

**ARM[®] Cortex[®]-M
32-bit Microcontroller**

**AxTool - PinConfigure
User Manual**

Revision 1.00
December 2rd, 2019

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1. Introduction

The **AxTool - PinConfigure** is used to configure GPIO multi-functions of ASIX AX58200. Its features are listed below:

- **Configuring by the TreeView:** All the supported modules are collected and listed in the TreeView. The user can manipulate the tree to configure GPIO multi-functions easily.
- **Configuring by individual pins:** Configuring GPIO multi-functions by individual pins is allowed. The user can complete their operation more intuitively and efficiently.
- **Configuring by editing the register value directly:** The user can utilize this feature to inspect the accuracy of the value.
- **Generation of code or report:** After configuring GPIO multi-functions, the user can generate code or print a report. The generated code can be included into the developing projects. The report comprises all the configuration information.

Through the application, the user can configure GPIO multi-functions of the AX58200 correctly and handily.

2. Starting to Use the AxTool - PinConfigure

2.1 System Requirements

The following table lists system requirements for the user to run **AxTool - PinConfigure**.

	Table 1. Minimum Requirements	Table 2. Recommended Specifications
Operating System	Windows®XP with latest service pack	Windows®7 with latest service pack
Internet Explorer	Internet Explorer 8	Internet Explorer 10
Input	Keyboard and mouse required	

Note: To have a fully usable and pleasant experience with the application, it is strongly recommended that the version of the installed Internet Explorer (IE) be higher than 8.

2.2 Supported Chips

To see the list of supported chips, please refer to **Supported_chips.htm** in the folder of user manual. The alternative way is to click the **Read User Manual** button on the toolbar.

2.3 Running the NuTool - PinConfigure

To run **AxTool - PinConfigure**, double-click the **AxTool - PinConfigure.exe**. Note that the .exe file and the related folders, such as the content folder, should stay in the same directory; otherwise, the application will not work properly.

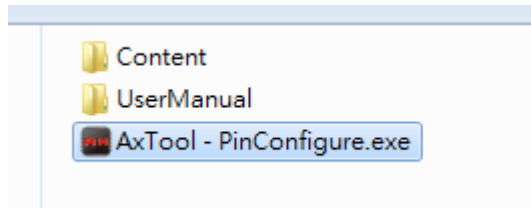


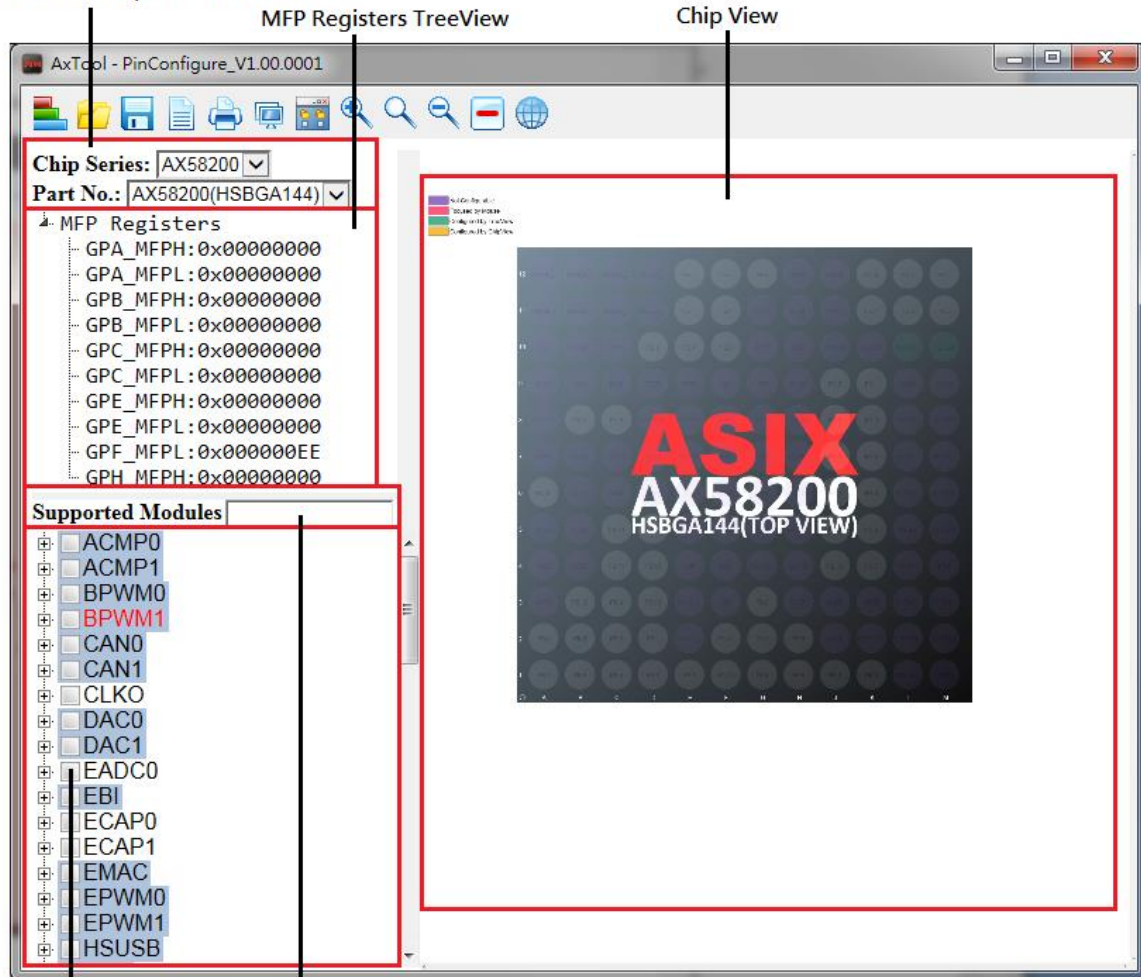
Figure 2-1 AxTool - PinConfigure.exe and Related Folders

3. User Interface Guide

3.1 GUI Overview

The PinConfigure Window includes a variety of components. The name of each component is described in the following figure.

Select field of Chip Series and Part No.



Supported Module - TreeView

Search Field

Figure 3-1 PinConfigure Window

3.2 Select Field of Chip Series and Part No.

The user can select the expected chip series and part No. from the upper-left select field (referring to the following figure). If the select field and the MFP Registers TreeView are hidden, please click the **Switch Select Field and MFP-Registers TreeView** to show them.

