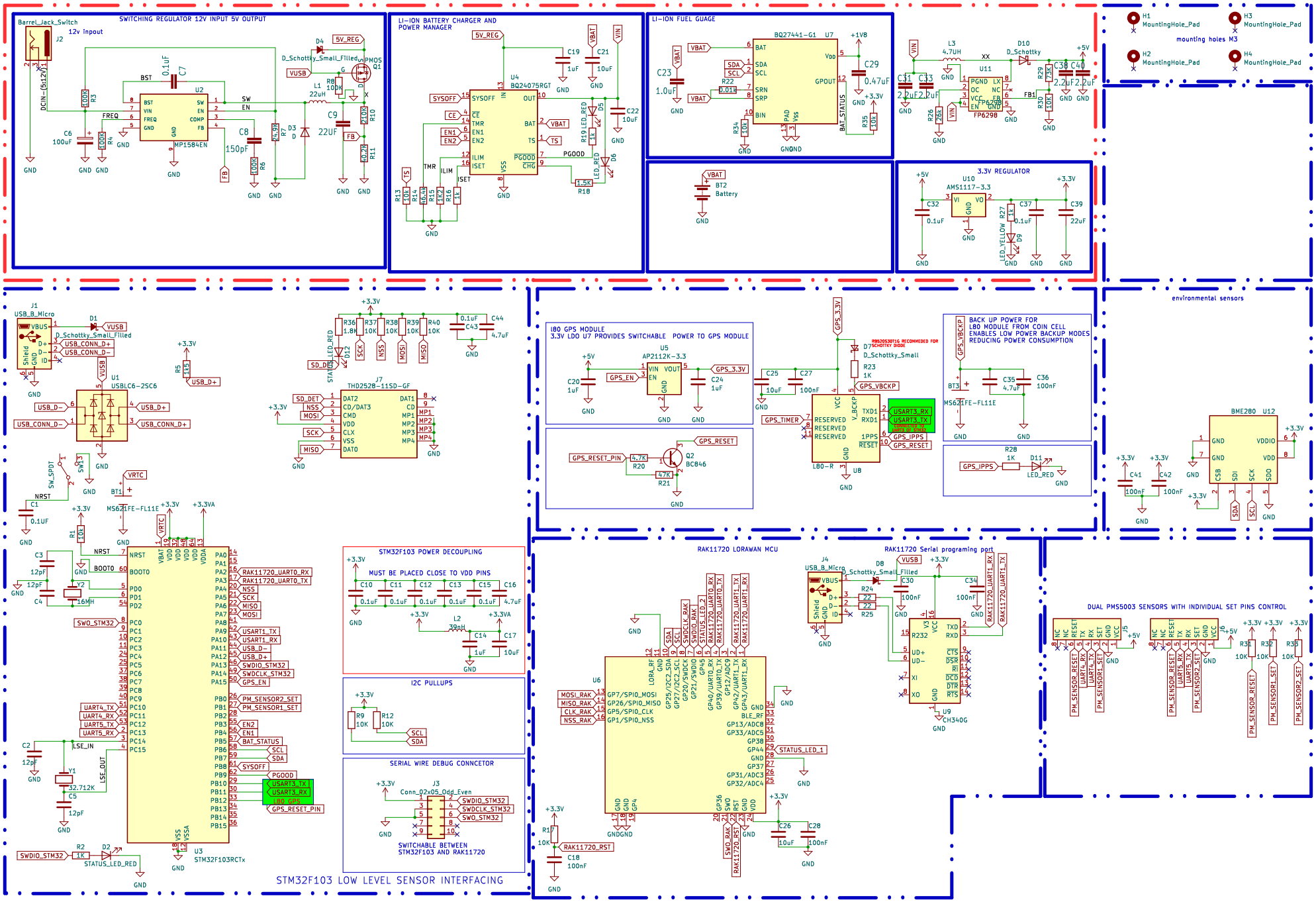
SWITCHING REGULATOR 12V INPUT 5V OUTPUT
Barrel_Jack_Switch
12v Inpout
J2
DCIN-(5x12V)
U2
MP1584EN
BST
SW
EN
FREQ
FB
VUSB
5V_REG
D4
D_Schottky_Small_Filled
PMOS
Q1
L1
22uH
C9
22UF
C8
150pF
C6
100uF
R3
100K
R4
100K
R6
100K
R7
4.3K
R8
100K
R10
210K
R11
0.23
C7
0.1uF
D3
D
GND
LI-ION BATTERY CHARGER AND POWER MANAGER
U4
BQ24075RGT
SYSOFF
CE
TMR
EN1
EN2
ILIM
ISET
IN
OUT
BAT
TS
PGOOD
CHG
VSS
VBAT
VIN
C19
1uF
C21
10uF
C22
10uF
R19
1k
LED_RED
D5
D6
R18
1.5K
R13
10K
R14
10K
R16
16.4k
R15
1K
R16
1K
LI-ION FUEL GUAGE
BQ27441-G1
U7
BAT
SDA
SCL
SRN
SRP
BIN
PAD
Vss
Vdd
GPOUT
BAT_STATUS
C23
1.0uF
C29
0.47uF
R22
0.01
R34
10K
R35
10K
+1V8
+3.3V
GNDND
BT2
Battery
L3
4.7UH
D10
D_Schottky
U11
FP6298
PGND
LX
OC
NC
VCC
FB
EN
GND
C31
2.2uF
C33
2.2uF
C38
2.2uF
C40
2.2uF
R26
26k
R29
73K
R30
10K
FB1
+5V
3.3V REGULATOR
U10
AMS1117-3.3
VI
VO
C32
0.1uF
C37
0.1uF
C39
22uF
R27
1k
D9
LED_YELLOW
H1
MountingHole_Pad
H2
MountingHole_Pad
H3
MountingHole_Pad
H4
MountingHole_Pad
mounting holes M3
J1
USB_B_Micro
VBUS
D+
D-
ID
Shield
GND
D1
D_Schottky_Small_Filled
USB_CONN_D+
USB_CONN_D-
U1
USBLC6-2SC6
USB_D+
USB_D-
R5
1k5
SW13
SW_SPDT
NRST
C1
0.1UF
R1
10k
VRTC
BT1
MS621FE-FL11E
+3.3VA
C3
12pF
C4
12pF
Y2
16MH
BOOT0
SWO_STM32
C2
12pF
Y1
32.712K
C5
12pF
LSE_IN
LSE_OUT
R2
1K
D2
STATUS_LED_RED
U3
STM32F103RCTx
NRST
BOOT0
PD0
PD1
PD2
