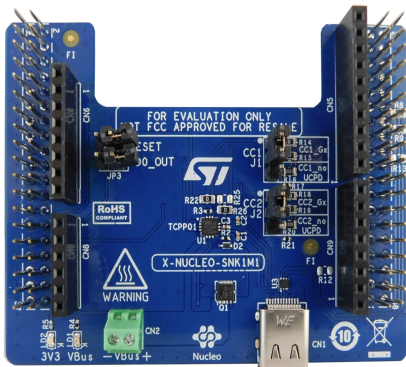


## USB Type-C™ Power Delivery Sink expansion board based on TCPP01-M12 for STM32 Nucleo



### Features

- On-board TCPP01-M12 protection for USB Type-C and PD Sink applications
- Compliant with the latest USB Type-C and Power delivery specification, including the Programmable Power Supply (PPS) feature
- USB-IF certified (Test ID certification: 5205)
- 100 W-rated solution
- 6 V overvoltage protection (OVP) on CC lines against short-to-V<sub>BUS</sub> when the connector is unplugged
- Up to 22 V adjustable overvoltage protection (OVP) on V<sub>BUS</sub> line against charger failure
- Surge protection (8/20 μs) and system-level ESD protection on V<sub>BUS</sub>
- Common mode filter and ESD protection on USB 2.0 High Speed data lines
- System level ESD protection on CC lines as per IEC61000-4-2 level 4 (±8 kV contact discharge)
- Low power mode for battery operation allowing zero current consumption when no cable is attached
- Integrated dead battery management when the device battery is fully depleted
- Overtemperature protection (OTP)
- RoHS compliant

### Description

The X-NUCLEO-SNK1M1 expansion board allows evaluating the features of TCPP01-M12 and the USB Type-C overvoltage protection for V<sub>BUS</sub> and CC lines suitable for Sink applications.

The expansion board is designed to be stacked on top of any STM32 Nucleo-64 development board exploiting the characteristics of the USB Type-C and Power Delivery (UCPD) peripheral embedded in their microcontrollers.

It can also be stacked on other STM32 Nucleo development boards not supporting the UCPD peripheral to demonstrate the Type-C basic operations (attach, detach and power supply current capability recognition).

The X-NUCLEO-SNK1M1 provides an effective demonstration of the dead battery operation, thanks to the integrated ST715PU33R LDO linear regulator that supplies the connected STM32 Nucleo development board when a Source is attached via a USB Type-C connector.

The X-NUCLEO-SNK1M1 is compliant with the latest USB Type-C and Power Delivery specifications and is also USB-IF certified as a 100 W solution supporting Programmable Power Supply (PPS) function.

The companion software package (X-CUBE-TCPP) contains the application examples for development boards embedding UCPD-based microcontrollers (NUCLEO-G071RB, NUCLEO-G474RE and NUCLEO-G0B1RE) and for non-UCPD ones (NUCLEO-L412RB-P).

Product summary	
USB Type-C™ Power Delivery Sink expansion board based on TCPP01-M12 for STM32 Nucleo	X-NUCLEO-SNK1M1
USB Type-C software expansion for STM32Cube	X-CUBE-TCPP
USB Type-C™ port protection	TCPP01-M12
STM32 Nucleo-64 development boards with STM32G071RB/ STM32G474RE/ STM32G0B1RE/ STM32L412RB MCUs	NUCLEO-G071RB/ NUCLEO-G474RE/ NUCLEO-G0B1RE/ NUCLEO-L412RB-P
Applications	USB Type-C and Power Delivery

# 1 Schematic diagrams

Figure 1. X-NUCLEO-SNK1M1 circuit schematic (1 of 2)

