HiRegBin

User Guide

Issue 00B08

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HiSilicon Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: http://www.hisilicon.com

Email: support@hisilicon.com

About This Document

Purpose

This document describes the usage of the HiRegBin, including viewing and modifying board hardware configurations and registers, creating the Reg file required by the Fastboot and Cfg file for the advanced CA solution, and importing and replacing the Reg file in Fastboot.

Related Version

The following table lists the product version related to this document.

Product Name	Version
Hi3716M	V31*X*
Hi3716M	V32*X*
Hi3716M	V33*X*
Hi3110E	V5*XX*
Hi3716M	V41*X*
Hi3716M	V42*X*
Hi3798C	V*XXX*

Intended Audience

This document is intended for:

- Technical support personnel
- Software development engineers
- Hardware development engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Alerts you to a high risk hazard that could, if not avoided, result in serious injury or death.
 WARNING	Alerts you to a medium or low risk hazard that could, if not avoided, result in moderate or minor injury.
 CAUTION	Alerts you to a potentially hazardous situation that could, if not avoided, result in equipment damage, data loss, performance deterioration, or unanticipated results.
TIP	Provides a tip that may help you solve a problem or save time.
 NOTE	Provides additional information to emphasize or supplement important points in the main text.

Change History

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made in previous issues.

Issue 00B08 (2016-05-23)

This issue is the eighth draft release, which incorporates the following change:

Chapter 3 is modified.

Issue 00B07 (2016-03-03)

This issue is the seventh draft release, which incorporates the following change:

Chapter 3 is modified.

Issue 00B06 (2016-02-01)

This issue is the sixth draft release, which incorporates the following changes:

Chapter 3 Multi-Table Main GUI and Functions

Section 3.4.2 is added.

Issue 00B05 (2015-12-29)

This issue is the fifth draft release, which incorporates the following changes:

Chapter 3 Multi-Table Main GUI and Functions

Chapter 3 is added.

Issue 00B04 (2015-07-21)

This issue is the fourth draft release, which incorporates the following changes:

Chapter 1 Overview

Step 4 in section 1.2 is added.

Chapter 2 GUI and Functions

Section 2.1 is modified.

Issue 00B03 (2015-04-30)

This issue is the third draft release, which incorporates the following changes:

Hi3798C V200, Hi3716M V420, and Hi3716M V410 are supported.

Chapter 1 Overview

Section 1.2 is modified.

Chapter 2 GUI and Functions

Section 2.1, section 2.2, section 2.4.1, section 2.5, and section 2.6 are modified, and all figures are updated.

Section 2.7 is added.

Issue 00B02 (2015-03-10)

This issue is the second draft release, which incorporates the following changes:

Hi3110E V500 is supported.

Issue 00B01 (2014-12-16)

This issue is the first draft release.

Contents

Figures

1 Overview

1.1 Introduction to the HiRegBin

The HiRegBin is used to create Reg files and Cfg files. It has the following functions:

- Creates a Reg file.
- Creates a Cfg file.
- Imports demo board configurations.
- Imports a Reg file.
- Imports a Cfg file.
- Imports the Reg file in Fastboot.
- Replaces the Reg file in Fastboot.

1.2 Environment Preparations

Before using the HiRegBin, perform the following steps:

Step 1 Copy **HiTool-STB-*X.X.X*.zip** and **jre-6u1-windows-i586-p.rar** in **$SDK_DIR/tools/windows/HiTool** to a local hard disk drive on a PC that runs Windows 7 or Windows XP.

Ensure that JRE 1.6 (jre-6u1-windows-i586-p) or later is preinstalled on the PC. Otherwise, the HiTool cannot run properly. You can download JRE 1.6 from http://www.oracle.com/technetwork/java/javase/downloads/java-archive-downloads-javase6-419409.html.

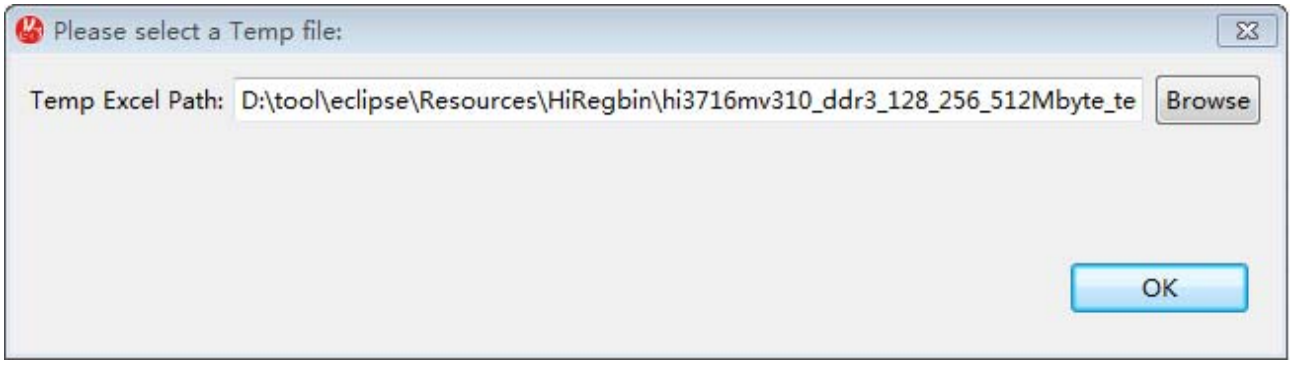
Step 2 Decompress **HiTool-STB-*X.X.X*.zip**, and double-click **HiTool.exe**.

Step 3 Select a chip (for example, Hi3716M V310) and click **HiRegBin**, as shown in Figure 1-1.

Figure 1-1 Starting the HiRegBin

Step 4 Select the Temp Excel file corresponding to the chip, for example, **hi3716mv310_ddr3_128_256_512Mbyte_temp.xlsm**, and click **OK**, as shown in Figure 1-2.

Figure 1-2 Selecting a Temp Excel file



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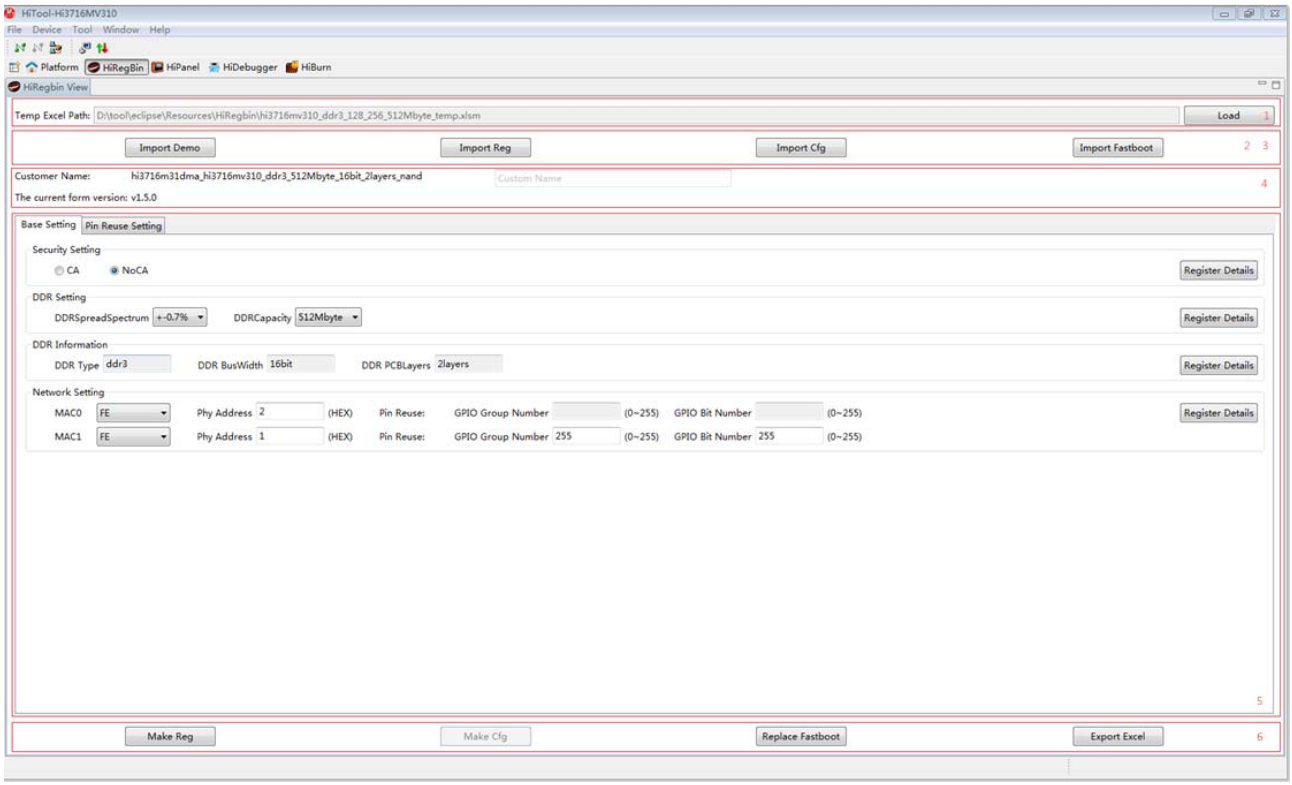
2 GUI and Functions

2.1 Main GUI

The main GUI is divided into five parts, as shown in Figure 2-1:

- 1: Temp file loading area
- 2: demo board import area
- 3: other import area
- 4: customer table information area
- 5: table configuration area
- 6: export area

Figure 2-1 Main GUI



The functions of each area are described as follows:

- Temp file loading area

  This area is used to load the Temp Excel file supported by the chip, for example, **hi3716mv310_ddr3_128_256_512Mbyte_temp.xlsm**.

- Demo board import area

  This area allows you to select the demo board supported by the current chip, and import the configuration information on the demo board into the HiRegBin.

- Other import area

  This area provides three import modes:

  - Import Reg
  - Import Cfg
  - Import Fastboot

  After you click one of the four import buttons, data is imported to the editing area, that is, the **Base Setting** and **Pin Reuse Setting** tab pages.

- Customer table information area

  This area displays the customer table name and version based on the imported table. It also allows you to customize the table name. The customer table name will be written into the files when the Reg and Cfg files are created.

- Table configuration area

  This area consists of the **Base Setting** and **Pin Reuse Setting** tab pages for viewing and modifying imported table information.

- Export area

  This area provides four buttons for:

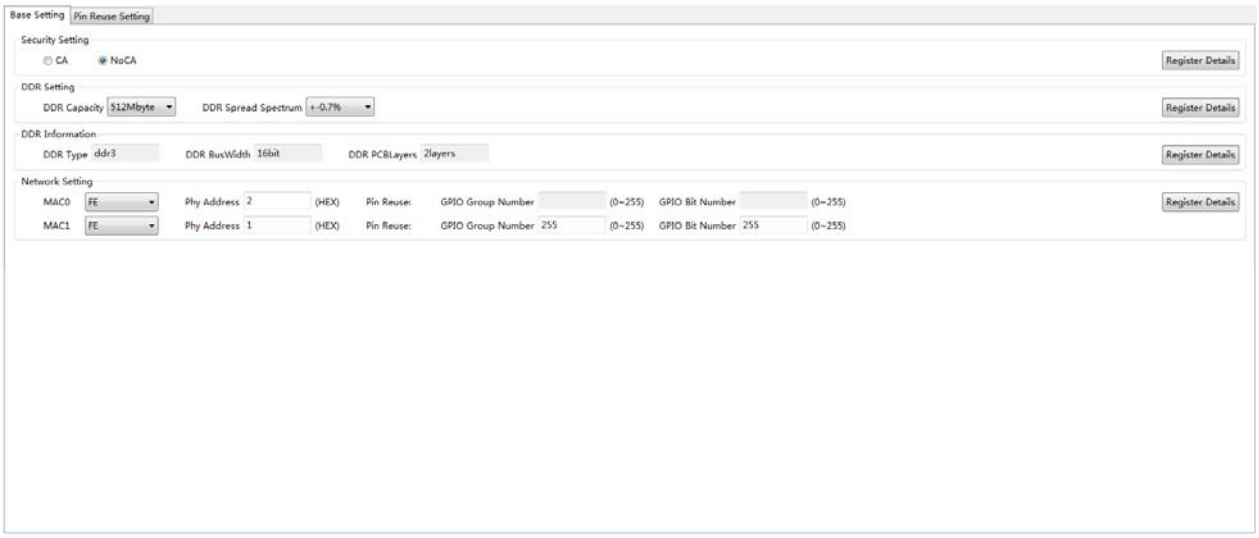
  - Creating a Reg file (**Make Reg**).
  - Creating a Cfg file (**Make Cfg**).
  - Replacing the Reg file in Fastboot to generate the new Fastboot (**Replace Fastboot**).
  - Exporting the Excel file (**Export Excel**).

2.2 Base Setting Tab Page

The **Base Setting** tab page consists of four panes, as shown in Figure 2-2:

- Security Setting
- DDR Setting
- DDR Information
- Network Setting

Figure 2-2 Base Setting tab page



The functions of each pane are described as follows:

- Security Setting

  Specifies the board security type. For an advanced CA chip, select **CA**; otherwise, select **NoCA**.
- DDR Setting

  Specifies the DDR capacity and spread spectrum.
- DDR Information

  Displays information about the DDR on the board, including the DDR type, bus width, and number of PCB layers.
- Network Setting

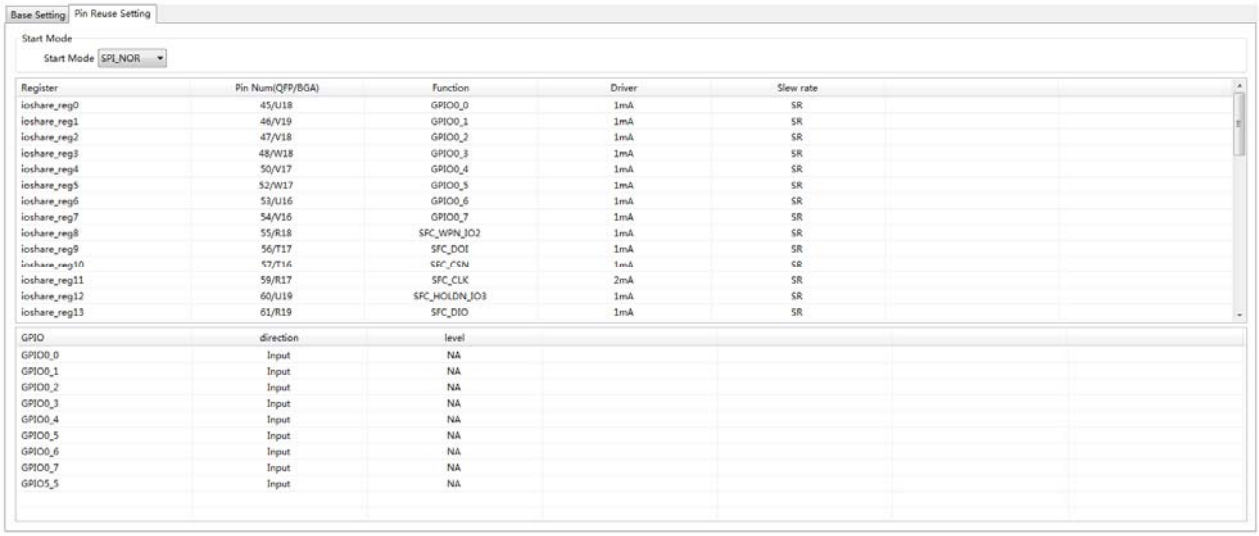
  Specifies the MAC ports supported by the board, including the MAC type, PHY address, and the GPIO pin group ID and bit number corresponding to the PHY reset pins (NA is entered when dedicated PHY reset pins are used).

