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CY4541 EZ-PD™ CCG4 Evaluation Kit Guide

Doc. No. 002-10353 Rev. *D

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Contents

1. Safety Information

1.1 Regulatory Compliance

The CY4541 EZ-PD CCG4 EVK is intended for use as a development platform for hardware or software in a laboratory environment. The board is an open-system design, which does not include a shielded enclosure. Due to this reason, the board may cause interference to other electrical or electronic devices in close proximity. In a domestic environment, this product may cause radio interference. In such cases, take adequate preventive measures. Also, do not use this board near any medical equipment or RF devices.

Attaching additional wiring to this product or modifying the product operation from the factory default may affect its performance and cause interference with other apparatus in the immediate vicinity. If such interference is detected, suitable mitigating measures must be taken.

The CY4541 EZ-PD CCG4 EVK as shipped from the factory has been verified to meet with requirements of CE as a Class A product.

	The CY4541 EZ-PD CCG4 EVK contains ESD-sensitive devices. Electrostatic charges readily accumulate on the human body and any equipment, and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused CY4541 CCG4 EVK boards in the protective shipping package.

	End-of-Life/Product Recycling This kit has an end-of-life cycle of five years from the year of manufacturing mentioned on the back of the box. Contact your nearest recycler for discarding the kit.

1.2   General Safety Instructions

1.2.1   ESD Protection

ESD can damage boards and associated components. Cypress recommends that you perform procedures only at an ESD workstation. If an ESD workstation is not available, use appropriate ESD protection by wearing an antistatic wrist strap attached to the chassis ground (any unpainted metal surface) on the board when handling parts.

1.2.2   Handling Boards

CY4541 EZ-PD CCG4 EVK boards are sensitive to ESD. Hold the board only by its edges. After removing the board from its box, place it on a grounded, static-free surface. Use a conductive foam pad if available. Do not slide the board over any surface.

Any physical action on the CY4541 EZ-PD CCG4 EVK such as changing wires, jumper settings, or measuring voltages can cause stress on the CY4541 printed circuit board assembly (PCBA) and Type-C connectors. You must ensure that the PCBA has proper support on the bottom side to avoid stress on the PCBA when the EVK is in operation.

2. Introduction

The CY4541 EZ-PD™ CCG4 Evaluation Kit (EVK) is based on the Cypress's CCG4 dual port Type-C Power Delivery (PD) controllers. EZ-PD™ CCG4 is a dual USB Type-C controller that complies with the latest USB Type-C and PD standards. This EVK is primarily intended to be a demonstration vehicle for Type-C PC designs that house one or two Type-C ports. CCG4 can act either as a power provider (Source) or as a power consumer (Sink). The kit also helps to evaluate several features on two Type-C ports, using a Dual Role Port (DRP) or SuperSpeed USB demo, and a DisplayPort demo.

2.1 Kit Contents

The CY4541 EZ-PD CCG4 EVK contains the following items:

- Two CCG EVK base boards assembled with one CY4541 CCG4 daughter card
- One 24-V DC power adapter*
- Two USB 3.0 Type-A to Type-B Cables
- Two USB Type-C to Type-A adapters
- One USB 3.0 EMCA (Electronically Marked Cable Assembly) Type-C cable*
- One USB 2.0 Type-A to Mini-B cable
- One set of jumper wires
- One screwdriver
- Quick Start Guide

Note: *The CY4541 EZ-PD CCG4 EVK supports power up to 100 W (20 V, 5 A). The power adapter provided with the kit can support only up to 2.7 A (at 24 V). The USB 3.0 Type-C EMCA cable provided with the kit can support only up to 3 A.

2.1.1 Hardware Not Included With the Kit

The CY4541 EZ-PD CCG4 EVK does not come with all the hardware needed to perform the demonstrations documented in DRP and SuperSpeed USB Demo. The following hardware is not included with this kit:

- A multimeter to measure voltage.
- Two USB pen drives for Kit Operation.
- DisplayPort cables to connect the PC to the CCG EVK base board. If the PC has a Mini DisplayPort, then a Mini DisplayPort to DisplayPort cable will be required.
- Type-C to DP adapters (available on the web) to connect a display monitor to the CY4541 EZ-PD CCG4 EVK board, which only has a DisplayPort interface.
- Display Splitter adapter (available on the web) for the kit to operate during the dual DisplayPort demonstration.
- A USB Type-C power adapter (available on the web) for DRP kit operation. Dual Type-C port operation requires a USB Type-C power adapter that supports a 14-V to 20-V power profile.
- A display monitor with DisplayPort (DP), HDMI, or VGA interface for the DisplayPort demonstration.
- A PC with two USB ports. USB 3.0 ports and Windows XP, or later operating system, is recommended.

2.2 Getting Started

For instructions on how to run a quick demonstration and observe kit functionality, refer to DRP and SuperSpeed USB Demo.

2.3 List of Recommended Hardware

See Table 2-1 for the list of recommended hardware for this kit to demonstrate the Dual Role Port (DRP) and DisplayPort Connection.

Table 2-1. List of Recommended Cables

No.	Description	Manufacturer	MPN	Vendor Link
1	DisplayPort to DisplayPort Cable (6", gold plated)*	Cable Matters	102005-6	Cablematters Link
2	Mini DisplayPort to DisplayPort Cable (3", gold plated)*	Cable Matters	101007-BLACK-3	Cablematters Link
3	Display Splitter Adapter	Lenovo	0B47092	Lenovo Link
4	USB Type-C to DisplayPort Adapter	Cable Matters	--	Amazon Link
	USB Type-C to HDMI Adapter	Cable Matters	--	Amazon Link
	USB Type-C to VGA Adapter	Cable Matters	--	Amazon Link
5	USB Type-C power adapter that supports 14V or above	Apple	--	Apple Store Link
6	USB 3.0 pen drive	SanDisk	--	Amazon Link

*Note: Use item 1 in Table 2-1 if the PC has a DisplayPort connector. Use item 2 in Table 2-1 if the PC has a Mini DisplayPort connector.

Refer to the Knowledge Base Article KBA12598 for getting information on the known issues of Apple USB-C Digital AV Multiport Adapter and Apple 29W USB-C Power Adapter while using with CY4541 EZ-PD CCG4 EVK.

3. Kit Installation

This chapter describes how to install the CY4541 EZ-PD CCG4 EVK.

3.1 CY4541 EZ-PD CCG4 EVK Kit Software Installation

To install the kit software, follow these steps:

1. Download the latest kit software setup, *CY4541Setup.exe*, from www.cypress.com/CY4541. This package contains the kit hardware files, kit guide, and quick start guide. Double-click **CY4541Setup.exe** to start the installation. Click **Next** when the screen shown in Figure 1 appears.

