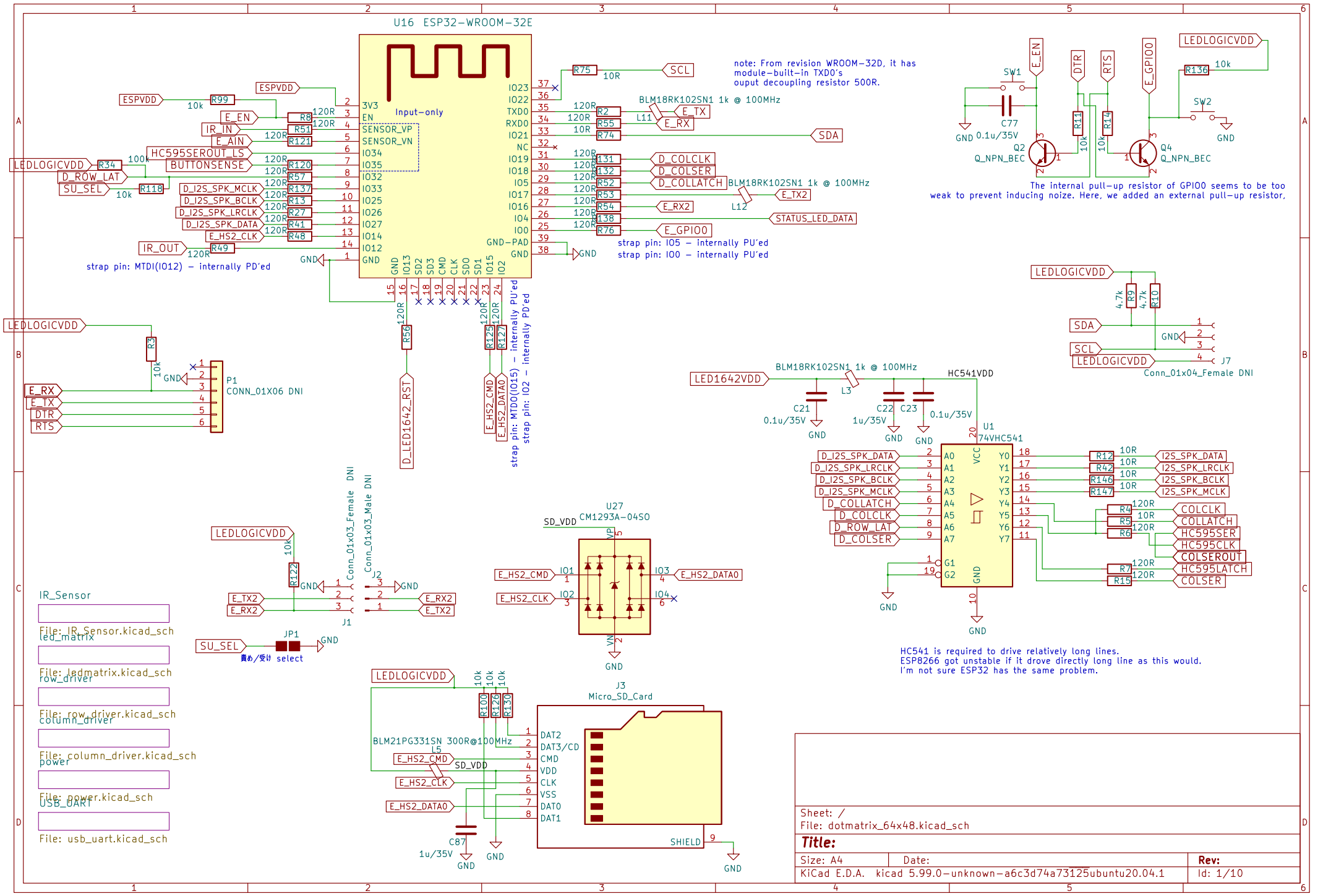
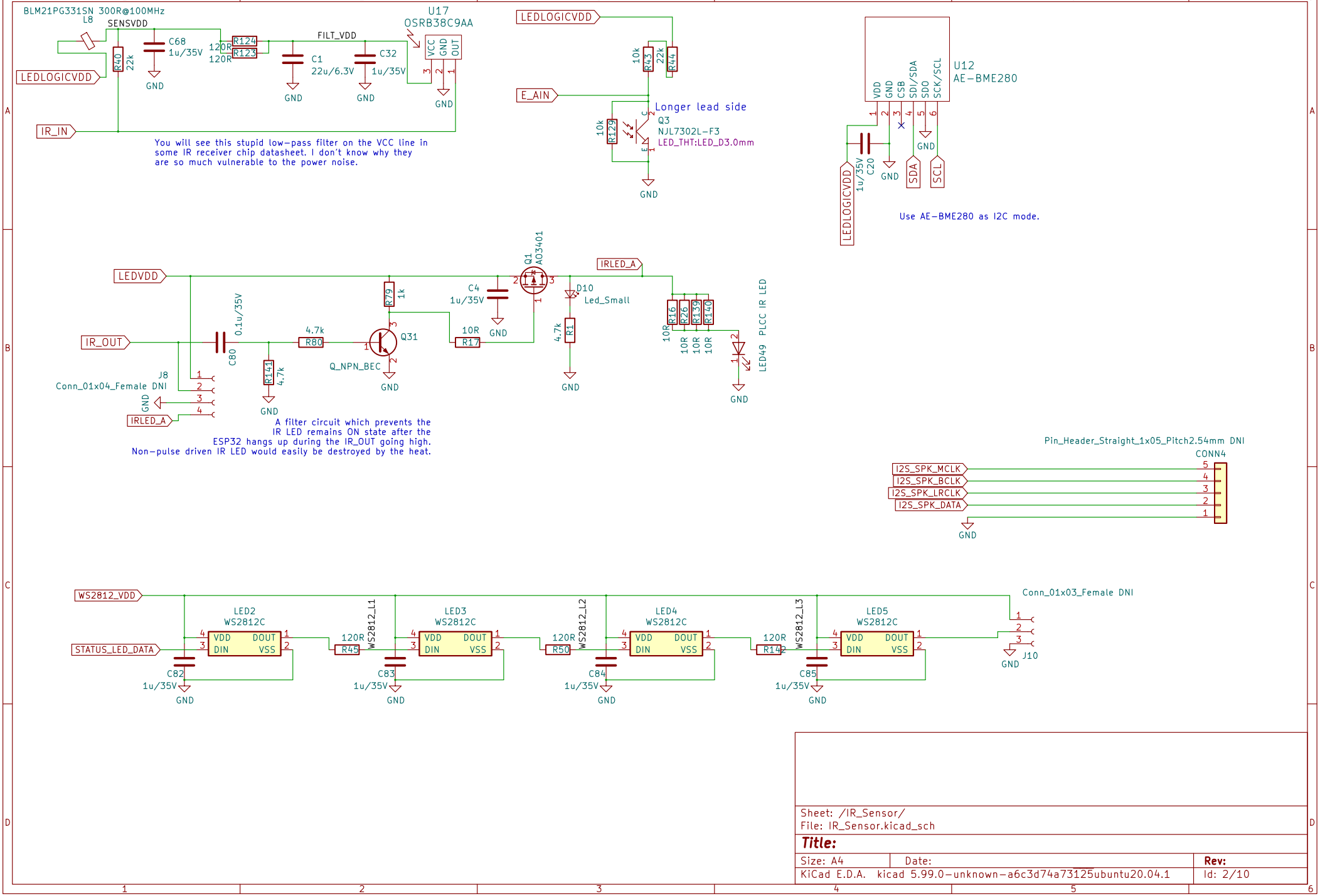
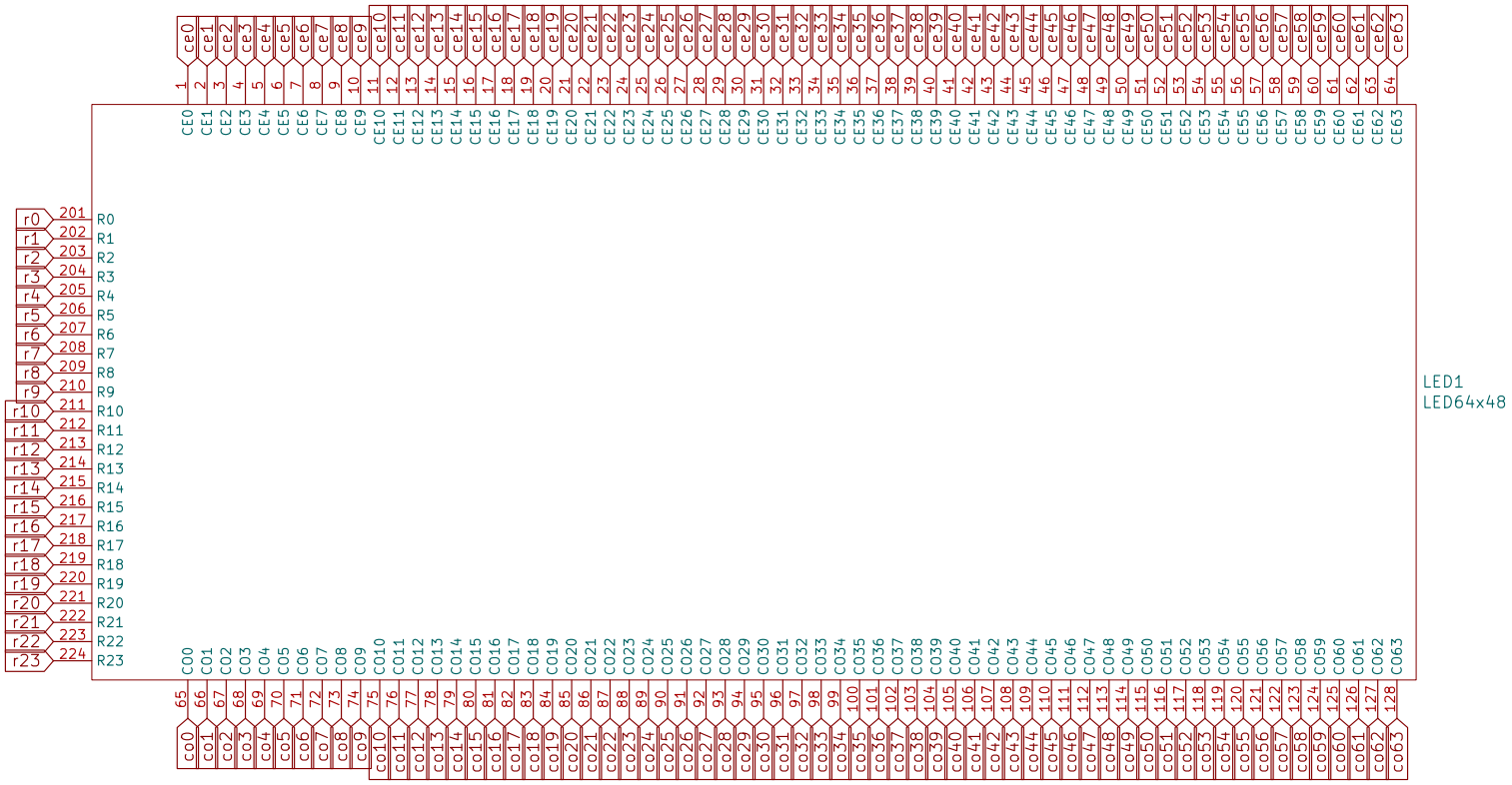

