and the NVT4558 are available at these headers. In addition, there is one SIM card socket and one SD card socket available on the board. The SIM card, or the SD card that is inserted in the socket can be directly accessed by the SD host controller or the SIM controller via the 100 mil headers on the host interface side of the level shifter.

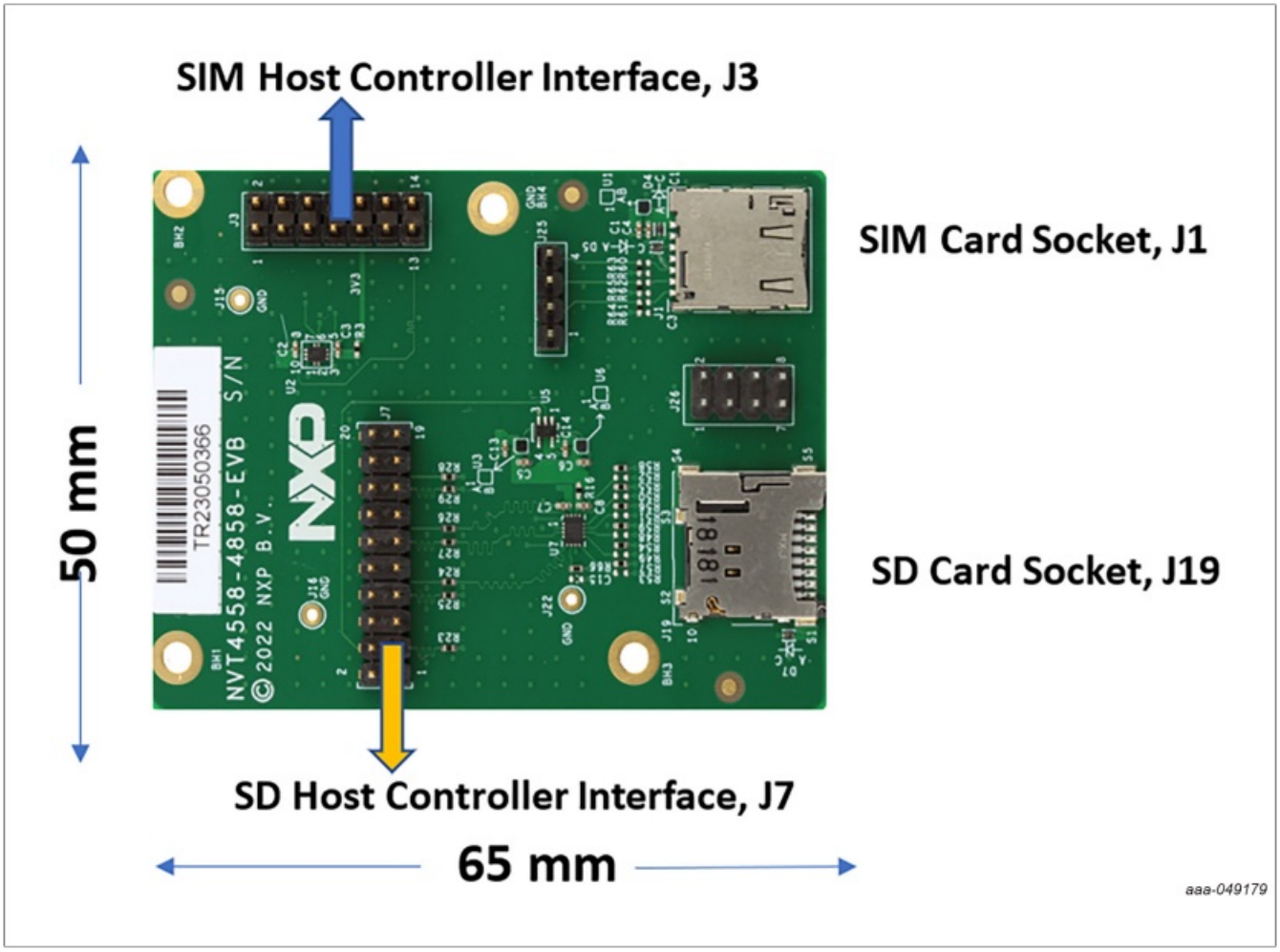


**Figure 1. NVT4558-4858-EVB evaluation board**

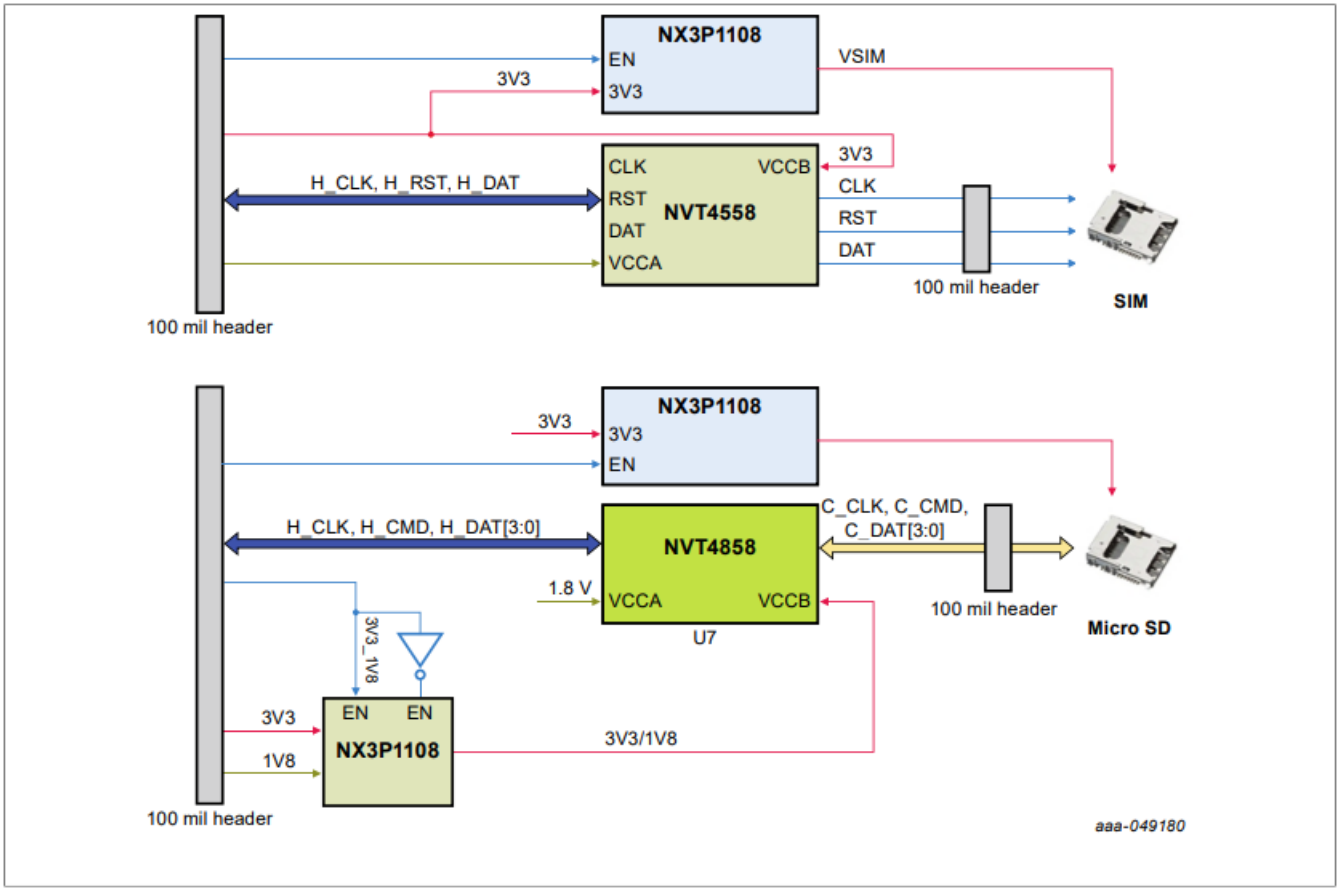


**Figure 2. NVT4558-4858-EVB evaluation board block diagram**

#### 4.1 SIM level shifter and host controller interface

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

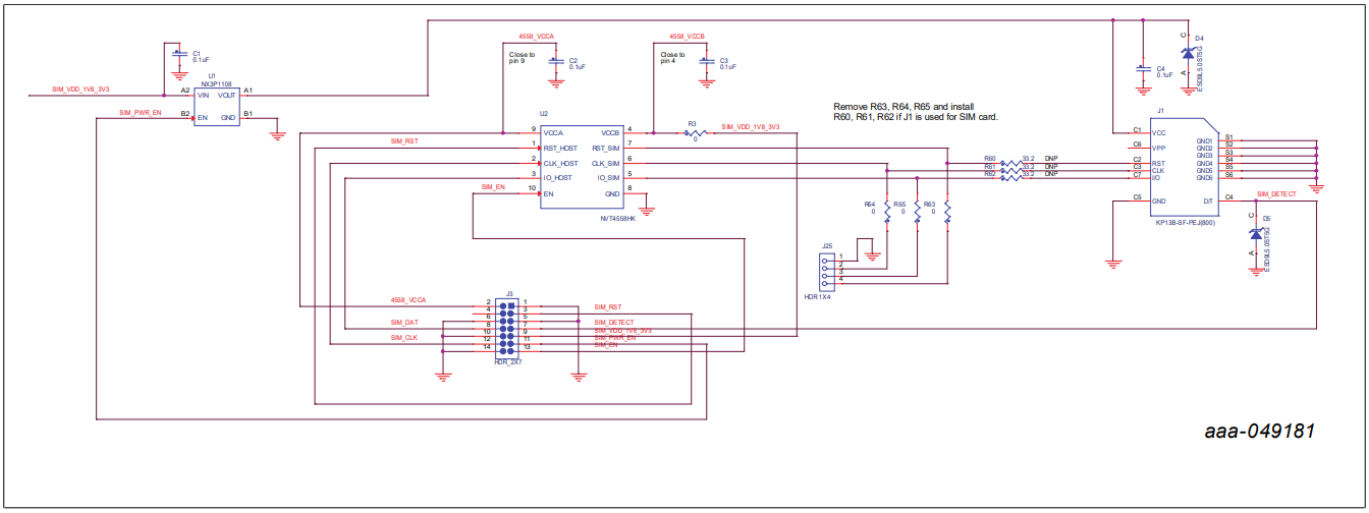


