ADuCM3029 EZ-KIT® Manual

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ANALOG DEVICES

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Regulatory Compliance

The *ADuCM3029 EZ-KIT* 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 *ADuCM3029 EZ-KIT* 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 *ADuCM3029 EZ-KIT* 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 boards in the protective shiping package.	

Contents

Hardware Reference

1 Preface

Thank you for purchasing the Analog Devices, Inc. *ADuCM3029 EZ-KIT®* evaluation system.

The ADuCM3029 processor is based on the ARM® Cortex®-M3 processor core, a collection of digital peripherals, embedded SRAM and flash memory. It also contains an analog subsystem which provides clocking, reset and power management capability in addition to an ADC subsystem. The ADuCM3029 Microcontroller is designed specifically for Motor Control and Industrial applications. The EZ-KIT ships with all of the necessary components required to start the evaluation immediately.

The EZ-KIT contains an array of three connectors that support the ADF7xxx Wireless Transceiver series of daughterboard products. Refer to ADF7xxx Wireless Transceiver Daughterboard Interface for more information.

The EZ-KIT contains an expansion interface 3 (EI3) and Arduino interface. These interfaces provide for connecting with daughter boards to expand on the functionality of the EZ-KIT. Refer to Expansion Interface 3 and Arduino Interface for more information

The evaluation board is designed to be used in conjunction with the IAR Embedded Workbench®and Segger® development environment for 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

Purpose of This Manual

This manual provides instructions for installing the product hardware (board). The text describes operation and configuration of the board components and provides guidelines for running code on the board.

Intended Audience

The primary audience for this manual is a programmer who is familiar with an ARM Cortex-M3-based processor core. The ADuCM3029 family of mixed-signal control processors is based on the ARM Cortex-M3 core.

For additional information about the Analog Devices processor, see the *Hardware Reference Manual*. The document describes the core and memory architecture of the ADuCM3029 processor, but does not provide detailed programming information for the ARM core.

The applicable documentation for programming the ARM Cortex-M3 processor core includes:

- *Cortex-M3 Devices Generic User Guide*
- *Cortex-M3 Technical Reference Manual*

For more information about programming the ARM core, visit the ARM Information Center:

http://infocenter.arm.com/help/.

Manual Contents

The manual consists of:

- ***Using the board***

  Provides basic board information.

- ***Hardware Reference***

  Provides information about the hardware aspects of the board.

- ***Bill of Matrials***

  A companion file in PDF format that lists all of the components used on the board is available in the installation directory for the Board Support Package (BSP) and on http://www.analog.com/ADuCM3029EZKIT .

- ***Schematic***

  A companion file in PDF format documenting all of the circuits used on the board is available in the installation directory for the Board Support Package (BSP) and on http://www.analog.com/ADuCM3029EZKIT .

Technical Support

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

- 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++®***:

If using CrossCore Embeded 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.tools.support@analog.com

  processor.china@analog.com

- Contact your Analog Devices sales office or authorized distributor. Locate one at:

  http://www.analog.com/adi-sales

- Send questions by mail to:

  Analog Devices, Inc.

  One Technology Way

  P.O. Box 9106

  Norwood, MA 02062-9106

  USA

Supported Processors

This evaluation system supports the Analog Devices ADuCM3029 processor.

Supported Tools

Information about code development tools for the *ADuCM3029 EZ-KIT* and ADuCM3029 family of processors is available at:

http://www.analog.com/ADuCM3029EZKIT .

Product Information

Product information can be obtained from the Analog Devices Website

Analog Devices Website

The Analog Devices website, http://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.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 e-mail notifications containing updates to the web pages that meet your interests, including documentation errata against all manuals. MyAnalog.com provides access to books, application notes, data sheets, code examples, and more.

Visit MyAnalog.com 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, Inc. 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.

Notation Conventions

Text conventions used in this manual are identified and described as follows. Additional conventions, which apply only to specific chapters, may appear throughout this document.

Example	*Description*
File **>** ***Close***	Titles in bold style indicate the location of an item within the CrossCore Embedded Studio IDE'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 ellipsis; read the example as an optional comma-separated list of `this`.
`.SECTION`	Commands, directives, keywords, and feature names are in text with `letter gothic` font.
`filename`	Non-keyword placeholders appear in text with `letter gothic` font and italic style format.
NOTE:	***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.

Example	*Description*
CAUTION:	***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.
ATTENTION:	***ATTENTION:*** 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 devices users. In the online version of this book, the word ***ATTENTION:*** appears instead of this symbol.

2 Using the Board

This chapter provides information on the major components and peripherals on the board along with instrustions for installing and setting up the emualtion software.

Product Overview

The board features:

- Analog Devices ADuCM3029 processor
  - 64-pin QFN package
  - 26 MHz oscillator
- SPI Flash (`SPI2`) chip
  - 32Mb
  - Windbond W25Q32
- Accelerometer (`SPI2`)
  - Analog Devices ADXL363
- Temp sensor
  - Analog Devices ADT7420
- Universal Asynchronous Receiver/Transmitter (`UART0`)
  - FTDI FT232R USB to UART IC
  - USB mini-B
- Debug (SWD/SWO) interface
  - J-Link Lite ARM debugger
  - SWD/SWO 20-pin 0.1” header for use with IAR emulators
  - SWD/SWO 10-pin 0.05” header
- LEDs

    - Five LEDs: one power (green), one board reset (red), and three general-purpose (amber)
- Pushbuttons
    - Five pushbuttons: one reset, one wake, boot and two IRQ/Flag
- Expansion Interface 3 (EI3) connector
    - CLKOUT
    - SPORT0
    - SPI1
    - UART0
    - TWI0
    - Timers
    - GPIOs
    - `RESET`
    - `GND`/3.3V/5V output
- Arduino interface
- ADF7xxx Wireless Transceiver Daughterboard interface
- External power supply
    - CE compliant
    - 5V @ 3.6 Amps
- Power measurement
    - Jumpers for measuring processor and board current draw

Package Contents

Your *ADuCM3029 EZ-KIT* package contains the following items.