Figure 1. CY4541 EZ-PD CCG4 EVK Installer Screen
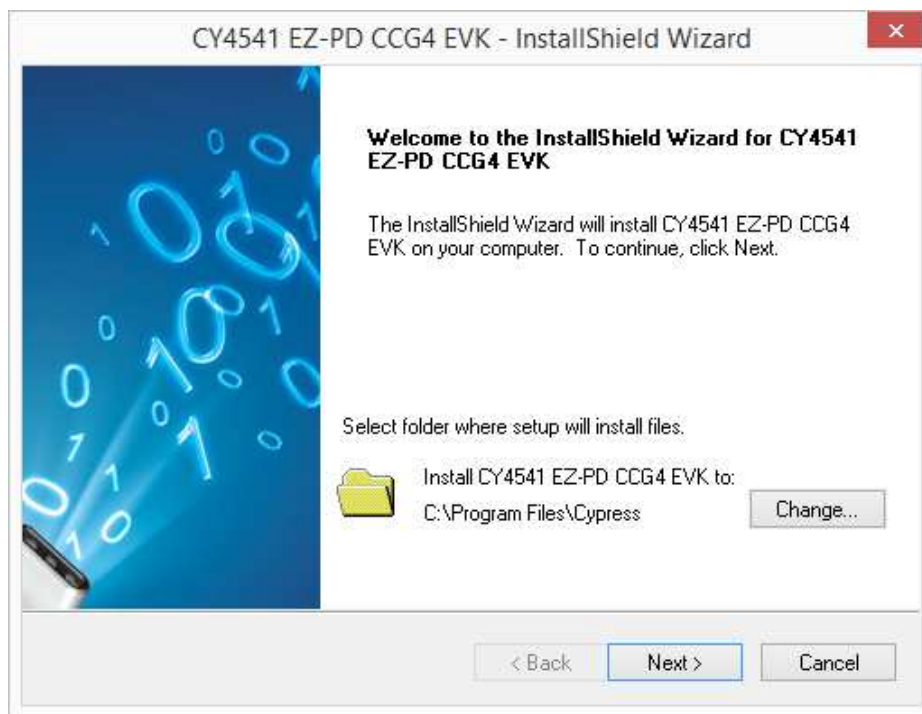
2. Select the required **Installation Type** and click the **Next** button to start the installation (Figure 2). For first-time installation, it is recommended that you select "Typical" as the **Installation Type**.

Figure 2. Installation Wizard
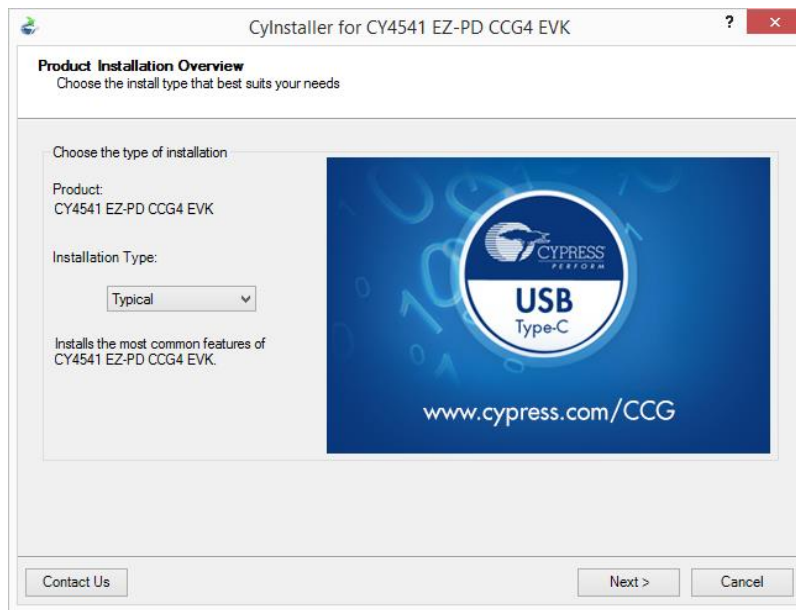
3. Accept the license agreement for the software components and click **Next** (Figure 3) to proceed with the installation. If you do not accept the terms in the agreement, click **Cancel** to exit from the installation.

Figure 3. License Agreement
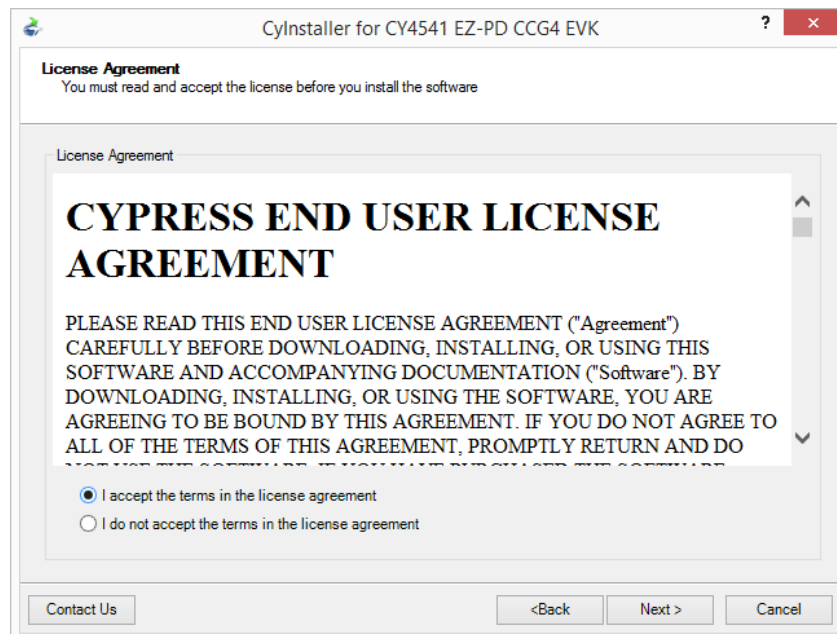
4. Figure 4 shows the installation progress. EZ-PD Configuration Utility also gets installed along with CY4541 EZ-PD CCG4 EVK.

Figure 4. Installation Progress
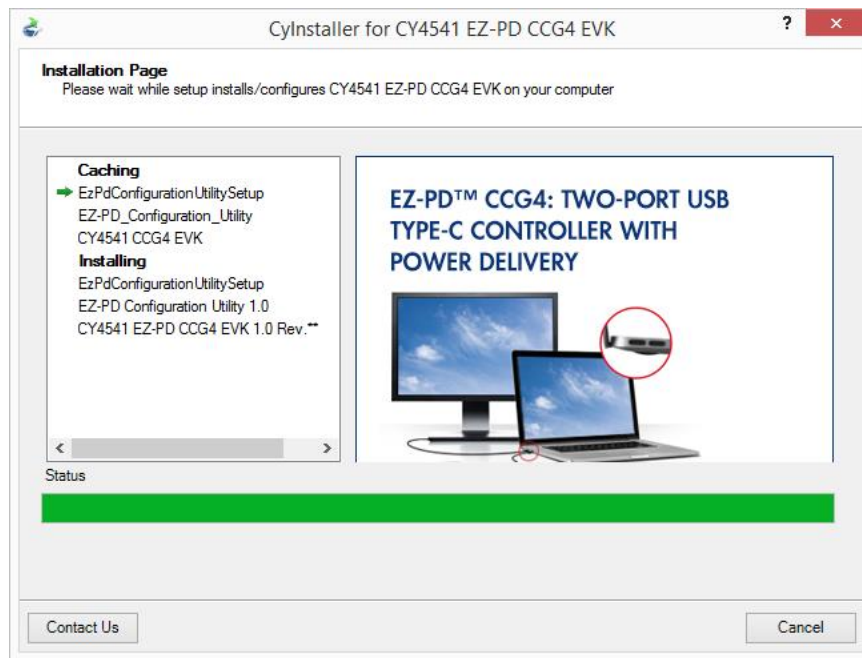
5. Click **Finish** when complete (Figure 5).

