

# **ADSP-BF706 EZ-KIT Mini™ Evaluation System Manual**

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## Regulatory Compliance

The ADSP-BF706 EZ-KIT Mini is designed to be used solely in a laboratory environment. The board is not intended for use as a consumer end product or as a portion of a consumer end product. The board is an open system design which does not include a shielded enclosure and therefore may cause interference to other electrical devices in close proximity. This board should not be used in or near any medical equipment or RF devices.

The ADSP-BF706 EZ-KIT Mini is in the process of being certified to comply with the essential requirements of the European EMC directive 2004/108/EC and therefore carries the “CE” mark.



The EZ-KIT Mini evaluation system contains ESD (electrostatic discharge) sensitive devices. Electrostatic charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused EZ-KIT Mini boards in the protective shipping package.





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# Contents



# PREFACE

Thank you for purchasing the ADSP-BF706 EZ-KIT Mini™, Analog Devices, Inc. low-cost evaluation system for the ADSP-BF706 Blackfin® processors.

The ADSP-BF706 processor is a member of the Blackfin family of products. Blackfin processors combine a dual-MAC state-of-the-art signal processing engine, the advantages of a clean, orthogonal RISC-like microprocessor instruction set, and single-instruction, multiple-data (SIMD) multimedia capabilities into a single instruction-set architecture. New enhancements to the Blackfin+™ core add 32-bit MAC and 16-bit complex MAC support, cache enhancements, branch prediction and other instruction set improvements—all while maintaining instruction set compatibility to previous Blackfin products.

The EZ-KIT Mini is shipped with all of the necessary hardware—you can start the evaluation immediately. The package contains the standalone evaluation board and USB cable. The EZ-KIT Mini ships with an on-board debug agent.

## Product Overview

The evaluation board is designed to be used in conjunction with the CrossCore® Embedded Studio (CCES) development tools to test capabilities of the ADSP-BF706 Blackfin processor. The CCES development environment aids advanced application code development and debug, such as:

- Create, compile, assemble, and link application programs written in C++, C, and assembly
- Load, run, step, halt, and set breakpoints in application programs
- Read and write data and program memory
- Read and write core and peripheral registers

## Product Overview

The board features:

- Analog Devices ADSP-BF706 processor
  - 88-Lead LFCSP (QFN) package
  - 25 MHz CLKIN core crystal
- Quad SPI Flash (SPI2)
  - 32M bit serial flash memory
  - Winbond W25Q32
- Audio
  - ADAU1761 low-power stereo codec
  - Line-in
  - Headphone

- USB0 interface
  - Micro-AB connector
- RESET controller
  - Analog Devices ADM6384 microprocessor supervisory circuits
- Debug (JTAG/SWD) interface
  - USB Mini-B connector
- Power measurement
  - VDD\_INT and VDD\_EXT
- LEDs
  - Four LEDs: one power (green), one board reset (red), one general-purpose (amber), and one debug status (multi-colored)
- Push buttons
  - Two push buttons: one reset and one IRQ/Flag
- External connection point connectors
  - EPPI0
  - SPORT
  - TWI
  - TMR
  - GPIOs
- USB bus-powered

## Purpose of This Manual

- Other features
  - ADSP-BF706 EZ-KIT Mini for Arduino Uno R3 connectivity
  - Boot mode strapped to SPI master
  - 0.051 ohm resistors for processor current measurement

For information about the hardware components of the EZ-KIT Mini, refer to [ADSP-BF706 EZ-KIT Mini Bill Of Materials](#).

## Purpose of This Manual

The *ADSP-BF706 EZ-KIT Mini Evaluation System Manual* provides instructions for installing the product hardware (board). The text describes operation and configuration of the board components and provides guidelines for running your own code on the ADSP-BF706 EZ-KIT Mini. Finally, a schematic and a bill of materials are provided for reference.

## Intended Audience

The primary audience for this manual is a programmer who is familiar with Analog Devices processors. This manual assumes that the audience has a working knowledge of the appropriate processor architecture, instruction set, and C/C++ programming languages.

Programmers who are unfamiliar with Analog Devices processors can use this manual, but should supplement it with other texts (such as the *ADSP-BF70x Blackfin+ Processor Hardware Reference* and the *ADSP-BF70x Blackfin+ Processor Programming Reference*) that describe your target architecture.

Programmers who are unfamiliar with CrossCore Embedded Studio should refer to the CCES online help.

## Manual Contents

The manual consists of:

- Chapter 1, [Using ADSP-BF706 EZ-KIT Mini](#)  
Describes EZ-KIT Mini functionality from a programmer's perspective and provides a simplified memory map of the processor.
- Chapter 2, [ADSP-BF706 EZ-KIT Mini Hardware Reference](#)  
Provides information about the EZ-KIT Mini hardware components.
- Appendix A, [ADSP-BF706 EZ-KIT Mini Bill Of Materials](#)  
Provides a list of hardware components used to manufacture the EZ-KIT Mini board.
- Appendix B, [ADSP-BF706 EZ-KIT Mini Schematic](#)  
Lists the resources for board-level debugging.

## What's New in This Manual

This is the second edition (Revision 1.1) of the *ADSP-BF706 EZ-KIT Mini Evaluation System Manual*. Changes to this manual from the previous revision (Revision 1.0) include an updated Bill of Materials and a revised schematic.

# Technical Support

You can reach Analog Devices processors and DSP technical support in the following ways:

- Post your questions in the processors and DSP support community at EngineerZone®:  
[ez.analog.com/community/dsp](http://ez.analog.com/community/dsp)
- Submit your questions to technical support directly at:  
[www.analog.com/support](http://www.analog.com/support)
- Email your questions about processors and processor applications to:  
[processor.support@analog.com](mailto:processor.support@analog.com) or  
[processor.china@analog.com](mailto:processor.china@analog.com) (Greater China support)
- Contact your Analog Devices sales office or authorized distributor. Locate one at:  
[www.analog.com/adi-sales](http://www.analog.com/adi-sales)
- Send questions by mail to:  
Processors and DSP Technical Support  
Analog Devices, Inc.  
Three Technology Way  
P.O. Box 9106  
Norwood, MA 02062-9106  
USA

## Supported Processors

This evaluation system supports the Analog Devices ADSP-BF706 Blackfin processors.

## Supported Tools

Information on supported tools for the ADSP-BF706 EZ-KIT Mini and the ADSP-BF70x family of Blackfin processors is available at:

[www.analog.com/BF706EZKitMini](http://www.analog.com/BF706EZKitMini).

## Product Information

Product information can be obtained from the Analog Devices website and the CCES online help system.

## Analog Devices Website

The Analog Devices website, [www.analog.com](http://www.analog.com), provides information about a broad range of products—analogue integrated circuits, amplifiers, converters, and digital signal processors.

To access a complete technical library for each processor family, go to [www.analog.com/processors/technical\\_library](http://www.analog.com/processors/technical_library). The manuals selection opens a list of current manuals related to the product as well as a link to the previous revisions of the manuals. When locating your manual title, note a possible errata check mark next to the title that leads to the current correction report against the manual.

Also note, [myAnalog.com](http://myAnalog.com) is a free feature of the Analog Devices website that allows customization of a Web page to display only the latest information about products you are interested in. You can choose to receive weekly email notifications containing updates to the Web pages that meet your interests, including documentation errata against all manuals. [myAnalog.com](http://myAnalog.com) provides access to books, application notes, data sheets, code examples, and more.

## Notation Conventions

Visit [myAnalog.com](http://myAnalog.com) (found on the Analog Devices home page) to sign up. If you are a registered user, just log on. Your user name is your email address.

## EngineerZone

EngineerZone is a technical support forum from Analog Devices. It allows you direct access to Analog Devices technical support engineers. You can search FAQs and technical information to get quick answers to your embedded processing and DSP design questions.




Use EngineerZone to connect with other DSP developers who face similar design challenges. You can also use this open forum to share knowledge and collaborate with the Analog Devices support team and your peers. Visit [ez.analog.com](http://ez.analog.com) to sign up.

## Notation Conventions

Text conventions used in this manual are identified and described as follows.

Example	Description
<code>File &gt; Close</code>	Titles in reference sections indicate the location of an item within the CCES environment's menu system (for example, the <b>Close</b> command appears on the <b>File</b> menu).
<code>{this   that}</code>	Alternative required items in syntax descriptions appear within curly brackets and separated by vertical bars; read the example as <i>this</i> or <i>that</i> . One or the other is required.
<code>[this   that]</code>	Optional items in syntax descriptions appear within brackets and separated by vertical bars; read the example as an optional <i>this</i> or <i>that</i> .
<code>[this,...]</code>	Optional item lists in syntax descriptions appear within brackets delimited by commas and terminated with an ellipse; read the example as an optional comma-separated list of <i>this</i> .



Example	Description
.SECTION	Commands, directives, keywords, and feature names are in text with letter gothic font.
<i>filename</i>	Non-keyword placeholders appear in text with italic style format.
	<p><b>Note:</b> For correct operation, ...</p> <p>A Note provides supplementary information on a related topic. In the online version of this book, the word <b>Note</b> appears instead of this symbol.</p>
	<p><b>Caution:</b> Incorrect device operation may result if ...</p> <p><b>Caution:</b> Device damage may result if ...</p> <p>A Caution identifies conditions or inappropriate usage of the product that could lead to undesirable results or product damage. In the online version of this book, the word <b>Caution</b> appears instead of this symbol.</p>
	<p><b>Warning:</b> Injury to device users may result if ...</p> <p>A Warning identifies conditions or inappropriate usage of the product that could lead to conditions that are potentially hazardous for the devices users. In the online version of this book, the word <b>Warning</b> appears instead of this symbol.</p>

## Notation Conventions

# 1 USING ADSP-BF706 EZ-KIT MINI

This chapter provides information about developing programs for the ADSP-BF706 EZ-KIT Mini evaluation system.

The following topics are covered.

- [Package Contents](#)
- [ADSP-BF706 EZ-KIT Mini](#)
- [Default Configuration](#)
- [EZ-KIT Mini Installation](#)
- [EZ-KIT Mini Session Startup](#)
- [Evaluation License](#)
- [SPI Flash](#)
- [Audio Codec](#)
- [USB Interface](#)
- [ADSP-BF706 EZ-KIT Mini for Arduino Uno R3 Connectivity](#)
- [External Connection Points](#)
- [Debug Interface](#)
- [Power-On-Self Test](#)
- [Power Architecture](#)

## Package Contents

- [Power Measurements](#)
- [Example Programs](#)
- [Reference Design Information](#)

## Package Contents

Your ADSP-BF706 EZ-KIT Mini package contains the following items.

- ADSP-BF706 EZ-KIT Mini
- USB Mini-B to Standard-A cable
- Rubber feet in a bag
- Release note

Contact the vendor where you purchased your EZ-KIT Mini or contact Analog Devices, Inc. if any item is missing.

## ADSP-BF706 EZ-KIT Mini

The ADSP-BF706 EZ-KIT Mini has an on-board debug agent.

## Default Configuration

The ADSP-BF706 EZ-KIT Mini board is designed to run as a standalone unit.

When removing the EZ-KIT Mini board from the package, handle the board carefully to avoid the discharge of static electricity, which can damage some components.

The EZ-KIT Mini evaluation system contains ESD (electrostatic discharge) sensitive devices. Electrostatic charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused EZ-KIT Mini boards in the protective shipping package.



Figure 1-1 shows the default jumper settings. Confirm that your board is in the default configuration before using the board.

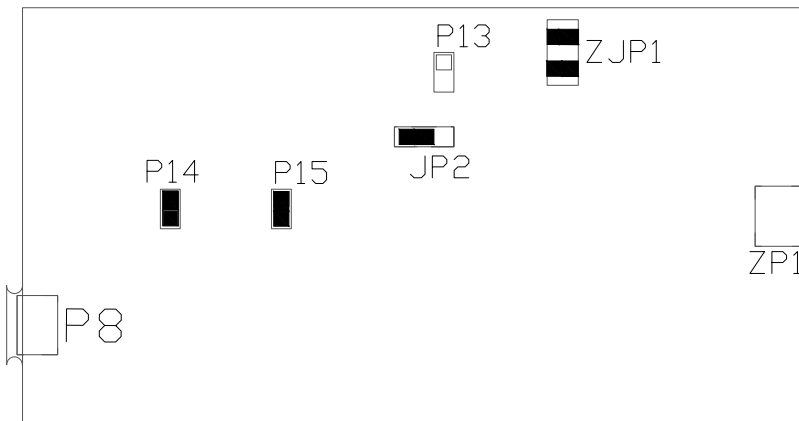


Figure 1-1. Default EZ-KIT Mini Hardware Setup

# EZ-KIT Mini Installation

It is assumed that the CrossCore Embedded Studio software is installed and running on your PC.


