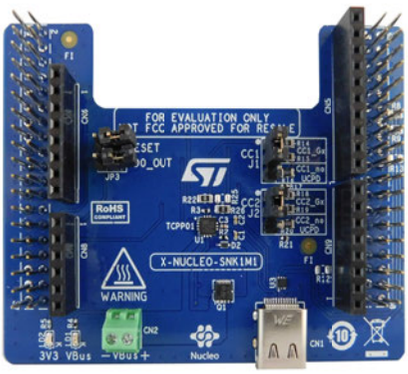
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X-NUCLEO-SNK1M1

Data brief

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_{BUS} when the connector is unplugged
- Up to 22 V adjustable overvoltage protection (OVP) on V_{BUS} line against charger failure
- Surge protection (8/20 µs) and system-level ESD protection on V_{BUS}
- 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

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

Description

The X-NUCLEO-SNK1M1 expansion board allows evaluating the features of TCPP01-M12 and the USB Type-C overvoltage protection for V_{BUS} 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.

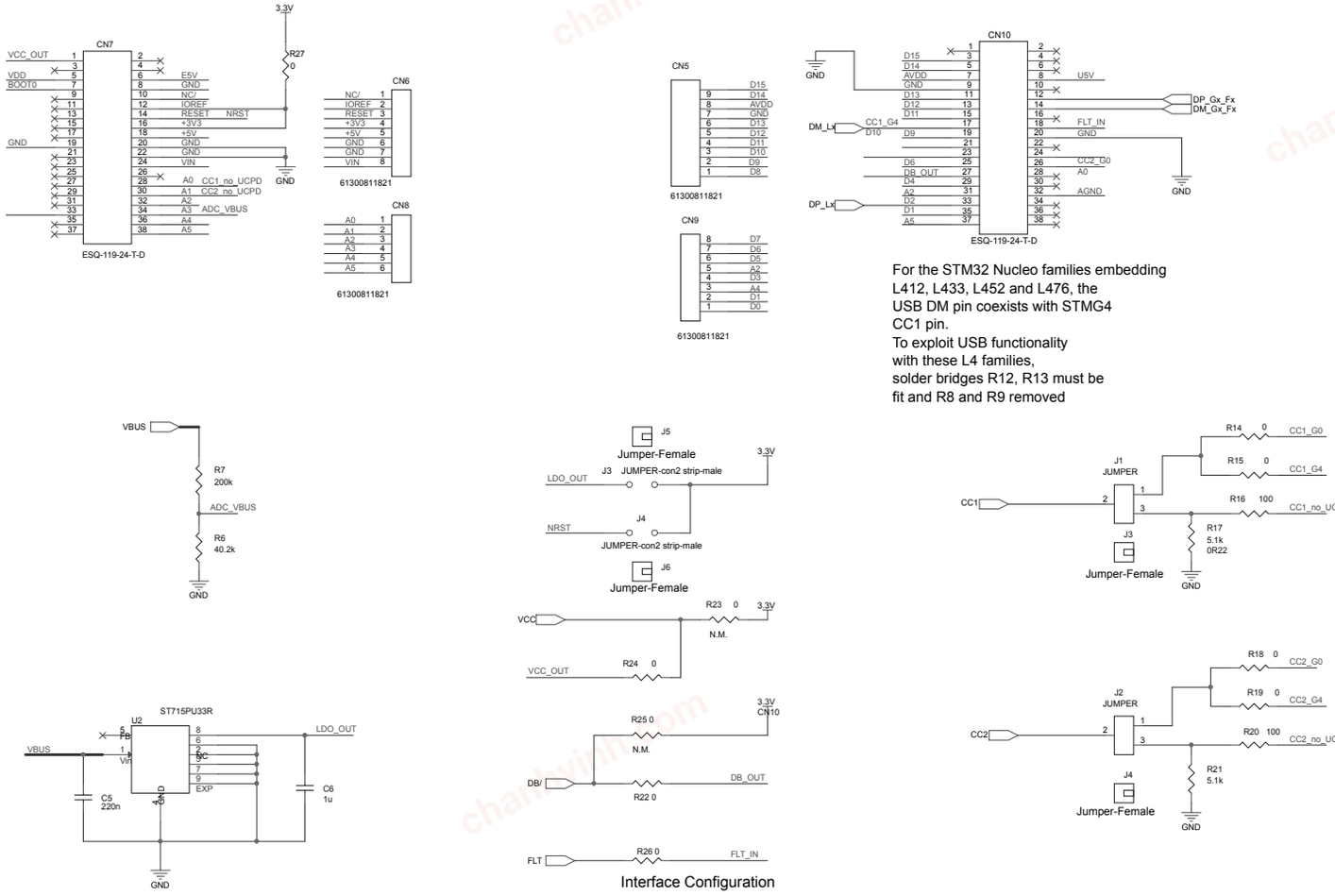
The X-NUCLEO-SNK1M1 is compliant with the latest USB Type-C and Power Delivery specifications and is also USB-IF certified as a 100 W solution supporting Programmable Power Supply (PPS) function.

