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CY4532

EZ-PD™ CCG3PA Evaluation Kit Guide

Doc. No. 002-18680 Rev. *B

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Safety Information



The CY4532 EZ-PD™ CCG3PA Evaluation Kit (EVK) is intended for use as an evaluation 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 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 CY4532 EZ-PD CCG3PA EVK boards contain ESD-sensitive devices. Electrostatic charges readily accumulate on the human body and any equipment, which can cause a discharge without detection. Permanent damage may occur to devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused CY4532 EZ-PD CCG3PA EVK boards in the protective shipping package.



End-of-Life/Product Recycling

The end-of-life cycle for this kit is five years from the date of manufacture mentioned on the back of the box. Contact the nearest recycler to discard the kit.

General Safety Instructions

ESD Protection

ESD can damage boards and associated components. Cypress recommends that the user 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.

Handling Boards

The boards provided with CY4532 EZ-PD CCG3PA EVK are sensitive to ESD. This also applies to the boards that are provided with a plastic casing, when they are removed from the casing. Hold the boards only by the edges. After removing a board from the box/casing, place it on a grounded, static-free surface. Use a conductive foam pad, if available. Do not slide the board over any surface.

Do's and Don'ts



- Use only a compatible 2-Cell Li-Ion battery. Make sure that the battery is connected to the Battery Terminal (J1) of CY4532 Power Board as per the marked polarity (+/-) on the hardware. See [Chapter 5. Kit Operation](#) for more details.
- Supply 12 V DC input only at the DC Jack (J3) of CY4532 Power Board.
- Do not exceed 24 V DC input at the DC Terminal (J2) of CY4532 Power Board.
- Do not connect any battery at the DC Terminal (J2) of CY4532 Power Board.
- Do not supply DC input at Load Terminals (J4 and J5) of CY4532 Power Board.
- Do not connect DC input at the DC Jack (J3) and battery at Battery Terminal (J1) simultaneously.
- Do not apply more than 6.5 V on the test points.
- Do not apply reverse voltage on the test points.
- Do not connect USB Type-C Power Adapter to the USB Type-C port (J13) located on the CY4532 Power Board.

Identifying Kit Revision and Serial Number

The CY4532 kit revision and serial number are printed on a sticker and pasted at the bottom side of the CY4532 kit box. See the figure below for more details.



1. Introduction



The CY4532 EZ-PD™ CCG3PA Evaluation Kit (EVK) is based on the CCG3PA product family of Cypress' USB Type-C microcontrollers. This EVK is intended to be an evaluation vehicle for USB Type-C Power Adapter (PA) and USB Type-C Power Bank (PB) applications. The kit can be configured for a PA or PB application using a combination of firmware, jumper settings on the kit hardware, and external accessories. The following paragraphs provide a brief description of both applications:

- **USB Type-C Power Adapter (PA):** This application is used to charge a device such as a mobile phone or notebook, which supports their battery charging through the Type-C interface. The device can be connected to the Type-C port or Type-A port on the CY4532 EVK's Main Board. This application requires a DC input to be supplied to the EVK.
- **USB Type-C Power Bank (PB):** This application uses a 1-Cell or 2-Cell Lithium-ion battery connected to the CY4532 EVK, which acts as the power source to support charging on USB Type-C and USB Type-A ports. In addition, the battery can be charged using a USB Type-C Power Adapter connected to the USB Type-C port of the EVK's Main Board.

In addition to the applications described above, the CY4532 Power Board can be used as a Programmer for Cypress EZ-PD CCGx Products supporting Configuration Channel (CC) boot-loading. See [Chapter 5. Kit Operation](#) for more details.

1.1 Kit Contents

The CY4532 EZ-PD CCG3PA EVK consists of the following:

- CY4532 EZ-PD CCG3PA EVK Power Board
- CY4532 EZ-PD CCG3PA EVK Main Board (pre-mounted on the CY4532 EVK Power Board)
- 12 V 50.4 W DC Power Adapter
- Quick Start Guide

Note: The Rev ** of the CY4532 EVK has a 12 V 24 W DC Power Adapter.

1.1.1 Hardware Not Included with the Kit

The CY4532 EZ-PD CCG3PA EVK does not come with all the hardware required to perform the demonstrations mentioned in [Power Adapter \(PA\) Demo](#) and [Power Bank \(PB\) Demo](#) sections of [Chapter 5. Kit Operation](#). The following items are not included:

- A USB Type-C device that can consume power over the Type-C port (example: laptop or mobile phone with USB Type-C port)
- A device that can be charged over the USB Type-A interface (example: mobile phone which can be charged through the USB port)
- 1-cell (2.7 V–4.2 V) or 2-cell (5.4 V–8.4 V) Li-ion battery
- USB Type-C Power Adapter. This is required to charge the battery attached to the CY4532 EVK in PB use-case.
- USB cables required for connecting the devices to the USB Type-C and Type-A ports

1.2 Getting Started

For instructions on how to run a quick demonstration and observe the kit functionality, see the [Power Adapter \(PA\) Demo](#) section.

1.3 Acronyms

Table 1-1. Acronyms Used in this Document

Acronym	Definition
AFC	Adaptive Fast Charging
BC	Battery Charging
CC	Configuration Channel
CCG	Cable Controller Generation
DFP	Downstream Facing Port
DRP	Dual Role Port
EC	Embedded Controller
EMCA	Electronically Marked Cable Assembly
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
EVK	Evaluation Kit
FET	Field-Effect Transistor
GPIO	General-Purpose Input/ Output
IC	Integrated Circuit
I ² C	Inter-Integrated Circuit
LED	Light-Emitting Diode
NA	Not Applicable
OCP	Over Current Protection
PA	Power Adapter
PB	Power Bank
PD	Power Delivery
PDO	Power Data Object
PPS	Programmable Power Supply
PMIC	Power Management Integrated Circuit
PS	Power Supply
PSoC [®]	Programmable System-on-Chip

Acronym	Definition
QC	Qualcomm Quick Charge
SWD	Serial Wire Debug
UART	Universal Asynchronous Receiver Transmitter
UFP	Upstream Facing Port
USB	Universal Serial Bus
USB-PD	Universal Serial Bus Power Delivery

2. Kit Installation



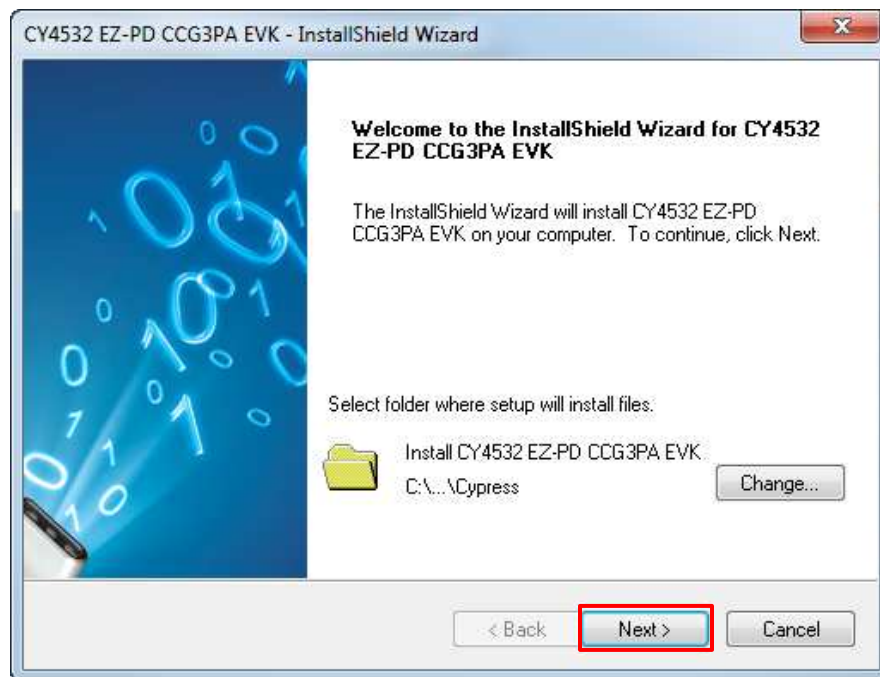
This chapter describes the procedure to install the CY4532 EZ-PD CCG3PA EVK software.