Follow these instructions to ensure correct operation of the product software and hardware.

To connect to the on-board debug agent of the EZ-KIT Mini:

1. Plug one side of the included USB cable into the debug agent (DA) USB (ZP1) connector of the EZ-KIT Mini. Plug the other side into a USB port of the PC.
2. The status LED (labeled `STATUS`) lights up green if the connection with the PC is working and the appropriate Windows driver is installed.

## EZ-KIT Mini Session Startup

It is assumed that the CrossCore Embedded Studio software is installed and running on your PC.

 Note: If you connect USB to the board before installing CCES on the PC, the Windows driver wizard may not find the board drivers.


1. Navigate to the CCES environment via the **Start** menu.

Note that CCES is not connected to the target board.


2. Use the Debug Configurations wizard to connect to the EZ-KIT Mini board.

If a debug configuration exists already, select the appropriate configuration and click **Debug**. Go to step 8.

To create a debug configuration, do one of the following:

- Click the down arrow next to the bug icon  , select **Debug Configurations**.
- Choose **Run > Debug Configurations**.

The **Debug Configuration** dialog box appears.

3. Select **CrossCore Embedded Studio Application** and click  (New launch configuration).

The **Select Processor** page of the **Session Wizard** appears.

4. Ensure **Blackfin** is selected in **Processor family**. In **Processor type**, select **ADSP-BF706**. Click **Next**.

The **Select Connection Type** page of the **Session Wizard** appears.

5. Select **EZ-KIT** and click **Next**.


The **Select Platform** page of the **Session Wizard** appears.



6. Choose the default **ADSP-BF706 EZ-KIT via Debug Agent**.
7. Click **Finish** to close the wizard.



The new debug configuration is created and added to the Debug Configurations list.

## EZ-KIT Mini Session Startup


8. In the **Name** edit box, users can select an appropriate name to describe the configuration, otherwise a default name is provided.
9. In the **Program(s) to load** section, choose the program to load (if the appropriate program is not already populated) when connecting to the board. If not loading any program upon connection to the target, do not make any changes.

 While connected to the target, there is no way to choose a program to download. To load a program once connected, terminate the session and then load the new program.

 To delete a configuration, go to the **Debug Configurations** dialog box and select the configuration to delete. Click  and choose **Yes** when asked if you wish to delete the selected launch configuration. Then **Close** the dialog box.

 To disconnect from the target board, click the terminate button  or choose **Run > Terminate**.


To delete a session, choose **Target > Session > Session List**. Select the session name from the list and click **Delete**. Click **OK**.

 The default configurations that show up in the CCES Debug Configurations wizard are for JTAG mode debugging only. To use SWD mode, a new platform needs to be created using the Target Configurator. When creating a new platform, choose **BF706 EZ-KIT-Mini** and then select JTAG or SWD.



## Evaluation License

When starting CCES for the first time, you are prompted to install a license with a serial number or to enable evaluation of the product without a serial number. In the box that contains the EZ-KIT Mini is a business card with a serial number on it. When prompted, choose “I have a serial number that I would like to activate” and enter the serial number shown on the card. If the evaluation license is installed but not activated, it allows 10 days of unrestricted use and then becomes disabled. The license can be re-enabled by activation. Once activated, the evaluation license offers unrestricted use for a defined period and then becomes disabled until an additional license is installed.

 If installing CCES without using a serial number, you will be limited to 90 days.

An evaluation license can be upgraded to a full license. Licenses can be purchased from:

- Analog Devices directly. Call (800) 262-5645 or 781-937-2384 or go to:  
[www.analog.com/buyonline](http://www.analog.com/buyonline).
- Analog Devices, Inc. local sales office or authorized distributor. To locate one, go to:  
[www.analog.com/adi-sales](http://www.analog.com/adi-sales).

# SPI Flash

The ADSP-BF706 processor has three SPI interfaces: SPI0, SPI1, and SPI2. SPI2 is connected to a Winbond W25Q32BC 32 Mb serial flash memory with dual and quad SPI support. This flash is used for booting and scratchpad space. The boot mode of the ADSP-BF706 EZ-KIT Mini is SPI master, which is set by resistors on the board.

For more information, refer to the SPI flash example in the POST, which is included in the ADSP-BF706 EZ-KIT Mini Board Support Package.

# Audio Codec

The ADAU1761 (U2) is a SigmaDSP® low power, stereo audio codec (24 bits) connected to the ADSP-BF706 EZ-KIT Mini through TWI and SPORT0 interfaces. Line-in is provided through a 3.5 mm audio jack (J1) and headphone connected to a 3.5 mm jack (J2). When cables are inserted, the loopback from J2 to J1 is disconnected.

Connector P7 allows connection to the unused microphone and line-out functionality of the audio codec.

Refer to [ADSP-BF706 EZ-KIT Mini Schematic](#) for more information.

# USB Interface

The ADSP-BF706 processor has an integrated USB PHY; the EZ-KIT Mini provides a micro-AB connector (P8).

See [Power Architecture](#) for information on powering an external USB device.

## ADSP-BF706 EZ-KIT Mini for Arduino Uno R3 Connectivity

The ADSP-BF706 EZ-KIT Mini supports shield use through connectors P2, P3, P5, and P6, allowing compatibility with the Arduino Uno R3 boards. The connectors are not provided, but can be purchased online. The connectors are standard 0.1" stackable headers that allow for more than one shield to be attached. Signal output from the Arduino Uno R3 board is buffered on the ADSP-BF706 EZ-KIT Mini to ensure that the voltage level is tolerant with the ADSP-BF706 processor. Output signals from the ADSP-BF706 processor drive at 3.3V to connectors P2, P3, and P5. See [ADSP-BF706 EZ-KIT Mini Schematic](#) for more details.

## External Connection Points

Connectors P1, P4, and P9 allow a user to attach wires to processor signals for interfaces such as EPPI, SPORT, TWI, TMR and GPIO of the ADSP-BF706 processor.

## Debug Interface

The EZ-KIT Mini has an on-board debug agent which provides software development with one piece of hardware.

# Power-On-Self Test

The Power-On-Self-Test Program (POST) tests all EZ-KIT Mini peripherals and validates functionality as well as connectivity to the processor. Once assembled, each EZ-KIT Mini is fully tested for an extended period of time with POST. All EZ-KIT Mini boards are shipped with POST pre-loaded into flash memory. The POST is executed by resetting the board and pressing the proper push button(s). The POST also can be used as a reference for a custom software design or hardware troubleshooting.

Note that the source code for the POST program is included in the ADSP-BF706 EZ-KIT Mini Board Support Package along with the `readme.html` file that describes how the board is configured to run POST.

## Power Architecture

The ADSP-BF706 EZ-KIT Mini has two methods to power the board—through the debug agent's USB mini connector (*ZP1*) or through the micro USB connector (*P8*) attached to the ADSP-BF706 processor.

By selecting the jumper positioning on *JP2*, the power source can be swapped between the two. Only change the *JP2* jumper setting when both USB cables are removed.

- Method 1. To configure the board to use the 5V power from the debug agent's USB mini connector, set *JP2* to positions 1 and 2 (labeled *DA*).
- Method 2. To configure the board to use power from the USB micro connector, set *JP2* to positions 2 and 3 (labeled *706*).

The debug agent can be powered separately, even with the *JP2* setting of the *706* as the power source (jumper on positions 2 and 3), by inserting a USB cable connected to a PC in both the micro and mini USB connector.

If the ADSP-BF706 EZ-KIT Mini is acting as a USB host through connector P8 and needs to supply power to a bus-powered device, install P13 to allow the appropriate bulk capacitance.

The voltage domains of the ADSP-BF706 EZ-KIT Mini are 3.3V (VDD\_EXT, 3V\_SLEEP) and 1.1V (VDD\_INT). These voltage domains are provided by VR1, VR2, and VR3.

A FET switch (U10) controls the 5V to the USB devices over the USB0\_VBUS signal.

## Power Measurements

Locations are provided for measuring the current draw from various power planes. Precision 0.051 ohm shunt resistors are available on the VDD\_INT and VDD\_EXT voltage domains. To measure current draw, the corresponding jumper is removed, voltage across the resistor is measured using an oscilloscope, and the value of the resistor is measured using a precision multi-meter. P15 is the jumper for VDD\_EXT and P14 for VDD\_INT. Once voltage and resistance are measured, the current is calculated by dividing the voltage by the resistance. For the highest accuracy, use a differential probe for measuring the voltage across the resistor.

## Example Programs

Example Analog Devices programs are provided with the ADSP-BF706 EZ-KIT Mini Board Support Package to demonstrate various capabilities of the product. Refer to a readme file provided with each example for more information.

Various third party demos and software examples are also available at: [www.analog.com/BF706EZKitMini](http://www.analog.com/BF706EZKitMini).

# Reference Design Information

A reference design info package is available for download on the Analog Devices website. The package provides information on the design, layout, fabrication, and assembly of the EZ-KIT Mini.

The information can be found at: [www.analog.com/BF706EZKitMini](http://www.analog.com/BF706EZKitMini).

# 2 ADSP-BF706 EZ-KIT MINI HARDWARE REFERENCE

This chapter describes the hardware design of the ADSP-BF706 EZ-KIT Mini board.

The following topics are covered.

- [System Architecture](#)  
Describes the board's configuration and explains how the board components interface with the processor.
- [Push Buttons](#)  
Shows the locations and describes the push buttons.
- [Jumpers](#)  
Shows the locations and describes the configuration jumpers.
- [LEDs](#)  
Shows the locations and describes the LEDs.
- [Connectors](#)  
Shows the locations and provides part numbers for the on-board connectors. In addition, the manufacturer and part number information is provided for the mating parts.

## System Architecture

This section describes the processor's configuration on the EZ-KIT Mini board (Figure 2-1).

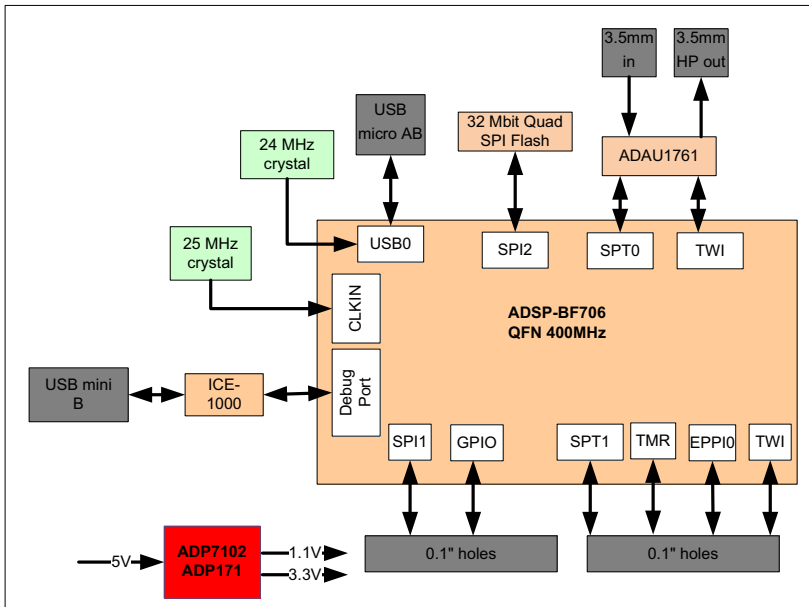


Figure 2-1. EZ-KIT Mini Block Diagram

This EZ-KIT Mini is designed to demonstrate the ADSP-BF706 processor's capabilities. The ADSP-BF706 EZ-KIT Mini has a 25 MHz input clock and runs at 400 MHz internally.

USB circuitry and a micro USB AB connector are provided for connecting to the EZ-KIT Mini as a host or a device. The frequency for the USB circuitry is generated by an external 24 MHz crystal.

User I/O to the processor is provided in the form of one user push button and one LED. See [ADSP-BF706 EZ-KIT Mini Schematic](#) for more information.



## Push Buttons

This section describes operation of the push buttons. The push-button locations are shown in [Figure 2-2](#).

