# EVAL-AD2437A1NZ Manual

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Part Number
EVAL-AD2437A1NZ

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# Regulatory Compliance

The *EVAL-AD2437A1NZ* evaluation board 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 *EVAL-AD2437A1NZ* evaluation board 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 shipping package. |  |

# Contents

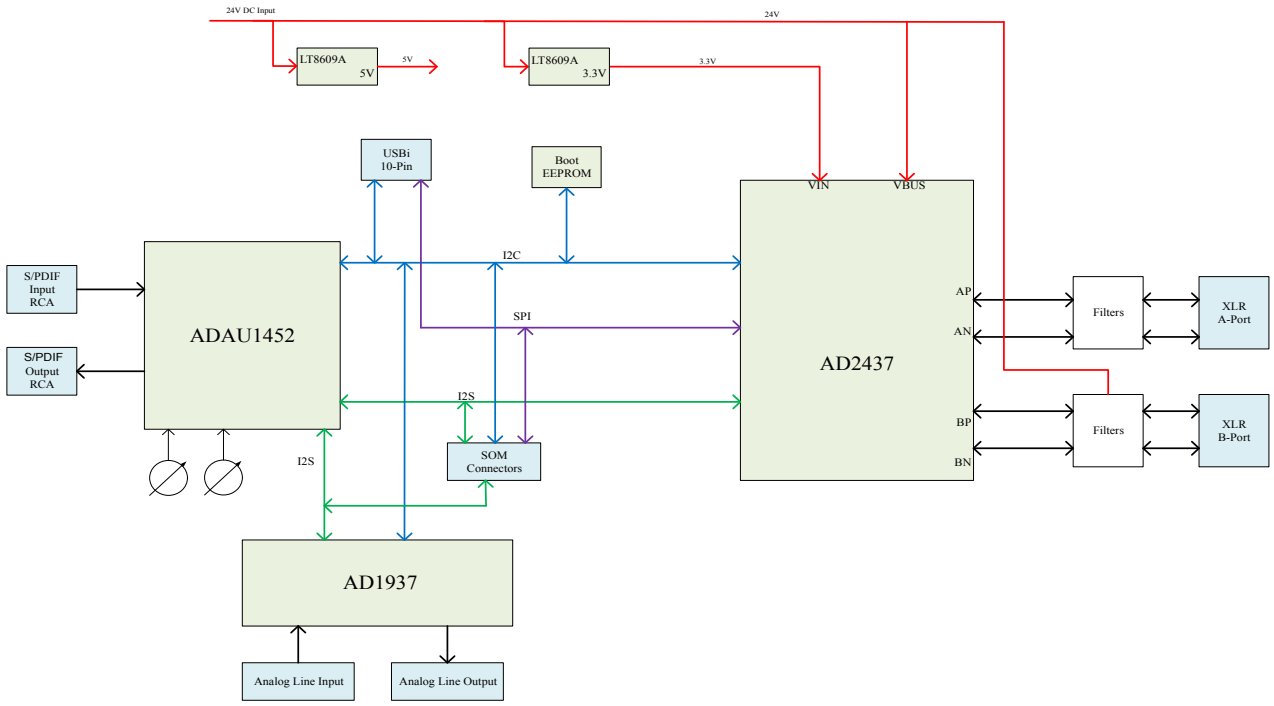
# 1 Preface

Thank you for purchasing the Analog Devices, Inc. *EVAL-AD2437A1NZ* evaluation board.

The *EVAL-AD2437A1NZ* is an evaluation board to evaluate various peripherals of the AD2437 A$^2$B (Audio Bus) transceiver. Refer to the datasheet/manual to get more details about the AD2437.

The *EVAL-AD2437A1NZ* can be configured to be a Main or Local Powered Sub (LPS) node. The *EVAL-AD2437A1NZ* can be connected to a Main Node, Local Powered Sub (LPS) or a Bus Powred Sub (BPS) node. These evaluation boards are intended to be used with the SigmaStudio+ graphical development tool.

Block Diagram of Evaluation Board:




In the default configuration (main mode), this evaluation board provides A$^2$B main node functionality for an A$^2$B network.

