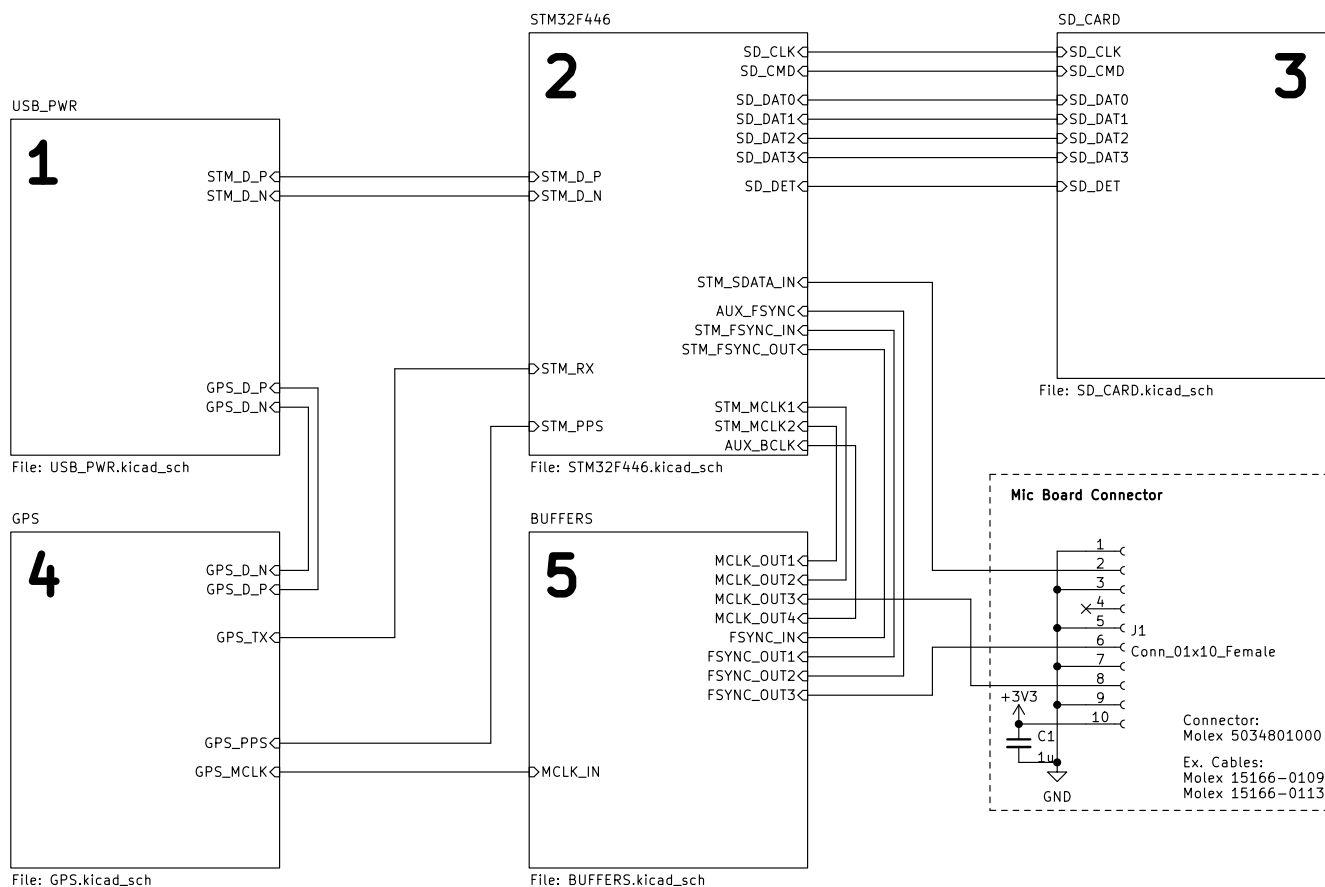


# Low-Power Acoustic Array



## Theory of Operation

The device is powered via USB or J101.  
J101 voltage range between 4.5–13v DC.  
Power source is selected with a header jumper on J101.

Micro SD card must be present for normal operation.  
SD card is formatted as ExFAT.

USB port 1 (J102) is connected to the STM32 and enumerates as a serial port.  
USB port 2 (J103) is connected to the GPS module.

There are two modes of operation (selected with MODE\_SEL jumper on J201)  
1. Start recording immediately when powered on. (no jumper)  
2. Start/stop recording with pushbutton SW201. (jumper)

Microphone board can be connected to J1 or with headers on J201.  
Microphone input format is 8-channel TDM with 32-bit frame length.