- *ADuCM3029 EZ-KIT* board
- Universal 5V DC power supply
- USB 2.0 cable
- J-Link Lite emulator

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

Default Configuration

The *ADuCM3029 EZ-KIT* board is designed to run as a standalone unit.

The ***Default Hardware Setup*** figure shows the default settings for jumpers and switches and the location of the jumpers, switches, connectors, and LEDs. Confirm that your board is in the default configuration before using the board.

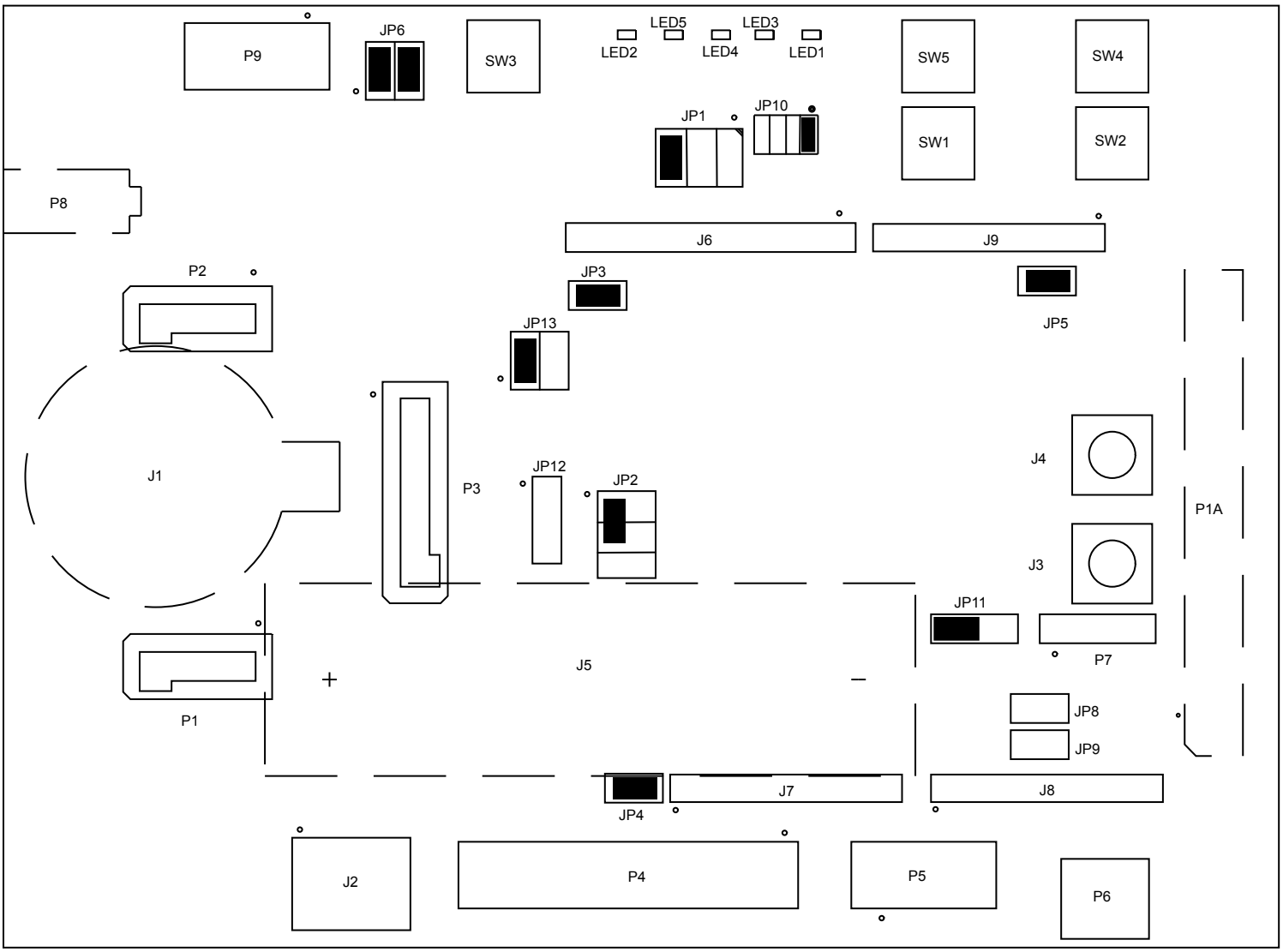

Figure 2-1: Default Hardware Setup

IAR Embedded WorkBench Setup

For information about the IAR Embedded Workbench®and Segger® product and software download, go to:

http://www.iar.com/en/Products/IAR-Embedded-Workbench.

The *ADuCM3029 EZ-KIT* software, based on the IAR Embedded WorkBench, can be found at:

http://www.analog.com/ADuCM3029EZKIT

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

1. Connect the EZ-KIT board to a personal computer (PC) running ***IAR Embedded WorkBench***, using a J-Link/J-Trace emulator:
    a. 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 ***IAR Embedded WorkBench***.
    b. Attach the emulator to the header connector, `P4` or `P5`, on the EZ-KIT board.
2. Attach the provided cord and appropriate plug to the 5V power adapter:
    a. Plug the jack-end of the power adapter into the power connector `P8` on the EZ-KIT board.
    b. Plug the other side of the power adapter into a power outlet. The power LED (`LED2`) is lit green when power is applied to the board.