A PC host controls the AD2437 $A^2B$ main transceiver using I2C or SPI signals over the USB-to- I2C/SPI bridge, USBi(EVAL-ADUSB2EB). This allows SigmaStudio+ to directly discover and control an $A^2B$ network as well as to read back registers and monitor performance. Alternatively, the *EVAL-AD2437A1NZ* is controllable over a SoM interface through an external DSP host device like the SC594. In the default configuration as a main mode, AD2437 digital audio signals interface directly to the ADAU1452 SigmaDSP™, which provides the clock and frame sync signals to the $A^2B$ network.

The evaluation board also supports local-powered sub mode with different jumper settings, where AD2437 digital audio signals could interface to ADAU1937 audio codec or four microphones with the help of the ADAU1452. In the sub mode, AD2437 drives clock and frame sync to ADAU1937 and ADAU1452 for transmitting or receiving data. Four digital MEMS PDM microphones can interface directly with the $A^2B$ transciever.

The SigmaStudio+® graphical development tool is the programming, development, and tuning software for the SigmaDSP, $A^2B$, and Sharc processors. Familiar audio processing blocks can be wired together as in a schematic, and the compiler generates DSP-ready code and a control surface for setting and tuning parameters. This tool allows engineers with no DSP code writing experience to easily implement a DSP into their design and yet is still powerful enough to satisfy the demands of experienced DSP designers. SigmaStudio+ links with both Analog Devices evaluation boards and production designs to provide full in-circuit real-time IC control.

SigmaStudio+ includes an extensive library of algorithms to perform audio processing such as filtering, mixing, and dynamics processing, as well as basic low-level DSP functions and control blocks. Advanced record-side processing algorithms such as Enhanced Stereo Capture and wind noise detection are included in the standard libraries. Plug-in algorithms from Analog Devices and 3rd party partners can be added to SigmaStudio+'s drag-and-drop library.

Along with its graphical DSP signal flow development, SigmaStudio+ also includes other features to speed up the design cycle from product concept to release. SigmaStudio+ includes tools for intuitively setting control registers, calculating tables of filter coefficients, visualizing filter magnitude and phase responses, generating C header files, and sequencing a series of controls to ease your transition from SigmaStudio+ to system implementation on your microcontroller.

# Purpose of This Manual

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

# 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 Materials*

  A companion file in PDF format that lists all of the components used on the board is available on the website at https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/EVAL-AD2437A1NZ.html.

- *Schematic*

  A companion file in PDF format documenting all of the circuits used on the board is available on the website at https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/EVAL-AD2437A1NZ.html.

# Technical Support

You can reach Analog Devices technical support in one of the following ways:

- Post your questions in the A$^2$B support community at EngineerZone®:

  http://ez.analog.com/a2b/

- Submit your questions to technical support directly at:

  http://www.analog.com/support

- E-mail your questions about A$^2$B transceiver applications and SigmaStudio+ to:

  A2B.support@analog.com

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

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

# Supported Integrated Circuit

This evaluation system supports the Analog Devices AD2437 IC.

# Supported Tools

Information about SigmaStudio+ and the A$^2$B software plug-in for the *EVAL-AD2437A1NZ* evaluation board is available at: www.analog.com/SigmaStudio+.

# Product Information

Information about the AD2437 product family is available at: www.analog.com/A2B

## Analog Devices Website

The Analog Devices website, http://www.analog.com, provides information about a broad range of products - analog integrated circuits, amplifiers, converters, transceivers, and digital signal processors.

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.

# 2 Using the Board

This chapter provides information on the major components and peripherals on the board, along with instructions for installing and setting up the emulation software.

## Product Overview

The board features:

- Analog Devices AD2437 - Audio Bus Transceiver
- Audio
  - Analog Devices ADAU1452 - SigmaDSP Digital Audio Processor
  - Analog Devices AD1937 - Four ADCs/Eight DACs with PLL, 192 kHz, 24-Bit Codec
  - One 3.5mm audio jack
  - Two RCA SPDIF Input and Output Connectors
  - Four XLR connectors for audio interface for balanced +4dBu line level input.
  - DB25 Connector for eight channels of +4dBu line level output
- $A^2B$
  - One Male and one female XLR connector with integrated light-ring for LED diffusion.
- LEDs
  - Thirteen LEDs: more details will be in LED section
- Pushbuttons
  - Three pushbuttons: Reset, SIO2, GPIO7
- External power supply
  - 24V @3.0 Amps

# Package Contents

Your *EVAL-AD2437A1NZ* package contains the following items.

