

USB Type-C™ and Power Delivery dual port interface board with automotive-grade STUSB1702Y USB Type-C controller



Features

- Both ports acting as Provider role
- Type-C attach and cable orientation detection
- High voltage protections on VBUS and CC lines
- VBUS switch gate drivers
- VBUS monitoring and discharge path
- A current sensing circuit for each port on VBUS line
- Power connector to interface with external power boards (not included)
- Total board dimensions: 85 mm x 81 mm
- RoHS compliant

Description

The **AEK-USB-2TYPEC1** automotive grade USB Type-C and Power Delivery dual port expansion board is part of the ST AutoDevKit development initiative. It embeds two **STUSB1702Y** USB Type-C™ port controllers for a two-port Provider solution.

Each **STUSB1702Y** USB Type-C port controller includes a fully-featured USB type-C state machine for attach/detach and cable orientation detection, a USB PD PHY and BMC transceiver, high voltage (20 V) technology VBUS voltage monitoring, 600 mA VCONN power switch, VBUS and VCONN discharge paths, 22 V CC line protection, VBUS switch gate drivers and data role configuration (not used in this case).

The two USB Type-C ports have USB 2.0 data lines that are accessible through on-board connectors J101 and J102. The same connectors may be used to redirect the data from one of the two USB 2.0 ports to the 4x20 pass-through connector.

The board also has a power status LED and three status LEDs to signal what each Type-C port is advertising: power role, VBUS negotiation status and CC line orientation (direct or flipped). Two alternate function connectors (not mounted) are available for extension or future developments.

The **AEK-USB-2TYPEC1** board is designed to be connected to a SPC58 Chorus 4 MB flash discovery board (**SPC58EC-DISP**) equipped with a 32-bit Power Architecture® microcontroller for automotive ASIL-B applications. The **AEKD-USBTYPEC1** kit consists of two boards and a USB-PD firmware package, so you can develop application based on the USB-PD Provider role.

The **AEK-USB-2TYPEC1** embeds a connector for an external power board, which would allow the system to deliver output voltage profiles up to 20 V and satisfy various power requests according to the USB Power Delivery specification.

Product summary	
dual-port USB Type-C function board	AEK-USB-2TYPEC1
evaluation kit with dual-port USB Type-C function board and SPC58 Chorus discovery board	AEKD-USBTYPEC1
automotive grade USB Type-C controller (with Tx/Rx line driver and BMC)	STUSB1702Y
firmware package for the AEKD-USBTYPEC1 kit	STSW-USB2TYPEC1

