ADSP-BF506F EZ-KIT Lite®
Evaluation System Manual

Revision 1.1, July 2012

Part Number
82-000226-01

Analog Devices, Inc.
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ANALOG DEVICES

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Regulatory Compliance

The ADSP-BF506F EZ-KIT Lite 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-BF506F EZ-KIT Lite has been certified to comply with the essential requirements of the European EMC directive 2004/108/EC and therefore carries the "**CE**" mark.

The ADSP-BF506F EZ-KIT Lite has been appended to Analog Devices, Inc. EMC Technical File (EMC TF) referenced **DSPTOOLS1**, issue 2 dated June 4, 2008 and was declared CE compliant by an appointed Notified Body (No.0673) as listed below.

Notified Body Statement of Compliance: Z600ANA2.038 dated June 21 2010.

Issued by: Technology International (Europe) Limited
56 Shrivenham Hundred Business Park
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The EZ-KIT Lite 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 Lite boards in the protective shipping package.

CONTENTS

PREFACE

USING ADSP-BF506F EZ-KIT LITE

ADSP-BF506F EZ-KIT LITE HARDWARE REFERENCE

PREFACE

Thank you for purchasing the ADSP-BF506F EZ-KIT Lite®, Analog Devices, Inc. evaluation system for the ADSP-BF504/BF506F Blackfin® processors.

Blackfin processors embody a type of embedded processor designed specifically to meet the computational demands and power constraints of today's embedded audio, video, and communications applications. They deliver breakthrough signal-processing performance and power efficiency within a reduced instruction set computing (RISC) programming model.

Blackfin processors support a media instruction set computing (MISC) architecture. This architecture is the natural merging of RISC, media functions, and digital signal processing (DSP) characteristics. Blackfin processors deliver signal-processing performance in a microprocessor-like environment.

Based on the Micro Signal Architecture (MSA), Blackfin processors combine a 32-bit RISC instruction set, dual 16-bit multiply accumulate (MAC) DSP functionality, and eight-bit video processing performance that had previously been the exclusive domain of very-long instruction word (VLIW) media processors.

The evaluation board is designed to be used in conjunction with the CrossCore® Embedded Studio (CCES) and VisualDSP++® development environments to test capabilities of the ADSP-BF504/BF506F Blackfin processors. The development environment aids advanced application code development and debug, such as:

- Create, compile, assemble, and link application programs written in C++, C, and ADSP-BF506F 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
- Plot memory

Access to the processor from a personal computer (PC) is achieved through a USB port or an external JTAG emulator. The USB interface provides unrestricted access to the ADSP-BF506F processor and evaluation board peripherals. Analog Devices JTAG emulators offer faster communication between the host PC and target hardware. Analog Devices carries a wide range of in-circuit emulation products. To learn more about Analog Devices emulators and processor development tools, go to http://www.analog.com/dsp/tools.

The ADSP-BF506F EZ-KIT Lite provides example programs to demonstrate the evaluation board capabilities.

Product Overview

The board features:

- Analog Devices ADSP-BF506F Blackfin processor
    - Core performance up to 400 MHz
    - External bus performance up to 80 MHz
    - 120-pin LQFP package
    - 25 MHz crystal
- Programmable VDDINT core power
    - Analog Devices AD5258 TWI digital potentiometer
    - Analog Devices ADP1715 low dropout linear regulator
- Internal parallel flash memory
    - Numonyx M58WT032 – 4 MB (2M x 16 bits)
- SPI flash memory
    - Numonyx M25P16 – 16 Mb
- Internal ADC
    - Analog Devices AD7266 2 MSPS, 12-bit, 3-channel SAR analog-to-digital converter
    - Twelve single-ended inputs
    - Six differential inputs

- Universal asynchronous receiver/transmitter (UART)
  - ADM3202 RS-232 line driver/receiver
  - DB9 female connector
- LEDs
  - Five LEDs: one board reset (red), three general-purpose (amber), and one power (green)
- Push buttons
  - Three push buttons: one reset and two programmable flags with debounce logic
- Expansion interface II
  - Provides access to most of the processor signals
- Land grid array
  - Easy probing of all port pins
- Other features
  - JTAG ICE 14-pin header
  - Processor power measurement jumpers

For information about the hardware components of the EZ-KIT Lite, refer to Chapter 2, "ADSP-BF506F EZ-KIT Lite Hardware Reference".

Purpose of This Manual

The *ADSP-BF506F EZ-KIT Lite 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-BF506F EZ-KIT Lite. 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 and instruction set.

Programmers who are unfamiliar with Analog Devices processors can use this manual but should supplement it with other texts that describe your target architecture. For the locations of these documents, see "Related Documents".

Programmers who are unfamiliar with CCES or VisualDSP++ should refer to the online help and user's manuals.

Manual Contents

The manual consists of:

- Chapter 1, "Using ADSP-BF506F EZ-KIT Lite" on page 1-1.
  Describes EZ-KIT Lite functionality from a programmer's perspective and provides an easy-to-access memory map.
- Chapter 2, "ADSP-BF506F EZ-KIT Lite Hardware Reference" on page 2-1.
  Provides information on the EZ-KIT Lite hardware components.
- Appendix A, "ADSP-BF506F EZ-KIT Lite Bill Of Materials" on page A-1.
  Provides a list of components used to manufacture the EZ-KIT Lite board.
- Appendix B, "ADSP-BF506F EZ-KIT Lite Schematic" on page B-1.
  Provides the resources to allow board-level debugging or to use as a reference guide. Appendix B is part of the online help.

What's New in This Manual

This is revision 1.1 of the *ADSP-BF506F EZ-KIT Lite Evaluation System Manual*. The manual has been updated to include CCES information. In addition, modifications and corrections based on errata reports against the previous manual revision have been made.

For the latest version of this manual, please refer to the Analog Devices Web site.

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®:
  `http://ez.analog.com/community/dsp`
- Submit your questions to technical support directly at:
  `http://www.analog.com/support`
- E-mail your questions about processors, DSPs, and tools development software from **CrossCore Embedded Studio** or **VisualDSP++**:

  Choose **Help > Email Support**. This creates an e-mail to `processor.tools.support@analog.com` and automatically attaches your **CrossCore Embedded Studio** or **VisualDSP++** version information and `license.dat` file.
- E-mail your questions about processors and processor applications to:
  `processor.support@analog.com` or
  `processor.china@analog.com` (Greater China support)
- In the **USA only**, call **1-800-ANALOGD** (1-800-262-5643)
- Contact your Analog Devices sales office or authorized distributor. Locate one at:
  `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 Analog Devices ADSP-BF504, ADSP-BF504F, and ADSP-BF506F Blackfin embedded processors.

Product Information

Product information can be obtained from the Analog Devices Web site and the online help system.

Analog Devices Web Site

The Analog Devices Web site, www.analog.com, provides information about a broad range of products—analog integrated circuits, amplifiers, converters, and digital signal processors.

To access a complete technical library for each processor family, go to 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 is a free feature of the Analog Devices Web site 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 e-mail notifications containing updates to the Web pages that meet your interests, including documentation errata against all manuals. myAnalog provides access to books, application notes, data sheets, code examples, and more.

Visit myAnalog (found on the Analog Devices home page) to sign up. If you are a registered user, just log on. Your user name is your e-mail address.

EngineerZone

EngineerZone is a technical support forum from Analog Devices. It allows you direct access to ADI 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 ADI support team and your peers. Visit http://ez.analog.com to sign up.

Related Documents

For additional information about the product, refer to the following publications.

Table 1. Related Processor Publications

Title	Description
ADSP-BF504/BF504F/BF506F Blackfin Embedded Processor Data Sheet	General functional description, pinout, and timing of the processor
ADSP-BF50x Blackfin Processor Hardware Reference	Description of the internal processor architecture and all register functions
Blackfin Processor Programming Reference	Description of all allowed processor assembly instructions

Notation Conventions

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

Example	Description
Close command (**File** menu)	Titles in reference sections indicate the location of an item within the development environment's menu system (for example, the **Close** command appears on the **File** menu).
`{this | that}`	Alternative required items in syntax descriptions appear within curly brackets and separated by vertical bars; read the example as `this` or `that`. One or the other is required.
`[this | that]`	Optional items in syntax descriptions appear within brackets and separated by vertical bars; read the example as an optional `this` or `that`.
`[this,…]`	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 `this`.

Example	Description
`.SECTION`	Commands, directives, keywords, and feature names are in text with `letter gothic` font.
`filename`	Non-keyword placeholders appear in text with italic style format.
	**Note:** For correct operation, ... A Note provides supplementary information on a related topic. In the online version of this book, the word **Note** appears instead of this symbol.
	**Caution:** Incorrect device operation may result if ... **Caution:** Device damage may result if ... 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 **Caution** appears instead of this symbol.
	**Warning:** Injury to device users may result if ... 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 **Warning** appears instead of this symbol.

1 USING ADSP-BF506F EZ-KIT LITE

This chapter provides specific information to assist you with development of programs for the ADSP-BF506F EZ-KIT Lite evaluation system.

The following topics are covered.

For information about the graphical user interface, including the boot loading, target options, and other facilities of the EZ-KIT Lite system, refer to the online help.

For more detailed information about the ADSP-BF506F Blackfin processor, see documents referred to at "Related Documents".

Package Contents

Your ADSP-BF506F EZ-KIT Lite evaluation system package contains the following items.

- ADSP-BF506F EZ-KIT Lite board
- USB cable

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

Default Configuration

The EZ-KIT Lite 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 Lite boards in the protective shipping package.

The ADSP-BF506F EZ-KIT Lite board is designed to run outside your personal computer as a standalone unit.

When removing the EZ-KIT Lite board from the package, handle the board carefully to avoid the discharge of static electricity, which can damage some components. Figure 1-1 shows the default jumper settings, switches, connector locations, and LEDs used in installation. Confirm that your board is in the default configuration before using the board.

CCES Install and Session Startup

For information about CCES and to download the software, go to www.analog.com/CCES. A link for the ADSP-BF506F EZ-KIT Lite Board Support Package (BSP) for CCES can be found at http://www.analog.com/Blackfin/EZKits.

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

Step 1: Connect the EZ-KIT Lite board to a personal computer (PC) running CCES using one of two options: an Analog Devices emulator or via the debug agent.

