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# ZB7412E0B User Guide

ZB7 Module BoosterPack™ Plug-in Board

**Drift 0.1**

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|-------------|-------------|-------------|
|             |             |             |

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## **1. INTRODUCTION**

The Jorjin ZB7 Module BoosterPack™ Plug-in board (ZB7412E0B) allows users to quickly and easily add Bluetooth low energy to a TI's LaunchPad™ development kit for developing network processor-based BLE applications. The ZB7 module can also be used to function as a standalone, System-on-Chip (SoC) device that can run additional sample applications using TI's royalty-free Bluetooth low energy software stack (BLE-Stack) software development kit (SDK). This user guide details how to run these standalone applications on the ZB7 module BoosterPack™, or on any custom board that incorporates the ZB7 module.

Note: To use the software examples from TI's website and the ZB7 Module BoosterPack, you also need a TI's MSP432 LaunchPad kit.

Note : BoosterPack, LaunchPad are trademarks of Texas Instruments.

## 2. ZB7 MODULE BOOSTERPACK PLUG-IN BOARD

In the following sub-sections, it'll divide into TOP and BOTTOM Side to explain details on the key parts and its features.

### 2.1. TOP Side

Figure 1 is TOP-Side picture of ZB7 module BoosterPack Plug-in Board.

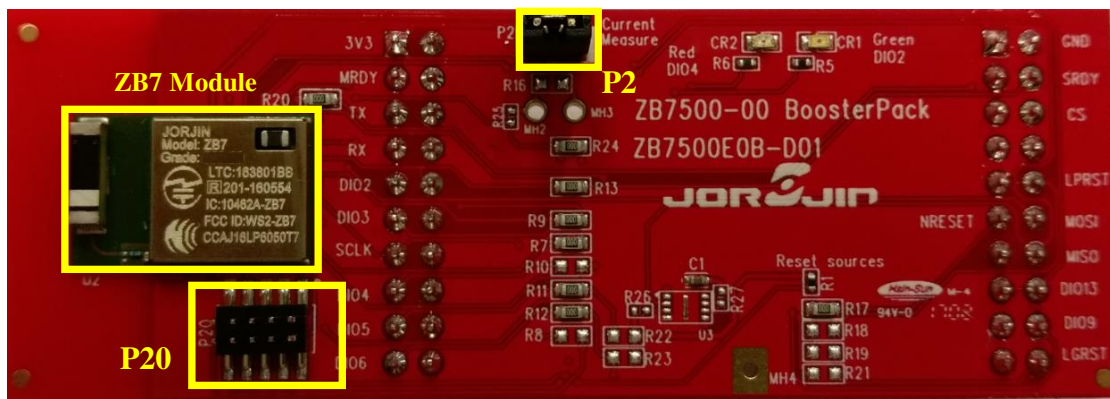


Figure 1. TOP Side of BoosterPack Plug-in Board

The picture above marks some key part and jumper, and Table 1 below shows the explanations to them in the details.

| Items | Key Parts  | Descriptions   |
|-------|------------|--|
| 1     | ZB7 Module | The core module for performance evaluation. It's related feature can be referred to its datasheet. |
| 2     | P2         | It is main power jumper for ZB7 module   |
| 3     | P20        | JTAG connection for programming and debugging the ZB7 module.                                      |

Table 1. TOP-Side Key parts of BoosterPack Plug-in Board

### 2.2. BOTTOM Side

Figure 2 is BOTTOM-Side picture of ZB7 module BoosterPack Plug-in Board.