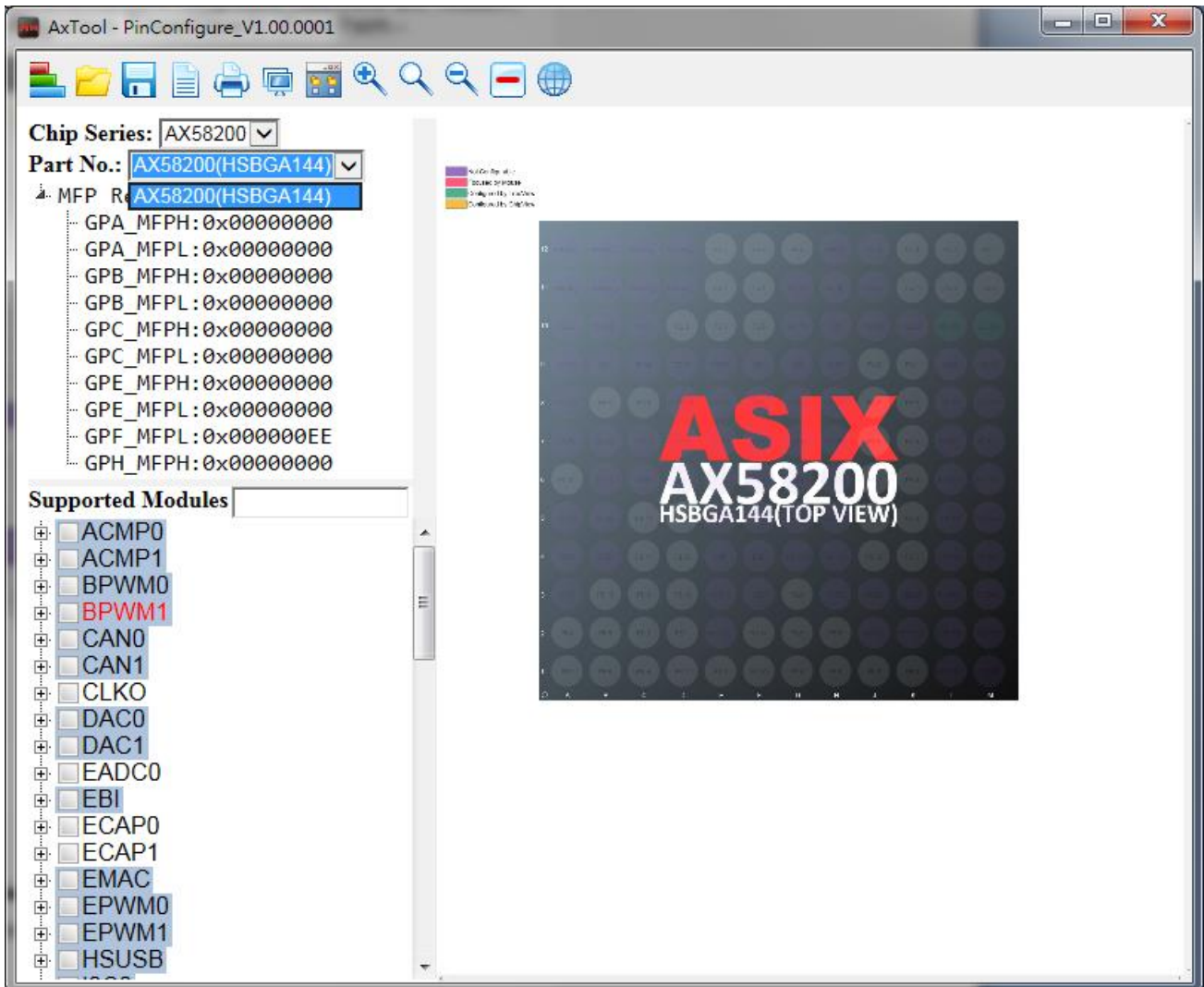


Figure 3-2 Selecting Part Number

3.3 MFP Registers TreeView

The current values of MFP registers are displayed in this TreeView. Moreover, the user can edit them directly by double-clicking on the expected one and enter a new value (referring to the following figure). After editing, the corresponding check boxes of the supported modules - TreeView and the chip view will be updated immediately. Some chips require two different MFP registers to configure GPIO multi-functions, and thus the user cannot edit the values of MFP registers by double-clicking these chips.