2.3 Pin Reuse Setting Tab Page

The **Pin Reuse Setting** tab page allows you to configure the following items, as shown in Figure 2-3:

- Boot mode
- Pin multiplexing registers
- GPIO

Figure 2-3 Pin Reuse Setting tab page



The functions are described as follows:

- Boot mode

  Specifies the boot mode of the board.
- Pin multiplexing registers

  Displays and configures attributes of pin multiplexing registers. If the function is set to GPIO, the current GPIOs are updated to the GPIO configuration list for configuring the GPIO direction and level.
- GPIO

  Displays the list of all GPIO pins selected in the pin multiplexing registers and their directions and levels, and configures the GPIO direction and level.

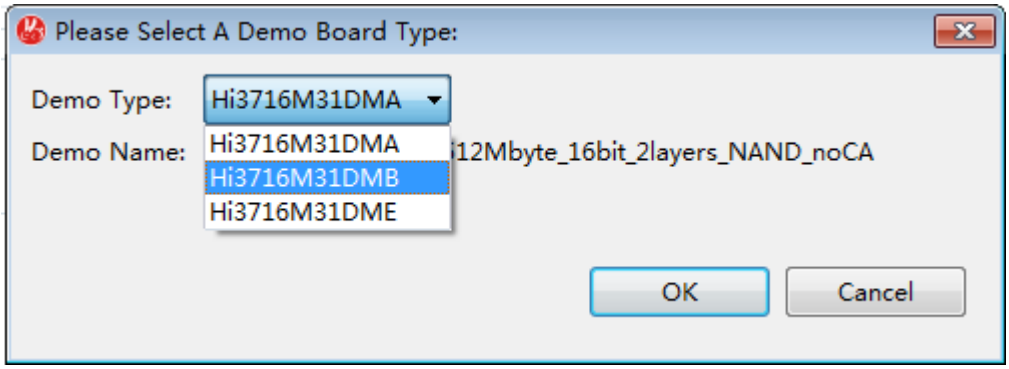
2.4 Importing Data

2.4.1 Import Demo

To import data from the demo board, perform the following steps:

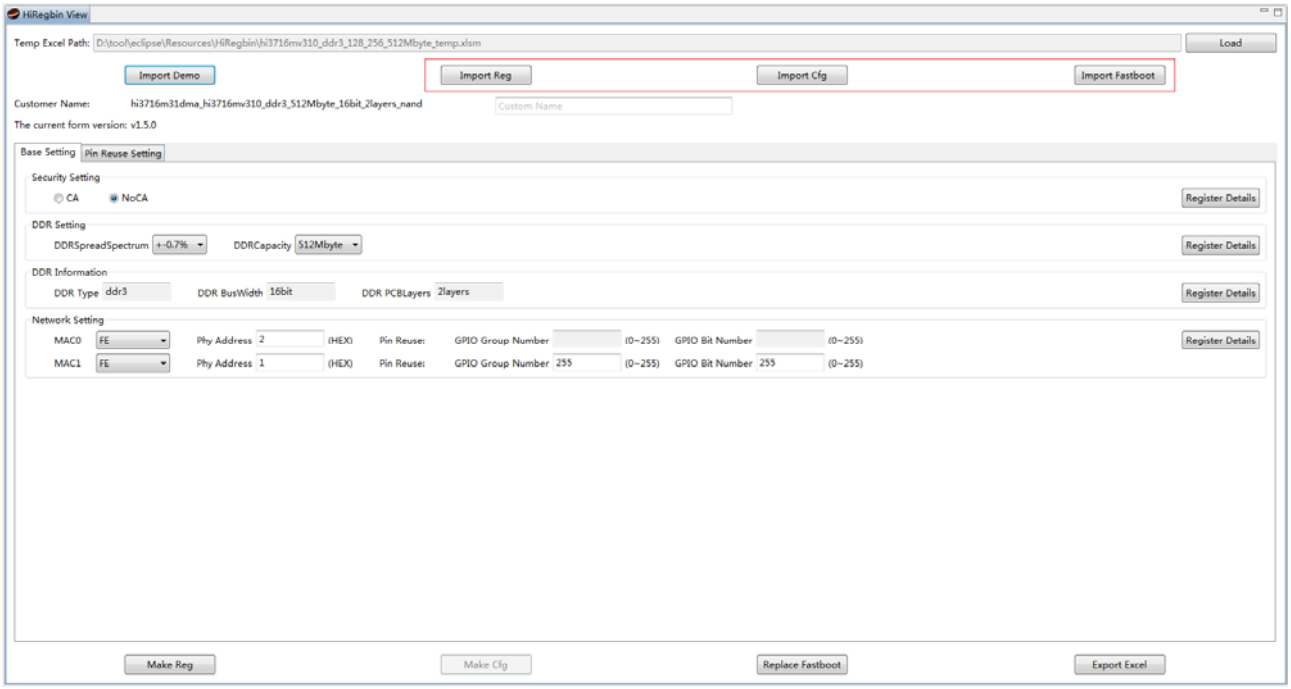
Step 1 Select the type of demo board to be imported from the **Demo Type** drop-down list, for example, **Hi3716M31DMB**, as shown in Step 1. The basic configuration information on the current board is displayed in the **Demo Name** area in the format of ***board name_chip name_DDR capacity_DDR bus width_number of PCB layers_flash type_CA type***.

Figure 2-4 Selecting a demo type



Step 2 Click **Import Demo** to import the current demo board information to the editing area, as shown in Figure 2-5.

Figure 2-5 Clicking Import Demo



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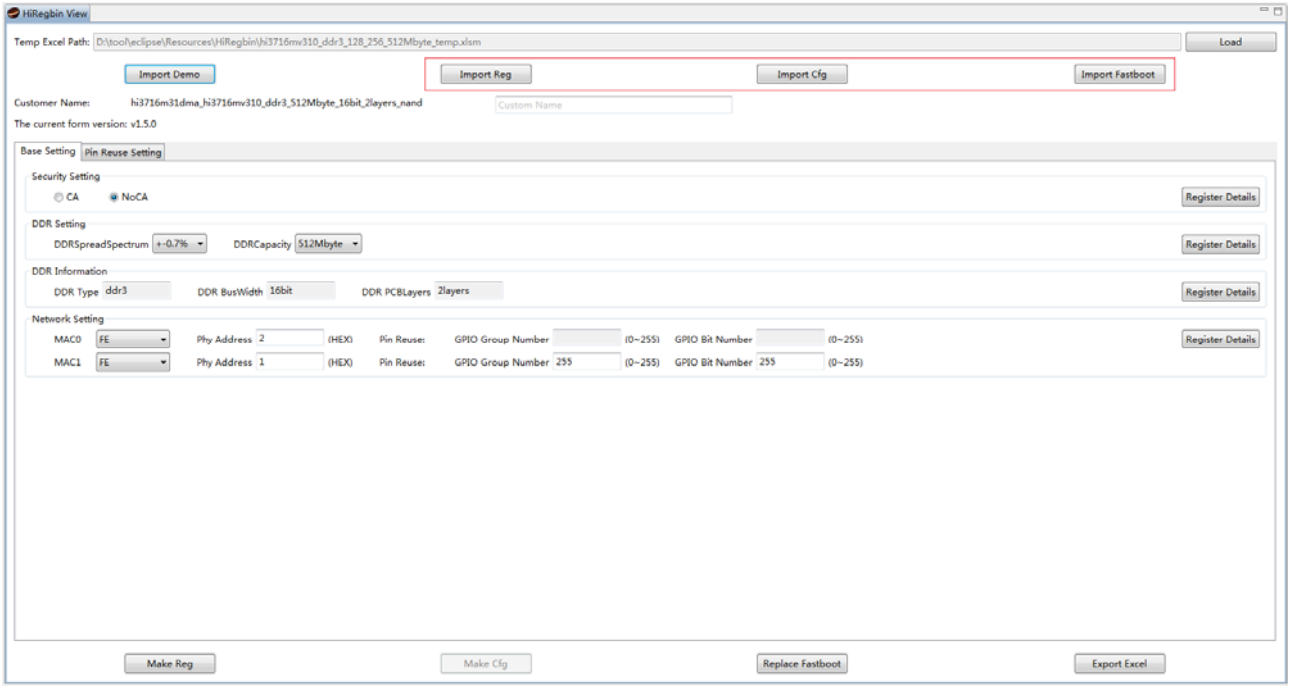
2.4.2 Import Reg/Import Cfg/Import Fastboot

The procedures for importing a Reg file, Cfg file, and Fastboot file are similar. The following describes the procedures by taking importing a Reg file as an example.

Click **Import Reg**, select the Reg file to be imported in the displayed dialog box, and confirm.

After the Reg file is imported successfully, the GUI is automatically updated to display the file information, as shown in Figure 2-6.

Figure 2-6 Importing a Reg file



CAUTION

The imported Fastboot file for an advanced CA chip must be an unsigned file.

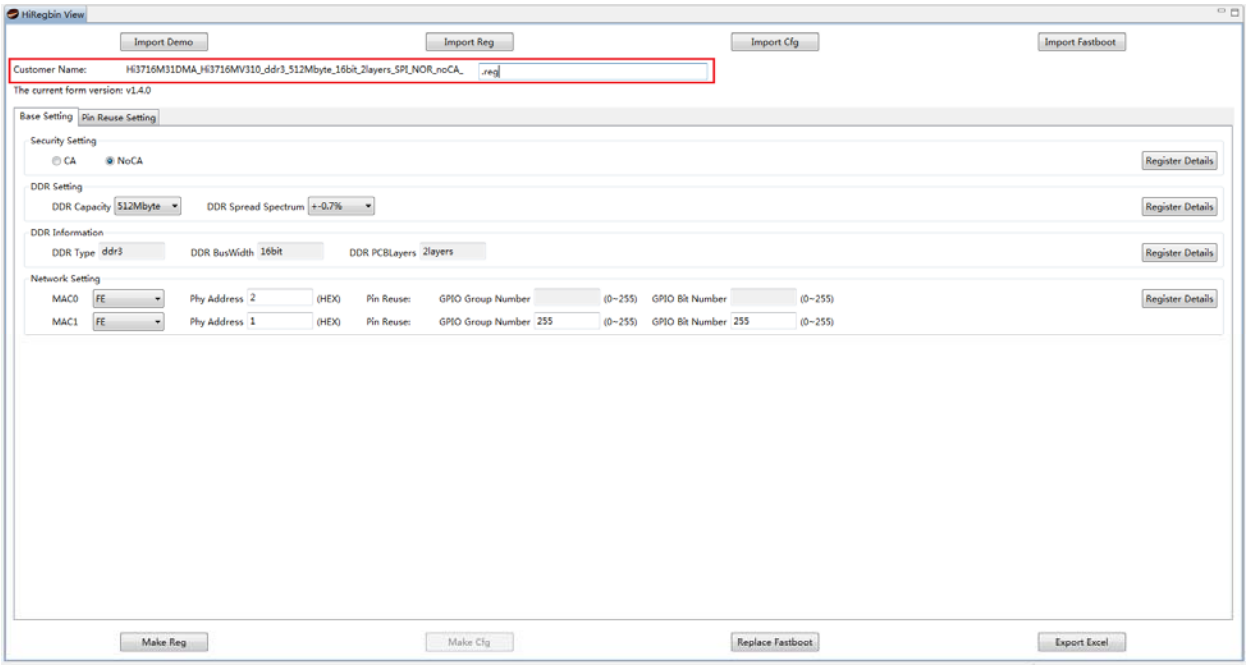
2.5 Creating a Reg/Cfg File

The procedures for creating a Reg file and a Cfg file are similar. If **Security Setting** is set to **CA**, the Reg file and Cfg file can be created at the same time; if it is set to **NoCA**, only the Reg file can be created. The following takes the procedures for creating a Reg file as an example.

Step 1 Import the demo board information to the editing area. For details, see section 2.4 "Importing Data."

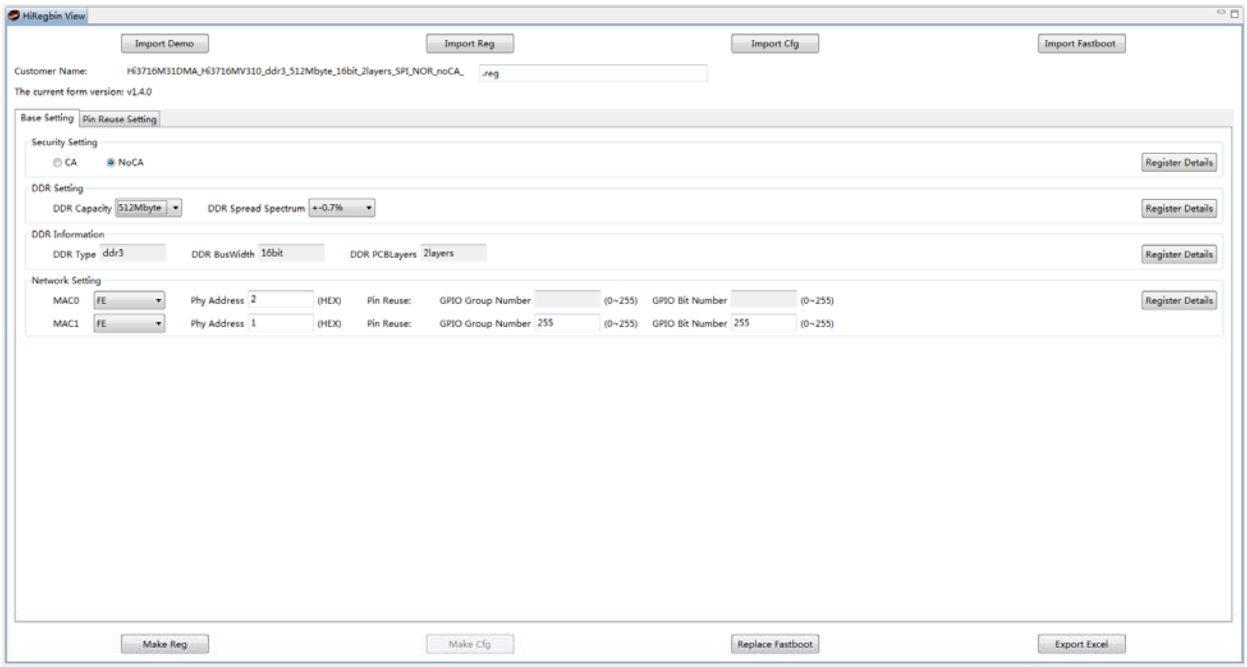
Step 2 (Optional) View and customize the customer table information, as shown in Figure 2-7.

