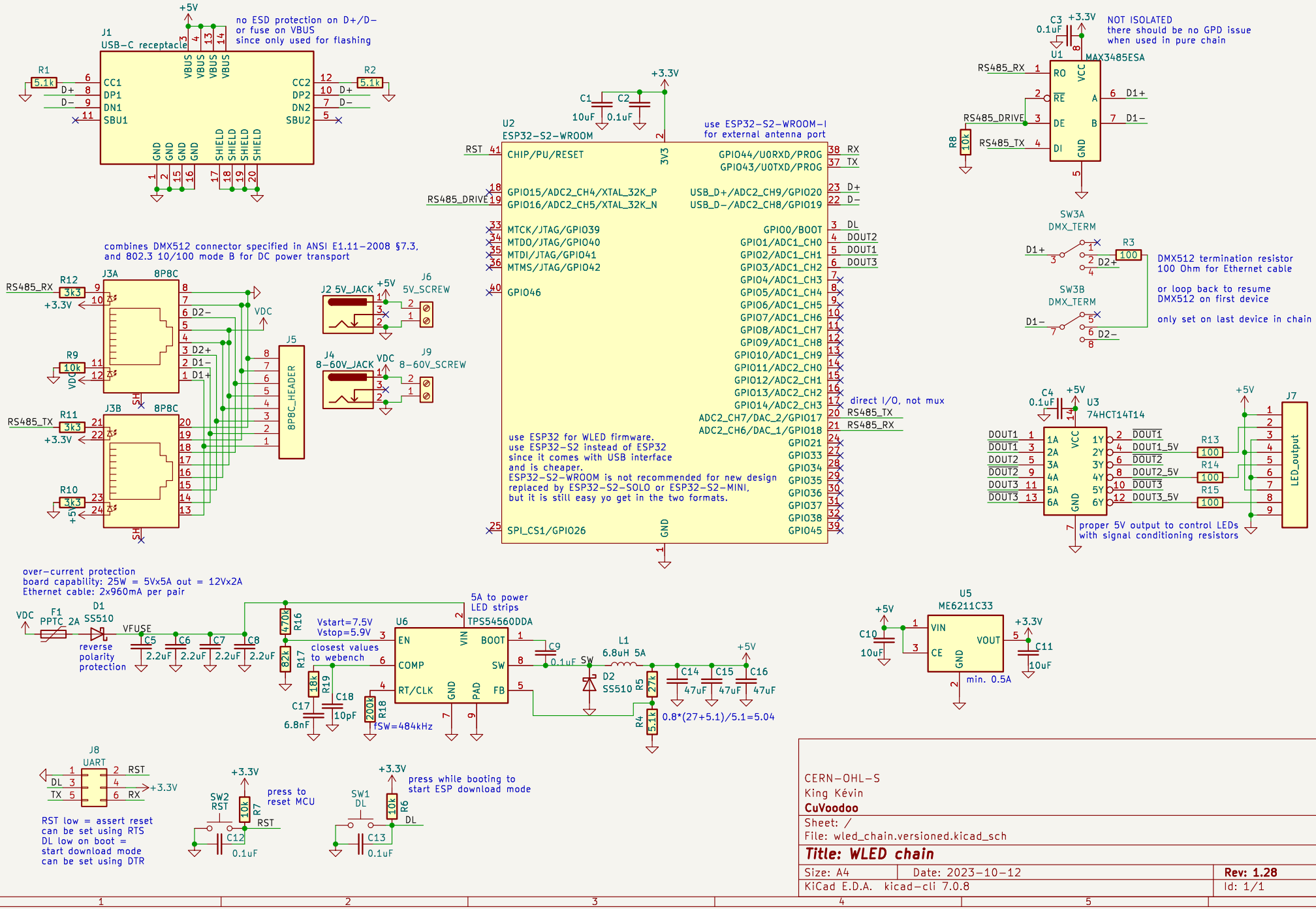
J1
USB-C receptacle
no ESD protection on D+/D-
or fuse on VBUS
since only used for flashing
R1 5.1k
R2 5.1k
CC1
DP1
DN1
SBU1
CC2
DP2
DN2
SBU2
VBUS
GND
SHIELD
U2
ESP32-S2-WROOM
use ESP32-S2-WROOM-I
for external antenna port
C1 10uF
C2 0.1uF
3V3
CHIP/PU/RESET
GPIO15/ADC2_CH4/XTAL_32K_P
GPIO16/ADC2_CH5/XTAL_32K_N
MTCK/JTAG/GPIO39
MTDO/JTAG/GPIO40
MTDI/JTAG/GPIO41
MTMS/JTAG/GPIO42
GPIO46
SPI_CS1/GPIO026
GPIO44/U0RXD/PROG
GPIO43/U0TXD/PROG
USB_D+/ADC2_CH9/GPIO20
USB_D-/ADC2_CH8/GPIO19
GPIO0/BOOT
GPIO1/ADC1_CH0
GPIO2/ADC1_CH1
GPIO3/ADC1_CH2
GPIO4/ADC1_CH3
GPIO5/ADC1_CH4
GPIO6/ADC1_CH5
GPIO7/ADC1_CH6
GPIO8/ADC1_CH7
GPIO9/ADC1_CH8
GPIO10/ADC1_CH9
GPIO11/ADC2_CH0
GPIO12/ADC2_CH1
GPIO13/ADC2_CH2
GPIO14/ADC2_CH3
ADC2_CH7/DAC_2/GPIO17
ADC2_CH6/DAC_1/GPIO18
GPIO21
GPIO33
GPIO34
GPIO35
GPIO36
GPIO37
GPIO38
GPIO45
direct I/O, not mux
use ESP32 for WLED firmware.