It is assumed that the IAR Embedded WorkBench software is installed and running on your PC.

1. Navigate to the ***IAR Embedded WorkBench*** environment via the ***Start*** menu.
2. Choose ***File*** > ***Open*** > ***Workspace*** to open a workspace for the project to download and debug.
3. Choose ***Project*** > ***Options***.

    The ***General Options***, ***Target*** page appears.
4. In ***Processor variant***, ensure ***Device*** is ***Analog Devices ADuCM302x***
5. Choose ***Debugger*** in the ***Category*** pane.

    The ***Debugger***, ***Setup*** options page appears.
    a. In ***Driver***, choose ***J-Link/J-Trace*** as the emulator to be used to debug the target board.
    b. Click the ***Download*** tab. The ***Debugger***, ***Download*** options page appears.
    c. Ensure ***Use flash loader(s)*** is enabled. Note that other download settings are optional.
6. Choose ***Debugger*** > ***J-Link/J-Trace*** in the ***Category*** pane.

    The emulator ***Setup*** options page appears.
    a. On the ***Setup*** page,
        - In ***Reset***, select ***Connect during reset*** from the drop-down list.
        - In ***JTAG/SWD speed***, select ***Auto***.
        - (Optional) In ***Clock setup***, change the default values.
    b. On the ***Connection*** page,

- In ***Communication***, select ***USB*** and ***Device 0***.
- In ***Interface***, select ***SWD***.

7. Click ***OK*** to save the emulator settings.
8. Choose ***Project*** > ***Debug and Download*** to download the project and start debugging.

Debug Interface

The EZ-KIT provides a SWD/SWO connection via `P4` or `P5`.

Power-On-Self Test

The Power-On-Self-Test Program (POST) tests all EZ-KIT peripherals and validates functionality as well as connectivity to the processor. Once assembled, each EZ-KIT is fully tested for an extended period of time with POST. All EZ-KITs boards are shipped with POST preloaded 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 Board Support Package (BSP) along with the `readme.txt` file that describes how the board is configured to run POST.

Power Measurements

Locations are provided for measuring the current draw from various power planes. Jumpers are available on the `MAIN_3V` and `PROC_3V` voltage domains. For current draw, the jumper is removed and a precision ammeter inserted in series. The board allows for measuring the current draw of just the processor by removing the jumper on pins 1 and 3 and inserting an ammeter. Current draw can be measured in all operating modes of the processor. Refer to Current Measurement (JP6).

Example Programs

Example programs are provided with the *ADuCM3029 EZ-KIT* Board Support Package (BSP) to demonstrate various capabilities of the product. The programs can be found in the `ADuCM3029_EZ-KIT\examples` installation folder. Refer to a readme file provided with each example for more information.

Reference Design Information

A reference design info package is available for download on the Analog Devices Web site. The package provides information on the schematic design, layout, fabrication, and assembly of the board.

The information can be found at:

http://www.analog.com/ADuCM3029EZKIT .

32M-bit Serial Flash Memory with Dual and Quad SPI (W25Q32)

The W25Q32BV (32 Mb) Serial Flash memory provides a storage solution for systems with limited space, pins and power. The 25Q series offers flexibility and performance well beyond ordinary Serial Flash devices. They are ideal for code shadowing to RAM, executing code directly from Dual/Quad SPI (XIP) and storing voice, text and data. The device operates on a single 2.7V to 3.6V power supply with current consumption as low as 4 mA active and 1 uA for power-down.

The W25Q32BV array is organized into 16,384 programmable pages of 256 bytes each. Up to 256 bytes can be programmed at a time. Pages can be erased in a group of 16 (4 KB sector erase), groups of 128 (32 KB block erase), groups of 256 (64 KB block erase) or the entire chip (chip erase). The W25Q32BV has 1024 erasable sectors and 64 erase blocks respectively. The small 4 KB sectors allow for greater flexibility in applications that require data and parameter storage.

The W25Q32BV supports the standard Serial Peripheral Interface (SPI), and a high performance Dual/Quad ouput as well as Dual/Quad I/O SPI: Serial Clock, Chip Select, Serial Data I/O0 (DI), I/O1 (DO), I/O2 (WP), and I/O3 (/HOLD). SPI clock frequencies of up to 104 MHz are supported, providing equivalent clock rates of 208 MHz (104 MHz x 2) for Dual I/O and 320 MHz (80 MHz x 4) for Quad I/O when using Fast Read Dual/Quad I/O instructions. These transfer rates can outperform standard Asynchronous 8 and 16-bit Parallel Flash memories. The Continous Read Mode allows for efficient memory access with as few as 8-clocks of instruction-overhead to read a 24-bit address, allowing true XIP (execute in place) operation.

16-Bit Digital I^{2}C Temperature Sensor (ADT7420)

The ADT7420 is a high-accuracy digital-temperature sensor offering breakthrough performance over a wide industrial range, housed in a 4 mm × 4 mm LFCSP package. It contains an internal band gap reference, a temperature sensor, and a 16-bit ADC to monitor and digitize the temperature to 0.0078°C resolution. The ADC resolution, by default, is set to 13 bits (0.0625°C). The ADC resolution is a user-programmable mode that can be changed through the serial interface.

The ADT7420 is guaranteed to operate over supply voltages from 2.7V to 5.5V. Operating at 3.3V, the average supply current is typically 210 µA. The ADT7420 has a shutdown mode that powers down the device and offers a shutdown current of typically 2.0 µA at 3.3V. The ADT7420 is rated for operation over the -40°C to +150°C temperature range.

