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ABSTRACT

This user's guide describes the installation procedure, and how to use this tool to create usable configuration images for TPS25750 devices. In addition, the process of importing and exporting configuration settings to a TPS25750 device is described.

Details regarding each configuration setting are not within the scope of this user's guide.

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1 Getting Started

1.1 Related Documents

- Texas Instruments, [TPS25750 USB Type-C and USB PD Controller with Integrated Power Switches Optimized for Power Applications](#) data sheet
- Texas Instruments, [TPS25750 Host Interface Technical Reference Manual](#)
- Texas Instruments, [TPS25750 EVM User's Guide](#)

1.2 Hardware

Obtain the following required hardware:

- PC with at least one USB 2.0 (or later) port
- TPS25750-EVM
- Barrel-jack laptop charger power-supply AC adapter (20 V)
- USB Micro-B to USB Standard-A cable for USB2.0 Low-speed (for TIVA Adapter option)

1.3 Software

The required software is available at the [TI Gallery](#), and can be run from the web browser, provided that Chrome, Firefox, or Safari is used. If this is desired, TI Cloud Agent needs to be installed as a browser extension as well as on the PC. When the application is launched, instructions will appear for installing TI Cloud Agent.

The software may also be run natively on the PC. If this is desired, GUI Composer Runtime needs to be installed natively. To install GUI Composer Runtime, click on the downwards-facing arrow inside one of the applications listed in the Gallery, and look towards the bottom set of links that appear. After selecting your native operating system, open the installer and follow the prompts to install the program.

1.4 Installation and Launch

The tool may be launched either through a web browser or as a native application.

1.4.1 Web Browser

1. Search for the TPS25750 Application Customization Tool in the Gallery.
2. Once found, click on the card that has the correct tool.
3. A new tab should open with the application launched. If TI Cloud Agent is not already installed, instructions should appear for installing the required software.

1.4.2 Native Application

1. Search for the TPS25750 Application Customization Tool in the Gallery.
2. Once found, click on the downwards-facing arrow on the bottom left side of the card, and look towards the top set of links that appear. Select your native operating system, and open the installer.
3. Once the installer is open, follow the directions to install the application.

1.5 TPS25750 Application Customization Tool Features

The TPS25750 Application Customization Tool provides users with the following capabilities:

- Generate new configuration settings.
- Load configuration settings to a device.
- Save configuration settings in JSON format.

2 Using the TPS25750 Application Customization Tool

2.1 Default View

After the TPS25750 Application Customization Tool starts up, a default form appears in the center of the page. On the right side of the form are common features that can be useful. The top navigation bar provides links to documentation for the tool.

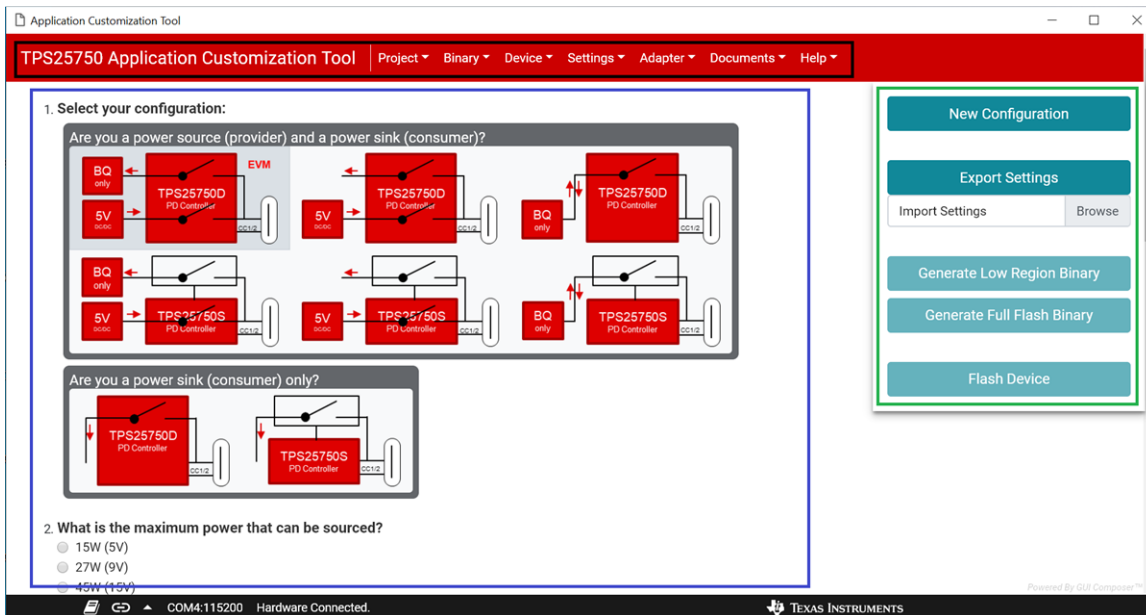


Figure 2-1. Main view of the tool is outlined in blue. The right side panel is outlined in green, and the top menu bar is outlined in black

2.2 Filling Out The Form

The form is the main component in the center of the tool. Many questions on the form can be answered by selecting the desired option. Other questions require text input, whose format is specified by the question itself. Some questions may also be disabled based on answers to the other questions. After sufficiently completing the form, the options to generate a binary or flash the device on the right side panel will be enabled.