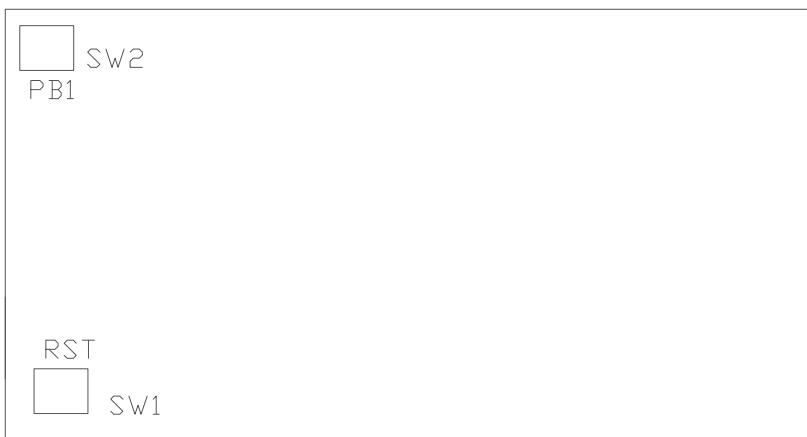


Figure 2-2. Push-Button Locations

### Reset Push Button (SW1)

The reset push button (SW1) resets the processor (U1) and is available on connector P3.

### GPIO Push Button (SW2)

The GPIO push button (SW2) is connected to the processor's PC\_02 port pin.

## Jumpers

This section describes functionality of the configuration jumpers. [Figure 2-3](#) shows the jumper locations.

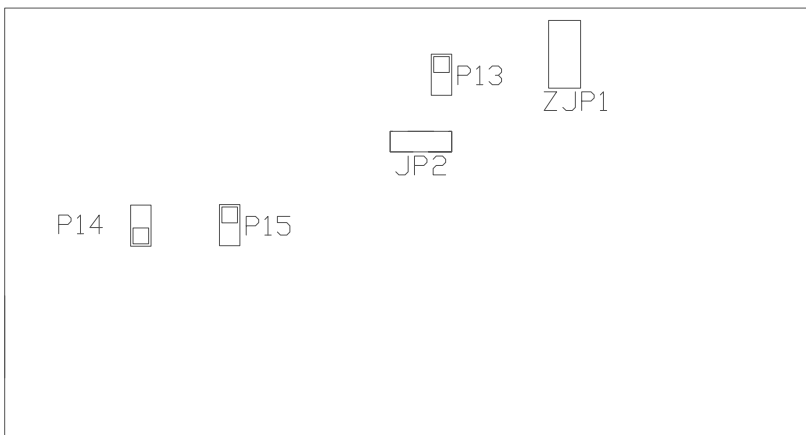


Figure 2-3. Jumper Locations

### Power Jumpers (P14-15)

Remove jumpers listed in [Table 2-1](#) to measure the respective voltage across the adjacent sense resistor.

Table 2-1. Power Jumpers

Power Jumper	Resistor
P14	VDD_INT
P15	VDD_EXT

### Debug Agent Jumper (ZJP1)

Debug agent jumper (ZJP1) needs jumpers across pins 1, 3 as well as 2, 4 for proper operation. The jumpers should run parallel to the silkscreen for ZJP1.

### Power Selection Jumper (JP2)

Positions 1, 2 select the debug agent as the entire board power source. 5V is supplied from ZP1. Setting JP2 to positions 2, 3 selects 5V power from the USB connector (P8). The debug agent can still be powered through ZP1. See [Power Architecture](#) for more details.

### Bulk Decoupling for USB Host Mode (P13)

When powering through ZP1, a device connected to P8 can be powered by the 5V sourced via USB connector ZP1. When using this feature, install a jumper on P13 prior to any USB cable insertion. P13 insertion adds a bulk cap to the 5V supply connected to P8.

## LEDs

## LEDs

This section describes the on-board LEDs. [Figure 2-4](#) shows the LED locations.

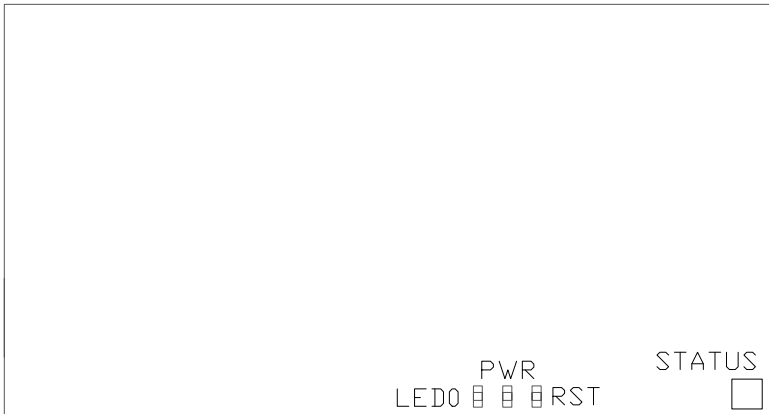


Figure 2-4. LED Locations

## GPIO LED (LED0)

One LED is connected to the general-purpose I/O pins of the processor (see [Table 2-2](#)). The LED is active high and is ON (amber) by writing a 1 to the correct processor signal.

Table 2-2. GPIO LED

LED Reference Designator	Processor Programmable Flag Pin
LED0	PC_03

## Reset LED (LED1)

When LED1 is ON (red), it indicates that the master reset is active. The reset LED is controlled by the Analog Devices ADM6384 supervisory reset circuit. A master reset is asserted by pressing SW1 which activates LED1. For more information, see [Reset Push Button \(SW1\)](#).

## Power LED (LED2)

When LED2 is ON (green), it indicates that power is supplied to the 3V\_SLEEP domain. 3V\_SLEEP domain can be turned off for USB power-saving modes.

## Status LED (ZLED1)

Status LED (ZLED1) provides the status of the debug agent.

- Green – Signifies the debug agent is powered, configured, and ready to invoke a CCES session.
- Magenta – Signifies the ICE is operating in JTAG mode. The LED blinks during USB activity between the host PC and the emulator.
- Cyan – Signifies the ICE is operating in SWD mode. The LED blinks during USB activity between the host PC and the emulator.

# Connectors

This section describes connector functionality and provides information about mating connectors. The connector locations are shown in [Figure 2-5](#).

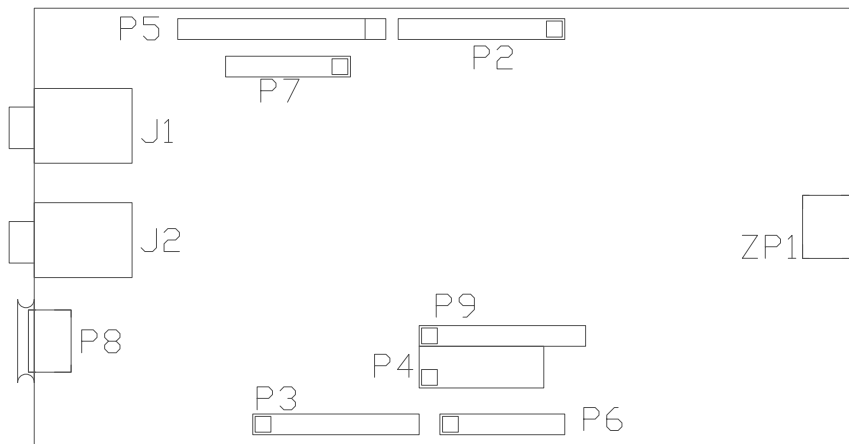


Figure 2-5. Connector Locations

Connectors P2, P3, P5, and P6 allow interfacing with Arduino Uno Rev 3.0 boards. Not installed by default, these connectors are 0.1" stackable headers that are available online.

Connectors P1, P4, and P9 are external connection points to processor signals that are not installed by default. See [ADSP-BF706 EZ-KIT Mini Schematic](#) for more details.

## USB Connector (P8)

Part Description	Manufacturer	Part Number
USB Micro-AB	Hirose	ZX62D-AB-5P8
<b>Mating Cable</b>		
USB Micro-B to Standard-A or Micro-A to Standard-A receptacle cable	Any	

## USB Connector (ZP1)

Part Description	Manufacturer	Part Number
USB Mini-B	DIGI-KEY	H11589CT-ND
<b>Mating Cable</b>		
USB Mini-B to Standard-A cable	Any	

## Audio Connectors (J1-2)

Part Description	Manufacturer	Part Number
3.5 mm stereo jack	DIGI-KEY	CP1-3515SJGRTR-ND
<b>Mating Connector</b>		
3.5 mm cable, headphone cable	Any	

## Connectors



# A ADSP-BF706 EZ-KIT MINI BILL OF MATERIALS

The bill of materials corresponds to the [ADSP-BF706 EZ-KIT Mini Schematic](#).

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
1	1	ADP171AUJZ SOT95P280-5N	VR3	ANALOG DEVICES	ADP171AUJZ-R7
2	2	ADP7102ARDZ-3.3 SOIC127P600-9N	VR1,VR2	ANALOG DEVICES	ADP7102ARDZ-3.3-R7
3	1	ADM6384YKS29D1Z SC70_4	U3	ANALOG DEVICES	ADM6384YKS29D1Z
4	1	ADAU1761 QFN50P500X500-33N	U2	ANALOG DEVICES	ADAU1761BCPZ-R7
5	1	ADSP-BF706 QFN50P1200X1200-89N	U1	ANALOG DEVICES	ADSP-BF706BCPZ-ENG
6	5	10UF 6.3V 10% 0805 X5R	C31,C32,C36,C37, C40	AVX	08056D106KAT2A
7	8	0.1UF 10V 10% 0402 X5R	C1,C6,C8-C10,C15, C17,C21	AVX	0402ZD104KAT2A
8	13	0.01UF 16V 10% 0402 X7R	C11-C14,C18-C20, C22,C23,C26,C42, C43,C45	AVX	0402YC103KAT2A
9	7	0.1UF 16V 10% 0603 X7R	C34,C35,C38,C39, C41,C44,C54	AVX	0603YC104KAT2A
10	1	0.033UF 25V 10% 0603 X7R	C53	AVX	06033C333KAT2A

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
11	1	0.33UF 16V 10% 0603 X7R	C52	AVX	0603YC334KAT2A
12	1	IDC 4X1 IDC4X1	P9	BERG-FCI	54101-T08-04LF
13	1	12.288MHZ OSCL254P500X320	U6	DIGI-KEY	535-10982-2-ND
14	6	1UF 16V 10% 0603 X5R	C46-C51	DIGI-KEY	399-5090-2-ND
15	2	1UF 16V 10% 0805 X7R	C25,C55	DIGI-KEY	399-1284-2-ND
16	1	GREEN LED_0603	LED2	DIGI-KEY	475-1409-2-ND
17	1	USB-MICRO 5PIN HIROSE_ZX62D-AB-5P8	P8	DIGI-KEY	H11494CT-ND
18	1	RED LED_0603	LED1	DIGI-KEY	475-2512-2-ND
19	1	YELLOW LED_0603	LED0	DIGI-KEY	475-2558-1-ND
20	1	15KV ESDA5V3SC6 SOT95P280X145-6N	D1	DIGI-KEY	497-6633-1-ND
21	1	MIC2025-1 SOIC8	U7	DIGI-KEY	576-1057-ND
22	1	25MHZ OSC013	Y1	DIGI-KEY	535-9140-1-ND
23	1	24MHZ OSC013	Y2	DIGI-KEY	535-9138-2-ND
24	1	74LCX125MX SOIC127P600-14N	U5	DIGI-KEY	74LCX125MXTR-ND
25	2	3.5MM STEREO CON_SJ1-3515-SMT	J1,J2	DIGI-KEY	CP1-3515SJGRTR-ND
26	1	150UF 10V 10% D TANT-LOW-ESR	CT1	DIGI-KEY	478-3321-2-ND
27	1	47.5K 1/10W 1% 0603	R45	DIGI-KEY	311-47.5KHRTR-ND
28	3	330.0 1/16W 1% 0402	R47,R51,R52	DIGI-KEY	541-330LCT-ND
29	9	100K 1/16W 5% 0402	R17,R19-R21,R41, R42,R53,R60,R70	DIGI-KEY	541-100KJTR-ND
30	1	76.8K 1/16W 1% 0402	R71	DIGI-KEY	541-76.8KLCT-ND