U16 ESP32-WROOM-32E
Input-only
strap pin: MTDI(IO12) – internally PD'ed
note: From revision WROOM-32D, it has module-built-in TXD0's ouput decoupling resistor 500R.
strap pin: IO5 – internally PU'ed
strap pin: IO0 – internally PU'ed
strap pin: MTDO(IO15) – internally PU'ed
strap pin: IO2 – internally PD'ed
BLM18RK102SN1 1k @ 100MHz
The internal pull-up resistor of GPIO0 seems to be too weak to prevent inducing noize. Here, we added an external pull-up resistor,
P1
CONN_01X06 DNI
J7
Conn_01x04_Female DNI
U1
74VHC541
HC541 is required to drive relatively long lines.
ESP8266 got unstable if it drove directly long line as this would.
I'm not sure ESP32 has the same problem.
U27
CM1293A-04SO
J1
Conn_01x03_Female DNI
Conn_01x03_Male DNI
JP1
書め/受け select
J3
Micro_SD_Card
BLM21PG331SN 300R@100MHz
IR_Sensor
File: IR_Sensor.kicad_sch
led_matrix
File: ledmatrix.kicad_sch
row_driver
File: row_driver.kicad_sch
column_driver
File: column_driver.kicad_sch
power
File: power.kicad_sch
USB_UART
File: usb_uart.kicad_sch
Sheet: /
File: dotmatrix_64x48.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1
Id: 1/10