**Figure 2. Bottom Side of BoosterPack Plug-in Board**

There are two BoostPack board mating connectors which are used for connecting to MSP432P401R LaunchPad Development Kit and are mounted on the bottom side as the picture above. Table 2 and Table 3 show the descriptions on the signals brought out from these two BoostPack mating connectors.

| Pin Number | Pin Name             | Pin Type           | Descriptions  |
|------------|----------------------|--------------------|---|
| 1          | 3V3                  | Power              | 3.3V power from MSP432P401R LaunchPad                                   |
| 2          | NC                   | --                 | Not Connected   |
| 3          | DIO_7 <sup>(1)</sup> | Digital/Analog I/O | GPIO, Sensor Controller, Analog   |
| 4          | NC                   | --                 | Not Connected   |
| 5          | DIO_0                | Digital I/O        | GPIO, Sensor Controller   |
| 6          | NC                   | --                 | Not Connected   |
| 7          | DIO_1                | Digital I/O        | GPIO, Sensor Controller   |
| 8          | NC                   | --                 | Not Connected   |
| 9          | DIO_2 <sup>(1)</sup> | Digital I/O        | GPIO, Sensor Controller, High drive capability / Enable the Green LED   |
| 10         | NC                   | --                 | Not Connected   |
| 11         | DIO_3 <sup>(1)</sup> | Digital I/O        | GPIO, Sensor Controller, High drive capability                          |
| 12         | NC                   | --                 | Not Connected   |
| 13         | DIO_10               | Digital/Analog I/O | GPIO, Sensor Controller, Analog / SPI_CLK signal for optional SPI flash |

|    |                      |             |   |
|----|----------------------|-------------|---|
| 14 | NC                   | --          | Not Connected   |
| 15 | DIO_4 <sup>(1)</sup> | Digital I/O | GPIO, Sensor Controller, High drive capability / Enable the Red LED |
| 16 | NC                   | --          | Not Connected   |
| 17 | DIO_5 <sup>(1)</sup> | Digital I/O | GPIO, High drive capability, JTAG_TDO                               |
| 18 | NC                   | --          | Not Connected   |
| 19 | DIO_6 <sup>(1)</sup> | Digital I/O | GPIO, High drive capability, JTAG_TDI                               |
| 20 | NC                   | --          | Not Connected   |

**Table 2. Bottom-Side J1 of BoosterPack Plug-in Board**

| Pin Number | Pin Name                | Pin Type           | Descriptions   |
|------------|-------------------------|--------------------|--|
| 1          | NC                      | -                  | Not Connected  |
| 2          | GND                     | GND                | Ground   |
| 3          | NC                      | -                  | Not Connected  |
| 4          | DIO_8                   | Digital/Analog I/O | GPIO, Sensor Controller, Analog  |
| 5          | NC                      | -                  | Not Connected  |
| 6          | DIO_14                  | Digital/Analog I/O | GPIO, Sensor Controller, Analog  |
| 7          | NC                      | -                  | Not Connected  |
| 8          | NC                      | -                  | Not Connected  |
| 9          | NC                      | -                  | Not Connected  |
| 10         | LP_RESET <sup>(2)</sup> | NC/Digital Input   | Not Connected or Reset signal from MSP432P401R. Selectable by R18.       |
| 11         | RESET_N <sup>(2)</sup>  | Digital Input      | Reset, active-low. Selectable by R17.                                    |
| 12         | DIO_11                  | Digital/Analog I/O | GPIO, Sensor Controller, Analog / SPI_MISO signal for optional SPI flash |
| 13         | NC                      | -                  | Not Connected  |
| 14         | DIO_12                  | Digital/Analog I/O | GPIO, Sensor Controller, Analog / SPI_MOSI signal for optional SPI flash |
| 15         | NC                      | -                  | Not Connected  |
| 16         | DIO_13                  | Digital/Analog I/O | GPIO, Sensor Controller, Analog  |

|    |                   |                    |  |
|----|-------------------|--------------------|--|
| 17 | NC                | -                  | Not Connected  |
| 18 | DIO_9             | Digital/Analog I/O | GPIO, Sensor Controller, Analog / SPI_CS signal for optional SPI flash |
| 19 | NC                | -                  | Not Connected  |
| 20 | NC <sup>(2)</sup> | -                  | Not Connected  |