Pins `A0` and `A1` are available for address selection, giving the ADT7420 four possible I^{2}C addresses. The `CT` pin is an open-drain output that becomes active when the temperature exceeds a programmable critical temperature limit. The `INT` pin is also an open-drain output that becomes active when the tempera-ture exceeds a programmable limit. The `INT` pin and `CT` pin can operate in comparator and interrupt event modes.

Micropower 3-Sensor Combination Including Acceleration and Temperature (ADXL363)

The ADXL363 is an ultralow power, three-sensor combination consisting of a 3-axis MEMS accelerometer, a temperature sensor, and an on-board ADC input for synchronous conversion of an external signal. The entire system consumes less than 2 µA at a 100 Hz output data rate and 270 nA when in motion triggered wake-up mode.

The ADXL363 communicates via a serial port interface (SPI) and always provides 12-bit output resolution for all three sensors.

The ADXL363 accelerometer provides selectable measurement ranges of ±2 g, ±4 g, and ±8 g, with a resolution of 1 mg/LSB on the ±2 g range. Unlike accelerometers that use power duty cycling to achieve low power consumption, the ADXL363 does not alias input signals by undersampling; it samples the full bandwidth of the sensor at all data rates.

The ADXL363 temperature sensor operates with a scale factor of 0.065°C (typical). Acceleration and temperature data can be stored in a 512-sample multimode FIFO buffer, allowing up to 13 sec of data to be stored.

In addition to the accelerometer and temperature sensor, the ADXL363 also provides access to an internal ADC for synchronous conversion of an additional analog input.

The ADXL363 operates on a wide 1.6V to 3.5V supply range and can interface, if necessary, to a host operating on a separate, lower supply voltage.

USB to UART (FT232R)

The FT232R is a USB-to-serial-UART interface with the following advanced features:

- Single chip USB to asynchronous serial data transfer interface
- Entire USB protocol handled on the chip. No USB specific firmware programming required
- Fully-integrated 1024 bit EEPROM storing device descriptors and CBUS I/O configuration
- Fully-integrated USB termination resistors
- Fully-integrated clock generation with no external crystal required, plus optional clock output selection enabling a glue-less interface to external MCU or FPGA
- Data transfer rates from 300 baud to 3 Mbaud (RS422, RS485, RS232) at TTL levels
- 128 byte receive buffer and 256 byte transmit buffer utilising buffer smoothing technology to allow for high-data throughput
- FTDI's royalty-free Virtual Com Port (VCP) and Direct (D2XX) drivers eliminate the requirement for USB driver development in most cases.
- Transmit and receive LED drive signals
- UART interface support for 7 or 8 data bits, 1 or 2 stop bits and odd / even / mark / space / no parity

- FIFO receives and transmits buffers for high-data throughput
- Device supplied pre-programmed with unique USB serial number
- Supports bus powered, self-powered and high-power bus powered USB configurations
- Integrated +3.3V level converter for USB I/O
- Integrated level converter on UART and CBUS for interfacing to between +1.8V and +5V logic
- True 5V/3.3V/2.8V/1.8V CMOS drive output and TTL input
- Configurable I/O pin output drive strength
- Integrated power-on-reset circuit
- Fully-integrated AVCC supply filtering - no external filtering required.
- UART signal inversion option
- +3.3V (using external oscillator) to +5.25V (internal oscillator) single supply operation
- Low-operating and USB suspend current
- Low USB bandwidth consumption
- UHCI/OHCI/EHCI host controller compatible
- USB 2.0 full speed compatible

ADF7xxx Wireless Transceiver Daughterboard Interface

The ADF7xxx Wireless Transceiver daughterboard interface supports the ADF7023, ADF7024, ADF7242, ADF7030 and ADF7030-1 wireless transceivers. These are low-power, high-performance, integrated radio transceivers supporting a wide range of modulation schemes and channel widths in the sub-GHz and 2.4 GHz frequency ranges.

"For more information about Analog Devices Transceiver offerings please visit : http://www.analog.com/en/products/rf-microwave/integrated-transceivers-transmitters-receivers/low-power-rf-transceivers.html

Arduino Interface

The Arduino interface supports connecting with 3V shield boards, extending the evaluation sysem's capabilities. The connectors provide power, ground, reset, ADC, TWI, UART and GPIO signals.

Expansion Interface 3

The Expansion Interface 3 (EI3) interface supports connecting with other EI3 daughterboards designed by Analog Devices, extending the evaluation system's capabilities. The connectors provide power, ground, reset, ADC, TWI, UART, SPORT and GPIO signals.

3 Hardware Reference

This chapter describes the hardware design of the *ADuCM3029 EZ-KIT* .

System Architecture

The board's configuration is shown in the ***Block Diagram*** figure.