## ADSP-BF706 EZ-KIT Mini Bill Of Materials

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
31	3	10UF 6.3V 20% 0603 X5R	C7,C16,C24	DIGI-KEY	490-3896-2-ND
32	2	100UF 16V 20% CAPAE660 ELEC	CT2,CT3	DIGI-KEY	565-2204-2-ND
33	1	600 200MA 0603	FER2	DIGI-KEY	490-1014-2-ND
34	2	IDC 6X1 IDC6X1	P6,P7	FCI	90726-406HLF
35	3	IDC 2X1 IDC2X1	P13-P15	FCI	90726-402HLF
36	1	IDC 6X2 IDC6X2	P4	FCI	68737-412HLF
37	1	600 500MA 1206	FER1	LAIRD TECH	HZ1206B601R-10
38	1	VARISTOR V5.5MLA 30A 0603	R1	LITTLEFUSE	V5.5MLA0603
39	1	PTC 0.5A 1206	R57	LITTLEFUSE	1206L050-C
40	4	18PF 50V 5% 0402 NP0	C2-C5	MURATA	GRM1555C1H180JZ01D
41	1	15KV ESD7004 DFN50P250X100-10N	D2	ON SEMI	ESD7004MUTAG
42	1	NCP380HSNA SOT95P280-6N	U10	ON SEMI	NCP380HSNAJAAT1G
43	2	MOMENTARY SWT024	SW1,SW2	PANASONIC	EVQ-Q2K03W
44	4	0 1/10W 5% 0402	R12,R14,R15,R64	PANASONIC	ERJ-2GE0R00X
45	23	0 1/10W 5% 0402	R2,R3,R6,R11,R13, R16,R18,R23,R25, R33-R37,R43,R44, R58,R59,R61,R62, R66,R67,R76	PANASONIC	ERJ-2GE0R00X
46	1	10UF 10V 10% 0805 X5R	C33	PANASONIC	ECJ-2FB1A106K
47	2	2.2K 1/10W 5% 0402	R4,R5	PANASONIC	ERJ-2GEJ222X
48	2	2.0K 1/10W 1% 0402	R24,R26	PANASONIC	ERJ-2RKF2001X
49	1	1K 1/4W 5% 0805	R31	PANASONIC	ERJ-P06J102V

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
50	1	120K 1/10W 1% 0402	R54	PANASONIC	ERJ-2RKF1203X
51	1	3.01K 1/16W 1% 0402	R69	ROHM	MCR01MZPF3011
52	1	IDC 3X1 IDC3X1_SMT	JP2	SAMTEC	TSM-103-01-T-SV
53	2	0.051 1/2W 1% 1206	R9,R10	SEI	CSF 1/2 0.05 1%R
54	1	SN74LVC1G08 SOT23-5	U8	TI	SN74LVC1G08DBVE
55	1	SI2333DS SOT23D	Q1	VISHAY	SI2333DS-T1-E3
56	5	10K 1/16W 5% 0402	R27,R29,R39,R63, R65	VISHAY	CRCW040210K0FKED
57	20	10K 1/16W 5% 0402	R7,R8,R22,R28,R30, R40,R46,R48-R50, R55,R56,R68, R72-R75,R77-R79	VISHAY	CRCW040210K0FKED
58	1	33 1/16W 5% 0402	R38	VISHAY	CRCW040233R0JNEA
59	1	1M 1/10W 5% 0603	R32	VISHAY	CRCW06031M00FNEA
60	1	30A GSOT05 SOT23-3	D3	VISHAY	GSOT05-E3-08
61	1	W25Q32 SO8W	U4	WINBOND	W25Q32FVSSIG

A

B

C

D

1

1

2

2

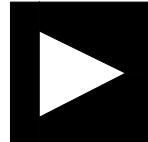
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4

4

# ADSP-BF706 EZ-KIT-MINI Schematic



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Title ADSP-BF706 EZ-KIT-MINI  
Title

