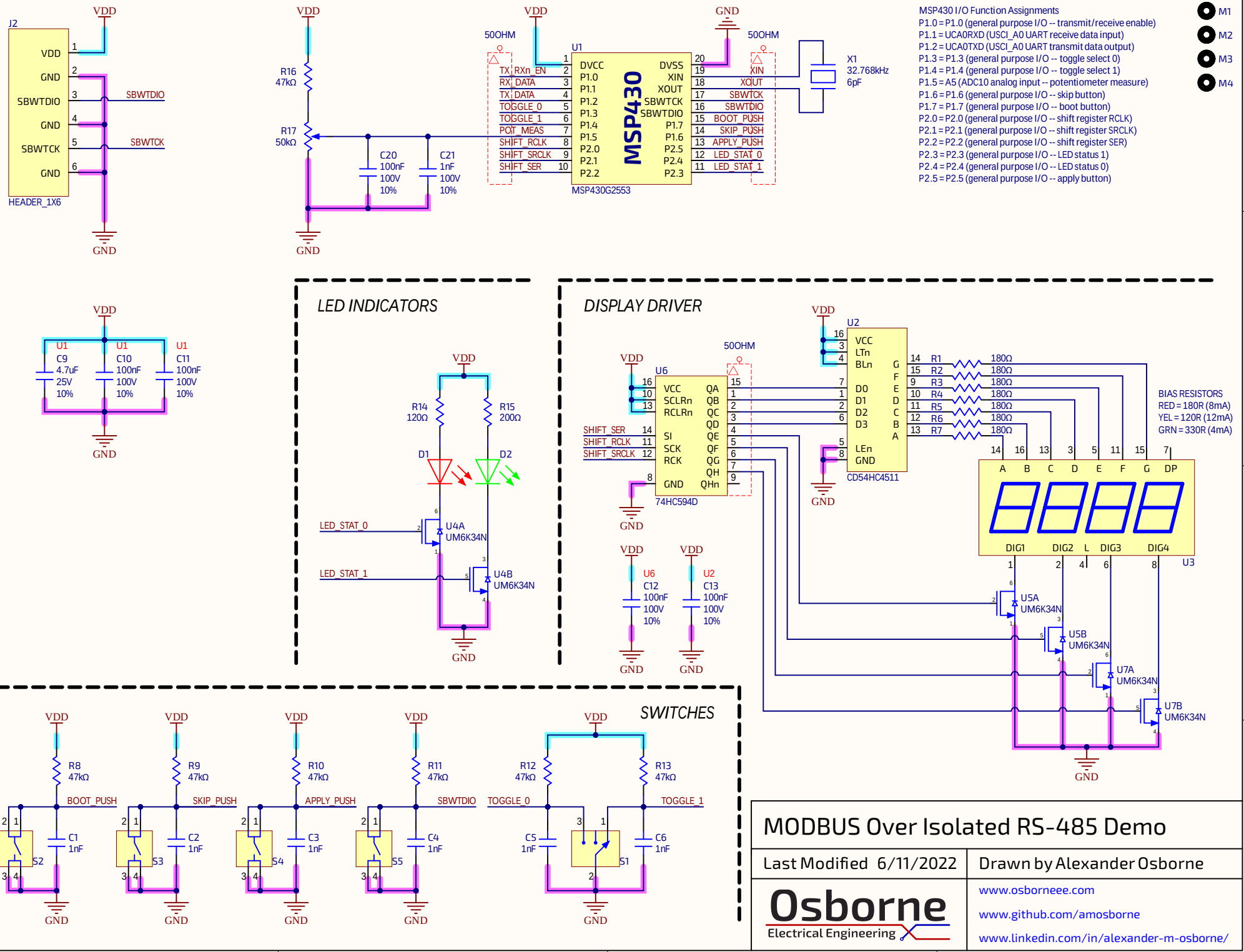