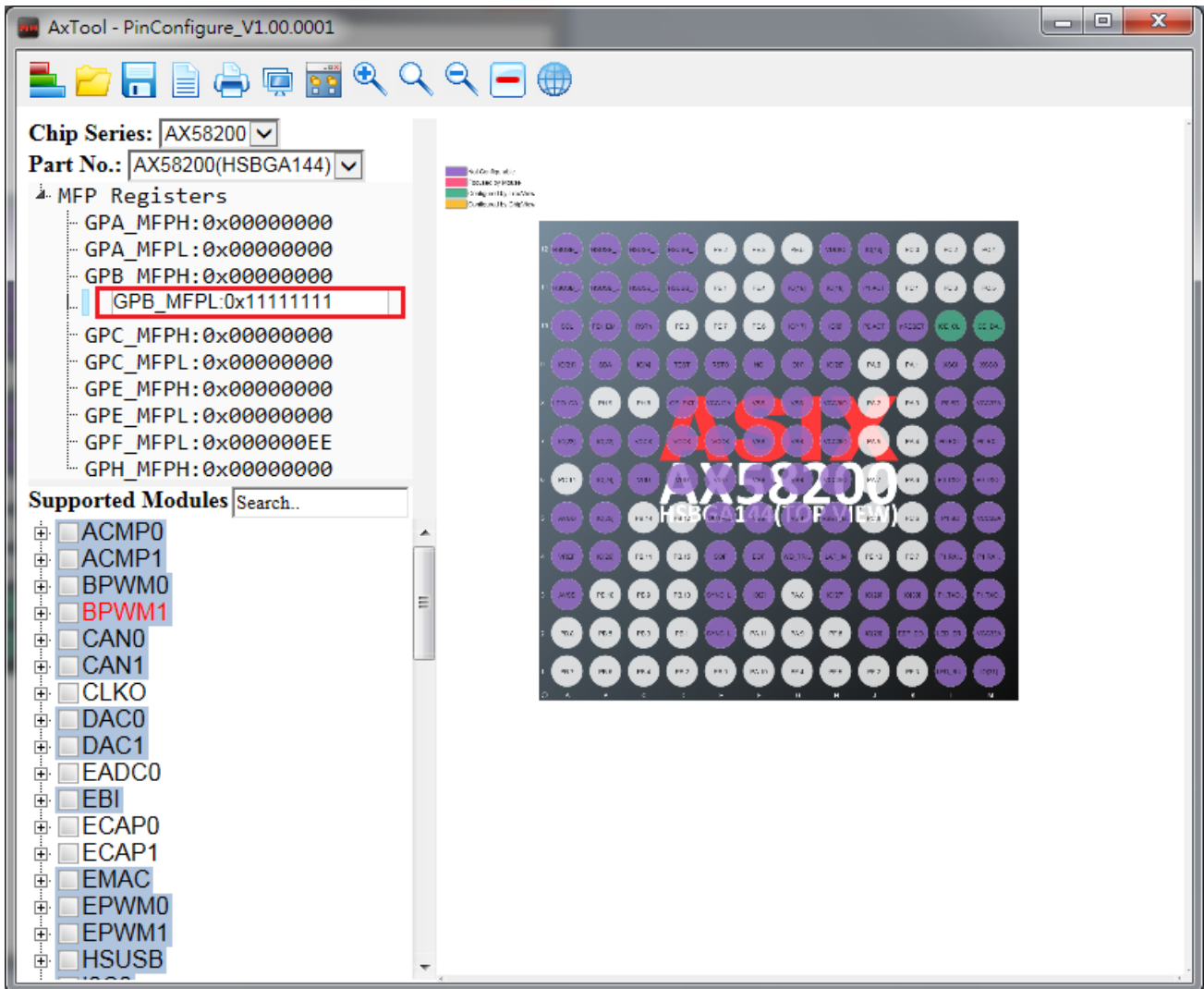


Figure 3-3 Editing a MFP Register

3.4 Supported Module - TreeView

3.4.1 Usage

With the supported module - TreeView, the user can configure the peripheral pin(s). Each time a module or its individual GPIO multi-function is checked in the check boxes, the chip view shown in the right window will display the new state of the pin(s). Besides, the corresponding value of MFP register will be updated at the same time. For example, the user configures ACMP0 and the results are shown as the following figure.

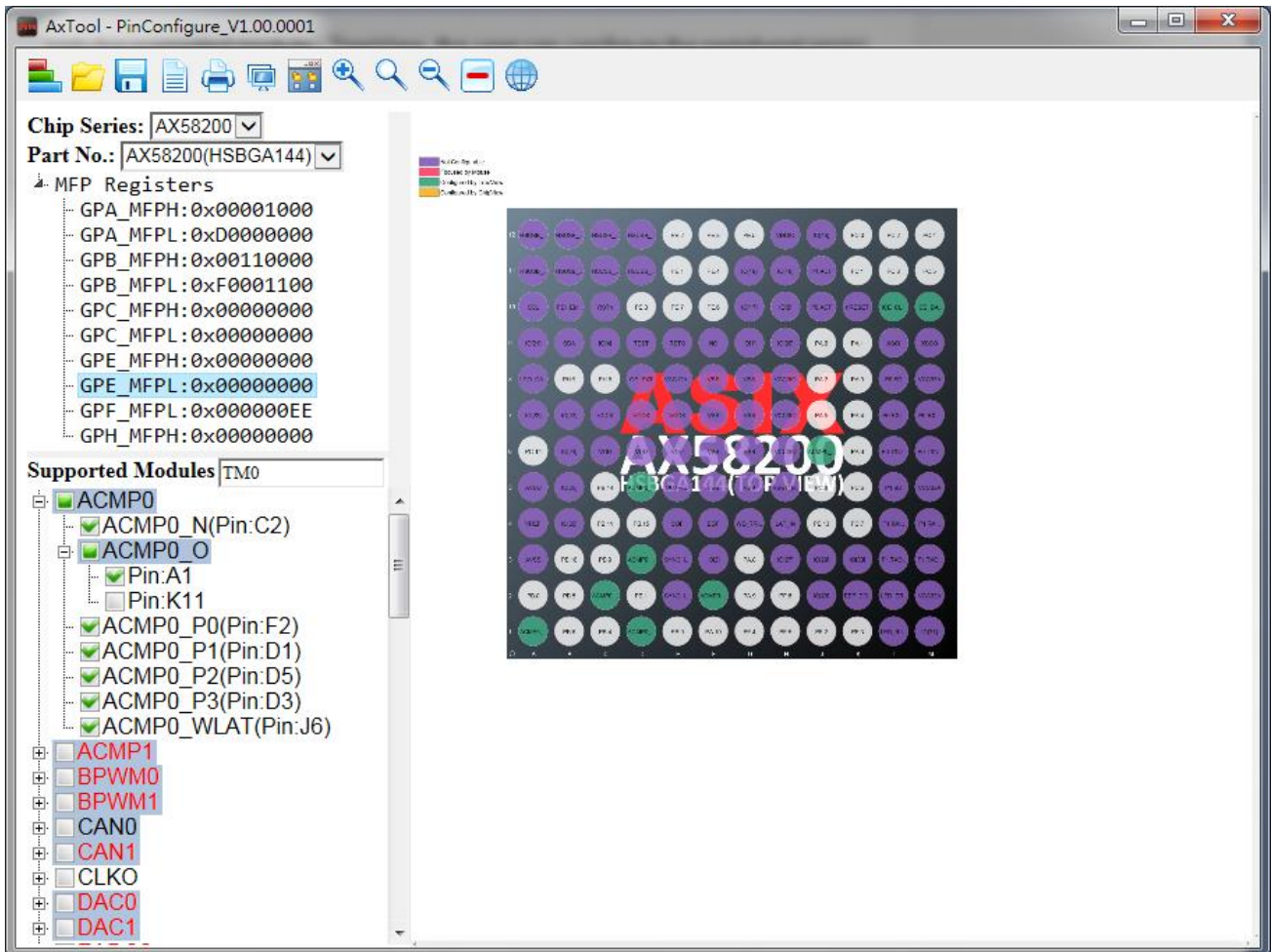


Figure 3-4 Results of Configuring ACMP0 by the TreeView

3.4.2 Conflict

When the pins have been configured to a module, the related texts in the check boxes will be marked in red. If the user obviously wants to configure the pins again through the TreeView, this case is called as a conflict. A dialog box which lists the relevant pins and their configured modules will be invoked (referring to the following figure). It offers two options to decide the next step. Clicking the Yes button, the tool will make the **adjustment of conflicts**. Clicking the No button, the tool will only configure the remaining pins.