- *EVAL-AD2437A1NZ* board
- EVAL-ADUSB2EBZ (Rev 1.5 and more)
- XLR Cable
- Universal 24V DC power supply
- $A^2B$ Software - Online Request Document

Contact the vendor where you purchased your *EVAL-AD2437A1NZ* evaluation board or contact Analog Devices, Inc. if any item is missing.

# Default Configuration

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.

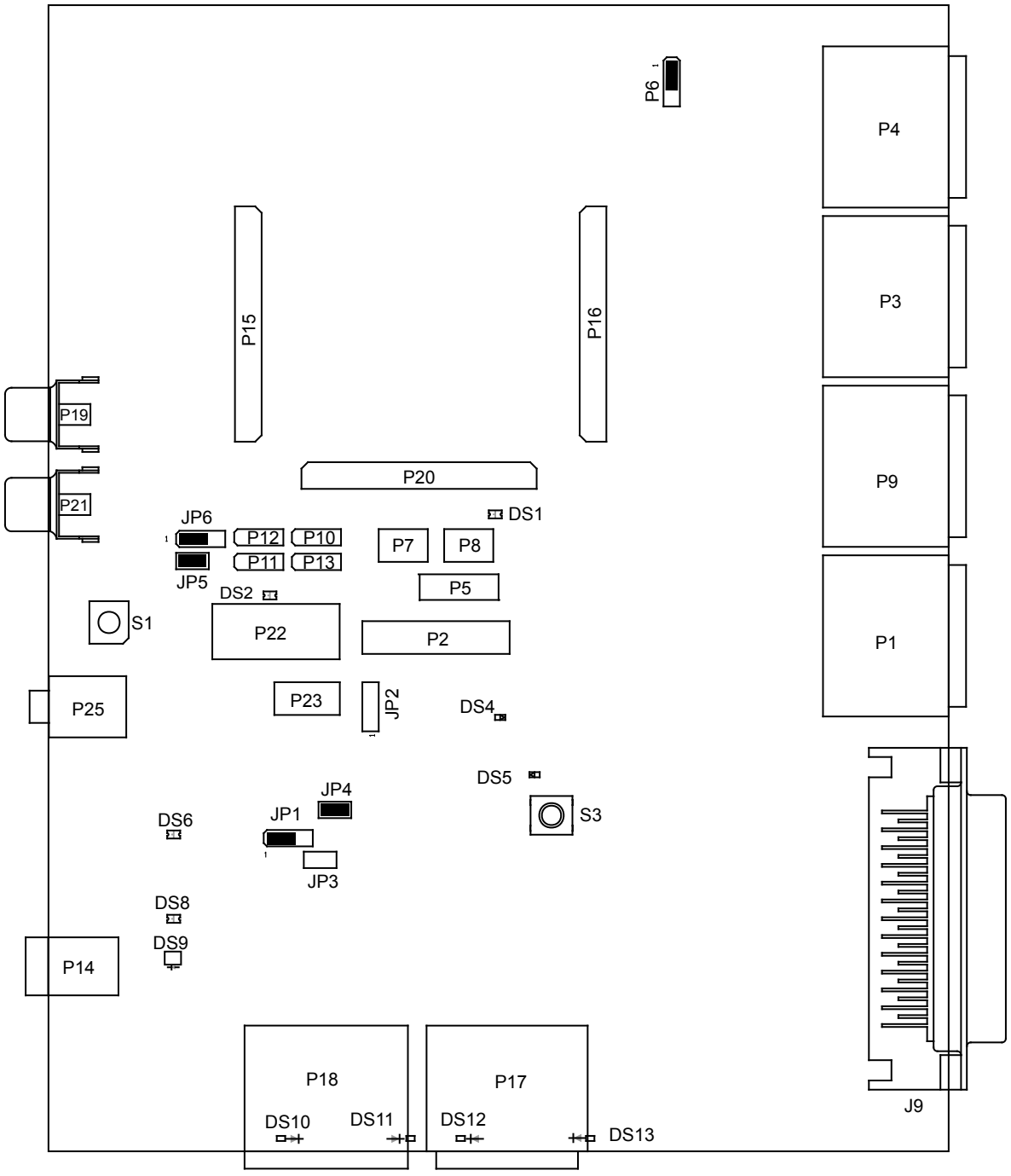



**Figure 2-1:** Default Hardware Setup

# 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:

https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/EVAL-AD2437A1NZ.html

# ADAU1452 - SigmaDSP Digital Audio Processor

The ADAU1452 is an automotive qualified audio processor that far exceeds the digital signal processing capabilities of earlier SigmaDSP® devices. The restructured hardware architecture is optimized for efficient audio processing. The audio processing algorithms are realized in sample-by-sample and block-by-block paradigms that can both be executed simultaneously in a signal processing flow created using the graphical programming tool, SigmaStudio+®. The restructured digital signal processor (DSP) core architecture enables some types of audio processing algorithms to be executed using significantly fewer instructions than were required on previous SigmaDSP generations, leading to vastly improved code efficiency.

The 1.2 V, 32-bit DSP core can run at frequencies of up to 294.912 MHz and execute up to 6144 instructions per sample at the standard sample rate of 48 kHz. However, in addition to industry standard rates, a wide range of sample rates are available. The integer PLL and flexible clock generator hardware can generate up to 15 audio sample rates simultaneously. These clock generators, along with the on board asynchronous sample rate converters (ASRCs) and a flexible hardware audio routing matrix, make the ADAU1452 ideal audio hubs that greatly simplify the design of complex multirate audio systems.

The ADAU1452 interfaces with a wide range of ADCs, DACs, digital audio devices, amplifiers, and control circuitry, due to their highly configurable serial ports, S/PDIF interfaces, and multipurpose input/output pins. They can also directly interface with PDM output MEMS microphones, thanks to integrated decimation filters specifically designed for that purpose.