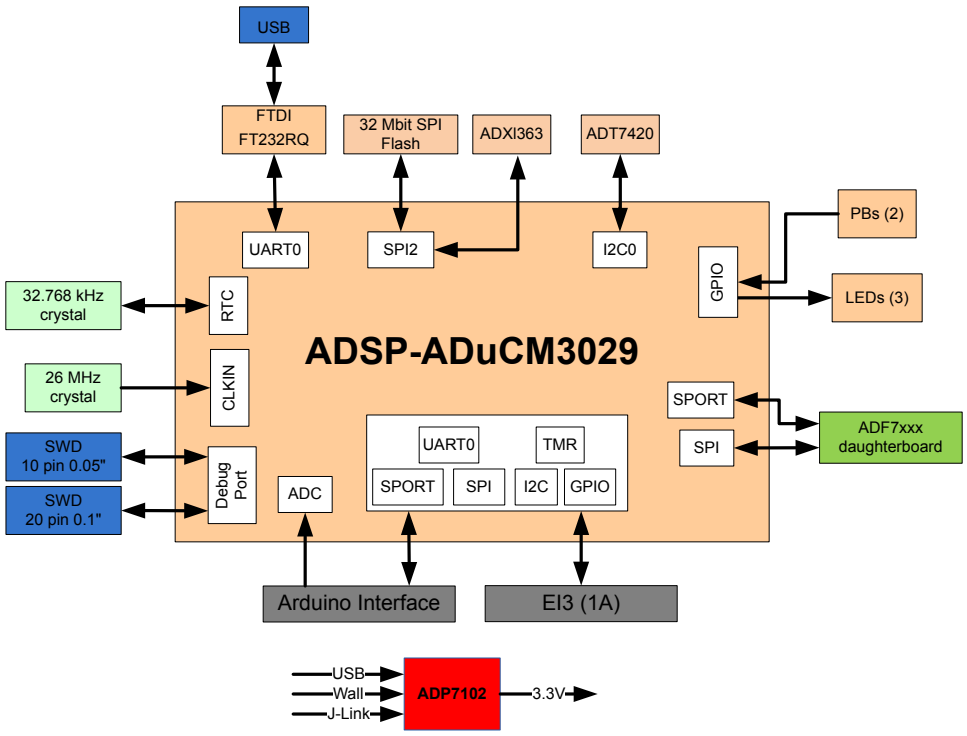

Figure 3-1: Block Diagram

This EZ-KIT is designed to demonstrate the ADuCM3029 processor's capabilities. The board has a 26 MHz input clock and runs at 26 MHz internally.

User I/O to the processor is provided in the form of two user pushbuttons and three LEDs.

Switches

This section describes operation of the switches. The switch locations are shown in the ***Switch Locations*** figure.

Figure 3-2: Switch Locations

Boot Mode Select (`SW1`)

The pushbutton switch determines the boot mode of the processor. The ***Boot Mode Select Switch*** table shows the available boot mode settings. By default, the processor boots from the internal flash memory.

Table 3-1: Boot Mode Select Switch

Position	*Processor Boot Mode*
0	UART download mode
1	*Flash boot. Boot from integrated flash memory.*

Reset Pushbutton (SW2)

The reset pushbutton resets the ADuCM3029 processor. The reset signal also is connected to the expansion connectors via the SYS_HWRST signal. Reset (LED1) is used to indicate when the board is in reset.

Wake Pushbutton (SW3)

The wake pushbutton is connected to the processor's WAKE signal, based on the setting of WAKE Select (JP10).

GPIO Pushbuttons (SW4-5)

The GPIO pushbuttons are connected to the processor's signals P1_14/GPIO30/SPI0_RDY/TEST_DTD5 and P2_06/GPIO38/ADC0_VIN3, respectively.

Jumpers

This section describes functionality of the configuration jumpers. The ***Jumper Locations*** figure shows the jumper locations.