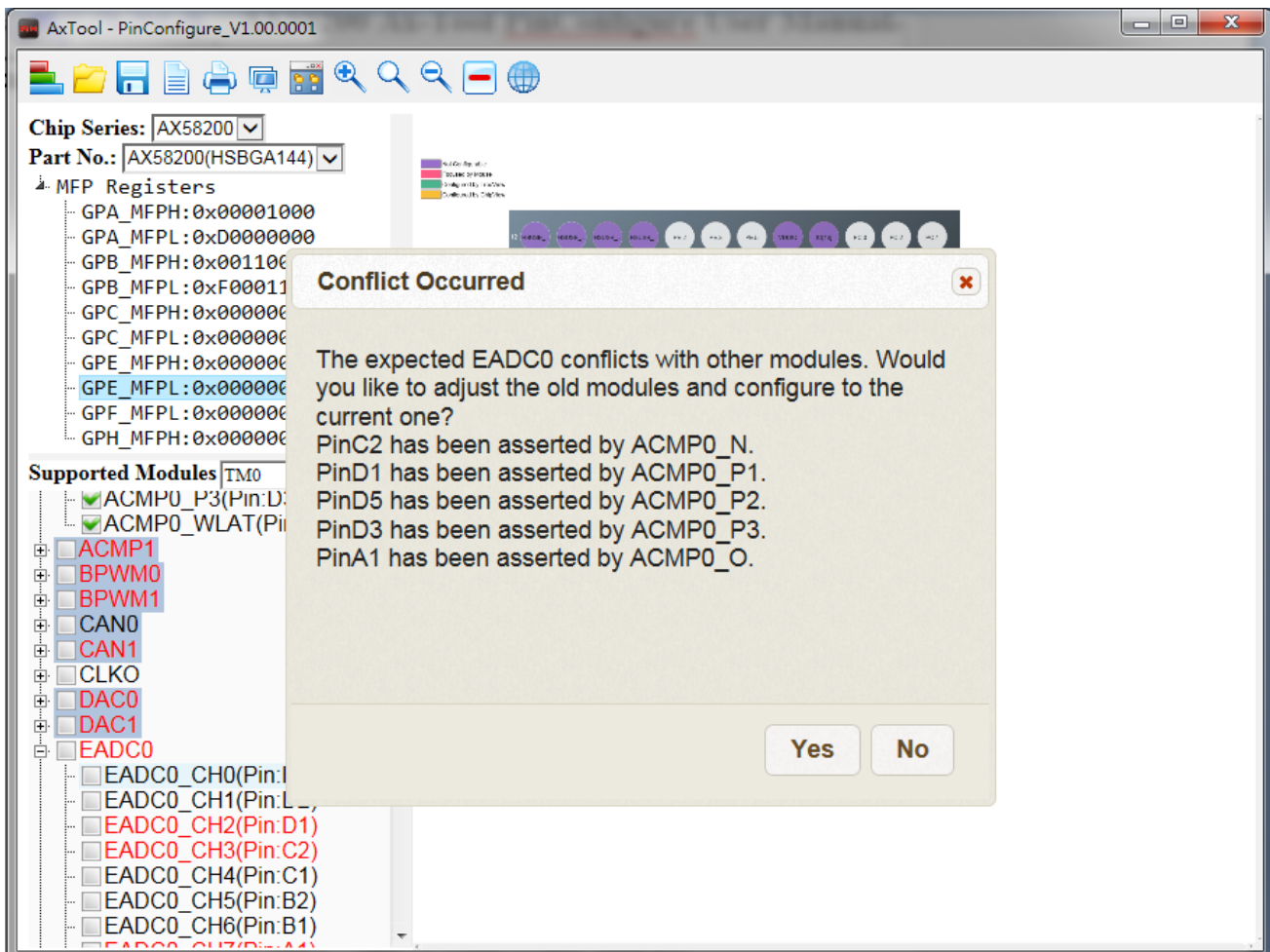


Figure 3-5 “Conflict Occurred” Dialog Box

3.4.3 Multiple Selections

There are some modules whose GPIO functions have multiple selections of pins to the same function. In this case, the related check boxes are highlighted with the steel blue color. The user is only permitted to select one of pins. For example, in the BRAKE module, its GPIO function of HUSB_VBUS_EN has two options, pin B3 and D4, but only one of them can be occupied by HUSB_VBUS_EN (referring to the following figure).

