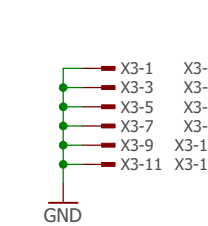
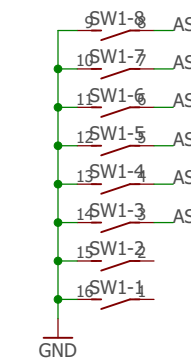


State	Next
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	12 (15 If /SER_WR = 0)
*9	12 (15 If /SER_WR = 0)
*10	12 (15 If /SER_WR = 0)
*11	12 (15 If /SER_WR = 0)
12	12 (15 If /SER_WR = 0)
*13	12 (15 If /SER_WR = 0)
*14	12 (15 If /SER_WR = 0)
15	15 (0 If /SER_WR = 1)

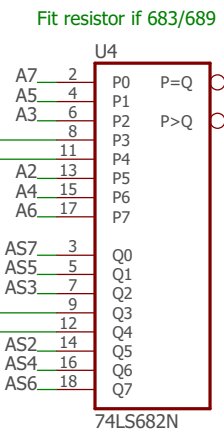
\*not reached

- P1-1 A15
- P1-2 A14
- P1-3 A13
- P1-4 A12
- P1-5 A11
- P1-6 A10
- P1-7 A9
- P1-8 A8
- P1-9 A7
- P1-10 A6
- P1-11 A5
- P1-12 A4
- P1-13 A3
- P1-14 A2
- P1-15 A1
- P1-16 A0
- P1-17 GND
- P1-18 VCC
- P1-19 /M1
- P1-20 /RESET
- P1-21 CLK
- P1-22 /INT
- P1-23 /MREQ
- P1-24 /WR
- P1-25 /RD
- P1-26 /IORQ
- P1-27 D0
- P1-28 D1
- P1-29 D2
- P1-30 D3
- P1-31 D4
- P1-32 D5
- P1-33 D6
- P1-34 D7
- P1-35 U1B
- P1-36 U2B
- P1-37 P3-3
- P1-38 P3-4
- P1-39 IF
- P2-1 GND
- P2-2 VCC
- P2-3 /RFSH
- P2-4 PAGE
- P2-5 CK2
- P2-6 /BUSAK
- P2-7 /HALT
- P2-8 /BUSRQ
- P2-9 /WAIT
- P2-10 /NMI

Typically U1A to U4A will be inputs from previous card and U1B to U4B will be outputs to the next card.  
If not used they may be linked.



Fit\_RN1 unless 682 is used



Default base address 0x1C

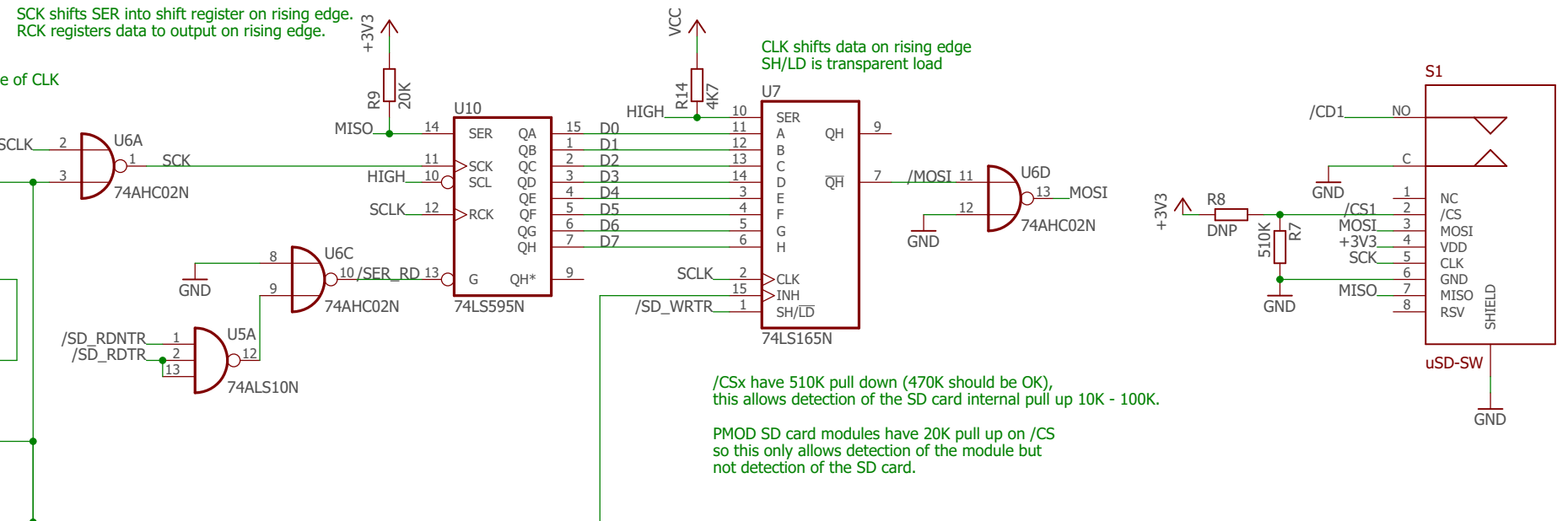
Fit resistor if 683/689

WR-ADR Output data and transfer (Y0)  
RD-ADR Read data without transfer (Y2)  
RD-ADR+1 Read data with transfer (Y3)  
WR-ADR+2 Output control (Y4)  
RD-ADR+2 Read status (Y6)