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Sheet: /

File: LowPowerArray.kicad\_sch

**Title: Low Power Array**

Size: USLetter Date: 2023-02-01

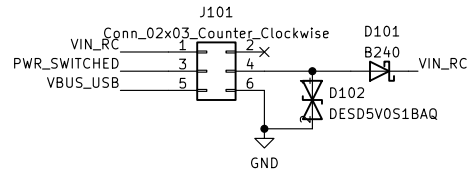
KiCad E.D.A. kicad (6.0.0-0)

Rev: 1

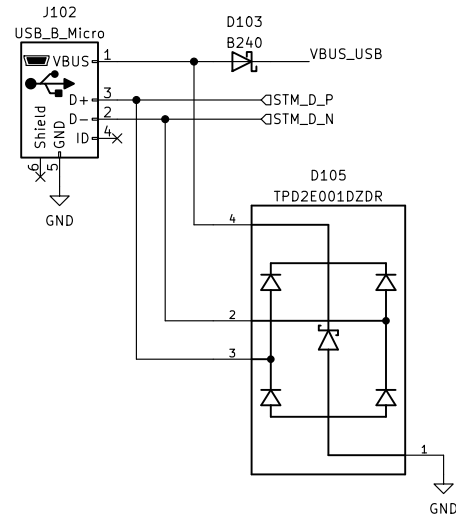
Id: 1/6

# 1

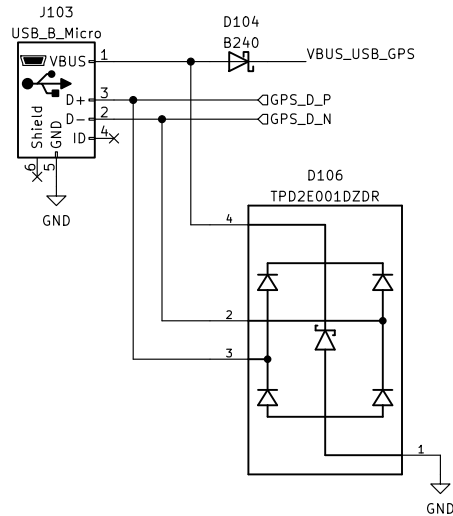
RC style connector  
4.5 < Vin < 13



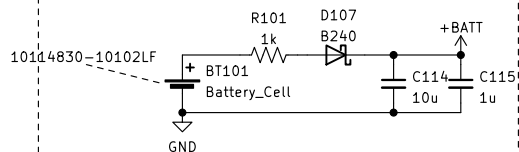
## Primary USB Connector & ESD Protection



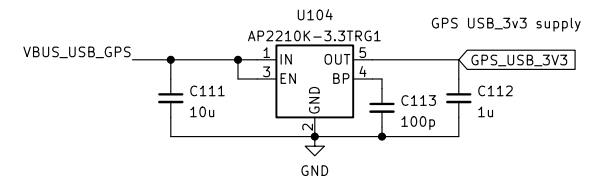
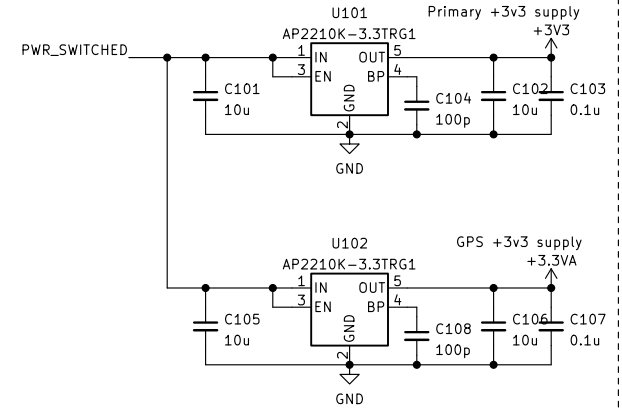
## GPS USB Connector & ESD Protection