2.1 CY4532 EZ-PD™ CCG3PA EVK Kit Software Installation

To install the kit software, follow these steps:

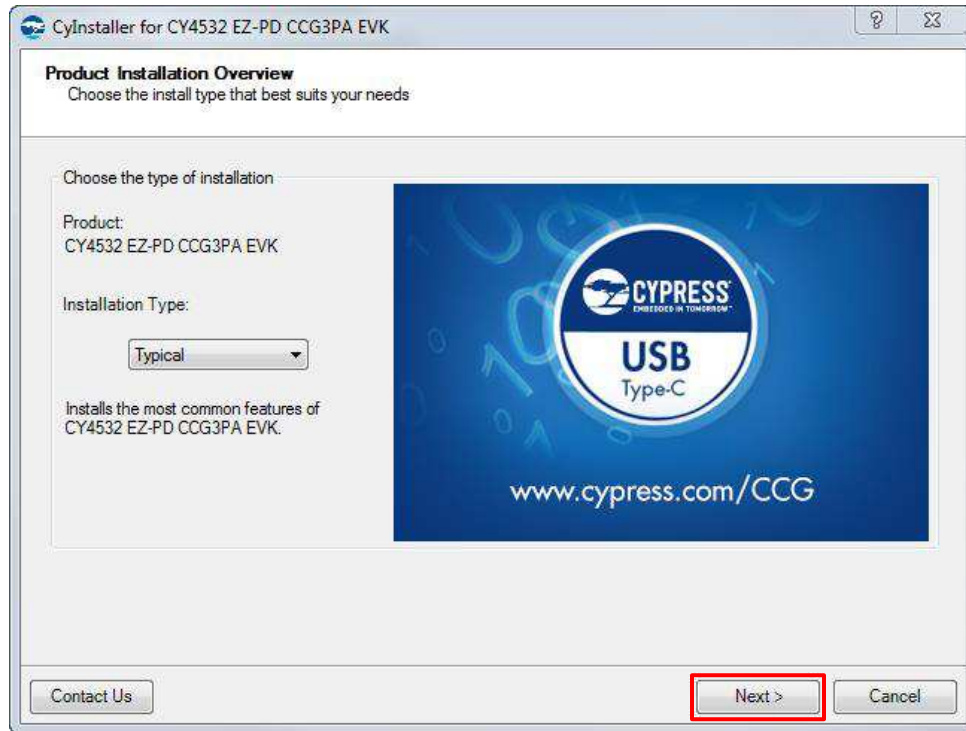
1. Download the latest kit software setup file *CY4532Setup.exe* from the kit's webpage www.cypress.com/CY4532. This package contains the kit hardware files, firmware binaries, and the kit documentation (Kit Guide, Quick Start Guide, and Release Notes). Double-click the executable to start the installation. Click **Next** when the screen shown in [Figure 2-1](#) appears.

Figure 2-1. CY4532 EZ-PD CCG3PA EVK Installer Screen



2. Select the required **Installation Type** and click **Next** to start the install ([Figure 2-2](#)). For first-time installation, it is recommended that you select **Typical** as the **Installation Type**.

Figure 2-2. Installation Wizard



3. Accept the license agreement for the software components and click **Next** (Figure 2-3).

Figure 2-3. License Agreement

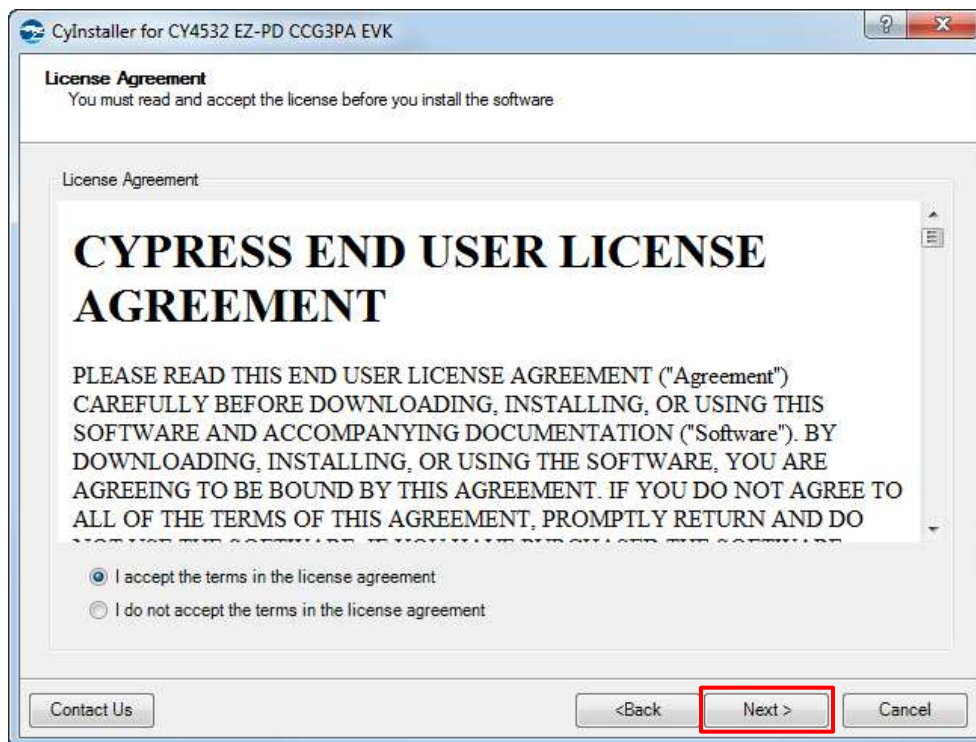
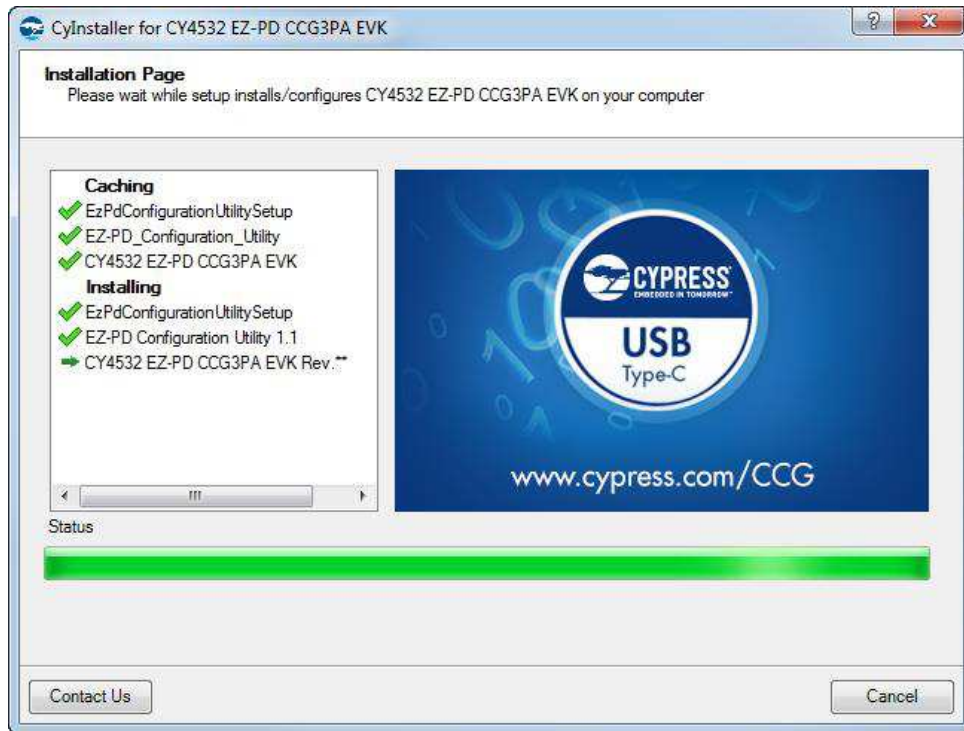