**Figure 3. NVT4558 host interface**

#### 4.2 NVT4558 to SIM controller interface via J3

User can connect the NVT4558-4858-EVB evaluation board to the SIM controller via J3 with a 14-pin ribbon cable. The pin map for the SIM interface header is shown below.

**Table 1. SIM controller interface header**

| J3 on NVT4858-4558-EVB | SIM controller | Comment |
|---|---|---|
| 2 – NVT4558_VCCA | VCC | Level Shifter VCCA (1.08V – 2.0V) |
| 3 – SIM_RST | SIM RST | SIM reset |
| 4 – NO CONNECT | – | NO CONNECT |
| 7 – SIM_DETECT | GPIO | SIM card insert detection, active low, pull-up on host side |
| 8 – SIM_DAT | SIM I/O | SIM Input/output data |
| 9 – SIM_VDD_1V8_3V3 | POWER | SIM card power – 1V8 or 3V3 |
| 11 – SIM_PWR_EN | GPIO | SIM card power enable, active high, 1.1V min |
| 12 – SIM_CLK | SIM CLK | SIM clock |
| 13 – SIM_EN | GPIO | Level shifter enable, reference to VCCA |
| 1, 5, 6, 10, 14 – GND | GND | ground |

#### 4.3 SIM interface resistor loading options

The SIM interface of NVT4558 (U2) can be routed to a 4-pin header, or to the SIM card socket. When the interface is routed to the header (J25), this option allows the user an easy way to scope out the SIM signals and this is the default configuration.

If the SIM interface of NVT4558 must be routed to the SIM socket (J1) to access the SIM card, then R63, R64, R65 must be removed and R60, R61, R62 must be stuffed.