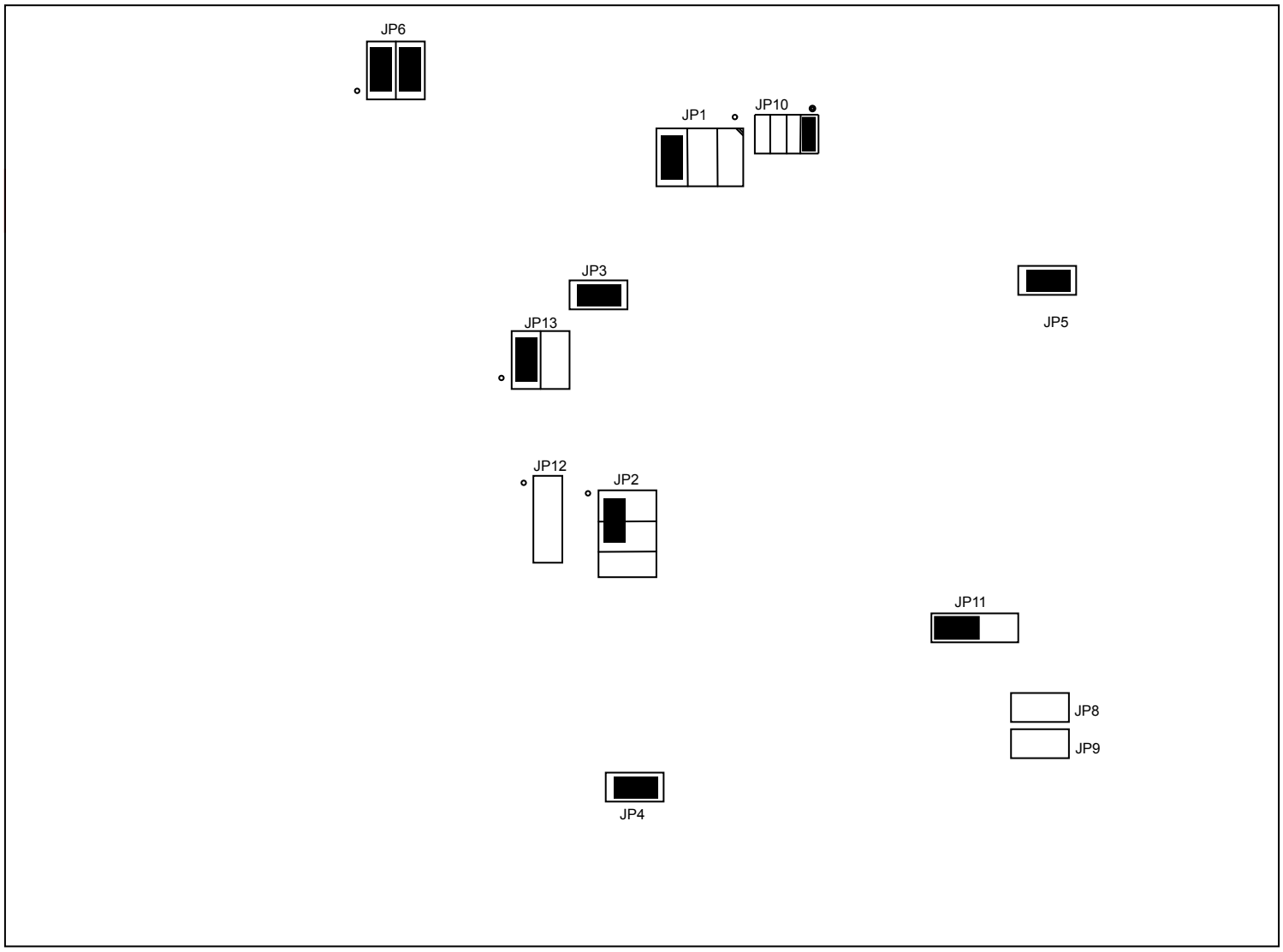

Figure 3-3: Jumper Locations

Main Power Select (`JP1`)

The main power select jumper selects whether the main power source for the board is provided from the emulator interface, USB, or wall transformer. Refer to the ***Main Power Select Jumper*** table. The default setting is to power the board from the wall transformer.

Table 3-2: Main Power Select Jumper

Position	*Power Source*
1 and 3	Emulator 5V
3 and 4	USB 5V
3 and 5	***Wall 5V***

IO Power Select (JP2)

The IO power select jumper selects whether the IO power source for the board is provided from the on-board 3V regualtor, coin battery, or PV cell battery. Refer to the ***IO Power Select Jumper*** table. The default setting is to power the IO from the on-board regualtor.

Table 3-3: IO Power Select Jumper

Position	*Power Source*
1 and 3	*on-board regualtor*
3 and 4	coin battery
3 and 5	PV cell

ADXL363 Power Enable (JP3)

The ADXL363 power enable jumper allows the part to be connected or disconnected from the IO power rail. When the jumper is installed, the device is connected to power. When the jumper is removed, power is disconnected from the device. The device can be removed from the power rail to yield more accurate current measurements of the IO rail when the device is not needed. The default is for the jumper to be installed.

W25Q32 Power Enable (JP4)

The W25Q32 power enable jumper allows the part to be connected or disconnected from the IO power rail. When the jumper is installed, the device is connected to power. When the jumper is removed, power is disconnected from the device. The device can be removed from the power rail to yeld more accurate current measurements of the IO rail when the device is not needed. The default is for the jumper to be installed.

ADT7420 Power Enable (JP5)

The ADT7420 power enable jumper allows the part to be connected or disconnected from the IO power rail. When the jumper is installed, the device is connected to power. When the jumper is removed, power is disconnected from the device. The device can be removed from the power rail to yeld more accurate current measurements of the IO rail when the device is not needed. The default is for the jumper to be installed.

Current Measurement (JP6)

The current measurement jumper is used to measure the current draw of the processor and 3V IO power rail. The default is for both jumpers to be installed. To measure the current draw of the processor, remove the jumper from pins 1 and 3 and insert an ammeter in series. In order to measure the current draw on the 3V IO rail remove the jumper from pins 2 and 4 and insert an ammeter in series.

Remote Boot Select (JP8)

The remote boot select jumper allows the SYS_BMODE0 to be controlled by the FT232 when the jumper is installed. The default is for the jumper not to be installed.

Remote Reset (JP9)

The remote reset jumper allows the SYS_HWRST to be controlled by the FT232 when the jumper is installed. The default is for the jumper not to be installed.

WAKE Select (JP10)

This jumper is used to determine which WAKE signal from the processor is connected to the Wake Pushbutton (SW3); see the ***Wake Jumpers*** table. The default setting is on pins 1 and 2.

Table 3-4: WAKE Jumpers

Setting	*Signal*
1 and 2	*SYS_WAKE0*
3 and 4	SYS_WAKE1
5 and 6	SYS_WAKE2
7 and 8	SYS_WAKE3

ADC VREF Select (JP11)

The ADC VREF select jumper it used to connect the ADC voltage reference of the processor to either the ADR441 or the ADR127 device. When the jumper is placed on pins 1 and 2, the reference is conencted to the ADR441, which is a ultralow noise, LDO XFET voltage reference with current sink and source. When the jumper is placed on pins 2 and 3, the reference is connected to the ADR127, which is a precisoin micropower LDO voltage reference. By default the jumper is connected to pins 2 and 3.

Battery Select (JP12)

The battery select jumper is used to choose between powering the board with a coin battery or a AA battery. When the jumper is installed on pins 1 and 2, the coin cell battery is selected. When the jumper is installed on pins 2 and 3, the AA battery is selected. By default, the jumper only connected to pin 1 - neither battery is connected.

LEDs

This section describes the on-board LEDs. The ***LED Locations*** figure shows the LED locations.