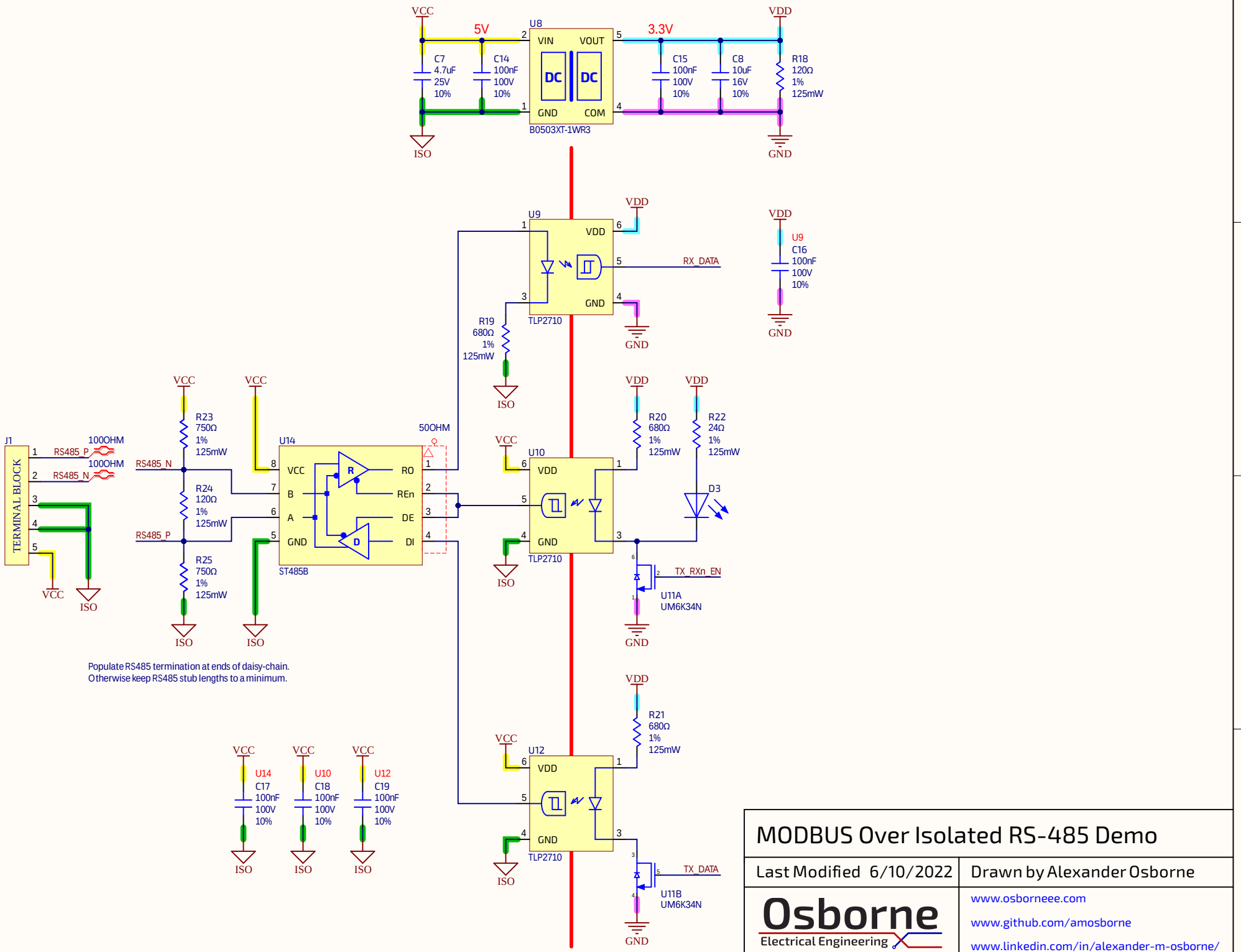