1 AEK-USB-2TYPEC1 schematics

Figure 2. AEK-USB-2TYPEC1 board schematic 1 - block diagram

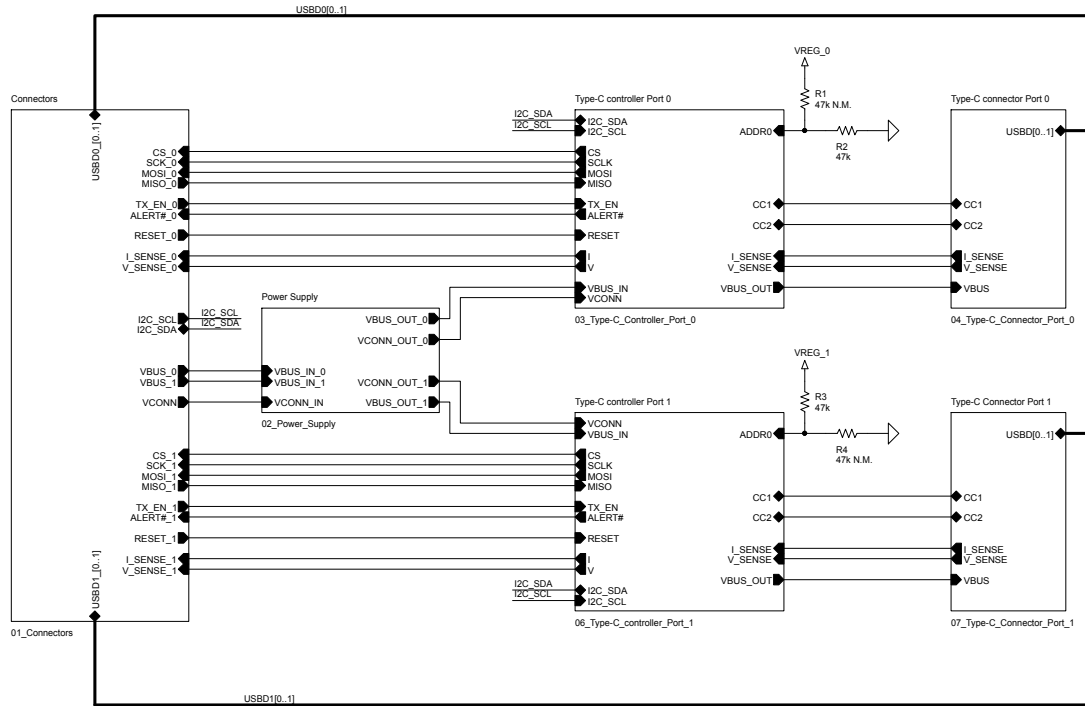


Figure 3. AEK-USB-2TYPEC1 board schematic 2 - connectors

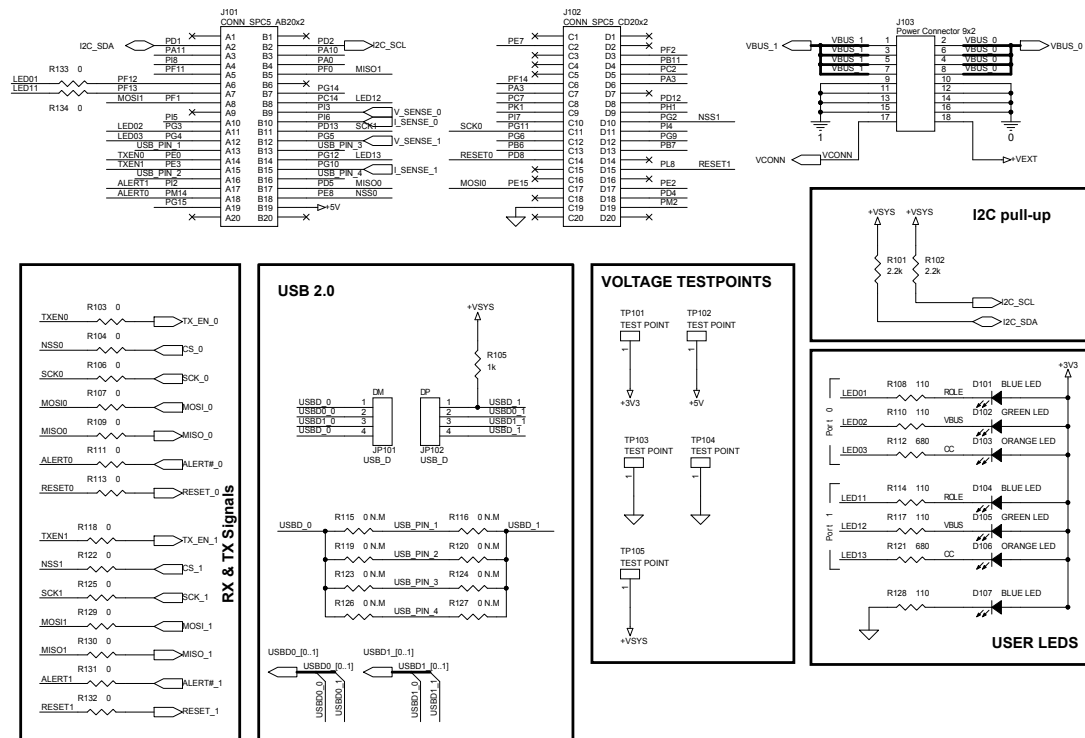


Figure 4. AEK-USB-2TYPEC1 board schematic 3 - power supply