Figure 5. Software Installation Complete
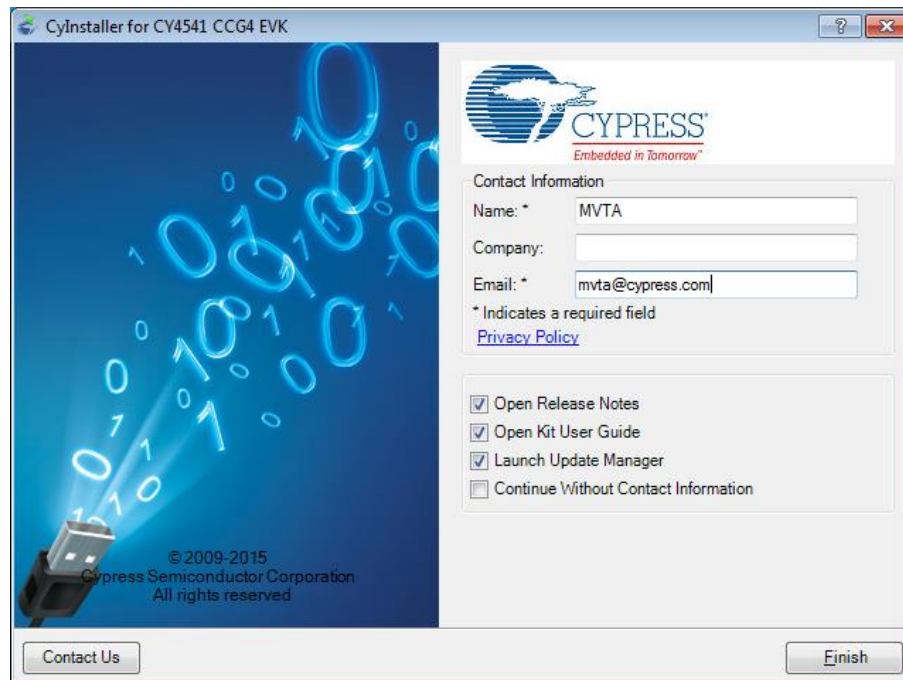
6. When the installation is complete, you have the option to **Launch Update Manager** to ensure you have the latest software package. Click the **Check for updates** button at the bottom of the window. If "No Updates" appears adjacent to the CY4541 EZ-PD CCG4 EVK, click the **Exit** button. If there are updates, click the **Update** button to download and install the latest kit package.

Figure 6. Cypress Update Manager
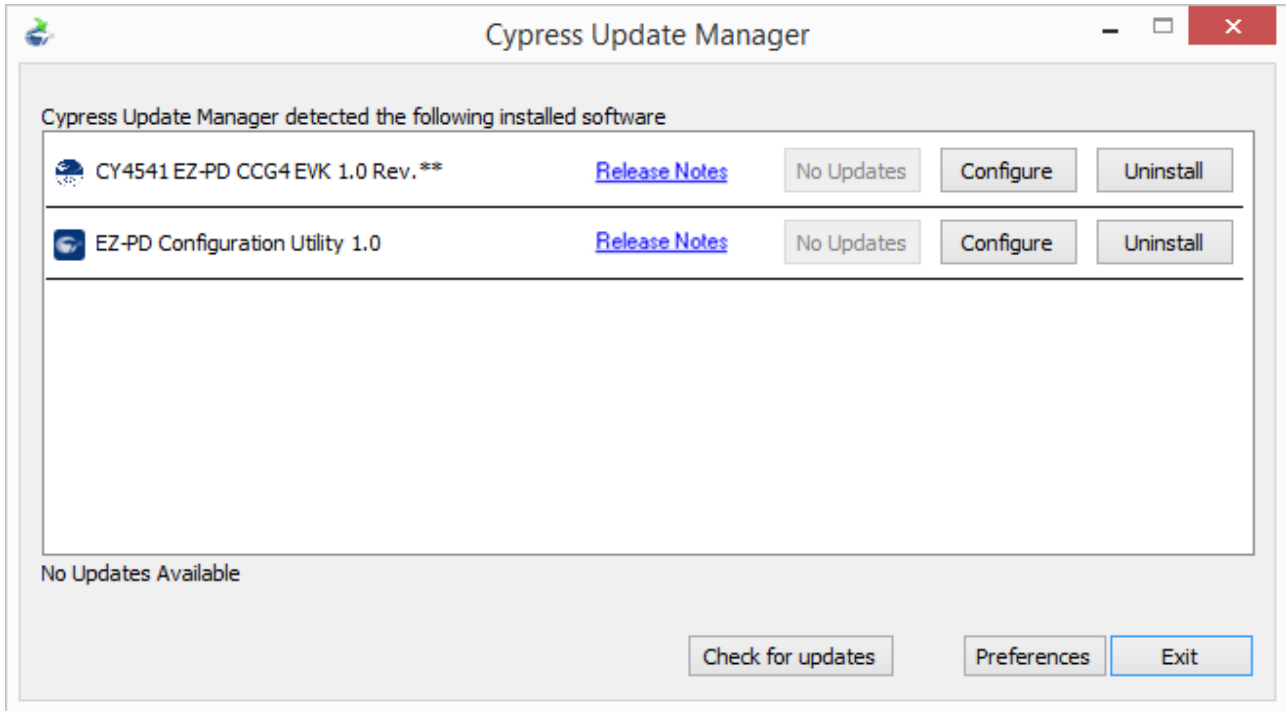
Note: You can launch the Cypress Update Manager from **Start** > **All Programs** > **Cypress** > **Cypress Update Manager**. The latest revision number of CY4541 EZ-PD CCG4 EVK may vary from the image shown in Figure 6.

7. After the installation is complete, the contents are available at the following location:
`<Install Directory>\CY4541 CCG4 EVK\1.0.`

Note: On the Windows 32-bit platform, the default <Install Directory> is `C:\Program Files\Cypress`; on the Windows 64-bit platform, it is `C:\Program Files(x86)\Cypress.`

4. CY4541 EZ-PD CCG4 EVK Hardware

4.1 CY4541 EZ-PD CCG4 EVK Architecture

Figure 7. CY4541 EZ-PD CCG4 EVK System-level Block Diagram
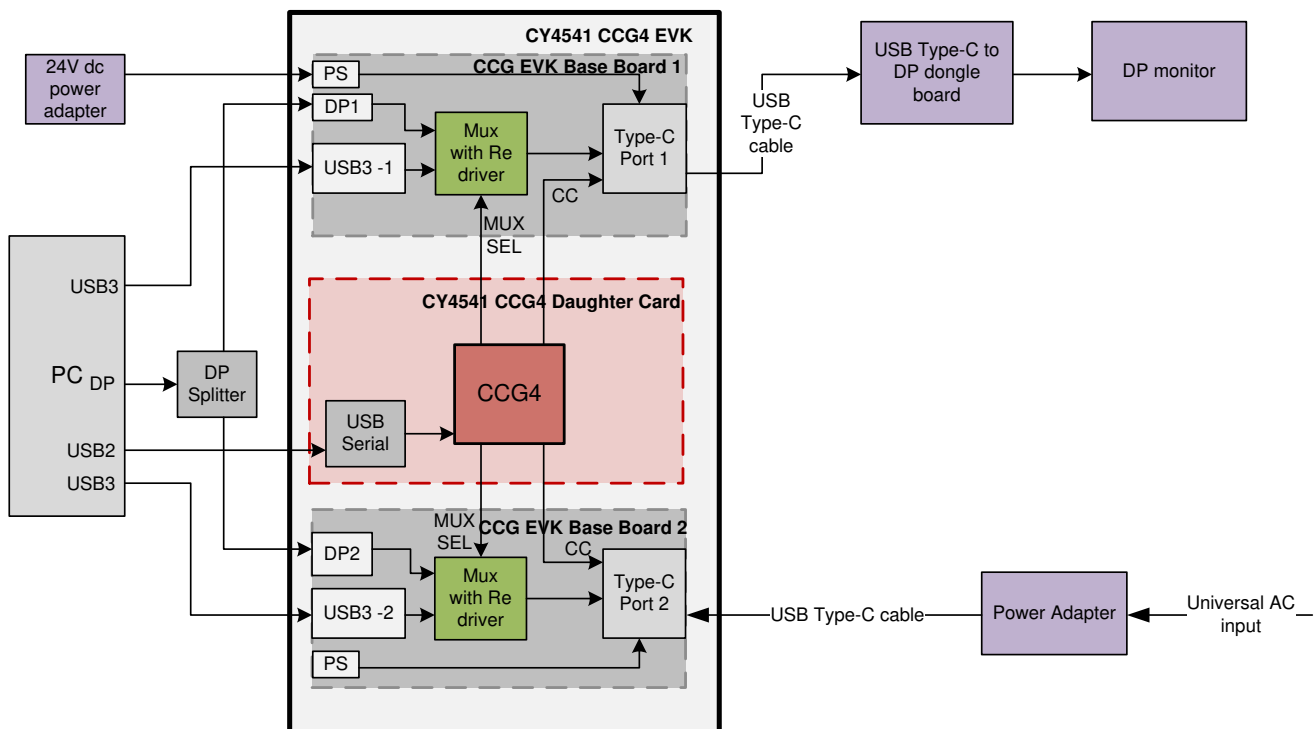
CCG4 is a dual USB Type-C controller that complies with the latest USB Type-C and PD standards. CCG4 provides a complete dual USB Type-C and USB-PD port control solution for PC designs. It can also be used in DRP applications in which a USB Type-C port can switch its power role from provider to consumer and vice-versa. CCG4 uses Cypress's proprietary M0S8 technology integrated with a 32-bit, 48-MHz ARM® Cortex®-M0 processor, 128-KB flash, and two Type-C transceivers including the Type-C termination resistors R_P and R_D.