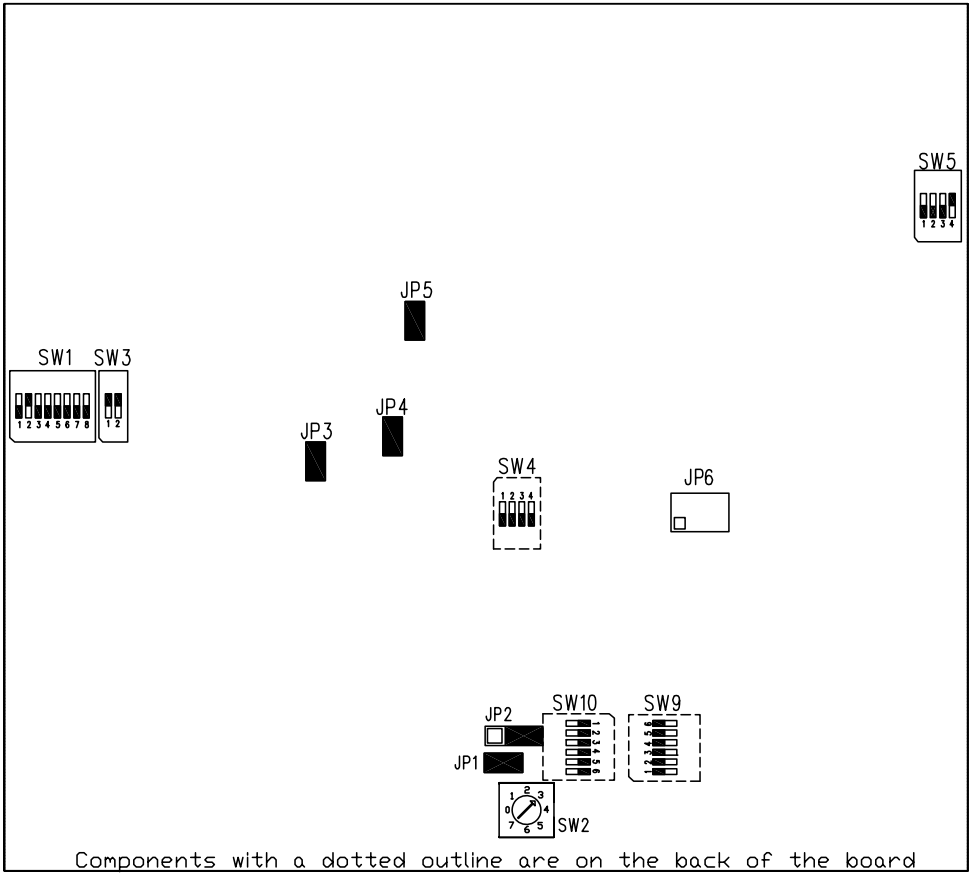

Figure 1-1. EZ-KIT Lite Hardware Setup

Using an Emulator:

1. Plug one side of the USB cable into the USB connector of the emulator. Plug the other side into a USB port of the PC running CCES.

2. Attach the emulator to the header connector `P1` (labeled `JTAG`) on the EZ-KIT Lite board.

Using the on-board Debug Agent:

1. Plug one side of the USB cable into the USB connector of the debug agent ZP1 (labeled USB).
2. Plug the other side of the cable into a USB port of the PC running CCES.

Step 2: Attach the provided cord and appropriate plug to the 5V power adaptor.

1. Plug the jack-end of the power adaptor into the power connector P9 (labeled 5V) on the EZ-KIT Lite board.
2. Plug the other side of the power adaptor into a power outlet. The power LED (labeled LED5) is lit green when power is applied to the board.
3. Power the emulator (if used). Plug the jack-end of the assembled power adaptor into the emulator and plug the other side of the power adaptor into a power outlet. The enable/power is lit green when power is applied.

Step 3 (if connected through the debug agent): Verify that the yellow USB monitor LED (labeled ZLED2) and the green power LED (labeled ZLED1) on the debug agent are both on. This signifies that the board is communicating properly with the host PC and ready to run CCES.

Session Startup

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

Note: If you connect the board or emulator first (before installing CCES) to 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 system configuration utility to connect to the EZ-KIT Lite board.

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

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

   - Click the down arrow next to the little 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-BF506F**. Click **Next**.

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

5. Select one of the following:
   - For standalone debug agent connections, **EZ-KIT Lite** and click **Next**.
   - For emulator connections, **Emulator** and click **Next**.

   The **Select Platform** page of the **Session Wizard** appears.
6. Do one of the following:
   - For standalone debug agent connections, ensure that the selected platform is **ADSP-BF506F EZ-KIT** Lite via Debug Agent.
   - For emulator connections, choose the type of emulator that is connected to the board.
7. Click **Finish** to close the wizard.

   The new debug configuration is created and added to the program(s) to load list.
8. In the **Program(s) to load** section, choose the program to load when connecting to the board. If not loading any program upon connection to the target, do not make any changes.

   Note that while connected to the target, there is no way to choose a program to download. To load a program once connected, terminate the session.

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 (red box) 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**.

VisualDSP++ Install and Session Startup

For information about VisualDSP++ and to download the software, go to www.analog.com/VisualDSP.

There are two options to connect the EZ-KIT Lite hardware to a personal computer (PC) running VisualDSP++: via an Analog Devices emulator or va a standalone debug module. The standalone debug agent allows a debug agent to interface to the ADSP-BF506F EZ-KIT Lite. The standalone debug agent is shipped with the kit.

To connect the EZ-KIT Lite to a PC via an emulator:

1. Plug the 5V adaptor into connector P9 (labeled 5V) or plug the USB cable into ZP1 (labeled USB).
2. Attach the emulator to the header connector P1 (labeled JTAG) on the EZ-KIT Lite.

To connect the EZ-KIT Lite to a PC via the debug agent:

1. Plug one side of the provided USB cable into the USB connector of the debug agent ZP1 (labeled USB). Plug the other side of the cable into a USB port of the PC running VisualDSP++.
2. Verify that the yellow USB monitor LED on the debug agent, ZLED2, is lit. This signifies that the board is communicating properly with the host PC and ready to run VisualDSP++.

Session Startup

1. If you are running VisualDSP++ for the first time, navigate to the VisualDSP++ environment via the **Start > Programs** menu. The main window appears. Note that VisualDSP++ does not connect to any session. Skip the rest of this step to step 2.

   If you have run VisualDSP++ previously, the last opened session appears on the screen. You can override the default behavior and force VisualDSP++ to start a new session by pressing and holding down the **Ctrl** key while starting VisualDSP++. Do not release the **Ctrl** key until the **Session Wizard** appears on the screen. Go to step 3.

2. To connect to a new EZ-KIT Lite session, start **Session Wizard** by selecting one of the following.

   - From the **Session** menu, **New Session**.
   - From the **Session** menu, **Session List**. Then click **New Session** from the **Session List** dialog box.
   - From the **Session** menu, **Connect to Target**.

3. The **Select Processor** page of the wizard appears on the screen. Ensure **Blackfin** is selected in **Processor family**. In **Choose a target processor**, select **ADSP-BF506F**. Click **Next**.

4. The **Select Connection Type** page of the wizard appears on the screen. Select **EZ-KIT Lite** and click **Next**.

5. The **Select Platform** page of the wizard appears on the screen. For standalone debug agent connections, ensure that the selected platform is **ADSP-BF506F EZ-KIT Lite via Debug Agent.** For emulator connections, choose the type of emulator that is connected. Specify your own **Session name** for your session or accept the default name.

The session name can be a string of any length; although, the box displays approximately 32 characters. The session name can include space characters. If you do not specify a session name, VisualDSP++ creates a session name by combining the name of the selected platform with the selected processor. The only way to change a session name later is to delete the session and open a new session.

Click **Next**.

6. The **Finish** page of the wizard appears on the screen. The page displays your selections. Check the selections. If you are not satisfied, click **Back** to make changes; otherwise, click **Finish**. VisualDSP++ creates the new session and connects to the EZ-KIT Lite. Once connected, the main window's title is changed to include the session name set in step 5.

To disconnect from a session, click the disconnect button  or select **Session > Disconnect from Target**.

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

CCES Evaluation License

The ADSP-BF506F EZ-KIT Lite software is part of the Board Support Package (BSP) for the Blackfin ADSP-BF50x family. The EZ-KIT Lite is a licensed product that offers an unrestricted evaluation license for 90 days after activation. Once the evaluation period ends, the evaluation license becomes permanently disabled. 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.

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:
  http://www.analog.com/buyonline.
- Analog Devices, Inc. local sales office or authorized distributor. To locate one, go to:
  http://www.analog.com/salesdir/continent.asp.

The EZ-KIT Lite hardware must be connected and powered up to use CCES with a valid evaluation or full license.

VisualDSP++ Evaluation License

The ADSP-BF506F EZ-KIT Lite installation is part of the VisualDSP++ installation. The EZ-KIT Lite is a licensed product that offers an unrestricted evaluation license for the first 90 days. Once the initial unrestricted 90-day evaluation license expires:

- VisualDSP++ restricts a connection to the ADSP-BF506F EZ-KIT Lite via the USB debug agent interface only. Connections to simulators and emulation products are no longer allowed.
- The linker restricts a user program to ¼ of memory (16K bytes), which is 4K bytes for code space with no restrictions for data space.

To avoid errors when opening VisualDSP++, the EZ-KIT Lite hardware must be connected and powered up. This is true for using VisualDSP++ with a valid evaluation or full license.

Memory Map

The ADSP-BF506F processor has internal static random access memory (SRAM) used for instruction or data storage. See Table 1-1. The internal memory details can be found in the *ADSP-BF50x Blackfin Processor Hardware Reference*.

The ADSP-BF506F EZ-KIT Lite board includes external serial peripheral interconnect (SPI) flash and internal flash memories. See Table 1-2; see also the following “Internal Flash Memory Interface” and “SPI Flash Memory Interface”.

Table 1-1. EZ-KIT Lite Internal Memory Map

Start Address	Content
0xFFE0 0000	CORE MEMORY MAPPED REGISTERS
0xFFC0 0000	SYSTEM MEMORY MAPPED REGISTERS
0xFFB0 1000	Reserved
0xFFB0 0000	INTERNAL SCRATCHPAD RAM (4K BYTES)
0xFFA1 4000	Reserved
0xFFA0 8000	Reserved
0xFFA0 4000	L1 INSTRUCTION SRAM/CACHE (16K BYTES)
0xFFA0 0000	L1 INSTRUCTION BANK A SRAM (16K BYTES)
0xFF80 8000	Reserved
0xFF80 4000	L1 DATA BANK A SRAM/CACHE (16K BYTES)
0xFF80 0000	L1 DATA BANK A SRAM (16K BYTES)
0xEF00 1000	Reserved

Table 1-2. EZ-KIT Lite External (Interface-Accessible) Memory Map

Start Address	Content
0xEF00 0000	BOOT ROM (4K BYTES)
0x2040 0000	Reserved
0x2000 0000	SYNC FLASH (32M BITS)
0x0000 0000	Reserved

Internal Flash Memory Interface

Internal parallel flash memory of the ADSP-BF506F EZ-KIT Lite is a 4 MB (2M x 16 bits) Numonyx M58WT032 device, which is internal to the processor. The address range for flash memory is 0x2000 0000 to 0x203F FFFF.

By default, the EZ-KIT Lite boots from SPI flash memory. The processor boots from internal parallel flash memory if the boot mode select switch (SW2) is set to position 1 or 2; see "Boot Mode Select Switch (SW2)" on page 2-8.

Flash memory code can be modified. For instructions, refer to the online help and example program included in the EZ-KIT Lite installation directory.

SPI Flash Memory Interface

SPI flash memory of the ADSP-BF506F EZ-KIT Lite is a 16 Mb Numonyx M25P16 device. The device is selected via SPI0_SEL1.