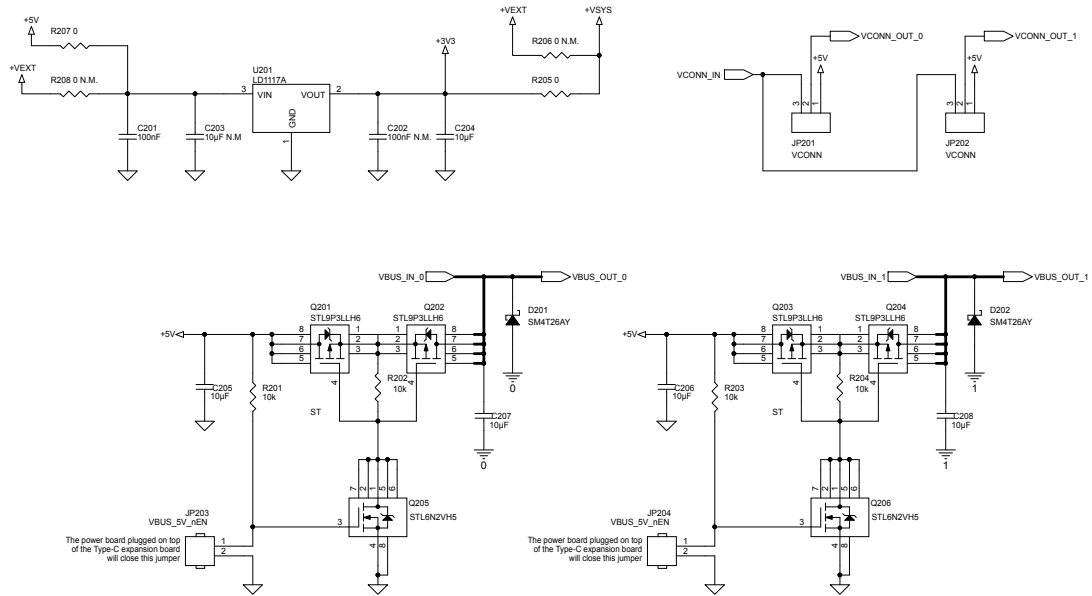


Figure 5. AEK-USB-2TYPEC1 board schematic 4 - Type-C control port 0

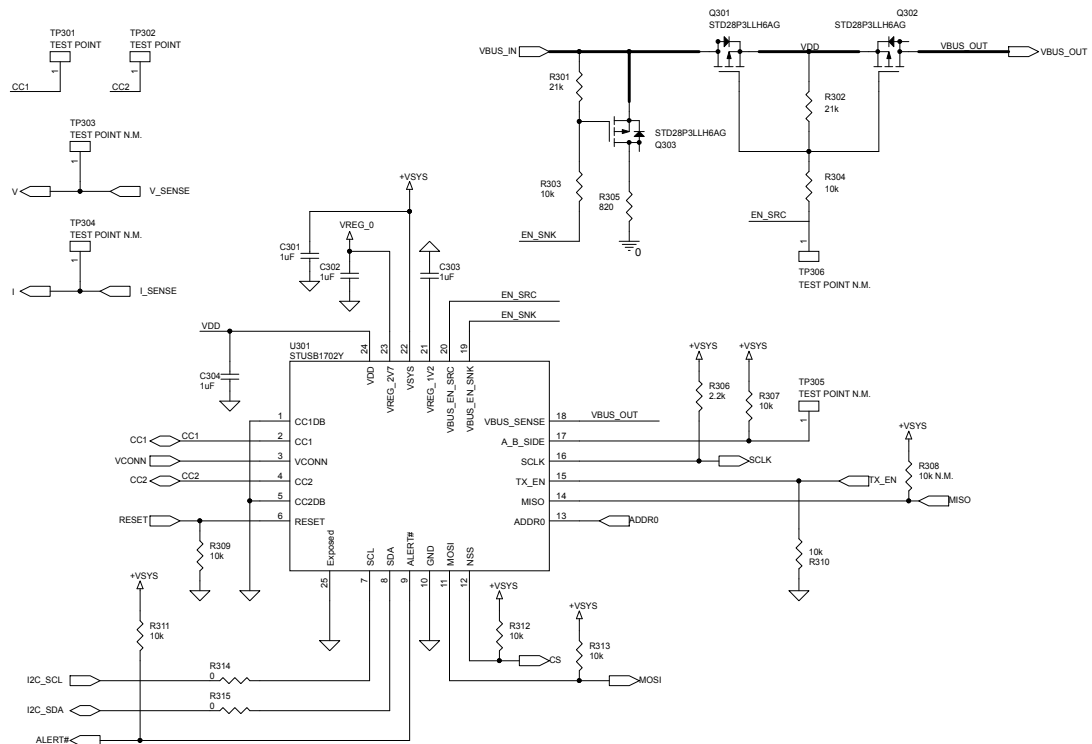


Figure 6. AEK-USB-2TYPEC1 board schematic 5 - Type-C connector port 0

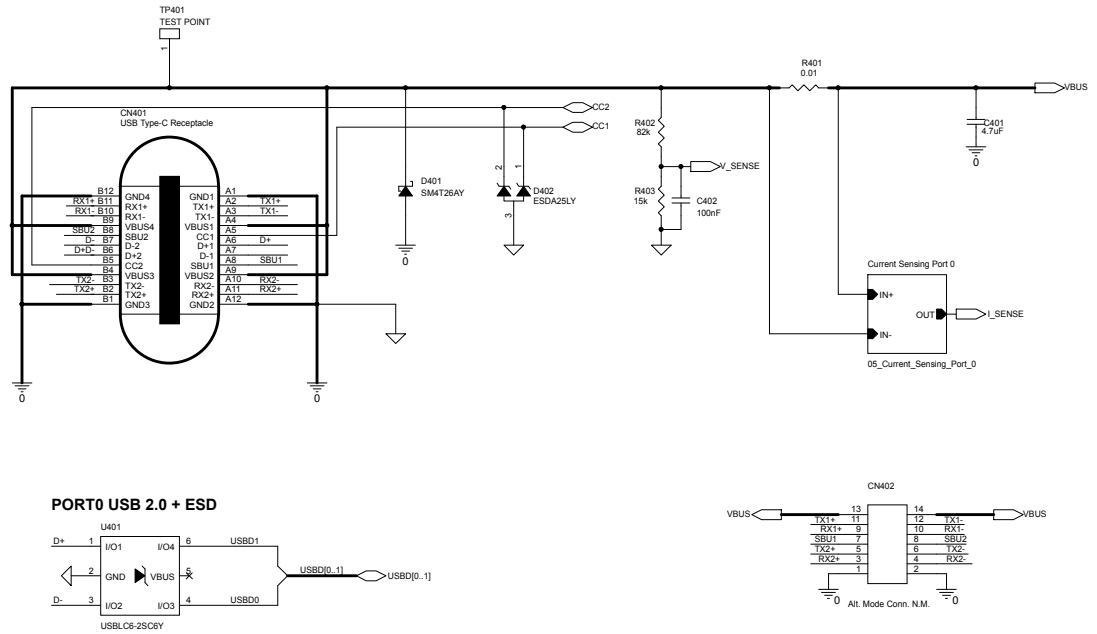


