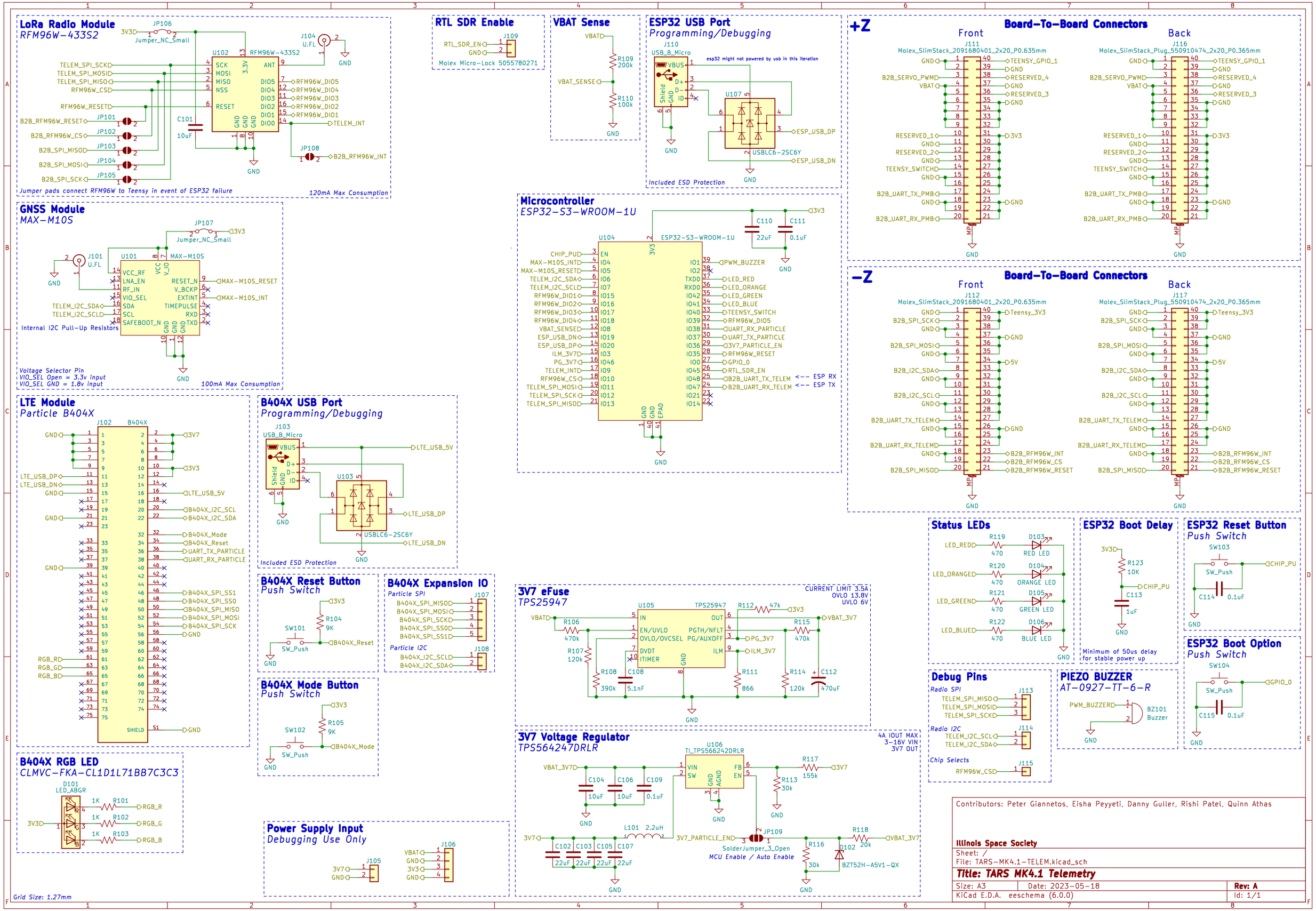
LoRa Radio Module
RFM96W-433S2
JP106
Jumper_NC_Small
U102
RFM96W-433S2
J104
U.FL
TELEM_SPI_SCK
TELEM_SPI_MOSI
TELEM_SPI_MISO
RFM96W_CS
RFM96W_RESET
B2B_RFM96W_RESET
B2B_RFM96W_CS
B2B_SPI_MISO
B2B_SPI_MOSI
B2B_SPI_SCK
JP101
JP102
JP103
JP104
JP105
C101
10uF
JP108
B2B_RFM96W_INT
TELEM_INT
Jumper pads connect RFM96W to Teensy in event of ESP32 failure
120mA Max Consumption
RTL SDR Enable
J109
RTL_SDR_EN
Molex Micro-Lock 5055780271
VBAT Sense
VBAT
R109 200k
VBAT_SENSE
R110 100k
ESP32 USB Port
Programming/Debugging
J110
USB_B_Micro
esp32 might not powered by usb in this iteration
U107
USBLC6-2SC6Y
ESP_USB_DP
ESP_USB_DN
Included ESD Protection
+Z
Board-To-Board Connectors
Front
J111
Molex_SlimStack_2091680401_2x20_P0.635mm
Back
J116
Molex_SlimStack_Plug_550910474_2x20_P0.365mm
GNSS Module
MAX-M10S
JP107
Jumper_NC_Small
J101
U.FL
U101
MAX-M10S
Internal I2C Pull-Up Resistors
Voltage Selector Pin
VIO_SEL Open = 3.3v input
VIO_SEL GND = 1.8v input
100mA Max Consumption
Microcontroller
ESP32-S3-WROOM-1U
U104
C110
22uF
C111
0.1uF
PWM_BUZZER
LED_RED
LED_ORANGE
LED_GREEN
LED_BLUE
TEENSY_SWITCH
RFM96W_DIO5
UART_RX_PARTICLE
UART_TX_PARTICLE
3V7_PARTICLE_EN
RFM96W_RESET
GPIO_0
RTL_SDR_EN
B2B_UART_TX_TELEM <-- ESP RX
B2B_UART_RX_TELEM <-- ESP TX
-Z
Board-To-Board Connectors
Front
J112