Independent sub and main I2C/SPI control ports allow the ADAU1452 not only to be programmed and configured by an external main device, but also to act as a main that can program and configure external slave devices directly. This flexibility, combined with self boot functionality, enables the design of standalone systems that do not require any external input to operate.

The power efficient DSP core executes full programs while consuming only a few hundred milliwatts (mW) of power and can run at a maximum program load while consuming less than a watt, even in worst case temperatures exceeding 100°C. This relatively low power consumption and small footprint make the ADAU1452 ideal replacements for large, general-purpose DSPs that consume more power at the same processing load.

# AD1937 - Four ADCs/Eight DACs with PLL, 192 kHz, 24-Bit Codec

The AD1937 is a high performance, single-chip codec that provides four analog-to-digital converters (ADCs) with differential input and eight digital-to-analog converters (DACs) with differential output, using the Analog Devices, Inc., patented multibit sigma delta (Σ-Δ) architecture. An I2C port is included, allowing a microcontroller to adjust

volume and many other parameters. The AD1937 operates from 3.3 V digital and analog supplies. The AD1937 is available in a 64-lead (differential output) LQFP.

The AD1937 is designed for low EMI. This consideration is apparent in both the system and circuit design architectures. By using the on-board PLL to derive the master clock from the LR (frame) clock or from an external crystal, the AD1937 eliminates the need for a separate high frequency master clock and can also be used with a suppressed bit clock. The DACs and ADCs are designed using the latest Analog Devices continuous time architecture to further minimize EMI. By using 3.3 V supplies, power consumption is minimized and further reduces emissions.

# ADM6315 - Open-Drain Microprocessor Supervisory Circuit

The ADM6315 is a reliable voltage-monitoring device that is suitable for use in most voltage-monitoring applications.

The ADM6315 is designed to monitor as little as a 1.8% degradation of a power supply voltage. The ADM6315 can monitor all voltages (at 100 mV increments) from 2.5 V to 5 V.

Included in this circuit is a debounced manual reset input. RESET can be activated using an ordinary switch (pulling MR low), a low input from another digital device, or a degradation of the supply voltage.