Size C	Board No. A0586-2014	Rev 1.1
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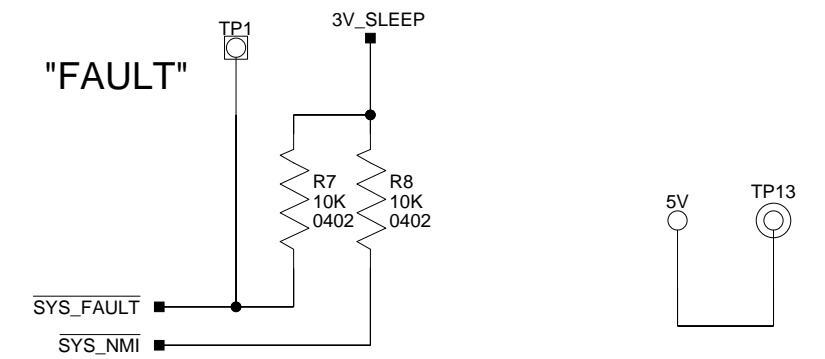
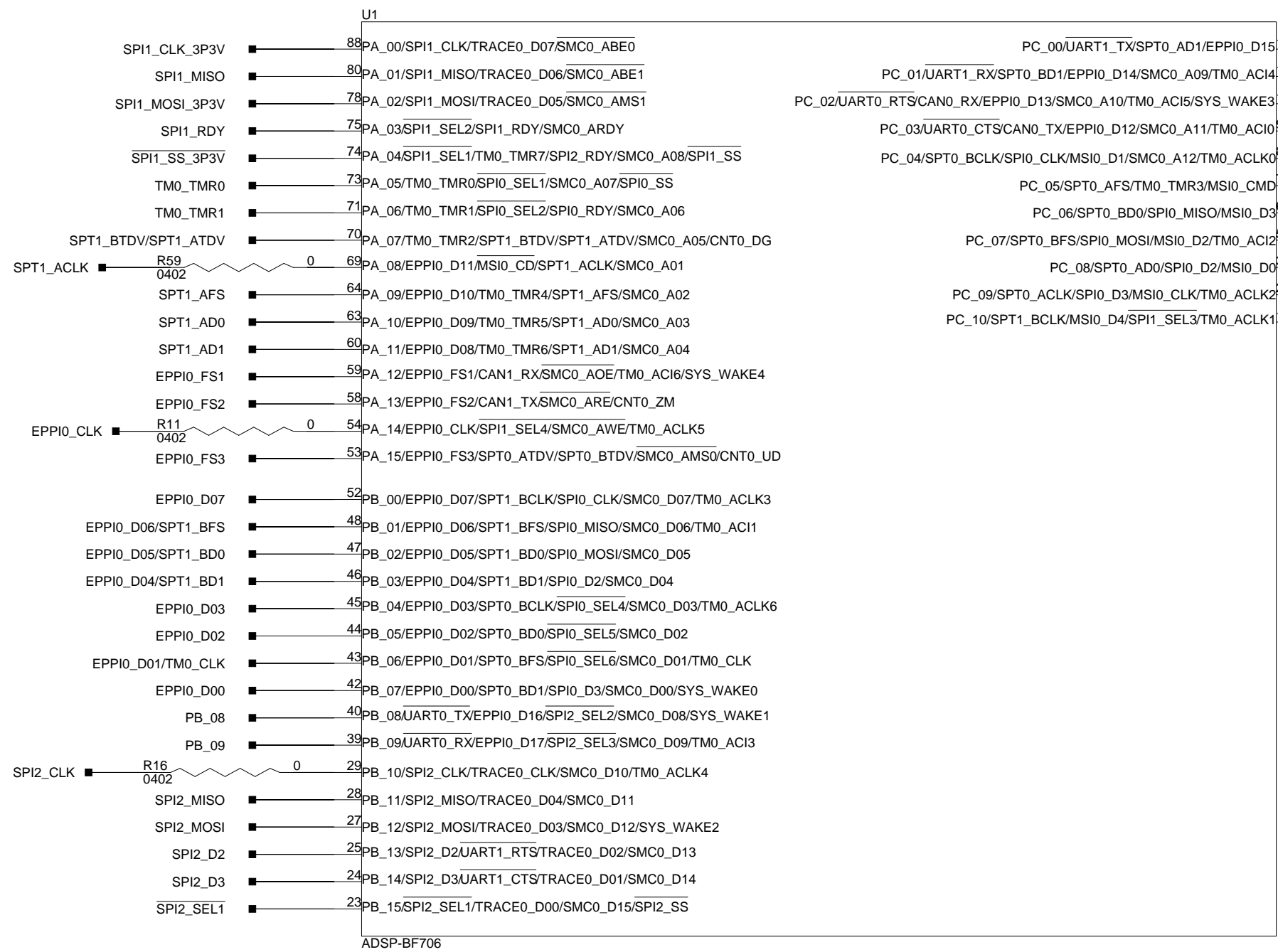
Date 10/17/2014	Sheet 1	of 5
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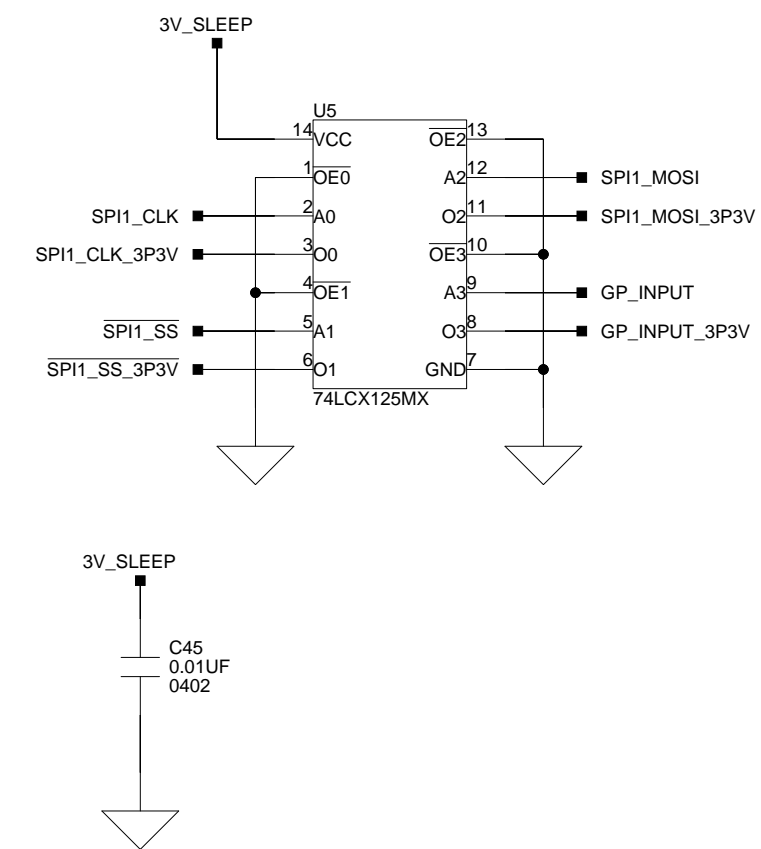
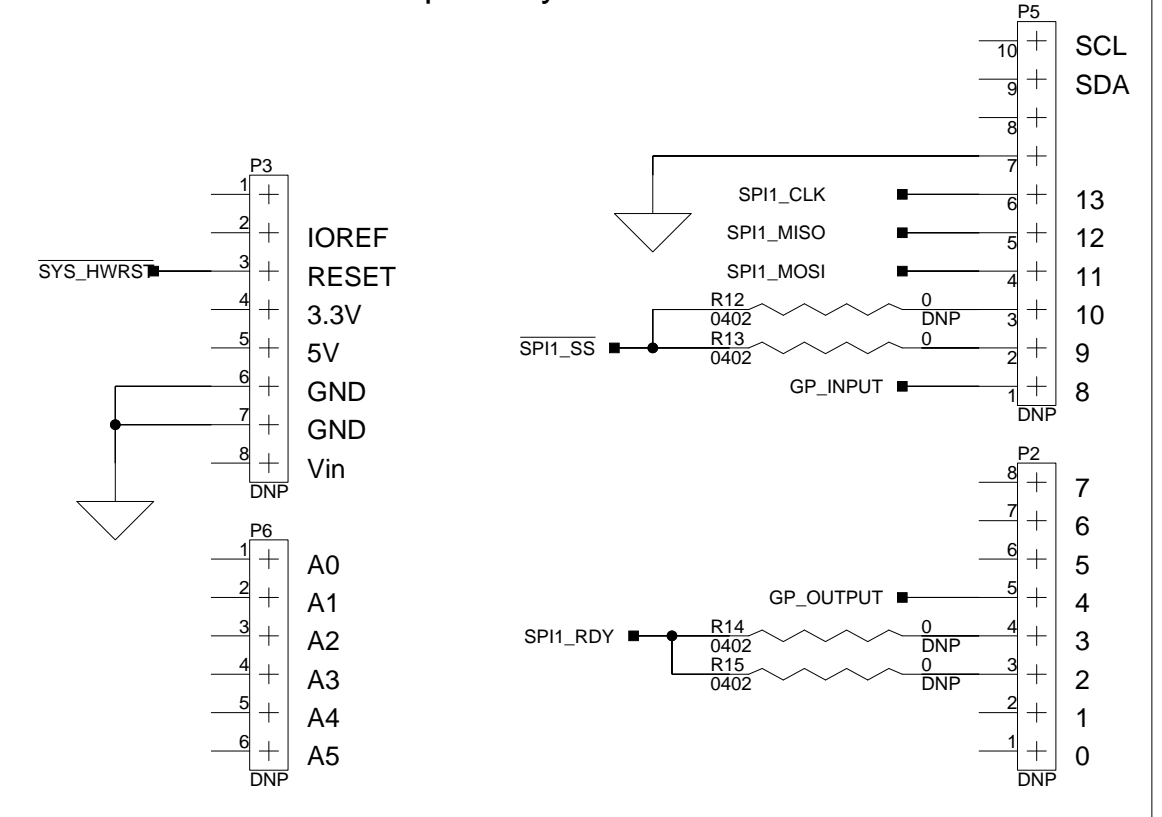
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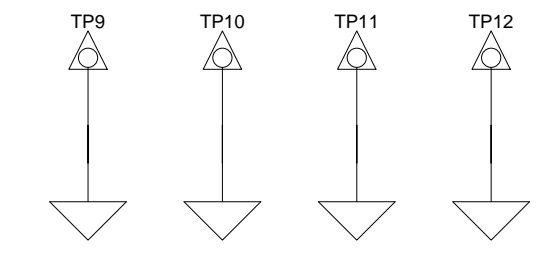
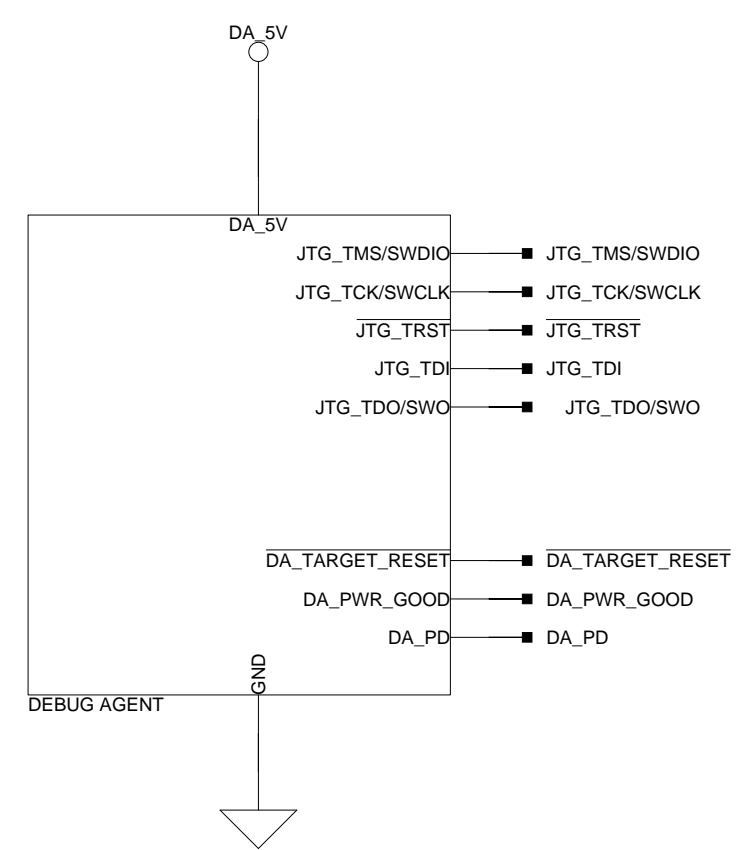
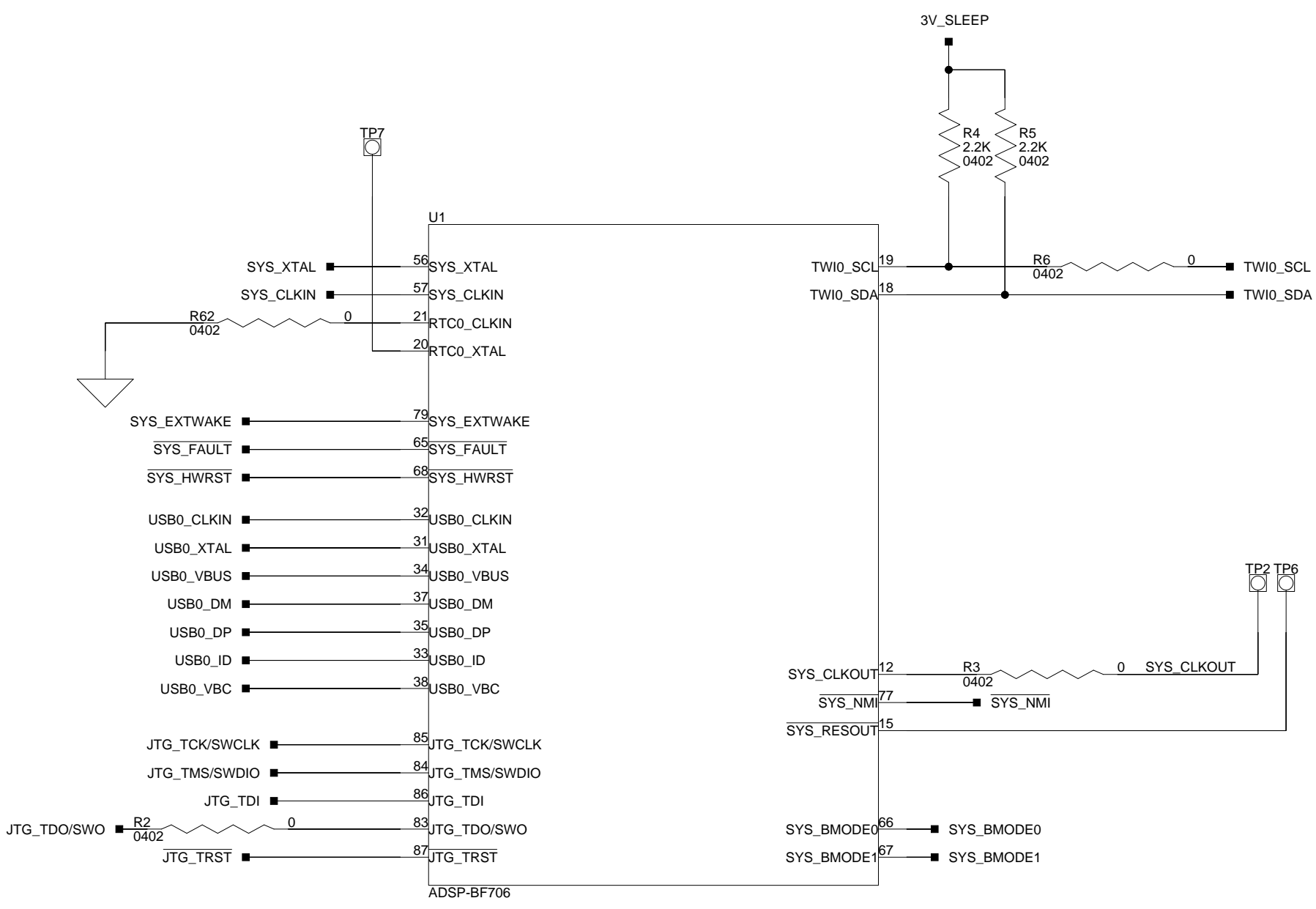
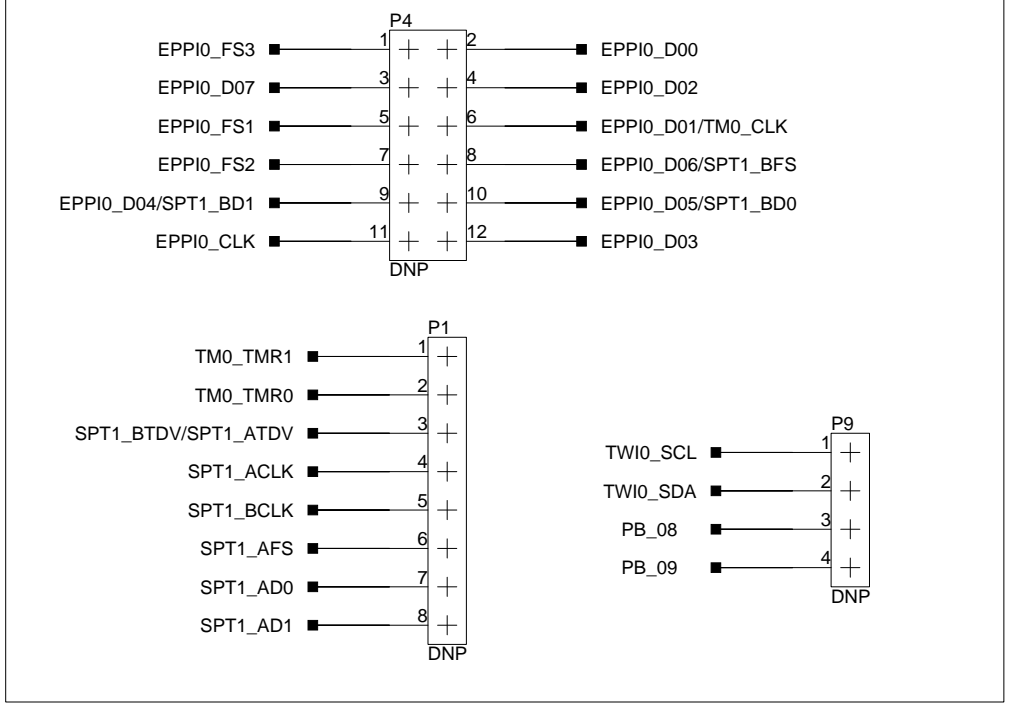
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Compatibility with Arduino Uno R3