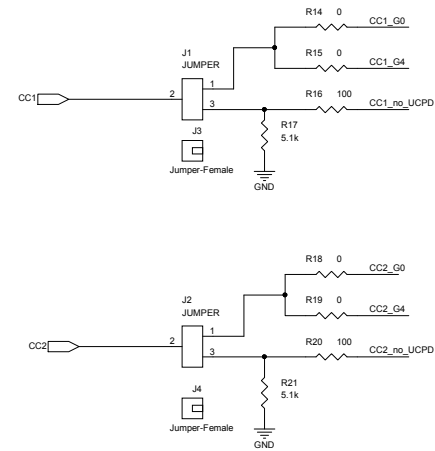
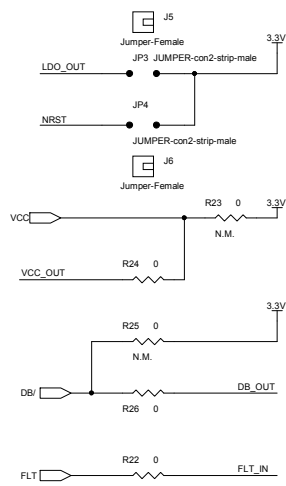
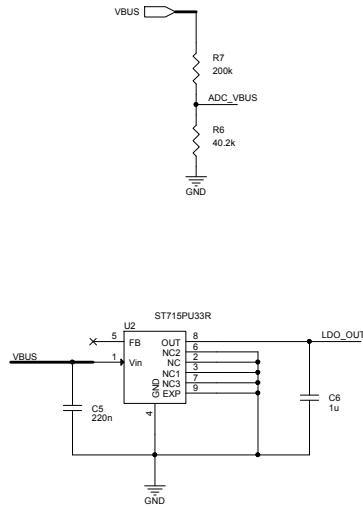
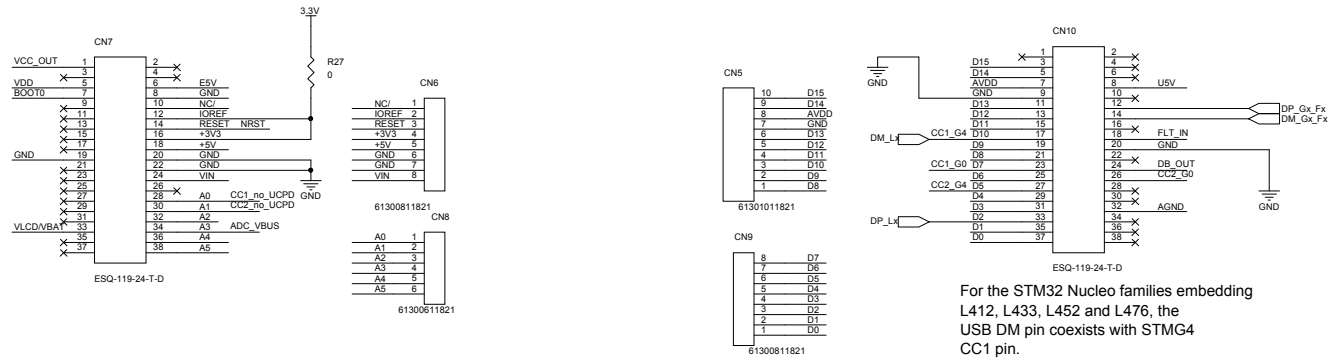
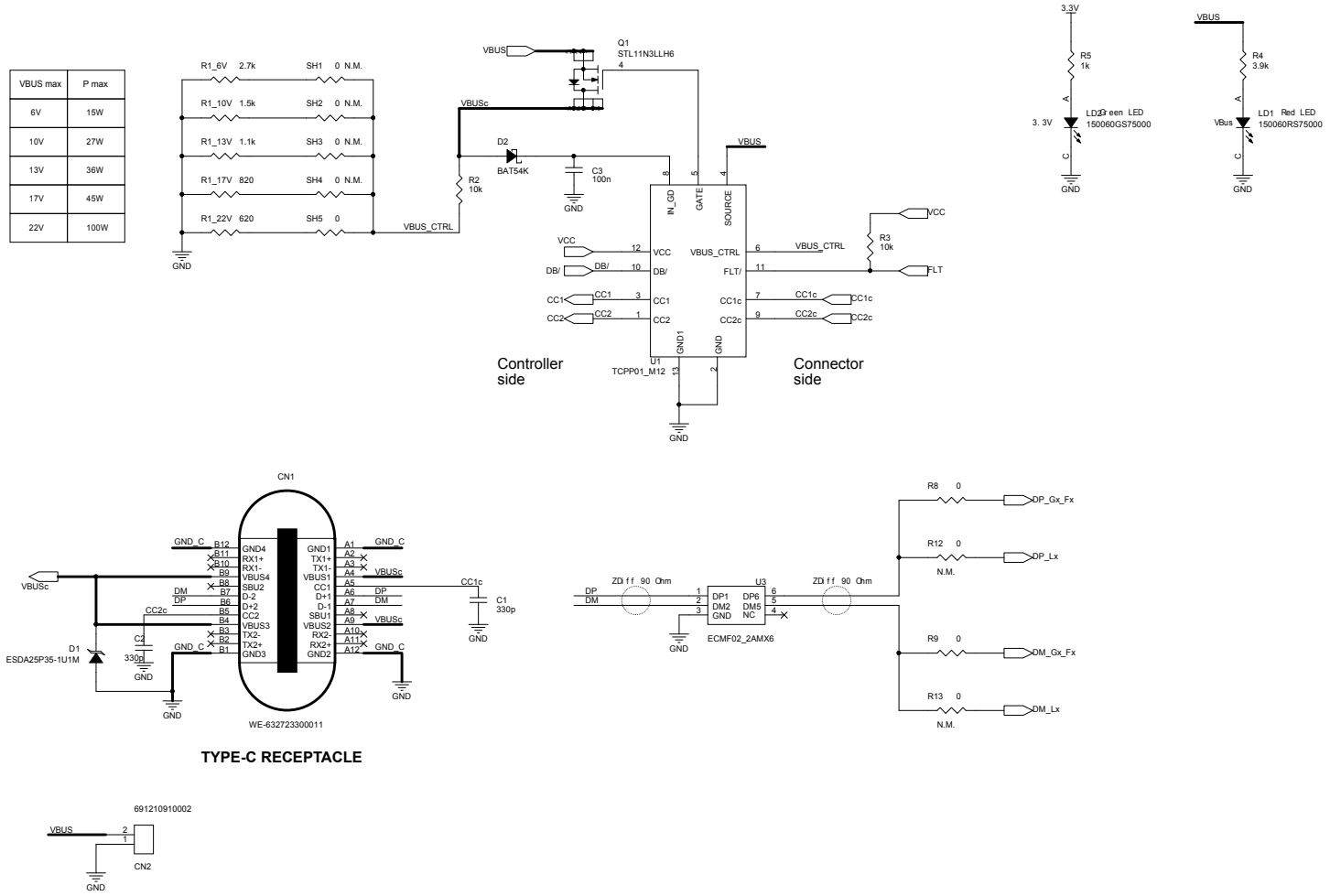


Figure 2. X-NUCLEO-SNK1M1 circuit schematic (2 of 2)



## Revision history

**Table 1. Document revision history**

Date	Version	Changes
15-Mar-2021	1	Initial release.
06-Apr-2021	2	Added NUCLEO-G0B1RE development board compatibility information.
07-Mar-2022	3	Updated <a href="#">Section 1</a> Schematic diagrams.