The manual reset function is very useful, especially if the circuit in which the ADM6315 is operating enters into a state that can be detected only by the user. Allowing the user to reset a system manually can reduce the damage or danger that could otherwise be caused by an out-of-control or locked-up system.

# LT8609 - 2A/3A Peak Synchronous Step-Down Regulator with 2.5µA Quiescent Current

The LT8609 is a compact, high efficiency, high speed synchronous monolithic step-down switching regulator that consumes only 1.7µA of non switching quiescent current. The LT8609 can deliver 2A of continuous current with peak loads of 3A (<1sec). Burst Mode operation enables high efficiency down to very low output currents while keeping the output ripple below 10mVP-P. A SYNC pin allows synchronization to an external clock, or spread spectrum modulation for low EMI operation. Internal compensation with peak current mode topology allows the use of small inductors and results in fast transient response and good loop stability. The EN/UV pin has an accurate 1V threshold and can be used to program VIN UVLO or to shut down the part. A capacitor on the TR/SS pin programs the output voltage ramp rate during start-up while the PG flag signals when VOUT is within ±8.5% of the programmed output voltage as well as fault conditions.

# 3 Hardware Reference

This chapter describes the hardware design of the *EVAL-AD2437A1NZ*.

## Switches

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

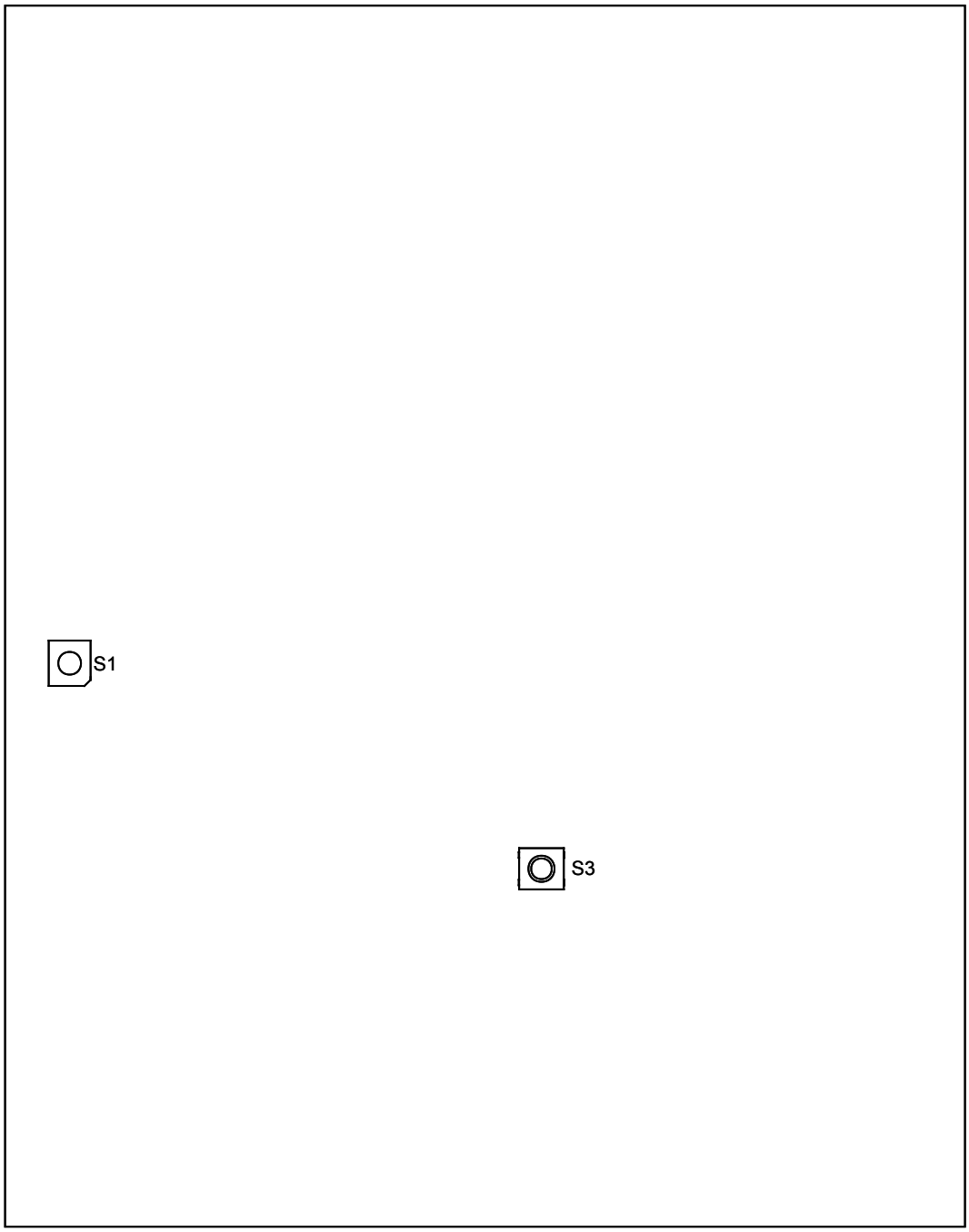



**Figure 3-1:** Switch Locations

## User I/O Ports ( S3)

General purpose momentary push button connected to SIO2 with a corresponding LED. Please see PRM for SIO2 configuration.

| Switch | Port |
|---|---|
| S3 | SIO2 |

### Reset Pushbutton ( S1)

The reset pushbutton resets the ADAU1452 and AD2437. Reset LED ( DS7) is used to indicate when the board is in reset.

