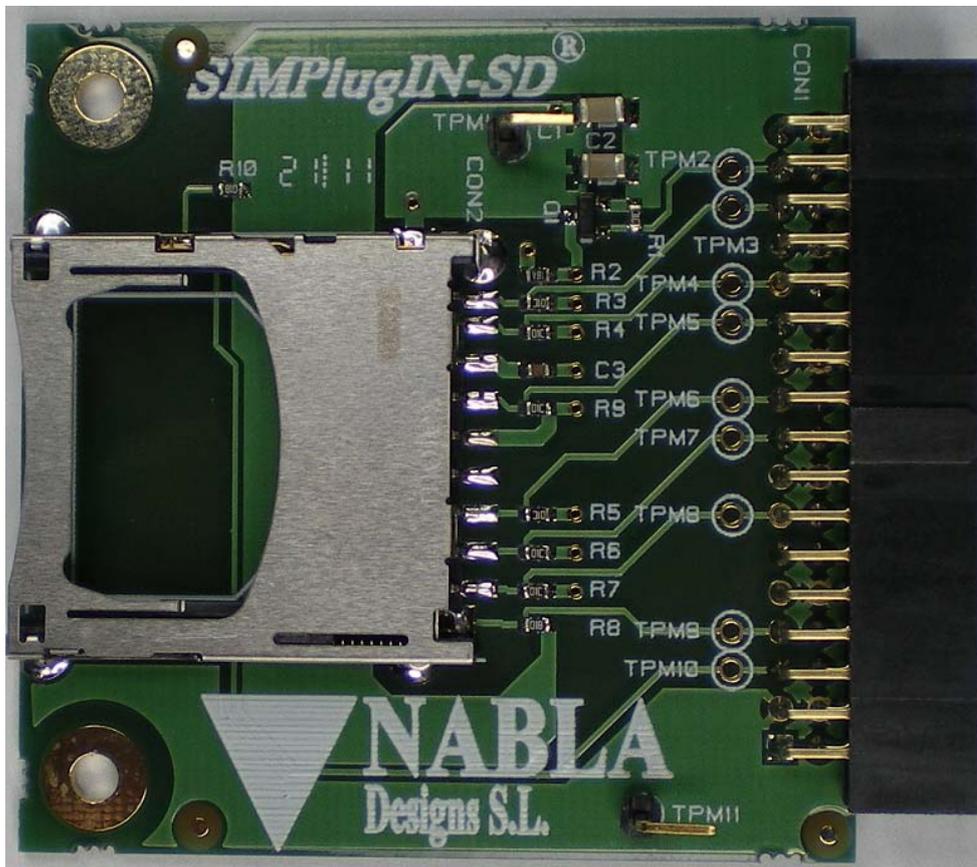


SIMPlugIN-SD User Manual

... a SIMPlugIN board® family member

Revision: see file name on page header
Date: August 26th 2011



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0) Introduction and references

This manual describes how to operate SIMPlugIN-SD board.

SIMPlugIN family boards are intended for engineers (engineering students too) that want to enjoy an easy to use and easy to expand FPGA development system.

SIMPlugIN-SD is an add-on board that provides one SD slot to the main board.

Additionally:

- All six SD signals have test point.
- The power supply of the SD slot is controlled by a mosfet transistor and so the SD slot may be completely turned off (since SD slot does not provide a reset this is the only way to reset the SD card inserted in the SD slot).

0.1) References

Note: from time to time companies modify their web pages. So, some of the detailed web link may be obsolete when you read the present document.

- SIMPlugIN- 6XL45 user manual and schematics
- In www.sdcard.org there is much useful information. Full specification specifications access is restricted to members (that is, subject to charge). Nevertheless there are available, free of charge, simplified but useful, specifications that at the time of writing were:

Simplified Specifications + File Size	Release Date
Part 1 Physical Layer Simplified Specification Ver3.01 + 1155KB	May 18, 2010
Part A1 ASSD Extension Simplified Specification Ver2.00 + 241KB	May 18, 2010
Part A2 SD Host Controller Simplified Specification Ver3.00 + 627KB	Feb. 25, 2011
Part E1 SDIO Simplified Specification Ver3.00 + 390KB	Feb. 25, 2011
Part E2 SDIO Bluetooth Type-A Simplified V1.00 + 248KB	Apr. 3, 2006

