USB Input

J1
HRO_Type-C-31-M-14

- VBUS A4
- CC1 A5 — CC1
- CC2 B5 — CC2
- D- A7 — USB-
- D- B7
- D+ A6 — USB+
- D+ B6
- SBU1 A8
- SBU2 B8
- SHIELD S1
- GND A1 — GND

L1 BLM15PX121SN1D

F1 1 A

+5V

C2 100nF — GND
C1 10uF — GND

R1 5.1K — GND
R2 5.1K — GND

+5V

U1 SRV05-4
- VP
- IO1 1 — USB-
- IO2 3 — USB+
- IO3 4 — USB+
- IO4 6 — USB-
- VN 2 — GND

Battery & ON/OFF Switch

GZ 103040 BATTERY
3.7V, 1200mAh, 4.44Wh
Maximum continuous charging current: 1C
Maximum continuous discharge current: 2C
Size: About 40x30x10mm

- Over charge/discharge Protection
- Overcurrent protection
- Short protection

J2 BATTERY
1
2
— +VBAT

R5 100K — GND

+5V

R3 100R

R4 10K — GND

Q1 2N7002

SW1 SW_Slide_DPDT
- 3A 3B
- 2A 2B
- 1A 1B

SYSOFF

+VBAT

GND

WHEN SYSOFF=1 (SW POS 1): BATT. OFF (cut out from the circuit)
WHEN SYSOFF=0 (SW POS 3 or +5V from USB): BATT ON (connected to the load)

Q2 will pull SYSOFF to GND as soon as the board is plugged in for charging,
re-enabling the battery as long as it remains connected to USB power supply.

Battery % Monitoring

Note: use internal pullups

+3V3   +3V3

+VBAT

U3 MAX17048
- VDD 3
- CELL 2
- ALRT 5
- SDA 8 — SDA
- SCL 7 — SCL
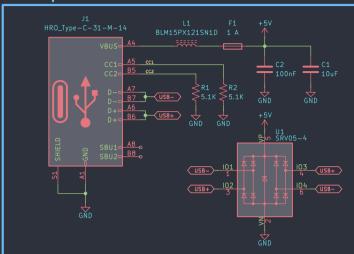- CTG 1
- GND 4
- GND 9
- QSTRT 6

C6 100nF — GND

R9 10K   R10 10K

R27 10K — GND

QSTART

Battery Charging / Input Voltage Handling

The OUT pin follows VBAT when running from battery,
else, follows the USB voltage.

+5V

C3 4.7uF — GND

D2 Red   R6 1.5K — PGOOD
D3 Emerald   R8 1.5K — CHG

U2 BQ24075RGT
- SYSOFF 15 — SYSOFF
- CE 4
- TMR 14 — TMR
- EN1 6 — +VSW
- EN2 5 — GND
- ILIM 12 — ILIM
- ISET 16 — ISET
- IN 13
- OUT 10 — +VSW
- BAT 2 — +VBAT
- TS 1 — TS
- PGOOD 7 — PGOOD
- CHG 9 — CHG
- VSS 8 — GND

R14 56K — GND
R13 2.2K — GND
R12 3.9K — GND

C5 4.7uF — GND
C4 4.7uF — GND

R7 10K — GND

EN1	EN2	Current
0	0	100mA
0	1	ILIM
1	0	500mA
1	1	Standby

ISET (Charging current): Kiset / Riset = 890A·Ω / 3900Ω = 230mA
ILIM (Input current): Kilim / Rilim = 1610A·Ω / 2200Ω = 730mA

TMR: Tprechg = Rtmr * Ktmr = 56kΩ * 48s/kΩ = 2688s = 45min
      Tmaxchg = 10 * Rtmr * Ktmr = 56kΩ * 48s/kΩ = 26880s = 7.5h

