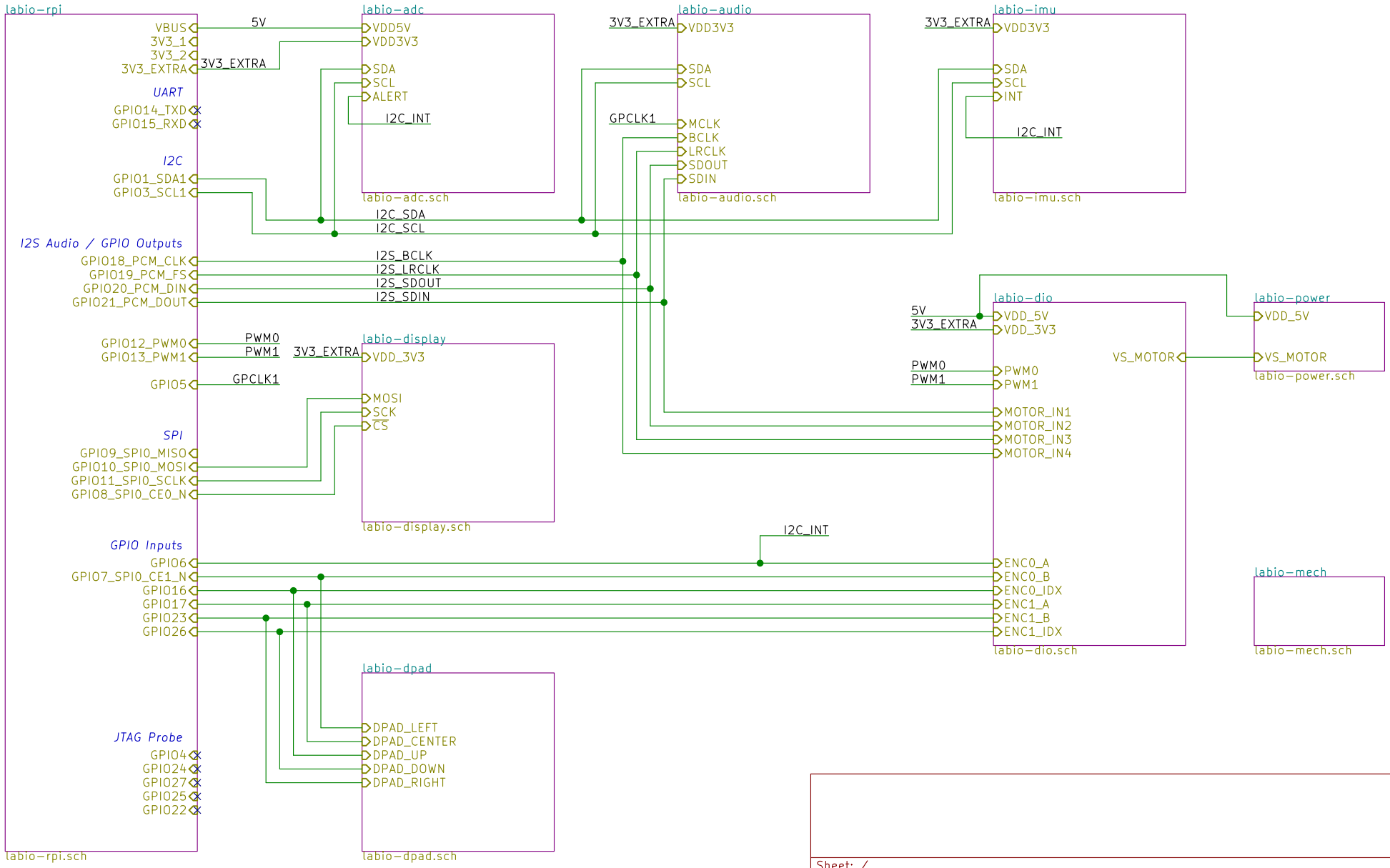
labio-rpi
VBUS
3V3_1
3V3_2
3V3_EXTRA
UART
GPIO14_TXD
GPIO15_RXD
I2C
GPIO1_SDA1
GPIO3_SCL1
I2S Audio / GPIO Outputs
GPIO18_PCM_CLK
GPIO19_PCM_FS
GPIO20_PCM_DIN
GPIO21_PCM_DOUT
GPIO12_PWM0
GPIO13_PWM1
GPIO5
SPI
GPIO9_SPI0_MISO
GPIO10_SPI0_MOSI
GPIO11_SPI0_SCLK
GPIO8_SPI0_CE0_N
GPIO Inputs
GPIO6
GPIO7_SPI0_CE1_N
GPIO16
GPIO17
GPIO23
GPIO26
JTAG Probe
GPIO4
GPIO24
GPIO27
GPIO25
GPIO22
labio-rpi.sch
5V
3V3_EXTRA
PWM0
PWM1
GPCLK1
labio-adc
VDD5V
VDD3V3
SDA
SCL
ALERT
I2C_INT
labio-adc.sch
I2C_SDA
I2C_SCL
labio-audio
VDD3V3
SDA
SCL
GPCLK1
MCLK
BCLK
LRCLK
SDOUT
SDIN
labio-audio.sch
