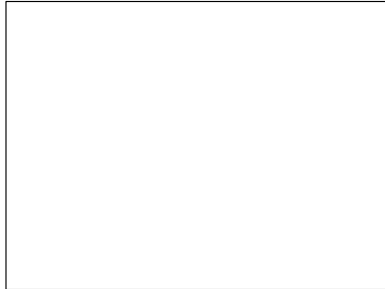


## [1] POWER

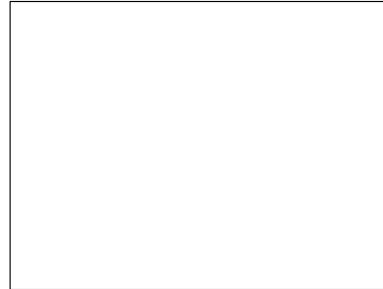
Power



File: Power.kicad\_sch

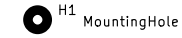
## [2] MCU

MCU



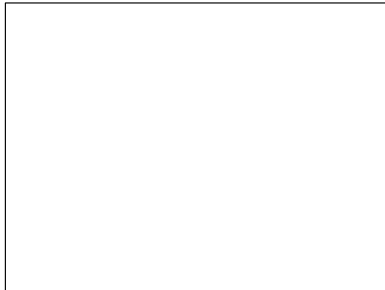
File: MCU.kicad\_sch

## MECHANICAL



## [3] SENSORS & FEEDBACK

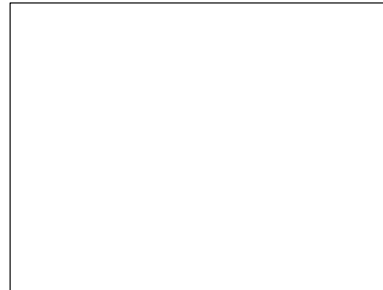
sense\_feedback



File: sense\_feedback.kicad\_sch

## [4] STEREO AUDIO CODEC

Audio CODEC



File: codec.kicad\_sch

## BACKLOG

SPI CS PULL-UP ?  
CODEC IN2, OUT2 PULL-DOWNs ?  
FOOTPRINT SELECN. {JACK, SW}

I2C Bus Topology: ESP32 <> Pull-up Resistors <> ICP20100 (BARO) <> LSM6DSL (MPU) <> RC FILTER <> ES8388 (CODEC)  
SPI Bus Topology: ESP32 <> MicroSD Card  
I2S Bus Topology: ESP32 <> Resistors (counter. Signal Reflection) <> ES8388 (CODEC)

Sheet: /  
File: basmsoundcard.kicad\_sch

### Title:

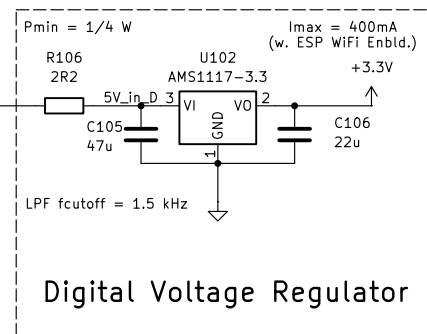
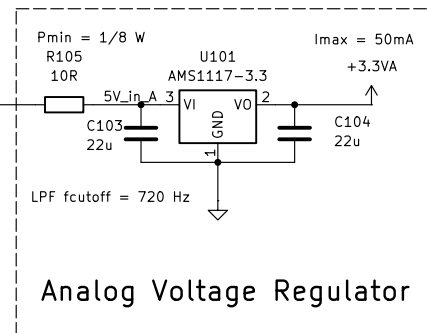
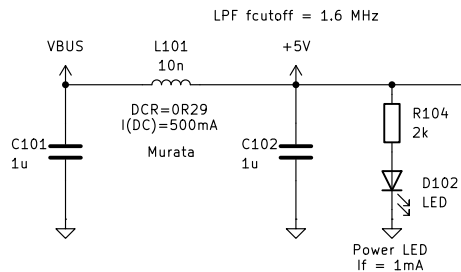
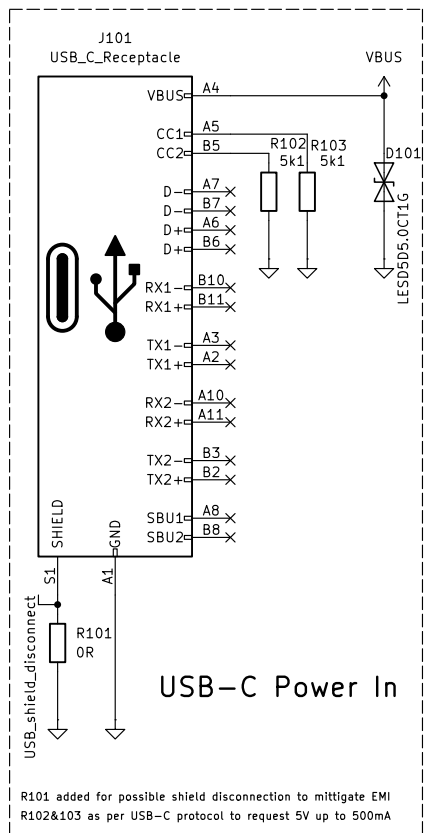
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Date:

Rev:

KiCad E.D.A. 8.0.8

Id: 0/5



Sheet: /Power/  
File: Power.kicad\_sch

**Title:**

Size: A4

Date:

KiCad E.D.A. 8.0.8

**Rev:**

Id: 1/5

# ESP32 C3 MINI 1 MCU

## ESP32-C3-MINI-1

### ESP32 C3 MINI 1 PIN ALLOCATIONS

GPIO 2 - I2C\_SCL  
GPIO 3 - I2C\_SDA

GPIO 7 - SPI1\_MISO  
GPIO 8 - SPI1\_SCK  
GPIO 18 - SPI1\_MOSI  
GPIO 19 - SPI1\_CS

GPIO 6 - WS2812B

GPIO 5 - I2S\_BCK (SCLK)  
GPIO 4 - I2S\_DIN  
GPIO 10 - I2S\_LRCK  
GPIO 1 - I2S\_MCLK (via PWM)  
GPIO 0 - I2S\_DOUT

GPIO 9 - SWITCH (incl. BOOT OPTION)

GPIO 20 - UART0\_RX  
GPIO 21 - UART0\_TX

### MicroSD Card Reader

J201  
Micro\_SD\_Card

1 DAT2  
2 DAT3/CD  
3 CMD  
4 VDD  
5 CLK  
6 SPI\_SCK  
7 VSS  
8 DAT0  
9 DAT1

10u C206  
0u1 C207

10k R201  
1u C201

3V3

3V3

10u C202  
0u1 C203

8 EN/CHIP\_PU  
3V3

12 I2S\_DOUT  
13 I2S\_MCLK

GPIO0/ADC1\_CH0/XTAL\_32K\_P  
GPIO1/ADC1\_CH1/XTAL\_32K\_N

GPIO21/U0TXD  
GPIO20/U0RXD

27 SPI1\_MISO  
26 SPI1\_SCK

GPIO19/USB\_D+  
GPIO18/USB\_D-

5k1 R202  
5k1 R203

3V3

I2C pullup  
[short bus length ~5cm  
& low-speed 100kbps]  
& BOM consolidation

5 I2C\_SCL  
6 I2C\_SDA  
18 I2S\_DIN  
19 I2S\_BCK  
20 WS2812B  
21 SPI1\_CS  
22 SPI1\_MOSI  
23 MCU\_GPIO9  
16 GPIO10

1 I2S\_LRCK

10k R204  
470R R205

3V3

R205 as per.  
Adafruit NeoPixel  
Datasheet

10u C206  
0u1 C207

10k R201  
1u C201

3V3

3V3

10u C202  
0u1 C203

8 EN/CHIP\_PU  
3V3

12 I2S\_DOUT  
13 I2S\_MCLK

GPIO0/ADC1\_CH0/XTAL\_32K\_P  
GPIO1/ADC1\_CH1/XTAL\_32K\_N

GPIO21/U0TXD  
GPIO20/U0RXD

27 SPI1\_MISO  
26 SPI1\_SCK

GPIO19/USB\_D+  
GPIO18/USB\_D-

5k1 R202  
5k1 R203

3V3

I2C pullup  
[short bus length ~5cm  
& low-speed 100kbps]  
& BOM consolidation

5 I2C\_SCL  
6 I2C\_SDA  
18 I2S\_DIN  
19 I2S\_BCK  
20 WS2812B  
21 SPI1\_CS  
22 SPI1\_MOSI  
23 MCU\_GPIO9  
16 GPIO10