## Connectors

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

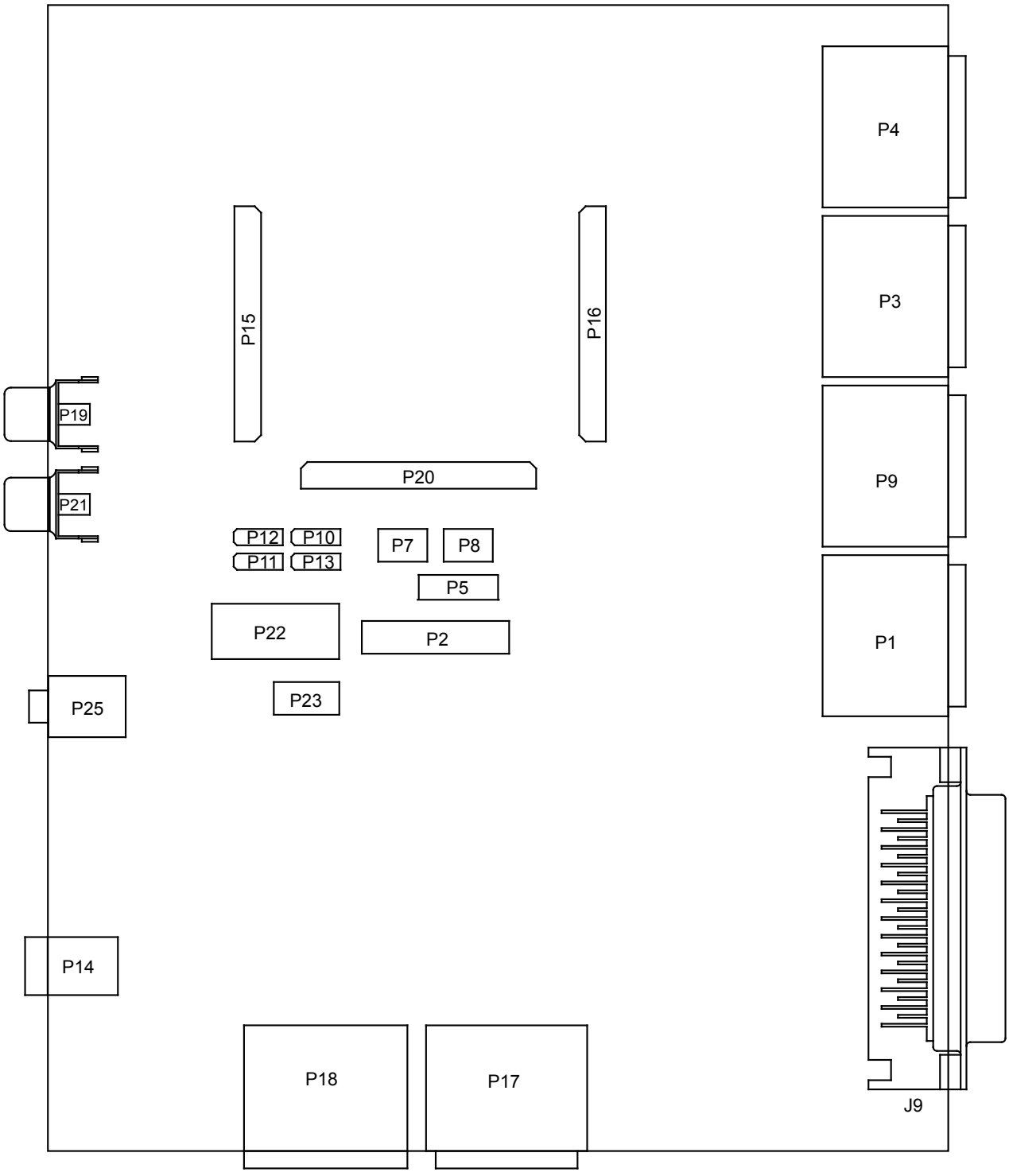



**Figure 3-2:** Connector Locations

## A²B ( P17and P18)

P17 is used to connect towards the next sub board and P18 is used to connect towards the main board. These connectors allow the AD2437 on the EVAL board to communicate to other A$^2$B devices on the bus. Integrated light rings diffuse surface mount LEDs that are activated if the bus bias is on.

| *Part Description* | *Manufacturer* | *Part Number* | *RefDes* |
|---|---|---|---|
| 3 pole XLR receptacle | Neutrik | NC3FAH2-LR-DAE<br>NC3MAH-LR | P17 - female<br>P18 - male |
| *Mating Cable* | | | |
| XLR cable assembly | | | |

## I2C/SPI Connector ( P2 and P23)

P2 and P23 and SPI signals interfaced with AD2437 IC respectfully. They can be interfaced with external custom boards if required. The connectors are 0.1" headers. The pin out can be found in the schematic.

## Sigma Studio+ ( P22)

This connector interfaces with SigmaStudio+ through the EVAL-ADUSB2EBZ board and is compatible for use with Total Phase Aardvark TP240141.The connector is a 0.1" header, the pinout can be found in the schematic.

## 4 Channel ADC Input ( P1, P9, P3, and P4)

There are four ADC channels in the AD1937 configured as two stereo pairs with differential inputs. The ADCs can operate at a nominal sample rate of 48 kHz, 96 kHz, or 192 kHz. The ADCs include on-board digital antialiasing filters with 79 dB stop band attenuation and linear phase response, operating at an oversampling ratio of 128 (48 kHz, 96 kHz, and 192 kHz modes). Digital outputs are supplied through two serial data output pins (one for each stereo pair) and a common frame clock (ALRCLK) and bit clock (ABCLK). Alternatively, one of the TDM modes can be used to access up to 16 channels on a single TDM data line.