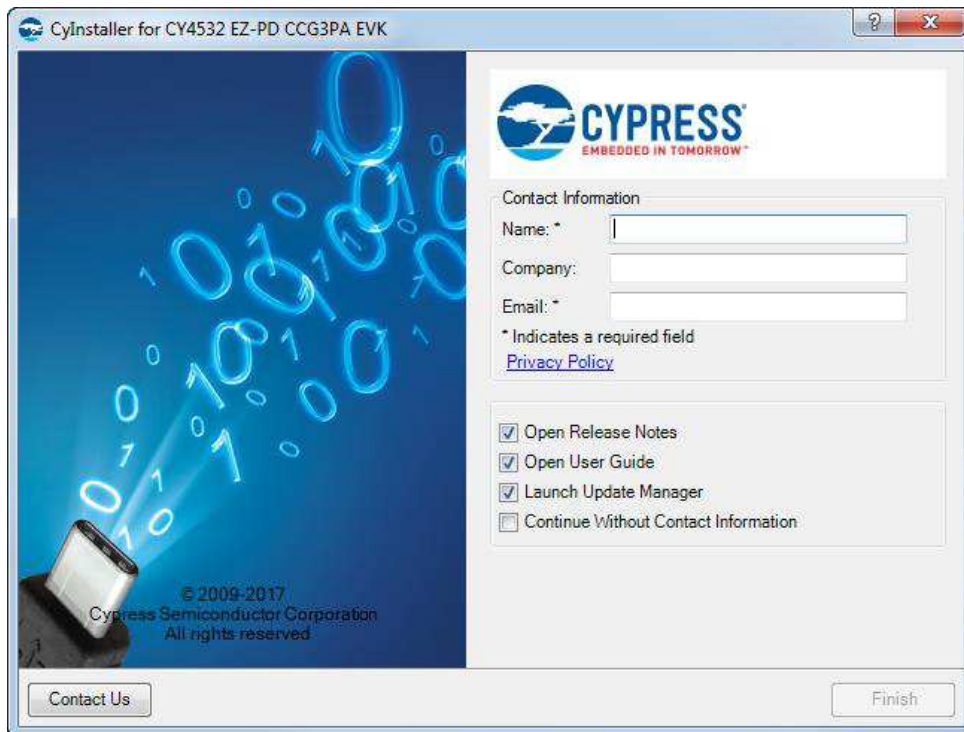
Figure 2-4 shows the installation progress.

Figure 2-4. Installation Progress



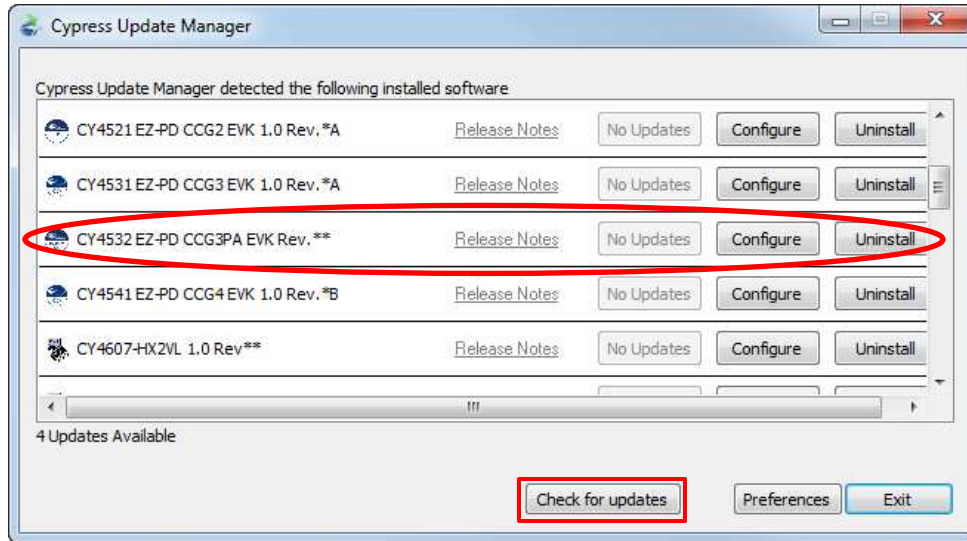
4. Enter the **Contact Information** or select **Continue Without Contact Information** and click **Finish**. (Figure 2-5).

Figure 2-5. Software Installation Complete



- When installation is complete, you have the option to launch the **Cypress Update Manager** (Figure 2-6) to make sure you have the latest software package. Click **Check for updates** at the bottom of the window. If **No Updates** appears adjacent to the CY4532 EZ-PD CCG3PA EVK, click **Exit**. If there are updates, click **Update** to download and install the latest kit package.

Figure 2-6. Cypress Update Manager



Note: You can launch the Cypress Update Manager at any time from **Start > All Programs > Cypress > Cypress Update Manager**.

After the installation is complete, the contents are available at this location: *<Install Directory>\CY4532 EZ-PD CCG3PA 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*.

3. CY4532 System Design Details



3.1 CY4532 EVK System Overview

This section provides details on the system capabilities of the CY4532 EVK. The kit supports USB Type-A and USB Type-C ports for charging.

3.1.1 Power Adapter Application

For a Power Adapter (PA) application, the input power source is the DC adapter provided with the EVK. It is rated for 50.4 W (12 V/4.2 A) of power, so the total output power including both charging ports is limited to 50.4 W. Applications may charge two devices simultaneously, one on the USB Type-A port and other on the USB Type-C port, if these adhere to the 50.4 W limit, failing which the charging may intermittently or completely stop.

Table 3-1 lists the specifications for the DC adapter to be used with the CY4532 EVK.

Table 3-1. Specifications of the DC Adapter to Use with CY4532 EVK

Parameter	Min	Max
DC Voltage	6 V	12 V
DC Current	-	5 A

Table 3-2 lists the charging protocols supported on the USB Type-A port.

Table 3-2. Charging Protocols Supported on USB Type-A Port

Protocol	CY4532 Operating Specification
QC 3.0 (Qualcomm Quick Charge)	3.6 V – 20 V
Apple Charging	5 V, 2.4 A
Samsung AFC (Adaptive Fast Charging)	5 V, 3 A 9 V, 2.1 A 12 V, 1.05 A
BC 1.2 (Battery Charging)	5 V

Table 3-3 lists the charging protocols supported on the USB Type-C port.