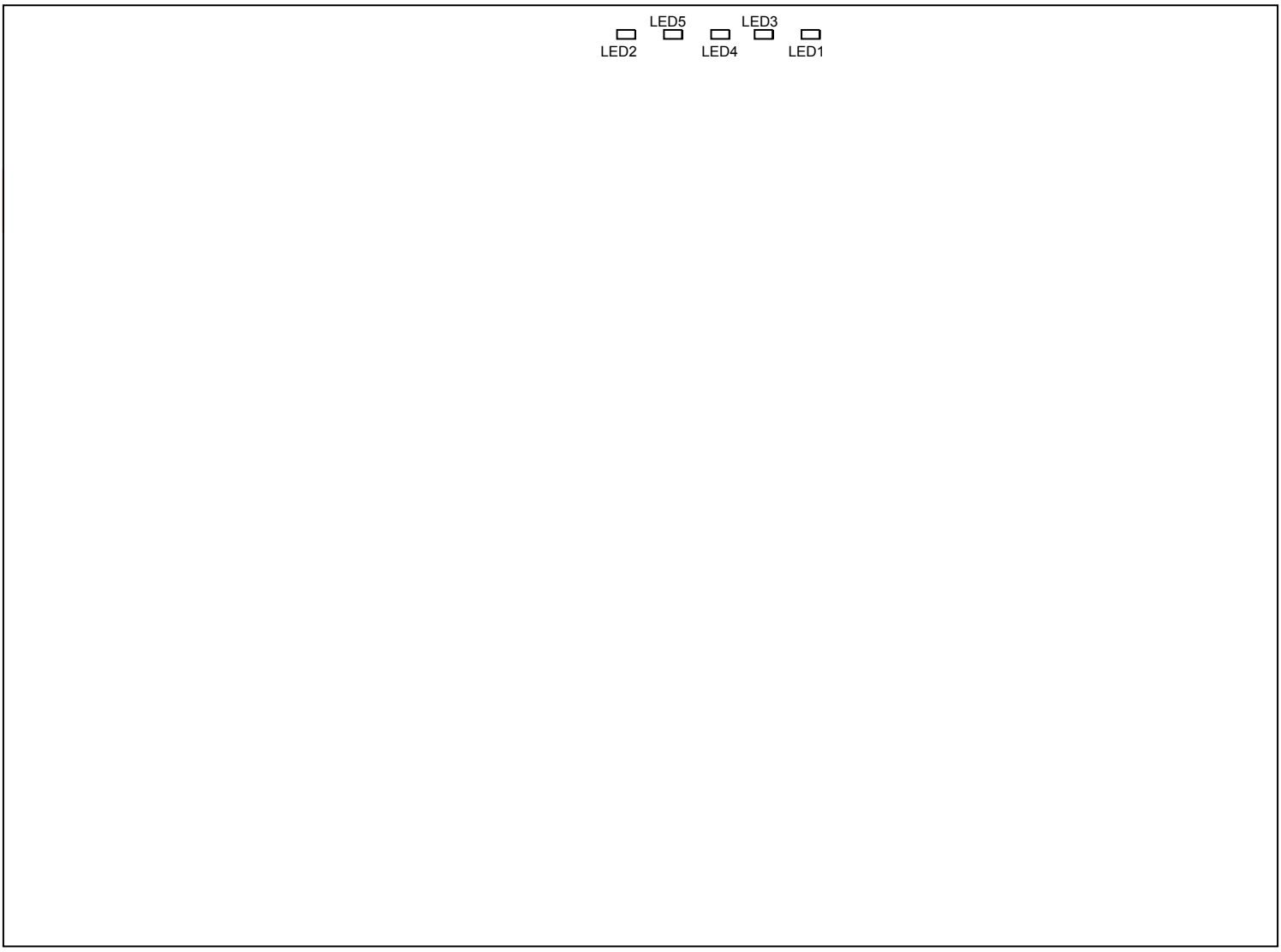

Figure 3-4: LED Locations

Reset (LED1)

When ON (red), it indicates that the board is in reset. A master reset is asserted by pressing SW2 , which activates the LED. For more information, see Reset Pushbutton (SW2).

Power (LED2)

When ON (green), it indicates that power is being supplied to the board properly.

GPIO (LED3-5)

Three LEDs are connected to the general-purpose I/O pins of the processor (see the ***GPIO LEDs*** table). The LEDs are active high and are ON (amber) by writing a 1 to the correct processor signal.

Table 3-5: GPIO LEDs

LED Reference Designator	*Processor Programmable Flag Pin*
LED3	P0_13
LED4	P1_12
LED5	P1_13

Connectors

This section describes connector functionality and provides information about mating connectors. The connector locations are shown in the ***Connector Locations*** figure.