The first question of the form asks to select a configuration that the TPS25750 is used for. There are two main categories of possible configurations that device can act as: a power source and a power sink, or a power sink only. Each of these two main categories have multiple possible configurations. See [Figure 2-2](#) below for how this question appears.

1. Select your configuration:

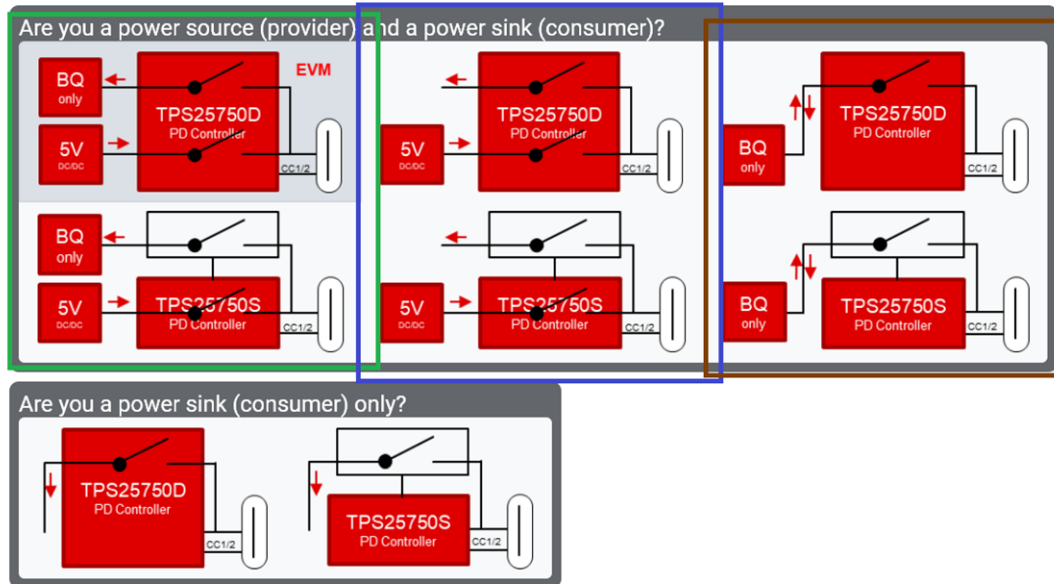


Figure 2-2. First question of the form

In the category where the device acts as a power source and power sink, one set of options is that the device is sourcing power from a 5 V DCDC converter, and sinking power through a BQ device (battery charger). This set is outlined in green in Figure 2-2, appears on the left side of the category, with the TPS25750D variant on the top and the TPS25750S variant on the bottom.

Another set of options is that the device is sourcing power from a 5 V DCDC converter, and sinking power through a non-BQ device. This set is outlined in blue in Figure 2-2, appears in the middle of the category, with the TPS25750D variant on the top and the TPS25750S variant on the bottom.

The final set of options in the category is that the device is sourcing and sinking power from a BQ device (battery charger). This set is outlined in brown in Figure 2-2, appears on the right side of the category, with the TPS25750D variant on the top and the TPS25750S variant on the bottom.

The second category, where only power sinking is configured, there are only two options: the use of the TPS25750D variant, which appears on the left, and the use of the TPS25750S variant, which appears on the right.

The following two questions ask what the maximum power that can be sourced or sinked is. If there is no source configured, then the question asking for the maximum source power will be disabled.

The following two questions ask for the preferred data role and the preferred power role of the device.

The sixth question asks what the highest data speed standard the device should support. If no USB data is being used, then that option should be selected.

The next two questions ask for the Vendor ID and the desired Product ID, respectively. The Vendor ID should be given by the USB-IF, whereas the Product ID is simply a configuration identifier. If you wish to enter your own values for these questions, first select the Yes option for those questions, and fill in the corresponding text box using a 4-digit hexadecimal number. See Figure 2-3 below for what these questions look like.

7. Do you have a Vendor ID provided by the USB-IF?

Yes, enter here in hexadecimal format: 0x

No, use the TI Vendor ID in the Vendor Information File (VIF)

8. Do you have a desired Product ID?

Yes, enter here as a 4-digit hexadecimal number: 0x

No, use "0x0000" as the Product ID

Figure 2-3. Vendor ID and Product ID questions. An enabled text field is shown on top, while a disabled text field is shown on the bottom

The last set of questions correspond to configuring the BQ device (battery charger). If a configuration in the first question is chosen such that no BQ device is being used, these questions will be disabled. The first question asks which BQ device is being used. The next two questions asks what the battery charger voltage and current should be. When entering the battery charger voltage or current, the range of valid numbers are displayed on the placeholder to the text box. The number entered should either be a whole number, or a decimal number specified to the hundredths place (for example, 16.18). An optional *V* for the voltage question or *A* for the current question can be added at the end of the number as well. See [Figure 2-4](#) for what these questions look like.