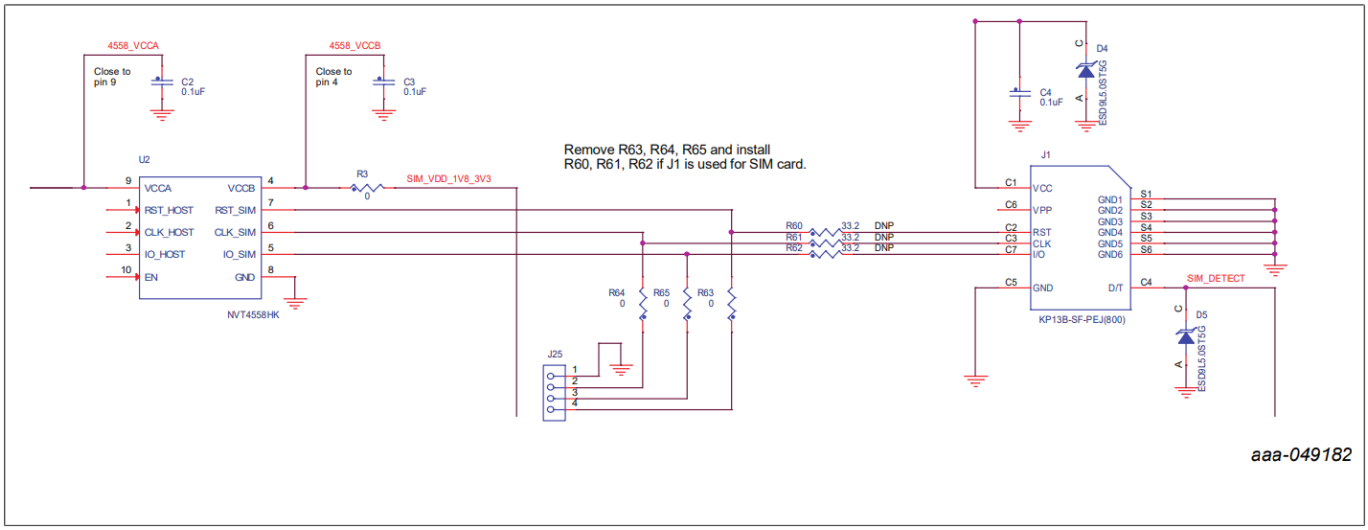


**Figure 4. NVT4558 SIM socket loading option**

#### 4.4 SD level shifter host controller interface

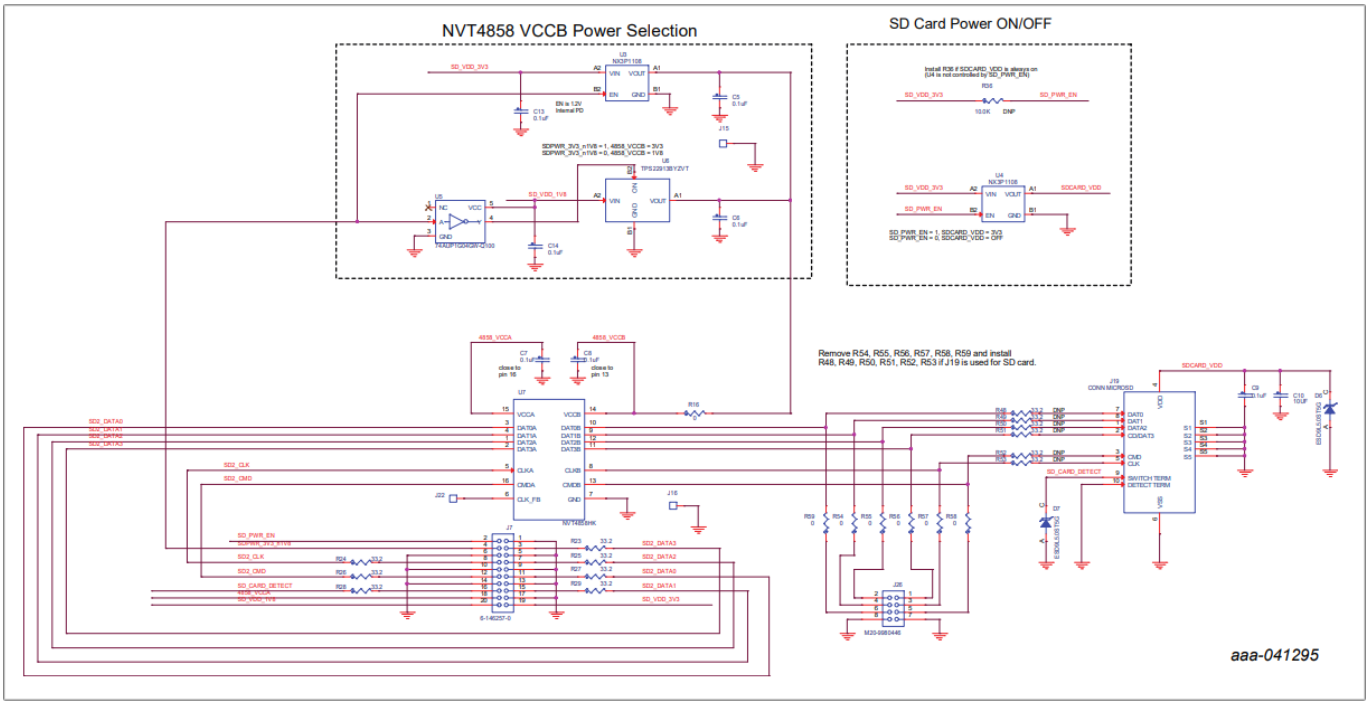


**Figure 5. NVT4858 host interface**

#### 4.5 NVT4858 to SIM controller interface via J7

**Table 2. SD controller interface header**

| J7 on NVT4558-4858-EVB | SD host controller | Comment |
|---|---|---|
| 2 – SD_PWR_EN | GPIO | 0 = turn off SD card power<br>1 = turn on SD card power |
| 3 – SD2_DATA3 | DAT3 | SD data3 |
| 4 – SD_PWR_3V3_1V8 | GPIO | SD card interface voltage (1V8 or 3V3 card)<br>0 = 1V8<br>1 = 3V3 |
| 7 – SD2_DATA2 | DAT2 | SD data2 |
| 8 – SD2_CLK | CLK | SD clock |
| 11 – SD2_DATA0 | DAT0 | SD data0 |
| 12 – SD2_CMD | CMD | SD command |
| 15 – SD2_DATA1 | DAT1 | SD data1 |
| 16 – SD_CARD_DETECT | GPIO | SD card detect, active low |
| 18 – 4858_VCCA | Power | Level Shifter VCCA (1.08V – 2.0V) |
| 19 – SD_VDD_3V3 | Power | SD card interface voltage – 3V3 (3V3 card) |
| 20 – SD_VDD_1V8 | Power | SD card interface voltage – 1V8 (1V8 card) |
| 1, 5, 6, 9, 10 , 13, 14, 17 – GND | Ground | Ground |