Table 3-3. Charging Protocols Supported on USB Type-C Port

Protocol	CY4532 Operating Specification
USB Type-C and PD	5 V, 3 A 9 V, 3 A ¹
QC 4.0 / PPS ²	3 V - 11 V, 3 A
QC3.0	3.6 V- 20 V
QC 2.0	5 V, 9 V, 12 V, 20 V
Apple Charging	5 V, 2.4 A
Samsung AFC (Adaptive Fast Charging)	5 V, 3 A 9 V, 2.1 A 12 V, 1.05 A
BC 1.2 (Battery Charging)	5 V

Note:

1. Default Power Bank Application supports 9 V, 2 A
2. Supported only for Power Adapter application

If an application uses a USB Type-C-to-Type-A converter on the USB Type-C port, all charging protocols supported on the USB Type-A port of the EVK are applicable.

The USB Type-C port has the over-current protection (OCP) feature implemented in the system. If the charging current exceeds the negotiated contract current by more than 30%, CCG3PA will treat this as a fault and stop charging on the USB Type-C port.

The CY4532 Kit has an additional feature to support VCONN supply for cable discovery in the Power Adapter application. The CY4532 Kit hardware and firmware require changes to exercise the VCONN operation. Please contact Cypress Technical Support through www.cypress.com/support to enable the VCONN operation on the CY4532 Kit.

Applications that exceed the CY4532 operating specifications need a DC adapter with a higher power rating; however, it should not exceed the specifications mentioned in Table 3-1. Changes in the PA firmware are also required for exceeding the CY4532 operating specifications to avoid OCP fault on the USB Type-C port.

3.1.2 Power Bank Application

For Power Bank (PB) applications, use standard-quality Li-Ion batteries. Table 3-4 lists the specifications of the battery to be used with the CY4532 Kit for 2-Cell and 1-Cell operations.

Table 3-4. Specifications of 2-Cell and 1-Cell Batteries

Parameter	2-Cell Specification		1-Cell Specification	
	Min	Max	Min	Max
DC Voltage	5.5 V	8.4 V	3.7 V	4.2 V
Charging Current	200 mA	3 A	200 mA	3 A
Discharging Current	3 A	5 A	3 A	5 A

Charging protocols listed in Table 3-2 and Table 3-3 are applicable for the Power Bank application as well.

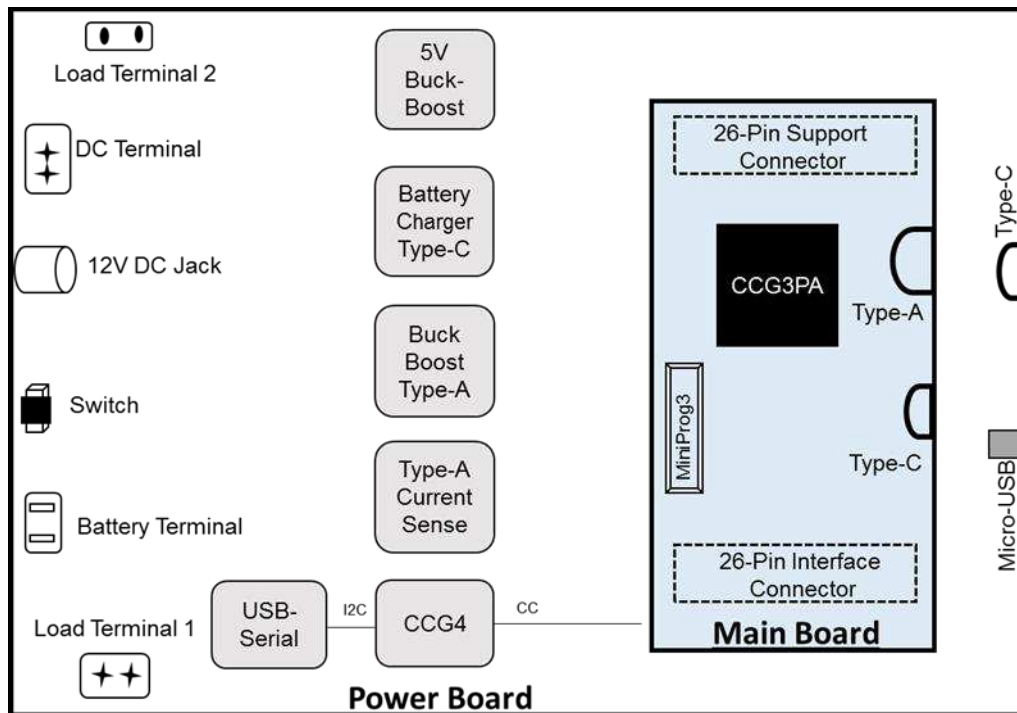
For applications that exceed the CY4532 operating specifications, a higher current rated battery is desired; however, the battery should not exceed specifications listed in Table 3-4. For exceeding the CY4532 operating specifications, applicable changes in PB firmware are also required to avoid OCP fault on the USB Type-C port.

Important Note: It is recommended to use 2-Cell battery as the maximum charging current supported by the EVK with 1-Cell battery operation is limited to 1.5 A. The charging may stop when the charging current exceeds 1.5 A.

3.2 CY4532 EVK Hardware Overview

The CY4532 EZ-PD CCG3PA EVK consists of a Power Board and a Main Board. The Main Board is pre-mounted on the Power Board during manufacturing. The CCG3PA device is located on the Main Board. The CY4532 hardware architecture is captured in [Figure 3-1](#).

Figure 3-1. CY4532 EZ-PD CCG3PA EVK Architecture



The CY4532 Power Board consists of the following key components:

- A DC Input Jack
- A Battery Input Terminal
- A Micro-USB connector to download firmware to CCG3PA
- A Type-C receptacle to enable programming of an external CCG3PA based hardware
- Regulators to support battery charging and to provide power for the USB Type-C and USB Type-A charging

The CY4532 Main Board consists of following the key components:

- CCG3PA silicon (CYPD3171-24LQXQ)
- A Type-C receptacle
- A USB Type-A connector
- MiniProg3 SWD header to program CCG3PA

The Main Board is mounted on the Power Board using two 26-pin connectors.

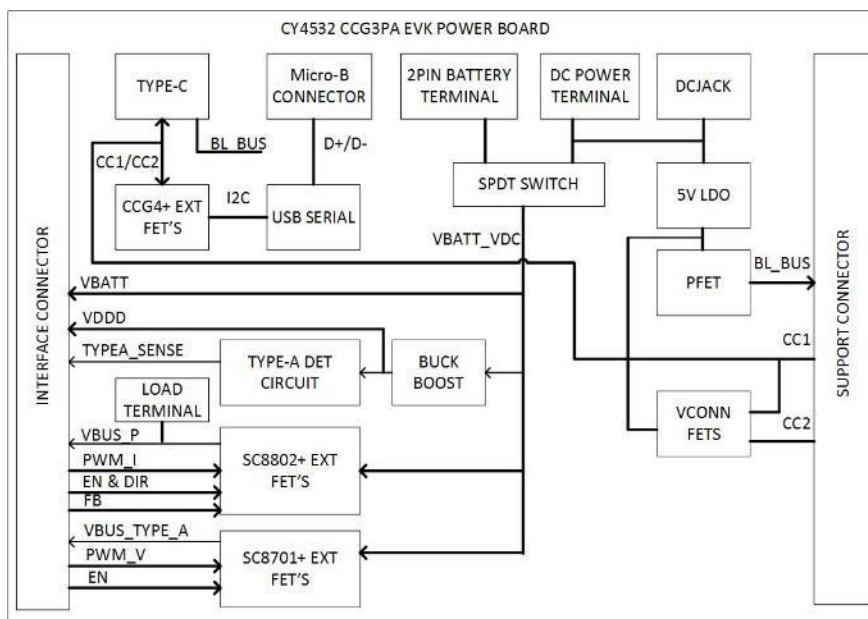
3.3 CY4532 Power Board

The CY4532 Power Board implements all the interfaces and logic to provide the required power supplies to the CY4532 Main Board. This board provides interfaces to connect a DC power input (for PA application) or a battery input terminal (for PB application).