Battery Charger Configuration

9. Select the battery charger component to integrate:

BQ25790 or BQ25792

BQ25713

BQ25731

10. What is the battery charging voltage?

11. What is the battery charging current?

Figure 2-4. View of the battery charger questions

2.3 Generating a New Configuration

To generate a new customization configuration for your TPS25750 device, click the *New Configuration* button on the right side menu. The button is outlined in [Figure 2-5](#). A modal will appear and ask to confirm resetting the form, seen in [Figure 2-6](#). This will erase the existing configuration and reset the form to the default settings. It is recommended to export the existing form first such that the existing configuration is not lost.

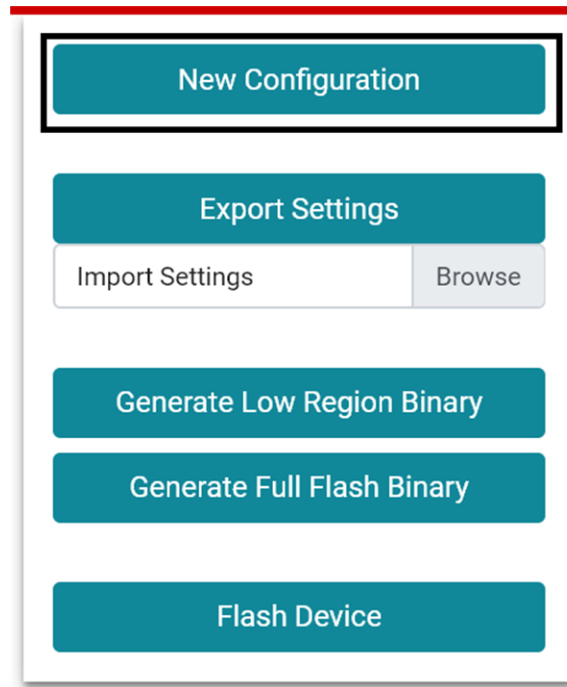


Figure 2-5. Button to generate a new configuration outlined in black

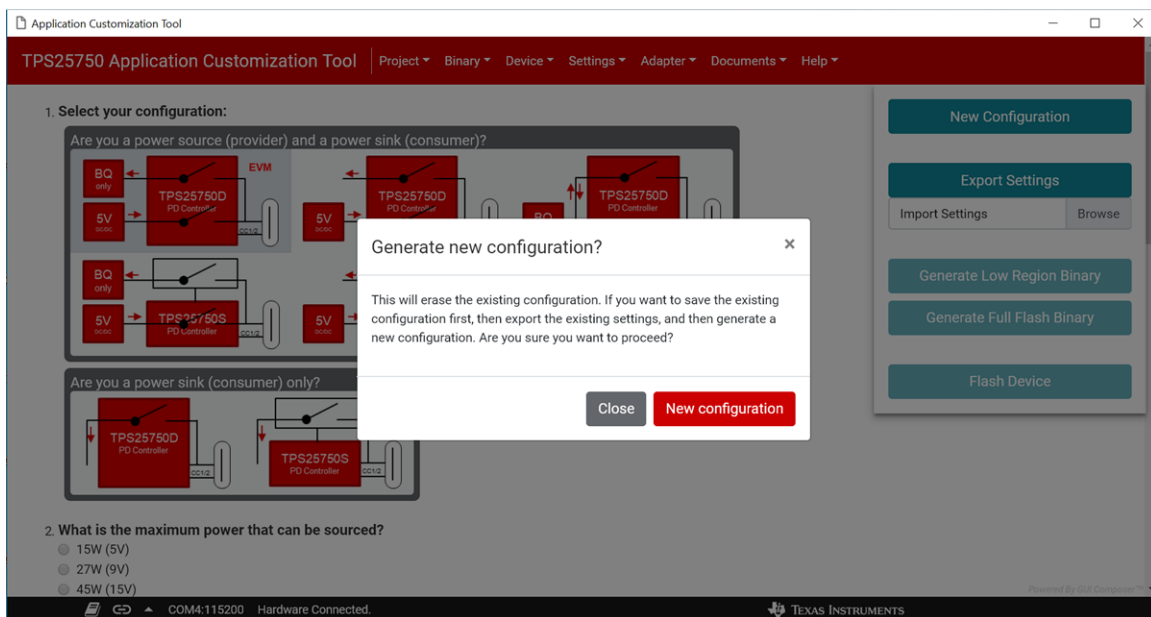


Figure 2-6. Modal that appears to confirm generating a new configuration

2.4 Exporting and Importing Settings

To export current tool settings, including the current configuration of the device as indicated by the form, click the *Export Settings* button on the right side menu, outlined in black in [Figure 2-7](#). This will download a new file containing the settings information. The default file name is *configXXXX.json*, where *XXXX* is the 4-character product ID set in question 8 of the form.

