changelog

: changelog.kicad_sch

EEG_Board1
PCB Edge

USB-C

: USB-C.kicad_sch

Sheetname: power

VBUS_IN○─────○VBUS_IN
CC2○────────○CC1
CC1○────────○CC2

Sheetfile: power.kicad_sch

AVDD DVDD
AVDDD DVDDD

SCL○────────○SCL
SDA○────────○SDA
VBUS_OUT○────○VBUS_OUT

Sheetname: nrf5340

DVDD
DVDDD

Sheetfile: nrf5340.kicad_sch

UART_RX UART_TX SWDCLK SWDIO BMI270_INT1

UART_RX UART_TX SWDCLK SWDIO

BMI270_INT1

Sheetname: ads1299

DVDD AVDD
DVDDD AVDDD

DRDY○────────○DRDY
START○───────○START

ADS1299_CS○────○ADS1299_CS
MISO○───────○MISO
MOSI○───────○MOSI
SCK○────────○SCK
BMI270_CS○

Sheetfile: ads1299.kicad_sch

GND Ground Tie GNDA

debug / programming interface

DVDD   1
SWDIO   2   J2
SWDCLK   3   Conn_01x04
            4

GND

UART

UART_RX   1
UART_TX   2   J1
            3   Conn_01x03

GND

Connector

U2
BMI270

                VDDIO   5   DVDD
                VDD   8

10 OSCB   OSDO   11
12 CSB

                                C4   C6
                               100nF   100nF

13 SCX
14 SDX   GND
1   SDO

3   ASCX   INT1   4   BMI270_INT1
2   ASDX   INT2   9

                GND   7
                GNDIO   6

                        GND

BMI270

J3
USB-C Connectors

VBUS	A4_B9 → VBUS_IN
CC1 → A5 CC1	SBU2 B8
A6 DP1	DN2 B7
A7 DN1	DP2 B6
A8 SBU1	CC2 B5 → CC2
SHIELD	S1
GND	B1_B12 → GND

USB-C

NPM1300

IC1
NPM1300

Pin	Name	Pin	Name
1	VOUT1	24	CC2
2	PVSS1	23	CC1
3	SW1	22	VBUSOUT
4	PVDD	21	VBUS
5	SW2	20	VSYS
6	PVSS2	19	VBAT
7	GPIO0	18	NTC
8	GPIO1	17	VSET1

Top pins: 33 PAD, 32 VOUT2, 31 VOUTLDO2, 30 LSIN2/VINLDO2, 29 LSOUT2/VOUTLDO2, 28 LSOUT1/VOUTLDO1, 27 LSIN1/VINLDO1, 26 LED2, 25 LED1, LED0

Bottom pins: 9 GPIO2, 10 GPIO3, 11 GPIO4, 12 VDDIO, 13 SDA, 14 SCL, 15 SHPHLD, 16 VSET2

VOUT1, PVSS1, SW1, PVDD, SW2, PVSS2

GND CHG GND VOUT2

C7 100nF

R3 150k

R2 150k

C8 1uF
C9 2.2uF
C10 1uF

VSYS
VBAT
VBUS_IN
VBUS_OUT
CC1 CC2

DVDD SDA SCL SDA SCLD

Note. VESTx with external resistor defines the default
output voltage setting as found in the following table.

Resistor value	VOUT1 Output voltage	VOUT2 Output voltage
< 100 Ω	0 V (OFF)	0 V (OFF)
4.7 kΩ	1.0 V	1.8 V
10 kΩ	1.2 V	2.0 V
22 kΩ	1.5 V	2.2 V
47 kΩ	1.8 V	2.4 V
68 kΩ	2.0 V	2.5 V
100 kΩ	2.2 V	2.7 V
150 kΩ	2.5 V	3.0 V
250 to 500 kΩ	2.7 V	3.3 V