3.3.1 Block Diagram

The block diagram of the CY4532 Power Board is shown in Figure 3-2. It provides two interfaces (DC Barrel Jack and DC Screw Terminals) to provide DC input power using an AC-DC power adapter or using a bench power supply respectively. It also includes a Battery Terminal to connect a 1-cell or 2-cell Li-ion battery. The input power mechanism (DC supply or battery) is selected using a switch (SW1).

Figure 3-2. CY4532 Power Board Block Diagram



The Power Board contains the following key parts:

- **SC8802 (U1):** This is a bidirectional buck boost regulator connected to the USB Type-C port on the main board. In the PA application, this part regulates the VBUS (VBUS_P) voltage from 3 V to 20 V on the USB Type-C port as per the PD contract negotiated with the device being charged. The input voltage range for this part is 2.7 V to 24 V.
 In the PB application, when the battery is being charged, this part provides power from the VBUS input (VBUS_P) to the battery. The VBUS voltage of 3 V to 20 V supplied from a USB Type-C charger is fed to this part and it controls the power supplied to the battery as per the battery type (1-cell or 2-cell).
- **SC8701 (U2):** This is a buck boost regulator connected to the USB Type-A port located on the CY4532 EVK Main Board. In both the PA and PB applications, it supplies power from the DC input/battery to provide the VBUS output (VBUS_TYPE_A) on the Type-A port. The input voltage range for this part is 2.7 V to 24 V.
- **TPS63060DSCR (U4):** This is a buck boost regulator that provides a constant 5 V output. The input supply to this part is provided through the DC jack (J3) or the Battery input (J1), based on the SW1 switch setting. The recommended input voltage range for this part is up to 12 V only. The output from this part is used to provide:
 - V_{DDD} supply to the CCG3PA device located on the CY4532 EVK Main Board
 - 5 V on the USB Type-A port of the CY4532 EVK Main Board to detect a device plug-in
 - VBUS on the USB Type-C port of the CY4532 EVK Power Board to enable flashing of an external CCG3PA based hardware
- **CYPD4126-40LQXI (U3):** This is a Cypress CCG4 controller part. It enables downloading firmware on to the CCG3PA part (which is located on the CY4532 EVK Main Board) using the EZ-PD configuration utility. It is connected to the

CCG3PA device using the CC lines. The CCG4 controller is connected to a Cypress USB-Serial part (U7) over I²C to receive the CCG3PA firmware.

Note: The CY4532 EVK Power Board can be used as an external CCG3PA programming accessory. The CY4532 EVK Main Board should not be connected to the Power Board for this use case. The CC lines of the CCG4 part are terminated at a USB Type-C receptacle on the Power Board. External CCG3PA based hardware can be connected to this USB Type-C receptacle to download firmware using the EZ-PD configuration utility running on a PC.

- **CY7C65211 (U7):** This is Cypress' USB-Serial part that is connected to the USB Micro-B connector (J12) of the CY4532 EVK Power Board. It is also connected to the CCG4 part over I²C. This part enables downloading the firmware on to the CCG3PA device (which is located on the CY4532 EVK Main Board) through the USB Micro-B port of the CY4532 Power Board.

3.3.2 Features

Table 3-5 lists the features of the CY4532 EVK Power Board.

Table 3-5. CY4532 EVK Power Board Features

Feature	Description
Power Supplies	The input power can be provided through the DC input interface or the battery. The input supply is fed to SC8802 and SC8701 to enable charging through USB Type-C and USB Type-A ports. In addition, SC8802 supports charging of a battery connected to the Power Board. Note: The DC power adapter provided with the kit can support only up to 4.2 A (at 12 V). The CY4532 EVK will not work with 5 V DC power adapters.
CY4532 Main Board Connectors	Two 26-pin connectors (Interface Connector and Support Connector) are available on the Power Board to connect it to the Main Board.
Firmware Download Interface	The CCG3PA firmware can be downloaded to the CCG3PA device located on the Main Board through the USB Micro-B interface available on the Power Board.

3.3.3 Connectors and Jumper Settings

Figure 3-3 shows the CY4532 Power Board connectors and the default jumper settings.

Table 3-6 lists the detailed description of the connectors and jumper settings.