The CY4541 EZ-PD CCG4 EVK consists of two CCG EVK base boards and one CY4541 CCG4 daughter card. The CY4541 CCG4 daughter card is connected to the two CCG EVK base boards to evaluate the CCG4's dual Type-C port capability as shown in Figure 7.

The CCG EVK base board consists of a DC input power supply, a display multiplexer, a DisplayPort connector, a SuperSpeed Type-B port, and a Type-C port. The CY4541 CCG4 daughter card consists of the CCG4 device and a USB-Serial IC to provide a USB interface for debugging. CCG4's CC lines of the respective Type-C interface are connected to the Type-C port on the CCG EVK base board. CCG4 controls the display multiplexer over an I2C interface.

The CY4541 EZ-PD CCG4 EVK has a power provider and power consumer path control circuitry to showcase CCG4's ability to switch its power role from a provider to a consumer and vice-versa. This EVK has overvoltage and overcurrent protection circuitry for VBUS and VCONN; it also supports programming CCG4 devices over SWD and I2C interfaces.

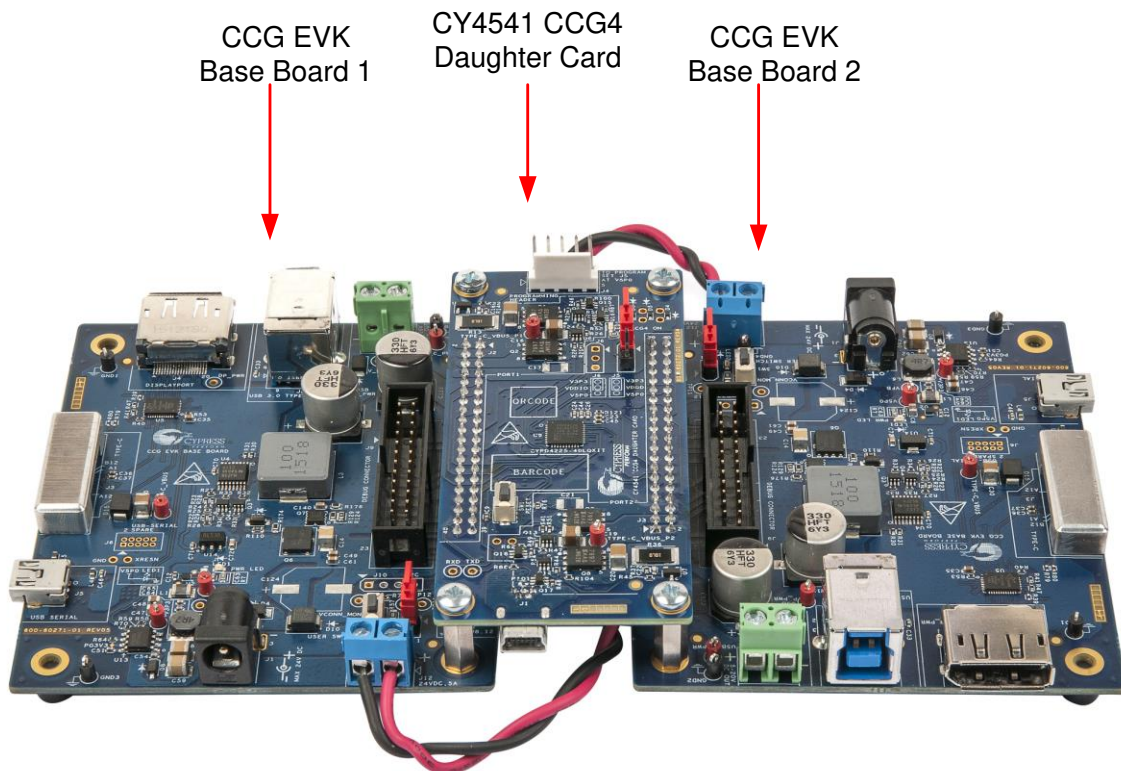A PC with two USB 3.0 ports and a DisplayPort along with the CY4541 EZ-PD CCG4 EVK is equivalent to a PD-enabled dual Type-C port PC.

4.2 CY4541 EZ-PD CCG4 EVK

Figure 8 shows the CY4541 EZ-PD CCG4 EVK setup, in which two CCG EVK base boards are connected to the CY4541 CCG4 daughter card.

Figure 8. CY4541 EZ-PD CCG4 EVK Setup

The following sections describe the CCG EVK base board and daughter card design.

4.3 CCG EVK Base Board

The CCG EVK base board is an evaluation board equipped with a Type-C port, a SuperSpeed USB Type-B port, and a DisplayPort interface. It is primarily intended as a demonstration board for PC designs that house a Type-C connector. The board also serves as a vehicle to evaluate the alternate Type-C modes, using the DisplayPort demo as an example.

4.3.1 Block Diagram

Figure 9 shows the CCG EVK base board block diagram. It has an onboard Type-C connector for the USB-PD interface and a CY4541 CCG4 daughter card interface connector to connect the CY4541 CCG4 daughter card. It also includes a SuperSpeed USB Type-B port and a DisplayPort connector to source video. The SuperSpeed USB signals and DisplayPort signals are connected to the Type-C connector through a display multiplexer controlled by the CCG4 device. A DC power adapter provides input voltage to the onboard Power Management IC (PMIC). The output voltage from the PMIC can be selected using two voltage selection lines, controlled by CCG4. This CCG EVK base board, along with the CY4541 CCG4 daughter card, helps convert any desktop or notebook PC with legacy USB ports to operate as a Type-C USB host.