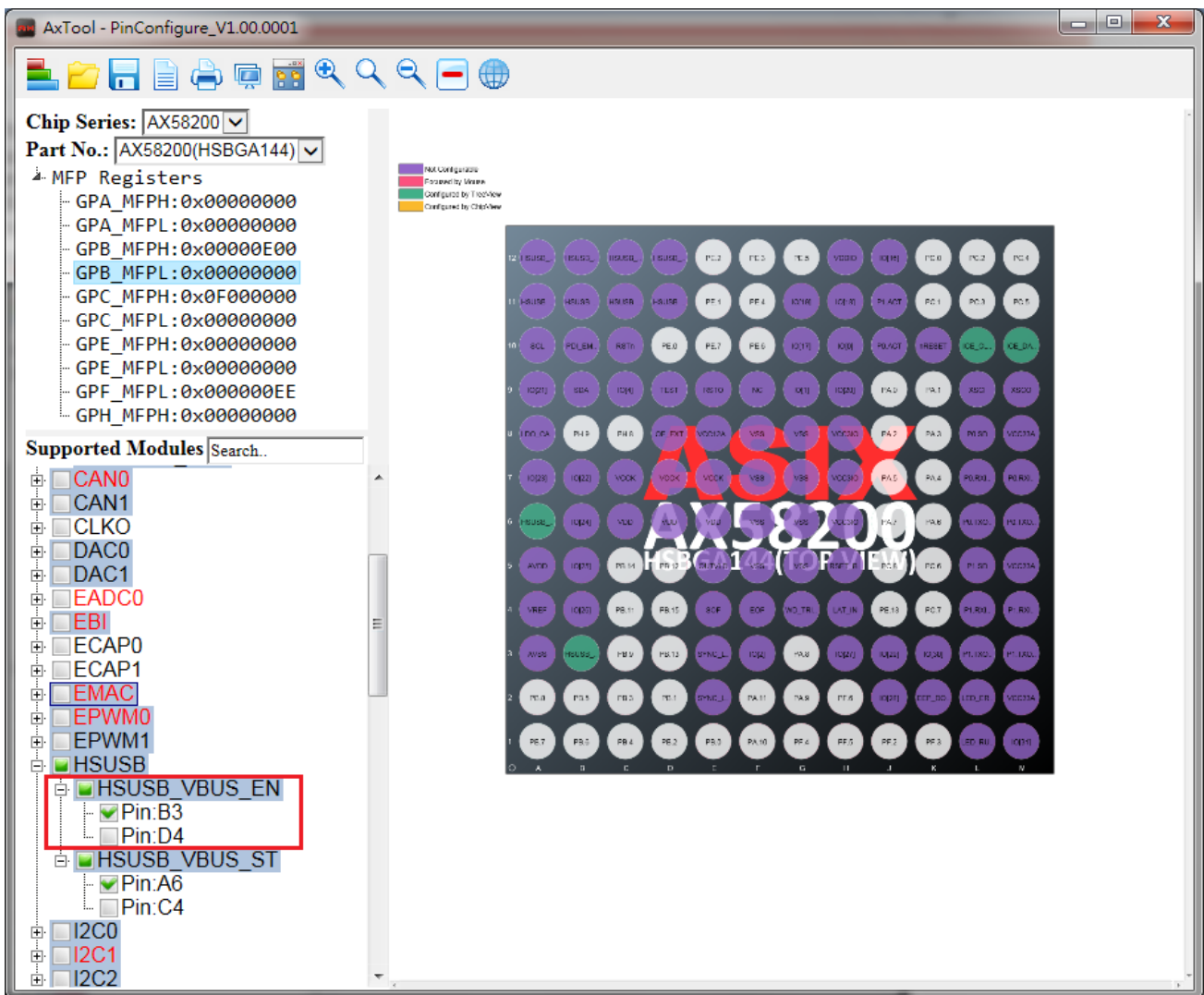


Figure 3-6 Multiple Selections of HUSB_VBUS_EN

3.4.4 Search

To find a specific module in the supported modules - TreeView, the user can input the expected module name in the search field. After input, the matched texts in the check boxes will be marked in bold and italics. Note that the search adopts the partial match, not exact match (referring to the following figure). The minimum number of input characters is two.

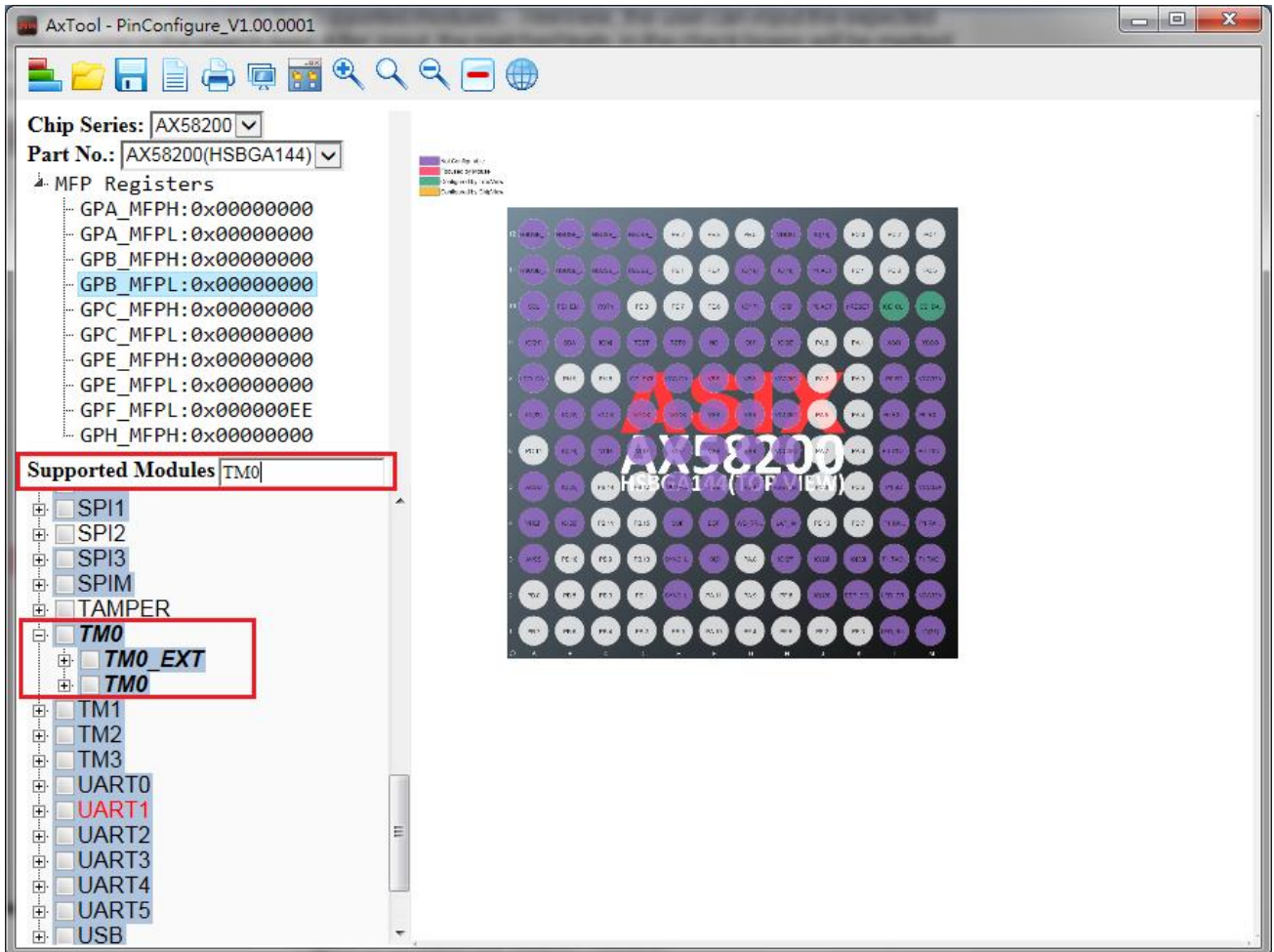


Figure 3-7 Matched Search Results

3.5 Chip View

The chip view, which is in the right pane of the window, depicts a graphical chip involving its pins. Each pin possesses its own information of the current pin assignment. The pins which are highlighted with the purple color denote that they do not belong to the configurable pins. If a pin is being configured to a GPIO multi-function, the corresponding function name will emerge in the vicinity of the pin. Meantime, the pin will be highlighted with the green color if it is configured by the TreeView, or with the orange color if it is configured by the individual pin.

To configure by the individual pin, follow the steps below:

1. Move the mouse cursor to the expected pin and click on the left button of the mouse. Then the list of all the related GPIO multi-functions will emerge in the vicinity of the pin (referring to Figure 3-8).
2. Move the mouse cursor into the list and select the expected GPIO function and click on it. Configuring by the individual pin is accomplished. At the same time, the TreeView and the value of the MFP register will be updated correspondingly (referring to Figure 3-9).