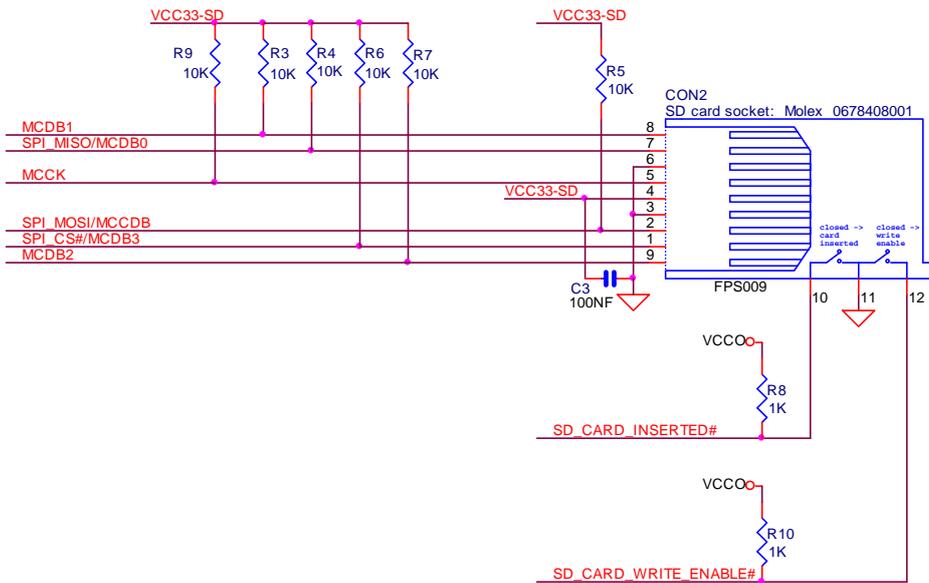
1) General description

All six SD signals are controlled by FPGA signals.

Additionally the SD connector has available two switches to detect SD Card insertion and the activation of SD card write protect marker.

REMEMBER:

The SD card, as such, does NOT “care” of write protection (the write protection marker is just a piece of plastic that does not influence at all SD card operation). Is up to the host (that is, in our case, up to the FPGA developer) to implement the write protection.



SD_CARD_INSERTED# is active (low) when the card is inserted.

SD_CARD_WRITE_ENABLE# is active (low) when the write protect marker is in the “write protected” position.

Notice that these signals can be read by the FPGA regardless of the state of VCC3-SD (turned off or on) power supply.

The SD card interface does not provide a reset signal. So the only way to reset the SD card is to turn off its power. SIMPlugIN-SD card provides a mosfet transistor to do that function.



When the signal SD_POWER_ON# is active (low) the mosfet transistor is on and the SD card is powered. When the transistor is off and the SD card is not powered and the resistor R2 acts as a small load that makes sure that VCC33-SD voltage reaches 0 volt in a reasonable time.

IMPORTANT: in addition of turning off the mosfet transistor it is necessary to put in Hi-Z all six SD signals
 SPI_CS#/MCDB3
 SPI_MOSI/MCCDB
 MCKK
 SPI_MISO/MCDB0
 MCDB1
 MCDB2

Power voltage comment:

Typically you should configure SIMPlugIN main board to supply 3.3 volt to VCCO supply pins of add-on connector. If the SD card inserted supports it, other voltages can be used (e.g. 2.5 volt or 1.8 volt). Notice that NTR2101P mosfet transistor is rated down to 1.8 volt bellow that there is no guaranty (but most likely it will work at 1.5 volts).

2) Connectors

SD card connector

1	SPI_CS#/MCDB3
2	SPI_MOSI/MCCDB
3	GND
4	VCC
5	MCCK
6	GND
7	SPI_MISO/MCDB0
8	MCDB1
9	MCDB2
10	SD_CARD_INSERTED#
11	GND
12	SD_CARD_WRITE_ENABLE#