BLM21PG331SN 300R@100MHz
L8
SENSVDD
C68
1u/35V
R40
22k
120R
120R
R124
R123
FILT_VDD
C1
22u/6.3V
C32
1u/35V
U17
OSRB38C9AA
VCC
GND
OUT
LEDLOGICVDD
IR_IN
GND
You will see this stupid low-pass filter on the VCC line in some IR receiver chip datasheet. I don't know why they are so much vulnerable to the power noise.
LEDLOGICVDD
10k
R43
22k
R44
E_AIN
10k
R129
Longer lead side
Q3
NJL7302L-F3
LED_THT:LED_D3.0mm
U12
AE-BME280
VDD
GND
CSB
SDI/SDA
SDO
SCK/SCL
C20
1u/35V
SDA
SCL
Use AE-BME280 as I2C mode.
LEDVDD
Q1
AO3401
IRLED_A
C4
1u/35V
D10
Led_Small
R79
1k
0.1u/35V
4.7k
R80
Q31
10R
R17
4.7k
R1
10R
R16
R26
R139
R140
LED49 PLCC IR LED
IR_OUT
C80
R141
4.7k
Q_NPN_BEC
J8
Conn_01x04_Female DNI
A filter circuit which prevents the IR LED remains ON state after the ESP32 hangs up during the IR_OUT going high.
Non-pulse driven IR LED would easily be destroyed by the heat.
Pin_Header_Straight_1x05_Pitch2.54mm DNI
CONN4
I2S_SPK_MCLK
I2S_SPK_BCLK
I2S_SPK_LRCLK
I2S_SPK_DATA
WS2812_VDD
STATUS_LED_DATA
LED2
WS2812C
LED3
WS2812C
LED4
WS2812C
LED5
WS2812C
VDD
DOUT
DIN
VSS
120R
R45
R50
R142
WS2812_L1
WS2812_L2
WS2812_L3
C82
C83
C84
C85
1u/35V
Conn_01x03_Female DNI
J10
Sheet: /IR_Sensor/
File: IR_Sensor.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1
Id: 2/10