**Table 3. Bottom-Side J2 of BoosterPack Plug-in Board**

Note

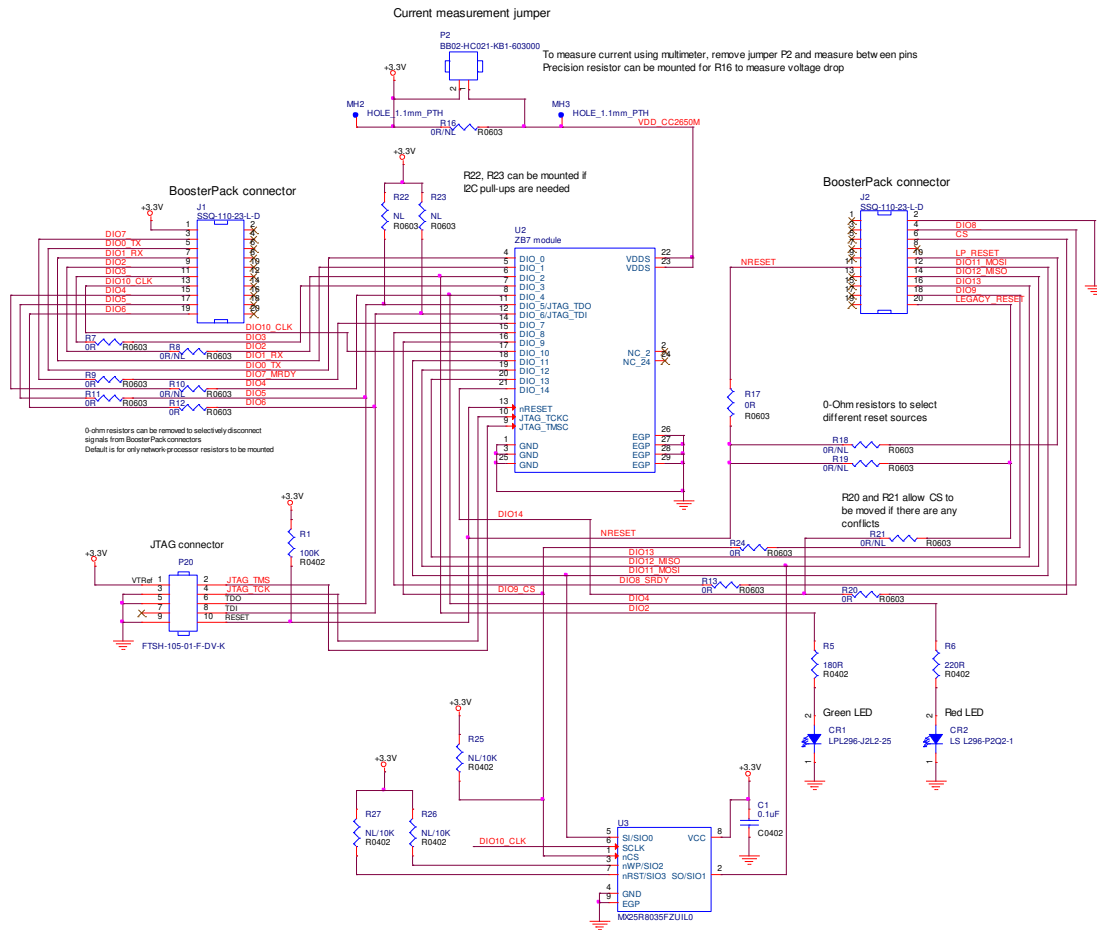
(1) 0-ohm resistors (R7, R8, R9, R10, R11, R12) can be removed to selectively disconnect signals from BoosterPack connectors. Default is for only network-processor resistors to be mounted. Please see the schematic.

(2) 0-Ohm resistors (R17, R18, R19) to select different reset sources. Please see the schematic.

### 2.3. Schematics

Figure 3 is the schematics of ZB7 module BoosterPack Plug-in Board.