SPI flash memory is pre-loaded with boot code for the power-on-self test (POST) program. For more information, refer to "Power-On-Self Test" on page 1-14.

Power-On-Self Test

The power-on-self-test program (POST) tests all EZ-KIT Lite peripherals and validates functionality as well as connectivity to the processor. Once assembled, each EZ-KIT Lite if fully tested for an extended period of time with a POST. All EZ-KIT Lite boards are shipped with a POST pre-loaded into one of their on-board flash memories. The POST is executed by resetting the board and pressing the proper push button(s). The POST also can be used for reference for a custom software design or hardware troubleshooting. Note that the source code for the POST program is included in the installation directory along with the readme file, which describes how the board is configured to run a POST.

The POST program is only available when using VisualDSP++.

LEDs and Push Buttons

The EZ-KIT Lite provides two push buttons and three LEDs for general-purpose I/O.

The three LEDs, labeled `LED2` through `LED4`, are accessed via the `PF0-2` GPIO ports of the processor. For information on how to program the flag pins, refer to the *ADSP-BF50x Blackfin Processor Hardware Reference Manual*.

The two general-purpose push buttons are labeled `PB0` and `PB1`. The status of each individual button can be read through programmable flag inputs `PF3` and `PF4`. The flag reads a '1' when a corresponding switch is being pressed. When the switch is released, the flag reads a '0'. A connection between the push buttons and processor inputs is established through a DIP switch, `SW3`. The switch should be turned off when another source is driving the signals.

An example program is included in the ADSP-BF506F installation directory to demonstrate functionality of the LEDs and push buttons.

The LED and push button signals also are connected to the expansion interface II; see "Expansion Interface II Connectors (P2 and P4)" on page 2-18 and "Expansion Interface II Connector (P3)" on page 2-18.

JTAG Interface

The board contains an on-board debug agent that operates via a USB port. The ADSP-BF506F EZ-KIT Lite receives all of its power via USB; therefore, no power supply is required.

For debugging, the JTAG connector (P1) allows an external emulator (USB-ICE or HPUSB-ICE) to connect to the board, instead of the on-board debug agent.

For more information about emulators, contact Analog Devices or go to: http://www.analog.com/processors/tools/blackfin.

Expansion Interface II

The expansion interface II allows an Analog Devices EZ-Extender® or a custom-design daughter board to be tested across various hardware platforms that have the same expansion interface.

The expansion interface II implemented on the ADSP-BF506F EZ-KIT Lite consists of three connectors, which are 0.1 in. shrouded headers (P2-4). The connectors contain a majority of the ADSP-BF506F processor's signals. For pinout information, go to "ADSP-BF506F EZ-KIT Lite Schematic" on page B-1. The mechanical dimensions of the expansion connectors can be obtained by contacting "Technical Support".

For more information about daughter boards, visit the Analog Devices Web site at:
http://www.analog.com/processors/tools/blackfin.

Limits to current and interface speed must be taken into consideration when using the expansion interface. Current for the expansion interface II is sourced from the EZ-KIT Lite; therefore, the current should be limited to 1A for 5V and 500 mA for the 3.3V planes. If more current is required, then a separate power connector and a regulator must be designed on a daughter card. Additional circuitry can add extra loading to signals, decreasing their maximum effective speed.

Analog Devices does not support and is not responsible for the effects of additional circuitry.

VDDINT Programmable Regulator

By default, the EZ-KIT Lite runs at 1.4V. The board contains a programmable regulator that supplies the processor's core with a voltage between 1.1 and 1.4. The voltage is adjusted by writing to the AD5258 digital potentiometer via the 2-wire interface (TWI) signals.Table 1-3 shows the appropriate step and corresponding voltage values. For an example of writing to the AD5258 potentiometer, refer to the POST example. For more information on the acceptable voltage/frequency values, refer to the *ADSP-BF504/BF504F/BF506F Blackfin Embedded Processor Data Sheet* and *ADSP-BF50x Blackfin Processor Hardware Reference* manual. For more information about the digital potentiometer, refer to the AD5258 data sheet.

Table 1-3. Voltage Values

Step Value	Voltage (V)
57	1.10
46	1.15
36	1.20
27	1.25
18	1.30
10	1.35
3	1.40

Power Measurements

Several locations are provided for measuring the current draw from various power planes. Precision 0.1 ohm shunt resistors are available on the VDDINT, VDDEXT, and VDDFLASH voltage domains. For current draw, the jumper is removed, voltage across the resistor can be measured using an oscilloscope, and the value of the resistor can be measured using a precision multi-meter. Once the voltage and resistance are measured, the current can be calculated by dividing the voltage by the resistance. For the highest accuracy, a differential probe should be used for measuring the voltage across the resistor.

Example Programs

Example programs are provided with the ADSP-BF506F EZ-KIT Lite to demonstrate various capabilities of the product. The programs are included in the product installation kit and can be found in the `Examples` folder of the installation. Refer to a readme file provided with each example for more information.

CCES users are encouraged to use the example browser to find examples included with the EZ-KIT Lite Board Support Package.

Board Design Database

A `.zip` file containing all of the electronic information required for the design, layout, fabrication and assembly of the product is available for download from the Analog Devices board design database at: `http://www.analog.com/board-design-database`.

2 ADSP-BF506F EZ-KIT LITE HARDWARE REFERENCE

This chapter describes the hardware design of the ADSP-BF506F EZ-KIT Lite board.

The following topics are covered.

- "System Architecture" on page 2-2
  Describes the board's configuration and explains how the board components interface with the processor.
- "Programmable Flags" on page 2-3
  Shows the locations and describes the programming flags (PFs).
- "Push Buttons and Switches" on page 2-7
  Shows the locations and describes the push buttons and switches.
- "Jumpers" on page 2-11
  Shows the locations and describes the configuration jumpers.
- "LEDs" on page 2-14
  Shows the locations and describes the LEDs.
- "Connectors" on page 2-16
  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 Lite board (Figure 2-1).

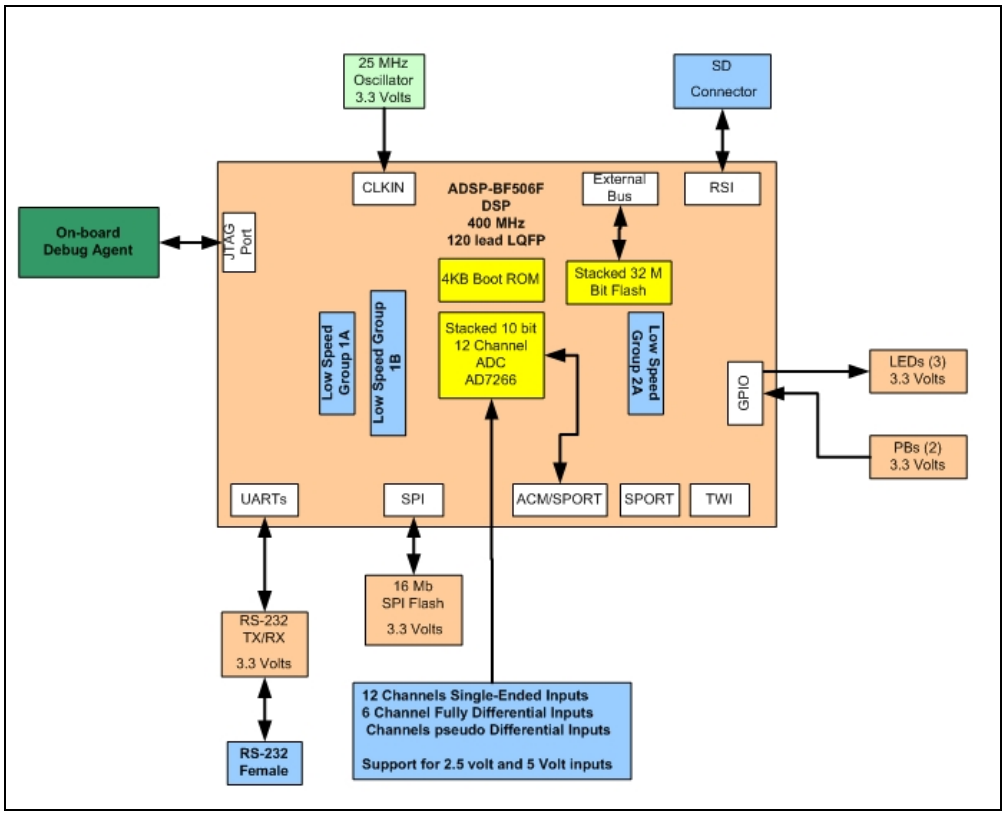

Figure 2-1. System Architecture

The EZ-KIT Lite is designed to demonstrate the ADSP-BF506F Blackfin processor capabilities. The processor has an I/O voltage of 3.3V. The core voltage of the processor is controlled by an Analog Devices ADP1715 low dropout regulator (LDO) and an Analog Devices AD5258 digipot, which is configurable over the 2-wire interface (TWI) signals. Refer to the

power-on-self test (POST) example in the ADSP-BF506F installation directory for information on how to set up the TWI interface.

The core voltage and clock rate can be set up on the fly by the processor. The input clock is 25 MHz. The default boot mode for the processor is SPI flash boot. See "Boot Mode Select Switch (SW2)" for information on how to change the default boot mode.

Programmable Flags

The processor has 35 general-purpose input/output (GPIO) signals spread across three ports (PF, PG, and PH). The pins are multi-functional and depend on the ADSP-BF506F processor setup. The following tables show how the programmable flag pins are used on the EZ-KIT Lite.

