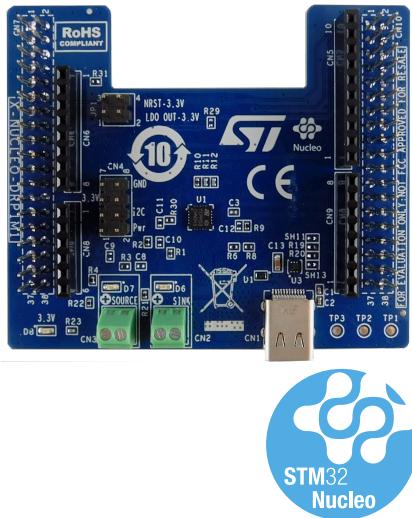


### USB Type-C™ Power Delivery dual role power (DRP) and dual role data (DRD) expansion board based on TCPP03-M20 for STM32 Nucleo



#### Features

- Support for all USB Type-C™ Power Delivery SPR profiles up to 100 W
- Management of Dual Role Data/Power configuration
- USB 2.0 Dual Role Data compliant according to STM32 USB data capability
- 8/20  $\mu$ s surge, overvoltage, overcurrent protection and discharge for V<sub>BUS</sub>
- Short to V<sub>BUS</sub> protection for CC1 and CC2 configuration channel pins
- ESD protection (IEC61000-4-2 level 4  $\pm$  8 kV contact discharge) for CC1, CC2, D+ and D-
- Overshoot, overcurrent protection and discharge for V<sub>CONN</sub>
- Common mode filter on D+/D- data lines
- Three power modes to optimize current consumption
- Compliant with Programmable Power Supplies (PPS)
- Free comprehensive development firmware library
- Compliant with STM32 Nucleo-64 boards featuring an STM32 with UCPD
- USB-IF certified (test ID certification: 6408)

#### Description

The X-NUCLEO-DRP1M1 expansion board allows evaluating the features of TCPP03-M20 and the USB Type-C™ features and protections required for V<sub>BUS</sub> and CC lines suitable for dual role power (DRP) applications.

The expansion board can be stacked on top of any STM32 Nucleo-64 with Power Delivery (UCPD) peripheral embedded in their microcontrollers.

The X-NUCLEO-DRP1M1 effectively demonstrates the dead battery and Sink operation, thanks to the integrated ST715PU33R LDO linear regulator that supplies the connected STM32 Nucleo development board. It also demonstrates USB Type-C™ Source operation when a compatible external Source is connected to the board.