Figure 9. CCG EVK base board Block Diagram
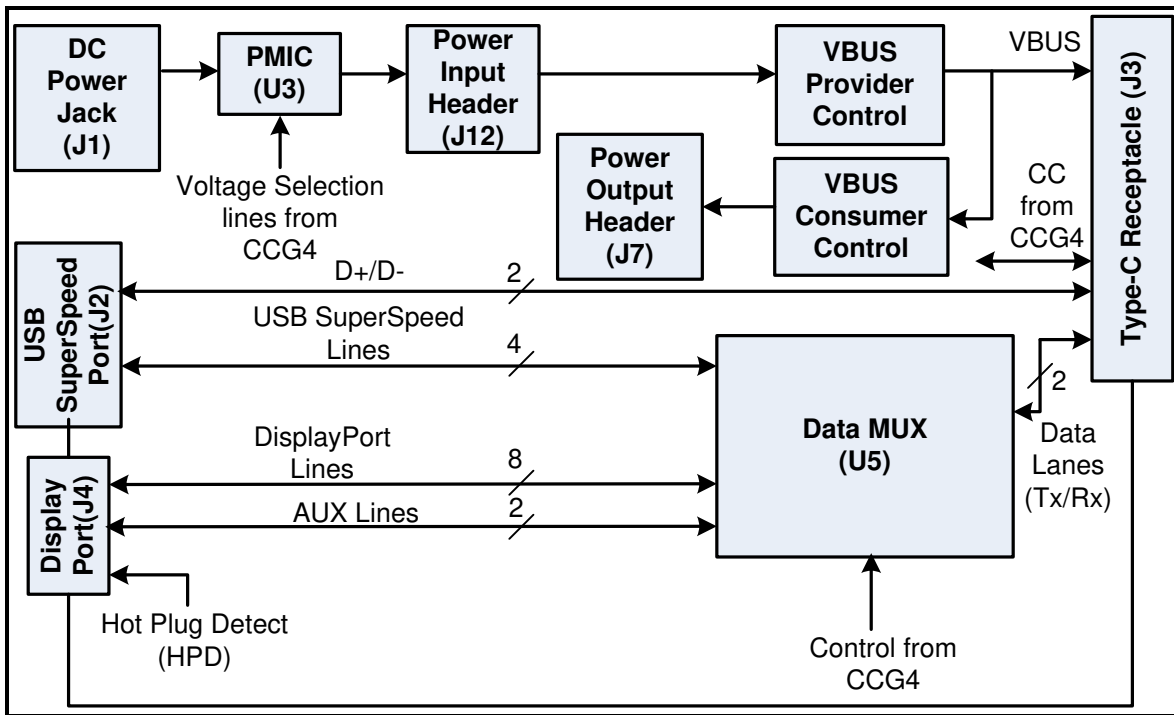
4.3.2 Features

Table 4-1 shows the features of the CCG EVK base board.

Table 4-1. CCG EVK Base Board Features

Feature	Description
Power	Negotiated power from the DC power adapter controlled by PMIC and CCG4.
	5 V from the Type-C connector (for dead battery support). For the dual Type-C port operation of this kit, use a USB Type-C power adapter that supports a 9 V to 20 V power profile.
	Note that the DC power adapter provided with the kit can support only up to 2.7A (at 24 V). This kit will not work with 5 V DC power adapters.
CY4541 CCG4 daughter card interface connector	Provides interface to connect the CY4541 CCG4 daughter card to the CCG EVK base board
Type-C Plug Orientation, Detection and Alternate modes	I2C interface between CCG4 and the display multiplexer to select between SuperSpeed USB and 2-lane or 4-lane DisplayPort.
	Hot Plug Detect (HPD) for DisplayPort Alternate mode of operation.

4.3.3 Connectors and Jumper Settings

Figure 10 shows the CCG EVK base board connectors and the default jumper settings.

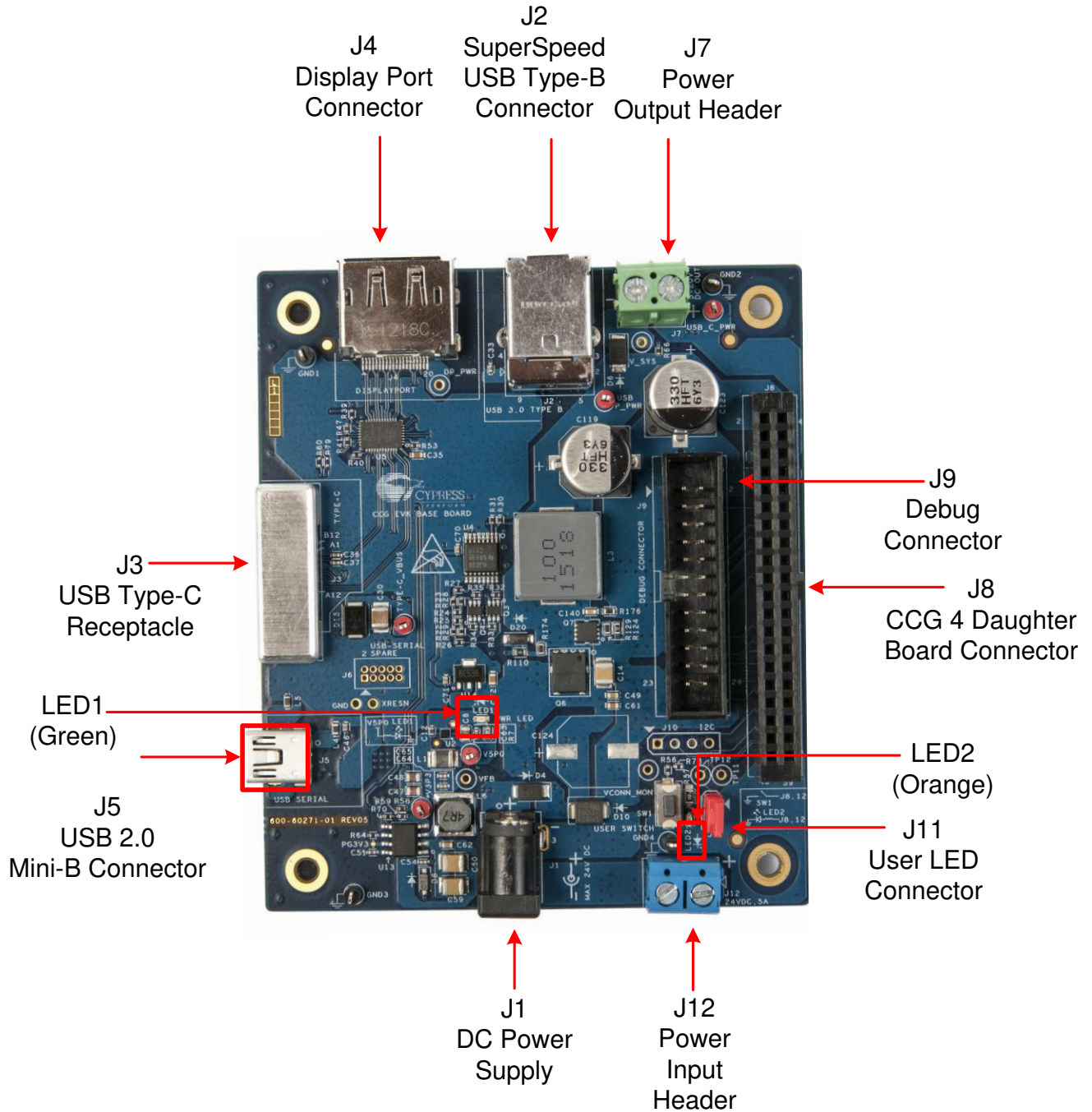Figure 10. CCG EVK Base Board Connectors

Table 4-2 shows a detailed description of the connectors and jumper settings.