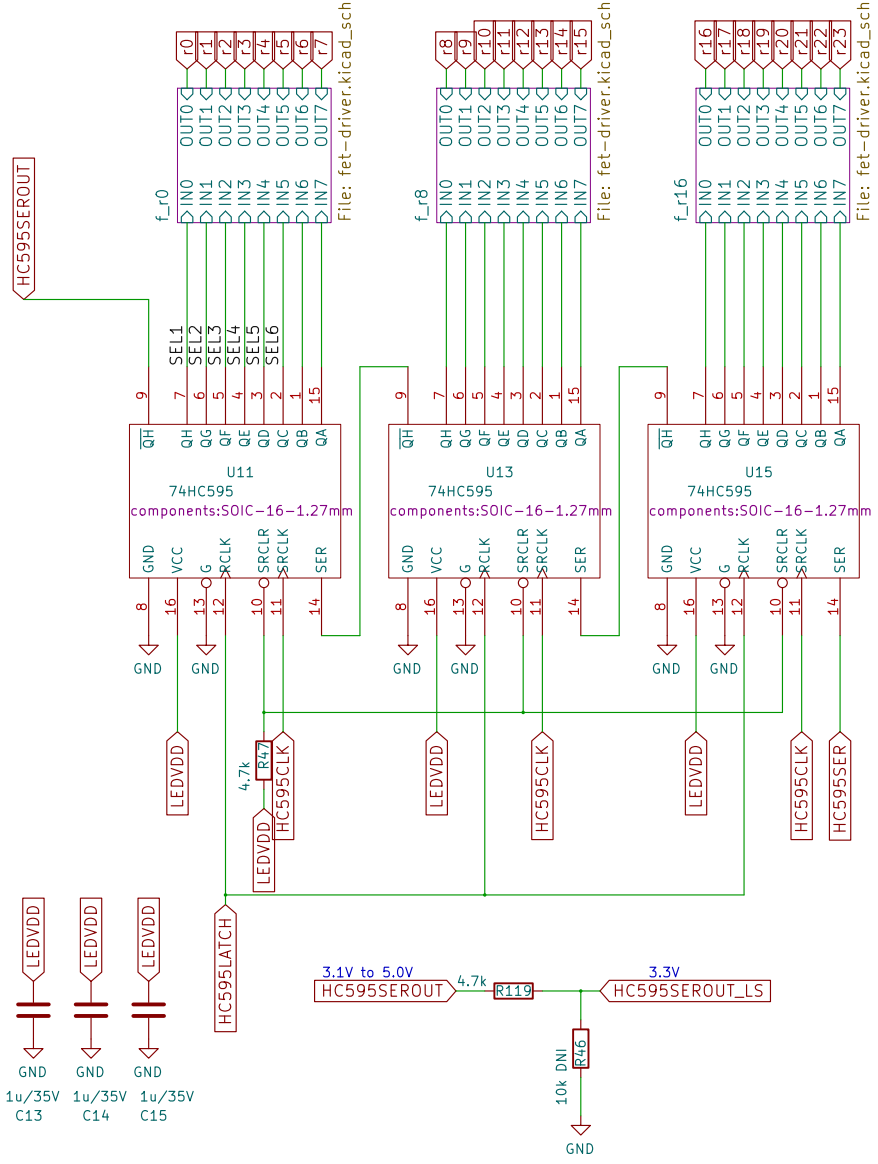


Sheet: /led_matrix/
File: ledmatrix.kicad_sch

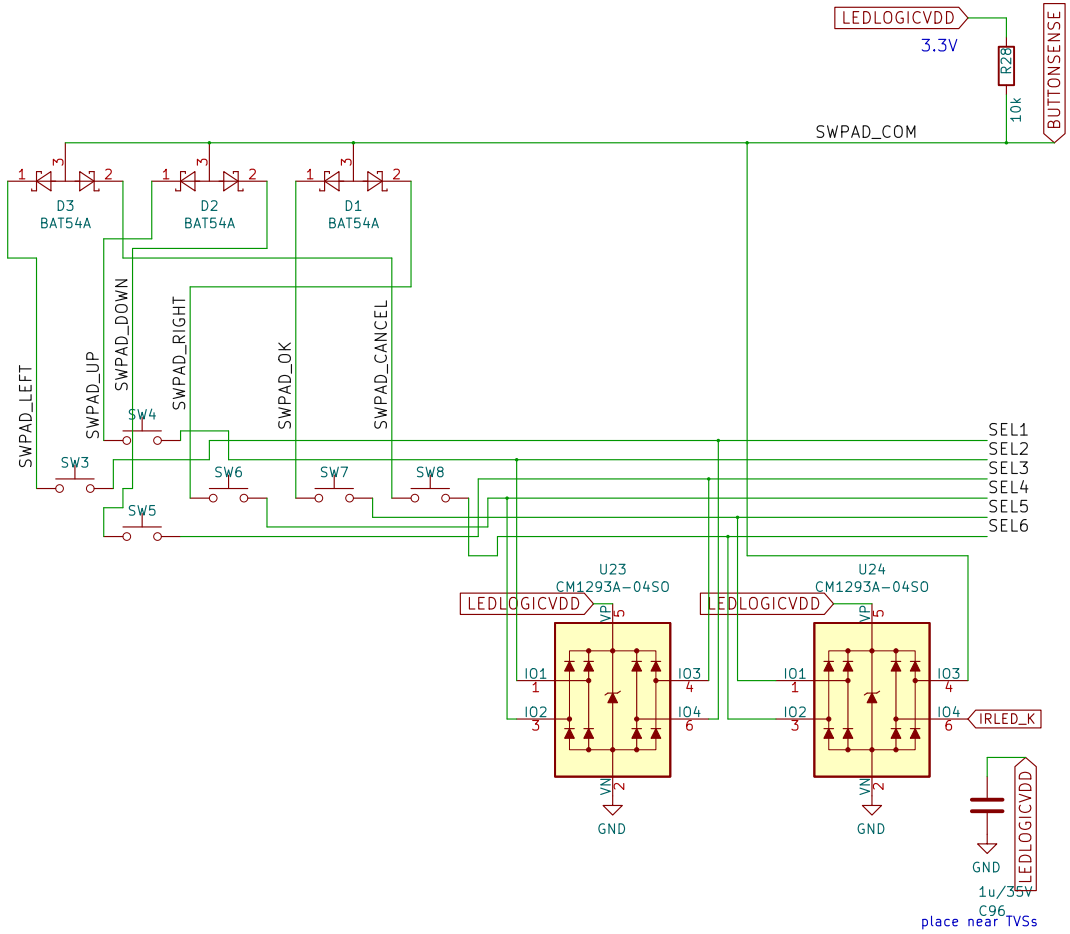
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 3/10