To import current tool settings, including the current configuration of the device as indicated by the form, click on the *Import Settings* button on the right side menu, outlined in red in [Figure 2-7](#). This will open up a file menu where the file output by exporting the settings should be selected. After selecting the file, the settings specified by the file will be restored.

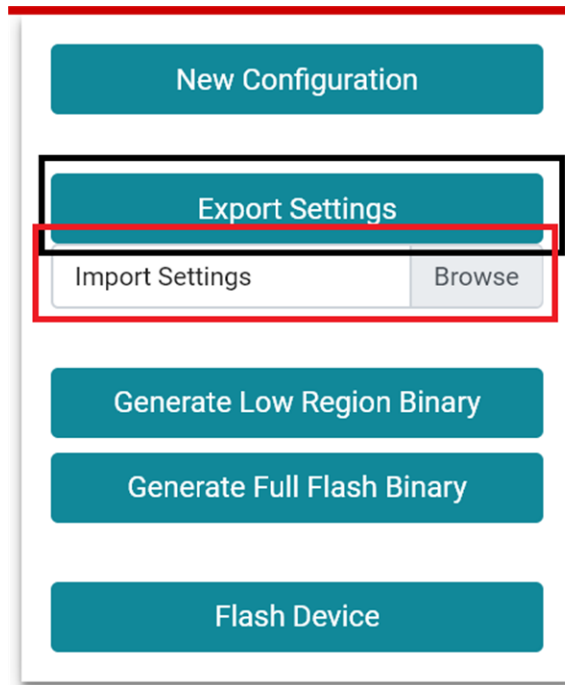


Figure 2-7. The button to export settings is outlined in black, while the button to import settings is outlined in red

2.5 Generating The Binary

After the form has been sufficiently filled out, the option to *Generate Full Flash Binary* will enable on the right side panel, outlined in black in [Figure 2-8](#). By clicking the button, a binary file will be downloaded. The binary file can then be used to flash the hardware device. The default file name for the downloaded binary file is *fullFlash.bin*.

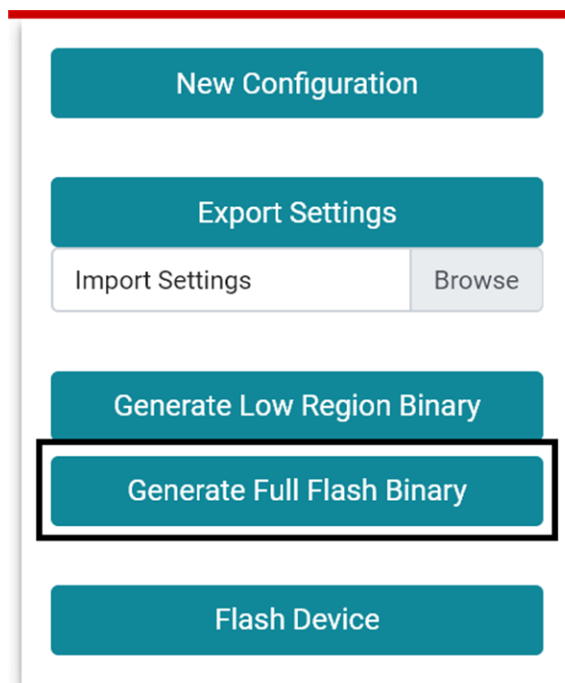


Figure 2-8. The option to generate the full flash binary is outlined in black

2.6 Flashing To The Hardware

The hardware can be updated with the new configuration by clicking on the *Flash Device* button the right side panel, outlined in black in [Figure 2-9](#). Similar to generating the binary, this option is only available after the form is sufficiently filled out. After clicking the button, the binary will automatically be generated from the form and will be uploaded to the device. Currently, this feature only works using the TPS25750EVM.