1 I2S\_LRCK

10k R204  
470R R205

3V3

R205 as per.  
Adafruit NeoPixel  
Datasheet

### Programming & Debug Headers

UART & Programming

1  
2  
3  
4  
5  
6

J202  
UART Debug

VBUS

FTDI\_DTR

UART0\_RX  
UART0\_TX  
FTDI\_RTS

Adafruit CP2120N Friend Pinout

P1 - GND  
P2 - CTS  
P3 - 5V  
P4 - TXD  
P5 - RXD  
P6 - RTS

LED5D5.0CT1G

D201  
D203  
D205

see <Feedback> for WS2812B

# Auto-Programming

FTDI\_DTR

10k  
R206

DTR B

Q201  
L8050QLT1G

CHIP\_PU

FTDI\_RTS

10k  
R207

RTS B

Q202  
L8050QLT1G

MCU\_GPI09

implemented as per

1. ESP32-C3-DevKitM-1 Schematic Diagram Rev1.0

D

# Programming Switches

The image displays two circuit diagrams for programming switches. The left diagram shows switch SW201 (labeled SW\_MEC\_5G) connected to the MCU\_GPIO9 pin. A pull-up resistor, labeled 0u1 C204, is connected between the switch and ground. The right diagram shows switch SW202 (labeled SW\_MEC\_5G) connected to the CHIP\_PU pin. A pull-up resistor, labeled 0u1 C205, is connected between the switch and ground.

implemented as per

1. ESP32-C3-DevKitM-1 Schematic Diagram Rev1.0

### MicroSD Card Reader

J201  
Micro\_SD\_Card

+3.3V

C206 10u

C207 0u1

SPI1\_CS 1

SPI1\_MOSI 2

SPI1\_SCK 4

SPI1\_MISO 7

R208 OR

DAT2

DAT3/CD

CMD

VDD

CLK

VSS

DAT0

DAT1

SHIELD 9

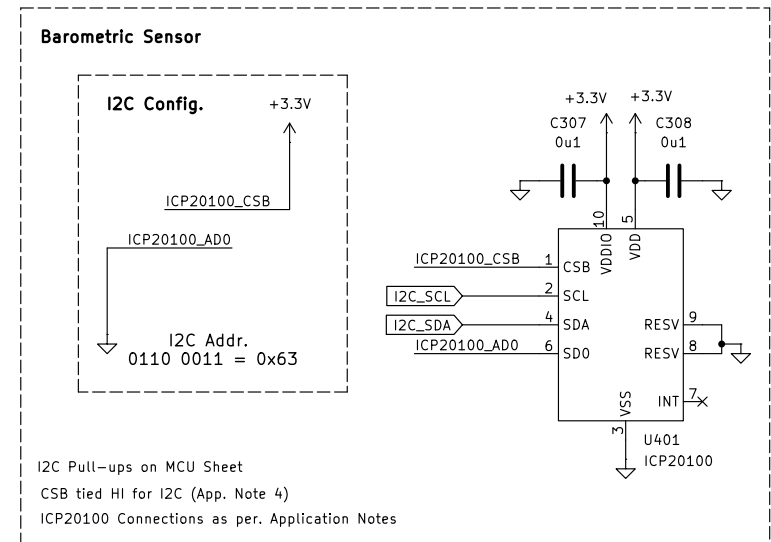
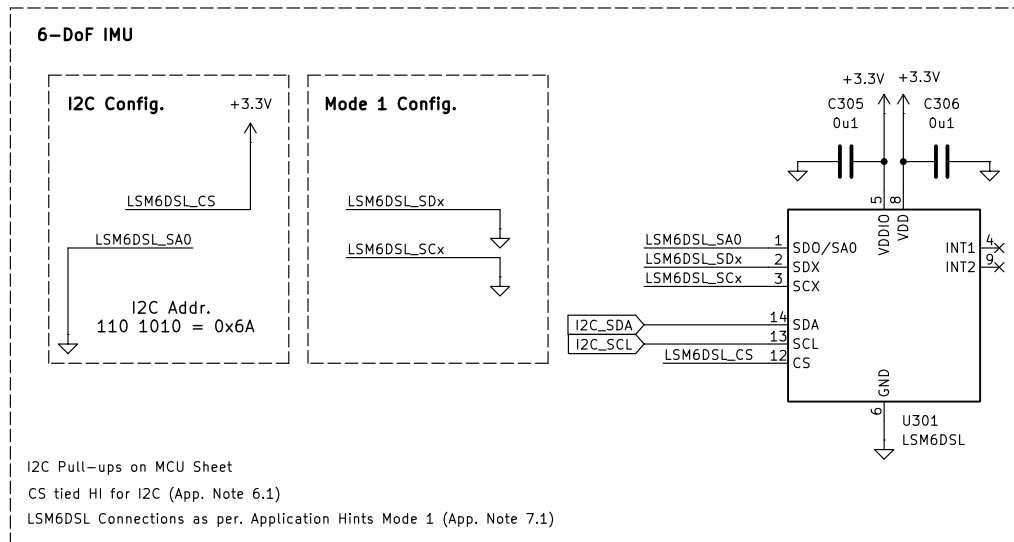
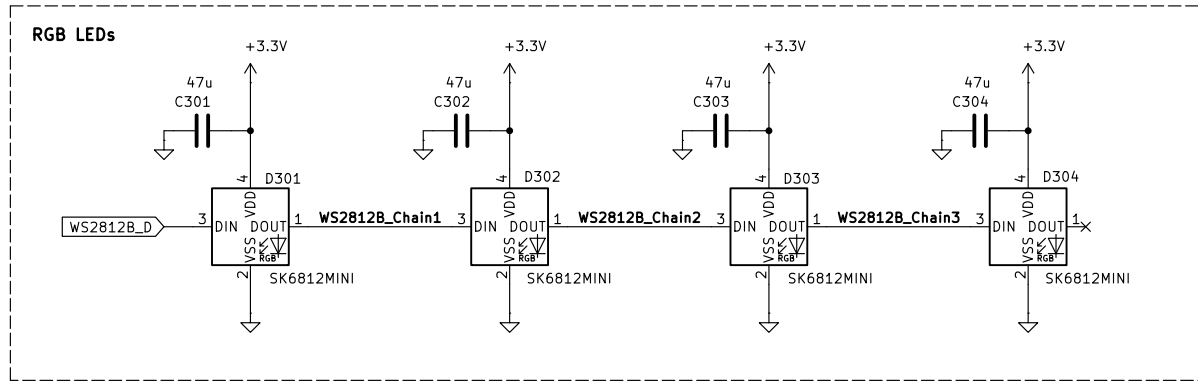
R209 OR