Figure 2-7 Adding and modifying the customer table name



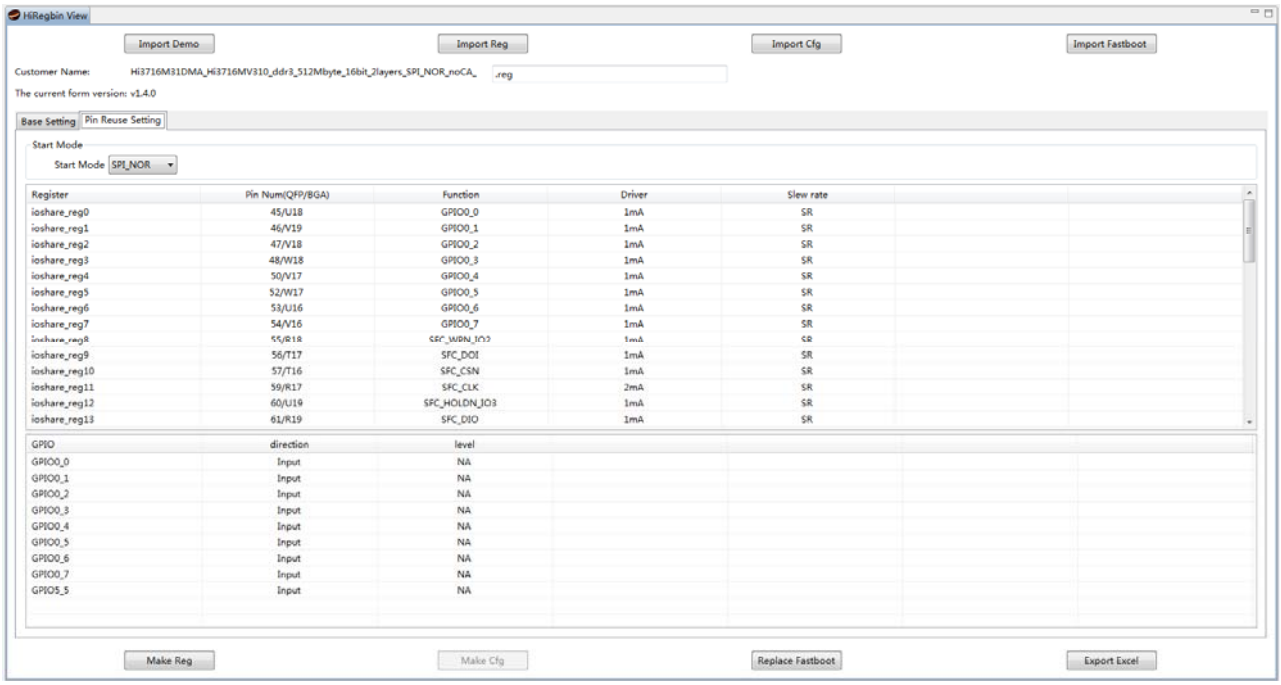
Step 3 View and modify information on the **Base Setting** tab page. For example, change the **DDR Capacity** and **DDR Spread Spectrum**, as shown in Figure 2-8.

Figure 2-8 Modifying information on the Base Setting tab page



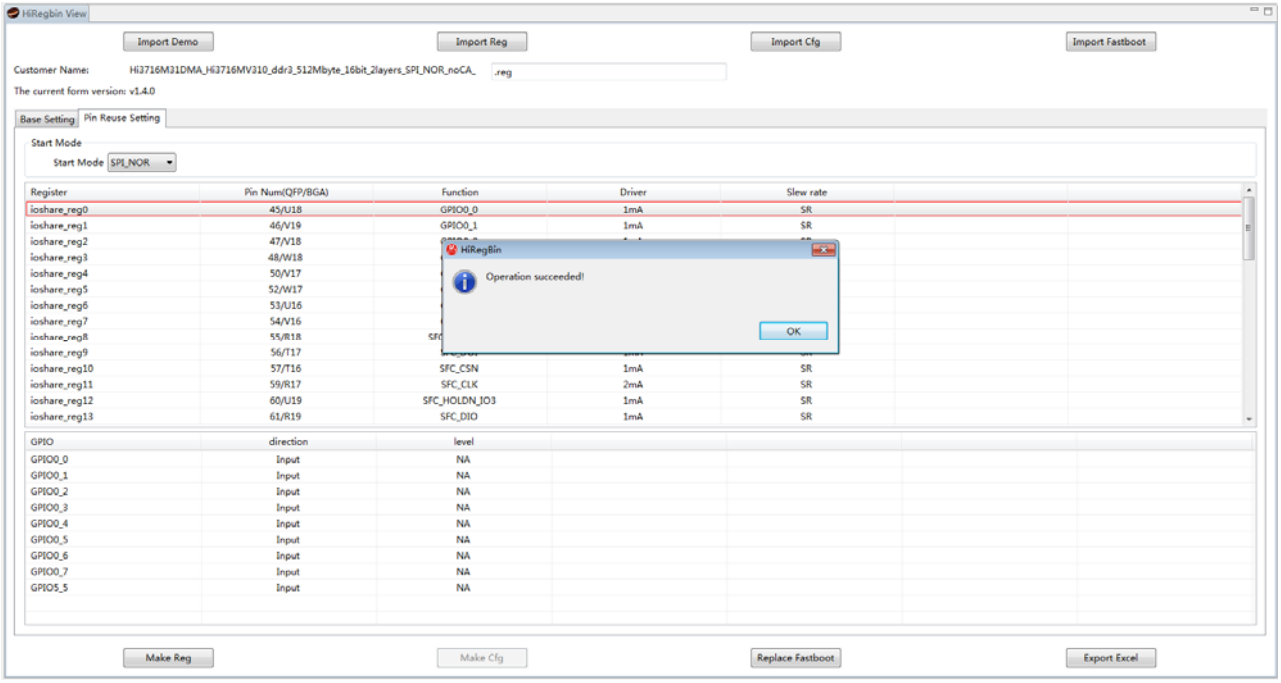
Step 4 View and modify information on the **Pin Reuse Setting** tab page. For example, change the boot mode and the function corresponding to the ioshare_reg0 register, as shown in Figure 2-9.

Figure 2-9 Modifying information on the Pin Reuse Setting tab page



Step 5 Click **Make Reg**, select a path for saving the file, and confirm. A message is displayed, indicating that the file is created successfully, as shown in Figure 2-10.

Figure 2-10 Message indicating that the file is created successfully



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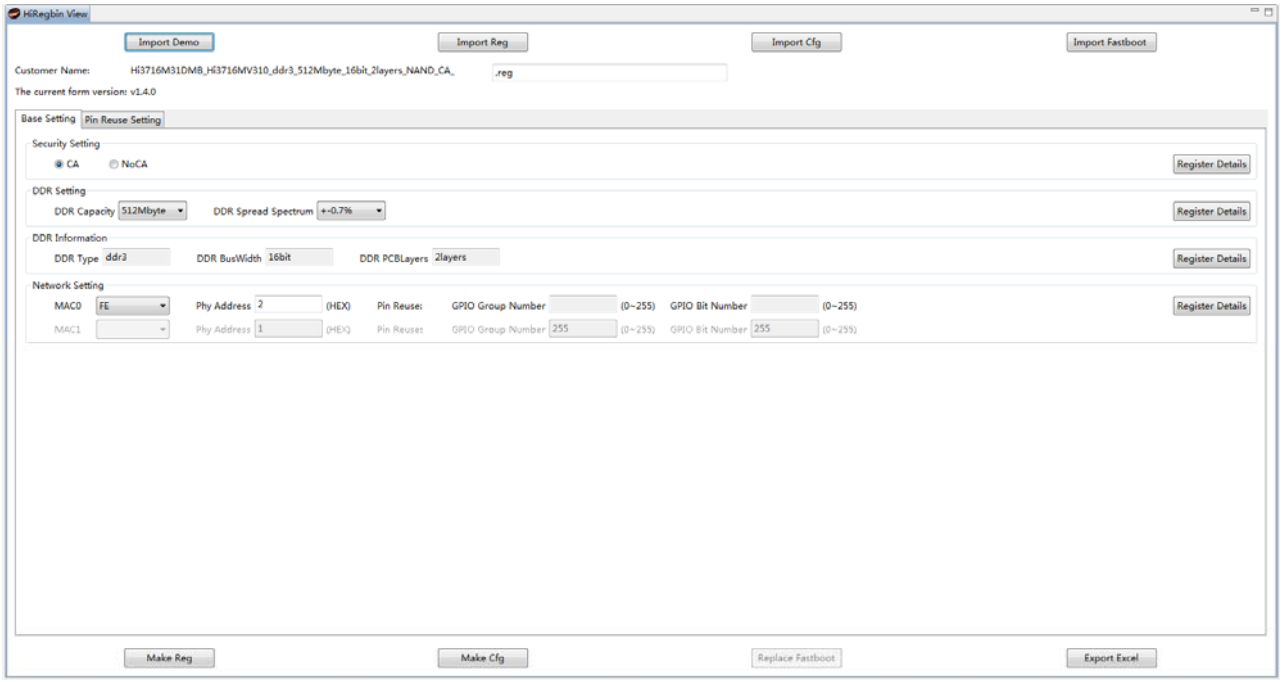
2.6 Replacing the Reg File in Fastboot

To replace the Reg file in Fastboot, perform the following steps:

Step 1 Import the demo board information to the editing area. For details, see section 2.4 "Importing Data."

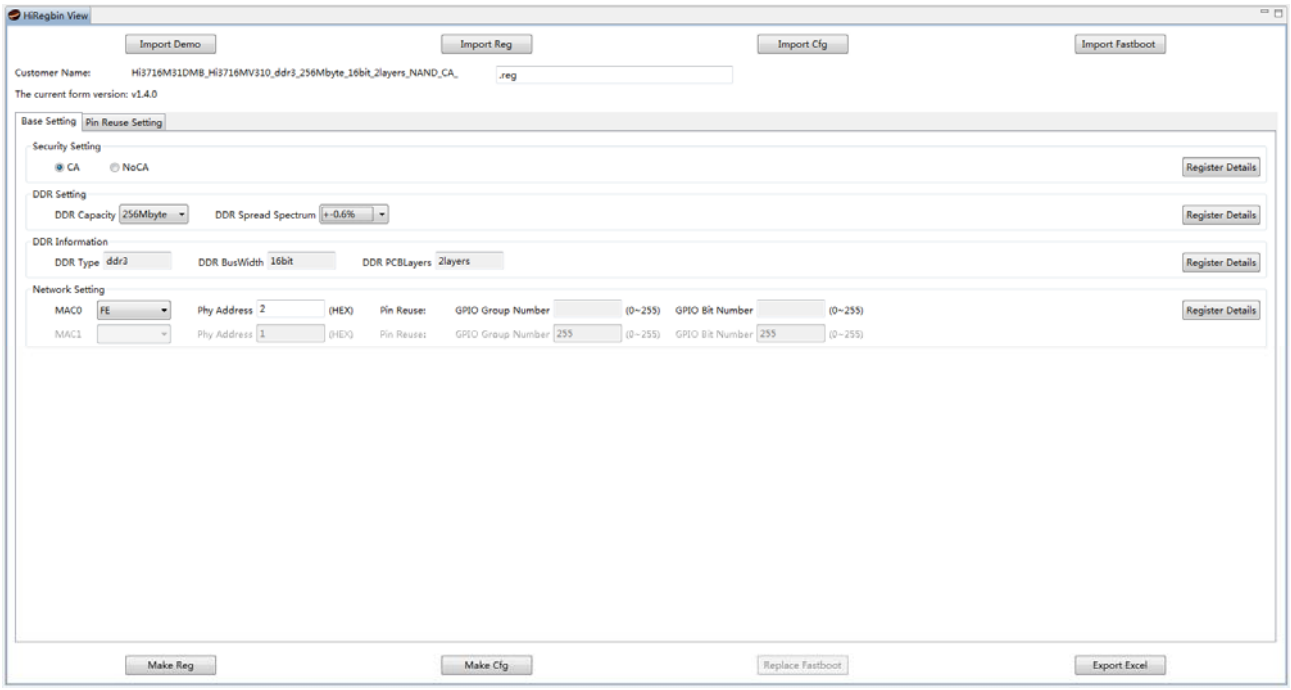
Step 2 (Optional) View and customize the customer table information, as shown in Figure 2-11.

Figure 2-11 Adding and changing the customer table name



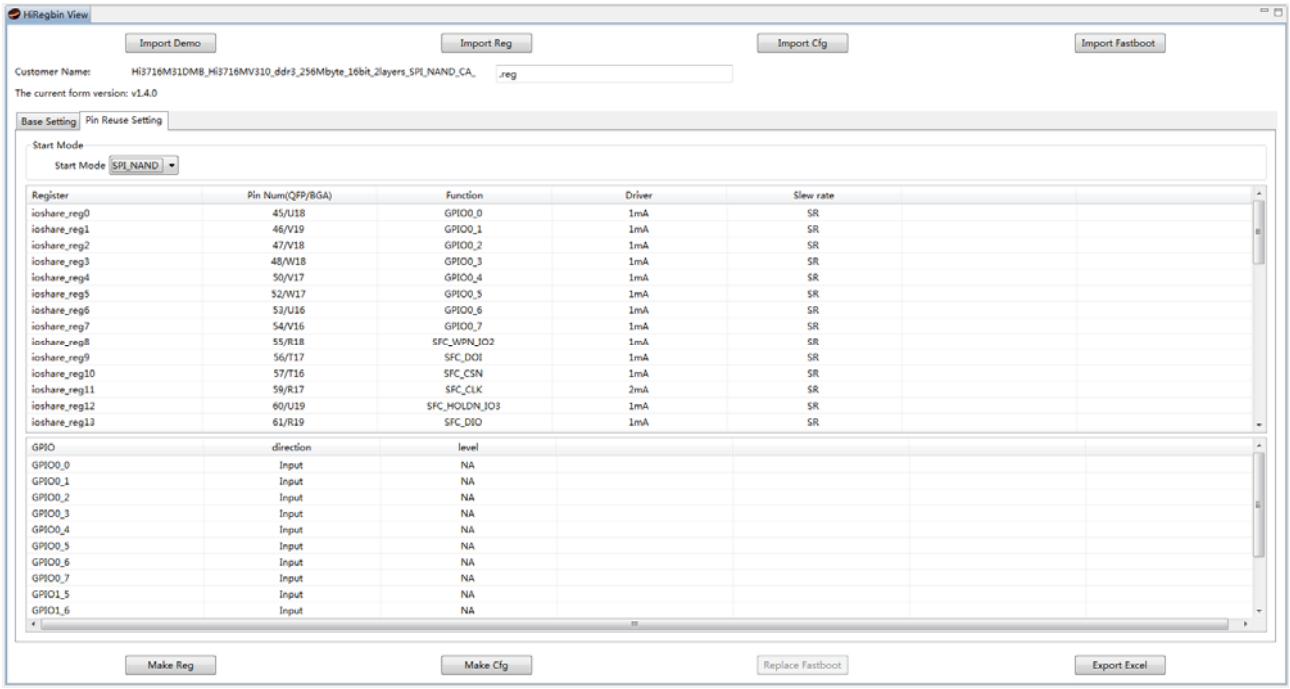
Step 3 View and modify information on the **Base Setting** tab page. For example, change **DDR Capacity** and **DDR Spread Spectrum**, as shown in Figure 2-12.