Molex_SlimStack_2091680401_2x20_P0.635mm
Back
J117
Molex_SlimStack_Plug_550910474_2x20_P0.365mm
LTE Module
Particle B404X
J102
B404X
B404X USB Port
Programming/Debugging
J103
USB_B_Micro
U103
USBLC6-2SC6Y
LTE_USB_5V
LTE_USB_DP
LTE_USB_DN
Included ESD Protection
B404X Reset Button
Push Switch
SW101
SW_Push
R104 9K
B404X_Reset
B404X Expansion IO
Particle SPI
J107
Particle I2C
J108
B404X Mode Button
Push Switch
SW102
R105 9K
B404X_Mode
3V7 eFuse
TPS25947
U105
CURRENT LIMIT 3.5A
OVLO 13.8V
UVLO 6V
3V7 Voltage Regulator
TPS564247DRLR
U106
TI_TPS566242DRLR
4A IOUT MAX
3-16V VIN
3V7 OUT
JP109
SolderJumper_3_Open
MCU Enable / Auto Enable
BZT52H-A5V1-QX
Status LEDs
RED LED
ORANGE LED
GREEN LED
BLUE LED
ESP32 Boot Delay
R123 10K
C113 1uF
Minimum of 50us delay for stable power up
ESP32 Reset Button
Push Switch
SW103
CHIP_PU
ESP32 Boot Option
Push Switch
SW104
GPIO_0
Debug Pins
Radio SPI
J113
Radio I2C
J114
Chip Selects
J115
PIEZO BUZZER
AT-0927-TT-6-R
BZ101 Buzzer
B404X RGB LED
CLMVC-FKA-CL1D1L71BB7C3C3
D101
LED_ABGR
RGB_R
RGB_G
RGB_B
Power Supply Input
Debugging Use Only
J105
J106
Grid Size: 1.27mm
Contributors: Peter Giannetos, Eisha Peyyeti, Danny Guller, Rishi Patel, Quinn Athas
Illinois Space Society
Sheet: /
File: TARS-MK4.1-TELEM.kicad_sch
Title: TARS MK4.1 Telemetry
Size: A3
Date: 2023-05-18
Rev: A
KiCad E.D.A. eeschema (6.0.0)
Id: 1/1