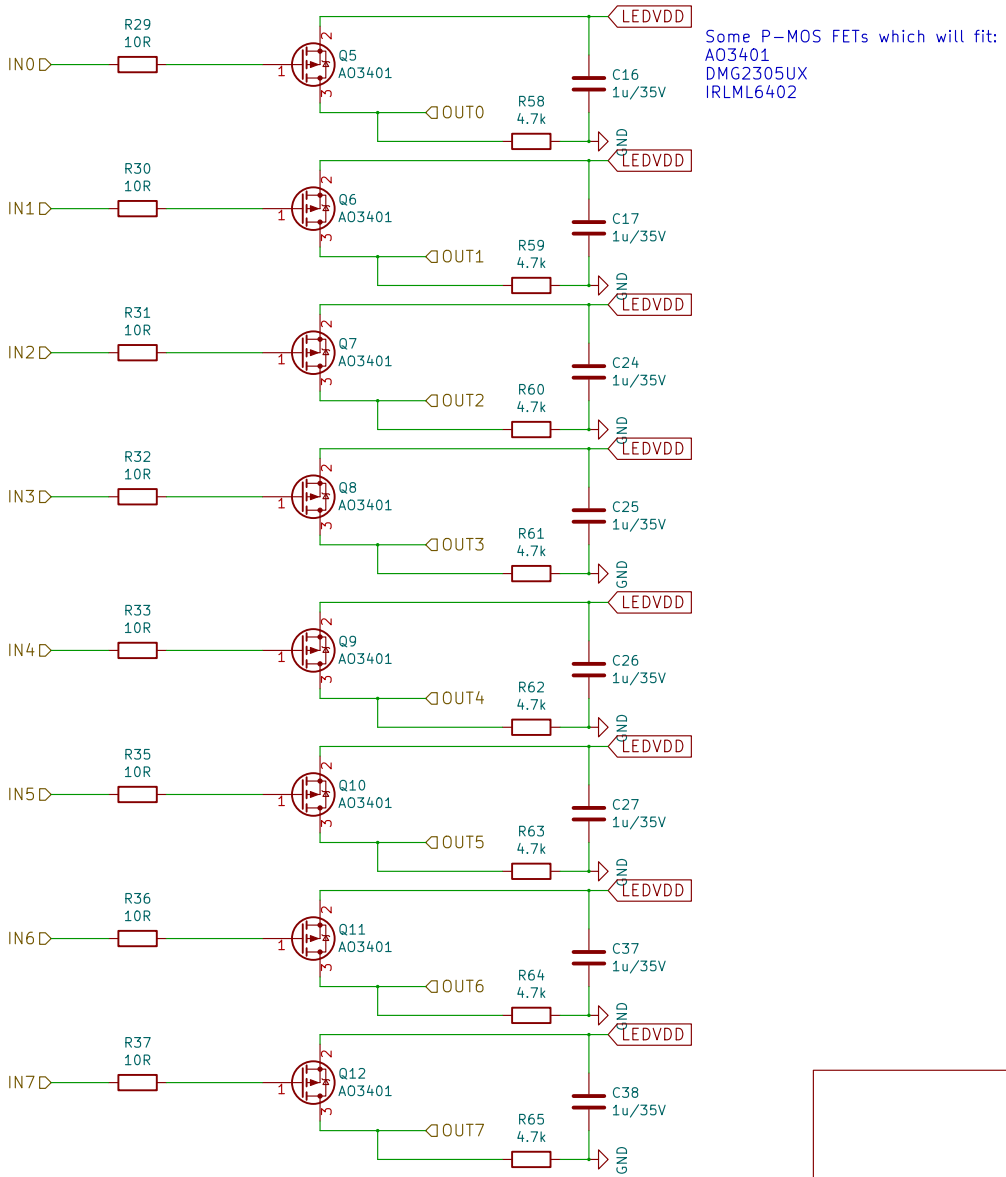
HC595SER is a 3.3V logic while HC595 runs on LEDVDD which is between 3.1V to 5.0V depending on LED color you use. The default kit's LED color is red, and the LEDVDD is 3.1V.
Always check the logic level is compatible.
for LEDVDD > 4.5V : use 74HCT595; otherwise use 74HC595



R46 must be installed when HC595SEROUT does not match to 3.3V levels



Sheet: /row_driver/		
File: row_driver.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 4/10