Figure 2-12 Modifying information on the Base Setting tab page



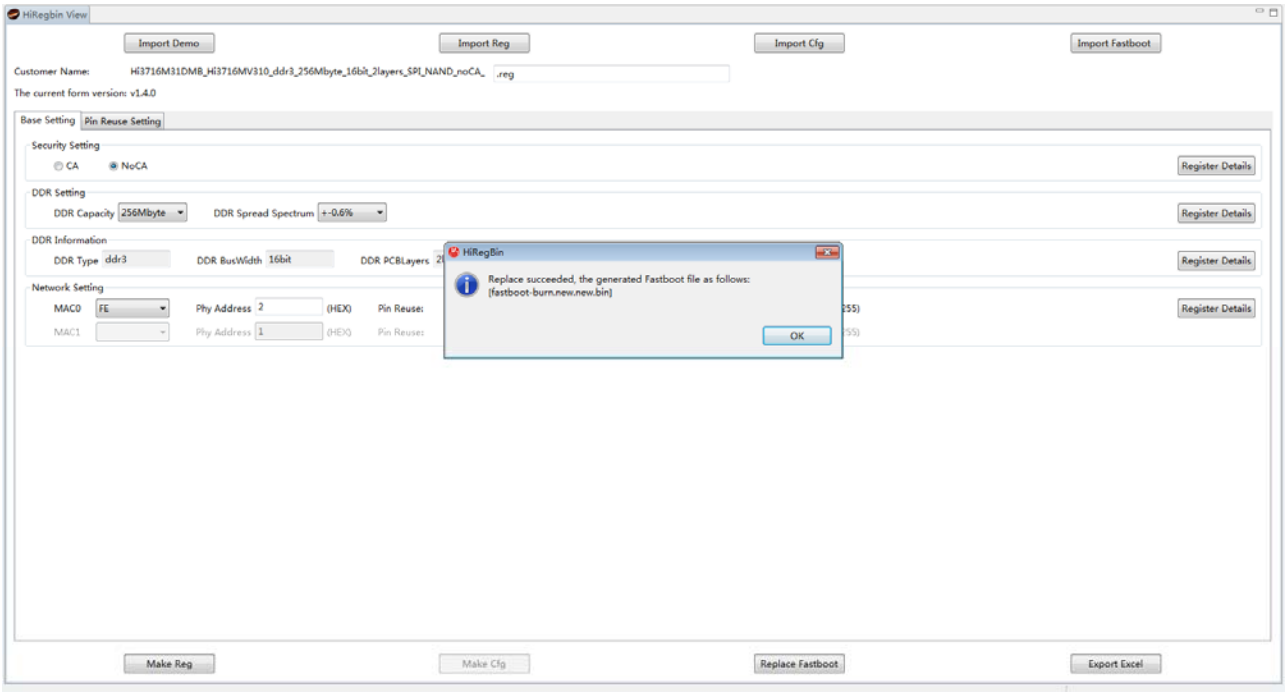
Step 4 View and modify information on the **Pin Reuse Setting** tab page. For example, change the boot mode and the function corresponding to the ioshare_reg0 register, as shown in Figure 2-13.

Figure 2-13 Modifying information on the Pin Reuse Setting tab page



Step 5 Click **Replace Fastboot**, select the Fastboot with the Reg file to be replaced, and confirm. A message is displayed, showing the file name of the newly generated Fastboot (the path is the previously selected Fastboot path), as shown in Figure 2-14.

Figure 2-14 Message indicating that the Reg file of Fastboot is replaced successfully



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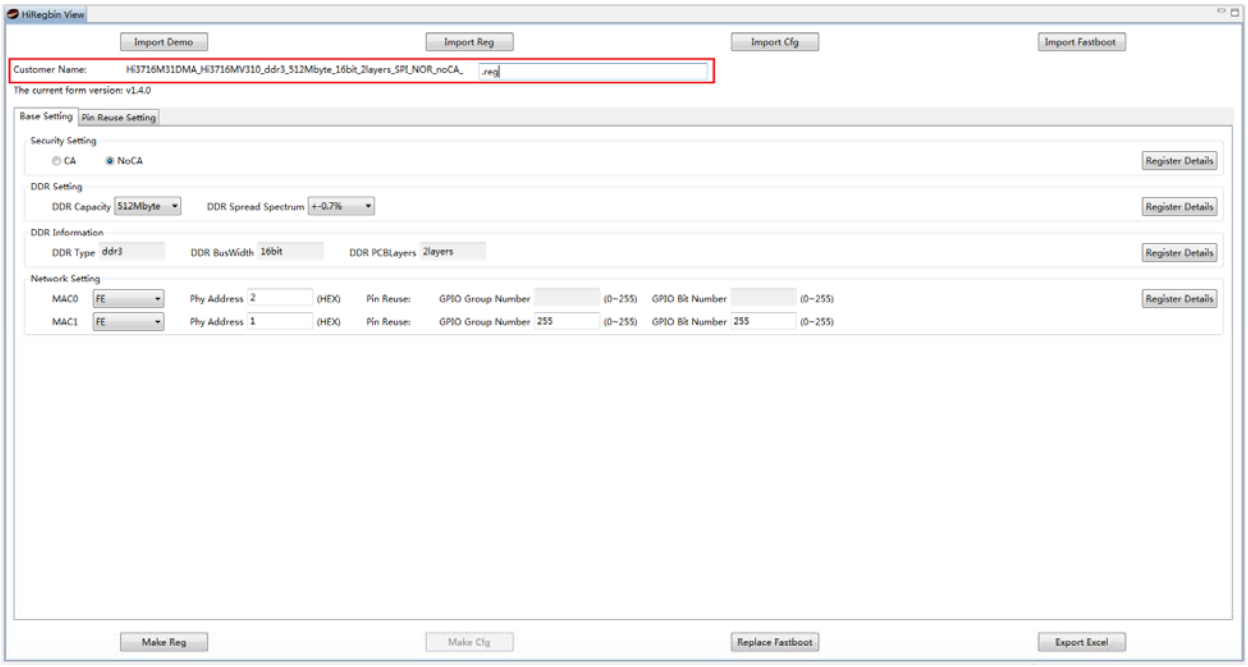
2.7 Exporting the Excel File

To export the Excel file, perform the following steps:

Step 1 Import the demo board information to the editing area. For details, see section 2.4 "Importing Data."

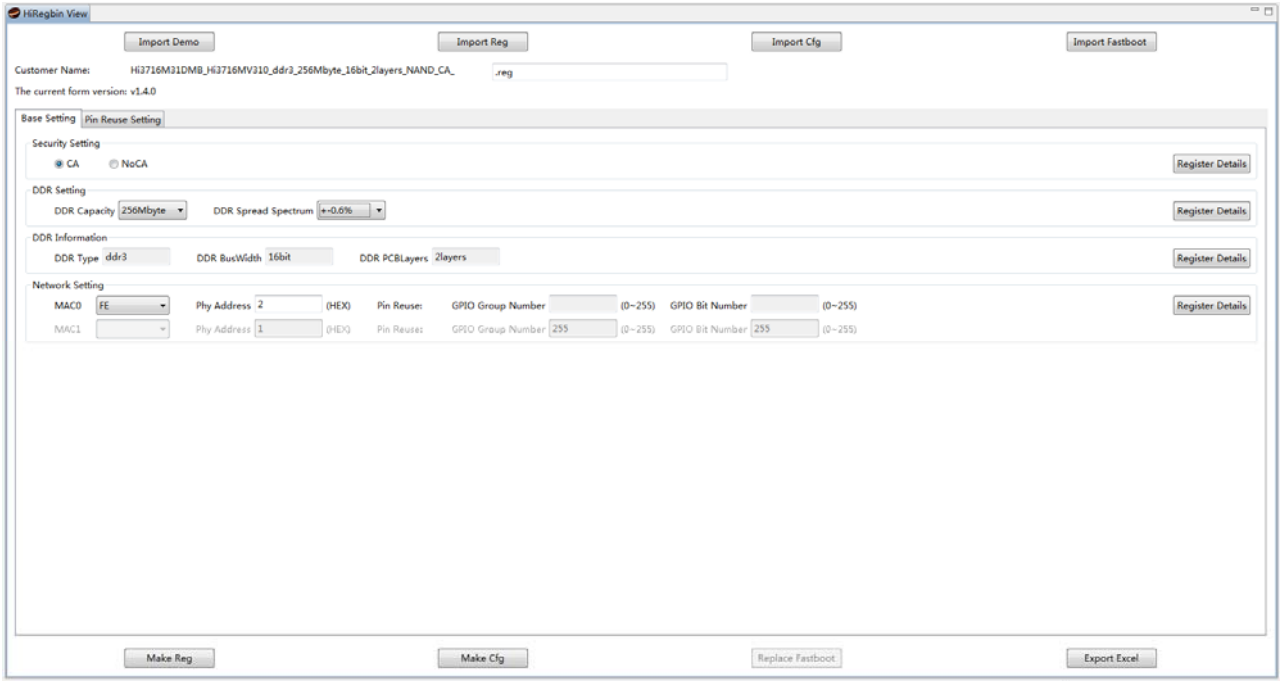
Step 2 (Optional) View and customize the customer table information, as shown in Figure 2-15.

Figure 2-15 Adding and changing the customer table name



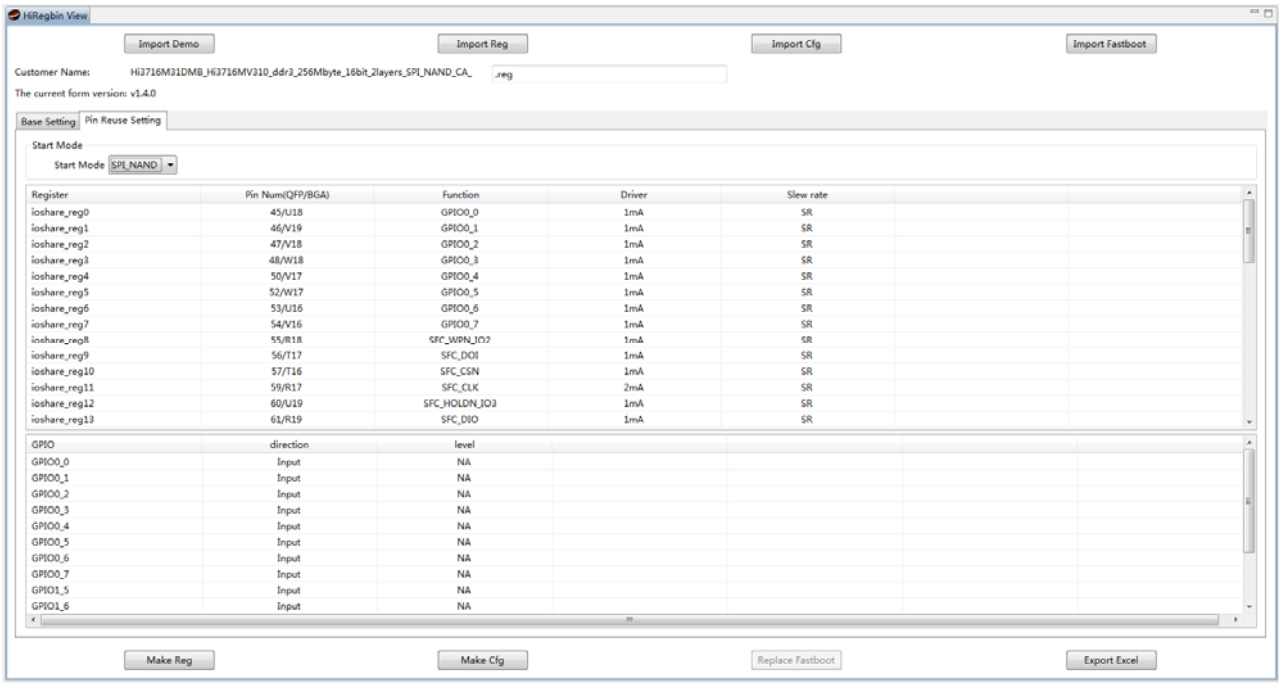
Step 3 View and modify information on the **Base Setting** tab page. For example, change **DDR Capacity** and **DDR Spread Spectrum**, as shown in Figure 2-16.