#### 4.6 SD interface resistor loading options

The SD card interface of NVT4558 (U7) can be routed to an 8-pin header, or to the SD card socket. When the interface is routed to the header (J26), this option allows the user an easy way to scope out the SD signals; this is the default configuration.

If the SD interface of NVT4858 must be routed to the SD socket (J19) to access the SD card, then R54, R55, R56, R57, R58, R59 must be removed and R48, R49, R50, R51, R52, R53 must be stuffed.

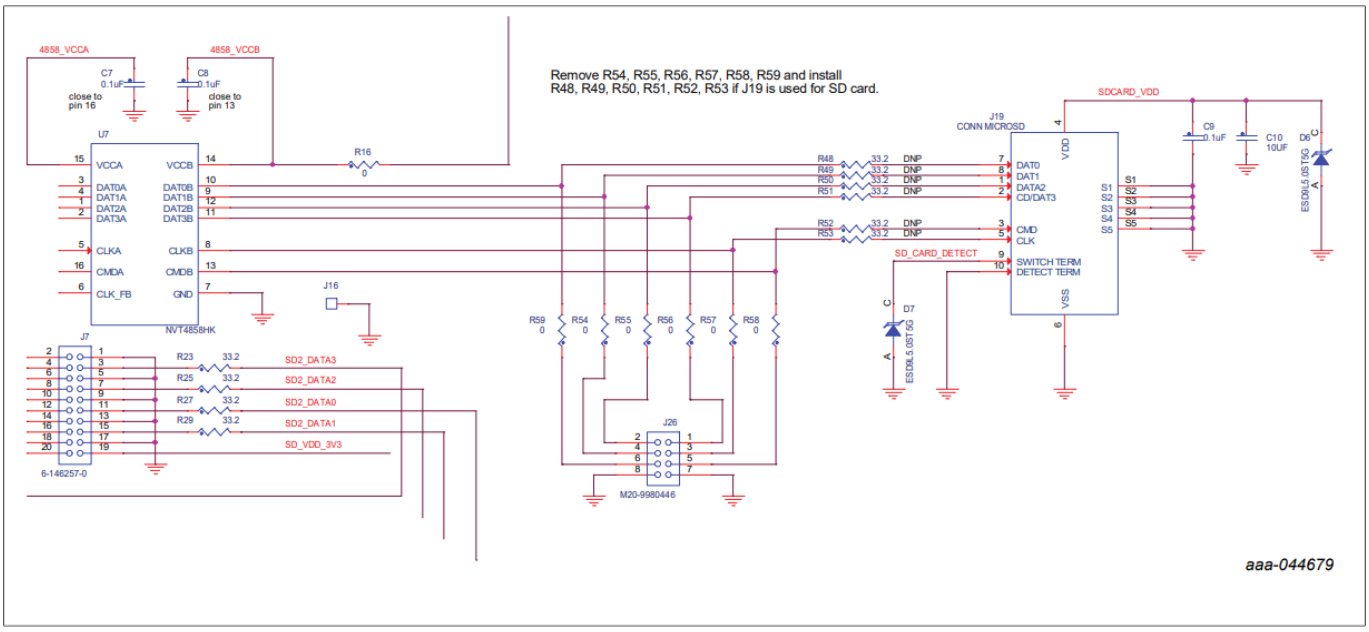


**Figure 6. SD socket loading option**

#### 5 Errata list

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**Table 3.Errata list**

| Date | Errata Description | Demo Impact | Solution |
|---|---|---|---|
| – | None | None | None |

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**Document identifier: UM11855**

## Documents / Resources

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|---|---|
|  | NXP UM11855 Evaluation Board [pdf] User Manual<br>UM11855 Evaluation Board, UM11855, Evaluation Board, Board |

## References

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