## Coin Cell Backup Battery



## LDO Voltage Regulators



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Sheet: /USB\_PWR/

File: USB\_PWR.kicad\_sch

**Title: USB & Power**

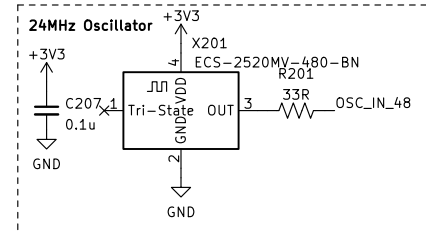
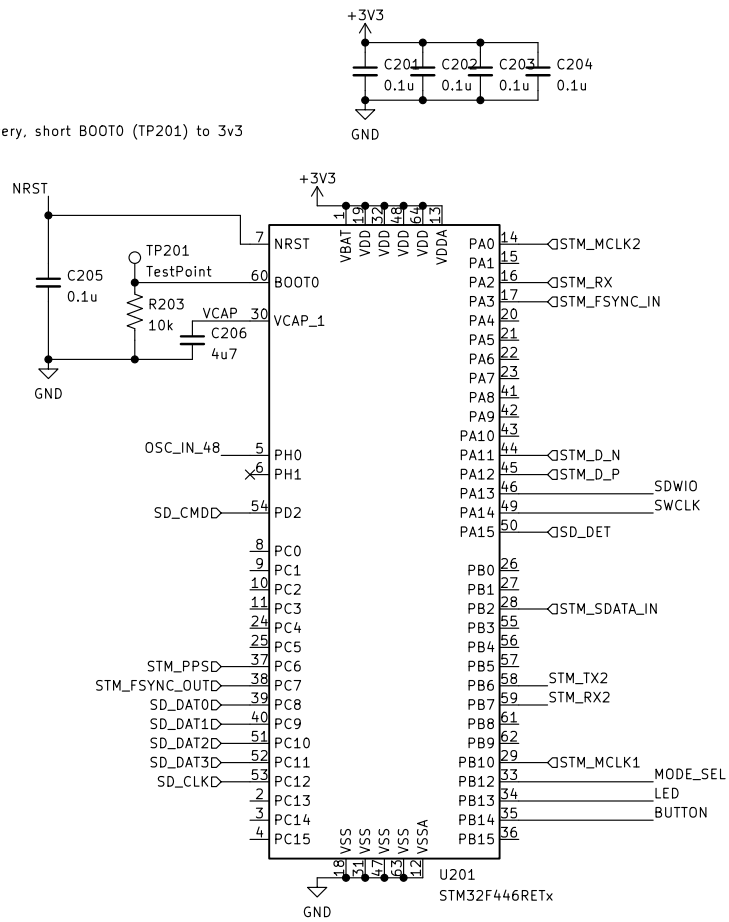
Size: USLetter Date: 2023-02-01

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Rev: 1

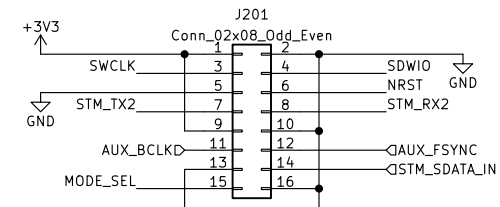
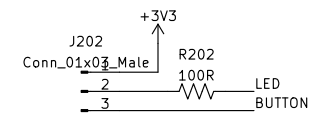
Id: 2/6

For Bootloader recovery, short BOOT0 (TP201) to 3v3



Pixhawk "Safety Switch" Connector (Hirose DF13-3P-1.25DSA)

Internal pull-down resistor on BUTTON  
Open drain on LED (drive LOW for LED ON)



