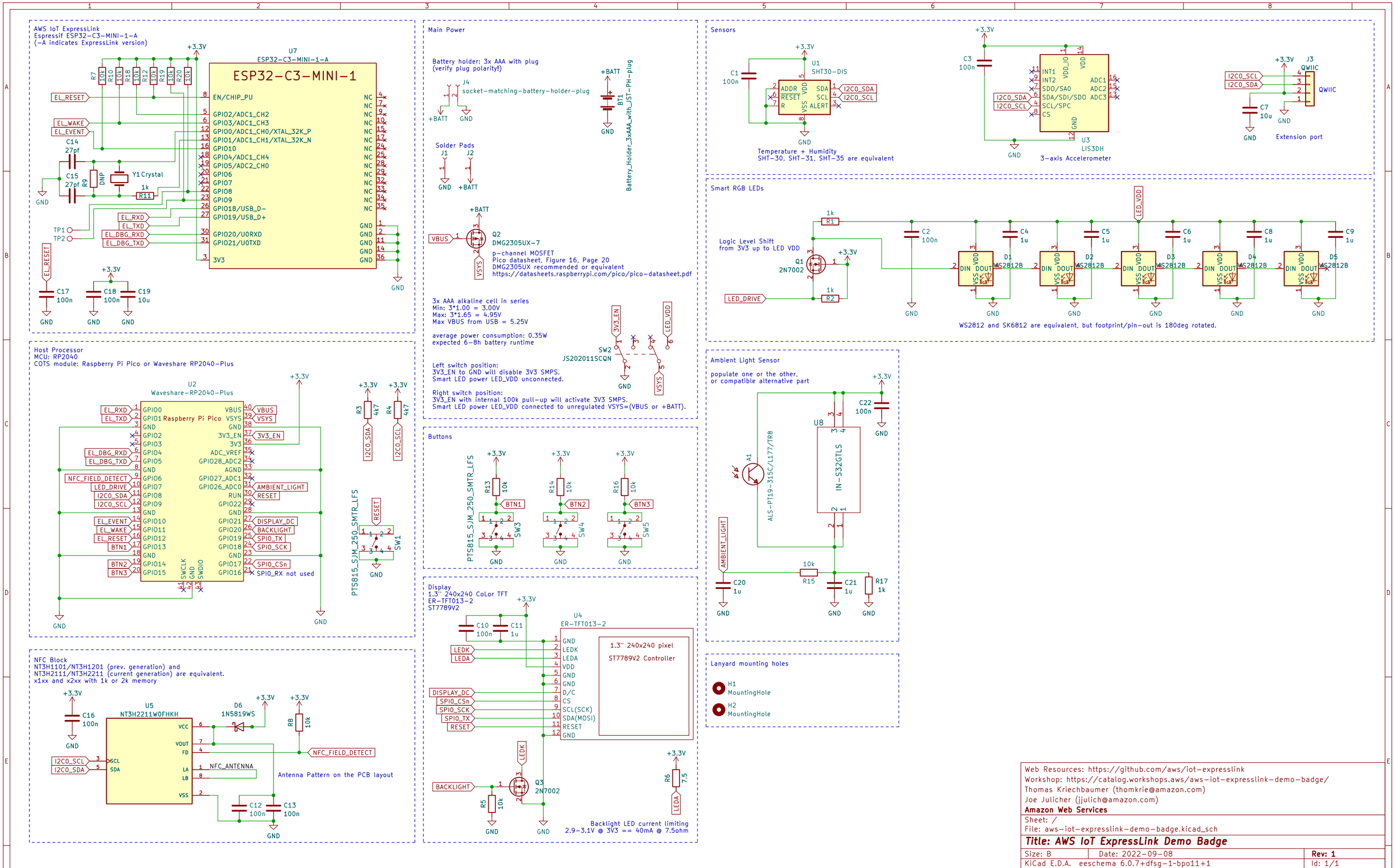
AWS IoT ExpressLink
Espressif ESP32-C3-MINI-1-A
(-A indicates ExpressLink version)
U7
ESP32-C3-MINI-1-A
ESP32-C3-MINI-1
EN/CHIP_PU
GPIO2/ADC1_CH2
GPIO3/ADC1_CH3
GPIO0/ADC1_CH0/XTAL_32K_P
GPIO1/ADC1_CH1/XTAL_32K_N
GPIO10
GPIO4/ADC1_CH4
GPIO5/ADC2_CH0
GPIO6
GPIO7
GPIO8
GPIO9
GPIO18/USB_D-
GPIO19/USB_D+
GPIO20/U0RXD
GPIO21/U0TXD
3V3
EL_RESET
EL_WAKE
EL_EVENT
EL_RXD
EL_TXD
EL_DBG_RXD
EL_DBG_TXD
Y1 Crystal
TP1
TP2
Main Power
Battery holder: 3x AAA with plug
(verify plug polarity!)
