USB Connector and ESD Protection

J1
USB_B_Micro
+5V

VBUS 1
D+ 3 USB_CONN_D+
D- 2 USB_CONN_D-
ID 4
Shield 6 5 GND
GND

U2
USBLC6-2SC6
USB_CONN_D+ 6 4 USB_CONN_D-
USB_D+ 1 3 USB_D-
+5V
GND

3V3 Regulator

max. 200mA @ 3V3

+5V
F1 100mA
FB1 100 @ 100MHz

U1
XC6206P332MR
VI 3 VO 2 +3V3
GND 1
C1 10u
C2 10u
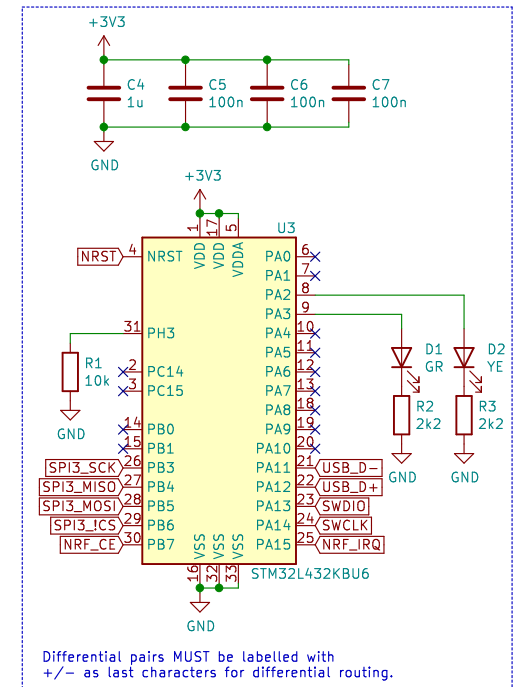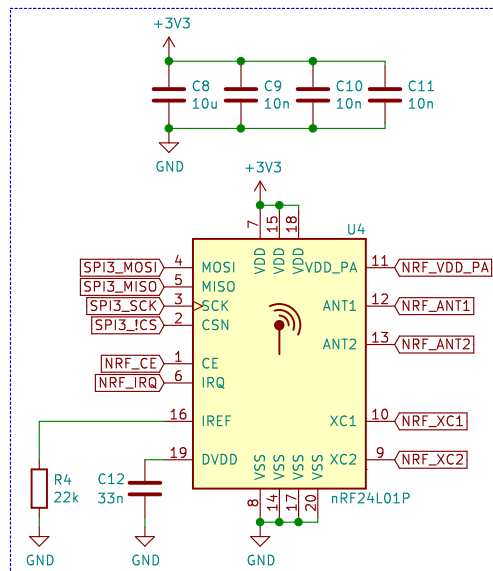GND
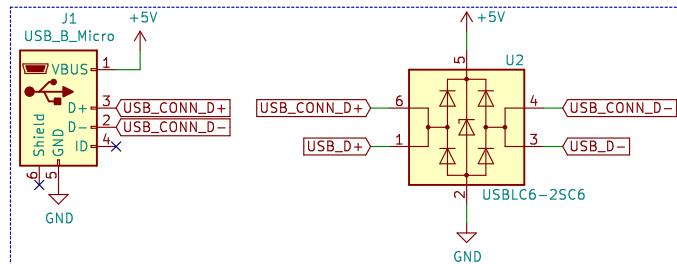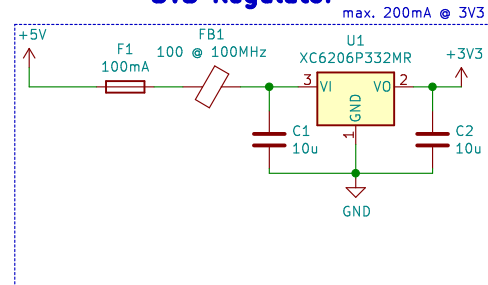
Not reverse polarity protection not required STM32 is
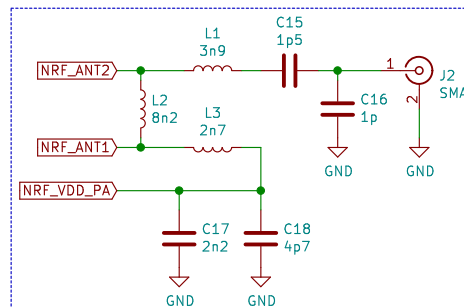powered with USB connector, So the polarity will be correct.