The difference between configuring by individual pins and TreeView is that the user can arbitrarily configure any pin by the individual pins without considering the occurrence of a conflict. To disable the configured pins by individual pins, move the mouse cursor to the expected pins and left-click. Select the last row of the list which is named as Reset (referring to Figure 3-10). Then the disable operation is completed.

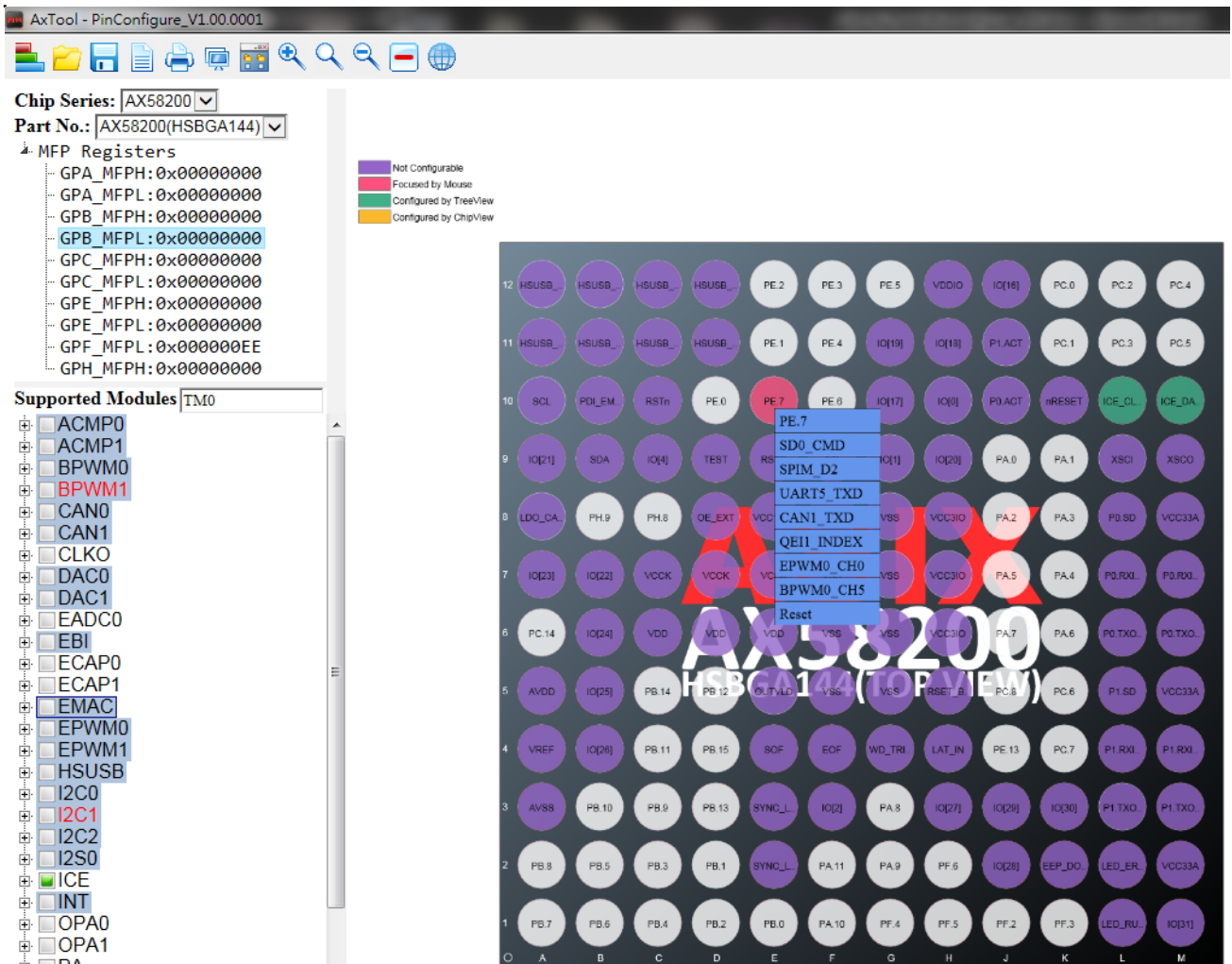
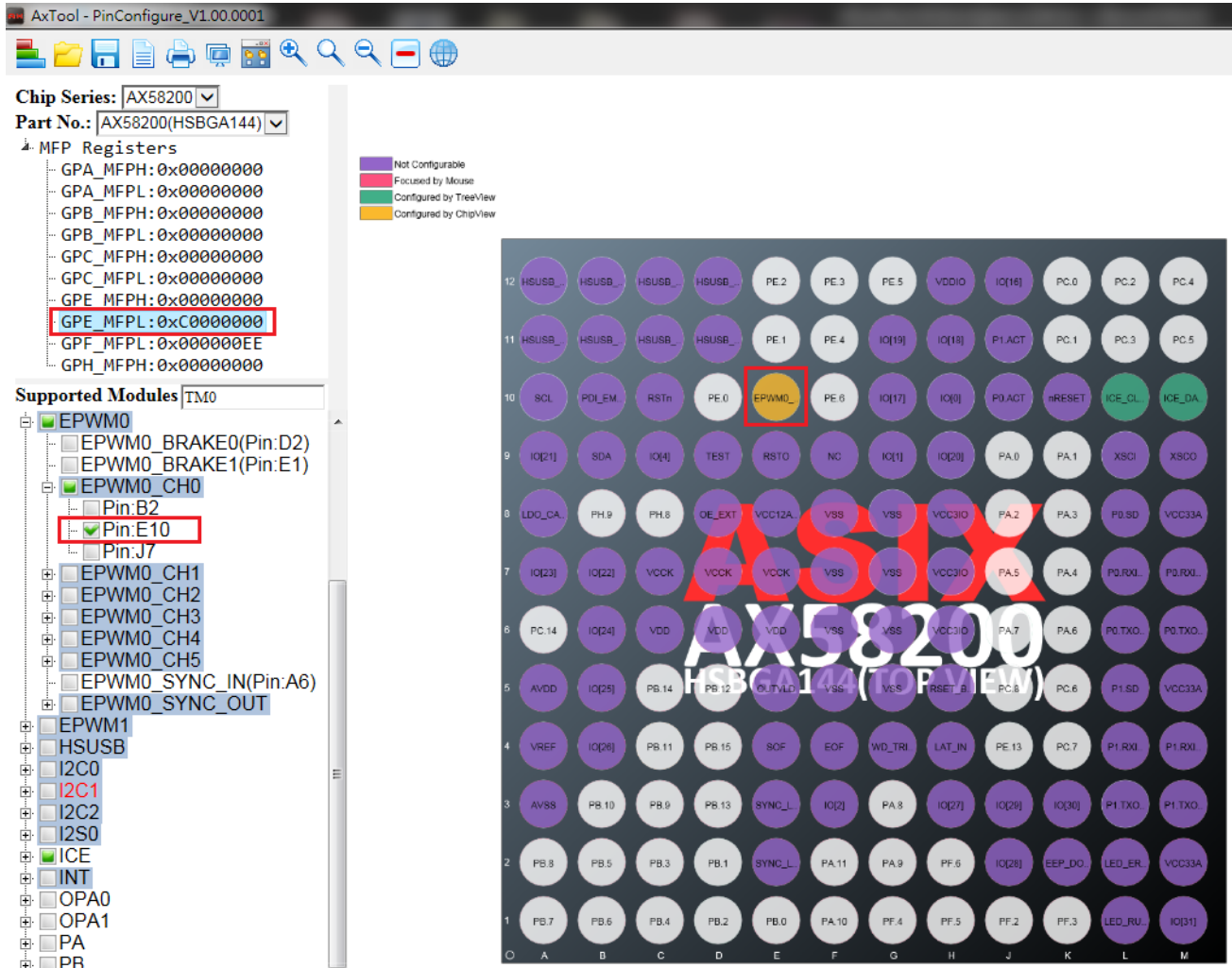