- PF programmable flag pins – Table 2-1
- PG programmable flag pins – Table 2-2
- PH programmable flag pins – Table 2-3

Table 2-1. Port F Programmable Flag Connections

Processor Pin	Other Processor Function	EZ-KIT Lite Function
PF0	TSCLK0/UA0_RX_ALT/TMR6/ CUD0	Default: LED0 Land grid array, expansion interface II
PF1	RSCLK0/UA0_TX_ALT/TMR5/ CDG0	Default: LED1 Land grid array, expansion interface II
PF2	DT0PRI/PWM0_BH/PPI_D8/ CZM0	Default: LED2 Land grid array, expansion interface II
PF3	TFS0/PWM0_BL/PPI_D9/ CDG0	Default: PB0 Land grid array, expansion interface II
PF4	RFS0/PWM0_CH/PPI_D10/ TACLK0	Default: PB1 Land grid array, expansion interface II

Table 2-1. Port F Programmable Flag Connections (Cont'd)

Processor Pin	Other Processor Function	EZ-KIT Lite Function
PF5	RFS0/PWM0_CH/PPI_D10/ TACLK0	Default: not used Land grid array, expansion interface II
PF6	UA1_TX/PWM0_TRIP/ PPI_D12	Default: not used Land grid array, expansion interface II
PF7	UA1_RX/PWM0_SYNC/ PPI_D13/TACI3	Default: not used Land grid array, expansion interface II
PF8	UA1_RTS/DT0SEC/PPI_D7	Default: not used Land grid array, expansion interface II
PF9	UA1_CTS/DR0SEC/PPI_D6/ CZM0	Default: not used Land grid array, expansion interface II
PF10	SPI0_SCK/TMR2/PPI_D5	Default: SPI0_SCK Land grid array, expansion interface II
PF11	SPI0_MISO/PWM0_TRIP/ PPI_D4/TACLK2	Default: SPI0_MISO Land grid array, expansion interface II
PF12	SPI0_MOSI/PWM0_SYNC/ PPI_D3	Default: SPI0_MOSI Land grid array, expansion interface II
PF13	SPI0_SEL1/TMR3/PPI_D2/ SPI0_SS	Default: SPI0_SEL1 Land grid array, expansion interface II
PF14	SPI0_SEL2/PWM0_AH/ PPI_D1	Default: not used Land grid array, expansion interface II
PF15	SPI0_SEL3/PWM0_AL/ PPI_D0	Default: not used Land grid array, expansion interface II

Table 2-2. Port G Programmable Flag Connections

Processor Pin	Other Processor Function	EZ-KIT Lite Function
PG0	SPI1_SEL3/TMRCLK/ PPI_CLK/ UA1_RX_ALT/ TACI4	Default: CAN_ERR Land grid array, expansion interface II
PG1	SPI1_SEL2/PPI_FS3/ CAN_RX/ TACI5	Default: CAN_RX Land grid array, expansion interface II

Table 2-2. Port G Programmable Flag Connections (Cont'd)

Processor Pin	Other Processor Function	EZ-KIT Lite Function
PG2	SPI1_SEL1/TMR4/CAN_TX/ SPI1_SS	Default: CAN_TX Land grid array, expansion interface II
PG3	HWAIT/SPI1_SCK/DT1SEC/ UA1_TX_ALT	Default: not used Land grid array, expansion interface II
PG4	SPI1_MOSI/DR1SEC_ALT/ PWM1_SYNC/TACLK6	Default: SD_WP Land grid array, expansion interface II
PG5	SPI1_MISO/TMR7/ PWM1_TRIP	Default: SD_CD Land grid array, expansion interface II
PG6	PG6 ACM_SGLDIFF/SD_D3/ PWM1_AH	Default: ACM_SGLDIFF SD_D3, land grid array, expansion interface II
PG7	ACM_RANGE/SD_D2/PWM1_AL	Default: ACM_RANGE SD_D2, land grid array, expansion interface II
PG8	DR1SEC/SD_D1/PWM1_BH	Default: ADC_DOUTB SD_D1, land grid array, expansion interface II
PG9	DR1PRI/SD_D0/PWM1_BL	Default: ADC_DOUTA SD_D0, land grid array, expansion interface II
PG10	RFS1/SD_CMD/PWM1_CH/ TACI6	Default: ADC_CS SD_CMD, land grid array, expansion interface II
PG11	RSCLK1/SD_CLK/PWM1_CL/ TACLK7	Default: ADC_SCLK SD_CLK, land grid array, expansion interface II
PG12	UA0_RX/SD_D4/PPI_D15/ TACI2	Default: UART0_RX DS_D4, land grid array, expansion interface II
PG13	UA0_TX/SD_D5/PPI_D14/ CZM1	Default: UART0_TX DS_D5, land grid array, expansion interface II
PG14	/UA0_RTS/SD_D6/TMR0/ PPI_FS1/CUD1	Default: UART0_RTS DS_D5, land grid array, expansion interface II
PG15	/UA0_CTS/SD_D7/TMR1/ PPI_FS2/CDG1	Default: UART0_CTS DS_D7, land grid array, expansion interface II

Table 2-3. Port H Programmable Flag Connections

Processor Pin	Other Processor Function	EZ-KIT Lite Function
PH0	ACM_A2/DT1PRI/SPI0_SEL3 /WAKEUP	Default: ACM_A2 Land grid array, expansion interface II
PH1	ACM_A1/TFS1/ SPI1_SEL3_ALT/TACLK3	Default: ACM_A1 Land grid array, expansion interface II
PH2	ACM_A0/TSCLK1/ SPI1_SEL2_ALT/TACI7	Default: ACM_A0 Land grid array, expansion interface II

Push Buttons and Switches

This section describes operation of the push buttons and switches. The push button and switch locations are shown in Figure 2-2.

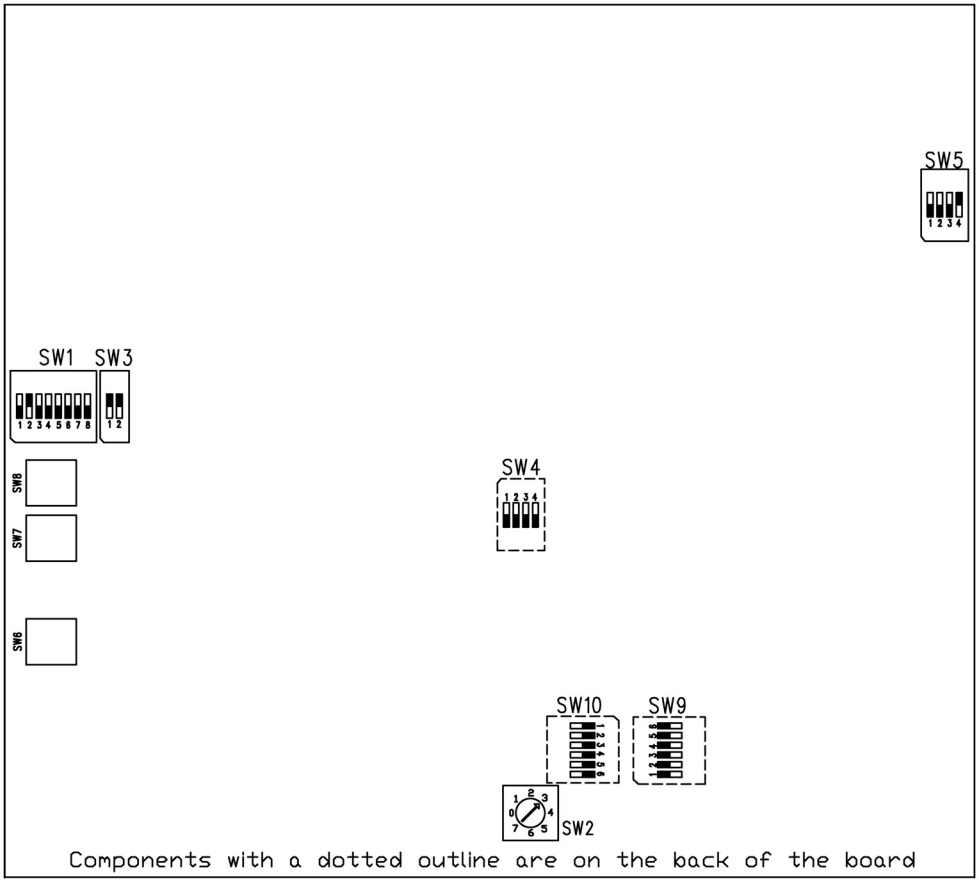

Figure 2-2. Push Button and Switch Locations

UART Setup Switch (SW1)

The UART setup switch (SW1) configures the UART0 signals between the DCE connector (J1) and processor. Table 2-4 shows the switch settings.

Table 2-4. UART Setup Switch (SW1)

SW1 Position	Function
1 and 3	Enable flow control
2	Disconnects the UART_RX signal from the processor; the UART_RX signal can be used for another function
4	Connects the RTS and CTS signals together
5	Allows the host to reset the EZ-KIT Lite via the CTS signal
6 and 7	Selects the source for the CTS signal
8	Loops the TX and RX signals together for testing

Boot Mode Select Switch (SW2)

The boot mode select switch (SW2) determines the boot mode of the processor. Table 2-5 shows the available boot mode settings. By default, the ADSP-BF506F processor boots from SPI flash memory.

Table 2-5. Boot Mode Select Switch (SW2)

SW2 Position	Processor Boot Mode
0	Idle—no boot
1	Boots from stacked parallel flash in asynchronous mode
2	Boots from stacked parallel flash in synchronous mode
3	Boots through SPI0 master from SPI memory
4	Boots through SPI0 slave from host device
5	Boots through PPI from host

Table 2-5. Boot Mode Select Switch (SW2) (Cont'd)

SW2 Position	Processor Boot Mode
6	Reserved
7	Boots through UART0 slave from host device

Push Button Enable Switch (SW3)

The push button enable switch (SW3) disconnects the associated push button circuit from the general-purpose I/O (GPIO) pins of the processor and allows the signals to be used on the expansion interface.

ADC Enable Switch (SW4)

The ADC enable switch (SW4) disconnects the ADC from the SPORT1 interface of the processor and allows the ADC signals to be used on the SD connector or the expansion interface.

CAN Enable Switch (SW5)

The CAN enable switch (SW5) disconnects the CAN transceiver from the processor and allows the CAN signals to be used on the expansion interface.

Reset Push Button (SW6)

The reset push button (SW6) resets the processor via a hardware reset. The reset push button does not reset the on-board debug agent. The only way to reset the debug agent is to cycle power.

Programmable Flag Push Buttons (SW7–8)

Two momentary push buttons (SW7 and SW8) are provided for general-purpose user input. The buttons are connected to the PF3-4 GPIO pins of the

processor. The push buttons are active high and, when pressed, send a high (1) to the processor. The GPIO enable switch (SW3) disconnects the push buttons from the associated push button signals (refer to "Push Button Enable Switch (SW3)" on page 2-9 for more information).

ADC Loopback Switches (SW9–10)

The ADC loopback switches (SW9 and SW10) are used for testing only. The switches connect a test signal to the ADC inputs.

Jumpers

This section describes functionality of the configuration jumpers. Figure 2-3 shows the jumper locations.

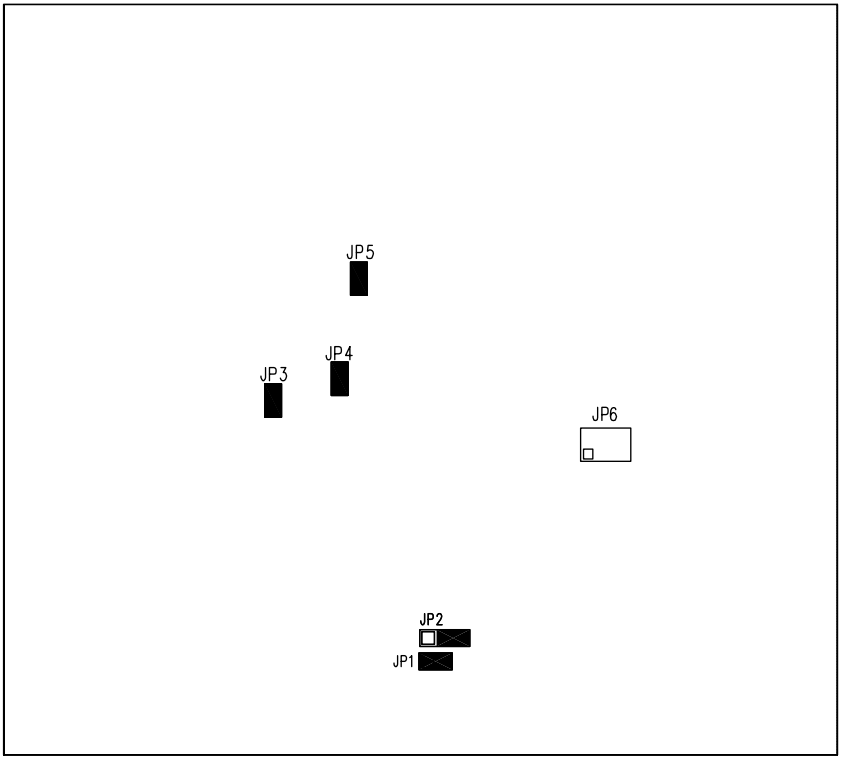

Figure 2-3. Configuration Jumper Locations

SPI FLASH CS Enable Jumper (JP1)

The SPI flash CS enable jumper (JP1) connects the SPI0_SEL1 signal to SPI flash memory. By default, JP1 is installed, and SPI flash is connected.