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Sheet: /STM32F446/

File: STM32F446.kicad\_sch

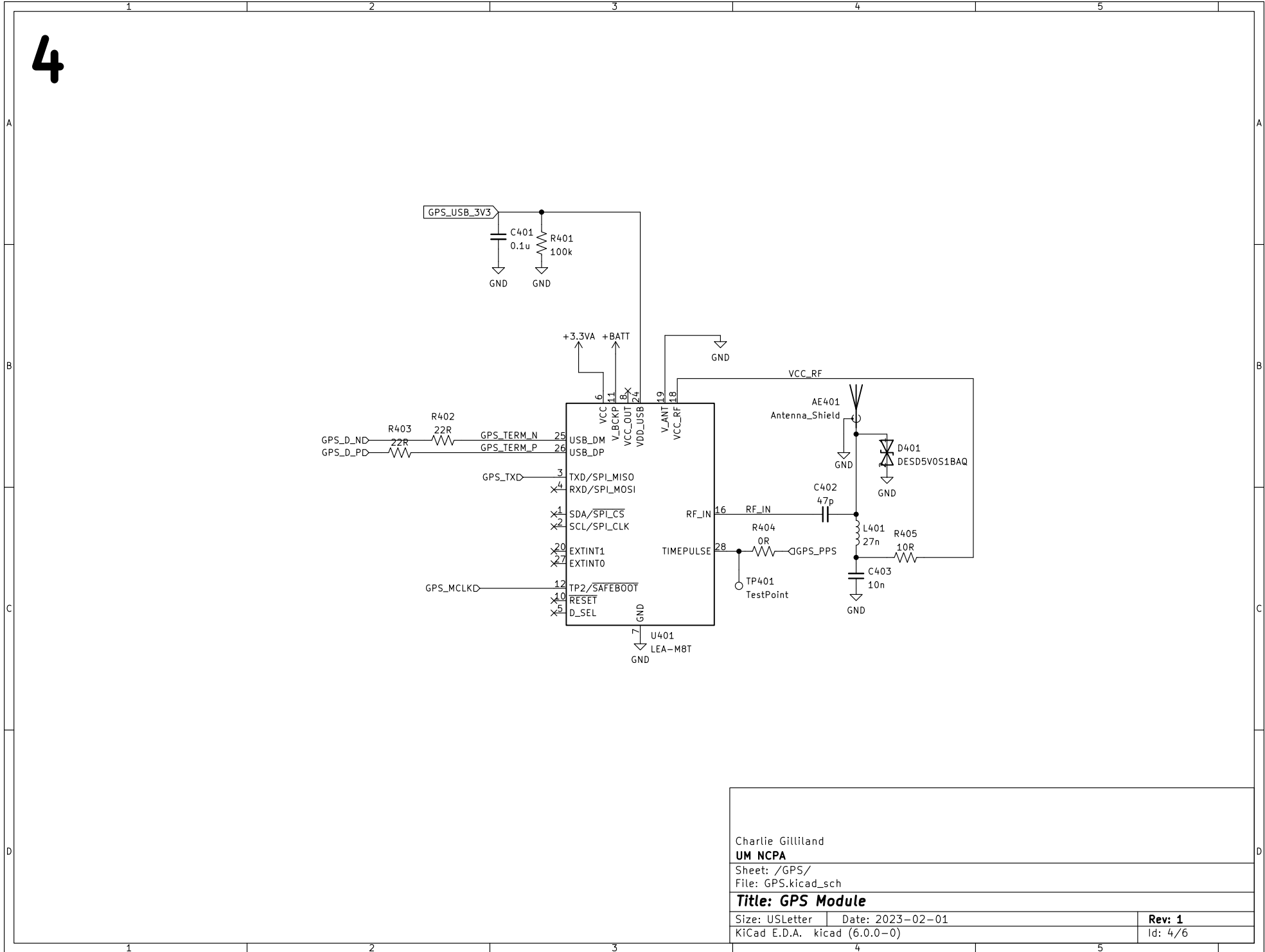
**Title: STM32F446**

Size: USLetter Date: 2023-02-01

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**Rev: 1**

Id: 3/6

[illegible]