Figure 3-3. CY4532 Power Board Connectors

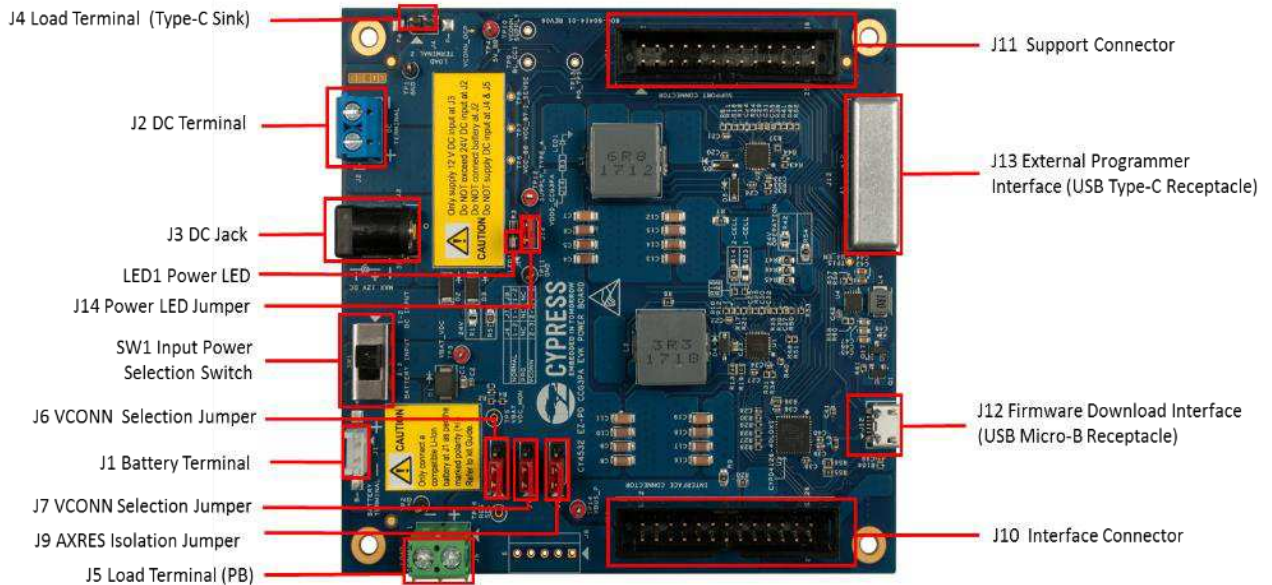


Table 3-6. CY4532 Power Board Connector/Jumper/LED Description

Connector/Jumper	Description	Type	Purpose	Default State
J1	Battery Terminal	Input	To connect a 1-cell or 2-cell Li-ion battery Battery voltage range: 2.7 V (Min) to 8.4 V (Max)	NA
J2	DC Terminal	Input	To connect any external power supply with the board Supply voltage range: 6 V (Min) to 24 V (Max) The board's default configuration does not support the usage of this terminal. See the CY4532 EVK's Power Board schematics to understand the usage of this terminal.	NA
J3	DC Jack	Input	12 V DC power adapter provided with the kit can plugged into this jack. The AC/DC adapter shipping with the kit will provide 12 V with a current up to 4.2 A. If you need additional power sourcing, you can use your choice of power adapter that can source more current at 12 V.	NA
J4	Load Terminal 2 (Type-C Sink)	Output	For future use	NA
J5	Load Terminal 1 (PB)	Output	To connect an external electronic load for the PB application to emulate the battery charging current Load range: 0 A (Min) to 5 A (Max) Note: Make sure to connect the load on J5 and not on J4.	NA
J6	VCONN Selection Jumper	Input	To enable the VCONN operation on the Power Board for PA application	Short pins 1 and 2
J7	VCONN Selection Jumper	Input	To enable the VCONN operation on the Power Board for PA application	Short pins 1 and 2
J9	AXRES Isolation Jumper	Input	To isolate the AXRES pin of CCG3PA device on the Main Board from the Power Board.	Short pins 1 and 2
J10	Interface Connector	Input/Output	To connect various control signals from the CCG3PA to the regulators.	NA
J11	Support Connector	Input/Output	To connect CCG4's CC signals and other signals between the Power board and the Main board	NA
J12	USB Micro-B receptacle	Input/Output	Interface to download firmware on to the CCG3PA part	NA
J13	USB Type-C receptacle	Input/Output	External CCG3PA programming interface	NA
J14	LED Jumper	NA	This jumper connects power to anode of LED1. If the jumper is not installed LED indication will stop as there is no power supplied to LED.	Short pins1 and 2
LED1	Power LED	Output	LED to indicate that the board is powered either from a DC adapter, a battery, or an external Type-C charger.	OFF

Note: In Rev ** of the CY4532 EVK, the features listed in [Table 3-7](#) are different from those listed in [Table 3-6](#).

Table 3-7. Connector/Jumper/LED Differences

Connector/Jumper	Remark/Difference	Default state
J12	USB Mini-B receptacle instead of USB Micro-B receptacle	NA
J14	Not Present	NA
LED1	LED will blink for a second when the board is powered either from a DC adapter, a battery, or an external Type-C charger.	OFF

The Rev ** of the CY4532 EVK also can be identified using the board revision numbers listed in Table 3-8. These revision numbers are printed on the silk screen of the boards:

Table 3-8. Board Revision Numbers

#	Board	Revision Number Printed on the Silk Screen
1	CY4532 EZ-PD CCG3PA EVK MAIN BOARD	600-60412-01 REV04
2	CY4532 EZ-PD CCG3PA EVK POWER BOARD	600-60414-01 REV04

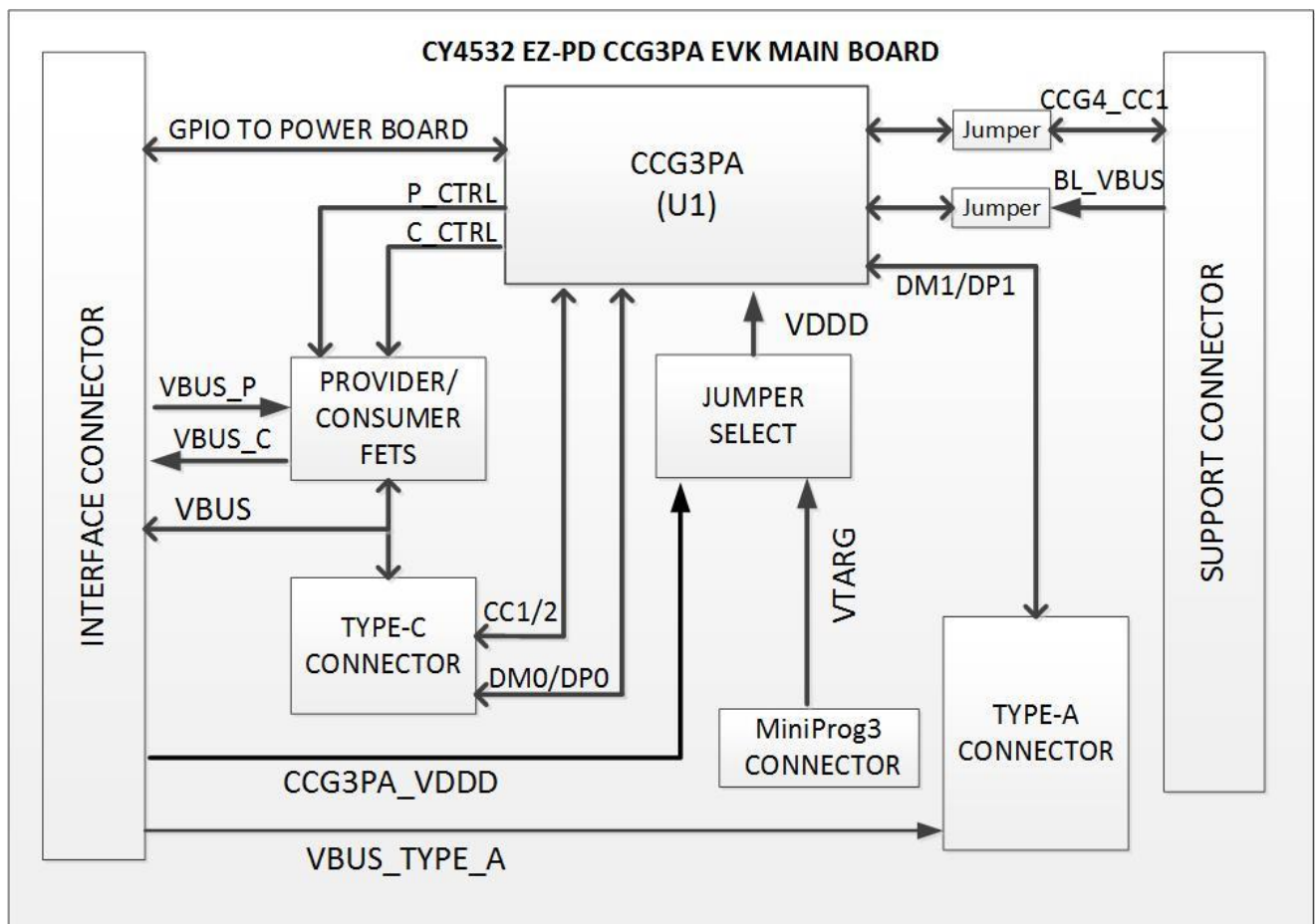
3.4 CY4532 Main Board

The CY4532 Main Board consists of the CCG3PA silicon (CYPD3171-24LQXQ), USB Type-C and USB Type-A ports and a MiniProg3 SWD header. The Main Board is mounted on the Power Board using two sets of connectors.

3.4.1 Block Diagram

Figure 3-4 shows the block diagram of the CY4532 EVK Main Board.

