MCU (copy)

MCU (copy).sch

Battery_and_Power

Battery_and_Power.sch

Sensors

Sensors.sch

Justin Knudsen & Nathan Morton

SOAR

Sheet: /
File: SensorBoard.sch

Title: SOAR Sensor Board

Size: A4 | Date: 2018-30-12 | **Rev: 1**
KiCad E.D.A. kicad (5.0.1-3-g963ef8bb5) | Id: 1/4

MS560702BA03-50 (Barometer)

R1 10k
C1 0.1uF
GND
+3.3V

1	VDD	
2	PS	
3	GND	
4	CSB	

MS5607-02BA

SCLK	8	SPI2_SCK
SDI/SDA	7	SPI2_MOSI
SDO	6	SPI2_MISO
CSB	5	BARO_CS

U1

SD Card

J2
Micro_SD_Card

+3.3V
R2 10k
C6 10u
GND

SD1_CS
SPI3_MOSI
SPI13_SCK
SPI3_MISO

1	DAT2	
2	DAT3/CD	
3	CMD	
4	VDD	
5	CLK	
6	VSS	
7	DAT0	
8	DAT1	

SHIELD 9
GND

GND

GND GND
C 10n1
C3 0.1u
+3.3V
+3.3V

VDDIO 8
VDD 13

SPI1_MOSI	24	SDA/MOSI
SPI1_MOSI	9	AD0/MISO
SPI1_SCK	23	SCL/SCLK
CS	22	CS
GND	11	FSYNC

INT	12	
AUX_SDA	21	
AUX_SCK	7	
REGOUT	10	
RESV_VDDIO	1	
RESV_GND	20	

MPU-9250

C4 0.1u
GND
GND
+3.3V

GND 18
U2
GND

Tank Pressure

P = V+ * 1000PSI/0.1V

ADC2 = 2* 200K/13K* V+

+3.3V
0.1uF
C19
GND

V+
V−
Gnd
Power

4		
3		
2		
1		

J1
GND
+5V

13K R5
R1
R2
R1

U4
INA326

100 R7
C20 1uF
ADC2
GND

C18 0.5nF
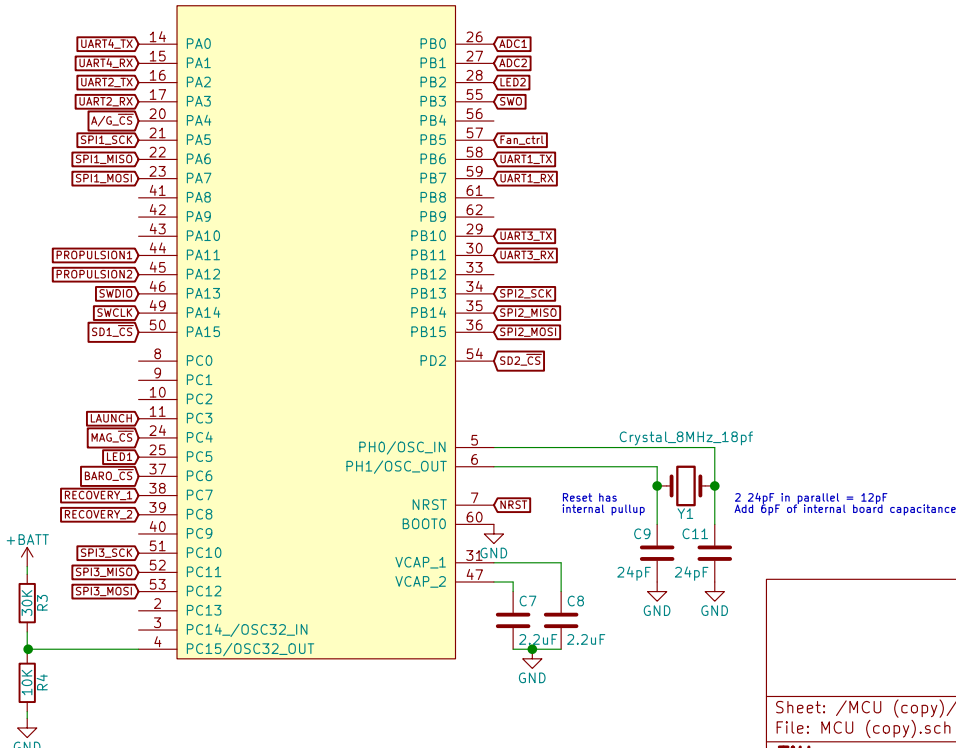GND
200K R6
GND

See STM32 Hardware Design Guide for schematic example

Digital Decoupling
1 100nF for each power supply (place close to each VDD pin)
plus 1 10uF

STM32F405

Same family as F407 on Discovery boards

+3.3V

C10	C12	C13	C15	C17
10uF	0.1uF	0.1uF	0.1uF	0.1uF

GND

+3.3V

U3
STM32F405R

+3.3V

Analog Supply Decoupling

C14	C16
1uF	10nF

GND

f

Power Supply

Pin	Signal
1	VBAT
19	VDD
32	VDD
48	VDD
64	VDD
13	VDDA

VSS	18
VSS	63
VSSA	12

GND

Pin	Net	Signal		Signal	Net	Pin
14	UART4_TX	PA0		PB0	ADC1	26
15	UART4_RX	PA1		PB1	ADC2	27
16	UART2_TX	PA2		PB2	LED2	28
17	UART2_RX	PA3		PB3	SW0	55
20	A/G_CS	PA4		PB4		56
21	SPI1_SCK	PA5		PB5	Fan_ctrl	57
22	SPI1_MISO	PA6		PB6	UART1_TX	58
23	SPI1_MOSI	PA7		PB7	UART1_RX	59
41		PA8		PB8		61
42		PA9		PB9		62
43		PA10		PB10	UART3_TX	29
44	PROPULSION1	PA11		PB11	UART3_RX	30
45	PROPULSION2	PA12		PB12		33
46	SWDIO	PA13		PB13	SPI2_SCK	34
49	SWCLK	PA14		PB14	SPI2_MISO	35
50	SD1_CS	PA15		PB15	SPI2_MOSI	36
8		PC0		PD2	SD2_CS	54
9		PC1				
10		PC2				
11	LAUNCH	PC3				
24	MAG_CS	PC4				
25	LED1	PC5				
37	BARO_CS	PC6		PH0/OSC_IN		5
38	RECOVERY_1	PC7		PH1/OSC_OUT		6
39	RECOVERY_2	PC8				
40		PC9		NRST	NRST	7
51	SPI3_SCK	PC10		BOOT0		60
52	SPI3_MISO	PC11				
53	SPI3_MOSI	PC12		VCAP_1		31
2		PC13		VCAP_2		47
3		PC14_/OSC32_IN				
4		PC15/OSC32_OUT				

Crystal_8MHz_18pf

Reset has
internal pullup

2 24pF in parallel = 12pF
Add 6pF of internal board capacitance

Y1

C9	C11
24pF	24pF

GND   GND

GND

C7	C8
2.2uF	2.2uF

GND

+BATT

| R3 | 30K |
| R4 | 10K |

GND