I2S_BCLK
I2S_LRCLK
I2S_SDOUT
I2S_SDIN
labio-imu
VDD3V3
SDA
SCL
INT
I2C_INT
labio-imu.sch
labio-display
VDD_3V3
MOSI
SCK
CS
labio-display.sch
labio-dio
VDD_5V
VDD_3V3
PWM0
PWM1
MOTOR_IN1
MOTOR_IN2
MOTOR_IN3
MOTOR_IN4
ENC0_A
ENC0_B
ENC0_IDX
ENC1_A
ENC1_B
ENC1_IDX
VS_MOTOR
labio-dio.sch
labio-power
VDD_5V
VS_MOTOR
labio-power.sch
labio-mech
labio-mech.sch
labio-dpad
DPAD_LEFT
DPAD_CENTER
DPAD_UP
DPAD_DOWN
DPAD_RIGHT
labio-dpad.sch
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Date:
Rev:
KiCad E.D.A. kicad 4.0.2-stable
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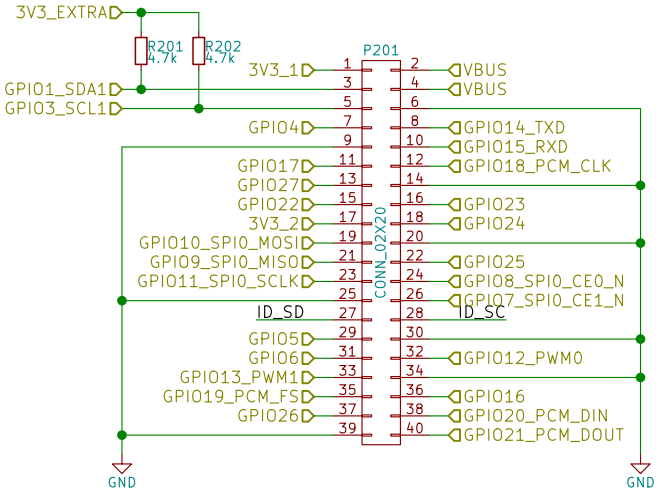