Figure 3-4. CY4532 EVK Main Board Block Diagram



The Main Board contains the following key parts:

- **CYPD3171-24LQXQ (U1):** This is the CCG3PA controller with the required control logic to implement PA and PB applications.
- **Power MOSFETs (Q1 and Q2):** These MOSFETs are P-Channel devices which control the Provider and the Consumer paths for VBUS at the Type-C connector.

3.4.2 Features

Table 3-9 lists the features of the CY4532 EVK Main Board.

Table 3-9. CY4532 EVK Main Board Features

Feature	Description
CCG3PA controller	The CYPD3171-24LQXQ part is located on the Main Board. This part implements the PA and PB control functionality
USB Type-C Source/Sink Port	A USB Type-C receptacle to attach devices that can consume power over a USB Type-C port (PA and PB applications) and to charge the battery connected to the power board (PB application)
USB Type-A Source Port	A USB Type-A receptacle to attach devices that can consume power over USB Type-A
Programming	SWD pins to debug/program CCG3PA using MiniProg3 (not required if the EZ-PD configuration utility is used)

3.4.3 Connectors and Jumper Settings

Figure 3-5 shows the CY4532 Main Board connectors and default settings of the jumpers.

Table 3-10 lists the detailed description of the connectors/jumper settings

Figure 3-5. CY4532 EVK Main Board Connector/Jumper Settings

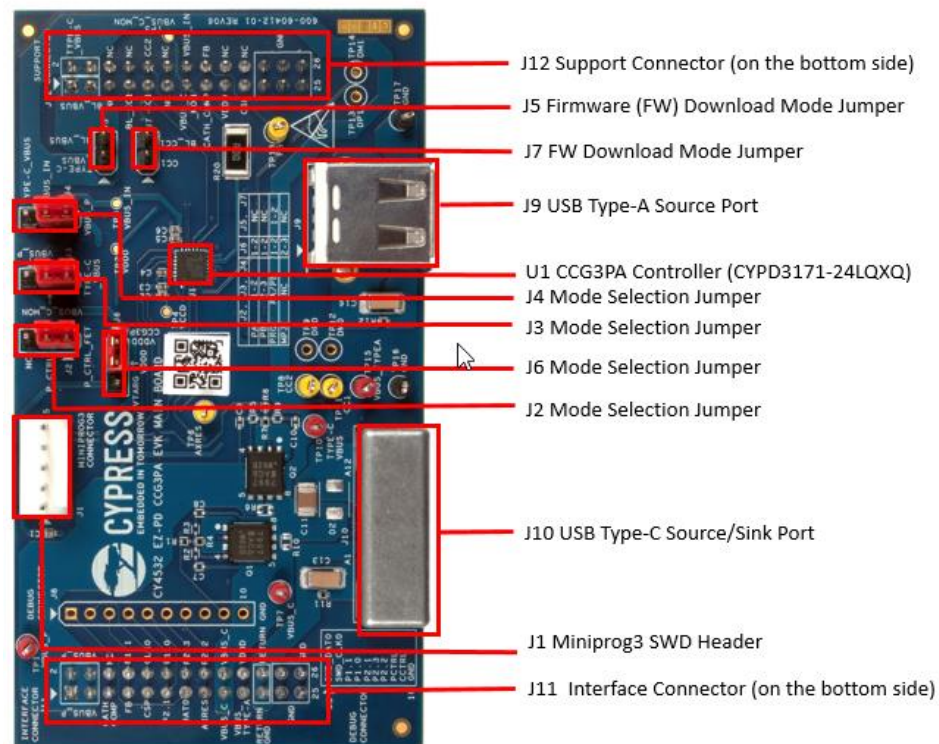


Table 3-10. CY4532 EVK Main Board Connector/Jumper Description

Connector/Jumper	Description	Type	Purpose	Default State
J2, J3, J4, and J6	Mode Selection Jumpers	Input	To configure the Main Board for PA/ PB/ FW download/ MiniProg3 mode Note: Current consumed by the CCG3PA controller can be measured at J6 at any point of time.	Short pins 1 and 2
J5 and J7	FW Download Mode Jumpers	Input	To enable firmware download through the USB Mini-B connector located on the Power Board	Open
J9	USB Type-A Source Port (Type-A receptacle)	Input/Output	USB Type-A receptacle to attach devices that can consume power over a USB Type-A port	NA
J10	USB Type-C Source/Sink Port (Type-C receptacle)	Input/Output	USB Type-C receptacle to attach devices which can consume power over a Type-C port (PA and PB applications) and to charge the battery connected to the EVK (PB application)	NA
J11	Interface Connector	Input/Output	To connect the control signals from CCG3PA to the power regulators.	NA
J12	Support Connector	Input/Output	To connect CCG4's CC signals and other signals between the Power board and Main board	NA

4. Programming the EZ-PD CCG3PA Controller



The CCG3PA controller on the CY4532 EZ-PD CCG3PA EVK is pre-programmed with the latest PA firmware binary image at the time of manufacturing. However, a newer firmware image may be available on the [CY4532 EZ-PD CCG3PA EVK webpage](#) and with the CY4532 EZ-PD CCG3PA EVK installer. The firmware version of the onboard CCG3PA controller can be verified by using the [EZ-PD Configuration Utility](#) as shown in [Figure 4-4](#).

If the onboard CCG3PA controller's firmware version does not match the latest version on the [CY4532 EZ-PD CCG3PA EVK webpage](#), follow the steps in this chapter to reprogram the CCG3PA device with the latest firmware. Device configuration parameters (such as vendor ID, Power Data Objects (PDOs), and so on) can be updated using the [EZ-PD Configuration Utility](#). See the EZ-PD Configuration Utility User Manual available in the [EZ-PD Configuration Utility](#) webpage.

4.1 Programming the CCG3PA Controller on the CY4532 EVK

4.1.1 Procedure to Program the CCG3PA Controller

The EZ-PD Configuration Utility is a Windows Application, which can be used to configure and program the CCG3PA controller on the CY4532 Main Board. Steps to update the firmware running on the CCG3PA controller are as follows:

1. Download and install the latest kit software setup file "CY4532Setup.exe" from the kit's webpage: www.cypress.com/CY4532. This installs the EZ-PD Configuration Utility as well.
Note: Make sure that no devices are connected on the Type-C or Type-A ports of the CY4532 EVK before proceeding with the next step.
2. Set the jumpers on the CY4532 Main Board and Power Board as list in [Table 4-1](#).