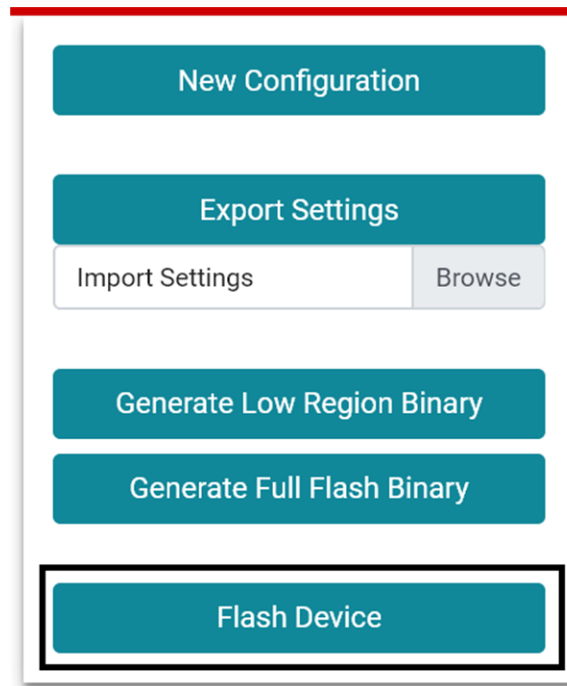


Figure 2-9. Button to flash the binary to the device is outlined in black

3 Example Configuration

This section will walk through setting up a new configuration, filling out the form, and flashing to the device. A TPS25750EVM is needed to execute the final step. If one is not available, the remainder of the example can still be followed.

- Select the *New Configuration* button on the right side panel. See [Figure 3-1](#).

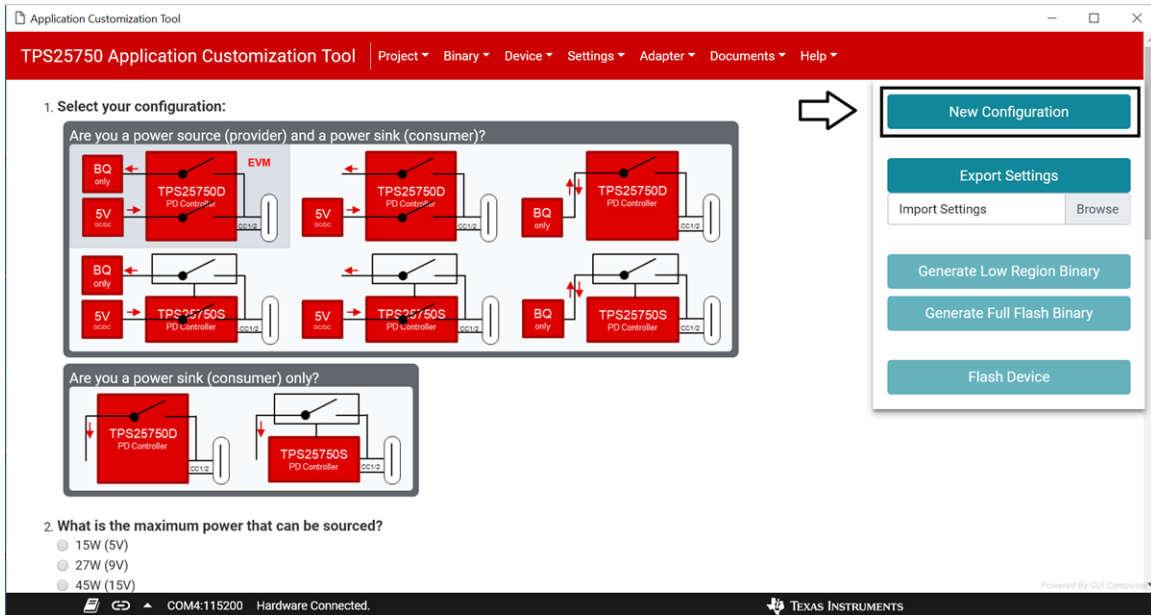


Figure 3-1. Button to generate a new configuration is pointed to by the arrow

- When the modal appears, click the red *New configuration* button, as shown in [Figure 3-2](#). This will reset any existing configuration on the form.

