USB Type-C™ Power Delivery source expansion board based on TCPP02-M18 for STM32 Nucleo

**Features**

- Supports all USB Type-C™ Power Delivery SPR profiles up to 100 W
- Manages source role data/power configuration
- Compliant with USB 2.0 dual role data according to STM32 USB data capability
- 8/20 μs surge and overcurrent protections, and discharge for \( V_{BUS} \)
- Short to \( V_{BUS} \) protection for configuration channel pins (CC1 and CC2)
- ESD protection (IEC61000-4-2 level ±8 kV contact discharge) for CC1, CC2, D+, and D-
- Overvoltage and overcurrent protections, and discharge for \( V_{CONN} \)
- Common mode filter on D+/D- data lines
- Two power modes to optimize the current consumption
- Compliant with programmable power supplies (PPS)
- Free comprehensive development firmware library
- Compliant with STM32 Nucleo-64 boards featuring an STM32 with UCPD feature for Power Delivery and without UCPD feature for a 5 V solution only

**Description**

The X-NUCLEO-SRC1M1 expansion board allows evaluating the features of the TCPP02-M18 for the USB Type-C™ and the protections for \( V_{BUS} \) and CC lines suitable for source applications.

The expansion board is designed to be stacked on top of any STM32 Nucleo-64 development board with Power Delivery (UCPD) peripheral embedded in the microcontroller.

You can also stack it on top of any other STM32 Nucleo-64 development board not supporting the UCPD peripheral for 5 V, source only, to demonstrate the USB Type-C™ basic operations (attach, detach and 5 V power supply current capability information).

When using an STM32 Nucleo-64 development board with a Power Delivery peripheral, data functionalities as a host device or dual role data (DRD) are also allowed.

The X-NUCLEO-SRC1M1 provides an effective demonstration of the source operation of the USB Type-C™ connector when an external compatible source is connected to the board. The integrated ST715PU33R LDO linear regulator can supply the connected STM32 Nucleo development board.

The X-NUCLEO-SRC1M1 is compliant with the latest USB Type-C™ and Power Delivery specifications.

The companion software package (X-CUBE-TCPP) contains the application examples for the development boards embedding UCPD-based microcontrollers (for example, NUCLEO-G071RB, NUCLEO-G474RE, and NUCLEO-G0B1RE) and for those not supporting the UCPD peripheral (NUCLEO-F446RE).
Figure 1. X-NUCLEO-SRC1M1 circuit schematic (1 of 3)
Figure 2. X-NUCLEO-SRC1M1 circuit schematic (2 of 3)
Figure 3. X-NUCLEO-SRC1M1 circuit schematic (3 of 3)

High input voltage
85 mA LDO linear regulator
Board versions

Table 1. X-NUCLEO-SRC1M1 versions

<table>
<thead>
<tr>
<th>Finished good</th>
<th>Schematic diagrams</th>
<th>Bill of materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>XNUCLEO$SRC1M1A (1)</td>
<td>XNUCLEO$SRC1M1A schematic diagrams</td>
<td>XNUCLEO$RSC1M1A bill of materials</td>
</tr>
</tbody>
</table>

1. This code identifies the X-NUCLEO-SRC1M1 evaluation board first version.
## Revision history

Table 2. Document revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-Dec-2021</td>
<td>1</td>
<td>Initial release.</td>
</tr>
<tr>
<td>09-May-2022</td>
<td>2</td>
<td>Updated cover page description.</td>
</tr>
</tbody>
</table>