Table 4-2. CCG EVK Base Board Jumper/Connector Description

Jumper/Connector	Description		Default
J1	DC power jack to connect the DC power adapter to the CCG EVK base board		NA
J2	SuperSpeed USB Type-B connector (receptacle)		NA
J3	USB Type-C connector (receptacle)		NA
J4	DisplayPort connector		NA
J7	Header for voltage measurement when CCG4 acts as power consumer or power output header		NA
J8	CY4541 CCG4 daughter card interface connector		NA
	Pin 1: USB_P_PWR (USB Provider power)	Pin 2: USB_P_PWR (USB Provider power)	
	Pin 3: Type-C VBUS	Pin 4: Type-C VBUS	
	Pin 5: USB_C_PWR (USB Consumer power)	Pin 6: USB_C_PWR (USB Consumer power)	
	Pin 7: GND	Pin 8: GND	
	Pin 9: SW0/I2C_SCL	Pin 10: VBUS_DISCHRG	
	Pin 11: SW1/I2C_SDA	Pin 12: CCG_SWD_IO	
	Pin 13: OCP (Over Current Protection)	Pin 14: CCG_SWD_CLK	
	Pin 15: AC Adapter Det1	Pin 16: CCG_XRES	
	Pin 17: VSEL2 (Voltage Selection line 2)	Pin 18: I2C_ADDR0	
	Pin 19: V5P0	Pin 20: VCONN_MON	
	Pin 21: CC1	Pin 22: CC2	
	Pin 23: V3P3	Pin 24: VBUS_P_CTRL (VBUS Provider Control)	
	Pin 25: RXD	Pin 26: VBUS_MON_GPIO (VBUS Monitoring I/O)	
	Pin 27: TXD	Pin 28: I2C_INT_EC	
	Pin 29: MUX_DP_AUXN	Pin 30: VBUS_C_CTRL (VBUS Consumer Control)	
	Pin 31: MUX_DP_AUXP	Pin 32: OVP_TRIP (Overvoltage Detection Signal)	
	Pin 33: SBU2	Pin 34: I2C_SDA_EC	
	Pin 35: SBU1	Pin 36: HOTPLUG_DET	
	Pin 37: I2C_SCL_EC	Pin 38 : Test Point (TP12, USBDP signal)	
	Pin 39: VSEL1 (Voltage selection line 1)	Pin 40: Test Point (TP11, USBDM signal)	
J9	Debug connector		NA
	Pin 1: Type-C VBUS	Pin 2: Type-C VBUS	
	Pin 3: CCG_SWD_IO	Pin 4: CCG_XRES	
	Pin 5: CC1	Pin 6: CC2	
	Pin 7: I2C_SCL_EC	Pin 8: I2C_SDA_EC	
	Pin 9: I2C_INT_EC	Pin 10: HOTPLG_DET	
	Pin 11: SW0/I2C_SCL	Pin 12: SW1/I2C_SDA	
	Pin 13: SW2	Pin 14: OCP (Over Current Protection)	
	Pin 15: CCG_SWD_CLK	Pin 16: OVP_TRIP	
	Pin 17: VSEL1 (Voltage Selection line 1)	Pin 18: VSEL2 (Voltage Selection line 2)	
	Pin 19: VBUS_P_CTRL (VBUS Provider Control)	Pin 20: VBUS_DISCHRG	
	Pin 21: VBUS_MON_GPIO	Pin 22: VBUS_C_CTRL (VBUS Consumer Control)	
	Pin 23: GND	Pin 24: GND	

Jumper/Connector	Description	Default
J11	User LED header - connects CCG4 SWD_IO pin to LED2 when shorted. Pin 1: SWD_IO Pin 2: LED	Short pin 1 and pin2
J12	Header for voltage measurement when CCG4 acts as power provider or power input header.	NA
J5	USB 2.0 Mini-B connector (receptacle)	NA

4.4 CY4541 CCG4 Daughter Card

The CY4541 CCG4 daughter card is an evaluation board with a CCG4 controller (CYPD4225-40LQXIT) and a USB-Serial Bridge Controller (CY7C65215) to provide a USB interface for debugging. The CY4541 CCG4 daughter card must be assembled with the CCG EVK base boards. This complete assembly setup supports Type-C host applications such as PCs.

PD-enabled USB products (such as a PC with a Type-C port) operate as a power provider and a power consumer. The USB PD specification refers to such USB Type-C ports as Dual Role Ports (DRPs).

4.4.1 Block Diagram

Figure 11 shows the CY4541 CCG4 daughter card block diagram.

Figure 11. Block Diagram of CY4541 CCG4 Daughter Card
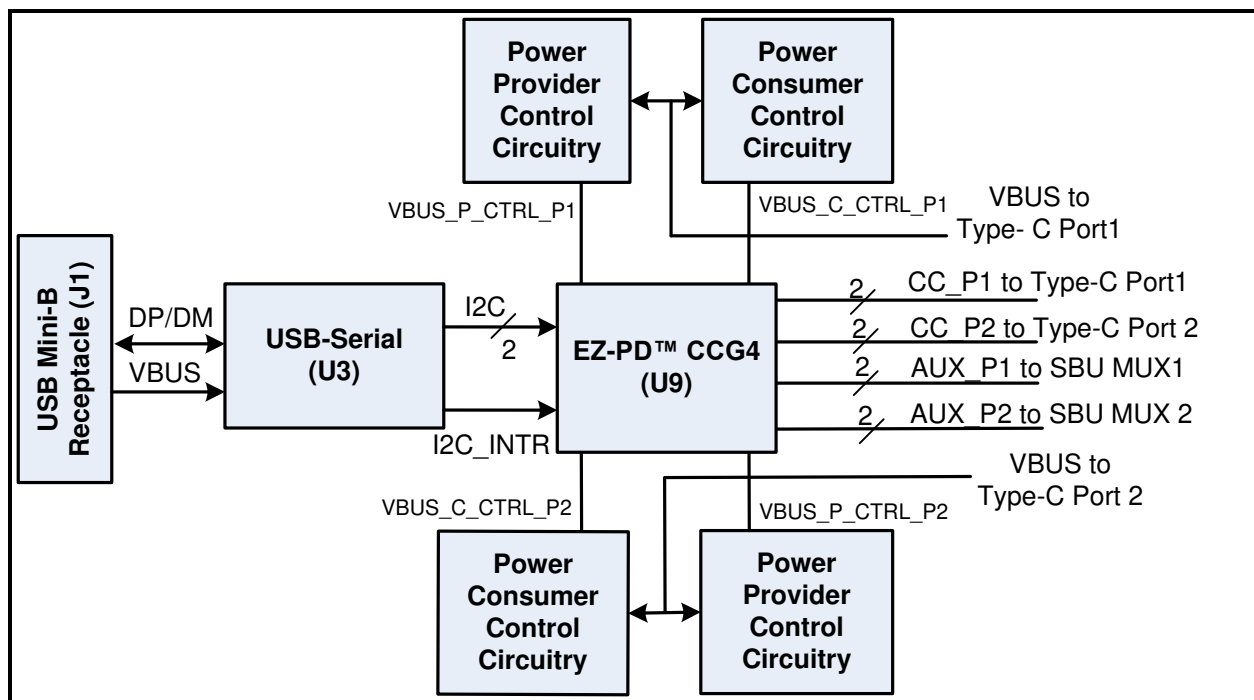
4.4.2 Features

lists the CY4541 CCG4 daughter card features.

Table 4-3. CY4541 CCG4 daughter card Features

Feature	Description
CCG4 device	CYPD4225-40LQXIT
CCG4 package	40-QFN
USB PD/ Type-C	Dual Type-C port support
	Ability to act as power provider (source) and power consumer (sink)
	Supports the following PD capabilities (VSEL pins): 5 V up to 3 A 5 V up to 5 A 9 V up to 5 A 15 V up to 5 A 20 V up to 5 A
	VBUS provider and consumer FET control for VBUS source or sink path
	VBUS discharge control FET
VBUS Provider path and Consumer path control	VBUS provider path and consumer path control FETs per Type-C port
OVP and OCP	VCONN overcurrent protection
	VBUS overvoltage protection
	VBUS overcurrent protection
Plug orientation, Detection and Alternate modes	Dual Alternate mode/Display support
	Three mux-select pins per Type-C port to select between SuperSpeed USB and 2-lane or 4-lane DisplayPort
	Hot Plug Detect (HPD) for DisplayPort Alternate Mode operation
	SBU (Side Band Use) multiplexer support to select between Auxiliary lines and UART TXD/RXD signals
USB/I2C Programming	USB Type-B Mini receptacle connected to USB-to-serial device, which programs the CCG4 controller using the EZ-PD Configuration Utility
SWD Programming	SWD pin debugging/programming using MiniProg3 device (not provided with the kit)
Power	5 V from DC power jack 5 V regulated from Type-C connector 5 V from USB Type-B mini connector 1.8 V/3.3 V/5 V From SWD programming header

4.4.3 Connectors and Jumper Settings

Figure 12 shows the CY4541 CCG4 daughter card connectors and default jumper settings. Table 4-4 lists the jumpers and header description and default settings.