Add-on connector

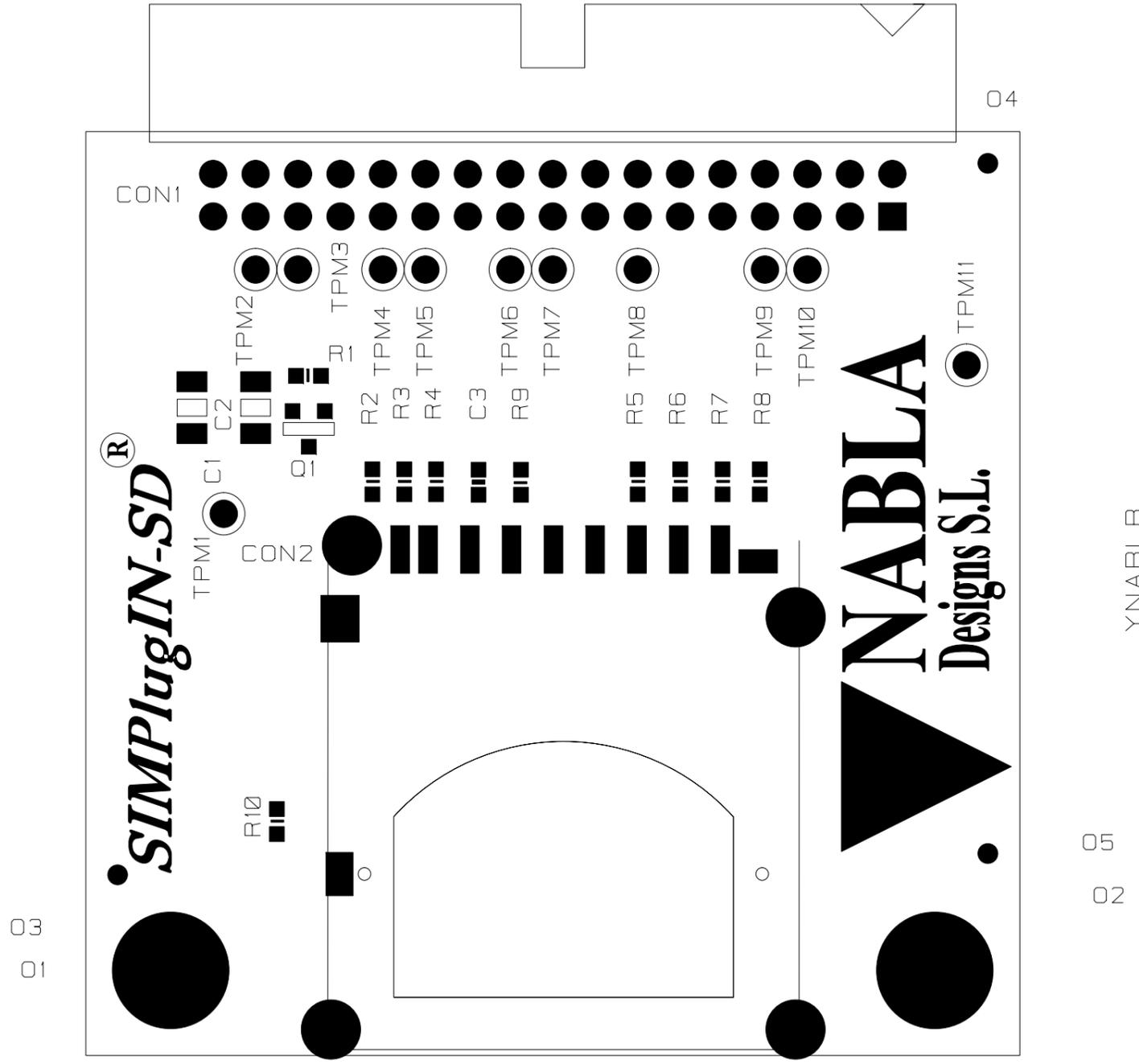
1	
2	
3	GND
4	VCCO
5	SD_CARD_WRITE_ENABLE#
6	
7	SD_CARD_INSERTED#
8	
9	GND
10	VCCO
11	
12	
13	MCDB2
14	
15	GND
16	VCCO
17	SPI_CS#/MCDB3
18	
19	SPI_MOSI/MCCDB
20	
21	GND
22	VCCO
23	MCKK
24	
25	SPI_MISO/MCDB0
26	
27	GND
28	VCCO
29	MCDB1
30	
31	SD_POWER_ON#
32	
33	GND
34	VCCO