Voltage Reference Select Jumper (JP2)

The voltage reference select jumper (JP2) selects between a 2.5V on-chip reference and an external voltage reference. When the jumper is installed on positions 2 and 3, the on-chip 2.5V reference is used. When the jumper is installed on positions 1 and 2, an external reference can be connected to the ADC through the DCAPA and DCAPB signals (see "ADC Voltage Reference (JP6)" on page 2-13). By default, JP2 is installed on positions 2 and 3.

VDDEXT Power Jumper (JP3)

The VDDEXT power jumper (JP3) is used to measure the processor's I/O voltage and current. By default, JP3 is ON, and the current flows through the two-pin IDC header. To measure power, remove the jumper on JP3 and measure the voltage across the precision resistor and resistance value. For more information, refer to "Power Measurements" on page 1-17.

VDDINT Power Jumper (JP4)

The VDDINT power jumper (JP4) is used to measure the processor's core voltage and current. By default, JP4 is ON, and the current flows through the two-pin IDC header. To measure power, remove the jumper on JP4 and measure the voltage across the precision resistor and resistance value. For more information, refer to "Power Measurements" on page 1-17.

VDDFLASH Power Jumper (JP5)

The VDDFLASH power jumper (JP5) is used to measure the internal parallel flash voltage and current. By default, JP5 is ON, and the current flows through the two-pin IDC header. To measure power, remove the jumper on JP5 and measure the voltage across the precision resistor and resistance value. For more information, refer to "Power Measurements" on page 1-17.

ADC Voltage Reference (JP6)

The ADC voltage reference jumper (JP6) is used to supply a reference voltage to the ADC. In order to use an external voltage reference, a jumper must be placed on positions 1 and 2 of JP2. To use the on-board AD780 precision voltage reference, install a jumpers at position 1, 2 and 3, 4. To supply your own voltage reference, remove all jumpers from JP6 and connect your voltage reference to pins 1 and 3. By default, no jumpers are installed on JP6.

LEDs

This section describes the on-board LEDs. Figure 2-4 shows the LED locations.

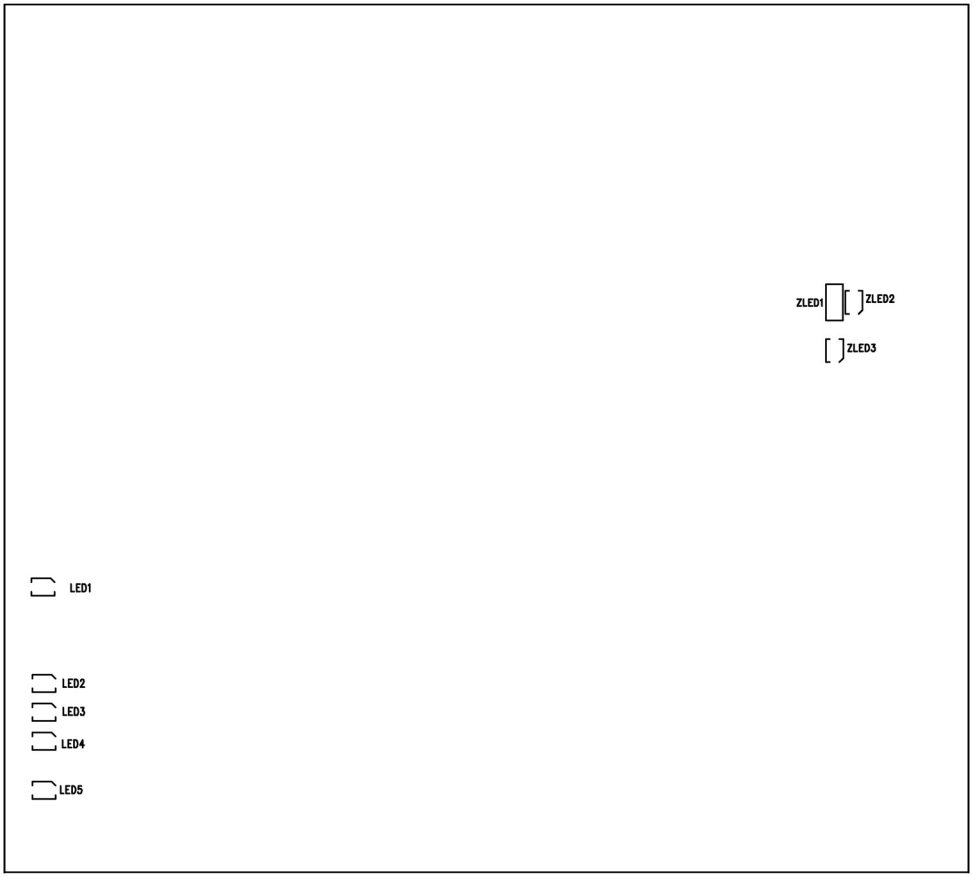

Figure 2-4. LED Locations

Reset LED (LED1)

When LED1 is lit, it indicates that the master reset of all the major ICs is active. The reset signal is controlled by the Analog Devices ADM708 supervisory reset circuit.

GPIO LEDs (LED2–4)

Three LEDs connect to the three general-purpose I/O pins of the processor (see Table 2-6). The LEDs are active high and lit by writing a "1" to the correct programmable flag signal.

Table 2-6. GPIO LEDs

LED Reference Designator	Processor Programmable Flag Pin
LED2	PF0
LED3	PF1
LED4	PF2

Power LED (LED5)

When LED5 is lit solid, it indicates that power is being properly supplied to the board.

Connectors

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

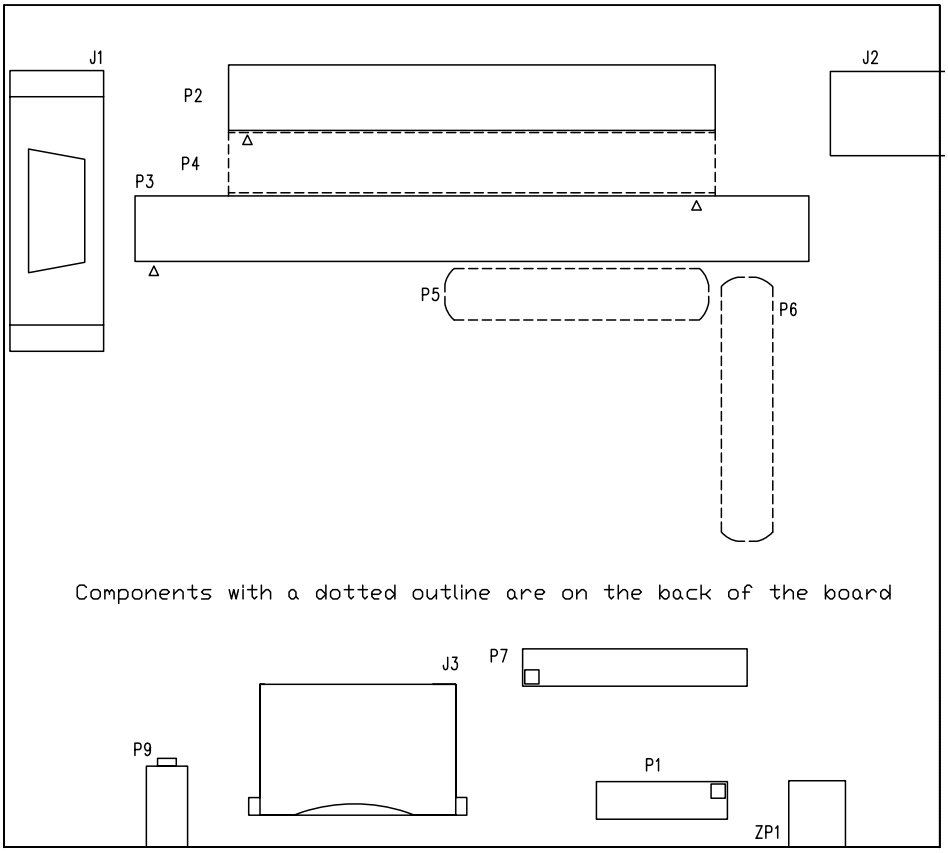

Figure 2-5. Connector Locations

RS-232 Connector (J1)

Part Description	Manufacturer	Part Number
DB9, female, vertical mount	NORCOMP	191-009-213-L-571
Mating Cable		
2m female-to-female cable	DIGI-KEY	AE1020-ND

CAN Connector (J2)

Part Description	Manufacturer	Part Number
RJ11 modular jack	AMP	5558872-1
Mating Cable		
4-conductor modular jack cable	L-COM	TSP3044

SD Connector (J3)

Part Description	Manufacturer	Part Number
SD 8-bit	MORETHANALL	MHC-W21-601-LF
Memory Card		
256 MB	SANDISK-STACK	SDSDB-256-A10

JTAG Connector (P1)

The JTAG header (P1) is the connecting point between the JTAG interface and ADSP-BF506F processor.

Pin 3 is missing to provide keying. Pin 3 in the mating connector should have a plug.

When an emulator is used with the EZ-KIT Lite, the on-board debug agent is bypassed.

Expansion Interface II Connectors (P2 and P4)

P2 and P4 are board-to-board connectors providing signals for the SPI, TWI, UART, SPORT, and GPIO signals of the processor. The connectors are located on the upper edge of the board (one connector is on the top and one is on the bottom). For more information, see "Expansion Interface II" on page 1-15.

Part Description	Manufacturer	Part Number
50-position 0.1", SMT header	SAMTEC	TSSH-125-01-L-DV-A
Mating Connector		
50-position 0.1", SMT socket	SAMTEC	SSW-125-22-F-D-VS

Expansion Interface II Connector (P3)

P3 is a board-to-board connector providing signals for the PPI and GPIO signals of the processor. The connector is located on the upper edge of the board. For more information, see "Expansion Interface II" on page 1-15.

Part Description	Manufacturer	Part Number
70-position 0.1", SMT header	SAMTEC	TSSH-135-01-L-DV-A
Mating Connector		
70-position 0.1", SMT socket	SAMTEC	SSW-135-22-F-D-VS

DMAX Land Grid Array Connectors (P5–6)

The DMAX land grid array areas (P5 and P6) are intended for the probing of the processor signals. The pads are exposed and designed to attach a Tektronix logic analyzer to the connectors listed in the following table. For more information about the land grid array, consult the Tektronix web site.