Figure 3. Schematics of BoosterPack Plug-in Board





### 3. APPLICATION DEVELOPMENT

Texas Instrument had developed a development board, MSP432P401R LaunchPad Development Kit, for evaluating ZB7412E0B. Figure 4 shows the development kit and ZB7412E0B board

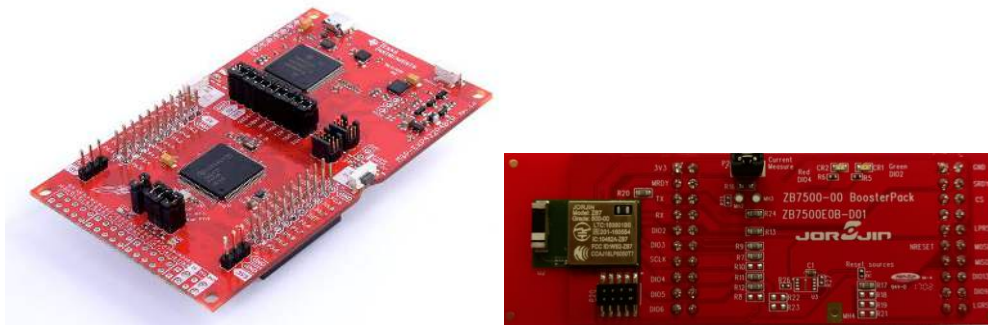


Figure 4. MSP-EXP432P401R and ZB7412E0B Board

#### 3.1. Programming Hardware Setup

Use the following instructions to set up the hardware.

1. Connect the 10-pin JTAG cable to the JTAG pins on the ZB7412E0B, then connect the other end of the cable to the XDS110 Out pins on the MSP-EXP432P401R.

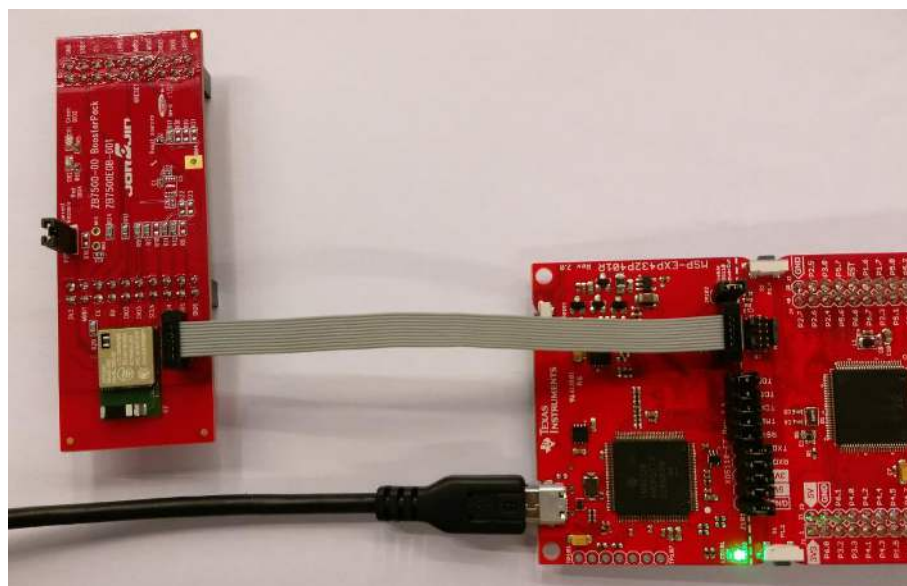
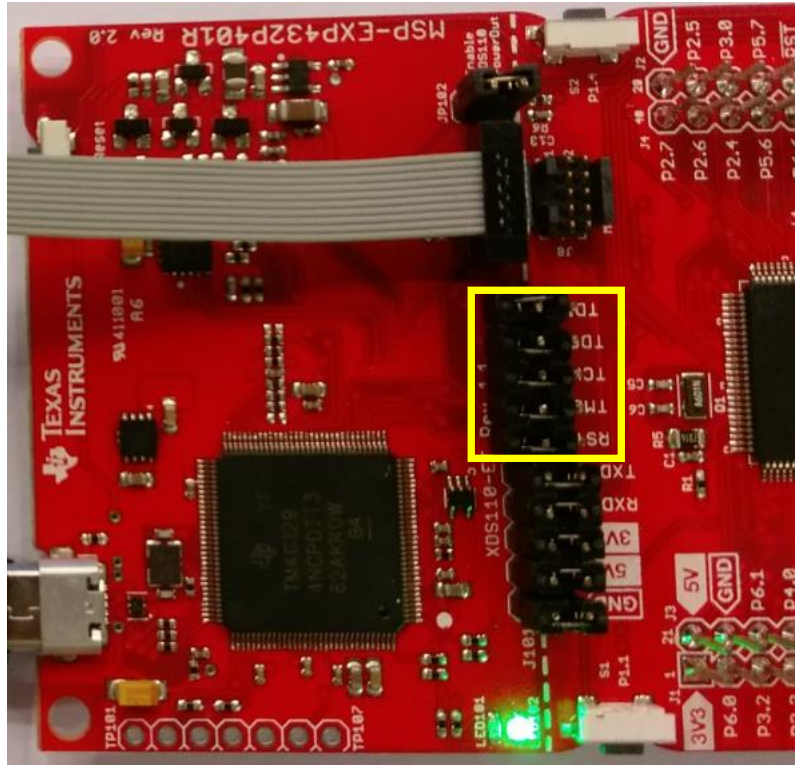