Figure 2-16 Modifying information on the Base Setting tab page



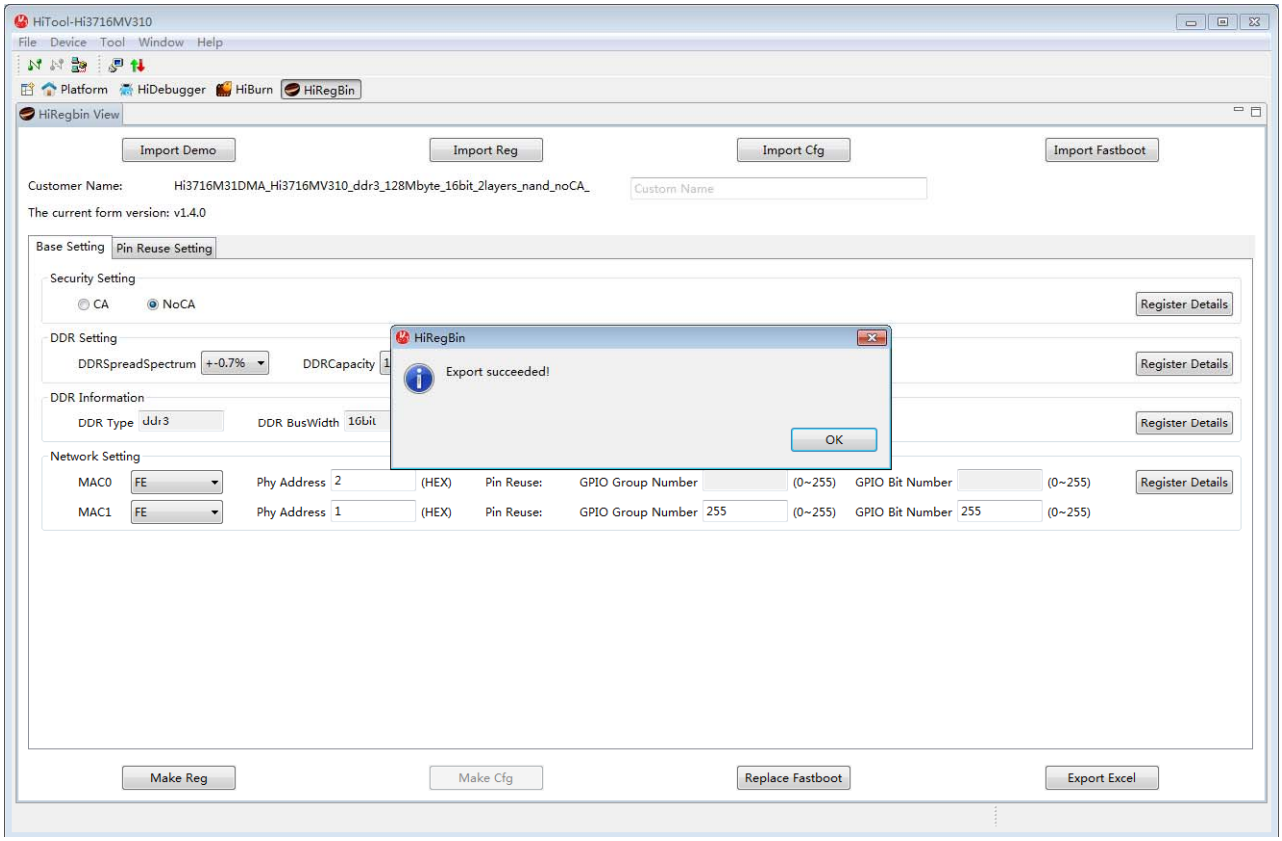
Step 4 View and modify information on the **Pin Reuse Setting** tab page. For example, change **Start Mode** and **Function** corresponding to the ioshare_reg0 register, as shown in Figure 2-17.

Figure 2-17 Modifying information on the Pin Reuse Setting tab page



Step 5 Click **Export Excel**, select a path for storing the Excel file, and click **OK**. The file is exported successfully, as shown in Figure 2-18.

Figure 2-18 Exporting Excel successfully



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3 Multi-Table Main GUI and Functions

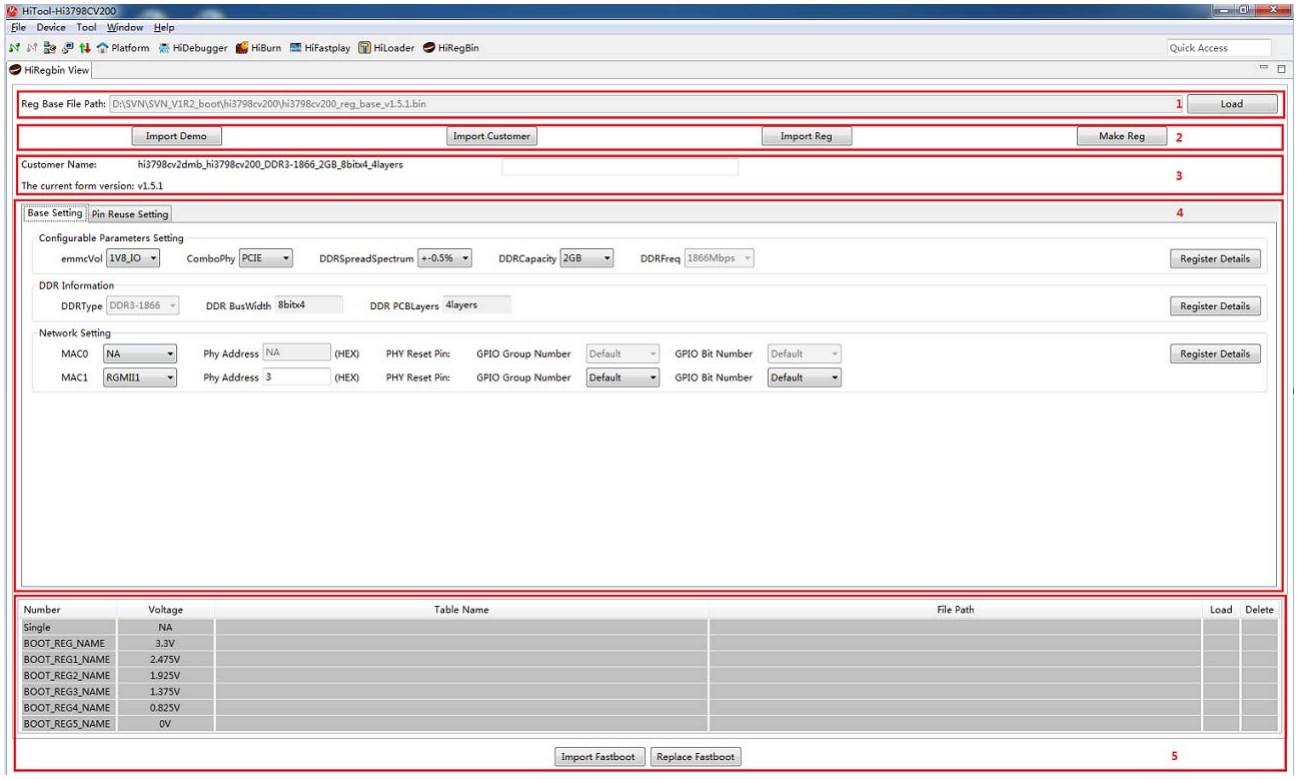
3.1 Multi-Table Main GUI

The multi-table function is new in the Hi3798C V200 series chips.

The multi-table main GUI is divided into five parts, as shown in Figure 3-1:

- 1: Temp file loading area
- 2: importing and creating the Reg area
- 3: customer table information area
- 4: table configuration area
- 5: importing or replacing the fastboot area

Figure 3-1 Multi-table main GUI



The functions of each area are described as follows:

- RegBase file loading area

  The area is used to load the RegBase file supported by the chip, for example: **hi3798cv200_reg_base_v1.5.1.bin**.

- Importing and creating the Reg area

  This area can be used to import the Reg file in three ways and create the Reg file in one way, which are described as follows:

  - Importing from the demo board: This function is used to select different demo board types supported by the chip, and import the configuration parameter information of the corresponding demo board to the tool GUI.
  - Importing from the customer configuration files: This function is used to import the configuration files saved by customers into the tool for user viewing and editing. The configuration files store basic information configuration and pin multiplexing configuration in the Reg files created earlier.
  - Importing from the Reg files: This function is used to import the created Reg file into the tool and update the configuration items of the Reg file to the GUI for user viewing.

  After you click the corresponding import buttons, data is imported to the editing area, that is, the **Base Setting** and **Pin Reuse Setting** tab pages.

  - Creating the Reg file: This function is used to write the option parameters of the current GUI, such as basic information configuration and pin multiplexing configuration, and other fixed register information to the Reg file to generate a file with a fixed format.

- Customer table information area

  This area displays the customer table name and version based on the imported table. It also allows you to customize the table name. The customer table name will be written into the files when the Reg files are created.

- Table configuration area

  This area consists of the **Base Setting** and **Pin Reuse Setting** tab pages for viewing and modifying imported table information.

- Multi-table functional area

  This area contains a multi-table list and two buttons (**Import Fastboot** and **Replace Fastboot**), whose functions are described as follows:

  - Importing the boot: This function is used to parse the table information of the imported boot into the list.
  - Multi-table list: This list is used to display the table number, corresponding voltage, demo board type, table name, and file path of the imported boot.
  - Replacing the boot: This function is used to replace the table information of the imported boot into a new boot.

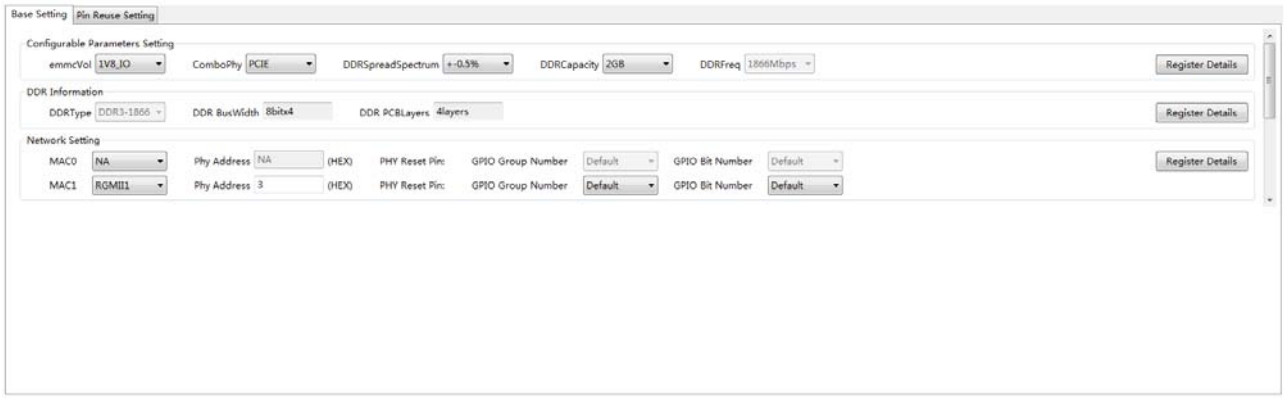
3.2 Base Setting

The **Base Setting** tab page consists of four panes, as shown in Figure 3-2:

- Configurable Parameters Setting

- DDR Information
- Network Setting

Figure 3-2 Base Setting tab page



The functions are described as follows:

- Configurable Parameters Setting

  Configures the COMBO PHY, eMMC I/O voltage, as well as three DDR parameters (capacity, spread spectrum, and frequency).
- DDR Information

  Displays information about the DDR on the board, including the DDR type, bus width, and number of PCB layers.
- Network Setting

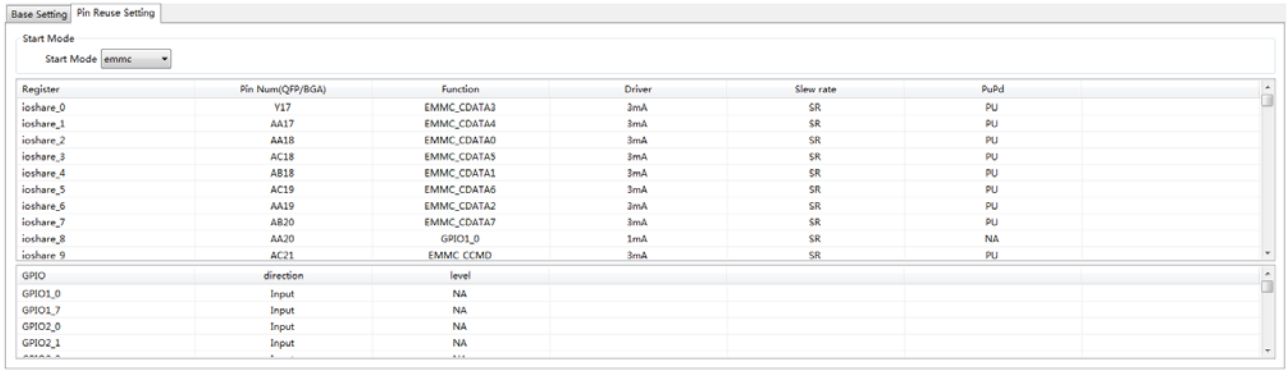
  Specifies the MAC ports supported by the board, including the MAC type, PHY address, and the GPIO pin group ID and bit number corresponding to the PHY reset pins (NA is entered when dedicated PHY reset pins are used).

3.3 Pin Reuse Setting

The **Pin Reuse Setting** tab page allows you to configure the following items, as shown in Figure 3-3:

- Start mode
- Pin multiplexing registers
- GPIO

Figure 3-3 Pin Reuse Setting tab page



The functions are described as follows:

- Start mode

  Specifies the boot mode of the board.
- Pin multiplexing registers

  Displays and configures attributes of pin multiplexing registers. If the function is set to GPIO, the current GPIOs are updated to the GPIO configuration list for configuring the GPIO direction and level.
- GPIO

  Displays the list of all GPIO pins selected in the pin multiplexing registers and their directions and levels, and configures the GPIO direction and level.

