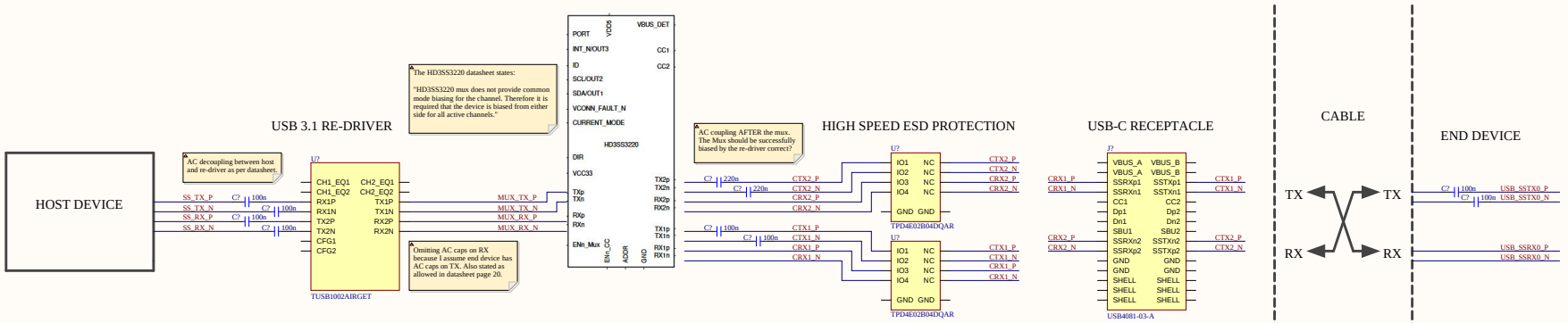
2:1 USB C FLIP MUX CC CONTROLLER



https://www.ti.com/lit/ds/symlink/hd3ss3220.pdf

Note

HD3SS3220 mux does not provide common mode biasing for the channel. Therefore it is required that the device is biased from either side for all active channels. Also note that mux channels are for differential SS signals only.

https://www.ti.com/lit/an/slaae24/slaae24.pdf

In Figure 7-1, the host controller Vcm meets the MUX Vcm requirement, but end point Vcm does not meet the MUX Vcm requirement. An AC capacitor is placed between the MUX and Connector.

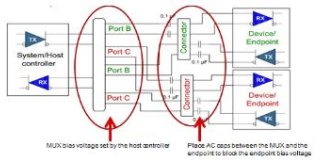


Figure 7-1. AC Capacitor Placed at Endpoint Side

In Figure 7-2, the host controller and endpoint Vcm meets the MUX Vcm requirement. MUX bias voltage is provided either by the host or the endpoint. An AC capacitor is placed by the host side.

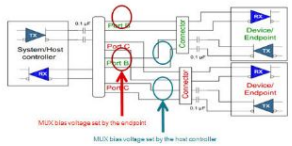


Figure 7-2. AC Capacitor Placed at Host Side

In Figure 7-3, the host controller and endpoint Vcm is outside the MUX Vcm requirement, an external biased voltage is required.

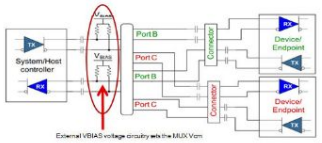


Figure 7-3. AC Capacitor Placed on Both Sides of MUX With External Bias

https://www.ti.com/lit/ds/symlink/tusb1002a.pdf

8.2.2 Detailed Design Procedure

The TUSB1002A differential receivers and transmitters have internal BIAS and termination. For this reason, the TUSB1002A must be connected to the USB3.2 host and receptacle through external A/C coupling capacitors. In this example, as depicted in Table 4, 100 nF capacitors are placed on TX2P and TX2N, RX1P and RX1N, and TX1P and TX1N. 330 nF A/C coupling capacitors along with 220 kΩ resistors are placed on the RX2P and RX2N. Inclusion of the 330 nF capacitors and 220k resistors is optional. The ordered list below details the three implementation options for the RX2p/n path.

Three implementation options for USB connector to TUSB1002A's RX pins:

1. DC couple TUSB1002A's RX pins to USB connector. No 330 nF capacitors and no 220 kΩ pull-down resistors.
2. 330 nF capacitors with 220 kΩ resistors as depicted in Figure 18. The purpose of 220 kΩ resistors is to discharge the capacitor within 250ms after a USB device is removed from the USB connector.
3. The stub from the 220 kΩ resistor pad may create impedance discontinuities causing negative impact to performance. Assuming leakage current from external components is enough to discharge capacitor, 330 nF capacitor without the 220 kΩ resistor is a valid option.

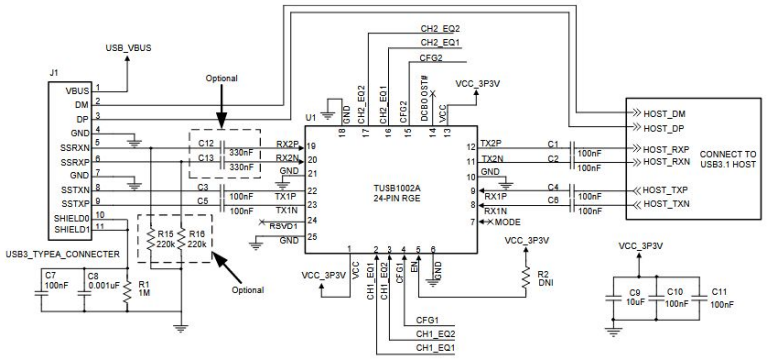


Figure 18. Host Implementation Schematic