# MODBUS Over Isolated RS-485 Demo

| Last Modified 6/11/2022 | Drawn by Alexander Osborne |
|---|---|
| Osborne Electrical Engineering | www.osborneee.com<br>www.github.com/amosborne<br>www.linkedin.com/in/alexander-m-osborne/ |




# MODBUS Over Isolated RS-485 Demo

Last Modified 6/10/2022

Drawn by Alexander Osborne

Osborne Electrical Engineering

www.osborneee.com

www.github.com/amosborne

www.linkedin.com/in/alexander-m-osborne/

| Line # | Description | Designator | Quantity | Manufacturer 1 | Manufacturer Part Number 1 |
|---|---|---|---|---|---|
| 1 | USB-to-Optical Isolated RS-422/485 Adapter | | 1 | usbgear | USBG-COMi-SI-M |
| 2 | CAP, CER, 1nF ±10%, 100V, 0805 | C1, C2, C3, C4, C5, C6, C21 | 7 | Wurth Electronics | 885012207116 |
| 3 | CAP, CER, 4.7uF ±10%, 25V, 0805 | C7, C9 | 2 | Samsung | CL21B475KAFNNNE |
| 4 | CAP, CER, 10uF ±10%, 16V, 0805 | C8 | 1 | Samsung | CL21B106KOQNNNE |
| 5 | CAP, CER, 100nF ±10%, 100V, 0805 | C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20 | 11 | Wurth Electronics | 885012207128 |
| 6 | Red LED Indicator 0805 | D1 | 1 | Wurth Electronics | 150080RS75000 |
| 7 | Green LED Indicator 0805 | D2 | 1 | Wurth Electronics | 150080GS75000 |
| 8 | Blue LED Indicator 0805 | D3 | 1 | Wurth Electronics | 150080BS75000 |
| 9 | Screw Terminal Block, 5-Position | J1 | 1 | | |
| 10 | Header, 1-Row, 6-Position | J2 | 1 | | |
| 11 | RES, 180Ω ±1.00%, 125mW, 0805 | R1, R2, R3, R4, R5, R6, R7 | 7 | Yageo | RT0805FRE07180RL |
| 12 | RES, 47.0kΩ ±1.00%, 125mW, 0805 | R8, R9, R10, R11, R12, R13, R16 | 7 | TE Connectivity | CRGCQ0805F47K |
| 13 | RES, 120Ω ±1.00%, 125mW, 0805 | R14, R18, R24 | 3 | TE Connectivity | CRGCQ0805F120R |
| 14 | RES, 200Ω ±1.00%, 125mW, 0805 | R15 | 1 | Yageo | RT0805FRE07200RL |
| 15 | 50kOhm Thumbwheel Potentiometer | R17 | 1 | Bourns | 3352T-1-503LF |
| 16 | RES, 680Ω ±1.00%, 125mW, 0805 | R19, R20, R21 | 3 | Stackpole Electronics | RMCF0805FT680R |
| 17 | RES, 24Ω ±1.00%, 125mW, 0805 | R22 | 1 | Vishay | CRCW080524R0FKEA |
| 18 | RES, 750Ω ±1.00%, 125mW, 0805 | R23, R25 | 2 | Yageo | RT0805FRE07750RL |
| 19 | SPDT Toggle Switch, On-Off-On, Through Hole | S1 | 1 | CIT Relay & Switch | AST13SNCQ |
| 20 | PTS647 Series Tactile Switch | S2, S3, S4, S5 | 4 | ITT C&K | PTS647SN70SMTR2LFS |
| 21 | MSP430 16-BIT, 16KB FLASH, 20-TSSOP | U1 | 1 | Texas Instruments | MSP430G2553IPW20R |
| 22 | BCD Decoder, 7-Segment Display Driver | U2 | 1 | Texas Instruments | CD74HC4511MT |
| 23 | Quad 7-Segment Display, Common Cathode | U3 | 1 | Vishay Lite-On | LTC-4727JR |
| 24 | NCH+NCH 50V 200mA Small Signal MOSFET | U4, U5, U7, U11 | 4 | Rohm | UM6K34NTCN |
| 25 | Shift Register, 8-Bit | U6 | 1 | Toshiba | 74HC594D |
| 26 | Isolated DC/DC, 5Vin, 3.3Vout, 300mA | U8 | 1 | MORNSUN | B0503XT-1WR3 |
| 27 | Logic Output Optoisolator 5MBd | U9, U10, U12 | 3 | Toshiba | TLP2710(TP4,E |
| 28 | 1/1 RS485 Transceiver, Half-Duplex | U14 | 1 | STMicroelectronics | ST485BDR |
| 29 | 32.768kHz Tuning Fork Crystal, 6pF | X1 | 1 | Wurth Electronics | 830014219B |