Figure 12. CY4541 CCG4 Daughter Card Connectors
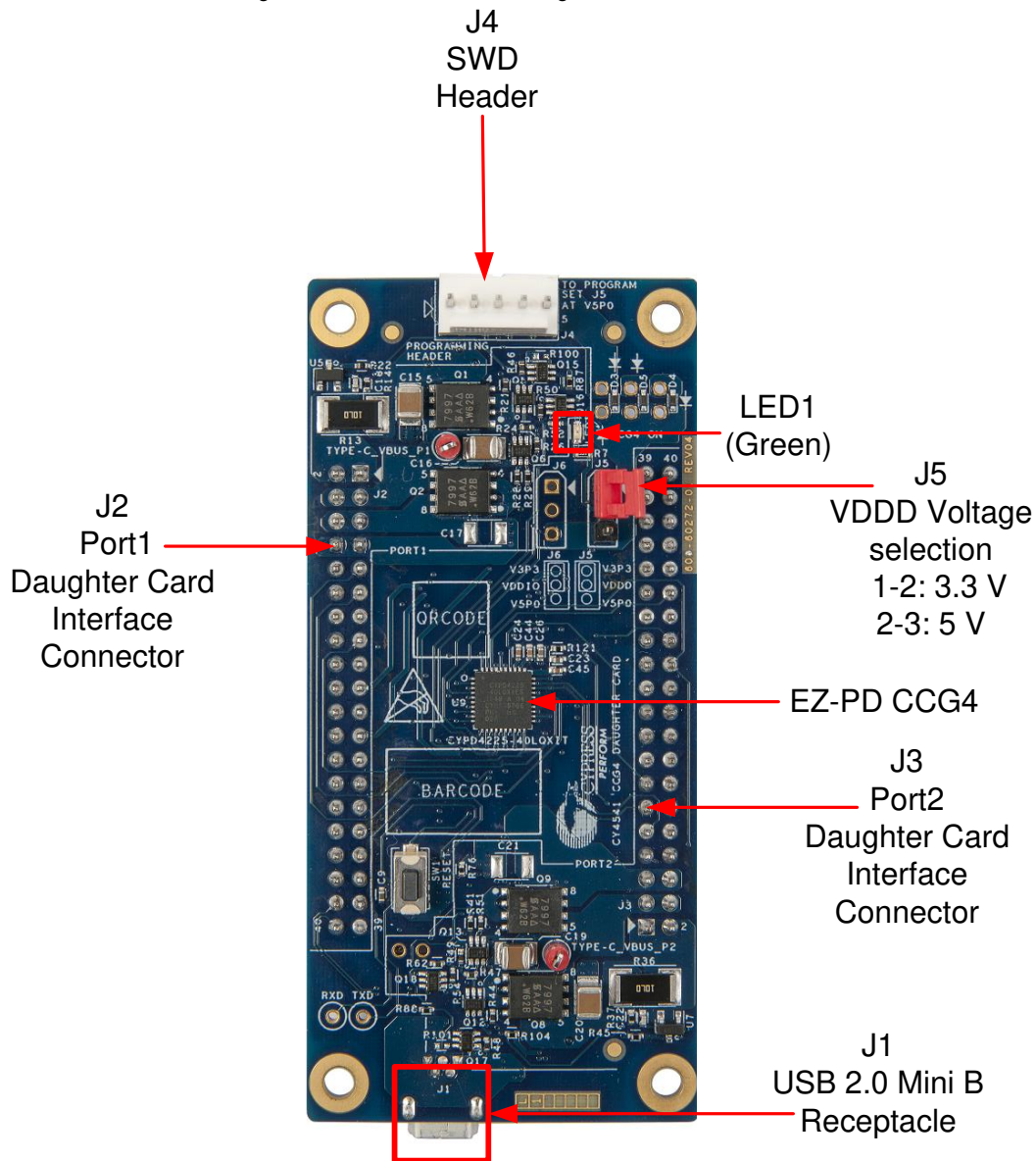
Table 4-4. CY4541 CCG4 daughter card Jumper Description and Default Settings

Jumper/Connector	Description		Default
J1	USB 2.0 Mini-B connector (receptacle)		NA
J2	Type-C Port1 interface		NA
	Pin 1: USB_P_PWR_P1 (USB Provider power)	Pin 2: USB_P_PWR_P1 (USB Provider power)	
	Pin 3: Type-C_VBUS_P1	Pin 4: Type-C_VBUS_P1	

Jumper/Connector	Description		Default
	Pin 5: USB_C_PWR_P1 (USB Consumer power)	Pin 6: USB_C_PWR_P1 (USB Consumer power)	
	Pin 7: GND	Pin 8: GND	
	Pin 9: I2C_SCL	Pin 10: VBUS_DISCHRG_P1	
	Pin 11: I2C_SDA	Pin 12: SWD_IO	
	Pin 13: OCP_P1 (Over Current Protection)	Pin 14: SWD_CLK	
	Pin 15:P_PWR_P1_MON	Pin 16: XRES	
	Pin 17: VSEL2 _P1(Voltage Selection line 2)	Pin 18: I2C_ADDR_P1	
	Pin 19: V5P0_P1	Pin 20: No Connect	
	Pin 21: CC1_P1	Pin 22: CC2_P1	
	Pin 23: V3P3_P1	Pin 24: VBUS_P_CTRL_P1 (VBUS Provider Control)	
	Pin 25: RXD_P1	Pin 26: VBUS_MON_P1 (VBUS Monitoring I/O)	
	Pin 27: TXD_P1	Pin 28: I2C_INT_EC	
	Pin 29: DP_AUXN_P1	Pin 30: VBUS_C_CTRL_N_P1 (VBUS Consumer Control)	
	Pin 31: DP_AUXP_P1	Pin 32: OVP_TRIP_P1 (Overvoltage Detection Signal)	
	Pin 33: SBU2_P1	Pin 34: I2C_SDA_EC	
	Pin 35: SBU1_P1	Pin 36: HOTPLUG_DET_P1	
	Pin 37: I2C_SCL_EC	Pin 38 : USB2_DP	
	Pin 39: VSEL1 _P1(Voltage selection line 1)	Pin 40: USB2_DM	
J3	Type-C Port2 Interface		NA
	Pin 1: USB_P_PWR_P2 (USB Provider power)	Pin 2: USB_P_PWR_P2 (USB Provider power)	
	Pin 3: Type-C_VBUS_P2	Pin 4: Type-C_VBUS_P2	
	Pin 5: USB_C_PWR_P2 (USB Consumer power)	Pin 6: USB_C_PWR_P2 (USB Consumer power)	
	Pin 7:GND	Pin 8:GND	
	Pin 9: I2C_SCL	Pin 10: VBUS_DISCHRG_P2	
	Pin 11: I2C_SDA	Pin 12: No Connect	
	Pin 13: OCP_P2 (Over Current Protection)	Pin 14: No Connect	
	Pin 15: P_PWR_P2_MON	Pin 16: No Connect	
	Pin 17: VSEL2 _P2(Voltage Selection line 2)	Pin 18: I2C_ADDR_P2	
	Pin 19: V5P0_P2	Pin 20: VCONN_MON	