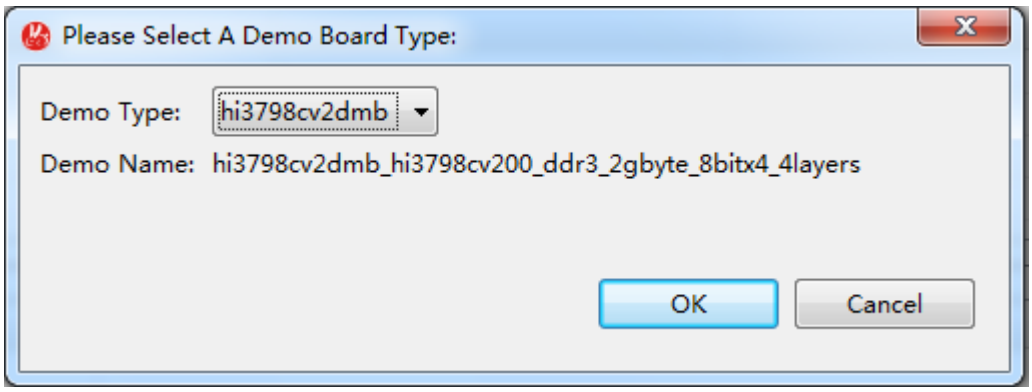
3.4 Importing Data

3.4.1 Import Demo

To import data from the demo board, perform the following steps:

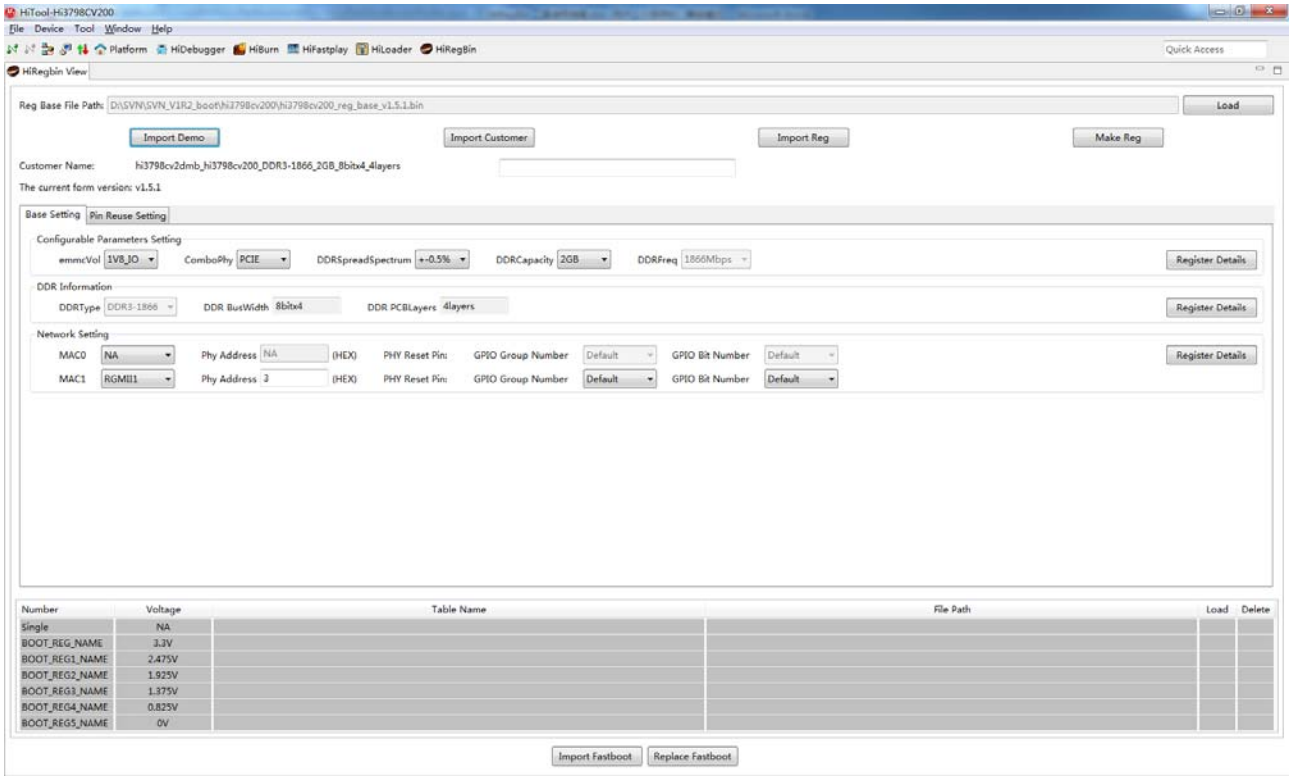
Step 1 Select the type of demo board to be imported from the **Demo Type** drop-down list, for example, **hi3798cv2dmb**, as shown in Figure 3-4. The basic board configuration information is refreshed in **Demo Name** in the following format: board name_chip name_DDR capacity_DDR bus width_number of PCB layers_flash type.

Figure 3-4 Selecting the Demo Type



Step 2 Click **Import Demo** to import the current demo board information to the editing area, as shown in Figure 3-5.

Figure 3-5 Clicking Import Demo



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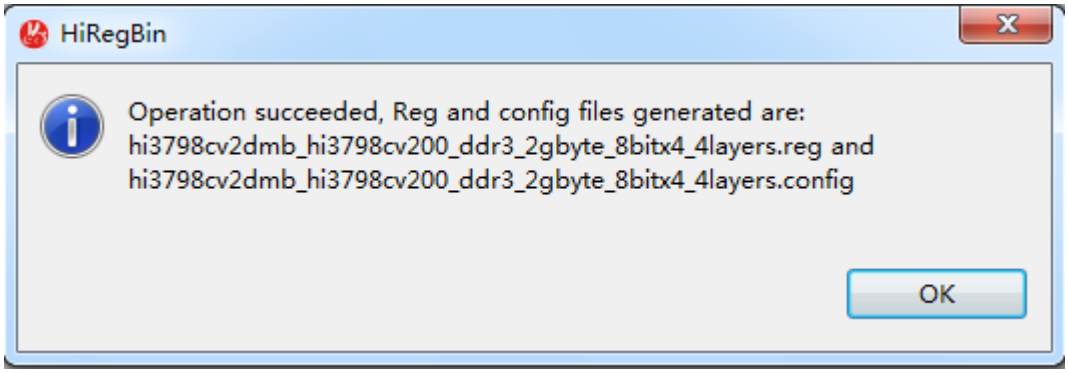
3.4.2 Import Customer Configuration File

The function of importing customer configuration file is as follows: During the making of the Reg file, a configuration file is generated. This file records the options for configuring the basic information and pin multiplexing in the current GUI. The importing customer configuration file function is used to acquire previous user configurations by importing the customer configuration file after the Demo configuration is updated.

To import the user configuration file, perform the following steps:

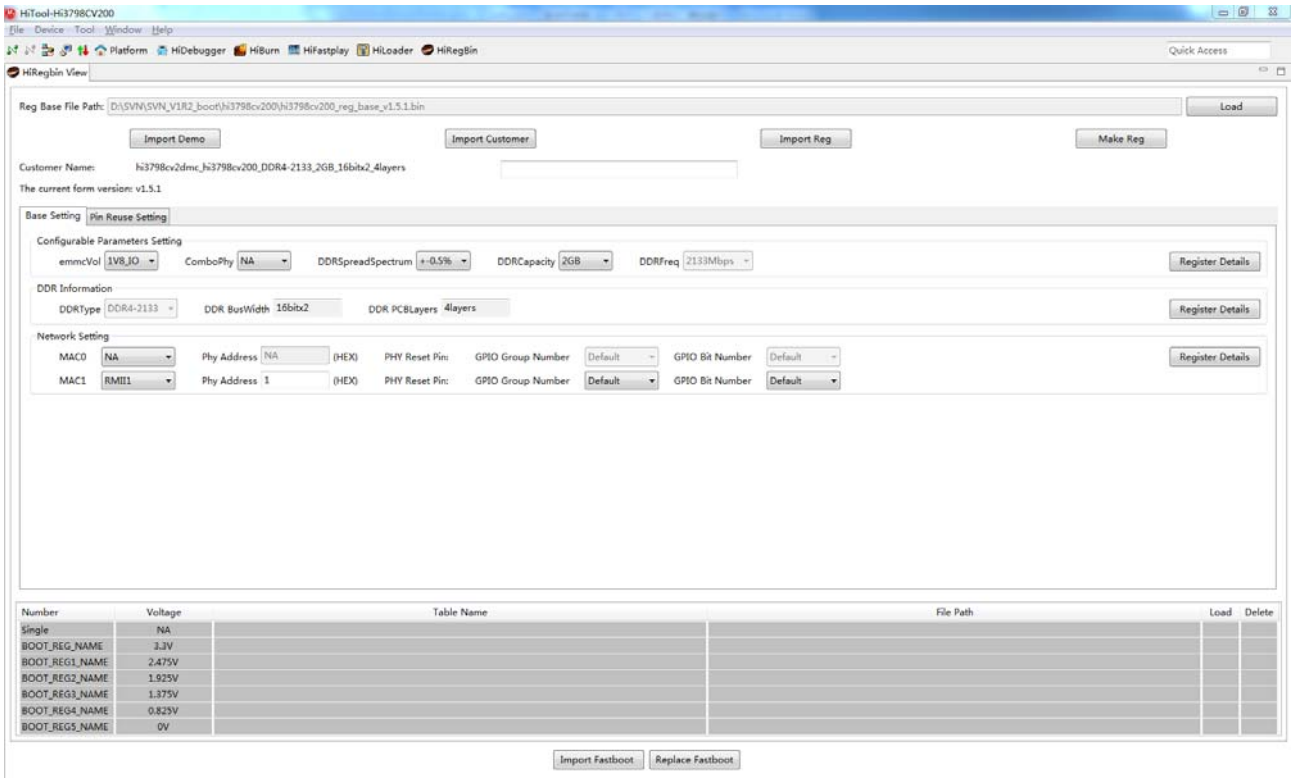
Step 1 Configure the parameters on the tool as required and then click **Make Reg**. The Reg file and the config file are generated for storing customer configurations of the current GUI (including the basic configuration and the pin multiplexing configuration), as shown in Figure 3-6.

Figure 3-6 Making the Reg file while generating the config file



Step 2 Start the new-version HiRegBin tool and click **Import Customer**. Select the config file that is generated previously, for example, **hi3798cv2dmb_hi3798cv200_ddr3_2gbyte_8bitx4_4layers.config**. Click the confirmation button to import the config file into the GUI. The GUI loads the current Demo board configuration and then automatically matches the configurable parameters on the GUI based on the previous configuration, as shown in Figure 3-7.

Figure 3-7 Importing customer configuration file into editing area



----End

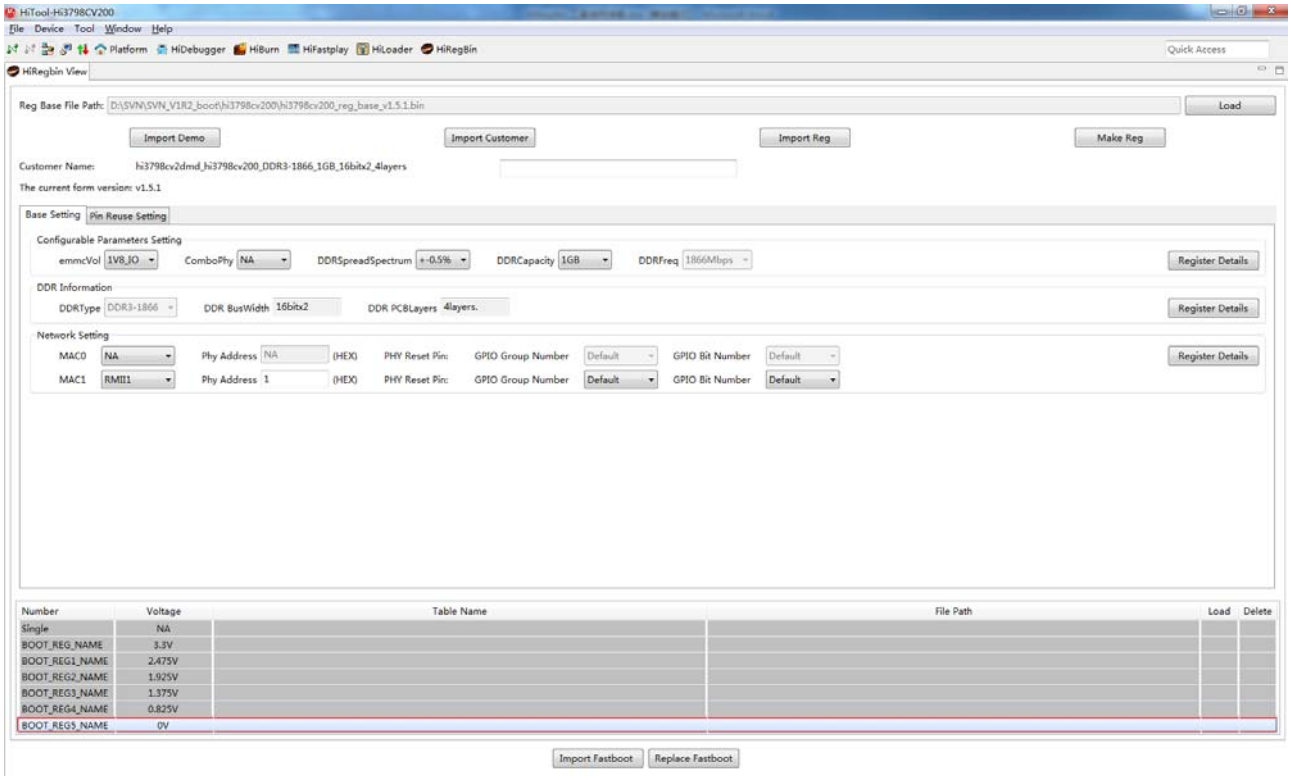
3.4.3 Import Reg for User Viewing

To import data from the Reg file, perform the following steps:

Step 1 Click **Import Reg**, select the Reg file to be imported in the displayed dialog box, and confirm.

Step 2 After the Reg file is imported successfully, the GUI is automatically updated to display the file information, as shown in Figure 3-8.

Figure 3-8 Importing a Reg file for user viewing



CAUTION

You are advised to use the function of importing a Reg file for viewing configuration of the current Reg file, rather than for making a Reg file. Because when the Temp file is updated, if new registers are added or register values are changed, the new or modified registers in the Temp file fail to be written into the new Reg file created by using this function. Therefore, you are advised to use this function for the viewing purpose only. If you want to inherit the previous Reg configuration, you can use the function of importing data from the customer configuration file for editing and making.

----End

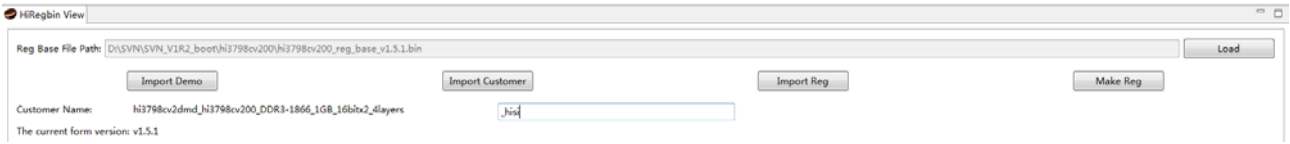
3.5 Making Reg

To make a Reg file, perform the following steps:

Step 1 Import the demo board information to the editing area. For details, see section 3.4.1 "Import Demo."

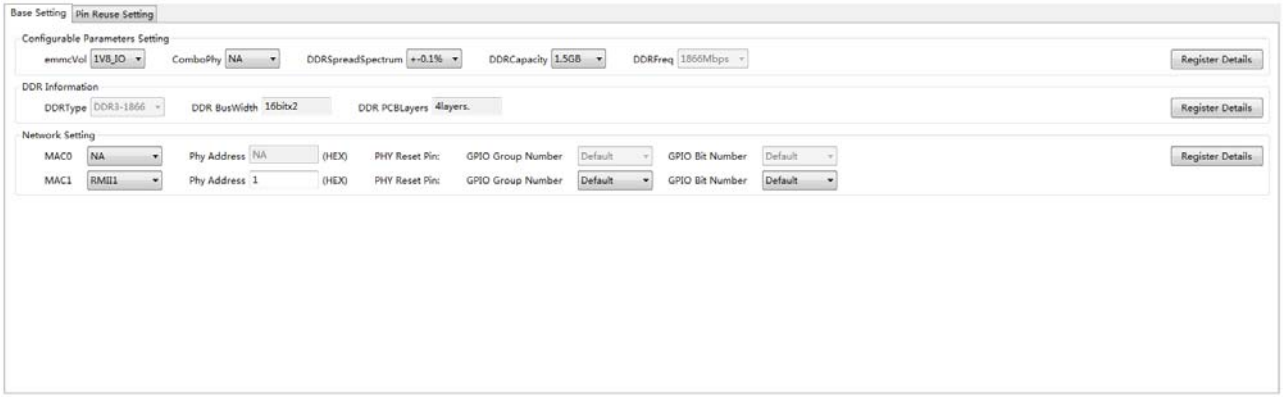
Step 2 (Optional) View and customize the customer table information, as shown in Figure 3-9.