SD\_Shield Disconnect

The diagram illustrates the pin connections for the Adafruit CP2120N Friend Pinout, which is used for programming and debugging the CP2120N module. The connections are organized into four main sections:

- UART & Programming:** This section shows the connection of the UART pins (FTDI\_DTR, UART0\_RX, UART0\_TX, FTDI\_RTS) to the J202 UART Debug header. The J202 header has pins 1 through 6, with pins 1 and 2 connected to FTDI\_DTR, pins 3 and 4 connected to UART0\_RX and UART0\_TX, and pins 5 and 6 connected to FTDI\_RTS. The J202 header is also connected to the UART & Programming header.
- I2C & SPI:** This section shows the connection of the I2C and SPI pins (WS2812B\_D, SPI1\_CS, SPI1\_MOSI, SPI1\_SCK, SPI1\_MISO) to the J203 I2C & SPI Debug header. The J203 header has pins 1 through 6, with pins 1 and 2 connected to WS2812B\_D, pins 3 and 4 connected to SPI1\_CS and SPI1\_MOSI, and pins 5 and 6 connected to SPI1\_SCK and SPI1\_MISO. The J203 header is also connected to the I2C & SPI header.
- I2S:** This section shows the connection of the I2S pins (I2S\_BCK, I2S\_DIN, I2S\_LRCK, I2S\_DOUT, I2S\_MCLK) to the J204 I2S Debug header. The J204 header has pins 1 through 6, with pins 1 and 2 connected to I2S\_BCK, pins 3 and 4 connected to I2S\_DIN and I2S\_LRCK, and pins 5 and 6 connected to I2S\_DOUT and I2S\_MCLK. The J204 header is also connected to the I2S header.
- Power & RGB LEDs:** This section shows the connection of the power and RGB LED pins (+3.3V, +3.3VA, +3.3V) to the J205 Power & RGB Debug header. The J205 header has pins 1 through 6, with pins 1 and 2 connected to +3.3V, pins 3 and 4 connected to +3.3VA, and pins 5 and 6 connected to +3.3V. The J205 header is also connected to the Power & RGB LEDs header.