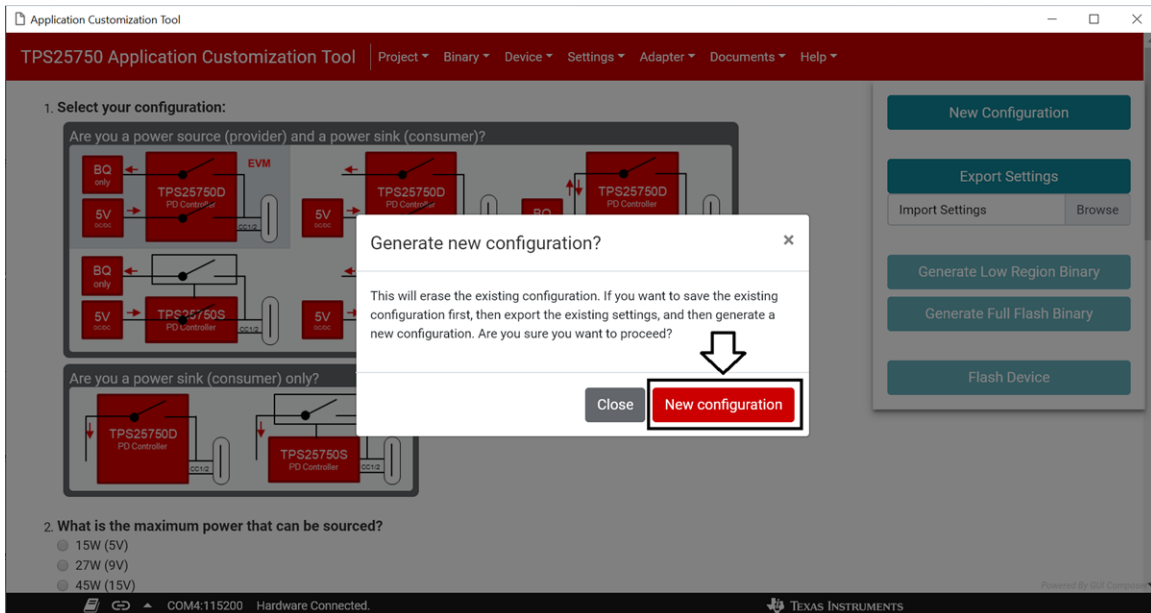


Figure 3-2. New configuration can be generated by clicking the button pointed to by the arrow

- Question one should already be filled out. Ensure that the top-left option is selected.

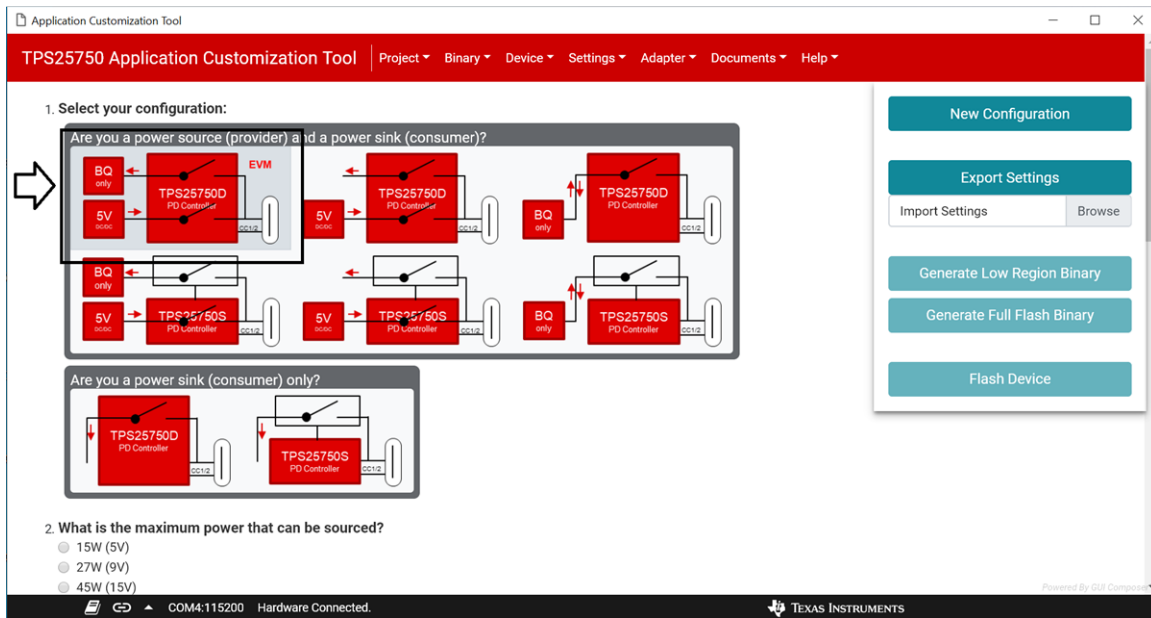


Figure 3-3. Ensure that the option outlined in black is selected

- Question two should also be answered already. Ensure that *100W (20V)* is selected. See [Figure 3-3](#).
- Question three should already be filled out as well. Ensure that *100W (20V)* is selected. See [Figure 3-3](#).
- Question four should also be filled out. Ensure that *Host & Device - Dual Role Port (DRP)* is selected. See [Figure 3-3](#).
- Select *Power source (provider)* as the answer to question five. See [Figure 3-3](#).