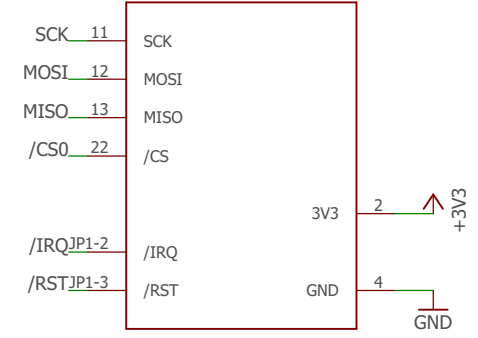
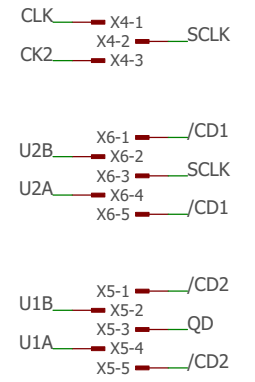
Use:-  
IN A,(C) (12 clock cycles)  
INI (12 + 4 clock cycles)  
INIR (12 + 4 + (5) clock cycles)  
Note.  
IN A,(nn) (11 clock cycles)  
May not be reliable above 12MHz.

Max CLK frequency with 74LS163 is 12MHz.  
For 20MHz, 74ALS163 may be used.

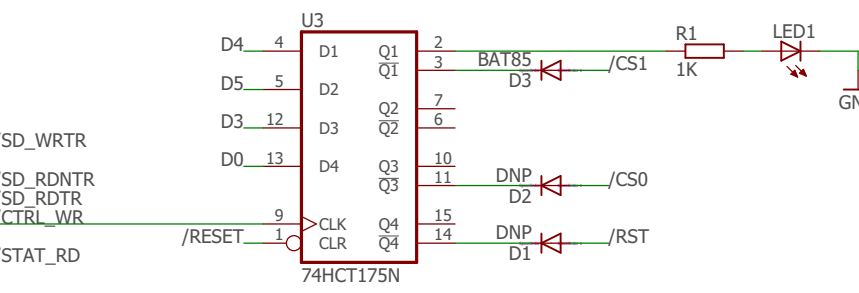
SCK shifts SER into shift register on rising edge.  
RCK registers data to output on rising edge.



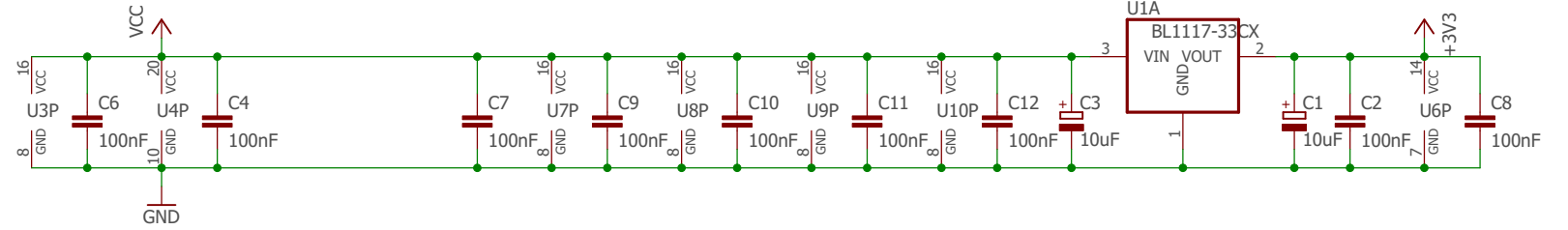
/CSx have 510K pull down (470K should be OK),  
this allows detection of the SD card internal pull up 10K - 100K.  
PMD SD card modules have 20K pull up on /CS  
so this only allows detection of the module but  
not detection of the SD card.



U1 SOT 223, 3.3v Low drop out regulator  
C1 and C3 = 10uF LCSC.COM C9807 CL31A106KAHNNNE  
Multilayer Ceramic Capacitors MLCC - SMD/SMT 10uF 25V 1206 RoHS  
Check datasheet for U1 decoupling requirement



LED1 and LED2 low current type,  
select R1 and R12 to suit.



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