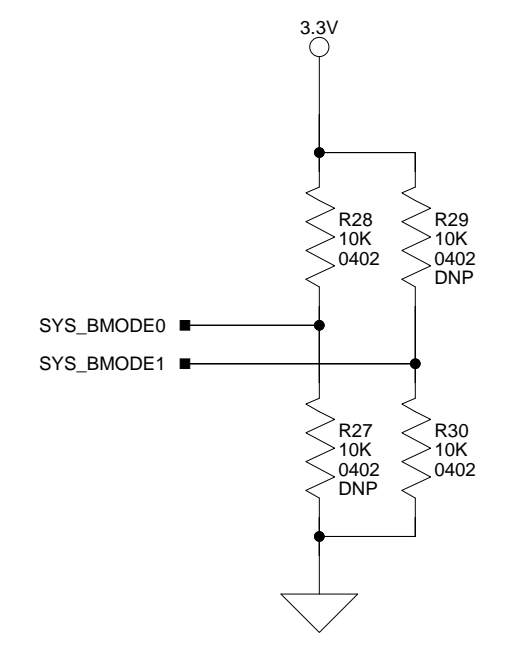
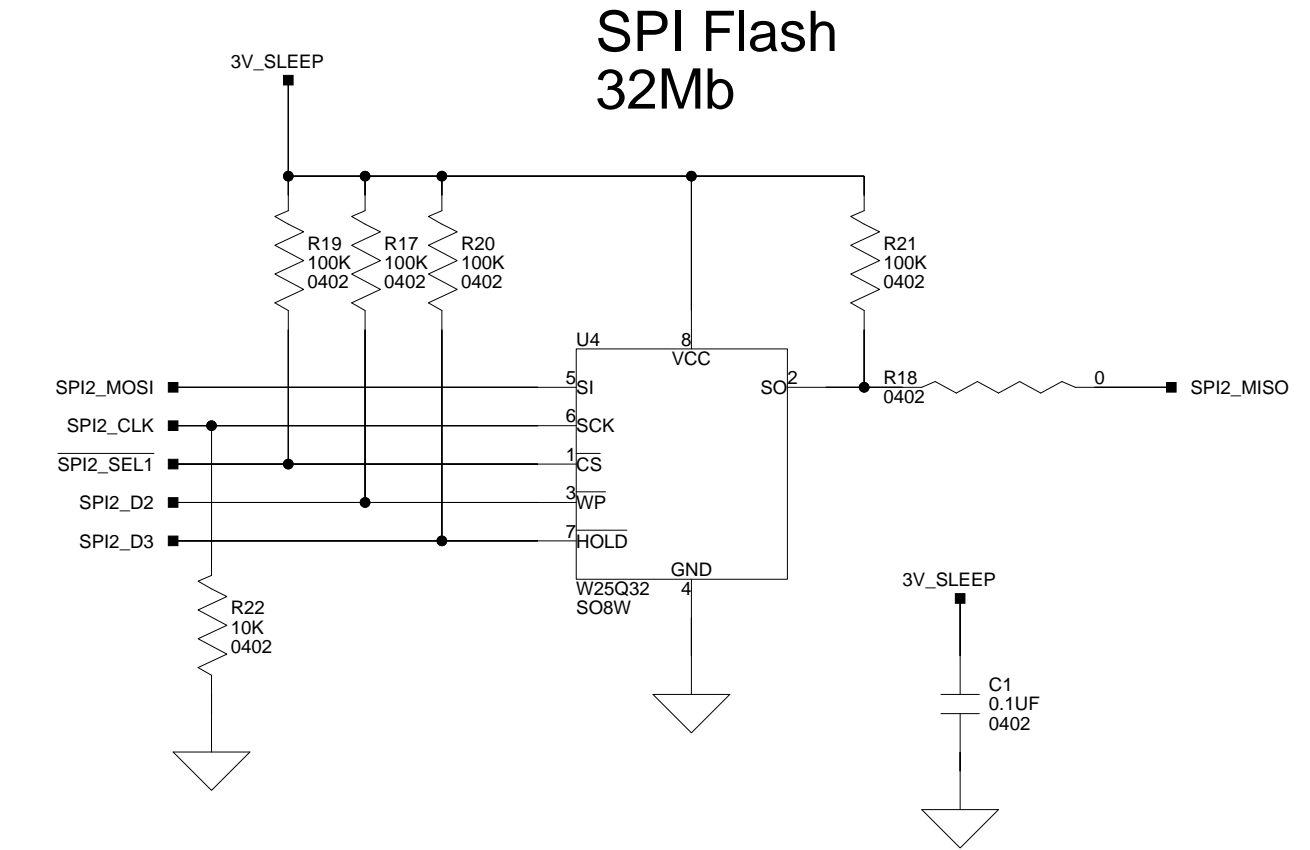
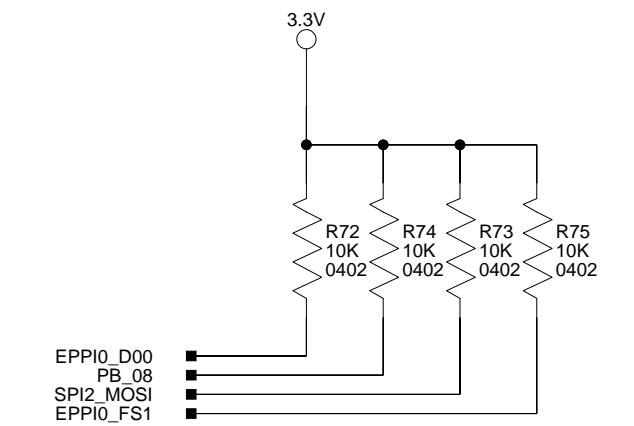
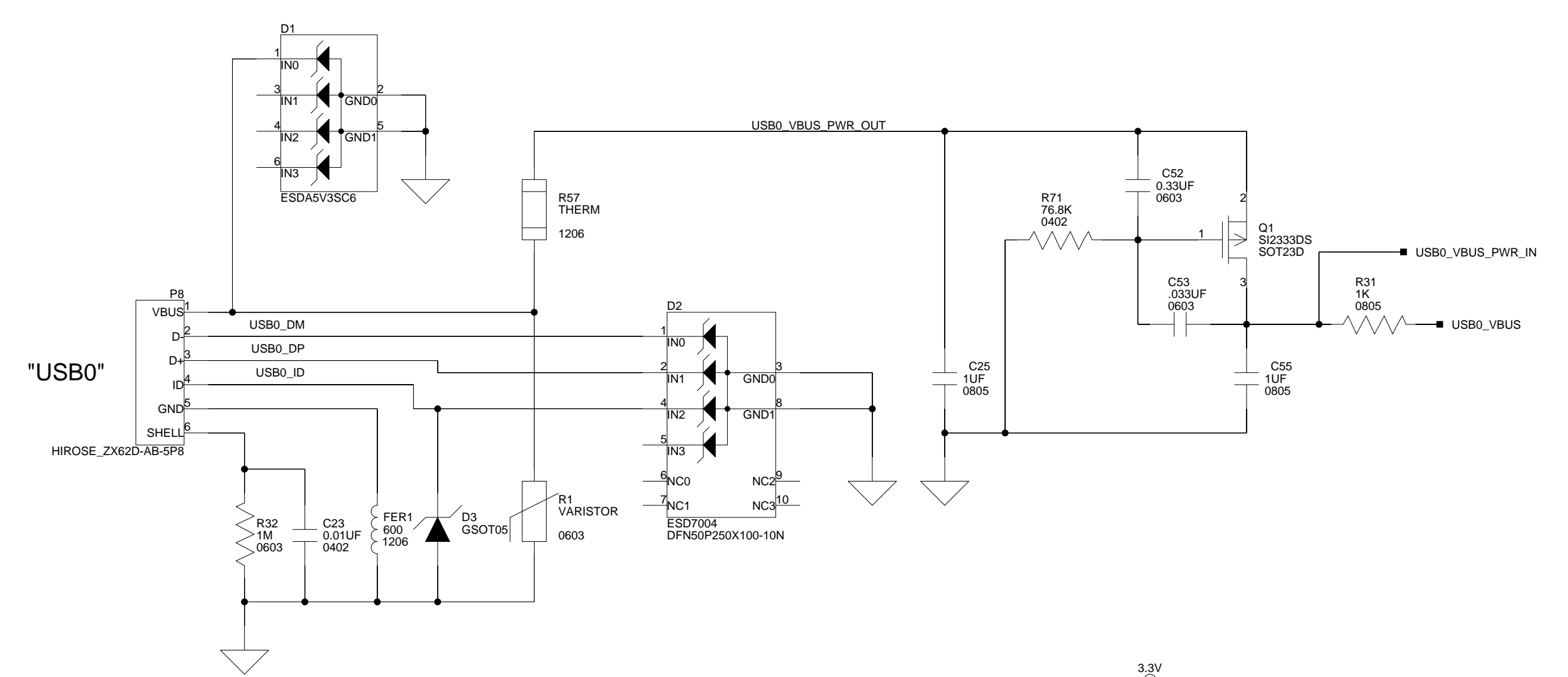
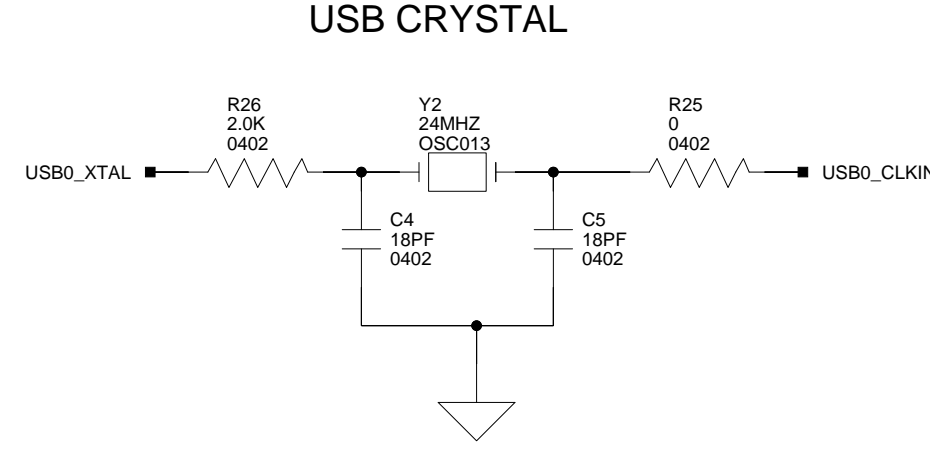
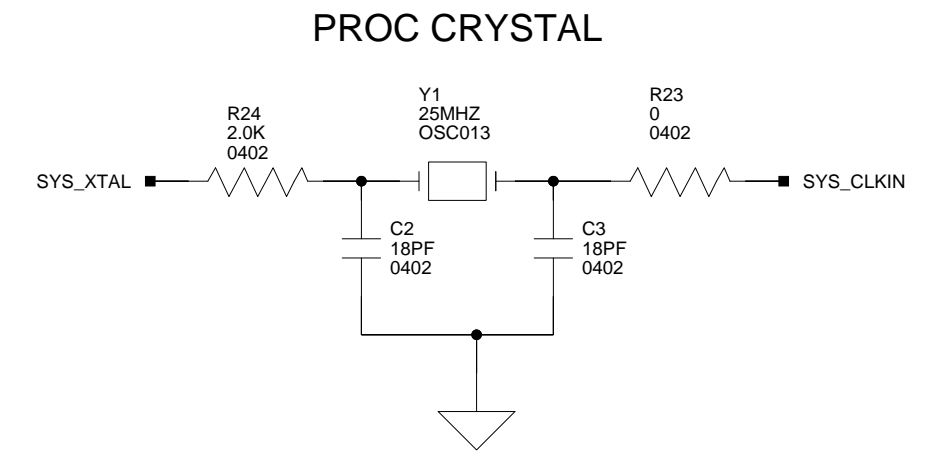
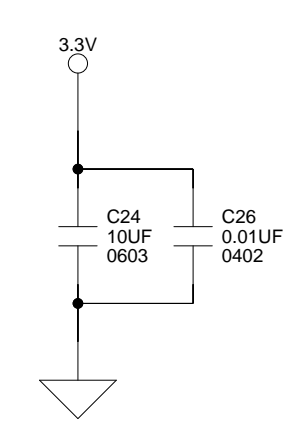
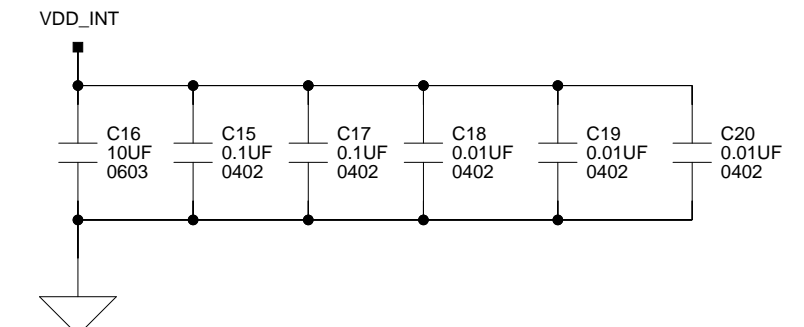
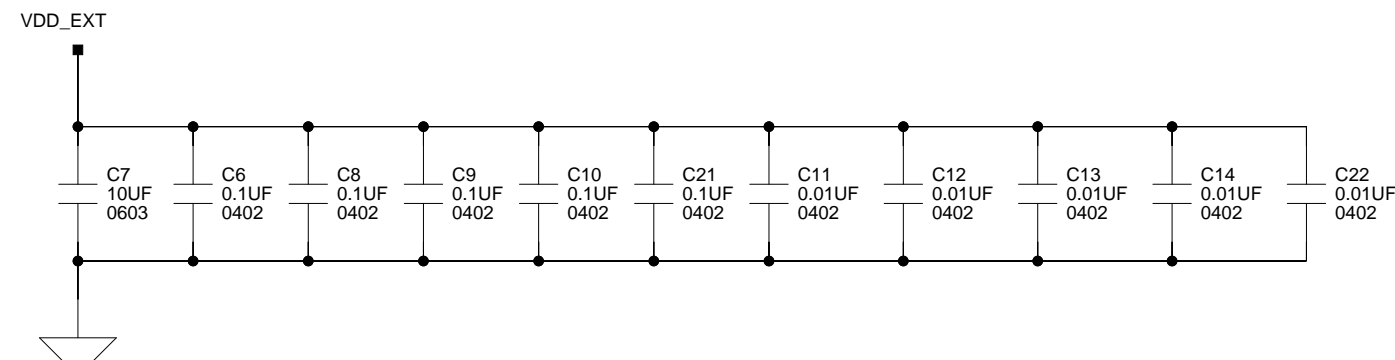
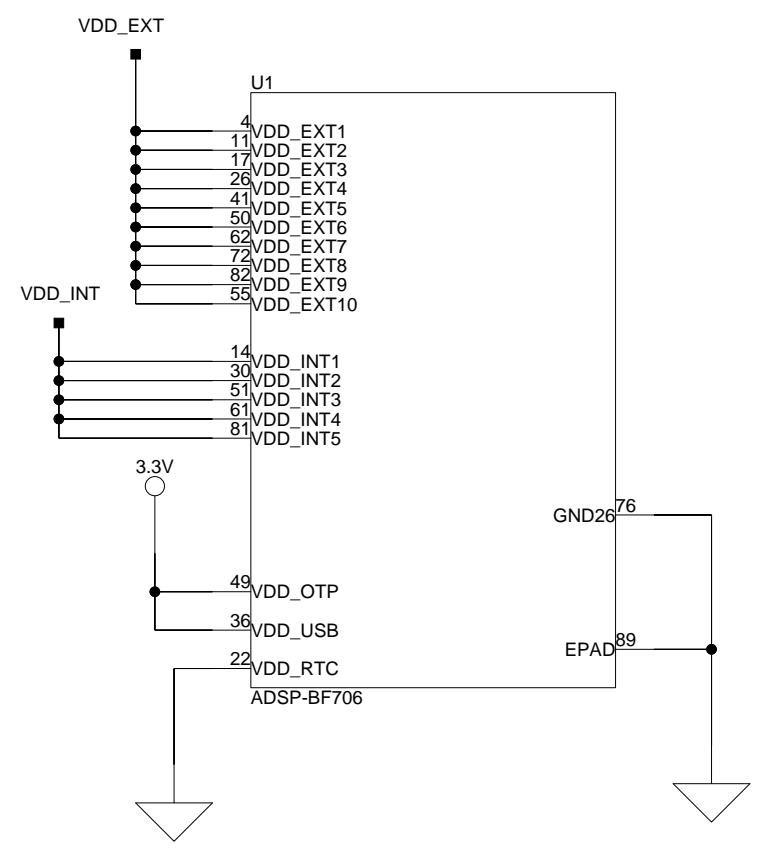