Table 4-1. CY4532 EVK Jumper Settings for programming the CCG3PA Controller

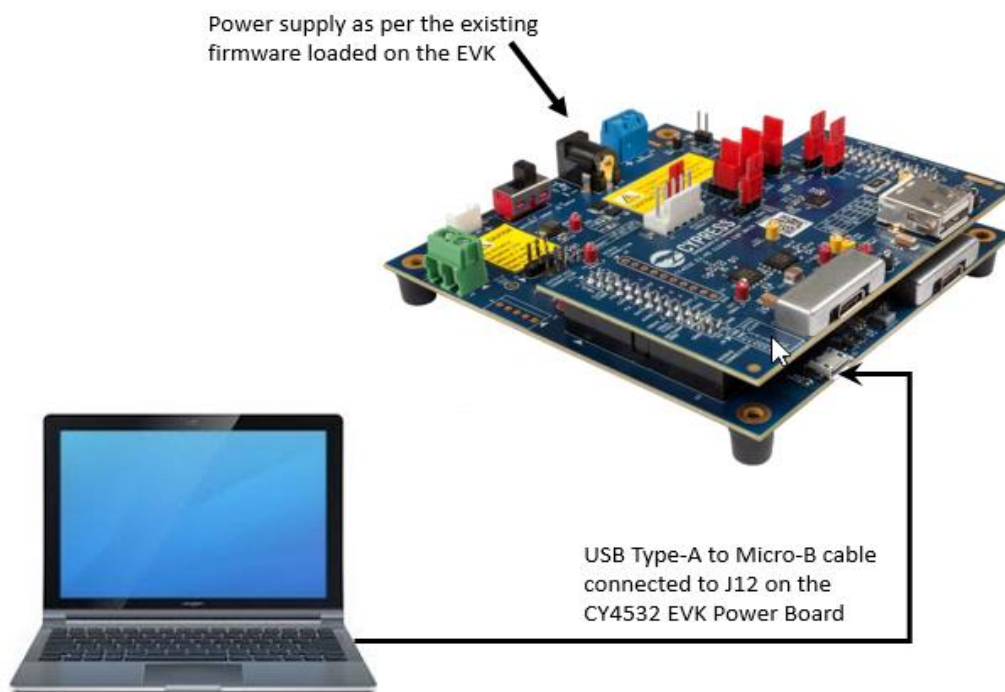
Board Type	Jumper Header	Status
Main Board	J2	Short 1 and 2 if the existing FW loaded on the EVK is PA firmware. Short 2 and 3 if PB firmware is loaded
	J3	
	J4	
	J6	Short 1 and 2
	J5	
	J7	
Power Board	J6	Open
	J7	Open
	J9	Open

Note: See [Appendix C - Identifying the Application Firmware Type](#) for instructions to identify the application firmware already loaded on the EVK.

3. Apply power to the EVK as per the existing firmware loaded on the EVK. If PA firmware is loaded, power the EVK using the DC Input. If PB firmware is loaded, power the EVK using the Battery Input. Make sure that the Input Power Selection Switch (SW1) is set as per the type of power input used.
4. Connect a USB Type-A to Micro-B cable from a host PC to connector J12 on the Power Board as shown in [Figure 4-1](#).

Note: For the Rev ** of the CY4532 EVK, use USB Type-A to Mini-B cable.

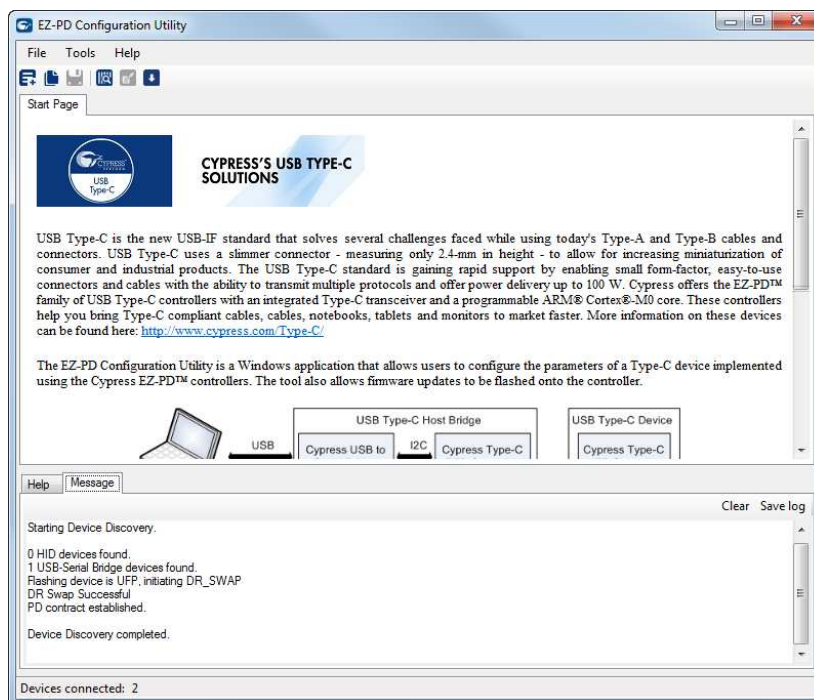
Figure 4-1. Programming the CCG3PA Controller on the CY4532 EZ-PD CCG3PA EVK



5. Launch the EZ-PD Configuration Utility as shown in Figure 4-2. After installation, the EZ-PD Configuration Utility is available on the start menu at:

Windows > Start > All Programs > Cypress > EZ-PD Configuration Utility > EZ-PD Configuration Utility

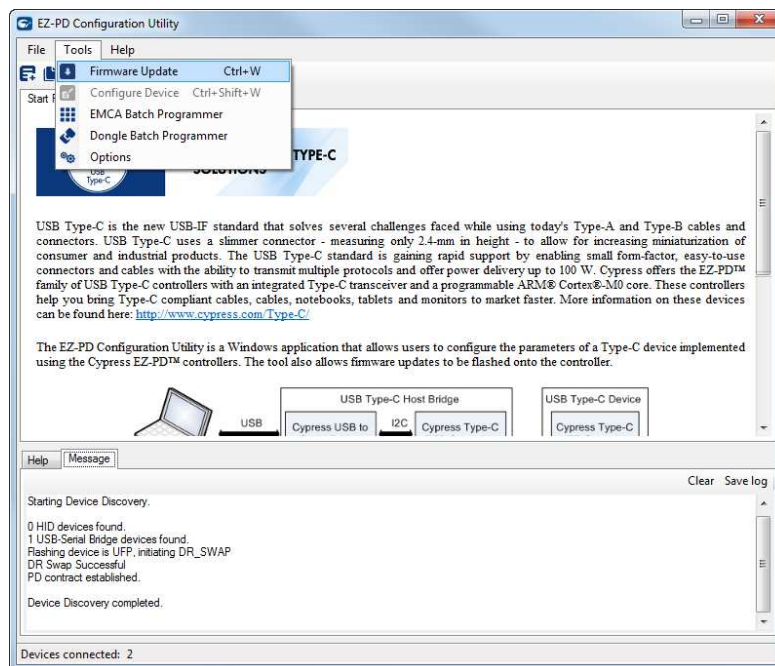
Figure 4-2. EZ-PD Configuration Utility



Confirm that the Utility's status bar displays the connection with two devices as shown in Figure 4-2.

6. Select **Tools > Firmware Update** to update the firmware of the CCG3PA controller as shown in [Figure 4-3](#). See the Utility's User Manual available on the [EZ-PD Configuration Utility](#) webpage for more details. You can also click **Help > User Manual** in the EZ-PD Configuration Utility to access this user manual.

Figure 4-3. Upgrading the CCG3PA Firmware



7. Download the latest firmware images from the [CY4532 EZ-PD CCG3PA EVK](#) webpage. Select the type of firmware (PA/PB application). The firmware filenames are:

- PA: *CYPD3171-24LQXQ_cla_<version>_pa.cyacd*
- PB: *CYPD3171-24LQXQ_pb_<version>_pb.cyacd*

The CCG3PA controller firmware is provided in the *cyacd* format. The latest firmware binary for each application and the standard part numbers are provided on the [CY4532 EZ-PD CCG3PA EVK](#) webpage. The firmware images are also available at the following location after the CY4532 EZ-PD CCG3PA EVK installation: *<Install_Directory>\CY4532 EZ-PD CCG3PA EVK\1.0\Firmware*

8. Select **UFP-AMA** from the **Select target** list shown in [Figure 4-4](#). Click the button located next to **Firmware path 1** at the top of the window and navigate to the location of the firmware image.