Part Description	Manufacturer	Part Number
Primary retention	Tektronix	020290800
Alternate retention	Tektronix	020291000

ADC Input Connector (P7)

Part Description	Manufacturer	Part Number
24-position 0.1”, TH header	SAMTEC	TSSH-112-01-L-D

Power Connector (P9)

Part Description	Manufacturer	Part Number
0.65 mm power jack	CUI	045-0883R
Mating Connector		
5.0VDC@3.6A power supply	GLOBETEK	GS-1750(R)

A ADSP-BF506F EZ-KIT LITE BILL OF MATERIALS

The bill of materials corresponds to "ADSP-BF506F EZ-KIT Lite Schematic" on page B-1.

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
1	1	74LVC14A SOIC14	U1	TI	74LVC14AD
2	1	IDT74FCT3244 APY SSOP20	U5	IDT	IDT74FCT3244APYG
3	1	25MHZ OSC003	U15	EPSON	SG-8002CA MP
4	2	SN74LVC1G08 SOT23-5	U18,U20	TI	SN74LVC1G08DBVR
5	1	TJA1041 SOIC14	U19	PHILIPS	TJA1041T/N1
6	1	SI4411DY SO-8	U3	VISHAY	Si4411DY-T1-E3
7	1	BF506F M25P16 U4	U4	ST MICRO	M25P16-VMW6G
8	1	MIC94042 MLF4	U6	MICREL	MIC94042YFL
9	1	ADM708SARZ SOIC8	U17	ANALOG DEVICES	ADM708SARZ
10	1	ADM3202ARNZ SOIC16	U16	ANALOG DEVICES	ADM3202ARNZ
11	1	ADSP-BF506F LQFP120	U7	ANALOG DEVICES	ADSPBF506FBSWZ-ENG
12	1	ADP1864AUJZ SOT23-6	VR1	ANALOG DEVICES	ADP1864AUJZ-R7

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
13	1	ADP1715 MSOP8	VR3	ANALOG	ADP1715ARMZ-R7
14	1	AD5258 MSOP10	U2	ANALOG DEVICES	AD5258BRMZ10
15	1	ADP1715 MSOP8	VR4	ANALOG DEVICES	ADP1715ARMZ-1.8-R7
16	6	AD8022 MSOP8	U9-14	ANALOG DEVICES	AD8022ARMZ
17	1	ADP1613 MSOP8	VR2	ANALOG DEVICES	ADP1613ARMZ-R7
18	1	DIP8 SWT016	SW1	C&K	TDA08H0SB1
19	2	DIP6 SWT017	SW9-10	CTS	218-6LPST
20	2	DIP4 SWT018	SW4-5	ITT	TDA04HOSB1
21	1	DB9 9PIN CON038	J1	NORCOMP	191-009-213-L-571
22	1	RJ11 4PIN CON039	J2	TYCO	5558872-1
23	1	DIP2 SWT020	SW3	C&K	CKN9064-ND
24	4	IDC 2X1 IDC2X1	JP1,JP3-5	FCI	90726-402HLF
25	1	IDC 3X1 IDC3X1	JP2	FCI	90726-403HLF
26	1	IDC 7X2 IDC7X2	P1	SAMTEC	TSW-107-07-T-D
27	1	IDC 12X2 IDC12X2	P7	SAMTEC	SSW-112-01-T-D
28	1	3A RESETABLE FUS004	F1	TYCO	SMD300F-2
29	6	IDC 2PIN_JUMPER_SHORT	SJ1-6	DIGI-KEY	S9001-ND

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
30	1	PWR .65MM CON045	P9	DIG	CP1-023-ND
31	3	MOMENTARY SWT024	SW6-8	PANASONIC	EVQ-Q2K03W
32	1	ROTARY SWT027	SW2	COPAL	S-8110
33	1	SD_CONN 8-BIT CON067	J3	MORETHA-NALL	MHC-W21-601-LF
34	3	YELLOW LED001	LED2-4	PANASONIC	LN1461C
35	2	100 1/10W 5% 0805	R92,R94	VISHAY	CRCW0805100RJNEA
36	2	600 100MHZ 500MA 1206	FER2-3	STEWARD	HZ1206B601R-10
37	2	0 1/10W 5% 0805	R71,C101	VISHAY	CRCW08050000Z0EA
38	1	190 100MHZ 5A FER002	FER4	MURATA	DLW5BSN191SQ2
39	2	0.47UF 16V 10% 0805	C76-77	AVX	0805YC474KAT2A
40	2	1UF 10V 10% 0805	C87-88	AVX	0805ZC105KAT2A
41	8	10UF 6.3V 10% 0805	C7,C13,C21,C33,C71, C73-74,C121	AVX	08056D106KAT2A
42	1	4.7UF 6.3V 10% 0805	C113	AVX	08056D475KAT2A
43	34	0.1UF 10V 10% 0402	C4-6,C9-12,C20,C22-24,C31-32,C37-48,C70 ,C72,C75,C89-92,C109 ,C118	AVX	0402ZD104KAT2A
44	24	0.01UF 16V 10% 0402	C2-3,C8,C14-19,C25-30,C81-86,C93,C108, C122	AVX	0402YC103KAT2A

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
45	42	10K 1/16W 5% 0402	R3-6,R9,R11,R14,R19, R27-38,R69-70,R72-73, R79,R81-83,R88-91, R95,R98-101,R108, R128,R133-134,R137	VISHAY	CRCW040210K0FKE D
46	3	4.7K 1/16W 5% 0402	R15-17	VISHAY	CRCW04024K70JNE D
47	25	0 1/16W 5% 0402	R21-22,R25-26,R39-40, R42-43,R45-46,R49-50, R52-53,R55-56,R58-61, R63-64,R66-67,R130	PANASONIC	ERJ-2GE0R00X
48	11	33 1/16W 5% 0402	R7-8,R18,R20,R135-136,R138-142	VISHAY	CRCW040233R0JNEA
49	2	2.2UF 10V 10% 0805	C119-120	AVX	0805ZD225KAT2A
50	2	1A SK12 DO-214AA	D8,D10	DIODES INC	B120B-13-F
51	24	10PF 50V 5% 0805	C34-36,C49-69	AVX	08055A100JAT2A
52	1	1UF 16V 10% 0603	C96	PANASONIC	ECJ-1VB1C105K
53	1	68PF 50V 5% 0603	C112	AVX	06035A680JAT2A
54	3	4.7UF 6.3V 20% 0603	C106-107,C110	PANASONIC	ECJ-1VB0J475M
55	1	470PF 50V 5% 0603	C111	AVX	06033A471JAT2A
56	1	220UF 6.3V 20% D2E	CT1	SANYO	10TPE220ML
57	5	330 1/10W 5% 0603	R80,R84-87	VISHAY	CRCW0603330RJNEA
58	1	0 1/10W 5% 0603	R111	PHYCOMP	232270296001L

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
59	15	10 1/10W 5% 0603	R23-24,R41,R44,R47-48,R51,R54,R57,R62,R65,R68,R75,R77,R113	VISHAY	CRCW060310R0JNEA
60	1	4700PF 16V 10% 0603	C79	DIGI-KEY	311-1083-2-ND
61	2	100PF 50V 5% 0603	C78,C80	AVX	06035A101JAT2A
62	1	1000PF 50V 5% 0603	C104	PANASONIC	ECJ-1VC1H102J
63	2	62.0 1/10W 1% 0603	R74,R76	DIGI-KEY	311-62.0HRTR-ND
64	1	4.99K 1/16W 1% 0603	R112	VISHAY	CRCW06034K99FKEA
65	1	24.9K 1/10W 1% 0603	R123	DIGI-KEY	311-24.9KHTR-ND
66	5	0.05 1/2W 1% 1206	R121-122,R125-126,R131	SEI	CSF 1/2 0.05 1%R
67	7	10UF 16V 10% 1210	C97-100,C102,C114,C117	AVX	1210YD106KAT2A
68	1	GREEN LED001	LED5	PANASONIC	LN1361CTR
69	1	RED LED001	LED1	PANASONIC	LN1261CTR
70	2	1000PF 50V 5% 1206	C115-116	AVX	12065A102JAT2A
71	1	255.0K 1/10W 1% 0603	R127	VISHAY	CRCW06032553FK
72	1	80.6K 1/10W 1% 0603	R124	DIGI-KEY	311-80.6KHRCT-ND
73	1	22000PF 25V 10% 0402	C94	DIGI-KEY	490-3252-1-ND

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
74	2	5A MBRS540T3G SMC	D6-7	ON SEMI	MBRS540T3G
75	1	2.5UH 30% IND013	L3	COILCRAFT	MSS1038-252NLB
76	1	33.0K 1/16W 1% 0402	R2	ROHM	MCR01MZPF3302
77	1	1.0K 1/16W 1% 0402	R120	PANASONIC	ERJ-2RKF1001X
78	1	220PF 50V 10% 0402	C1	DIGI-KEY	311-1035-2-ND
79	2	100K 1/16W 5% 0402	R1,R114	DIGI-KEY	541-100KJTR-ND
80	1	2.2UF 25V 10% 0805	C103	DIGI-KEY	490-3331-1-ND
81	2	1A MBR130LSFT1G SOD-123FL	D4-5	ON SEMI	MBR130LSFT1G
82	2	1UH 20% IND019	L1-2	COILCRAFT	ME3220-102MLB
83	2	33 1/16W 5% RNS003	RN1-2	PANASONIC	EXB-2HV330JV
84	3	1.2K 1/16W 1% 0402	R12-13,R117	VISHAY	CRCW04021K20FKED
85	2	4.3 1/4W 5% 1206	R116,R119	PANASONIC	ERJ-8GEYJ4R3V
86	1	2.67K 1/16W 1% 0402	R118	PANASONIC	ERJ-2RKF2671X
87	1	22UH 20% IND024	L4	COILCRAFT	MSD7342-223MLC
88	1	330 100MHZ 1.5A 0805	FER1	MURATA	BLM21PG331SN1D

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
89	1	3300PF 50V 5% 0603	C95	PANASONIC	ECJ-1VB1H332K
90	1	27.4K 1/10W 1% 0603	R115	PANASONIC	ERJ-3EKF2742V
91	1	20.0K 1/16W 1% 0402	R109	VISHAY	CRCW040220K0FKED
92	1	30A GSOT05 SOT23-3	D2	VISHAY	GSOT05-GS08
93	1	30A GSOT03 SOT23-3	D3	VISHAY	GSOT03-GS08
94	1	40A ESD5Z2.5T1 SOD-523	D9	ON SEMI	ESD5Z2.5T1G
95	1	7A VESD01-02V-GS08 SOD-52	D1	VISHAY	VESD01-02V-GS08
96	1	IDC 25x2 IDC25x2_SMTA	P2	SAMTEC	TSSH-125-01-L-DV-A
97	1	35x2 IDC35x2_SMTA	P3	SAMTEC	TSSH-135-01-L-DV-A

