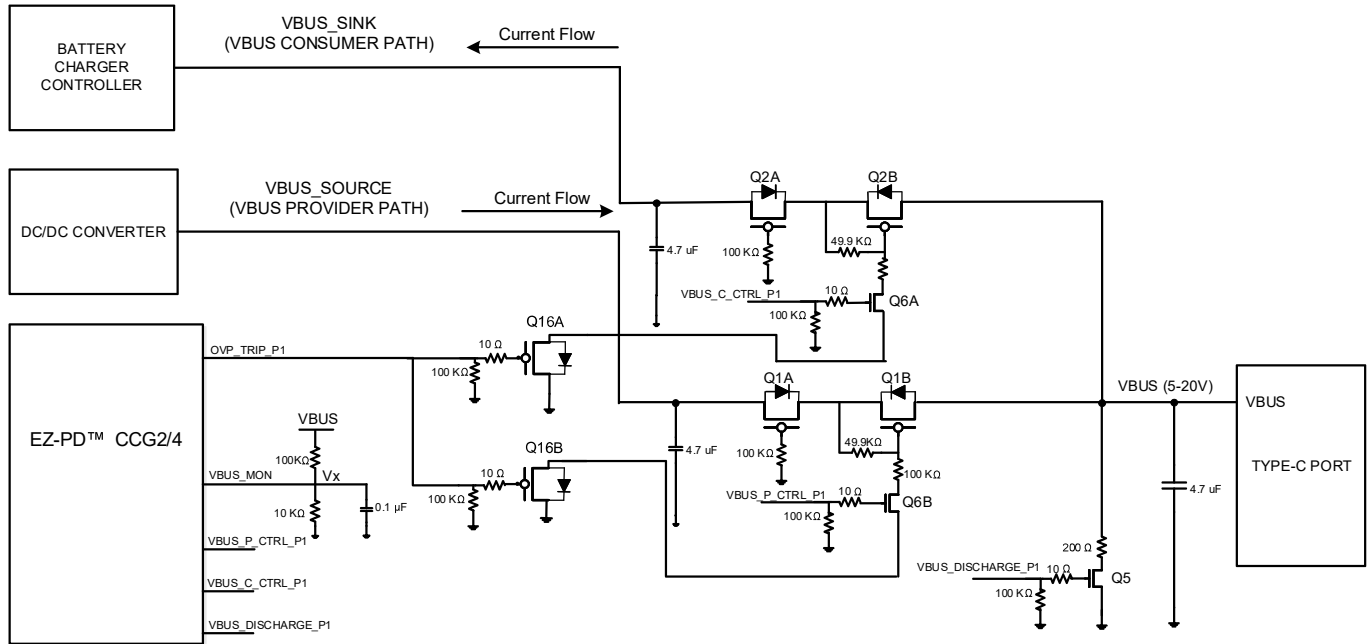


10.4.1 Control of VBUS Provider Path and VBUS Consumer Path

A Battery Charger Controller (BCC) controls the charging (sinking of VBUS) or discharging (sourcing of VBUS) of the battery. A CCG2/CCG4 device consists of two I/Os per Type-C port, namely, VBUS_P_CTRL and VBUS_C_CTRL, to control the VBUS provider (sourcing of power) or consumer (sinking of power) path connected to the BCC. Figure 47 shows the recommended implementation of FETs to control this VBUS path.

Figure 47. VBUS Provider and Consumer Path Control



VBUS_C_CTRL and VBUS_P_CTRL are active HIGH pins. As shown in Figure 47, when VBUS_C_CTRL is LOW, FET Q6A turns OFF. This FET controls Q2A and Q2B, and turns them OFF. Thus, a CCG2/CCG4 device will not be able to consume power from the DFP or charging UFP, as its power consumer path is OFF. When VBUS_C_CTRL is HIGH, FET Q6A is ON, which turns ON FETs Q2A and Q2B, and thus the VBUS consumer path is ON.

When the VBUS_P_CTRL pin is HIGH, FETs Q6B, Q1A, and Q1B are ON, and thus the VBUS provider path turns ON. When VBUS_P_CTRL is LOW, FETs Q6B, Q1A, and Q1B are OFF.

The diodes between the source and drain terminals of FETs Q2A and Q2B turn OFF the VBUS consumer path completely when the VBUS provider path is active. Similarly, the diodes between the source and drain terminals of FETs Q1A and Q1B turn OFF the VBUS provider path completely when the VBUS consumer path is active. This capability of CCG4 to switch the power role from provider to consumer or vice-a-versa can be demonstrated by using the CY4541 EZ-PD CCG4 EVK as shown in Figure 47. The CY4541 EZ-PD CCG4 EVK along with a USB 3.0-enabled notebook or a PC emulates a CCG4-enabled Type-C notebook. See Chapter 4 (DRP Kit Operation) of the CY4541 EZ-PD CCG4 EVK kit guide for details on hardware connections of this setup.