Figure 3-8 List of All the Related GPIO Multi-functions



Chip Series: AX58200

Part No.: AX58200(HSBGA144)

MFP Registers

- GPA_MFPH: 0x00000000
- GPA_MFPL: 0x00000000
- GPB_MFPH: 0x00000000
- GPB_MFPL: 0x00000000
- GPC_MFPH: 0x00000000
- GPC_MFPL: 0x00000000
- GPE_MFPH: 0x00000000
- GPE_MFPL: 0xC0000000**
- GPF_MFPL: 0x000000EE
- GPH_MFPH: 0x00000000

Supported Modules TM0

- EPWM0
 - EPWM0_BRAKE0(Pin:D2)
 - EPWM0_BRAKE1(Pin:E1)
 - EPWM0_CH0
 - Pin:B2
 - Pin:E10**
 - Pin:J7
 - EPWM0_CH1
 - EPWM0_CH2
 - EPWM0_CH3
 - EPWM0_CH4
 - EPWM0_CH5
 - EPWM0_SYNC_IN(Pin:A6)
 - EPWM0_SYNC_OUT
- EPWM1
- HSUSB
- I2C0
- I2C1
- I2C2
- I2S0
- ICE
- INT
- OPA0
- OPA1
- PA
- PR

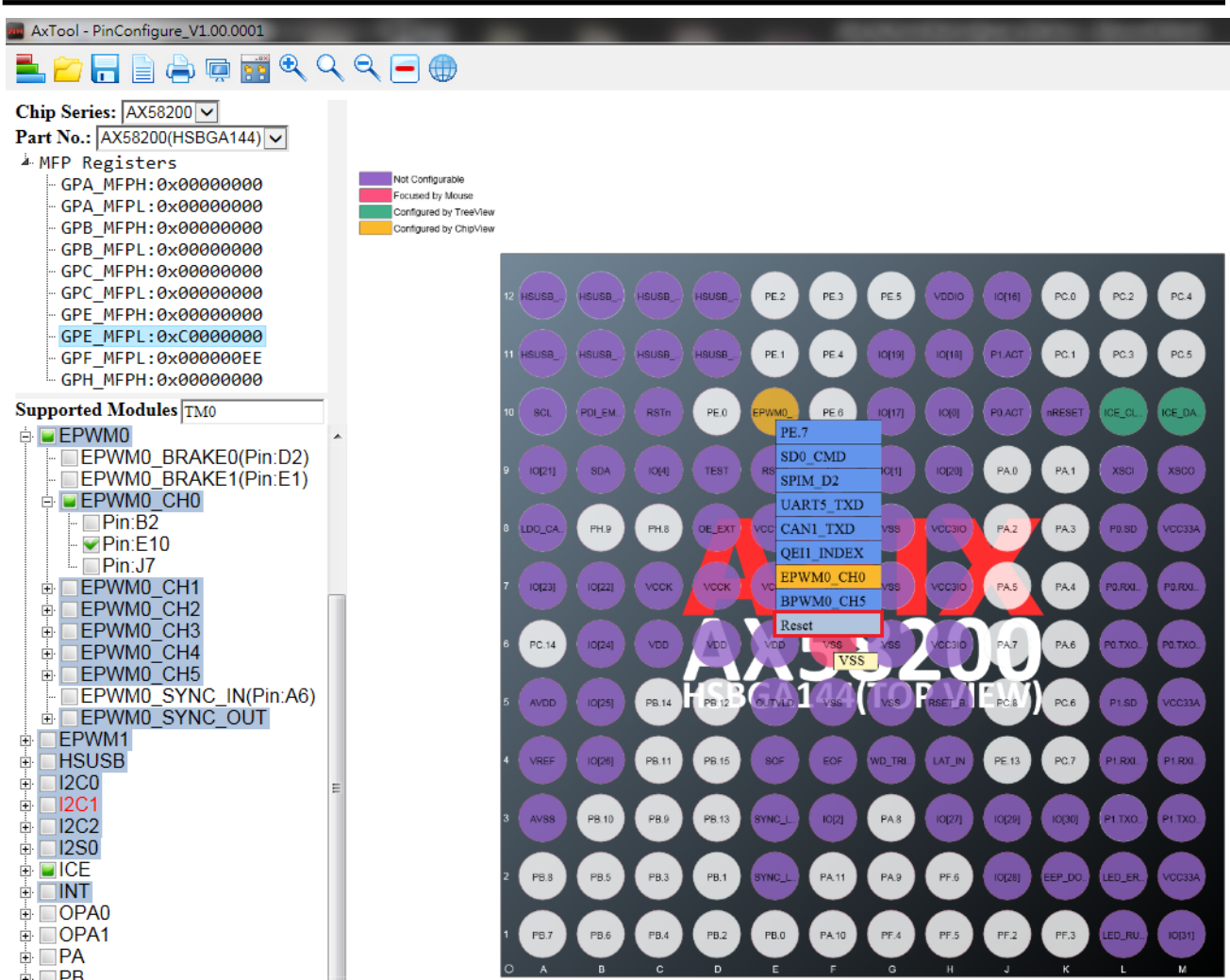
Pin Grid Legend:

- Not Configurable (Purple)
- Focused by Mouse (Red)
- Configured by TreeView (Green)
- Configured by ChipView (Yellow)

Pin Grid:

12	HSUSB_	HSUSB_	HSUSB_	HSUSB_	PE.2	PE.3	PE.5	VDDIO	IO[16]	PC.0	PC.2	PC.4	
11	HSUSB_	HSUSB_	HSUSB_	HSUSB_	PE.1	PE.4	IO[19]	IO[18]	P1.ACT	PC.1	PC.3	PC.5	
10	SCL	PD_LM	RSTn	PE.0	EPWM0	PE.6	IO[17]	IO[0]	P0.ACT	nRESET	ICE_CL	ICE_DA	
9	IO[21]	SDA	IO[4]	TEST	RSTO	NC	IO[1]	IO[20]	PA.0	PA.1	XSCI	XSC0	
8	LDO_CA	PH.9	PH.8	OE_EXT	VCC12A	VSS	VSS	VCC3IO	PA.2	PA.3	P0.SD	VCC3A	
7	IO[23]	IO[22]	VCCK	VCCK	VSS	VSS	VCC3IO	PA.5	PA.4	P0.RX	P0.RX		
6	PC.14	IO[24]	VDD	VDD	VSS	VSS	VCC3IO	PA.7	PA.6	P0.TX	P0.TX		
5	AVDD	IO[25]	PB.14	PB.12	OUT_VLD	VSS	RSET_B	PC.8	PC.6	P1.SD	VCC3A		
4	VREF	IO[26]	PB.11	PB.15	SOF	EOF	WD_TRI	LAT_IN	PE.13	PC.7	P1.RX	P1.RX	
3	AVSS	PB.10	PB.9	PB.13	SYNC_L	IO[2]	PA.8	IO[27]	IO[26]	IO[30]	P1.TX	P1.TX	
2	PB.8	PB.5	PB.3	PB.1	SYNC_L	PA.11	PA.9	PF.6	IO[28]	EEP_D0	LED_ER	VCC3A	
1	PB.7	PB.6	PB.4	PB.2	PB.0	PA.10	PF.4	PF.5	PF.2	PF.3	LED_RU	IO[31]	
	O	A	B	C	D	E	F	G	H	J	K	L	M

Figure 3-9 Results of Configuring EPWM0_CH0 by the Individual Pin



Chip Series: AX58200

Part No.: AX58200(HSBGA144)

MFP Registers

- GPA_MFPH: 0x00000000
- GPA_MFPL: 0x00000000
- GPB_MFPH: 0x00000000
- GPB_MFPL: 0x00000000
- GPC_MFPH: 0x00000000
- GPC_MFPL: 0x00000000
- GPE_MFPH: 0x00000000
- GPE_MFPL: 0xC0000000
- GPF_MFPL: 0x000000EE
- GPH_MFPH: 0x00000000

Supported Modules TMO

- EPWM0
 - EPWM0_BRAKE0(Pin:D2)
 - EPWM0_BRAKE1(Pin:E1)
 - EPWM0_CH0
 - Pin:B2
 - Pin:E10
 - Pin:J7
 - EPWM0_CH1
 - EPWM0_CH2
 - EPWM0_CH3
 - EPWM0_CH4
 - EPWM0_CH5
 - EPWM0_SYNC_IN(Pin:A6)
 - EPWM0_SYNC_OUT
- EPWM1
- HSUSB
- I2C0
- I2C1
- I2C2
- I2S0
- ICE
- INT
- OPA0
- OPA1
- PA
- PR

Figure 3-10 Disabling the Configured Pin


4. Toolbar

4.1 Switch Select Field and MFP-Registers TreeView

To show the select field and the MFP Registers TreeView, click the **Switch Select Field and MFP-Registers TreeView**  button on the toolbar.


4.2 Load Configuration

The user can browse the previously saved configuration files (*.cfg) and select one of them to restore the configured MCU chip.


To load the configuration, click the **Load Configuration**  button on the toolbar, select the directory preserving the expected configuration file and click the Open button.

4.3 Save Configuration


To save the current configuration, take the following steps:

1. Click the **Save Configuration**  button on the toolbar.
2. Browse a user-defined location and give a proper name to the configuration file (*.cfg).
3. Click the Save button. The current configuration will be saved as a .cfg file with a given name. The configuration file can be used to restore the configured MCU chip in the future.


4.4 Generate Code

To generate code to be included into the developing projects, click the **Generate Code**  button on the toolbar. The user can determine the criteria by which the configured information is being classified.


4.5 Print Report

To print a report, click the **Print Report**  button on the toolbar. After inputting the project name and selecting the expected criteria, click on the Confirm button to print the report.


4.6 Generate Report of Pin Description

To generate report of pin description, click the Generate Report of Pin Description  button on the toolbar.


4.7 Run AxCAD

To run NuCAD, click the **Run AxCAD**  button on the toolbar. AxCAD can generate the OrCAD or Protel library file (.OLB or .LIA) to facilitate the schematic design. The OrCAD requirement of the version should be higher than or equal to 16.2. Altium Designer of the version should be higher than or equal to 10.


4.8 Zoom In

To adjust the chip view to a larger one, click the **Zoom In**  button on the toolbar. Besides, the user can do the operation by scrolling the mouse wheel up and holding the Ctrl key on the keyboard simultaneously.

4.9 Best Fit

To adjust the chip view to fit the window, click the **Best Fit**  button on the toolbar.

4.10 Zoom Out

To adjust the chip view to smaller one, click the **Zoom Out**  button on the toolbar. Besides, the user can do the operation by scrolling the mouse wheel down and holding the Ctrl key on the keyboard simultaneously.

4.11 Disable all Checked Modules

To disable all checked modules, click the **Disable all Checked Modules**  button on the toolbar.

4.12 Settings


To select UI language, click the **Settings**  button on the toolbar. There are three languages supported in the application, including English, Simplified Chinese, and Traditional Chinese. Besides, if the user wants to display a tooltip, please choose “Yes”.



Figure 0-1 “Settings” Dialog Box

Revision History

Revision	Date	Description
1.00	2019/12/02	Preliminary release

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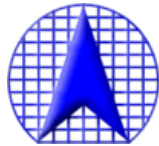
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