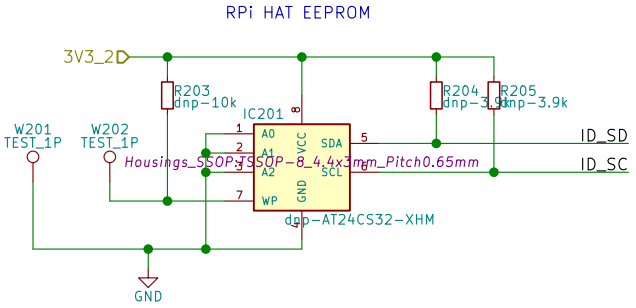

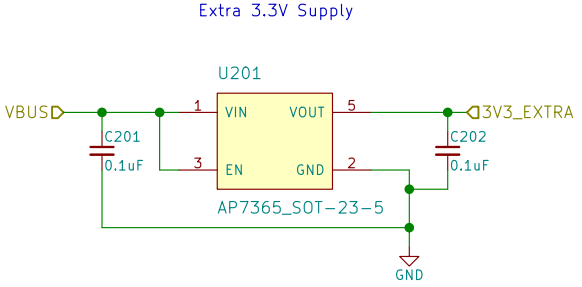

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Title:		
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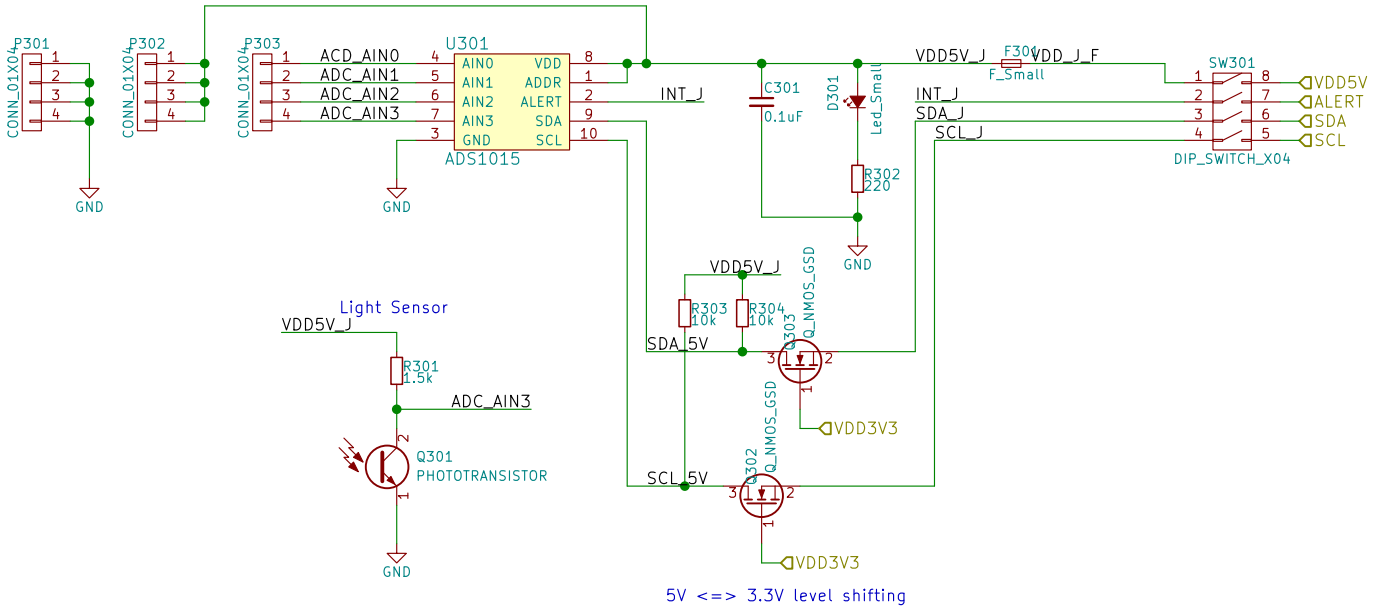
12-bit (ADS1015) or 16-bit (ADS1115) ADC
with differential PGA and 4-channel mux.

7-bit addr: 0x73

5V VDD to safely sample RPi VBUS.