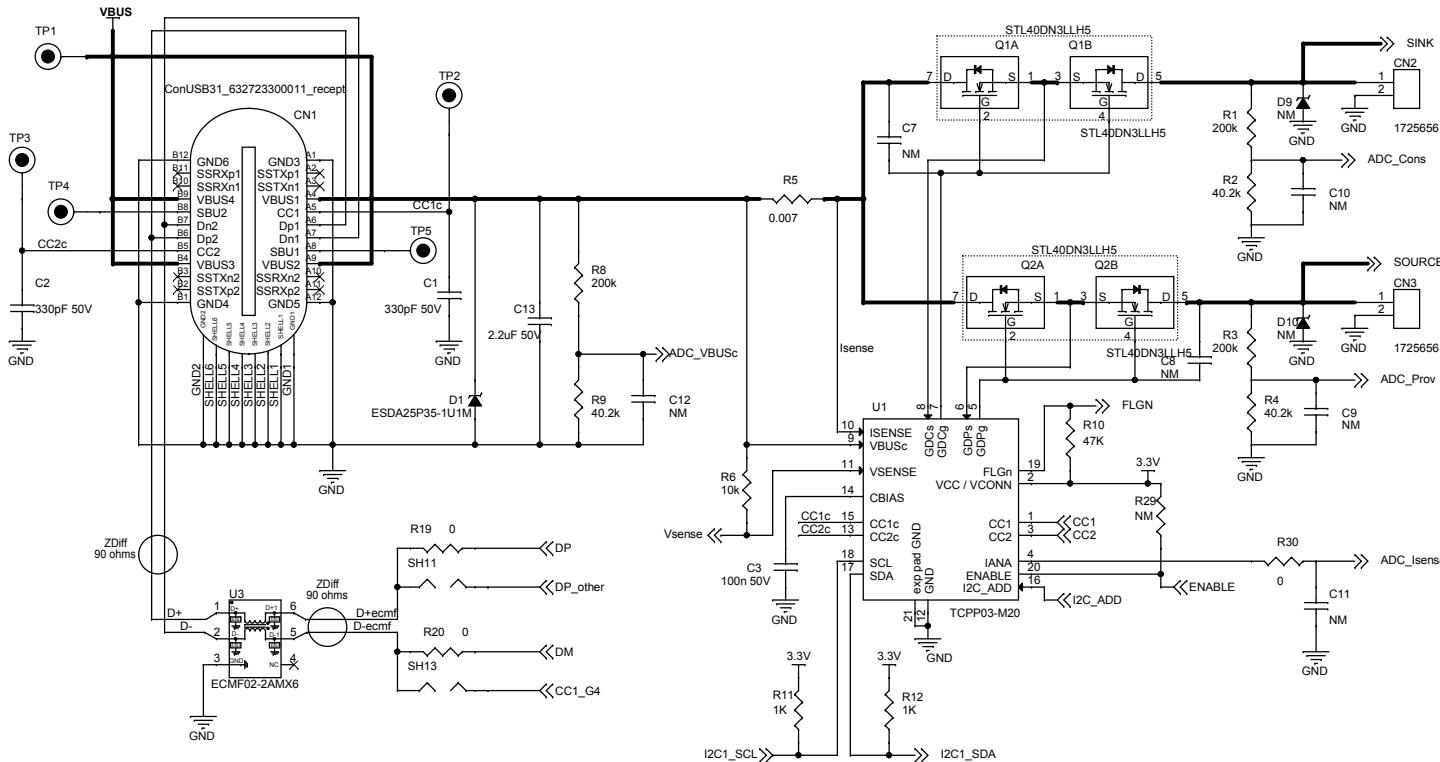
Moreover, the expansion board allows Dual Role Data functionalities for sourcing devices.

The X-NUCLEO-DRP1M1 is compliant with the USB Type-C™ and Power Delivery specifications 3.1 standard power range (SPR) and is USB-IF certified as a 100 W DRP solution supporting programmable power supply (PPS).

The companion software package (X-CUBE-TCPP) contains the application examples for development boards embedding UCPD-based microcontrollers (NUCLEO-G071RB and NUCLEO-G474RE) that can be ported to other development boards embedding UCPD-based microcontrollers (for example, NUCLEO-G0B1RE).

| Product summary  |                               |
|--|-------------------------------|
| USB Type-C power delivery dual role power (DRP) and dual role data (DRD) expansion board based on TCPP03-M20 | X-NUCLEO-DRP1M1               |
| USB Type-C power delivery sink software expansion for STM32Cube  | X-CUBE-TCPP                   |
| STM32 Nucleo-64 development board with STM32G071RB MCU   | NUCLEO-G071RB                 |
| Applications   | USB Type C and Power Delivery |

Figure 1. X-NUCLEO-DRP1M1 schematic diagram (1 of 3)