Microcontroller

+3V3
C4 1u   C5 100n   C6 100n   C7 100n
GND

+3V3

U3
STM32L432KBU6

NRST 4 NRST
VDD 1
VDD 17
VDDA 5
PH3 31

R1 10k
PC14 2
PC15 3
GND

PA0 6
PA1 7
PA2 8
PA3 9
PA4 10
PA5 11
PA6 12
PA7 13
PA8 18
PA9 19
PA10 20
PA11 21 USB_D-
PA12 22 USB_D+
PA13 23 SWDIO
PA14 24 SWCLK
PA15 25 NRF_IRQ

PB0 14
PB1 15
PB3 26 SPI3_SCK
PB4 27 SPI3_MISO
PB5 28 SPI3_MOSI
PB6 29 SPI3_!CS
PB7 30 NRF_CE

VSS 16
VSS 32
VSS 33
GND

D1 GR   D2 YE
R2 2k2   R3 2k2
GND   GND

Differential pairs MUST be labelled with
+/- as last characters for differential routing.

STM32 MCU has internal USB pull-up resistors. (AN4879)

NRF24 Transceiver

+3V3
C8 10u   C9 10n   C10 10n   C11 10n
GND

+3V3

U4
nRF24L01P

SPI3_MOSI 4 MOSI
SPI3_MISO 5 MISO
SPI3_SCK 3 SCK
SPI3_!CS 2 CSN
NRF_CE 1 CE
NRF_IRQ 6 IRQ

VDD 7
VDD 15
VDD 18
VDD_PA 11 NRF_VDD_PA
ANT1 12 NRF_ANT1
ANT2 13 NRF_ANT2
IREF 16
XC1 10 NRF_XC1
XC2 9 NRF_XC2
DVDD 19

VSS 8
VSS 14
VSS 17
VSS 20

R4 22k
C12 33n
GND   GND   GND

Antenna Impedance Matching and SMA Connector

L1 3n9   C15 1p5
NRF_ANT2
L2 8n2   L3 2n7
NRF_ANT1
NRF_VDD_PA
C16 1p
C17 2n2   C18 4p7
GND   GND

J2 SMA
1
2
GND
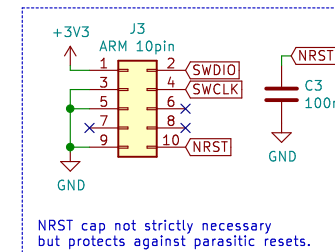
Route as 50 Ohm controlled impedance traces.
Follow datasheet regarding layout.
Passive antenna.

Crystal Oscillator

R5 1M
NRF_XC1   NRF_XC2
Y1 16MHz
C13 12p   C14 12p
GND
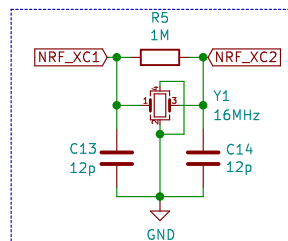
Load caps: C = 2 * (Cload - Cstray)

SWD Connector

J3
ARM 10pin
+3V3
1 2 SWDIO
3 4 SWCLK
5 6
7 8
9 10 NRST
GND

NRST
C3 100n
GND

NRST cap not strictly necessary
but protects against parasitic resets.

Yaswanth Chalamalasetti
Sheet: /
File: STM32-nRF24.sch
Title: STM32-nRF24 Development Board
Size: A4   Date: Rev: Rev. A
KiCad E.D.A. kicad (5.1.9)-1   Id: 1/1