Power + MCU + SWD

File: main.kicad_sch

Peripherals

File: peripherals.kicad_sch

Power (5V -> 3V3)

J1
USB_C_Receptacle_USB2.0_16P

VBUS   PWR_FLAG
FB1
GZ2012D101TF
+5V PWR_FLAG
U1
XC6206PxxxMR
+3V3
19-217/GHC-YR1S2/6T
PWR_LED_C

VBUS   A4
CC1   A5
CC2   B5
CONN_CC1
CONN_CC2
R2   R3
5k1   5k1
U2
USBLC6-2SC6

C1   C2   C3   C4
4u7   4u7   4u7   4u7
VI GND VO
D1   R1
1k

D-   A7
D-   B7
D+   A6
D+   B6
CONN_DN
CONN_DP

+3V3
V3
C5   C6
100nF   100nF

SHIELD GND
PWR_FLAG
SBU1   A8
SBU2   B8

S1 A1
PWR_FLAG

USB - UART Bridge
U3
CH340N

V3   VCC
TXD 6 UART_RX
RXD 7 UART_TX
USB_DP   1 UD+
USB_DN   2 UD-
GND
RTS 4

U4
E73-2G4M04S1B
BLE Module

+3V3
VCC 16
C7   C8
100nF   4u7

SWDCLK 37 SWDCLK
SWDIO   38 SWDIO
DCC 13

0V9_DECOUPLE   14 DEC1
1V3_RADIO_DECOUPLE 3 DEC2
SUPPLY_DECOUPLE   4 DEC3
1V3_LDO_DECOUPLE   12 DEC4

C9   C10   C11   C12
100nF   100nF   100nF   4u7

17 P0.02   P0.17 32   EXPANDER_SDA
18 P0.03   P0.18 33   EXPANDER_SCL
19 P0.04   P0.19 34   EXPANDER_A0
20 P0.05   P0.20 35
21 P0.06   P0.21 36
6DOF_MISO
22 P0.07   P0.22 39   FLASH_nCS
6DOF_SDA_MOSI 23 P0.08   P0.23 40   FLASH_MISO
6DOF_SCLK   24 P0.09   P0.24 41   FLASH_MOSI
6DOF_nCHIP_SEL 25 P0.10   P0.25 5   FLASH_SCLK
26 P0.11   P0.26 6
27 P0.12   P0.27 7   UART_RX
MAG_nCHIP_SEL 28 P0.13 P0.28 8   UART_TX
MAG_MISO   29 P0.14   P0.29 9   19-217/GHC-YR1S2/6T
30 P0.15   P0.30 10   DEBUG_LED_A   DEBUG_LED_C
MAG_INT   31 P0.16   P0.31 11   UART_TX
GND 0   D2   R4
1k

SWD Connector
+3V3

J2
Conn_ARM_JTAG_SWD_10
VTref 1
RESET 10
SWCLK/TCK 4 SWDCLK
SWDIO/TMS 2 SWDIO
SWO/TDO   6
NC/TDI   8
GNDDetect 9
GND   3

R5
0R
SWD_GND_DET
GND

H3   H4
MountingHole_Pad MountingHole_Pad
Grounded Mounting Holes

Tooling Holes
H1   H2
MountingHole MountingHole

Sheet: /Power + MCU + SWD/
File: main.kicad_sch
Title:
Size: A4   Date:
KiCad E.D.A. 8.0.0
Rev:
Id: 2/3

Accelerometer + Gyroscope

+3V3

C13 100nF
C14 100nF

6DOF_MISO — 1 SDO/SA0
MAG_SDA_MOSI — 2 SDX
MAG_SCLK — 3 SCX

6DOF_SDA_MOSI — 14 SDA
— 13 SCL
6DOF_SCLK — 12 CS
6DOF_nCHIP_SEL —

5 VDDIO
8 VDD
4 INT1 — 6DOF_INT1
7 INT2 — 6DOF_INT2

R7 0R
MAG_DRDY

6 GND

U5
LSM6DSO

NOR SPI Flash

+3V3

R6 5k1

C15 100nF

FLASH_nCS — 1 CS
FLASH_SCLK — 6 CLK
FLASH_MOSI — 5 DI(IO0)
FLASH_MISO — 2 DO(IO1)
— 3 IO2
— 7 IO3

8 VCC

4 GND

U6
W25Q128JVS

Magnetometer

+3V3

R8 5k1
R9 5k1
R10 5k1

MAG_nCHIP_SEL

C16 100nF
C17 100nF

MAG_SCLK — 1 SCL/SPC
MAG_SDA_MOSI — 11 SDA/SDI/SDO
MAG_MISO — 9 SDO/SA1

R11 5k1

10 CS
5 Vdd
6 Vdd_IO

8 DRDY — MAG_DRDY
7 INT — MAG_INT

C1 EXT_CAP
C18 100nF

3 GND

U7
LIS3MDL

#CS pin-> I2C/SPI mode selection
1: SPI idle mode / I2C communication enabled
0: SPI communication mode / I2C disabled

I2C Read Address: 0x39 (0x3D if MCU pulls MAG_MISO high)
I2C Write Address: 0x38 (0x3C if MCU pulls MAG_MISO high)

Per LIS3MDL datasheet, 5.1.1 I2C operation

Command	SAD[6:2]	SAD[1] = SDO/SA1	SAD[0]	R/W	SAD+R/W
Read	00111	0	0	1	00111001 (39h)
Write	00111	0	0	0	00111000 (38h)
Read	00111	1	0	1	00111101 (3Dh)
Write	00111	1	0	0	00111100 (3Ch)

IO Expander

+3V3

R12 5k1
R13 5k1
R15 5k1

C19 100nF

EXPANDER_SDA
EXPANDER_SCL
EXPANDER_nRESET

U8 PCA9557PW

1 SCL
2 SDA
15 RESET

16 VDD

6 IO0 — IO0_LED_C
7 IO1
9 IO2
10 IO3
11 IO4
12 IO5
13 IO6 — IO1_LED_C
14 IO7

EXPANDER_A0 — 3 A0
4 A1
5 A2

8 VSS

R14 5k1

+3V3

R18 5k1
R20 1k

19-217/GHC-YR1S2/6T
D3
IO0_LED_A

+3V3

R19 5k1
R21 1k

19-217/GHC-YR1S2/6T
D4
IO1_LED_A

+3V3

R17 5k1
SW2 SW_Push
IO6_SW_HIGH
C21 100nF

+3V3

R16 5k1
SW1 SW_Push
IO7_SW_HIGH
C20 100nF

I2C Read Address: 0x31 (0x33 if MCU pulls EXPANDER_A0 high)
I2C Write Address: 0x30 (0x32 if MCU pulls EXPANDER_A0 high)

Per PCA9557 datasheet, Table 2. Address Reference

A2	A1	A0	I2C BUS SLAVE ADDRESS
L	L	L	24 (decimal), 18 (hexadecimal)
L	L	H	25 (decimal), 19 (hexadecimal)

The last bit of the slave address defines the
operation (read or write) to be performed.
A high (1) selects a read operation,
while a low (0) selects a write operation.