External Connection Points

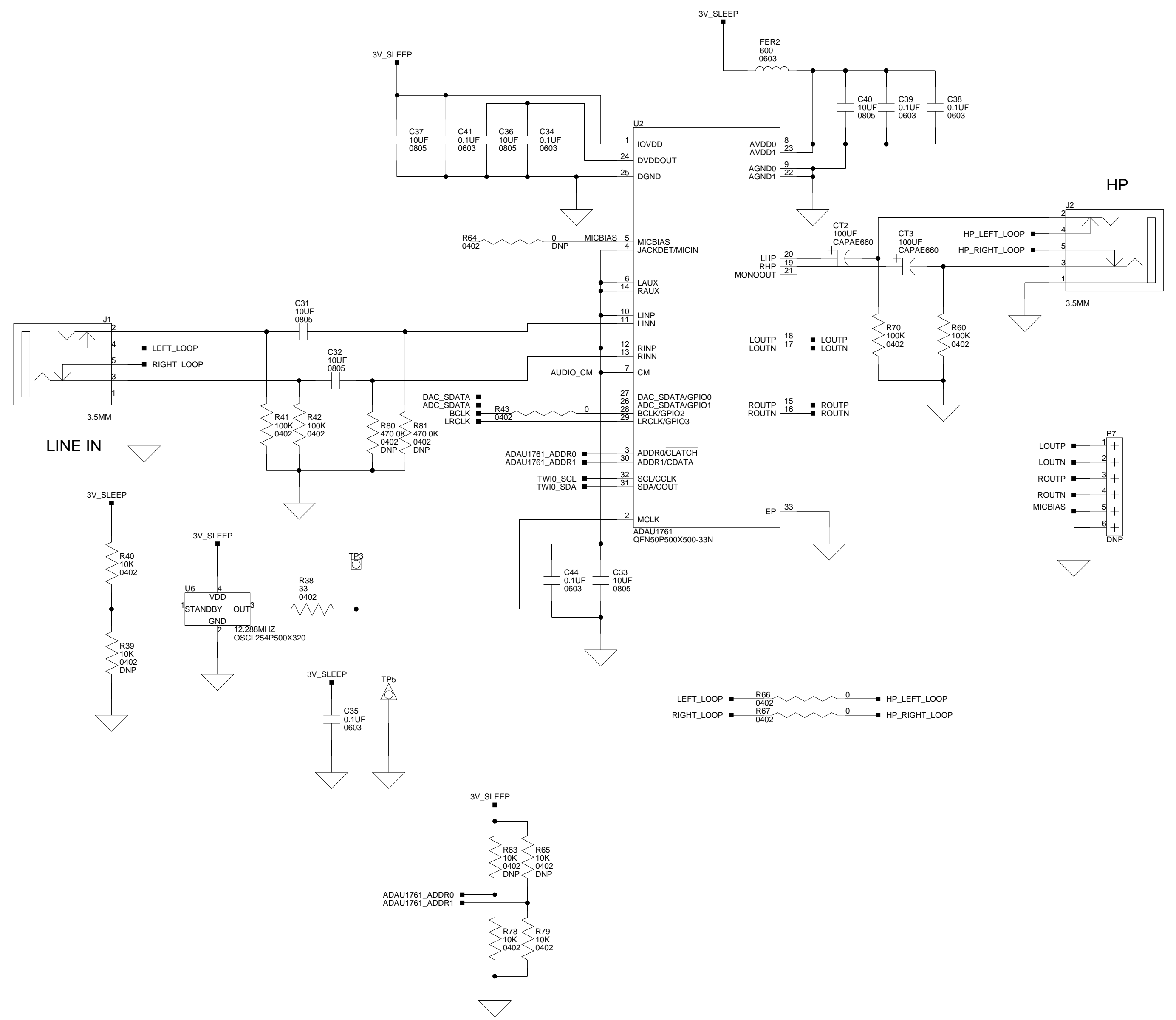
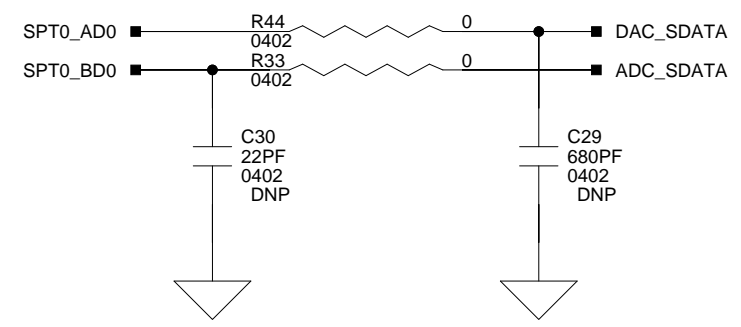
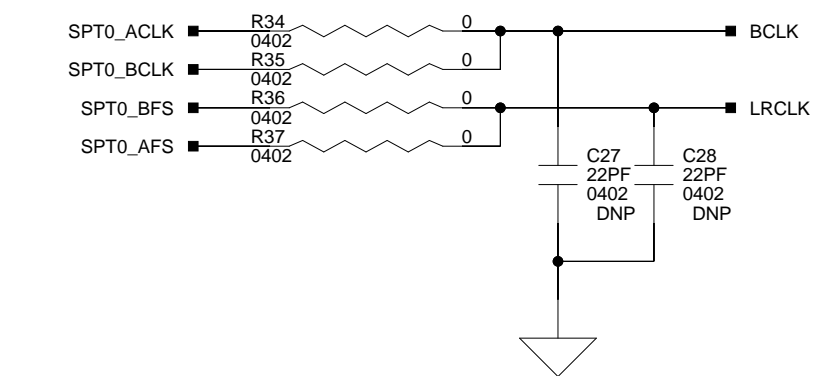


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Date	10/17/2014	Sheet 2	of 5

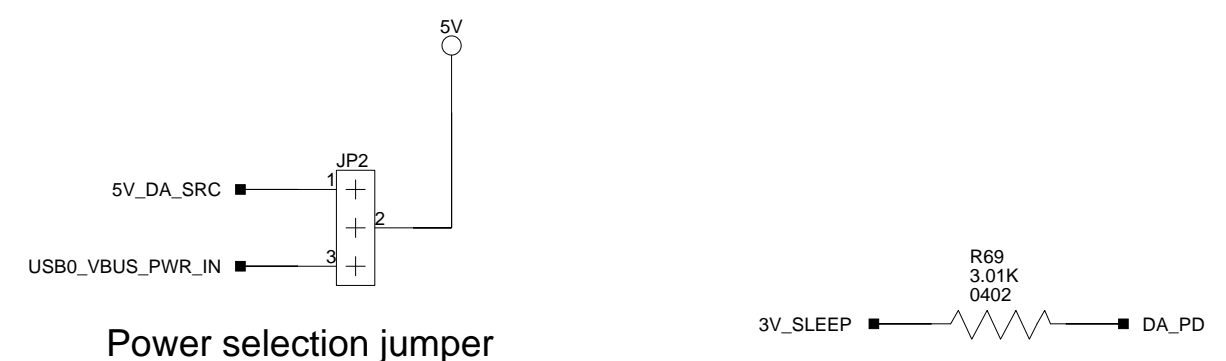
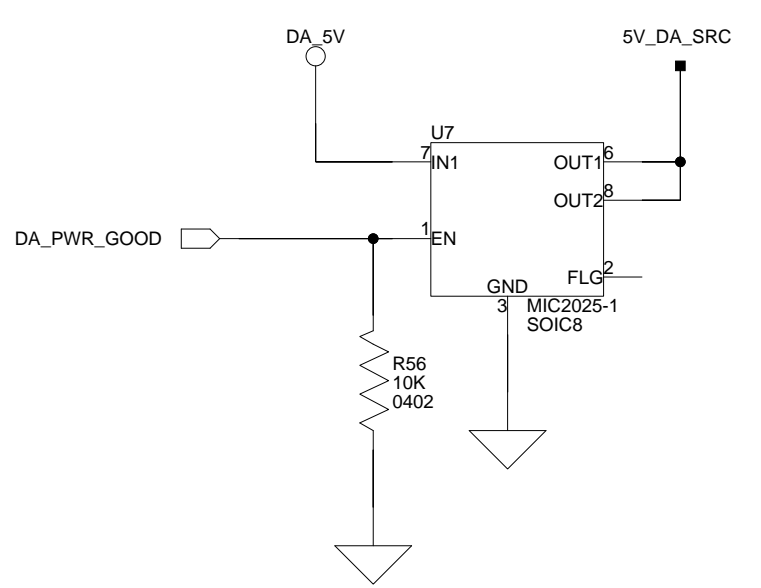
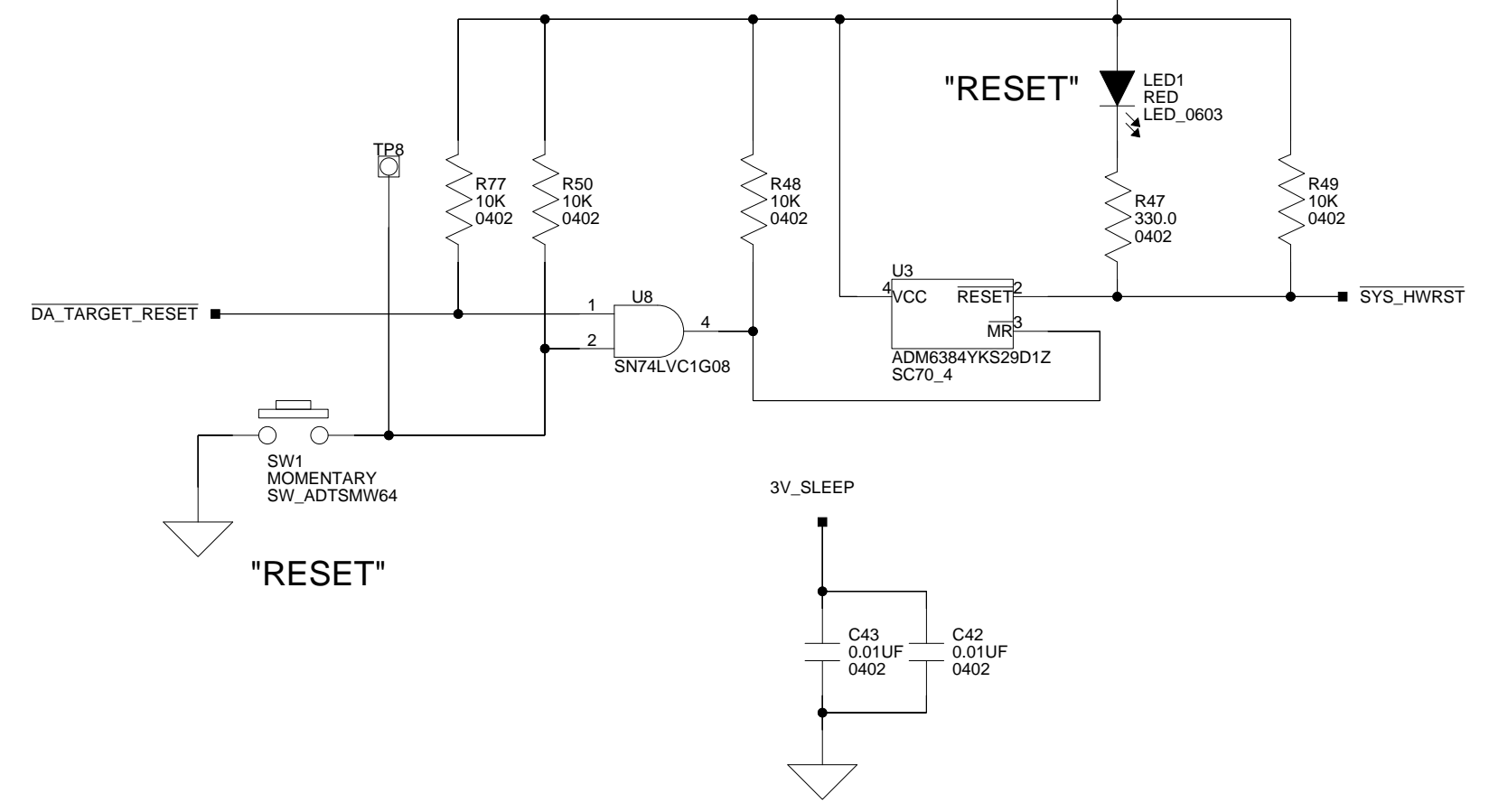
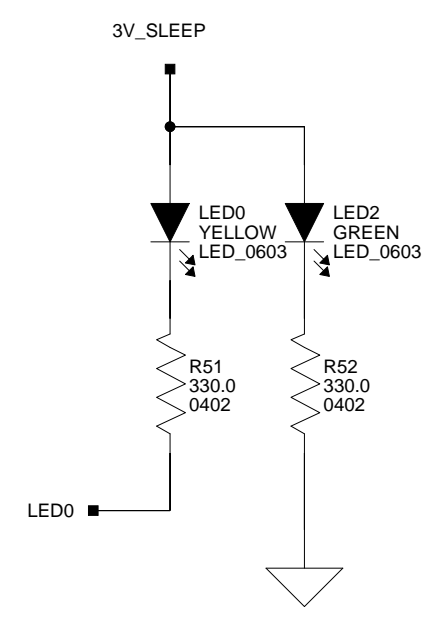
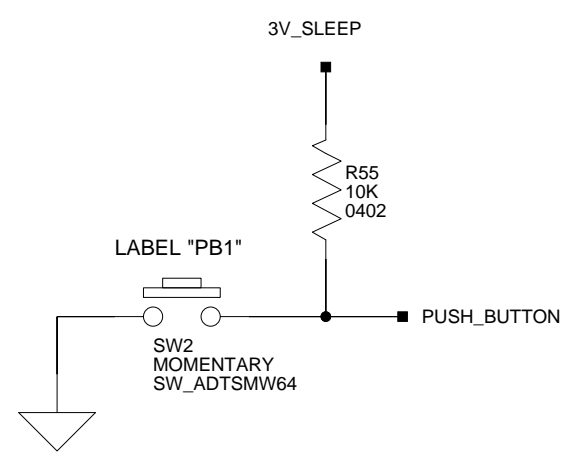