Sheet: /labio-adc/		
File: labio-adc.sch		
Title:		
Size: A4	Date:	**Rev:**
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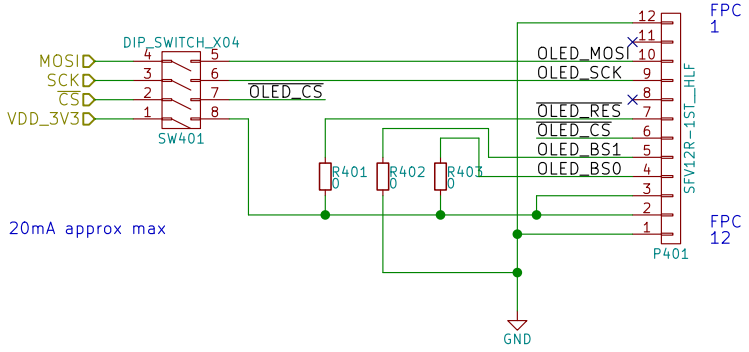
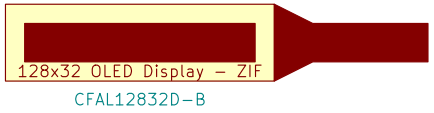
CFAL12832D-B* OLED Display
3-wire SPI mode.

Note: top side ZIF connector has pins reversed from FPC.



20mA approx max



Interface

Pin No	Sym	3 Wire SPI	4 Wire SPI	I2C
1	GND	GND	GND	GND
2	D2	NC	NC	SDA*
3	D1	SDA	SDA	SDA*
4	D0	CLK	SCLK	SCL
5	D/C#	NC	D/C	Vcc
6	RES#	RESET	RESET	RESET
7	CS#	GND	GND	GND
8	BS1	GND	GND	Vcc
9	BS0	Vcc	GND	GND
10	Vdd	Vcc**	Vcc**	Vcc**
11	Vbat	Vcc**	Vcc**	Vcc**
12	GND	GND	GND	GND

Microcontroller	Control lines defined by layout / code
+3.3v	Supply voltage
Ground	Supply ground

Notes:

*	Tie D2 and D1 together
**	Okay to Tie Vdd and Vbat together

Sheet: /labio-display/
File: labio-display.sch

Title:

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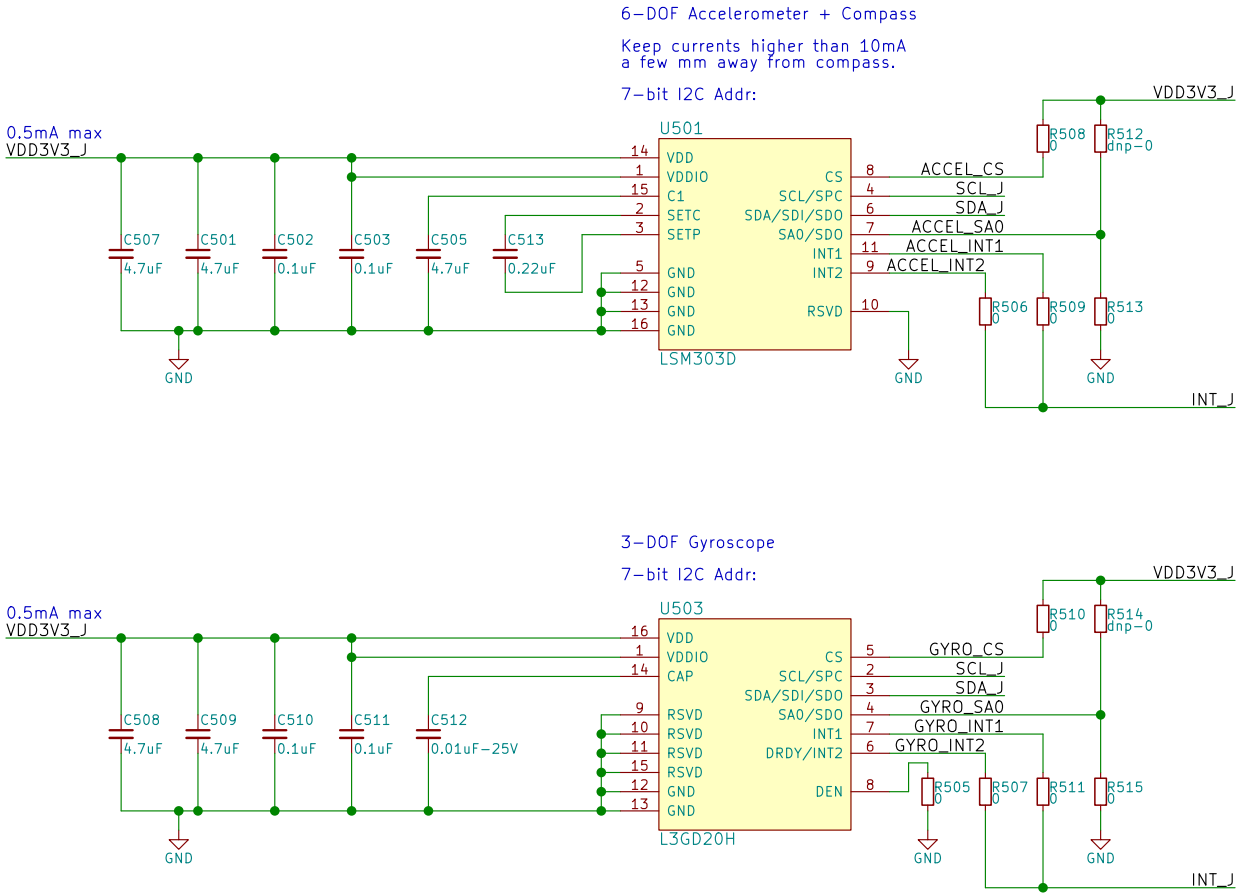
6-DOF Accelerometer + Compass
Keep currents higher than 10mA
a few mm away from compass.
7-bit I2C Addr:
0.5mA max
VDD3V3_J
U501
LSM303D
VDD
VDDIO
C1
SETC
SETP
GND
GND
GND
GND
CS
SCL/SPC
SDA/SDI/SDO
SA0/SDO
INT1
INT2
RSVD
ACCEL_CS
SCL_J
SDA_J
ACCEL_SA0
ACCEL_INT1
ACCEL_INT2
C507 4.7uF
C501 4.7uF
C502 0.1uF
C503 0.1uF
C505 4.7uF
C513 0.22uF
R508 0
R512 dnp-0
R506 0
R509 0
R513 0
INT_J
3-DOF Gyroscope
7-bit I2C Addr:
0.5mA max
VDD3V3_J
U503
L3GD20H
VDD
VDDIO
CAP
RSVD
RSVD
RSVD
RSVD
GND
GND
