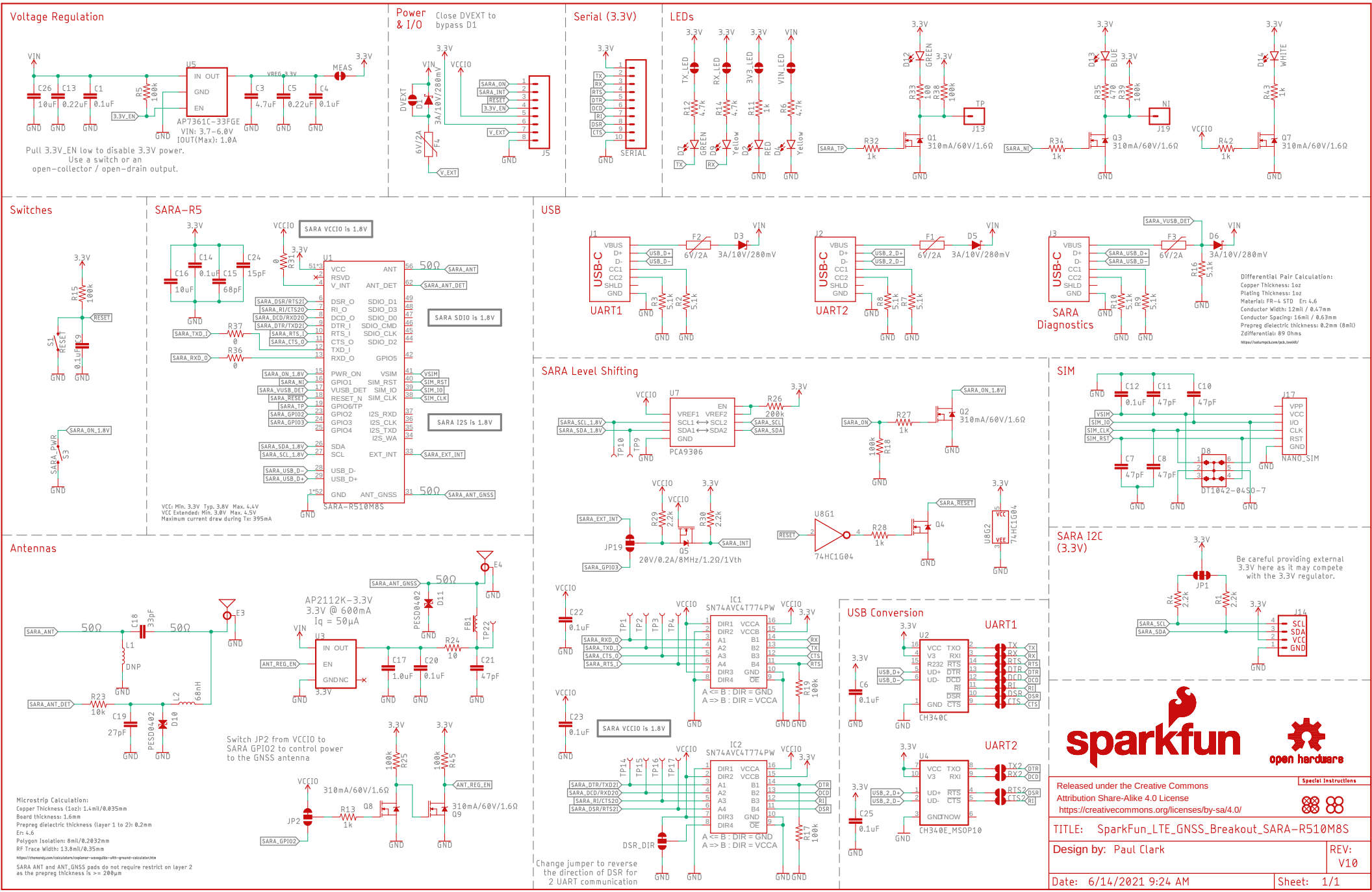
Voltage Regulation
Power & I/O
Close DVEXT to bypass D1
Serial (3.3V)
LEDs
Switches
SARA-R5
USB
SARA Level Shifting
SIM
SARA I2C (3.3V)
Antennas
USB Conversion
Pull 3.3V_EN low to disable 3.3V power. Use a switch or an open-collector / open-drain output.
AP7361C-33FGE
VIN: 3.7-6.0V
IOUT(Max): 1.0A
SARA VCCIO is 1.8V
SARA SDIO is 1.8V
SARA I2S is 1.8V
SARA-R510M8S
VCC: Min. 3.3V Typ. 3.8V Max. 4.4V
VCC Extended: Min. 3.0V Max. 4.5V
Maximum current draw during Tx: 395mA
UART1
UART2
SARA Diagnostics
Differential Pair Calculation:
Copper Thickness: 1oz
Plating Thickness: 1oz
Material: FR-4 STD Er: 4.6
Conductor Width: 12mil / 0.47mm
Conductor Spacing: 16mil / 0.63mm
Prepreg dielectric thickness: 0.2mm (8mil)
Zdifferential: 89 Ohms
PCA9306
SN74AVC4T774PW
74HC1G04
CH340C
CH340E_MSOP10
NANO_SIM
AP2112K-3.3V
3.3V @ 600mA
Iq = 50µA
Switch JP2 from VCCIO to SARA GPIO2 to control power to the GNSS antenna
Change jumper to reverse the direction of DSR for 2 UART communication
Be careful providing external 3.3V here as it may compete with the 3.3V regulator.
Microstrip Calculation:
Copper Thickness (1oz): 1.4mil/0.035mm
Board thickness: 1.6mm
Prepreg dielectric thickness (layer 1 to 2): 0.2mm
Er: 4.6
Polygon Isolation: 8mil/0.2032mm
RF Trace Width: 13.8mil/0.35mm
https://chemandy.com/calculators/coplanar-waveguide-with-ground-calculator.htm
SARA ANT and ANT_GNSS pads do not require restrict on layer 2 as the prepreg thickness is >= 200µm
sparkfun
open hardware
Special Instructions
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TITLE: SparkFun_LTE_GNSS_Breakout_SARA-R510M8S
Design by: Paul Clark
REV: V10
Date: 6/14/2021 9:24 AM
Sheet: 1/1