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		<b>Title</b> ADSP-BF706 EZ-KIT-MINI USB clk flash	
<b>Size C</b>	<b>Board No.</b> A0586-2014	<b>Rev</b> 1.1	
<b>Date</b> 10/17/2014	<b>Sheet</b> 3		<b>of</b> 5



		20 Cotton Road Nashua, NH 03063 PH: 1-800-ANALOGD
Title ADSP-BF706 EZ-KIT-MINI Audio		
Size C	Board No. A0586-2014	Rev 1.1
Date 10/17/2014	Sheet 4 of 5	



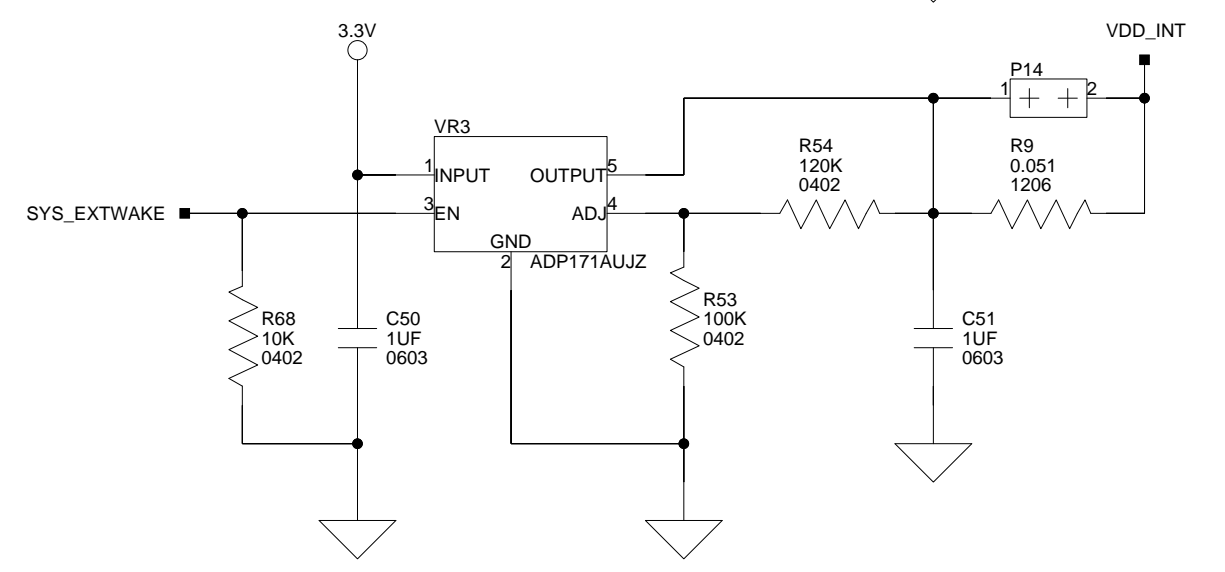
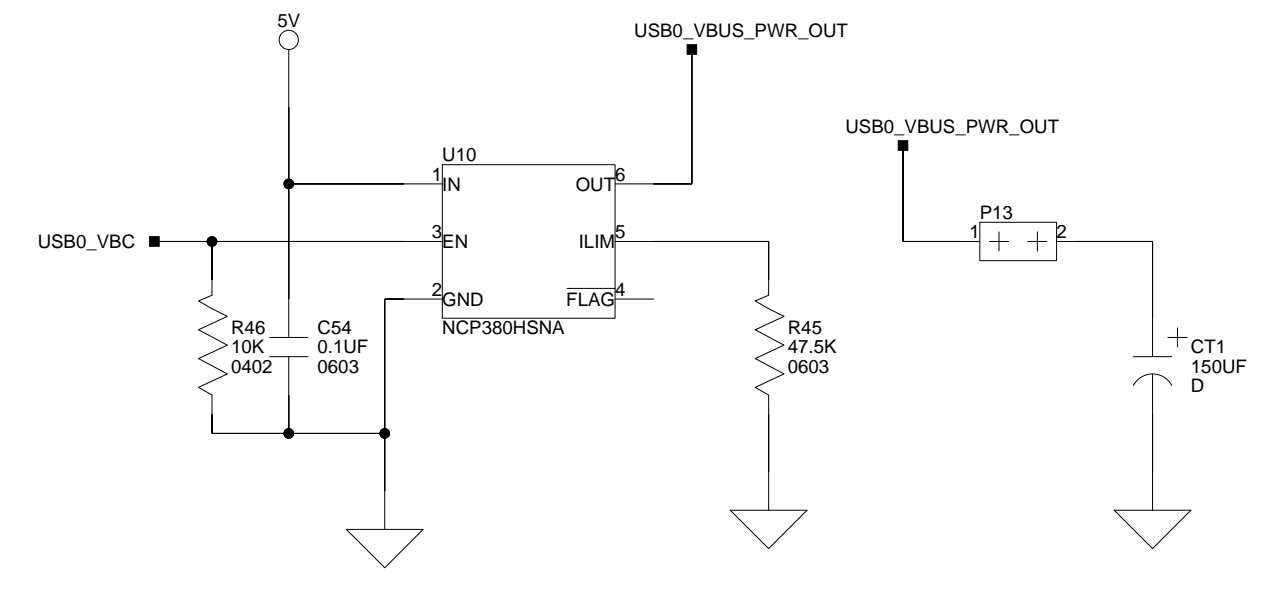
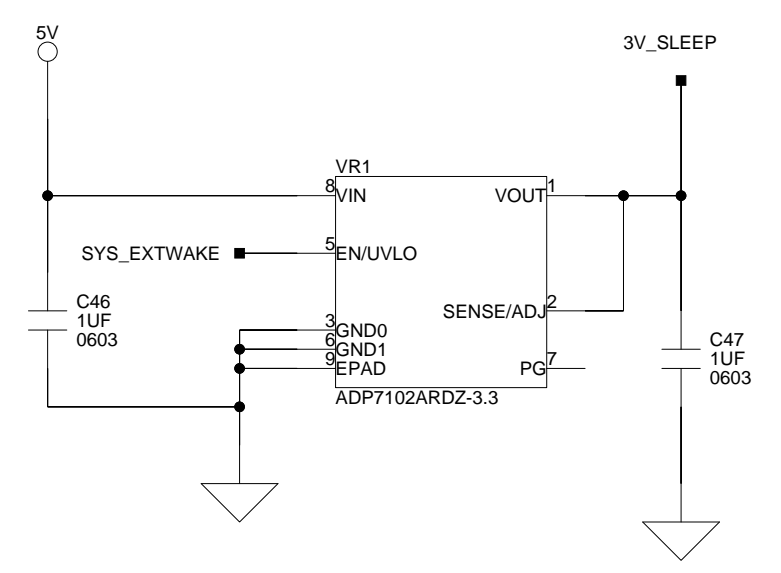
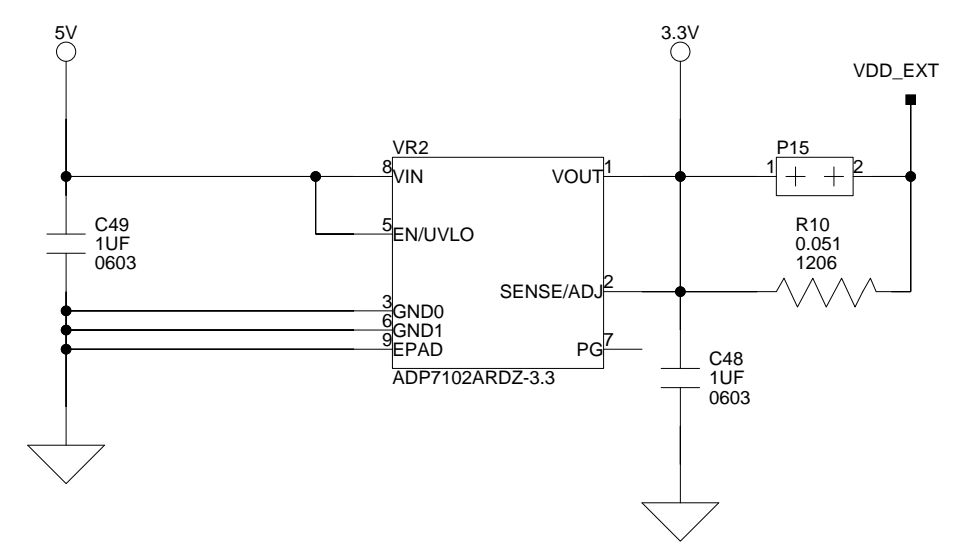


**Power selection jumper**

- 1&2: Debug agent connector (ZP1) source of power
- 2&3: BF706 USB connector (P8) source of power
- 2&3: Separate power sources, BF706 power from P8, and debug agent from ZP1 (requires 2 USB cables)



Add jumper to P13 when bus-powered device connected to P8.



		20 Cotton Road Nashua, NH 03063 PH: 1-800-ANALOGD	
		<b>Title</b> ADSP-BF706 EZ-KIT-MINI Power	
<b>Size C</b>	<b>Board No.</b> A0586-2014	<b>Rev</b> 1.1	
<b>Date</b> 10/17/2014	<b>Sheet</b> 5		<b>of</b> 5

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