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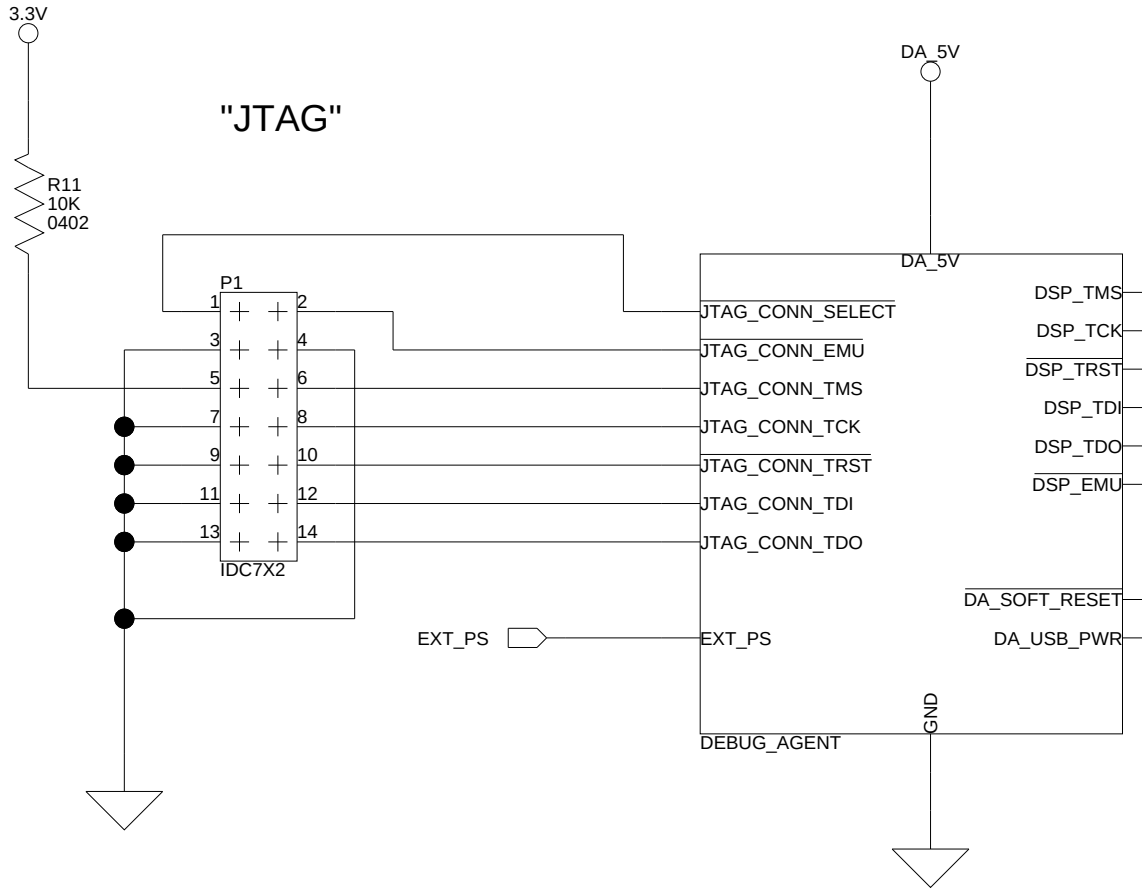
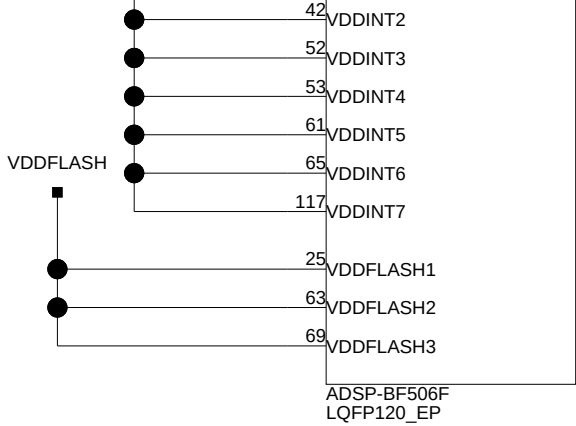
All USB interface circuitry is considered proprietary and has been omitted from this schematic.

When designing your JTAG interface please refer to the Engineer to Engineer Note EE-68 which can be found at http://www.analog.com




42
VDDINT2
52
VDDINT3
53
VDDINT4
61
VDDINT5
VDDFLASH
65
VDDINT6
117
VDDINT7
25
VDDFLASH1
63
VDDFLASH2
69
VDDFLASH3
ADSP-BF506F
LQFP120_EP

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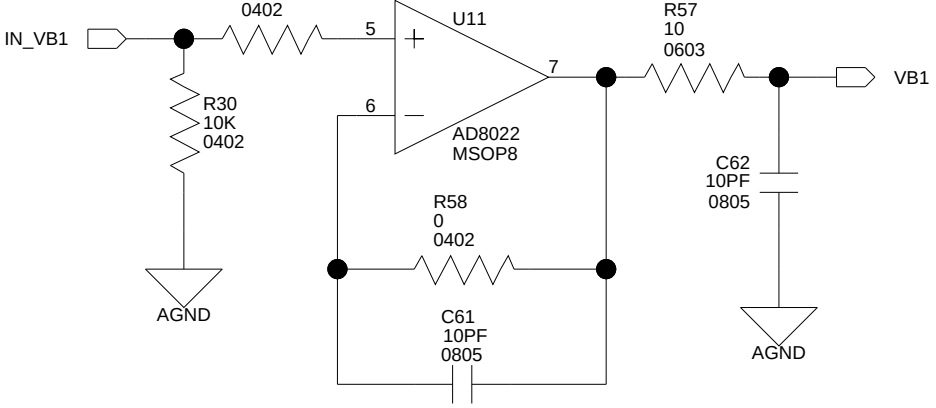
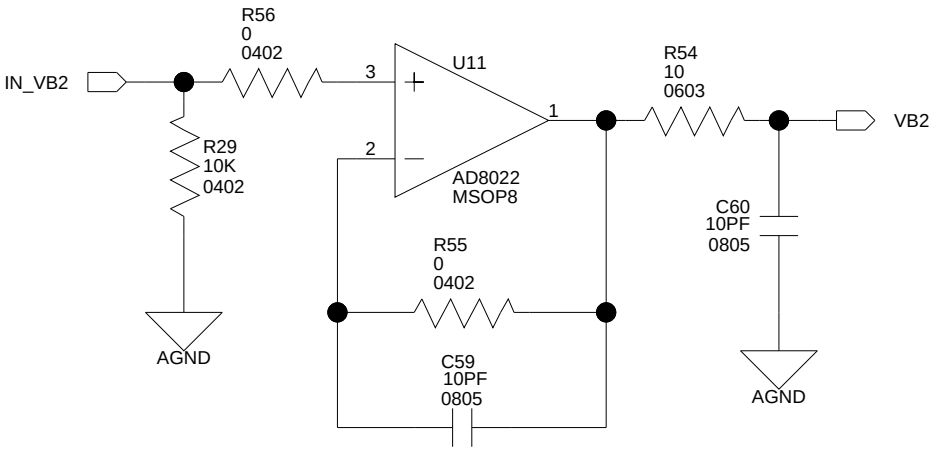
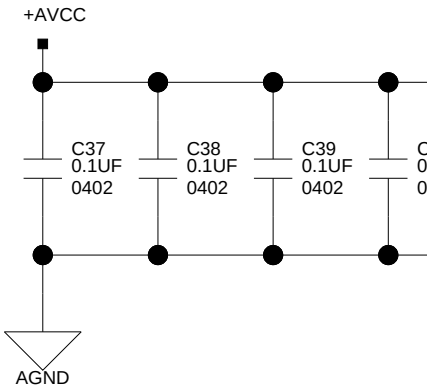
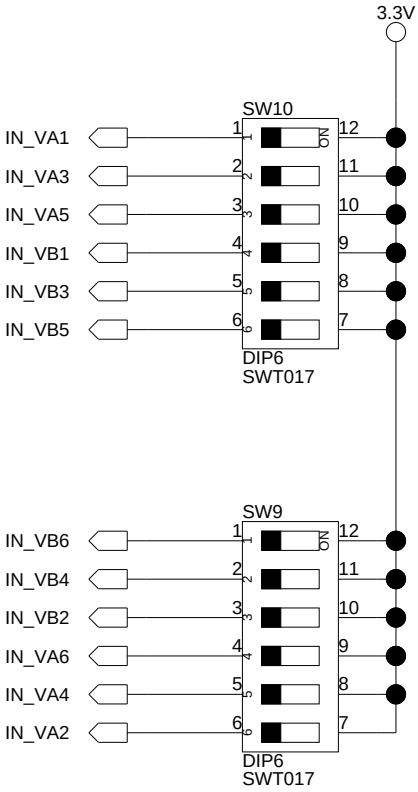

0402
IN_VB1
5
U11
R57
10
0603
7
VB1
R30
10K
0402
6
AD8022
MSOP8
C62
10PF
0805
R58
0
0402
AGND
C61
10PF
0805
AGND


R56
0
0402
IN_VB2
3
U11
R54
10
0603
1
VB2
R29
10K
0402
2
AD8022
MSOP8
C60
10PF
0805
R55
0
0402
AGND
C59
10PF
0805
AGND


+AVCC
C37
0.1UF
0402
C38
0.1UF
0402
C39
0.1UF
0402
AGND



SW9 & 10 are only used for POST

"ADC LOOPBACK"

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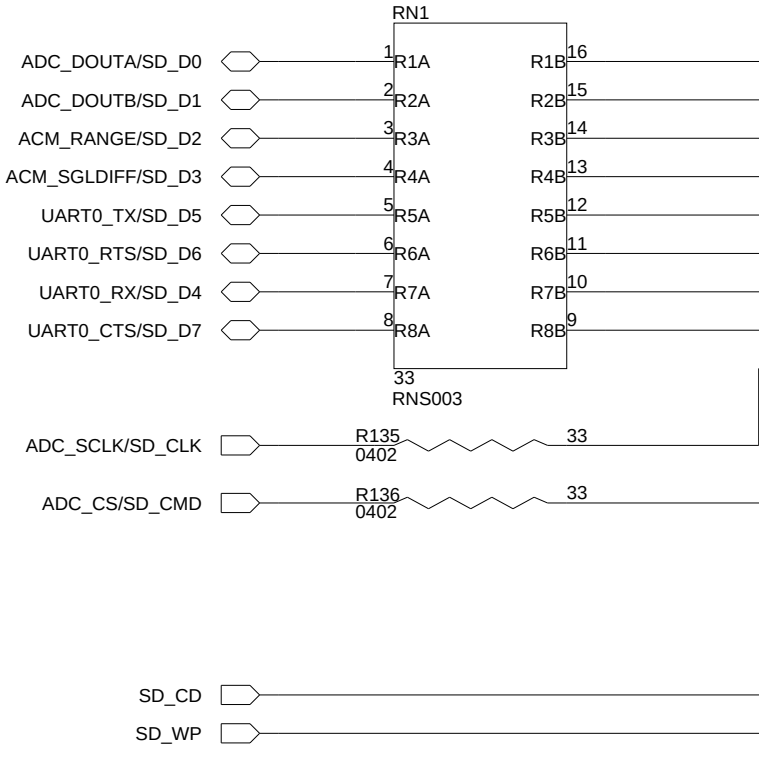
SW6
MOMENTARY
SWT024