1	2	3	4	5	6
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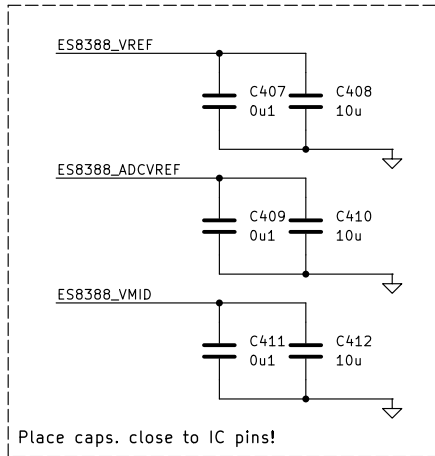
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File: sense\_feedback.kicad\_sch

**Title:**

Size: A4  
KiCad E.D.A. 8.0.8

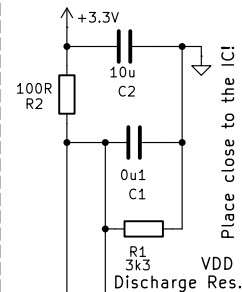
Date:

**Rev:**  
Id: 3/5

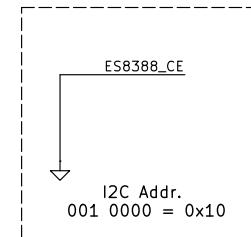
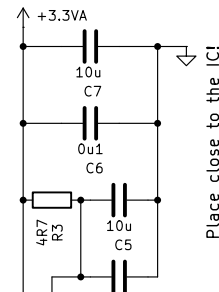


## ES8388 Audio CODEC

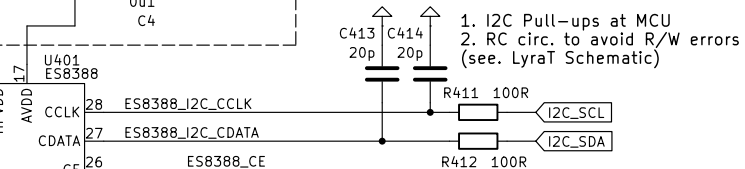
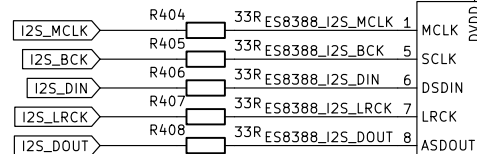
### [DIGITAL] Power Rail Decoupling



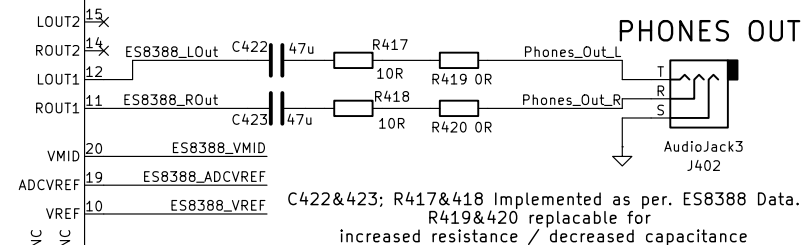
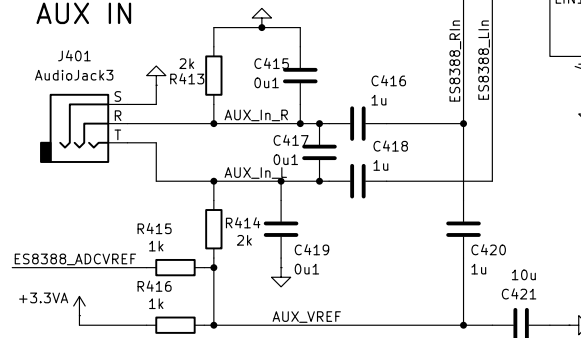
### [ANALOG] Power Rail Decoupling



ES8388 requires externally supplied MCLK



### AUX IN



implemented as per  
1. ESP32 LyraT V4.2 Schematic Diagram by ESPRESSIF  
2. ES8388 Datasheet by Everest Semis

Sheet: /Audio CODEC/  
File: codec.kicad\_sch

### Title:

Size: A4 Date:

KiCad E.D.A. 8.0.8

Rev:

Id: 4/5