Jumper/Connector	Description		Default
	Pin 21: CC1_P2	Pin 22: CC2_P2	
	Pin 23: V3P3_P2	Pin 24: VBUS_P_CTRL_P2 (VBUS Provider Control)	
	Pin 25: RXD_P2	Pin 26: VBUS_MON_P2 (VBUS Monitoring I/O)	
	Pin 27: TXD_P2	Pin 28: No Connect	
	Pin 29: DP_AUXN_P2	Pin 30: VBUS_C_CTRL_N_P2 (VBUS Consumer Control)	
	Pin 31: DP_AUXP_P2	Pin 32: OVP_TRIP_P2 (Overvoltage	
	Pin 33: SBU2_P2	Pin 34: No Connect	
	Pin 35: SBU1_P2	Pin 36: HOTPLUG_DET_P2	
	Pin 37: No Connect	Pin 38 : SW1_P2	
	Pin 39: VSEL1 _P2(Voltage selection line 1)	Pin 40: SW0_P2	
J4	SWD Programming header Pin 1: VTARG Pin 2: GND Pin 3: XRES Pin 4: SWD_CLK Pin 5: SWD_IO		NA
J5	VDDD voltage selection for CCG4 device 1 and 2 short: 3.3 V 2 and 3 short: 5.0 V		Short pin1 and pin2

4.5   CCG EVK Base Board and CCG4 Daughter Card Revisions

Table 4-5 provides details about the latest revision of the CCG EVK Base Board and CCG4 Daughter Card

Table 4-5: Revision of CCG EVK Base Board and CCG4 Daughter Card

Board	Revision
CCG EVK Base Board	Rev 05
CCG4 Daughter Card	Rev 04

Schematic and BoM details for the latest revision of hardware are available in Appendix A. The complete set of latest hardware files (Schematic, BoM & Layout) files are available under `<Install Directory>\CY4541 CCG4 EVK\1.0\Hardware`.

Revision number of a given hardware can be identified on the PCB as shown in Figure 13.

Figure 13: Revision Number of CCG EVK Base Board

Note that hardware design files (Schematic, BoM & Layout) of the earlier revisions of the hardware are also available as part of the kit installer. Refer to `<Install Directory>\CY4541 CCG4 EVK\1.0\Hardware\README.txt` to get more details.

5. Programming the CCG4 Device

The CCG4 device in the CY4541 EZ-PD CCG4 EVK is preprogrammed with the latest cyacd* firmware binary image at the time of manufacturing. However, a more recent *cyacd** file for CCG4 is available on the CY4541 EZ-PD CCG4 EVK webpage as well as in the CY4541 EZ-PD CCG4 EVK installer. The firmware version of the onboard CCG4 device can be verified by using the EZ-PD Configuration Utility as shown in Figure 17. If the onboard CCG4's firmware version does not match the latest version on the CY4541 EZ-PD CCG4 EVK webpage, follow the steps in this chapter to reprogram the CCG4 device. This firmware update is required for successful kit operation. Device configuration parameters (such as vendor ID, Power Data Objects (PDOs), DisplayPort mode parameters) can be updated using EZ-PD Configuration Utility. Refer to the EZ-PD Configuration Utility User Manual for more details.
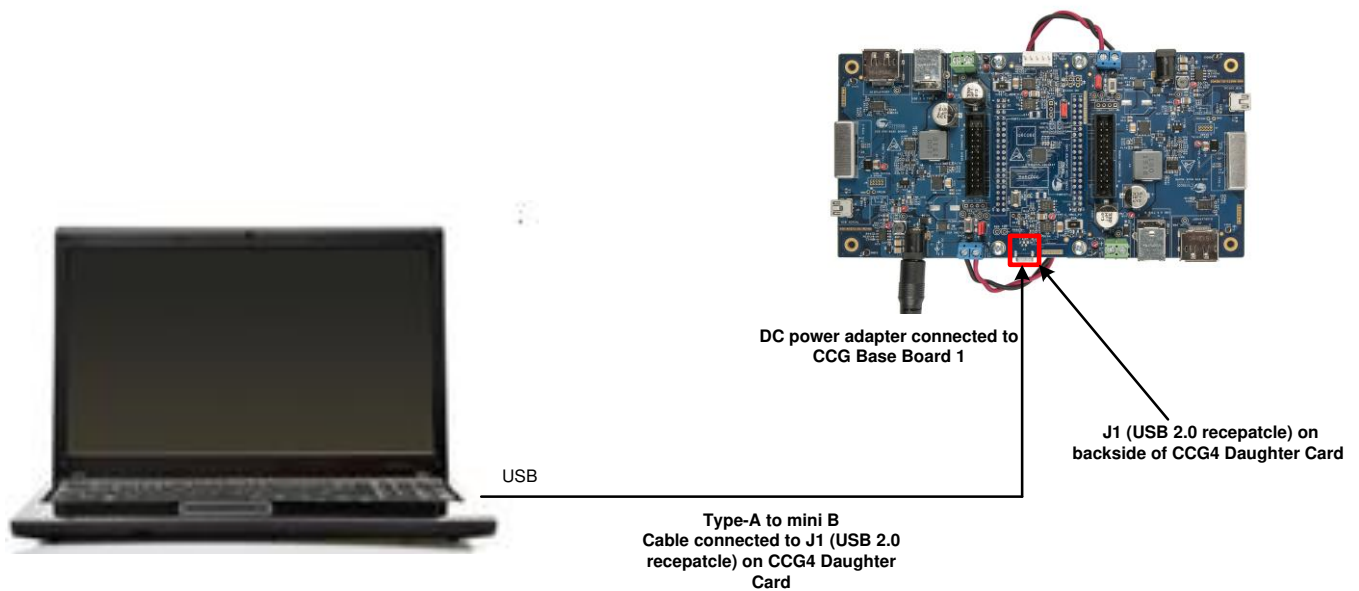
Note *: cyacd is the bootloader application and code data file format. The file consists of a header followed by lines of flash data. Excluding the header, each line in the .cyacd file represents an entire row of flash data. The data is stored as ASCII data in Big Endian format.

5.1 Programming CCG4 Device on the CY4541 CCG4 Daughter Card

Follow these steps to update the firmware running on the CCG4 device of the CY4541 CCG4 daughter card:

1. If the kit installation is not performed yet or was not performed recently, install the latest version of the software by downloading and installing the latest kit setup *CY4541Setup.exe* from www.cypress.com/CY4541.

2. Ensure that the voltage selection jumper (J5) is set to 5 V (pins 2 and 3 of jumper J5 on the CY4541 CCG4 daughter card are shorted).

3. Connect the boards and cables (USB 2.0 USB 2.0 Type-A to Mini-B cable, DC power adapter, and wires between the power input header (J12) on CCG EVK base board 1 and CCG EVK base board 2) as shown in Figure 14. Connect the DC power adapter to CCG EVK base board 1.

Figure 14. Programming the CCG4 Device

DC power adapter connected to CCG Base Board 1

J1 (USB 2.0 recepatcle) on backside of CCG4 Daughter Card

USB

Type-A to mini B Cable connected to J1 (USB 2.0 recepatcle) on CCG4 Daughter Card

4. The EZ-PD Configuration Utility is a Microsoft Windows Application, which can be used to configure and program the CCG4 device on the CY4541 CCG4 daughter card. After the kit installation, EZ-PD Configuration utility is available at the following location:

<Install_Directory>/Cypress/ EZ-PD Configuration utility

Alternatively, download and install the EZ-PD Configuration Utility from the Cypress webpage.

5. Open the EZ-PD Configuration Utility as shown in Figure 15. After the installation, the EZ-PD Configuration Utility is available at the following location:

Start > **All Programs** > **Cypress > EZ-PD Configuration Utility** > **EZ-PD Configuration Utility.exe**