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| 3 pole female XLR receptacle | Neutrik | NC3FAH2 |
| Mating Cable | | |
| XLR cable assembly | | |

## ADAU1452 AUX Select ( P10–P13)

P10–P13 are headers that can be used to interface peripherals to four of the ADAU1452's aux adc inputs. Refer to schematic for further details.

## Headphone DAC ( P25 )

P25 is a 3.5mm stereo TRS connector to allow headphone monitoring of the first two outputs of the DAC.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| 3.5mm Stereo Jack | CUI | SJ-3523-SMT |
| *Mating Cable* | | |
| Standard 3.5mm stereo audio male cable | | |

## SPDIF Output ( P19)

The SPDIF Output connector is connected to the SPDIFOUT on the ADAU1452.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| Right Angle Through Hole RCA Jack Connector | CUI | RCJ-011 |

## SPDIF Input ( P21)

The SPDIF Input connector is connected to the SPDIFIN on the ADAU1452.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| Right Angle Through Hole RCA Jack Connector. | CUI | RCJ-011 |

## 8 Channel DAC Output ( J9 )

All 8 DAC output channels will be supplied from the AD1937 to this DB25 connector. Refer to schematic for pin-outs.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| DB25 Connector | Amphenol ICC (FCI) | 609-DB25S564GTLF-ND |
| 25 Position D-Sub Receptacle, Female Sockets Connector | | |

## Multipurpose pins ( P5 )

Bi-directional pins designed for multipurpose use. For further information please refer to the schematic.