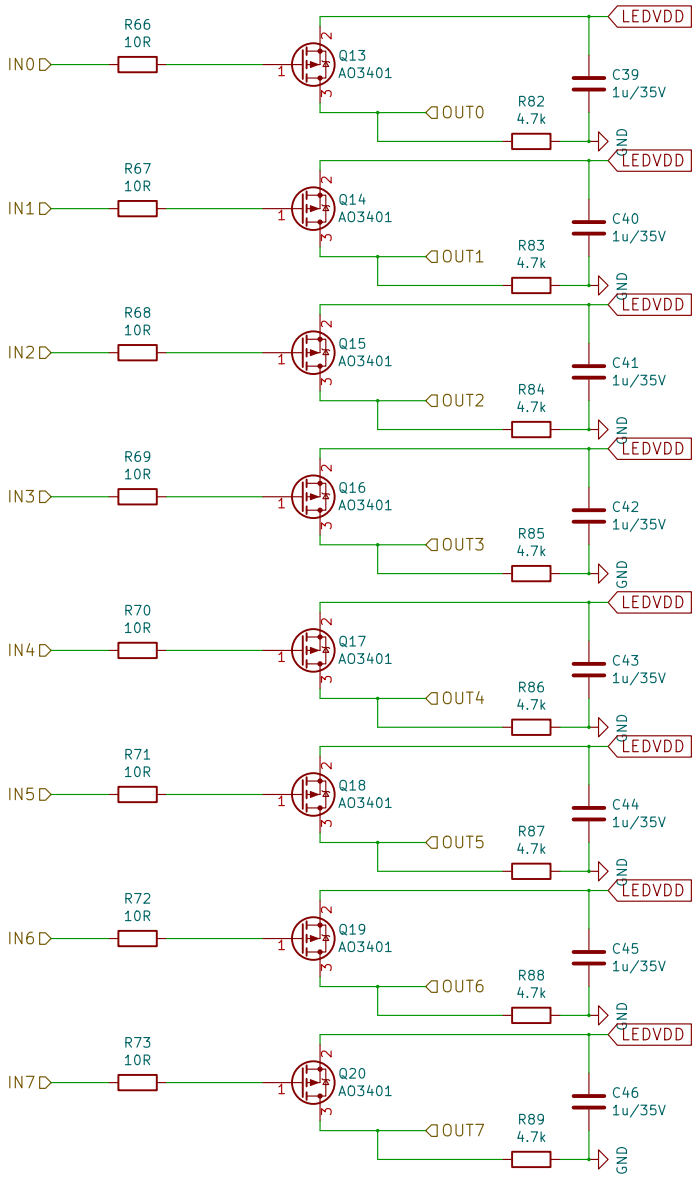


Some P-MOS FETs which will fit:
AO3401
DMG2305UX
IRLML6402

Sheet: /row_driver/f_r0/
File: fet-driver.kicad_sch

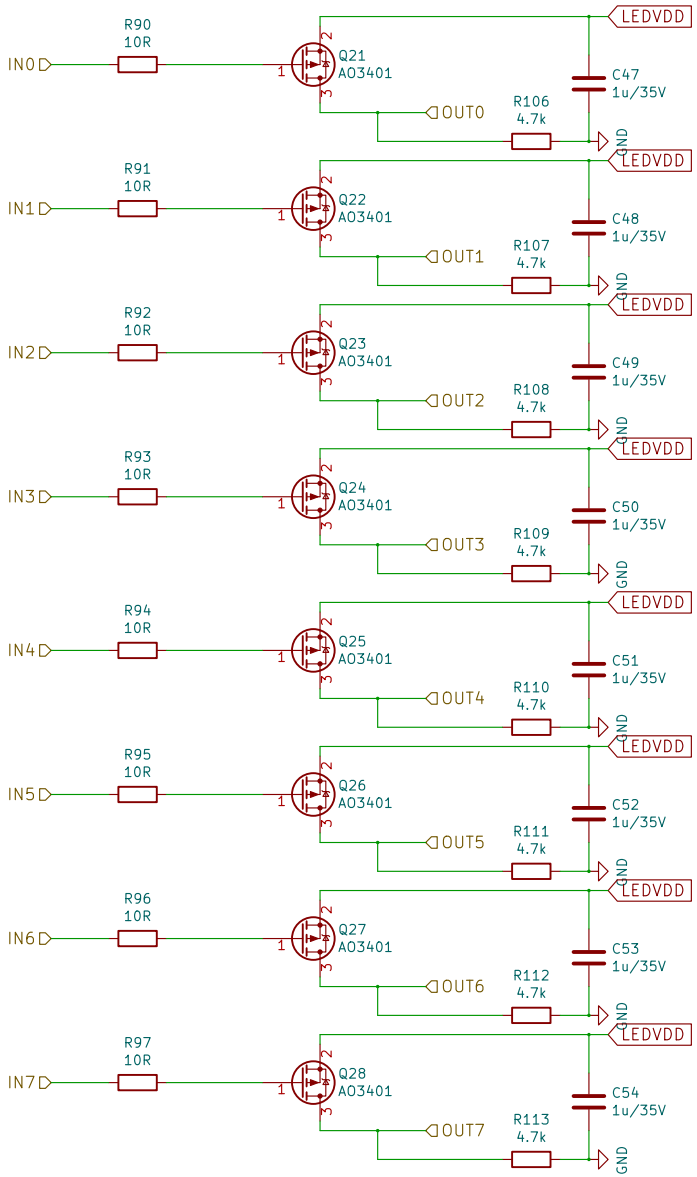
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 5/10



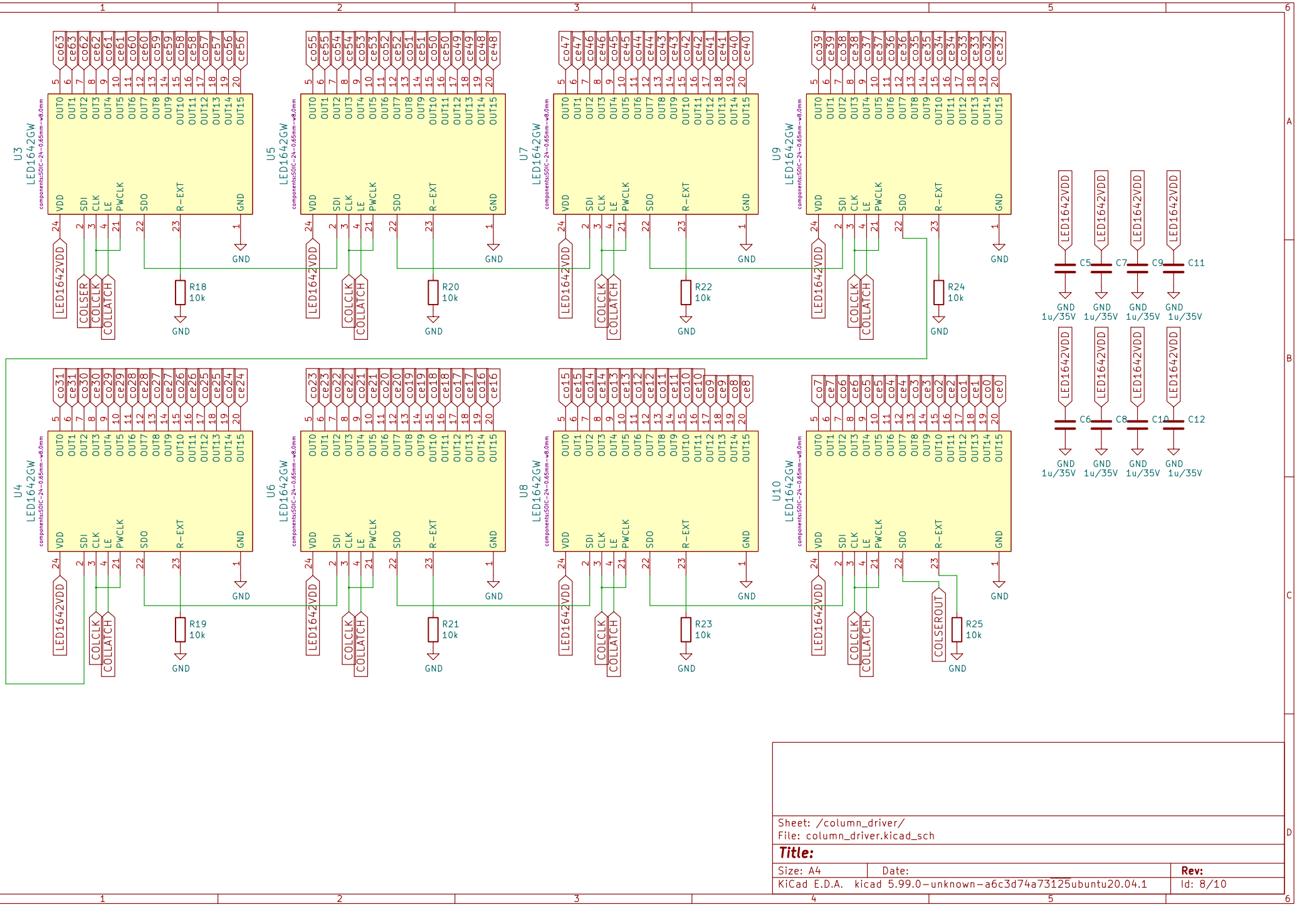
Some P-MOS FETs which will fit:
AO3401
DMG2305UX
IRLML6402