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
PC11
PC12
PC13
PC14
PC15
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13
PA14
PA15
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
VSS
VSSA
VBAT
VDD
VDDA
RAK11720_UART0_RX
RAK11720_UART0_TX
NSS
SCK
MISO
MOSI
USART1_TX
USART1_RX
USB_D-
USB_D+
SWDIO_STM32
SWDCLK_STM32
GPS_EN
PM_SENSOR2_SET
PM_SENSOR1_SET
UART4_TX
UART4_RX
UART5_TX
UART5_RX
EN2
EN1
BAT_STATUS
SCL
SDA
SYSOFF
PGOOD
USART3_TX
USART3_RX
L80 GPS
GPS_RESET_PIN
STM32F103 POWER DECOUPLING
MUST BE PLACED CLOSE TO VDD PINS
C10
0.1uF
C11
0.1uF
C12
0.1uF
C13
0.1uF
C15
0.1uF
C16
4.7uF
L2
39uH
C14
1uF
C17
10uF
I2C PULLUPS
R9
10K
R12
10K
SERIAL WIRE DEBUG CONNCETOR
J3
Conn_02x05_Odd_Even
SWDIO_STM32
SWDCLK_STM32
SWO_STM32
SWITCHABLE BETWEEN
STM32F103 AND RAK11720
STM32F103 LOW LEVEL SENSOR INTERFACING
J1
USB_B_Micro
D1
D_Schottky_Small_Filled
USB_CONN_D+
USB_CONN_D-
U1
USBLC6-2SC6
USB_D+
USB_D-
R5
1k5
+3.3V
R36
1.8K
R37
10K
R38
10K
R39
10K
R40
10K
C44
0.1uF
C43
4.7uF
D12
LED_RED
STATUS
SD_DET
NSS
SCK
MOSI
MISO
J7
THD252B-11SD-GF
DAT2
CD/DAT3
CMD
VDD
CLK
VSS
DAT0
DAT1
CD
MP1
MP2
MP3
MP4
L80 GPS MODULE
3.3V LDO U7 PROVIDES SWITCHABLE POWER TO GPS MODULE
U5
AP2112K-3.3
VIN
VOUT
EN
GND
+5V
GPS_EN
GPS_3.3V
C20
1uF
C24
1uF
GPS_RESET
GPS_RESET_PIN
4.7K
R20
47K
R21
Q2
BC846
C25
10uF
C27
100nF
GPS_TIMER
RESERVED
RESERVED