Figure 3-9 Adding and changing the customer table name



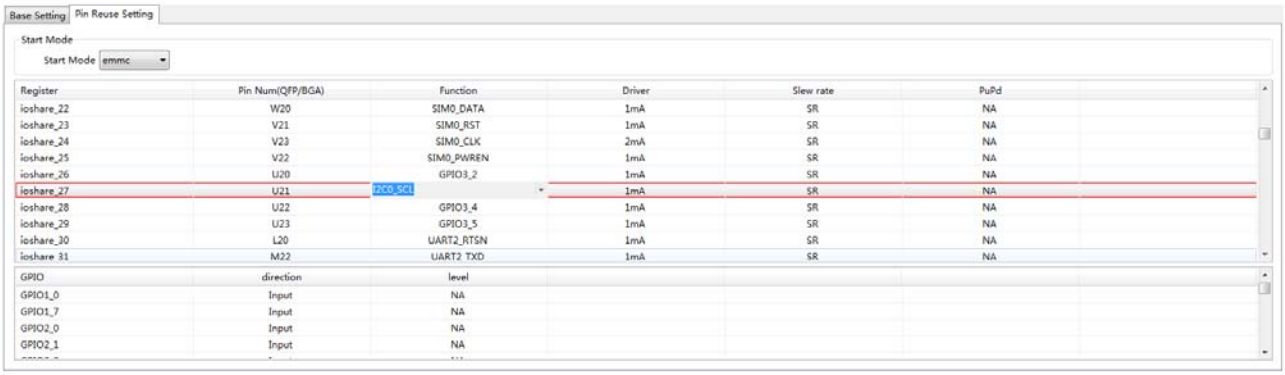
Step 3 View and modify information on the **Base Setting** tab page. For example, change the **DDRCapacity** and **DDRSpreadSpectrum**, as shown in Figure 3-10.

Figure 3-10 Modifying information on the Base Setting tab page



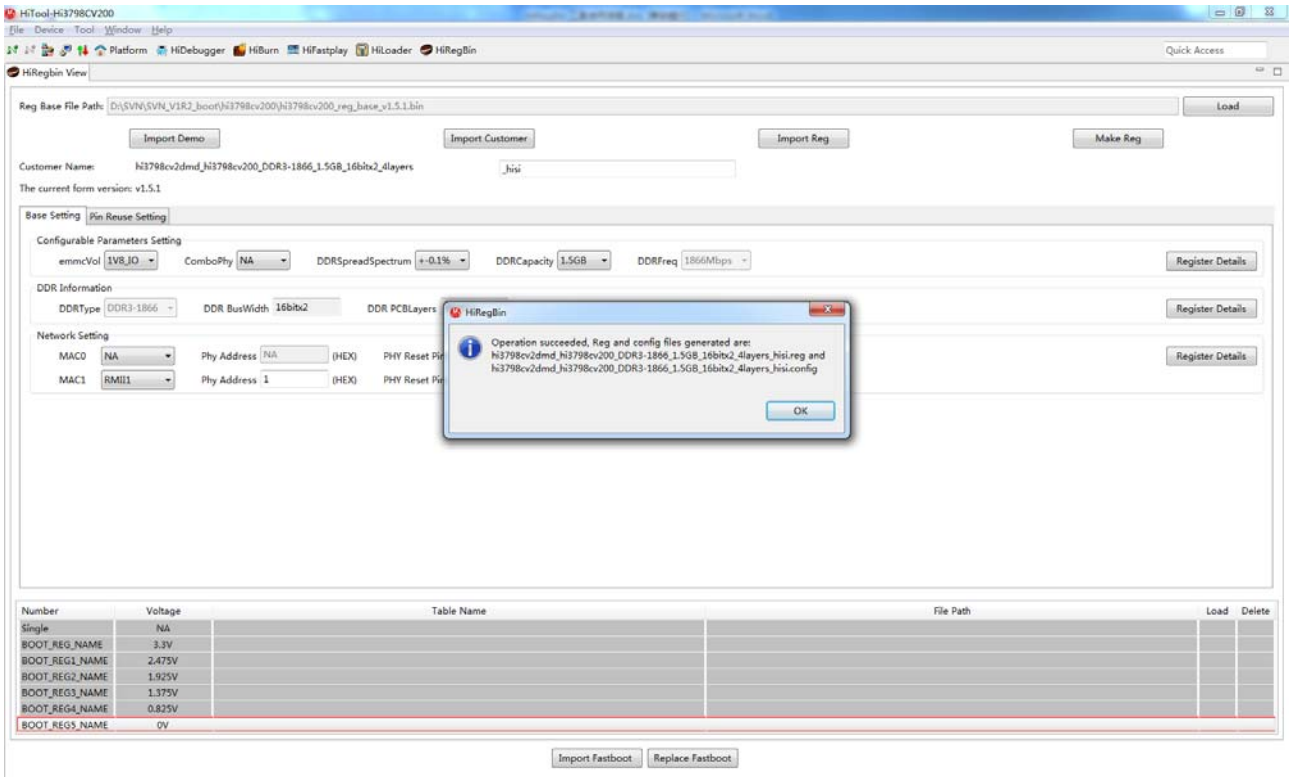
Step 4 View and modify information on the **Pin Reuse Setting** tab page. For example, change **Start Mode** and **Function** corresponding to the ioshare_reg27 register, as shown in Figure 3-11.

Figure 3-11 Modifying information on the Pin Reuse Setting tab page



Step 5 Click **Make Reg**, select a path for saving the file, and confirm. A message is displayed, indicating that the file is created successfully, as shown in Figure 3-12.

Figure 3-12 Message indicating that the file is created successfully and displaying the names of the generated Reg file and configuration file



----End

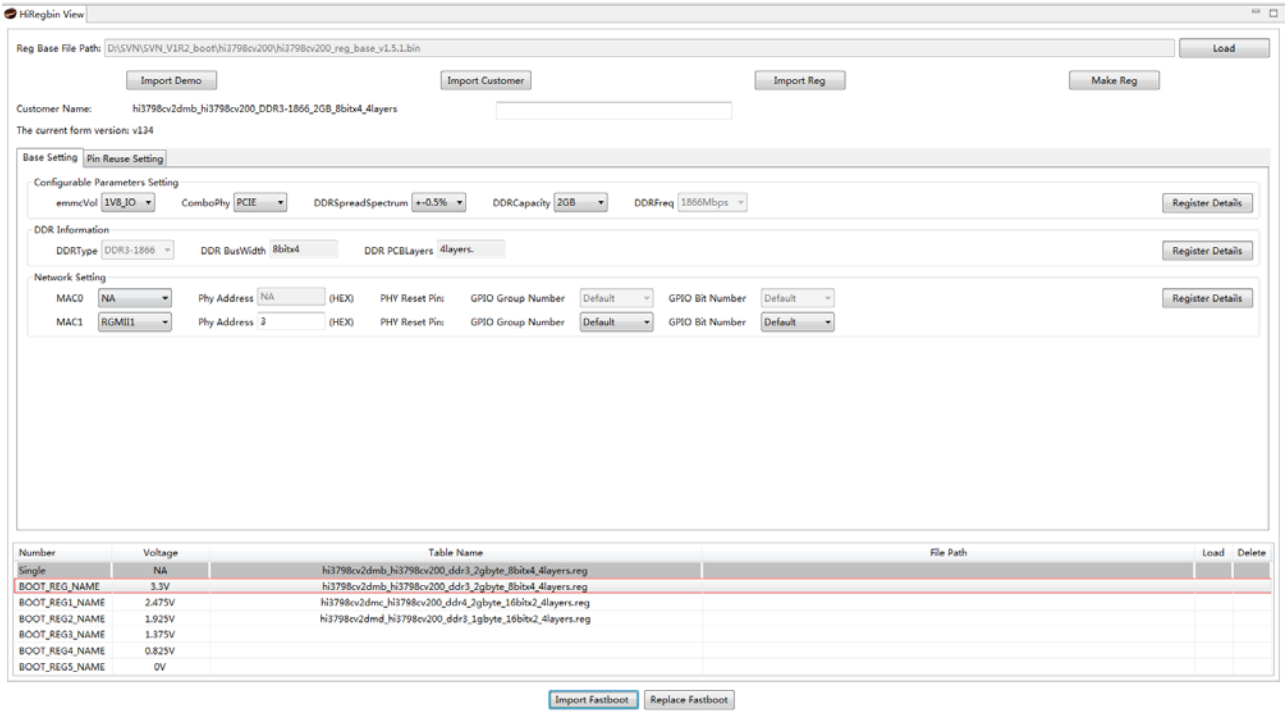
3.6 Multi-Table Functions

3.6.1 Importing/Exporting Multi-Table Boot

The multi-table importing and exporting function is provided for users to view and edit the Reg in the boot. The list consists of two parts: the single-table **Single** in the first row of the list and six multi-tables BOOT_REG_NAME. Each row in the list is in gray by default, indicating that the boot has not been imported. If the current boot supports the multi-table function, **Single** in the first row is not used by the boot. Therefore, the first row is in gray, indicating that this row can only be viewed and cannot be replaced. The other six multi-tables in the list are in non-gray color, indicating that these rows can be viewed and replaced. If the current boot does not support the multi-table function, **Single** in the first row is in non-gray color and can be viewed and replaced whereas the other rows are in gray and can be viewed but cannot be replaced. The process is as follows:

Step 1 Click **Import Fastboot**, select the fastboot image to be imported, and click **OK**. Take the import of the boot that supports the multi-table function as an example. After the importing succeeds, the BOOT_REG_NAME row is selected and the corresponding Reg file is imported to the editing area, as shown in Figure 3-13. If the format of the fastboot image is incorrect, an error is reported and the image cannot be imported.

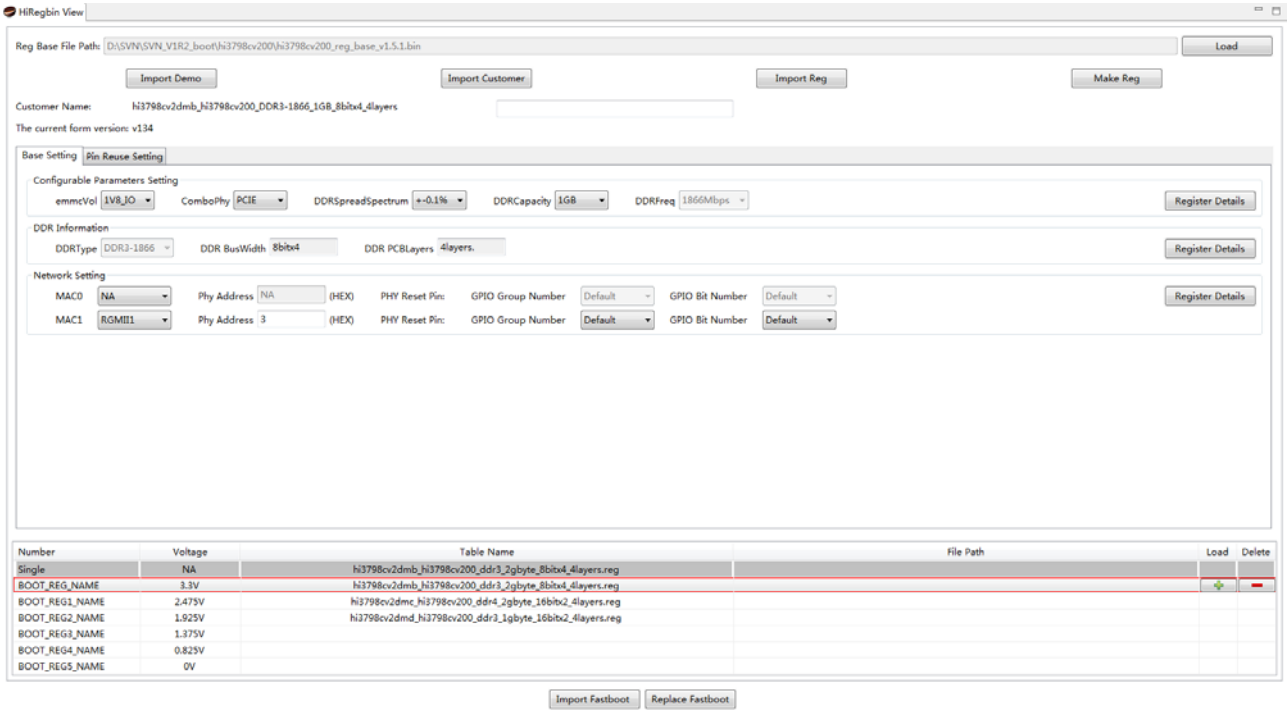
Figure 3-13 Importing the fastboot successfully



Step 2 (Optional) View and customize the customer table information.

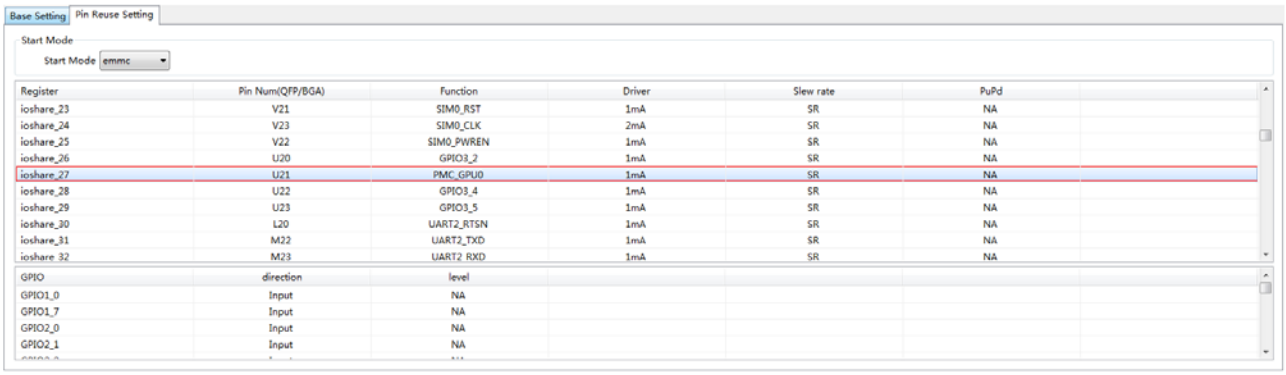
Step 3 View and modify information on the **Base Setting** tab page. For example, change the **DDRCapacity** and **DDRSpreadSpectrum**, as shown in Figure 3-14.