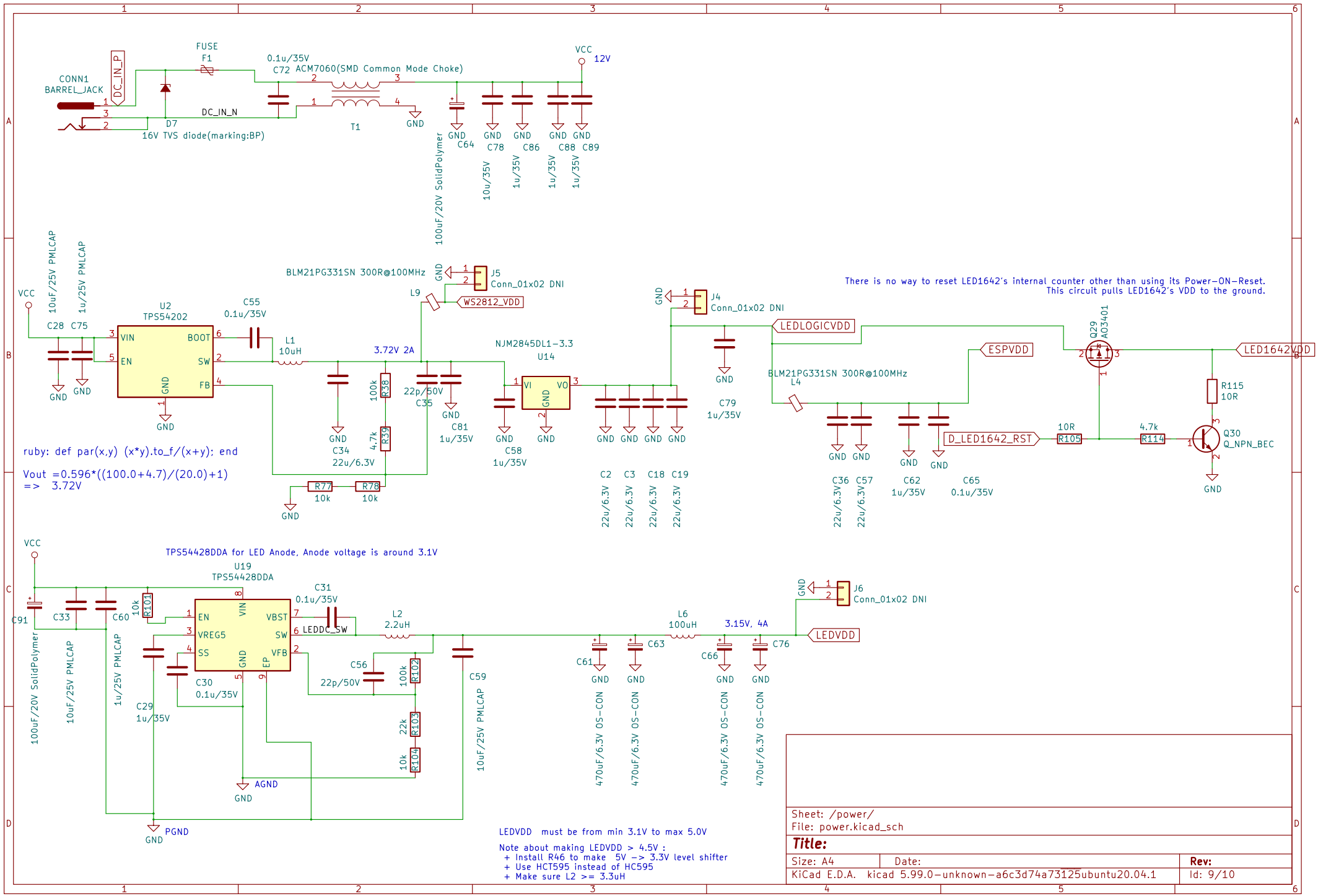
Sheet: /row_driver/f_r8/ File: fet-driver.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 6/10