use ESP32-S2 instead of ESP32
since it comes with USB interface
and is cheaper.
ESP32-S2-WROOM is not recommended for new design
replaced by ESP32-S2-SOLO or ESP32-S2-MINI,
but it is still easy yo get in the two formats.
U1
MAX3485ESA
C3 0.1uF
NOT ISOLATED
there should be no GPD issue
when used in pure chain
RS485_RX
RS485_DRIVE
RS485_TX
R8 10k
RO
RE
DE
DI
VCC
GND
A
B
D1+
D1-
SW3A
DMX_TERM
SW3B
DMX_TERM
R3 100
DMX512 termination resistor
100 Ohm for Ethernet cable
or loop back to resume
DMX512 on first device
only set on last device in chain
combines DMX512 connector specified in ANSI E1.11-2008 §7.3,
and 802.3 10/100 mode B for DC power transport
J3A 8P8C
J3B 8P8C
R12 3k3
R9 10k
R11 3k3
R10 3k3
+3.3V
+5V
VDC
SH
J5
8P8C_HEADER
J2 5V_JACK
J6
5V_SCREW
J4
8-60V_JACK
J9
8-60V_SCREW
C4 0.1uF
U3
74HCT14T14
1A
2A
3A
4A
5A
6A
1Y
2Y
3Y
4Y
5Y
6Y
DOUT1
DOUT2
DOUT3
DOUT1_5V
DOUT2_5V
DOUT3_5V
R13 100
R14 100
R15 100
J7
LED_output
proper 5V output to control LEDs
with signal conditioning resistors
over-current protection
board capability: 25W = 5Vx5A out = 12Vx2A
Ethernet cable: 2x960mA per pair
F1
PPTC 2A
D1
SS5510
reverse
polarity
protection
VFUSE
C5 2.2uF
C6 2.2uF
C7 2.2uF
C8 2.2uF
5A to power
LED strips
U6
TPS54560DDA
EN
COMP
RT/CLK
VIN
BOOT
SW
GND
PAD
FB
R16 470k
R17 82k
R19 18k
R18 200k
C17 6.8nF
C18 10pF
C9 0.1uF
Vstart=7.5V
Vstop=5.9V
closest values
to webench
fSW=484kHz
L1
6.8uH 5A
D2
SS510
R5 27k
R4 5.1k
0.8*(27+5.1)/5.1=5.04
C14 47uF
C15 47uF
C16 47uF
U5
ME6211C33
VIN
CE
GND
VOUT
C10 10uF
C11 10uF
min. 0.5A
J8
UART
RST
DL
TX
RX
RST low = assert reset
can be set using RTS
DL low on boot =
start download mode
can be set using DTR
SW2
RST
R7 10k
C12 0.1uF
press to
reset MCU
SW1
DL
R6 10k
C13 0.1uF
press while booting to
start ESP download mode
CERN-OHL-S
King Kévin
CuVoodoo
Sheet: /
File: wled_chain.versioned.kicad_sch
Title: WLED chain
Size: A4
Date: 2023-10-12
Rev: 1.28
KiCad E.D.A. kicad-cli 7.0.8
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