Figure 5. MSP-EXP432P401R to ZB7412E0B Connection

2. Ensure that the necessary jumpers are removed to isolate the XDS110 from the onboard of MSP-EXP432P401R (see the yellow box in Figure 6). Also, verify that the XDS110 power jumper (JP102) is selected to supply power to the ZB7412E0B.



**Figure 6. Jumpers to Remove on MSP-EXP432P401R**

After completing the previous steps, the provided micro-USB cable can be used to power and program the ZB7412E0B as detailed in the software developer's guide..

### 3.2. MSP-EXP432P401R and ZB7412E0B Hardware Setup

The ZB7412E0B is the quick and easy way to add Bluetooth low energy to MSP-EXP432P401R development kit. Simply plug the ZB7412E0B into the MSP-EXP432P401R to get started! See the Figure 7.

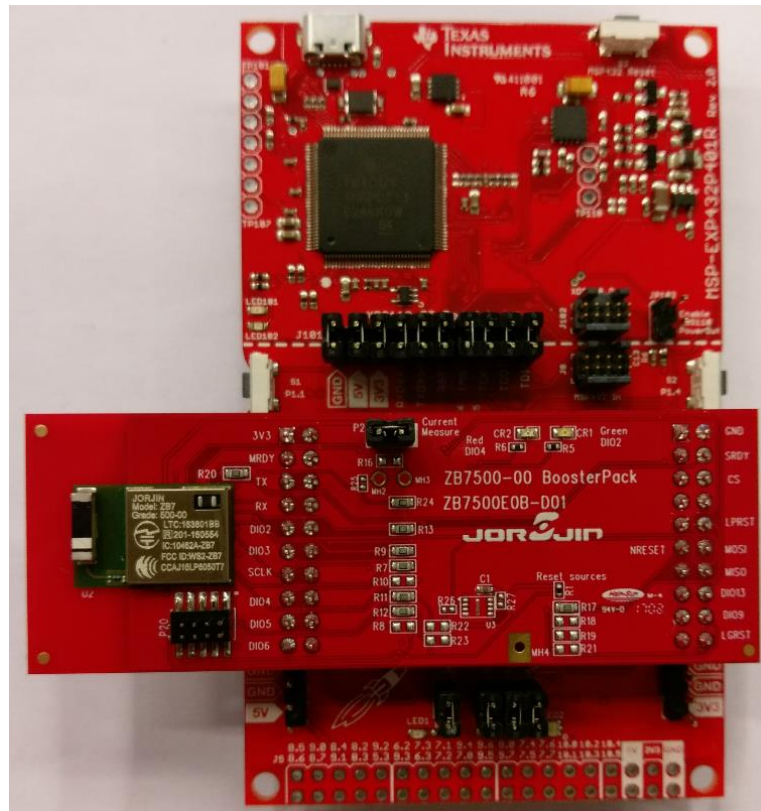


Figure 7. Plug ZB7412E0B into the MSP-EXP432P401R

More information available can refer to the link below  
<http://www.ti.com/product/CC2650/toolssoftware>

#### 4. HISTORY CHANGE

| Revision | Date        | Description |
|----------|-------------|-------------|
| D 0.1    | 2017/Apr/07 | Draft 0.1   |
|          |             |             |
|          |             |             |