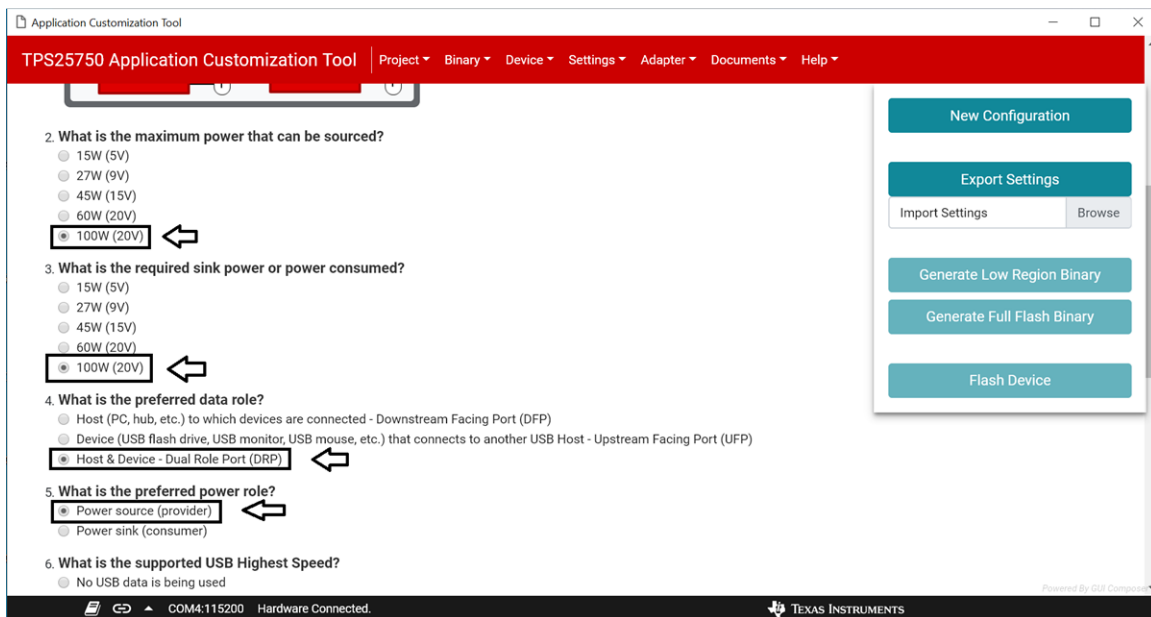


Figure 3-4. Ensure that the options pointed to by the arrows are selected

- Select the *USB 3.2 Gen 2* option for question six.
- For question seven, select *No, use the TI Vendor ID in the Vendor Information File (VIF)*.
- For question eight, select *No, use '0x0000' as the Product ID*.

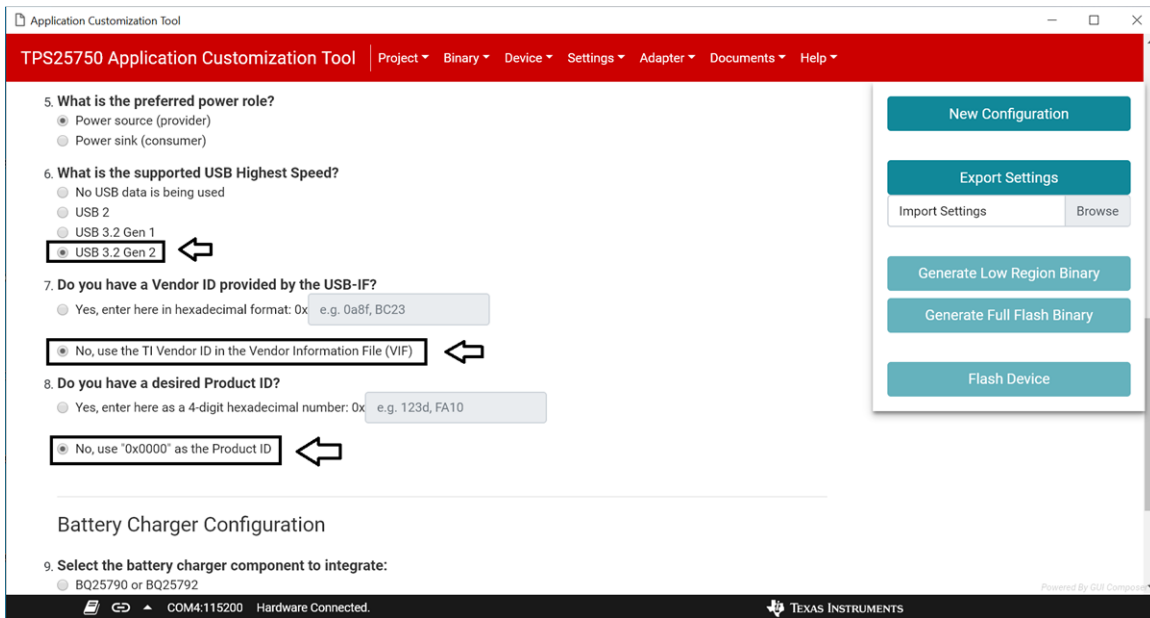


Figure 3-5. Ensure that the options pointed to by the arrows are selected

- Select *BQ25790* or *BQ25792* as the battery charger to integrate for question nine.
- Enter *3.7V* as the battery charging voltage for the question ten.
- Enter *1A* as the battery charging current for the question eleven.