2.5V Output
VOUT1
L1 2.2uH
C11 10uF
AVDD
SW1
PVSS1
GND

3.0V Output
VOUT2
L2 2.2uH
C12 10uF
DVDD
SW2
PVSS2
GND

−2.5V Output
C13 10uF
IC2 LM2664M6X_NOPB
AVDDD
4 SD, 5 V+, 6 CAP+
3 CAP−, 2 OUT, 1 GND
VSSA
C19 10uF
GNDA

Raw Voltage Output
VSYS
PVDD
VSYS_OUT
C15 10uF
C17 10uF
C18 10uF
PVSS1 PVSS2 GND

LED
D1 LED_Y
CHG
VSYS_OUT

Power Switch
SW1 SW_SPDT
VBAT
1
2
3
Battery BT1
GND

U1
NRF5340

USB power

R1
2.2

VBUS_OUT — VBUS_nrf

C3
4.7uF

GND

GND
C1
1uF

VBUS_nrf
GND
C2
1uF

C5
4.7uF
GND

DVDD

Pin	Signal
C1	VDD
A2	VBUS
A6	VDDH
A7	DCCH
A5	D−
A4	D+
F7	OUT_ANT
F8	OUT_MOD

ANT

E11 — RST

A8 — P0.02/NFC1
A9 — P0.03/NFC2
B4 — P0.04/AIN0
B8 — P0.05/AIN1
B3 — P0.06/AIN2
B6 — P0.07/AIN3
B9 — P0.08/TD3 — START
C7 — P0.09/TD2
A10 — P0.10/TD1 — MOSI
C8 — P0.11/TD0
D2 — P0.12/TC
C2 — P0.13/QSPI0 — MISO
C5 — P0.14/QSPI1 — SCK
C4 — P0.15/QSPI2
C6 — P0.16
C9 — P0.17/QSPI_CLK
D4 — P0.18/QSPI_CS
C3 — P0.19
D6 — P0.20
D3 — P0.21
D5 — P0.22
F3 — P0.23 — BMI270_INT1
D10 — P0.24
F10 — P0.25/AIN4
E10 — P0.26/AIN5 — BMI270_CS

C11 — SWDIO
D11 — SWDCLK

NC
VSS
GND

E9 — P0.27/AIN6
E6 — P0.28/AIN7
E8 — P0.29
E2 — P0.30
E3 — P0.31 — DRDY

B7 — P1.00
B5 — P1.01
B10 — P1.02/I2C — SDA
A3 — P1.03/I2C — SCL
D9 — P1.04
C10 — P1.05
F2 — P1.06
F4 — P1.07
D7 — P1.08 — ADS1299_CS
D8 — P1.09
F5 — P1.10
E5 — P1.11
E4 — P1.12
D1 — P1.13 — UART_RX
E1 — P1.14 — UART_TX
B2 — P1.15

NRF5340

INPUT CONNECTOR

J4
Conn_01x06

1P	1
2P	2
3P	3
4P	4
REF	5
BIAS	6

INPUT FILTERING

D2
TPD4E1B06DCKR

2P	1
	2
	4
1P	5
	6 NC
	3

GNDA

D3
TPD4E1B06DCKR

BIAS	1
REF	2
3P	4
4P	5
	6 NC
	3

GNDA

R5 2.2k — IN1P
R6 2.2k — IN2P
C38 1nF
C41 1nF
GNDA

R7 2.2k — IN3P
R8 2.2k — IN4P
C39 1nF
C42 1nF
GNDA

R9 2.2k — BIAS_DRV
R10 2.2k — E_REFERENCE
BIAS
REF
C40 1nF
C43 1nF
GNDA

ADS DECOUPLING

DVDD   AVDD
C30 1uF   C32 1uF   C34 1uF   C36 1uF
GNDA   VSSA
AVDD   AVDD
C31 1uF   C33 1uF   C35 1uF   C37 1uF
VSSA   GNDA

ADS1299

IC3
ADS1299-4PAGR

C25 100nF
C26 1uF
VSSA

C28 1uF   C29 1uF
GNDA

R4 1M
BIAS_DRV
C20 1nF
GNDA

GNDA
AVDD
GNDA
DVDD

Pins (top): 64 RESERVED, 63 BIASOUT, 62 BIASIN, 61 BIASINV, 60 BIASREF, 59 AVSS_5, 58 AVSS_4, 57 AVDD_4, 56 VCAP3, 55 AVDD1, 54 AVSS1, 53 CLKSEL, 52 DGND_3, 51 DVDD_2, 50 DGND_2, 49

Left pins:
1	IN8N
2	IN8P
3	IN7N
4	IN7P
5	IN6N
6	IN6P
7	IN5N
8	IN5P
9	IN4N
10	IN4P
11	IN3N
12	IN3P
13	IN2N
14	IN2P
15	IN1N
16	IN1P

E_REFERENCE
IN4P
IN3P
IN2P
IN1P

Right pins:
48	DVDD_1
47	DRDY
46	GPIO4
45	GPIO3
44	GPIO2
43	DOUT
42	GPIO1
41	DAISY_IN
40	SCLK
39	CS
38	START
37	CLK
36	RESET
35	PWDN
34	DIN
33	DGND_1

DRDY
MISO
GNDA
SCK
ADS1299_CS
START
DVDD
MOSI
GNDA

Bottom pins:
17 SRB1, 18 SRB2, 19 AVDD_3, 20 AVSS_1, 21 AVDD_2, 22 AVSS_2, 23 VREFP, 24 VREFN, 25 VCAP4, 26 VCAP1, 27 NC_1, 28 VCAP2, 29 NC_2, 30 RESV1, 31 AVSS_3, 32

AVDDD
VSSA
C22 100nF
C21 10uF
C23 1uF
C24 100uF
C27 1uF
VSSA
GNDA
VSSA

Version 0.1
- USB-C Type Power & Charge
- npm1300 BMS(Battery Manage System)
- EEG 4Channel (ADS1299)
- Dual Core Chip (NRF5340)
- gyro accelerometer sensor (BMI270)

Version 0.2(dev)
- USB Data Line Delete
- 100uF size fix (0402 -> 0805)
* dev only
- pin header size up (2.54mm)