Figure 3-14 Modifying information on the Base Setting tab page



Step 4 View and modify information on the **Pin Reuse Setting** tab page. For example, change **Start Mode** and **Function** corresponding to the ioshare_reg27 register, as shown in Figure 3-15.

Figure 3-15 Modifying information on the Pin Reuse Setting tab page



Step 5 Click **Replace Fastboot**. A **Replace Boot Reg** dialog box is displayed. Click **Browse** next to **Input Boot File** to select the fastboot to be replaced, and confirm. If **Multiple Table** is selected after the replaced fastboot image is imported, multiple tables are used for the current fastboot; otherwise, multiple tables are not used. Click **Browse** next to **Output Boot File** to select an output path (the path can be empty) as shown in Figure 3-16, and confirm. A message indicating that the fastboot is replaced successfully is displayed, as shown in Figure 3-17.

Figure 3-16 Selecting the path for the replaced boot

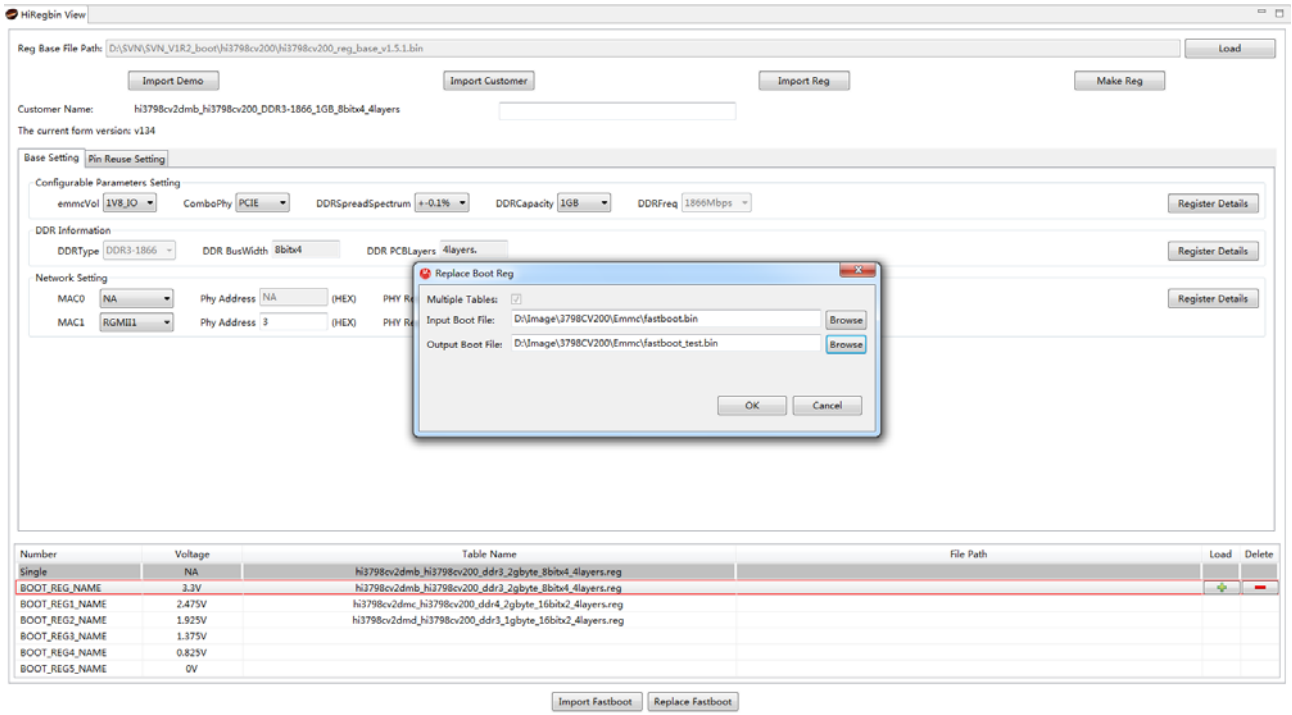
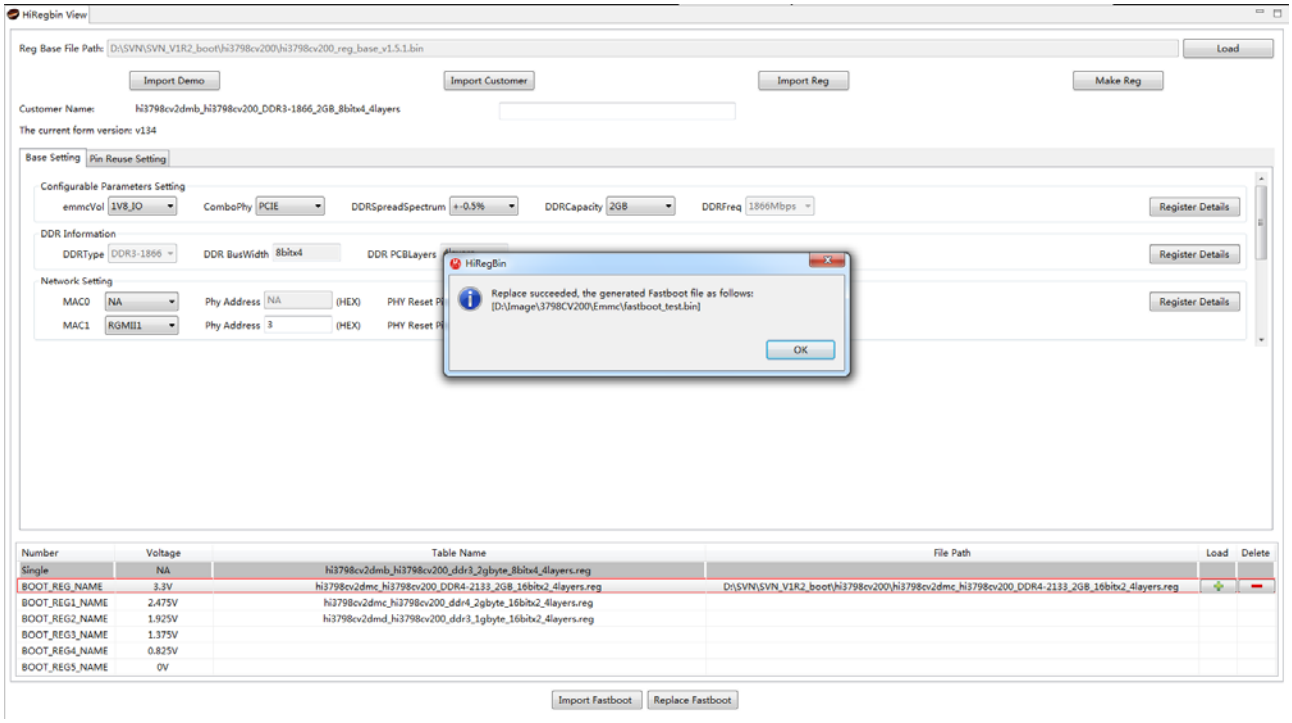


Figure 3-17 Message indicating that the fastboot is replaced successfully



----End

3.6.2 Editing the Multi-Table List

The multi-table list has the following functions:

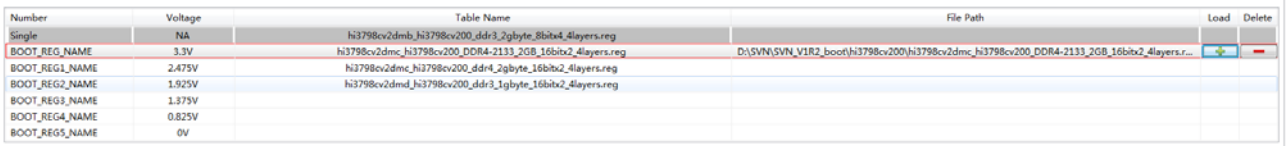
- Adding a Reg file to the current row
- Deleting a Reg file of a row
- Loading a Reg file to the editing page

The functions of each area are described as follows:

- Adding a Reg file to the current row

  Select the row to be added, click  on the right, and select the Reg file to be imported, for example, **hi3798cv2dmc_hi3798cv200_DDR4-2133_2GB_16bitx2_4layers.reg**, as shown in Figure 3-18.

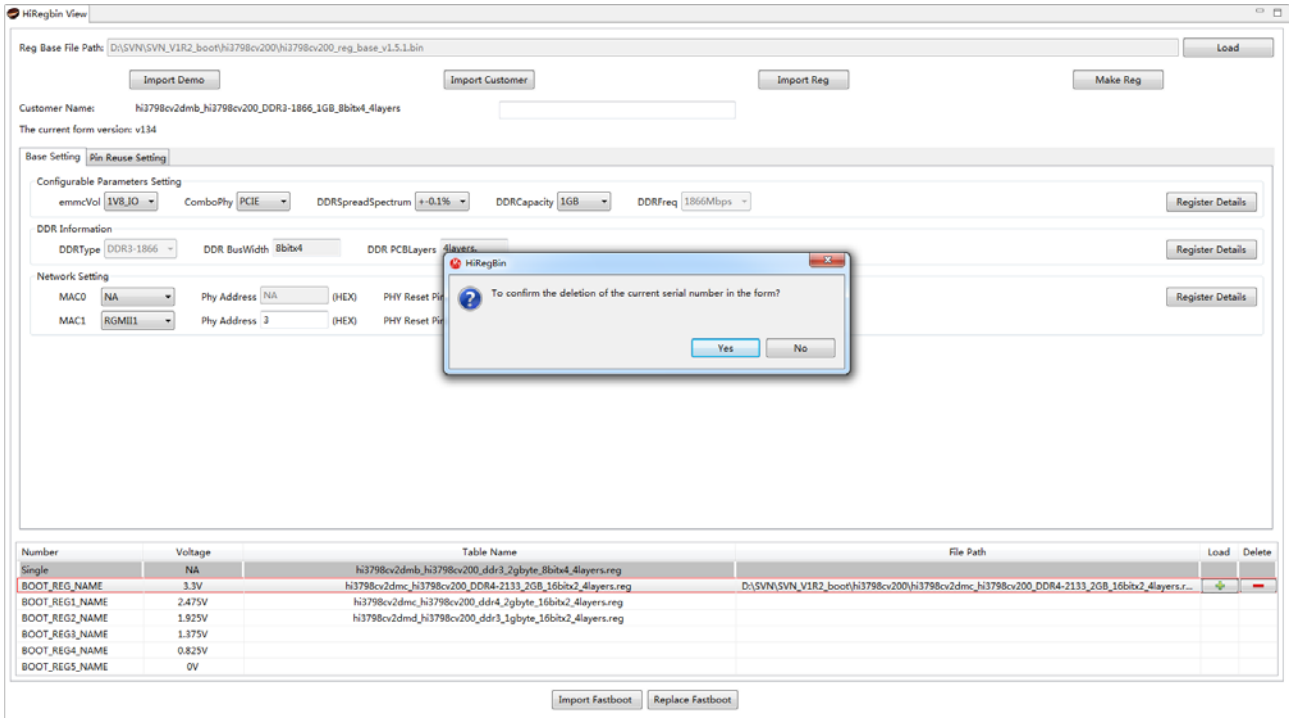
Figure 3-18 Importing a Reg file to the multi-table row



- Deleting a Reg file of a row

  Select the row to be deleted and click  on the right. Click **Yes** in the displayed dialog box, as shown in Figure 3-19. The Reg file of the current row is deleted.

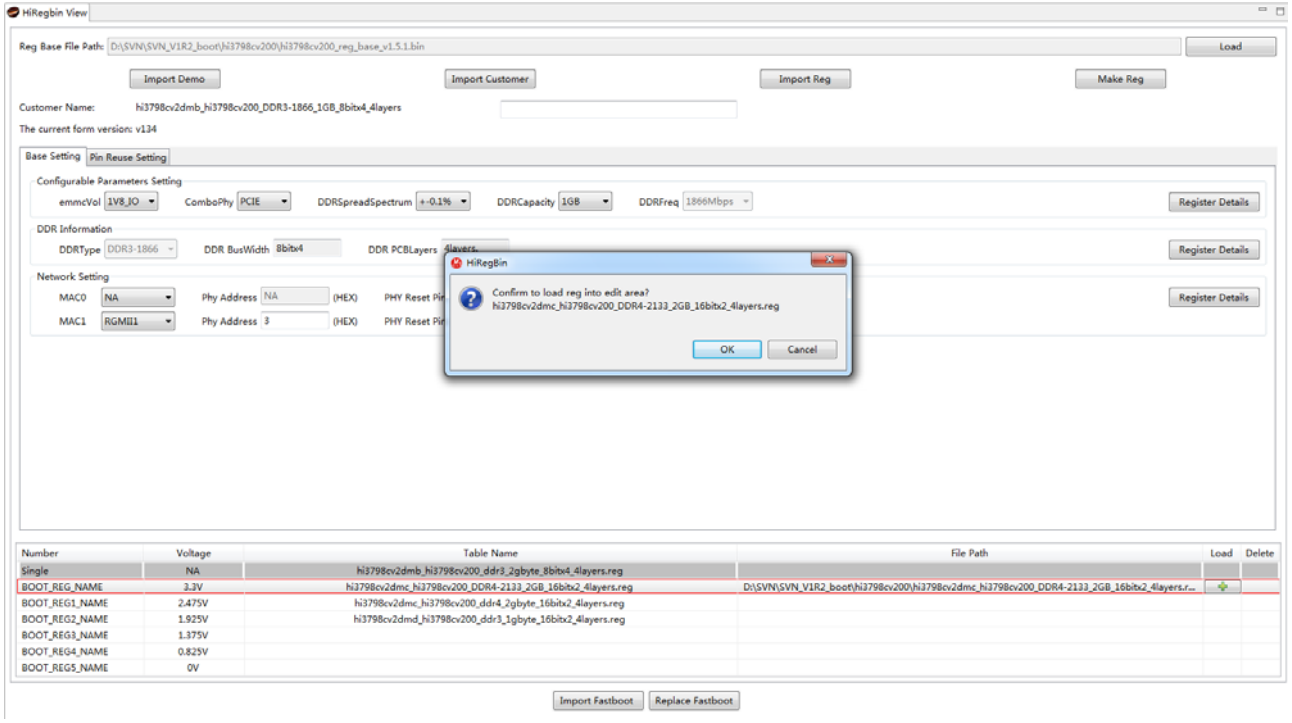
Figure 3-19 Deleting the current Reg file in the multi-table list



- Loading a Reg file to the editing page

  Double-click the row to be loaded. A confirmation box is displayed, as shown in Figure 3-20. Click **OK**.

Figure 3-20 Loading the Reg file of the current row to the editing area



----End