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).

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1 Schematic diagrams

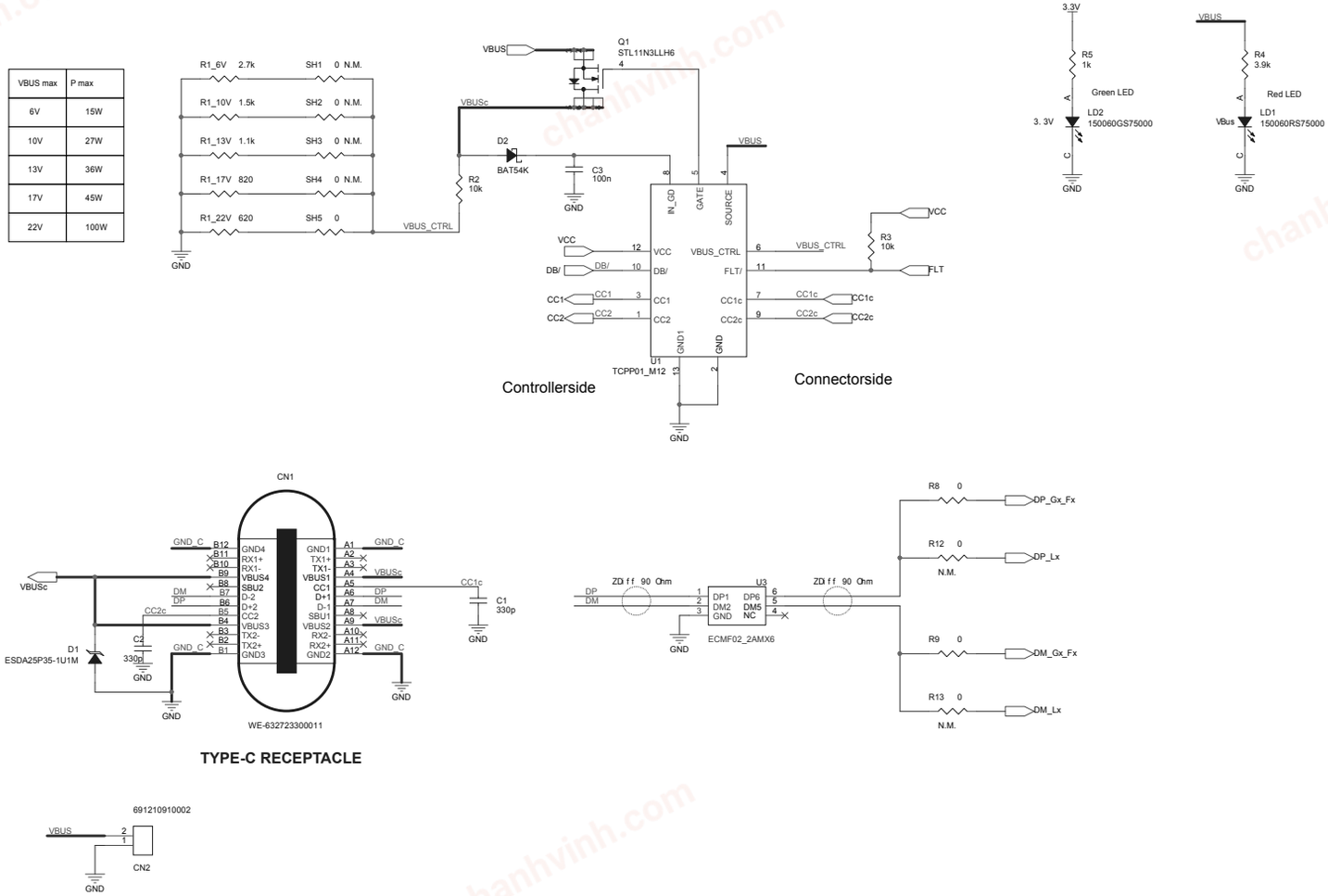
Figure 1. X-NUCLEO-SNK1M1 circuit schematic (1 of 2)



For the STM32 Nucleo families embedding L412, L433, L452 and L476, the USB DM pin coexists with STMG4 CC1 pin.
To exploit USB functionality with these L4 families, solder bridges R12, R13 must be fit and R8 and R9 removed

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



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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.

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