SOT23-5

ADM708SARZ
SOIC8

"RESET"



SD_CD
SD_WP

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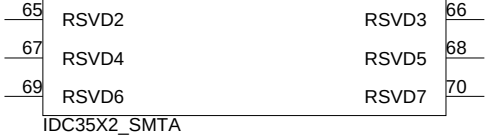
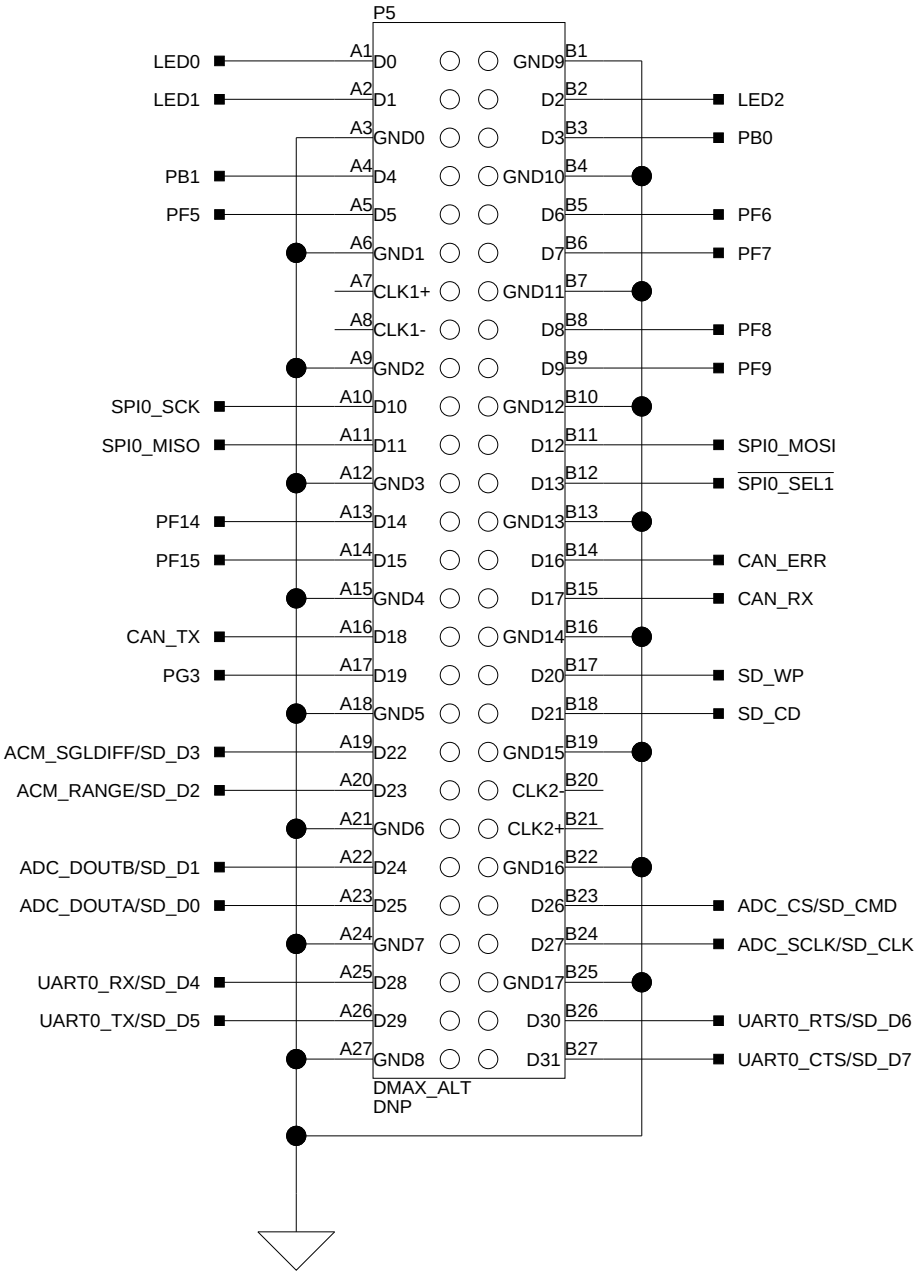

65
RSVD2
66
RSVD3
67
RSVD4
68
RSVD5
69
RSVD6
70
RSVD7
IDC35X2_SMTA


P5
LED0
A1
D0
GND9
B1
LED1
A2
D1
D2
B2
LED2
A3
GND0
D3
B3
PB0
PB1
A4
D4
GND10
B4
PF5
A5
D5
D6
B5
PF6
A6
GND1
D7
B6
PF7
A7
CLK1+
GND11
B7
A8
CLK1-
D8
B8
PF8
A9
GND2
D9
B9
PF9
SPI0_SCK
A10
D10
GND12
B10
SPI0_MISO
A11
D11
D12
B11
SPI0_MOSI
A12
GND3
D13
B12
SPI0_SEL1
PF14
A13
D14
GND13
B13
PF15
A14
D15
D16
B14
CAN_ERR
A15
GND4
D17
B15
CAN_RX
CAN_TX
A16
D18
GND14
B16
PG3
A17
D19
D20
B17
SD_WP
A18
GND5
D21
B18
SD_CD
ACM_SGLDIFF/SD_D3
A19
D22
GND15
B19
ACM_RANGE/SD_D2
A20
D23
CLK2-
B20
A21
GND6
CLK2+
B21
ADC_DOUTB/SD_D1
A22
D24
GND16
B22
ADC_DOUTA/SD_D0
A23
D25
D26
B23
ADC_CS/SD_CMD
A24
GND7
D27
B24
ADC_SCLK/SD_CLK
UART0_RX/SD_D4
A25
D28
GND17
B25
UART0_TX/SD_D5
A26
D29
D30
B26
UART0_RTS/SD_D6
A27
GND8
D31
B27
UART0_CTS/SD_D7
DMAX_ALT
DNP

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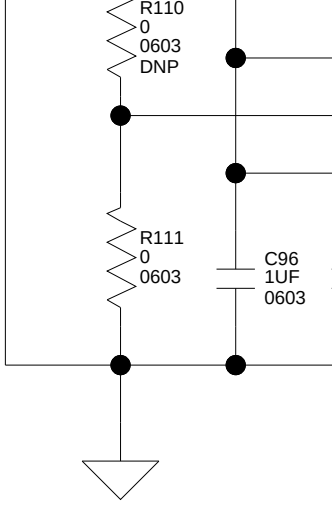

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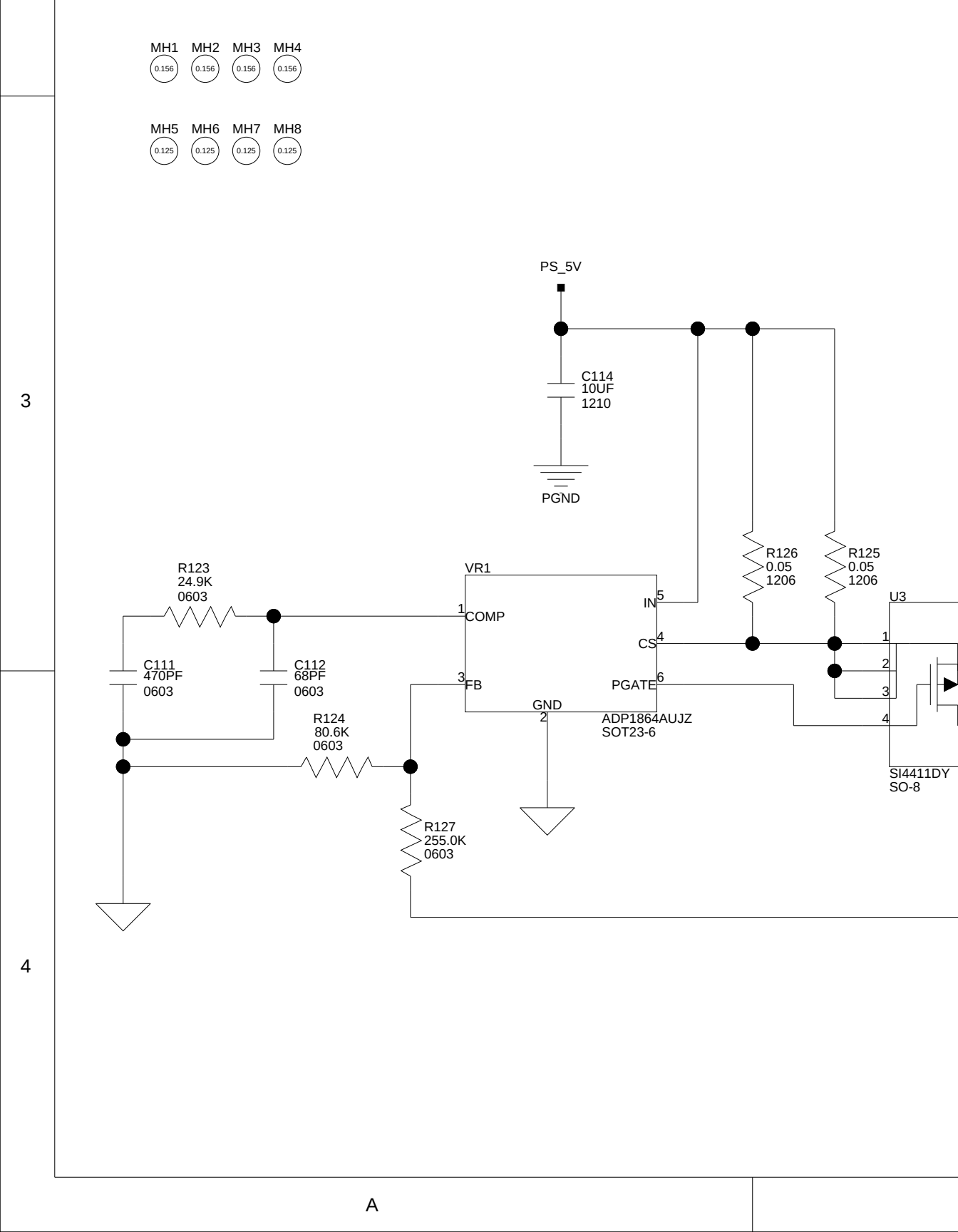
MH1
0.156
MH2
0.156
MH3
0.156
MH4
0.156
MH5
0.125
MH6
0.125
MH7
0.125
MH8
0.125
PS_5V
C114
10UF
1210
PGND
R126
0.05
1206
R125
0.05
1206
U3
R123
24.9K
0603
VR1
1
COMP
IN
5
CS
4
PGATE
6
3
FB
GND
2
ADP1864AUJZ
SOT23-6
C111
470PF
0603
C112
68PF
0603
R124
80.6K
0603
R127
255.0K
0603
1
2
3
4
SI4411DY
SO-8
3
4
A

I INDEX

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U

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