J4
socket-matching-battery-holder-plug
+BATT
GND
BT1
Battery_Holder_3xAAA_with_JST-PH-plug
Solder Pads
J1
J2
Q2
DMG2305UX-7
p-channel MOSFET
Pico datasheet, Figure 16, Page 20
DMG2305UX recommended or equivalent
https://datasheets.raspberrypi.com/pico/pico-datasheet.pdf
VBUS
VSYS
3x AAA alkaline cell in series
Min: 3*1.00 = 3.00V
Max: 3*1.65 = 4.95V
Max VBUS from USB = 5.25V
average power consumption: 0.35W
expected 6-8h battery runtime
Left switch position:
3V3_EN to GND will disable 3V3 SMPS.
Smart LED power LED_VDD unconnected.
Right switch position:
3V3_EN with internal 100k pull-up will activate 3V3 SMPS.
Smart LED power LED_VDD connected to unregulated VSYS=(VBUS or +BATT).
SW2
JS202011SCQN
3V3_EN
LED_VDD
Sensors
U1
SHT30-DIS
ADDR
RESET
VDD
VSS
SDA
SCL
ALERT
I2C0_SDA
I2C0_SCL
Temperature + Humidity
SHT-30, SHT-31, SHT-35 are equivalent
U3
LIS3DH
3-axis Accelerometer
INT1
INT2
SDO/SA0
SDA/SDI/SDO
SCL/SPC
CS
VDD_IO
ADC1
ADC2
ADC3
J3
QWIIC
Extension port
Smart RGB LEDs
Logic Level Shift
from 3V3 up to LED VDD
Q1
2N7002
LED_DRIVE
WS2812B
DIN
DOUT
WS2812 and SK6812 are equivalent, but footprint/pin-out is 180deg rotated.
Host Processor
MCU: RP2040
COTS module: Raspberry Pi Pico or Waveshare RP2040-Plus
U2
Waveshare-RP2040-Plus
Raspberry Pi Pico
NFC_FIELD_DETECT
LED_DRIVE
AMBIENT_LIGHT
RESET
DISPLAY_DC
BACKLIGHT
SPI0_TX
SPI0_SCK
SPI0_CSn
SPI0_RX not used
BTN1
BTN2
BTN3
PTS815_SJM_250_SMTR_LFS
Ambient Light Sensor
populate one or the other,
or compatible alternative part
U8
IN-S32GTLS
A1
ALS-PT19-315C/L177/TR8
Buttons
Display
1.3" 240x240 CoLor TFT
ER-TFT013-2
ST7789V2
U4
ER-TFT013-2
1.3" 240x240 pixel
ST7789V2 Controller
LEDK
LEDA
VDD
D/C
CS
SCL(SCK)
SDA(MOSI)
RESET
Q3
2N7002
Backlight LED current limiting
2.9-3.1V @ 3V3 == 40mA @ 7.5ohm
NFC Block
NT3H1101/NT3H1201 (prev. generation) and
NT3H2111/NT3H2211 (current generation) are equivalent.
x1xx and x2xx with 1k or 2k memory
U5
NT3H2211W0FHKH
D6
1N5819WS
VCC
VOUT
FD
SCL
SDA
LA
LB
VSS
NFC_ANTENNA
Antenna Pattern on the PCB layout
Lanyard mounting holes
H1
MountingHole
H2
MountingHole
Web Resources: https://github.com/aws/iot-expresslink
Workshop: https://catalog.workshops.aws/aws-iot-expresslink-demo-badge/
Thomas Kriechbaumer (thomkrie@amazon.com)
Joe Julicher (jjulich@amazon.com)
Amazon Web Services
Sheet: /
File: aws-iot-expresslink-demo-badge.kicad_sch
Title: AWS IoT ExpressLink Demo Badge
Size: B
Date: 2022-09-08
Rev: 1
KiCad E.D.A. eeschema 6.0.7+dfsg-1~bpo11+1
Id: 1/1