3) Configuration jumpers

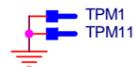
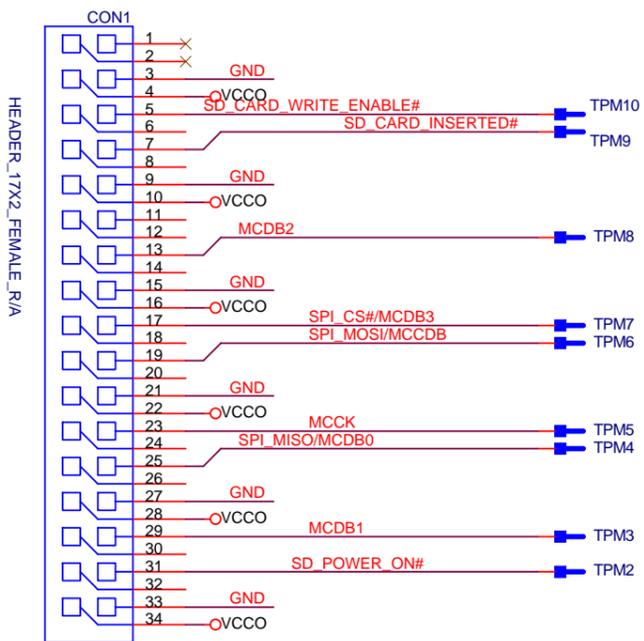
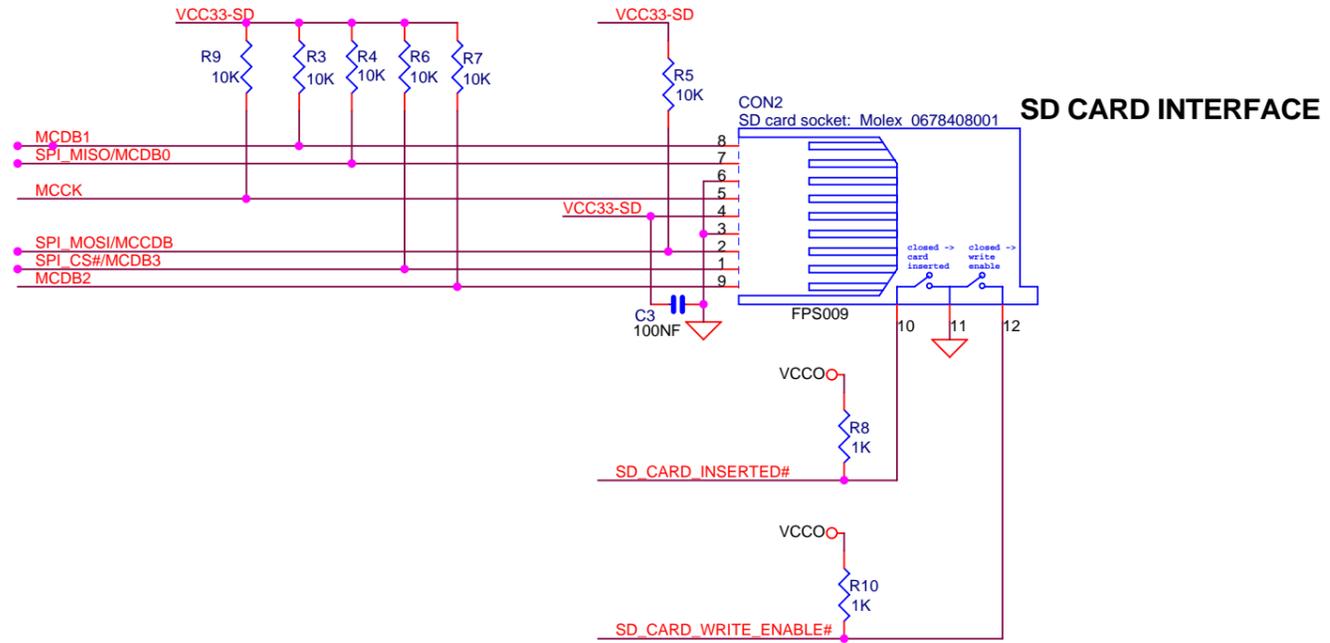
There are no configuration jumpers

4) Test points

TPM1	GND
TPM2	SD_POWER_ON#
TPM3	MCDB1
TPM4	SPI_MISO/MCDB0
TPM5	MCK
TPM6	SPI_MOSI/MCCDB
TPM7	SPI_CS#/MCDB3
TPM8	MCDB2
TPM9	SD_CARD_INSERTED#
TPM10	SD_CARD_WRITE_ENABLE#
TPM11	GND



<i>SIMPlugIN-SD</i>			
LAYER:			
COD:	DN559B11	DATE:	3/05/11



Revised: Wednesday, June 08, 2011

Revised: Wednesday, June 08, 2011				
Item	qty	Reference	Part	PCB Footprint
1	1	CON1	HEADER_17X2_FEMALE_R/A	
2	1	CON2	SD card socket: Molex 0678408001	
3	2	C1,C2	10uF	1206
4	1	C3	100nF	0603
5	1	Q1	NTR2101PT1G	sot23
6	7	R1,R3,R4,R5,R6,R7,R9	10K	0603
7	1	R2	150R	0603
8	2	R10,R8	1K	0603
9	2	TPM11,TPM1	header 1x1	header 1x1
10	9	TPM2,TPM3,TPM4,TPM5,TPM6, TPM7,TPM8,TPM9,TPM10	DNP header 1x1	header 1x1