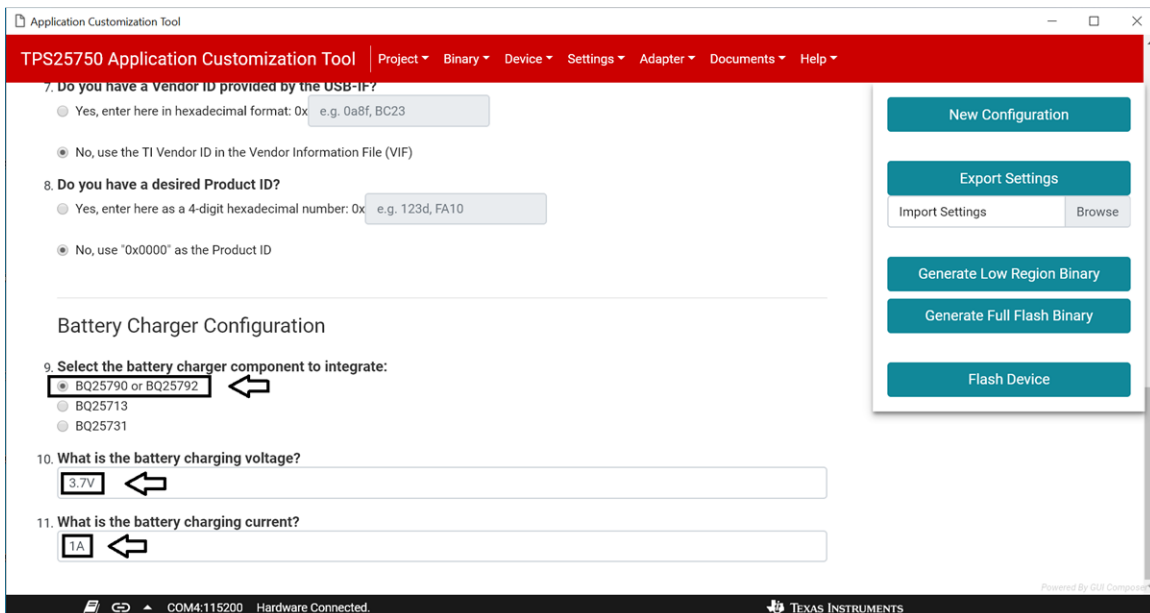


Figure 3-6. Ensure that the answers to the battery charger questions match those shown by the arrows

- The *Flash Device* button on the right side panel should now be enabled. Ensure that the TPS25750EVM is physically connected to the computer through USB, and click the *Flash Device* button to upload the new settings onto the device.

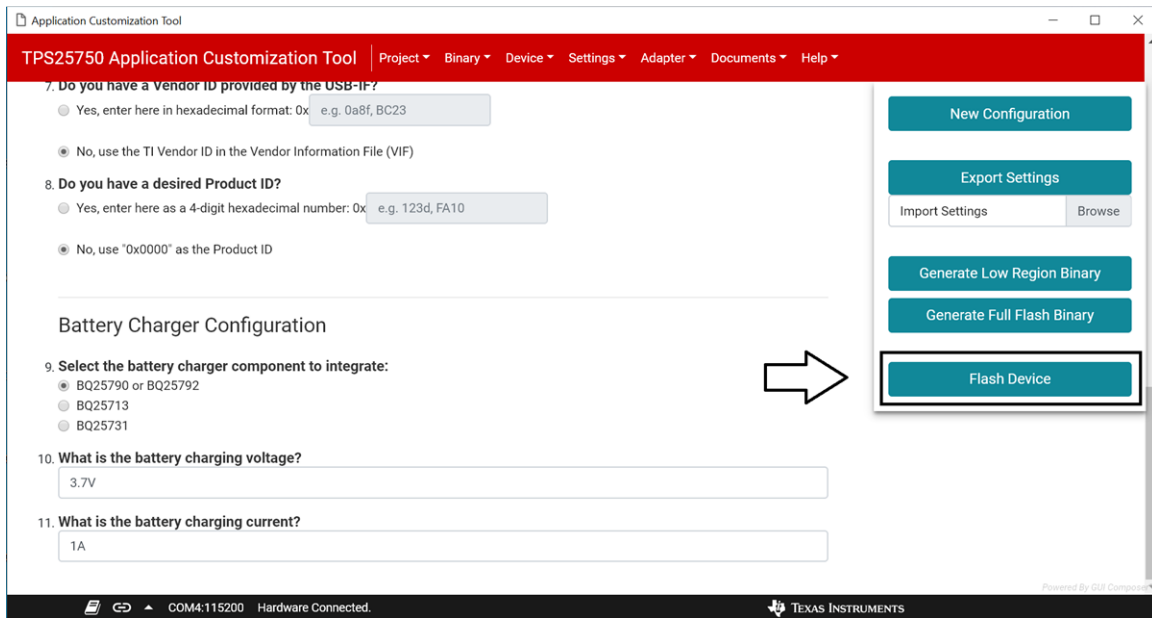


Figure 3-7. After filling out the form, click the button to flash to the device, pointed to by the arrow

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