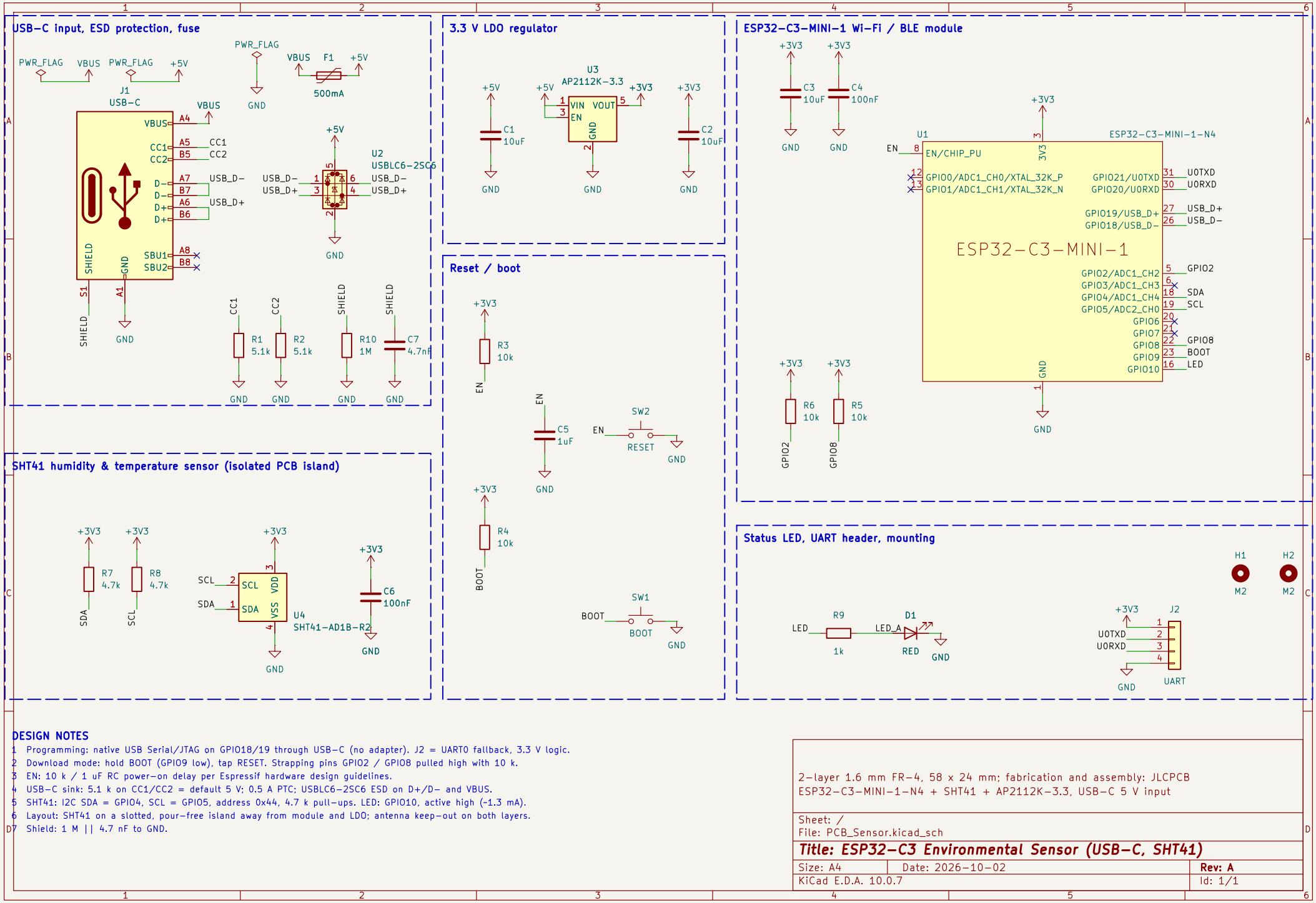
USB-C input, ESD protection, fuse
PWR_FLAG
VBUS
PWR_FLAG
+5V
J1
USB-C
VBUS
CC1
CC2
D-
D-
D+
D+
SHIELD
GND
SBU1
SBU2
A4
A5
B5
A7
B7
A6
B6
A8
B8
S1
A1
F1
500mA
U2
USBLC6-2SC6
USB_D-
USB_D+
R1
5.1k
R2
5.1k
R10
1M
C7
4.7nF
3.3 V LDO regulator
U3
AP2112K-3.3
VIN
VOUT
EN
C1
10uF
C2
10uF
+3V3
Reset / boot
R3
10k
R4
10k
C5
1uF
SW1
SW2
BOOT
RESET
ESP32-C3-MINI-1 Wi-Fi / BLE module
U1
ESP32-C3-MINI-1-N4
ESP32-C3-MINI-1
EN/CHIP_PU
GPIO0/ADC1_CH0/XTAL_32K_P
GPIO1/ADC1_CH1/XTAL_32K_N
GPIO21/U0TXD
GPIO20/U0RXD
GPIO19/USB_D+
GPIO18/USB_D-
GPIO2/ADC1_CH2
GPIO3/ADC1_CH3
GPIO4/ADC1_CH4
GPIO5/ADC2_CH0
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
C3
10uF
C4
100nF
R6
10k
R5
10k
SDA
SCL
LED
BOOT
SHT41 humidity & temperature sensor (isolated PCB island)
R7
4.7k
R8
4.7k
U4
SHT41-AD1B-R2
C6
100nF
Status LED, UART header, mounting
R9
1k
D1
RED
LED_A
J2
UART
U0TXD
U0RXD
H1
H2
M2
DESIGN NOTES
1 Programming: native USB Serial/JTAG on GPIO18/19 through USB-C (no adapter). J2 = UART0 fallback, 3.3 V logic.
2 Download mode: hold BOOT (GPIO9 low), tap RESET. Strapping pins GPIO2 / GPIO8 pulled high with 10 k.
3 EN: 10 k / 1 uF RC power-on delay per Espressif hardware design guidelines.
4 USB-C sink: 5.1 k on CC1/CC2 = default 5 V; 0.5 A PTC; USBLC6-2SC6 ESD on D+/D- and VBUS.
5 SHT41: I2C SDA = GPIO4, SCL = GPIO5, address 0x44, 4.7 k pull-ups. LED: GPIO10, active high (~1.3 mA).
6 Layout: SHT41 on a slotted, pour-free island away from module and LDO; antenna keep-out on both layers.
7 Shield: 1 M || 4.7 nF to GND.
2-layer 1.6 mm FR-4, 58 x 24 mm; fabrication and assembly: JLCPCB
ESP32-C3-MINI-1-N4 + SHT41 + AP2112K-3.3, USB-C 5 V input
Sheet: /
File: PCB_Sensor.kicad_sch
Title: ESP32-C3 Environmental Sensor (USB-C, SHT41)
Size: A4
Date: 2026-10-02
Rev: A
KiCad E.D.A. 10.0.7
Id: 1/1