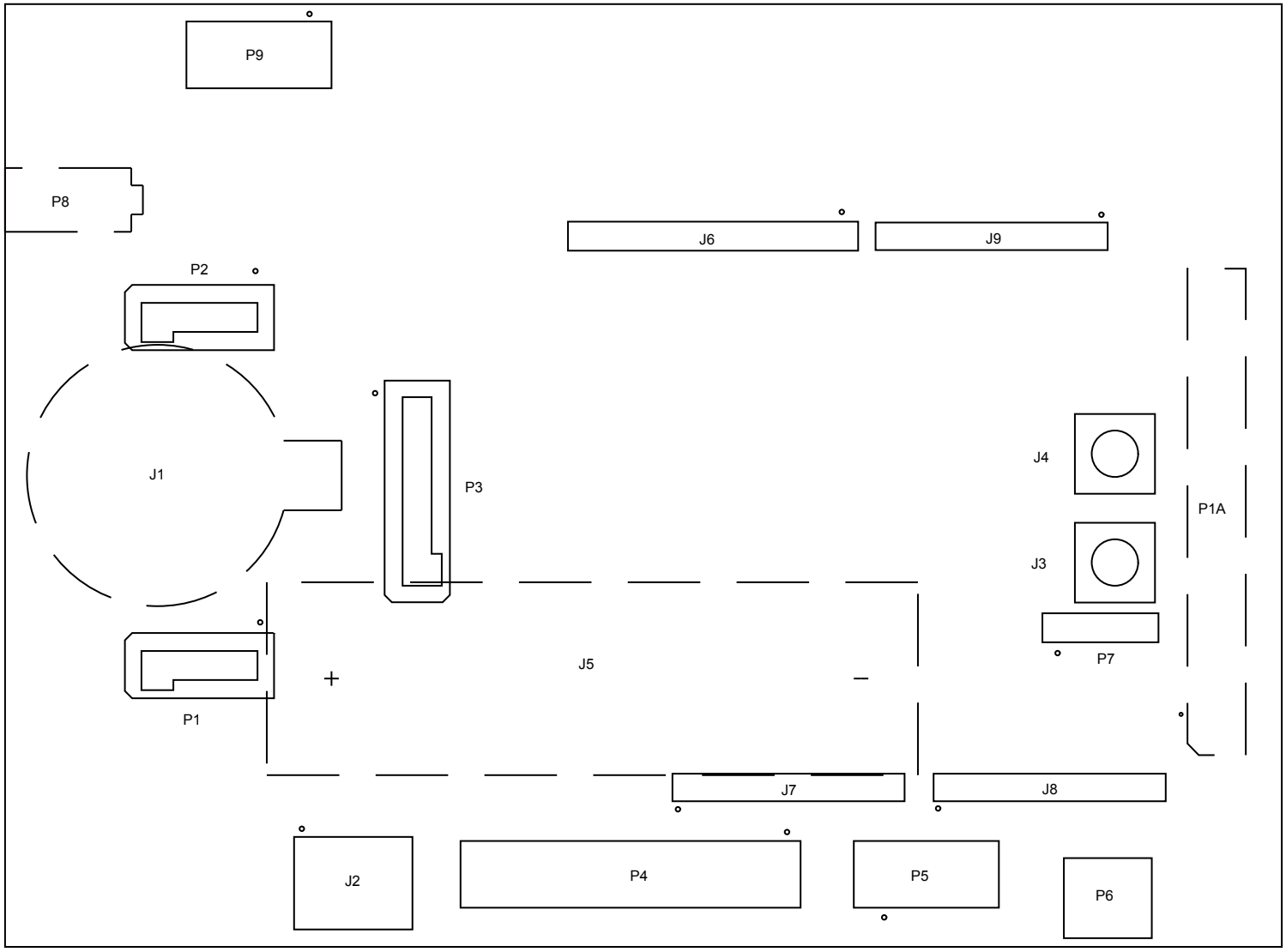

Figure 3-5: Connector Locations

NOTE: Connectors on the back of the board are noted with dotted lines.

Expansion Interface 3 (P1A)

One board-to-board connector provides signals from the SPI, TWI, UART, SPORT, and GPIO interfaces of the processor. This connector is located on the bottom side of the board. The connector expands the board's capabilities by providing an interface to EI3 daughterboards.

Part Description	*Manufacturer*	*Part Number*
120-pin 0.6mm	Hirose	FX8-120P-SV1(91)
Mating Connector		
120-pin 0.6mm	Hirose	FX8-120S-SV(21)

ADF7xxx Wireless Transceiver Daughterboard Interface (P1–3)

ADF7xxx wireless transceiver daughterboard interface connectors are listed in the following tables.

Table 3-6: P1 and P2 Connectors

Part Description	*Manufacturer*	*Part Number*
10-pin 0.05" terminal strip	Samtec	TFM-105-02-S-D-A
Mating Connector		
10-pin 0.05" socket strip	Samtec	SFM-105-02-L-D-A

Table 3-7: P3 Connectors

Part Description	*Manufacturer*	*Part Number*
20-pin 0.05" terminal strip	Samtec	TFM-110-02-S-D-A
Mating Connector		
20-pin 0.05" socket strip	Samtec	SFM-110-02-L-D-A

Debug (P4–5)

The debug connectors provides a connection point for the emualtor to interface with the processor. There are two debug connectors on the board. The P4 connector is a 0.1” 20 pin connector. The P5 connector is a 0.05" 10 pin connector. For more information, see Debug Interface.

USB (P6)

The USB connector provides an interface between the EZ-KIT and a host PC via the USB to UART (FT232R).

Part Description	*Manufacturer*	*Part Number*
USB mini-B	Hirose	UX60SC-MB-5S8

Power (P8)

The power connector provides power to the board when the jumper of Main Power Select (JP1) is placed on pins 3 and 5.

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

Battery (J1 and J5)

A battery can be used to power the board by setting the IO Power Select (JP2).

Table 3-8: J1 Connector

Part Description	*Manufacturer*	*Part Number*
Coincell Holder	MPD	BS-3
Battery		
3V 20mm Coin	Panasonic	CR2032

Table 3-9: J5 Connector

Part Description	*Manufacturer*	*Part Number*
AA Holder	Keystone Electronics	2460
Battery		
3.6V 2.6Ah AA	Dantona Industries	LS14500

PV Cell (J2)

This conenctor is used for interfacing with engery harvesting evaluation boards from Analog Devices.

Part Description	*Manufacturer*	*Part Number*
8-pin 0.1" right angle	Harwin	M20-7880446

Clock (J3-4)

The clock connectors allow for a connection point to the SYS_CLKIN and SYS_CLKOUT signals on the processor.

Part Description	*Manufacturer*	*Part Number*
SMC 75 ohms	Amphenol	152119-75
Mating Cable		
SMC cable		

Arduino Interface (J6–9)

The connectors for the Arduino interface are listed in the following tables.

Table 3-10: J6 Connector

Part Description	*Manufacturer*	*Part Number*
8-pin 0.1" socket strip	Samtec	SSW-108-01-TM-S
Mating Connector		
8-pin .1" terminal strip	Samtec	TSW-108-07-T-S

Table 3-11: J7-9 Connectors

Part Description	*Manufacturer*	*Part Number*
10-pin 0.1" socket strip	Samtec	SSW-110-01-TM-S
Mating Connector		
10-pin .1" terminal strip	Samtec	TSW-110-07-T-S