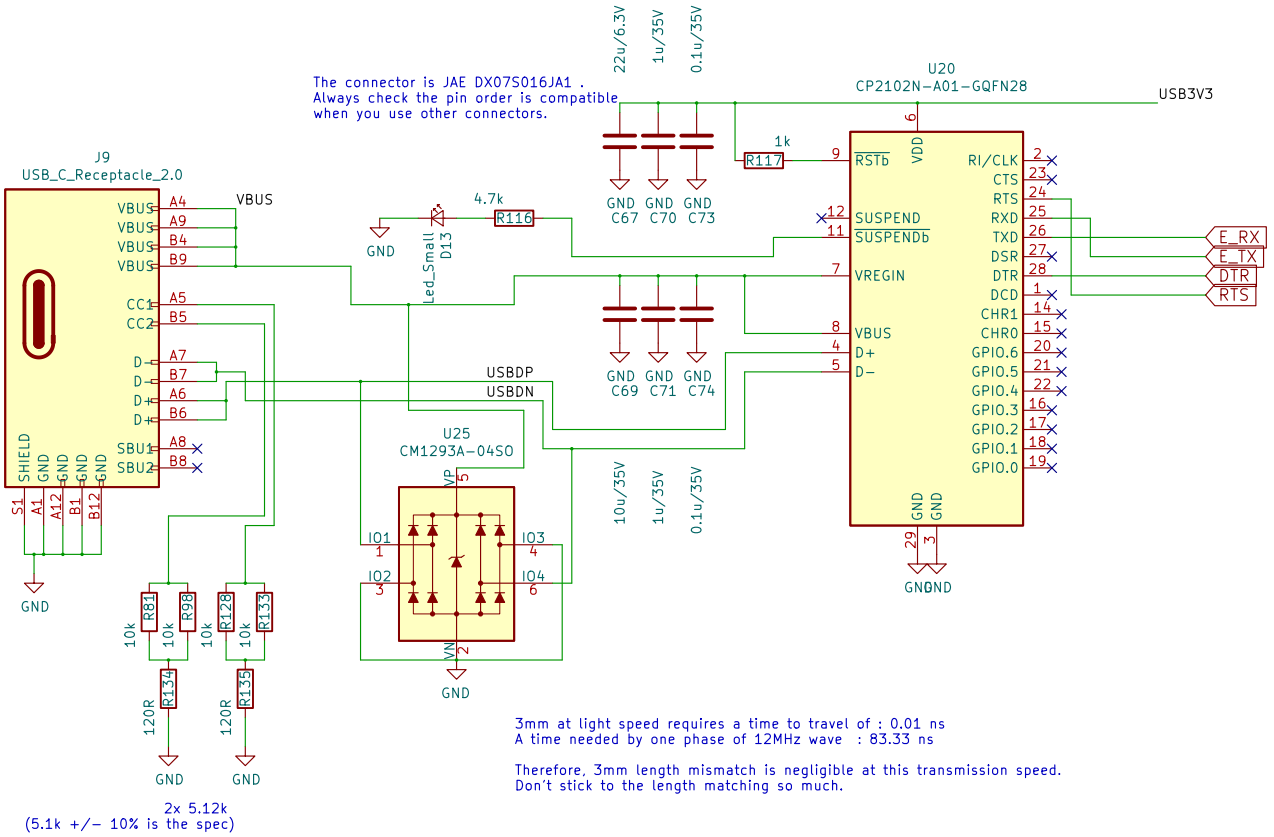


Some P-MOS FETs which will fit:
AO3401
DMG2305UX
IRLML6402

Sheet: /row_driver/f_r16/ File: fet-driver.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 7/10


U3
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U5
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U7
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U9
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U4
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U6
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U8
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
U10
LED1642GW
components:SOIC-24-0.65mm-w8.0mm
OUT0 OUT1 OUT2 OUT3 OUT4 OUT5 OUT6 OUT7 OUT8 OUT9 OUT10 OUT11 OUT12 OUT13 OUT14 OUT15
VDD SDI CLK LE PWCLK SDO R-EXT GND
LED1642VDD
COLSER
COLCLK
COLLATCH
COLSEROUT
R18 10k
R19 10k
R20 10k
R21 10k
R22 10k
R23 10k
R24 10k
R25 10k
GND
C5 C6 C7 C8 C9 C10 C11 C12
1u/35V
Sheet: /column_driver/
File: column_driver.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1
Id: 8/10


CONN1
BARREL_JACK
DC_IN_P
FUSE
F1
D7
16V TVS diode(marking:BP)
DC_IN_N
0.1u/35V
C72
ACM7060(SMD Common Mode Choke)
T1
GND
VCC
12V
100uF/20V SolidPolymer
C64
C78
C86
C88
C89
10u/35V
1u/35V
1u/35V
1u/35V
BLM21PG331SN 300R@100MHz
J5
Conn_01x02 DNI
WS2812_VDD
L9
U2
TPS54202
C28
C75
10uF/25V PMLCAP
1u/25V PMLCAP
C55
0.1u/35V
L1
10uH
3.72V 2A
R38
100k
R39
4.7k
C34
22u/6.3V
22p/50V
C35
C81
1u/35V
R77
10k
R78
10k
NJM2845DL1-3.3
U14
C58
1u/35V
C2
C3
C18
C19
22u/6.3V
J4
Conn_01x02 DNI
LEDLOGICVDD
C79
1u/35V
There is no way to reset LED1642's internal counter other than using its Power-ON-Reset.
This circuit pulls LED1642's VDD to the ground.
ESPVDD
BLM21PG331SN 300R@100MHz
L4
Q29
AO3401
LED1642VDD
R115
10R
D_LED1642_RST
R105
10R
R114
4.7k
Q30
Q_NPN_BEC
C36
C57
C62
1u/35V
C65
0.1u/35V
ruby: def par(x,y) (x*y).to_f/(x+y); end
Vout =0.596*((100.0+4.7)/(20.0)+1)
=> 3.72V
TPS54428DDA for LED Anode, Anode voltage is around 3.1V
U19
TPS54428DDA
C91
C33
C60
R101
10k
C31
0.1u/35V
LEDDC_SW
L2
2.2uH
L6
100uH
3.15V, 4A
J6
Conn_01x02 DNI
LEDVDD
C61
C63
C66
C76
470uF/6.3V OS-CON
C30
0.1u/35V
C29
1u/35V
C56
22p/50V
R102
100k
R103
22k
R104
10k
C59
10uF/25V PMLCAP
100uF/20V SolidPolymer
AGND
PGND
LEDVDD must be from min 3.1V to max 5.0V
Note about making LEDVDD > 4.5V :
+ Install R46 to make 5V -> 3.3V level shifter
+ Use HCT595 instead of HC595
+ Make sure L2 >= 3.3uH
Sheet: /power/
File: power.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1
Id: 9/10



Sheet: /USB_UART/		
File: usb_uart.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad 5.99.0-unknown-a6c3d74a73125ubuntu20.04.1		Id: 10/10