Figure 7. AEK-USB-2TYPEC1 board schematic 6 - current sensor port 0

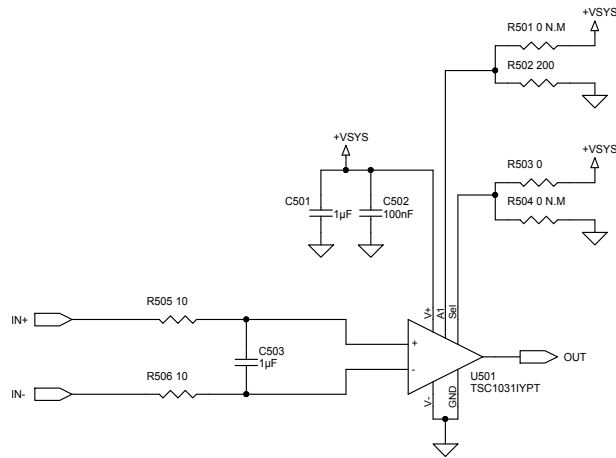


Figure 8. AEK-USB-2TYPEC1 board schematic 7 - Type-C control port 1

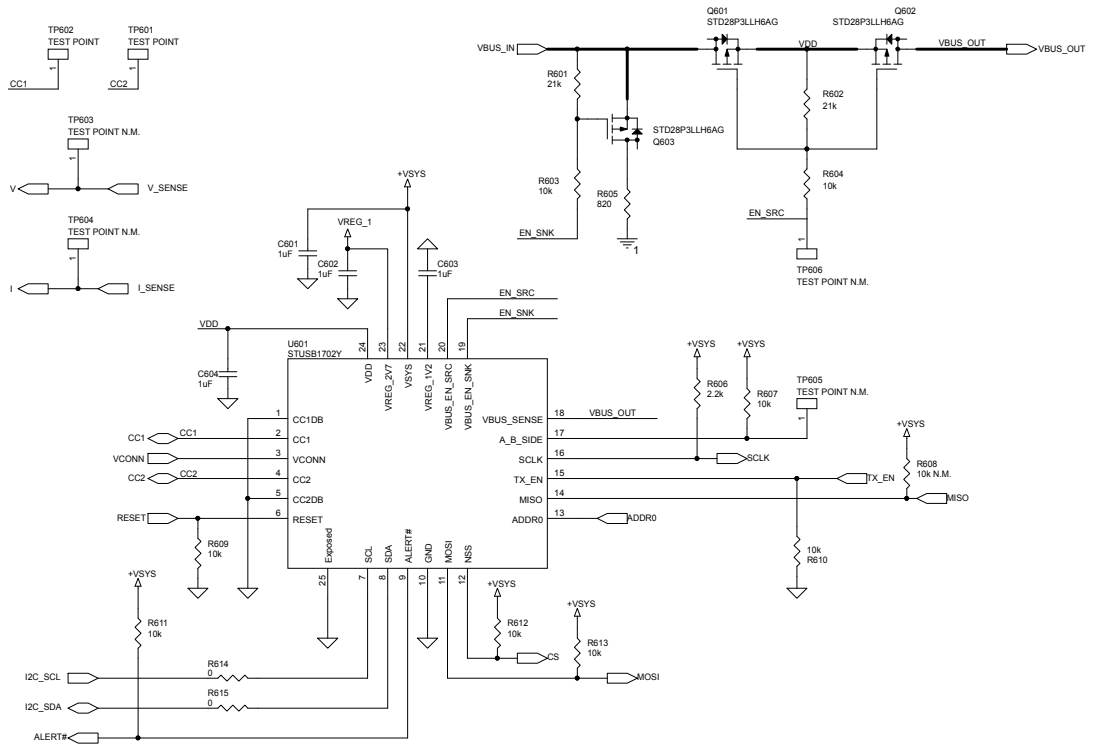


Figure 9. AEK-USB-2TYPEC1 board schematic 8 - Type-C connector port 1

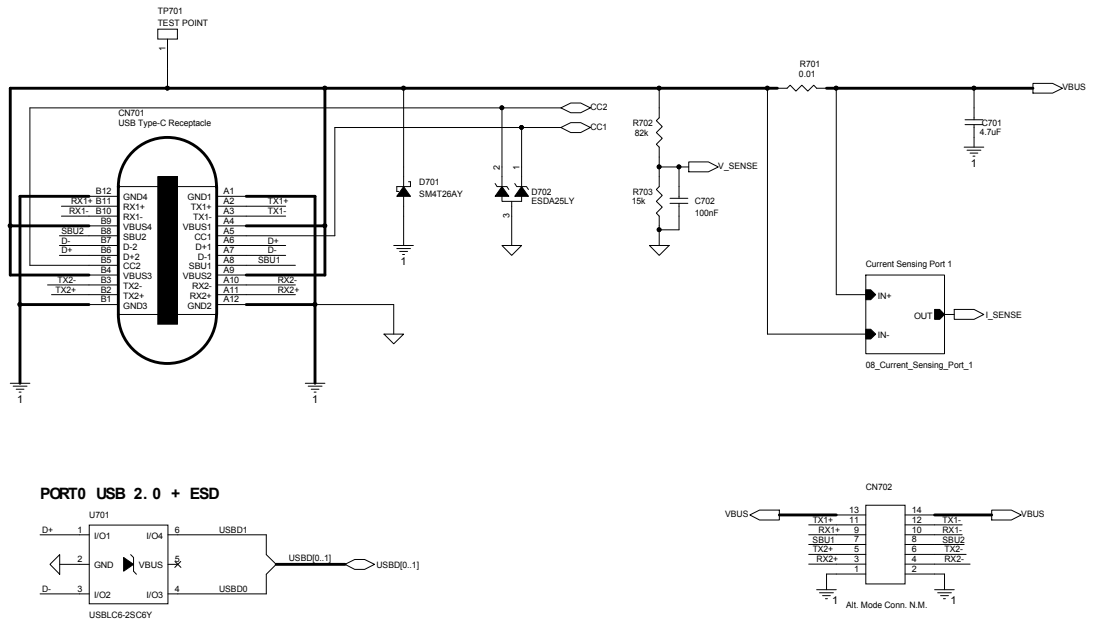
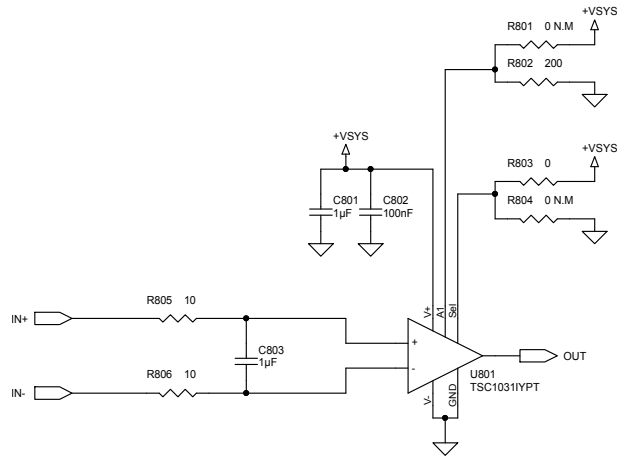


Figure 10. AEK-USB-2TYPEC1 board schematic 9 - current sensor port 1



Revision history

Table 1. Document revision history

Date	Version	Changes
06-Sep-2018	1	Initial release.

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