RESERVED
VCC
V_BCKP
TXD1
RXD1
1PPS
RESET
GND
L80-R
U8
USART3_RX
USART3_TX
GPS_IPPS
GPS_RESET
D7
RB520S30T1G RECOMMEDED FOR SCHOTTKY DIODE
D_Schottky_Small
R23
1K
GPS_VBCKP
BACK UP POWER FOR
L80 MODULE FROM COIN CELL
ENABLES LOW POWER BACKUP MODES
REDUCING POWER CONSUMPTION
BT3
MS621FE-FL11E
C35
4.7uF
C36
100nF
R28
1K
D11
LED_RED
environmental sensors
BME280
U12
GND
VDDIO
VDD
CSB
SDI
SCK
SDO
SDA
SCL
C41
100nF
C42
100nF
RAK11720 LORAWAN MCU
U6
MOSI_RAK
MISO_RAK
CLK_RAK
NSS_RAK
GP7/SPI0_MOSI
GP26/SPI0_MISO
GP5/SPI0_CLK
GP1/SPI0_NSS
LORA_RF
GND
GP25/I2C2_SDA
GP27/I2C2_SCL
GP20/SWDCK
GP21/SWDIO
GP45
GP40/UART0_RX
GP39/UART0_TX
GP44/UART1_TX
GP43/UART1_RX
BLE_RF
GP13/ADC8
GP33/ADC5
GP38
GP44
GP37
GP31/ADC3
GP32/ADC4
GP36
RST
VDD
SWDCLK_RAK
SWDIO_RAK
STATUS_LED_2
RAK11720_UART0_RX
RAK11720_UART0_TX
RAK11720_UART1_TX
RAK11720_UART1_RX
STATUS_LED_1
RAK11720_RST
R17
10K
C18
100nF
C26
10uF
C28
100nF
RAK11720 Serial programing port
J4
USB_B_Micro
D8
D_Schottky_Small_Filled
VUSB
C30
100nF
C34
100nF
R24
22
R25
22
RAK11720_UART1_RX
RAK11720_UART1_TX
R232
V3
VCC
TXD
RXD
UD+
UD-
XI
XO
CTS
DSR
RI
DCD
DTR
RTS
U9
CH340G
DUAL PMS5003 SENSORS WITH INDIVIDUAL SET PINS CONTROL
NC
RESET
TX
RX
SET
GND
VCC
J5
J6
PM_SENSOR_RESET
UART4_RX
UART4_TX
PM_SENSOR1_SET
PM_SENSOR2_RESET
UART5_RX
UART5_TX
PM_SENSOR2_SET
R31
10K
R32
10K
R33
10K
PM_SENSOR1_SET
PM_SENSOR2_SET