CS
SCL/SPC
SDA/SDI/SDO
SA0/SDO
INT1
DRDY/INT2
DEN
GYRO_CS
SCL_J
SDA_J
GYRO_SA0
GYRO_INT1
GYRO_INT2
C508 4.7uF
C509 4.7uF
C510 0.1uF
C511 0.1uF
C512 0.01uF-25V
R510 0
R514 dnp-0
R505 0
R507 0
R511 0
R515 0
INT_J
Pressure + Temperature
7-bit I2C Addr: 0x77
1mA max
VDD3V3_J
U502
BMP280
VDD
VDDIO
GND
GND
CSB
SCL/SCK
SDA/SDI
ADDR/SDO
BMP_CS
SCL_J
SDA_J
BMP_ADDR
C504 0.1uF
C506 0.1uF
R502 0
R503 dnp-0
R504 0
D501
Led_Small
R501 220
SW501
DIP_SWITCH_X04
VDD3V3
SCL
SDA
INT
Sheet: /labio-imu/
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Title:
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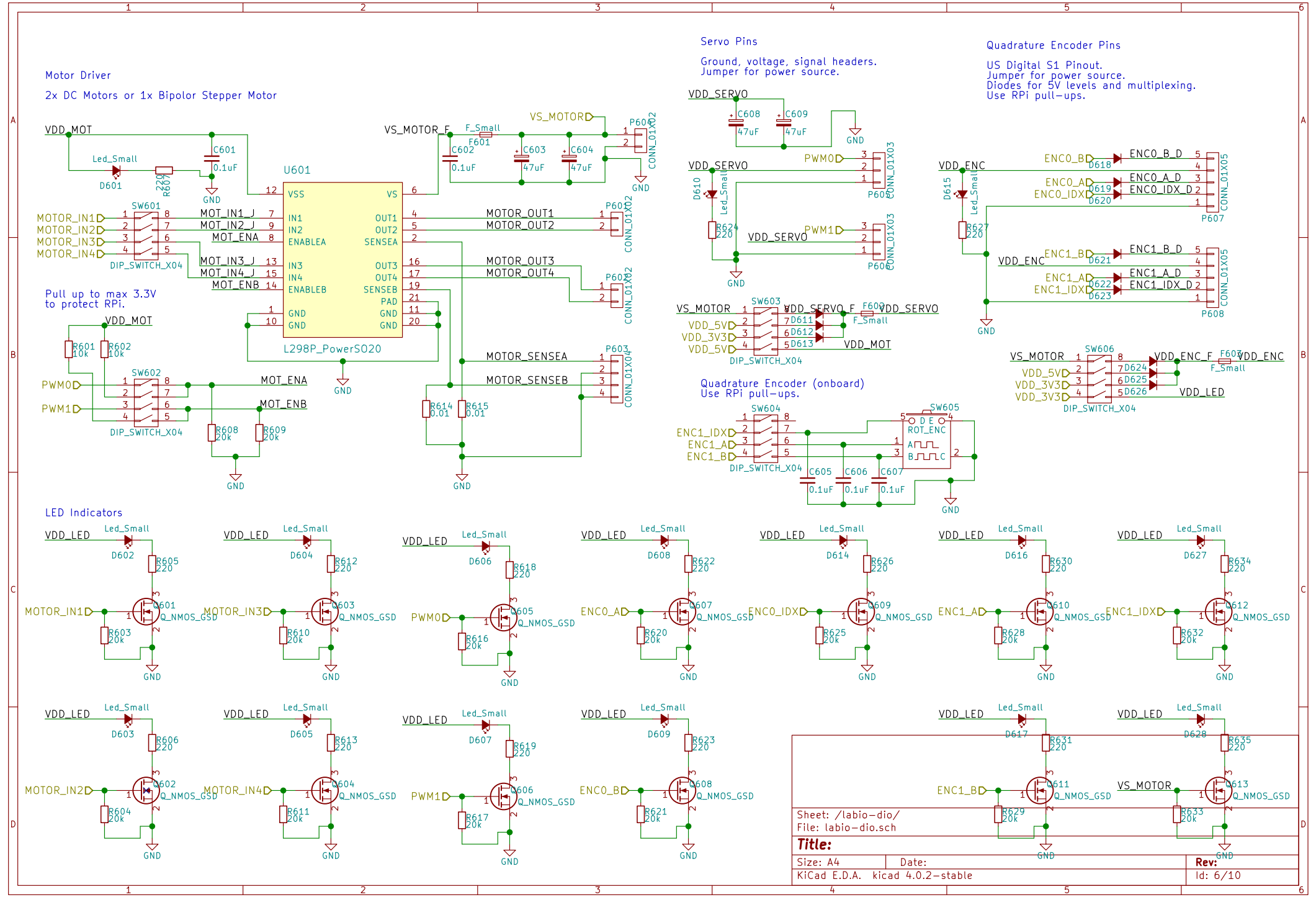
Motor Driver
2x DC Motors or 1x Bipolor Stepper Motor
U601
L298P_PowerSO20
Pull up to max 3.3V
to protect RPi.
Servo Pins
Ground, voltage, signal headers.
Jumper for power source.
Quadrature Encoder Pins
US Digital S1 Pinout.
Jumper for power source.
Diodes for 5V levels and multiplexing.
Use RPi pull-ups.
Quadrature Encoder (onboard)
Use RPi pull-ups.
LED Indicators
Sheet: /labio-dio/
File: labio-dio.sch
Title:
Size: A4
Date:
Rev:
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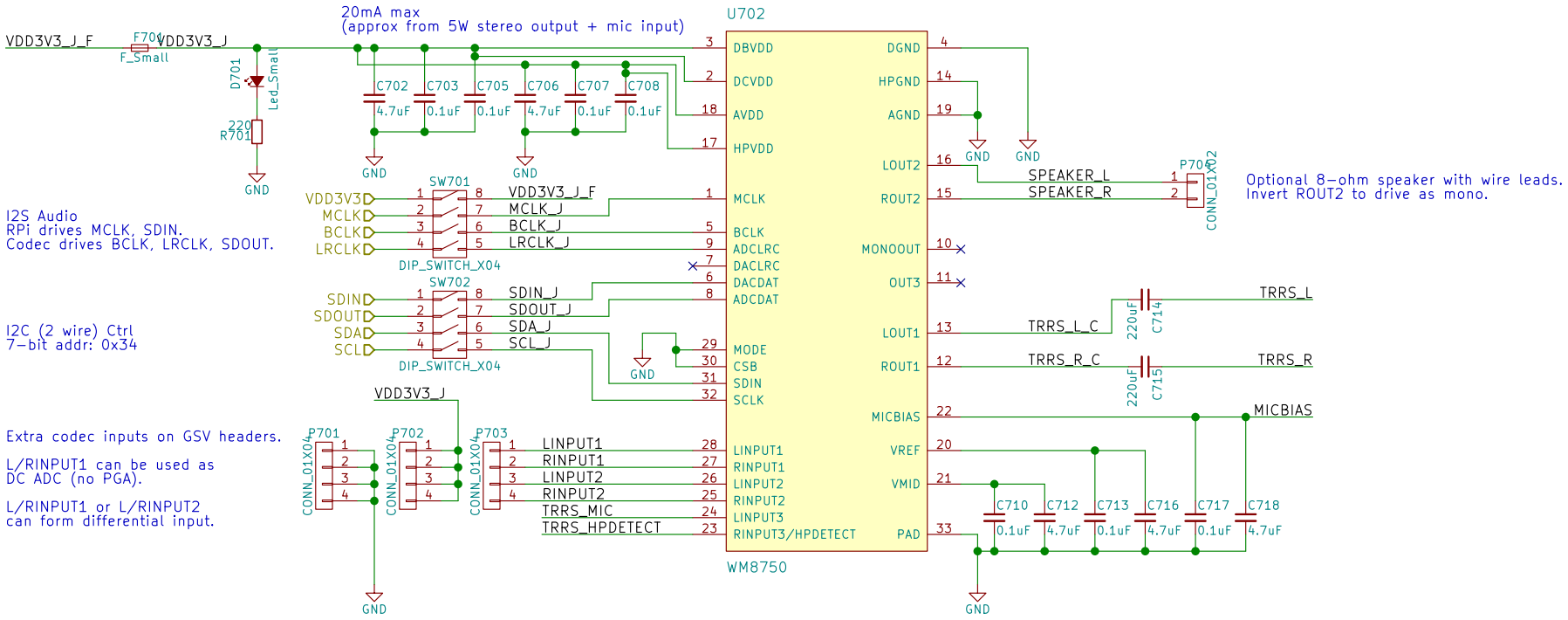