CE LOW = Charging active

DC/DC Stepdown 1V9 Supply

+VSW

U10 TPS62840YBG
- VIN B1
- EN C1
- VSET C2
- VOS A2
- SW B2
- GND A1

+1V9

C16 4.7uF — GND

R19 909R

L4 2.2uH

C17 10uF — GND
C18 10uF — GND

L5 2.2uH
Murata inductor - datasheet suggested

DC/DC Stepdown 3V3 Supply

+VSW

U4 TPS62840YBG
- VIN B1
- EN C1
- VSET C2
- VOS A2
- SW B2
- GND A1

+3V3

C7 4.7uF — GND

R11 267K — GND

L3 2.2uH

C8 10uF — GND
C9 10uF — GND

MICROCONTROLLER NRF52840

+3V3 +3V3 +3V3 +3V3 +3V3

C35 4,7uF C33 1uF C36 100nF C37 100nF C38 100nF
GND GND GND GND GND

+5V
R24 4,7R
C15 1uF C39 4,7uF
GND GND

L6 10uH L7 15nH

USB− AD6 D+
USB+ AD4 D−

C27 12pF
XL2 32MHz
GND
C26 12pF
GND

B24 XC1
A23 XC2

C28 15pF
XL1 32.768kHz
C29 15pF
GND

D2 P0.00
F2 P0.01
P0.09
P0.10

Sensor
NRESET
NCS
MISO
SCLK
MOSI
MOTION

Buttons
BTN_LEFT
BTN_RIGHT
BTN_DPI
BTN_FWD
BTN_BACK
BTN_WHEEL

Wheel
WHEEL_A
WHEEL_COM
WHEEL_B

BATT %
QSTART
SDA
SCL

LEDs
GLOW_EN
GLOW_LV

U5
nRF52840-QIxx

WHEEL_COM A12 P0.02
B13 P0.03
NCS J1 P0.04
K2 P0.05
MISO L1 P0.06
MOSI N1 P0.08
AD8 P0.13
AC9 P0.14
SDA AD10 P0.15
AC11 P0.16
SWD_NRST AD12 P0.17
AC15 P0.19
SCL AD16 P0.20
AC17 P0.21
QSTART AD18 P0.22
AC19 P0.23
GLOW_LV AD20 P0.24
SWD_D AC21 P0.25
NRESET G1 P0.26
H2 P0.27
B11 P0.28
A10 P0.29
BTN_LEFT B9 P0.30
A8 P0.31
BTN_DPI Y23 P1.01
W24 P1.02
V23 P1.03
U24 P1.04
T23 P1.05
R24 P1.06
P23 P1.07
P2 P1.08
A20 P1.10
BTN_WHEEL B19 P1.11
BTN_RIGHT B17 P1.12
A16 P1.13
WHEEL_B B15 P1.14
WHEEL_A A14 P1.15

P1.00 AD22 GLOW_EN
P0.12 U1 MOTION
P0.11 T2
P1.09 R1 SCLK
P0.07 M2

Standard drive pins − 2mA < 10kHz
High drive pins − 9mA

VBUS VDDH VDD VDD VDD VDD DCCH DCC

DEC4 B5
DEC6 E24
DEC1 C4
DEC2 A1B
DEC3 D23
DEC5 N24
DECUSB AC5

C30 100nF C32 47nF C31 1uF
GND GND GND

C34 4,7uF C40 820pF C41 100nF C43 12pF C42 100nF
GND GND GND GND GND

ANT

ANT H23
L8 4,7nH RF C48 0,4pF
C46 0,8pF C47 0,5pF C49 DNP
GND GND GND

+3V3
R25 100K
J3
SWDIO AC24 SWD_DIO SWDIO
RESET AC13 SWD_NRST RST
SWDCLK AA24 SWD_CLK SWCLK
SWD_D SWO
TC2030_SWD
GND

SWD_NRST R26 1,5K
SW8
SKRPACE010
GND

Optical Sensor

U6
PAW3395DM

+1V9

1 NC	NC 16
2 NC	LED_P 15
3 GND	NRESET 14
4 VDD	NCS 13
5 VDDREG	MISO 12
6 NC	MOSI 11
7 VDDIO	SCLK 10
8 GNDIO	MOTION 9

+1V9

C20 10uF   C21 100nF
GND   GND

5.6R R20
C19 47uF
GND

R21 10K   +3V3

NRESET
NCS
MISO
MOSI   SPI — 10MHz
SCLK
MOTION   Motion — 1kHz

VDDREG
C24 4.7uF   C25 100nF
GND   GND

+3V3
C22 10uF   C23 100nF
GND   GND

GND

Buttons

SW3
CMI627301D07
1 ○○ 2   BTN_LEFT
GND

SW4
CMI627301D07
1 ○○ 2   BTN_RIGHT
GND

SW5
Microswitch
1   3
BTN_DPI
GND

SW2
CMI627301D07
1 ○○ 2   BTN_WHEEL
GND

SW6
Microswitch
1   2   BTN_FWD
GND

SW7
Microswitch
1   2   BTN_BACK
GND

Aggiungi pulsante Kailh 7.3mm in parallelo;
In tal caso, usa encoder da 10mm.

Glow LED

+VSW

C50 10uF   R18 10K
GND

Q2 AO3401A
1   3
2

GLOW_EN   R17 100R
Q3 2N7002
R16 10K
GND

GLOW_PWR

SN74LVC1T45DW
U9
1 VCCA   VCCB 6
3 A   B 4
5 DIR   GND 2

+3V3   +VSW

R15 5.1K
GLOW_LV
GLOW_HV

+3V3
C44 100nF
GND

+VSW
C45 100nF
GND

GND

GLOW_PWR
C10 100nF   C11 100nF   C12 100nF   C13 100nF   C14 100nF
GND

GLOW_PWR
GLOW_HV

LED1	LED2	LED3	LED4	LED5
4 VDD	4 VDD	4 VDD	4 VDD	4 VDD
3 DIN DOUT 1	3 DIN DOUT 1	3 DIN DOUT 1	3 DIN DOUT 1	3 DIN DOUT 1
VSS RGB 2	VSS RGB 2	VSS RGB 2	VSS RGB 2	VSS RGB 2
WS2812_2020	WS2812_2020	WS2812_2020	WS2812_2020	WS2812_2020

GND

Scroll Wheel

+3V3   +3V3

R22 1M   R23 1M

U7
A   WHEEL_A
C   WHEEL_COM
B   WHEEL_B

TTC/Kailh Encoder E103

Triungulo Lab
Sheet: /Misc/
File: Misc.kicad_sch
Title: Cenere Mouse
Size: A4   Date:
KiCad E.D.A. 9.0.3
Rev: 1
Id: 4/4