# MCU – ESP32-S3-WROOM-1 N16R8

Dual-core LX7 @ 240MHz, 16MB Flash, 8MB PSRAM

## GPIO ASSIGNMENT TABLE

**Display (8080 parallel):**
GPIO4–11 = D0–D7 (8-bit data bus)
GPIO12=CS  GPIO13=RST  GPIO14=DC
GPIO46=WR  GPIO3=RD  GPIO45=BL

**Audio (I2S):**
GPIO15=BCLK  GPIO16=LRCK  GPIO17=DOUT

**SD Card (SPI):**
GPIO36=MOSI  GPIO37=MISO  GPIO38=CLK  GPIO3

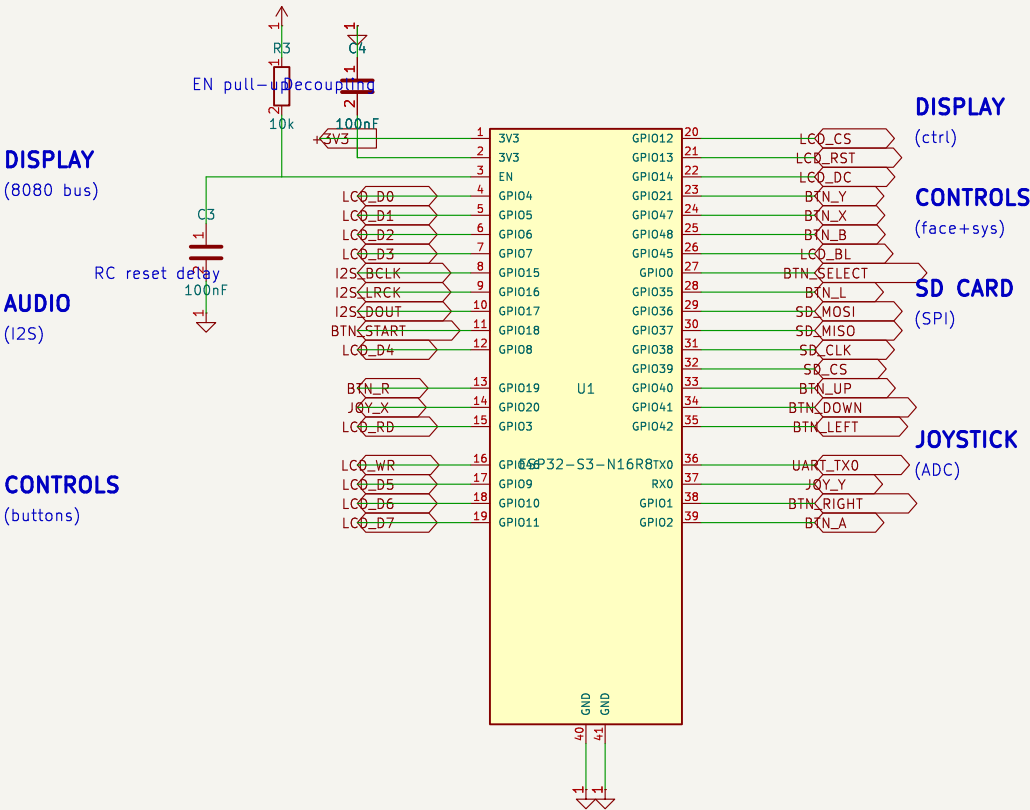**Controls (active low, 10k pull-up):**
D-pad: GPIO40=UP 41=DOWN 42=LEFT 1=RIGHT
Face:  GPIO2=A 48=B 47=X 21=Y
Sys:   GPIO18=START 0=SELECT 35=L 19=R

**Joystick (ADC, optional):**
GPIO20=X_AXIS (ADC2_CH9)
GPIO44/RX0=Y_AXIS (ADC2_CH7)

**Reserved (do not use):**
GPIO26–32 = Octal PSRAM (internal)
GPIO43 = TX0 (debug UART output)

DISPLAY
(8080 bus)

AUDIO
(I2S)

CONTROLS
(buttons)

DISPLAY
(ctrl)

CONTROLS
(face+sys)

SD CARD
(SPI)

JOYSTICK
(ADC)

U1
ESP32-S3-N16R8

R3 10k  EN pull-up
C4 100nF  decoupling
C3 100nF  RC reset delay

| Pin | Signal | | Pin | Signal |
|---|---|---|---|---|
| 1 | 3V3 | GPIO12 | 20 | LCD_CS |
| 2 | 3V3 | GPIO13 | 21 | LCD_RST |
| 3 | EN | GPIO14 | 22 | LCD_DC |
| 4 | GPIO4 LCD_D0 | GPIO21 | 23 | BTN_Y |
| 5 | GPIO5 LCD_D1 | GPIO47 | 24 | BTN_X |
| 6 | GPIO6 LCD_D2 | GPIO48 | 25 | BTN_B |
| 7 | GPIO7 LCD_D3 | GPIO45 | 26 | LCD_BL |
| 8 | GPIO15 I2S_BCLK | GPIO0 | 27 | BTN_SELECT |
| 9 | GPIO16 I2S_LRCK | GPIO35 | 28 | BTN_L |
| 10 | GPIO17 I2S_DOUT | GPIO36 | 29 | SD_MOSI |
| 11 | GPIO18 BTN_START | GPIO37 | 30 | SD_MISO |
| 12 | GPIO8 LCD_D4 | GPIO38 | 31 | SD_CLK |
| | | GPIO39 | 32 | SD_CS |
| 13 | GPIO19 BTN_R | GPIO40 | 33 | BTN_UP |
| 14 | GPIO20 JOY_X | GPIO41 | 34 | BTN_DOWN |
| 15 | GPIO3 LCD_RD | GPIO42 | 35 | BTN_LEFT |
| 16 | GPIO46 LCD_WR | TX0 | 36 | UART_TX0 |
| 17 | GPIO9 LCD_D5 | RX0 | 37 | JOY_Y |
| 18 | GPIO10 LCD_D6 | GPIO1 | 38 | BTN_RIGHT |
| 19 | GPIO11 LCD_D7 | GPIO2 | 39 | BTN_A |

GND  GND  40  41