**Figure 2. X-NUCLEO-DRP1M1 schematic diagram (2 of 3)**

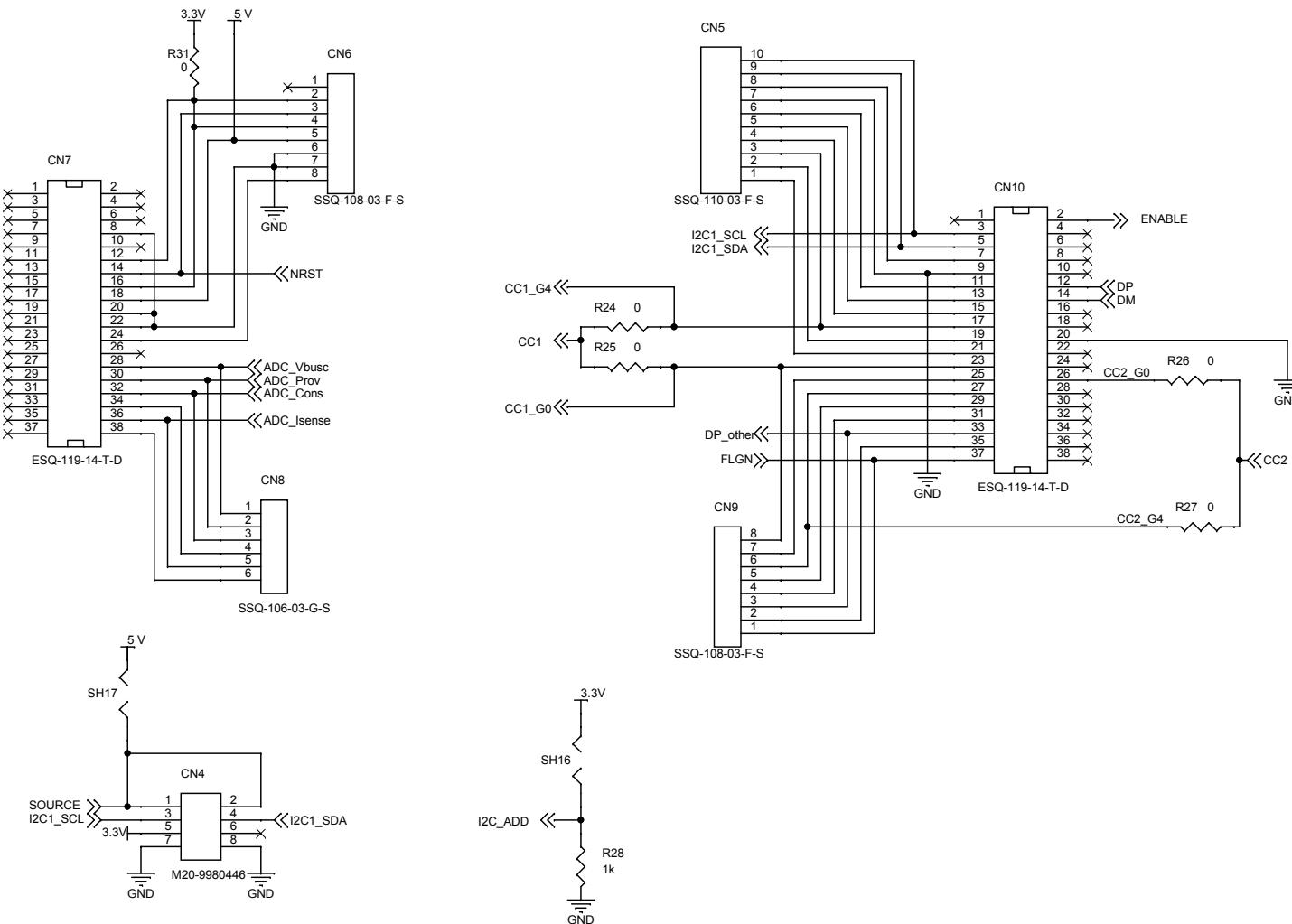
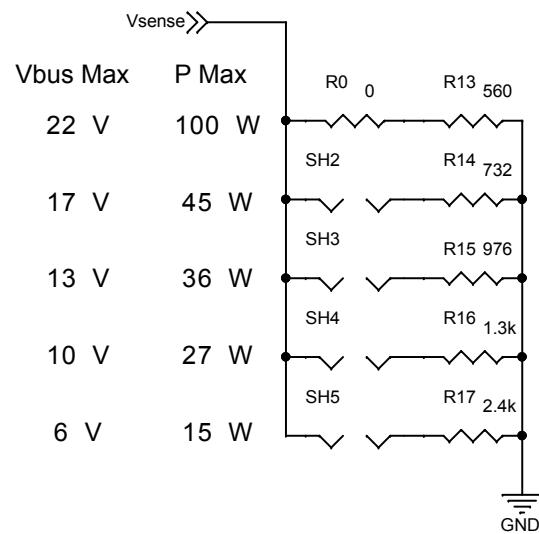
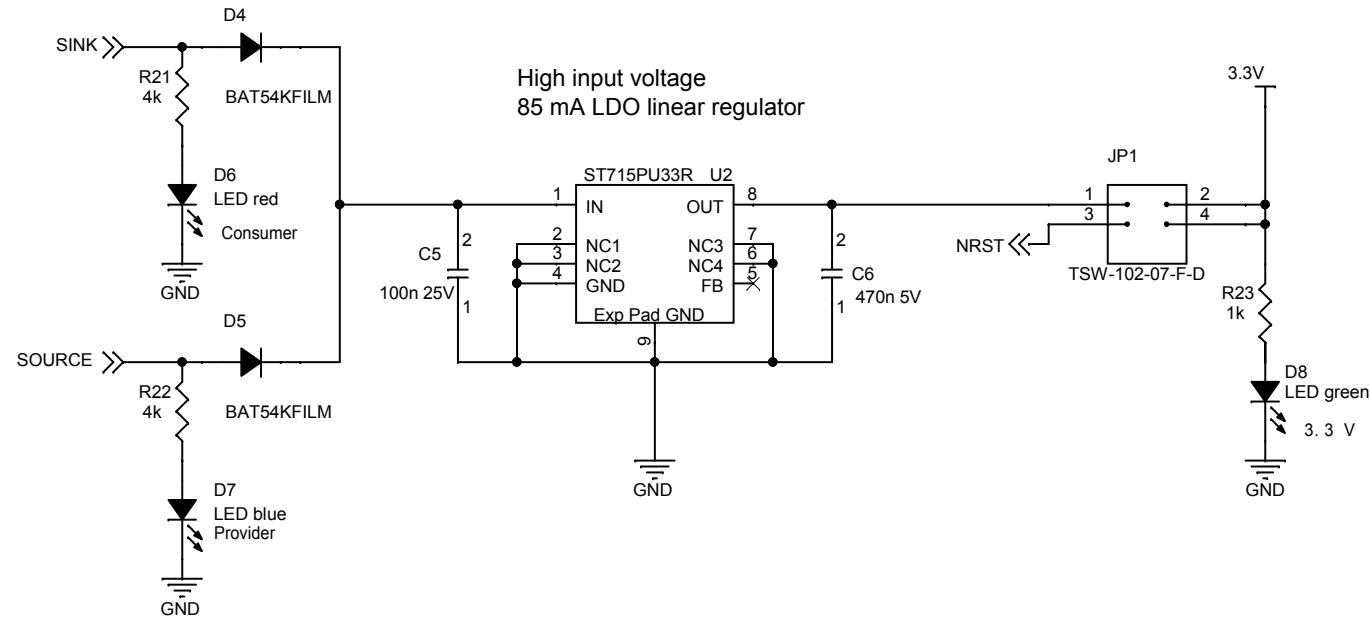


Figure 3. X-NUCLEO-DRP1M1 schematic diagram (3 of 3)



## Revision history

**Table 1. Document revision history**

| Date        | Revision | Changes                         |
|-------------|----------|---------------------------------|
| 11-Jul-2021 | 1        | Initial release.                |
| 18-Feb-2022 | 2        | Updated cover page description. |
| 09-May-2022 | 3        | Updated cover page features.    |

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