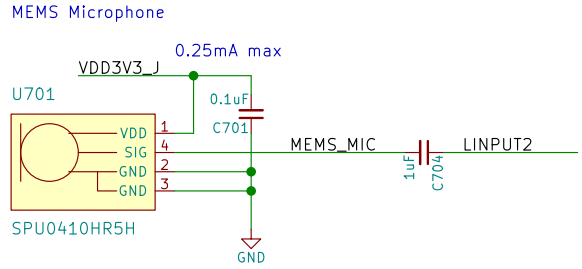

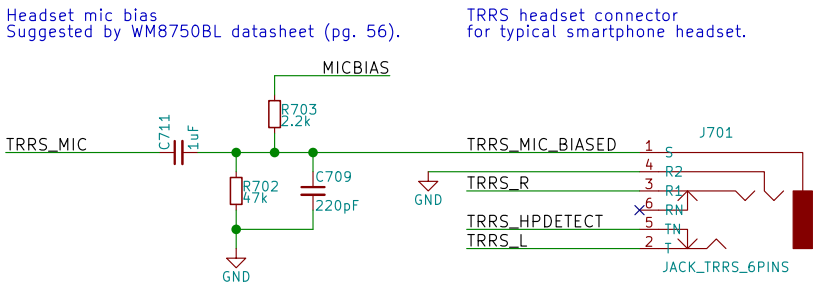

TRRS headset connector
for typical smartphone headset.

Sheet: /labio-audio/
File: labio-audio.sch

Title:

Size: A4	Date:	**Rev:**
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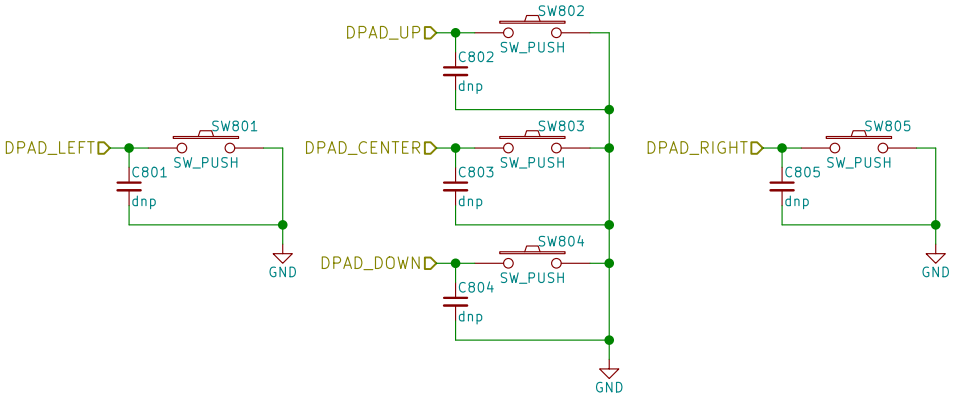
D-Pad

Use RPi pull-ups.
Optional C for decoupling.
Individual IO lines for interrupts.



Sheet: /labio-dpad/		
File: labio-dpad.sch		
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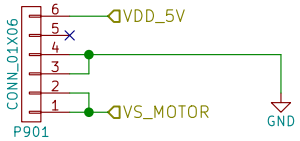
External Power (Future)

Provides logic and motor power from power supply or
battery pack with possible charging from USB (rpi) power.
2x motor power for current rating.



Sheet: /labio-power/		
File: labio-power.sch		
Title:		
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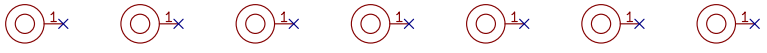
RPi-like Mounting Holes

M3 for M3/no 4/M2.5 hardware.

H1001 H1003 H1004 H1005 H1007 H1008 H1009



hole hole hole hole hole hole hole

Heatsink Mounting

25x25mm with 30x30mm M3 holes

H1002 H1006

hole hole

WiSE Lab

Carnegie Mellon

WiSE Lab

Carnegie Mellon

Sheet: /labio-mech/ File: labio-mech.sch		
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