4

GPS\_USB\_3V3

C401 0.1u

R401 100k

GND

+3.3VA

+BATT

GND

GPS\_D\_ND

R403 22R

R402 22R

GPS\_TERM\_N

GPS\_TERM\_P

GPS\_TXD

TXD/SPI\_MISO

RXD/SPI\_MOSI

SDA/SPI\_CS

SCL/SPI\_CLK

EXTINT1

EXTINT0

GPS\_MCLKD

TP2/SAFEBOOT

RESET

D\_SEL

GND

U401 LEA-M8T

VCC

V\_BCKP

VCC\_OUT

VDD\_USB

V\_ANT

VCC\_RF

RF\_IN

TIMEPULSE

TP401 TestPoint

AE401 Antenna\_Shield

D401 DESD5V0S1BAQ

C402 47p

L401 27n

R404 0R

R405 10R

C403 10n

GND

VCC\_RF

GPS\_PPS

Size: USLetter Date: 2023-02-01

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Sheet: /GPS/

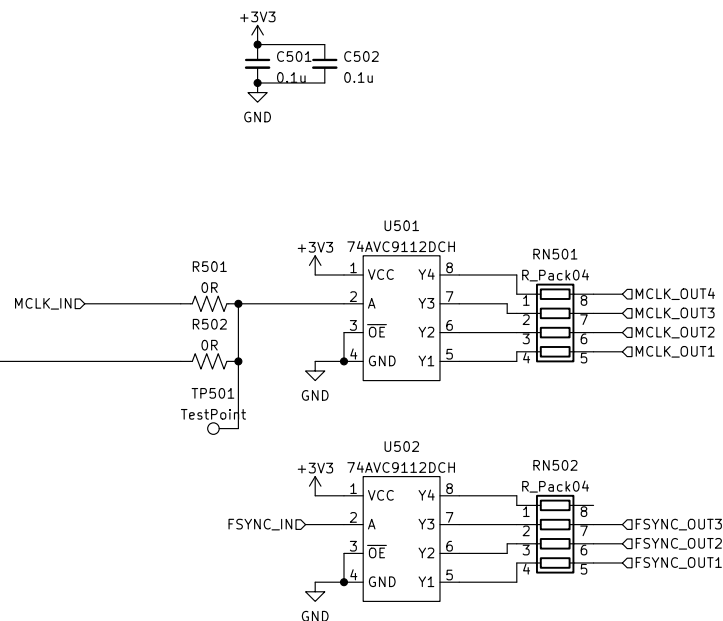
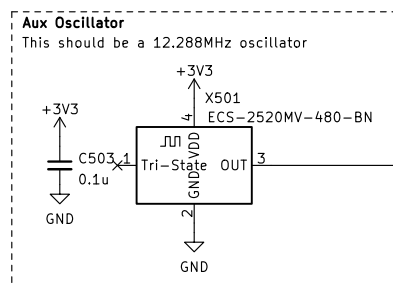
File: GPS.kicad\_sch

Title: GPS Module

Rev: 1

Id: 4/6

# 5



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Sheet: /BUFFERS/

File: BUFFERS.kicad\_sch

**Title: Buffers**

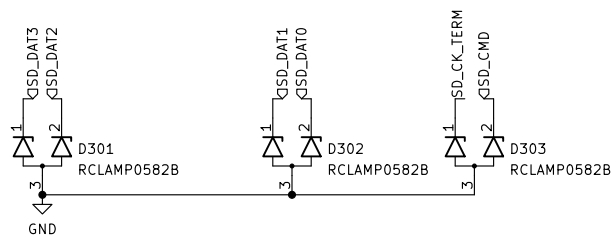
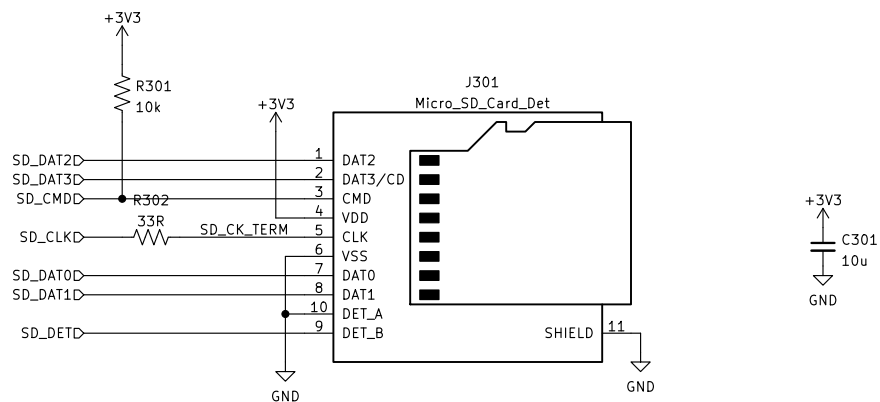
Size: USLetter Date: 2023-02-01

KiCad E.D.A. kicad (6.0.0-0)

**Rev: 1**

Id: 6/6

# 3



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Sheet: /SD\_CARD/

File: SD\_CARD.kicad\_sch

**Title: SD Card**

Size: USLetter Date: 2023-02-01

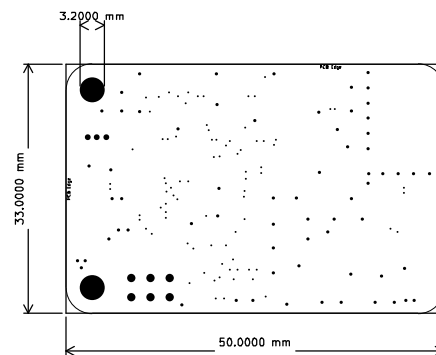
KiCad E.D.A. kicad (6.0.0-0)

**Rev: 1**

Id: 7/6

Use Sunstone 6-layer stackup (0.062") L06-062-1ozHoz

Layer 1: Signal  
Layer 2: GND  
Layer 3: PWR  
Layer 4: GND  
Layer 5: GND  
Layer 6: Signal



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Sheet:

File: LowPowerArray.kicad\_pcb

**Title: LowPowerArray**

Size: USLetter Date: 2023-02-01

KiCad E.D.A. kicad (6.0.0-0)

**Rev: 1**

Id: 1/1