## 1452 I2S Connector ( P7 and P8)

These connectors are I2S signals from ADAU1452 SigmaDSP. Ports allow probing or interfacing with external custom boards if required. The connector is a 0.1" header. The pinout can be found in the schematic.

## SoM Interface Connection ( P16, P20, P15)

The SoM Interface consists of three SAMTEC high speed connectors that provide the DSP peripheral signals for use with a plug in baseboard. The *SoM Connector* figure shows the connector locations on the back of the board.

These signals are based upon the peripheral signal needs, which allows multiple DSPs to be used with this connection. These connectors are self-mating and the pinout here reflects the connectors on the EV-SC594-SOM.

The *SoM Interface A Connector (P16)*, *SoM Interface B Connector (P20)*, and *SoM Interface C Connector (P15)* tables show the signal associated with each pin on the connectors.

**Table 3-1:** SoM Interface A Connector (P16)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|---|---|
| 1 | GND1 | 21 | DAI0_PIN10 | 41 | DAI0_PIN20 | 61 | NU | 81 | SPI3_MOSI |
| 2 | GND2 | 22 | DAI1_PIN10 | 42 | DAI1_PIN20 | 62 | USB_D2 | 82 | ~USB_RESET |
| 3 | DAI0_PIN01 | 23 | DAI0_PIN11 | 43 | GND3 | 63 | NU | 83 | ~SPI3_SEL1 |
| 4 | DAI1_PIN01 | 24 | DAI1_PIN11 | 44 | GND4 | 64 | USB_D3 | 84 | GPIO6 |
| 5 | DAI0_PIN02 | 25 | DAI0_PIN12 | 45 | GND5 | 65 | NU | 85 | GPIO5 |
| 6 | DAI1_PIN02 | 26 | DAI1_PIN12 | 46 | GND6 | 66 | USB_D4 | 86 | GPIO7 |
| 7 | DAI0_PIN03 | 27 | DAI0_PIN13 | 47 | HADC_VIN0 | 67 | NU | 87 | GND9 |
| 8 | DAI1_PIN03 | 28 | DAI0_PIN13 | 48 | HADC_VIN4 | 68 | USB_D5 | 88 | CNT_UD |
| 9 | DAI0_PIN04 | 29 | DAI0_PIN14 | 49 | HADC_VIN1 | 69 | NU | 89 | MLB_CLKP |
| 10 | DAI1_PIN04 | 30 | DAI1_PIN14 | 50 | HADC_VIN5 | 70 | USB_D6 | 90 | CNT_ZM |
| 11 | DAI0_PIN05 | 31 | DAI0_PIN15 | 51 | HADC_VIN2 | 71 | NU | 91 | MLB_CLKN |
| 12 | DAI1_PIN05 | 32 | DAI1_PIN15 | 52 | HADC_VIN6 | 72 | USB_D7 | 92 | CNT_DG |
| 13 | DAI0_PIN06 | 33 | DAI0_PIN16 | 53 | HADC_VIN3 | 73 | NU | 93 | MLB_SIGP |
| 14 | DAI1_PIN06 | 34 | DAI1_PIN16 | 54 | HADC_VIN7 | 74 | USB_NXT | 94 | GND10 |
| 15 | DAI0_PIN07 | 35 | DAI0_PIN17 | 55 | GND7 | 75 | NU | 95 | MLB_SIGN |
| 16 | DAI1_PIN07 | 36 | DAI1_PIN17 | 56 | GND8 | 76 | USB_STP | 96 | MLB_CLK |
| 17 | DAI0_PIN08 | 37 | DAI0_PIN18 | 57 | NU | 77 | SPI3_CLK | 97 | MLB_DATP |
| 18 | DAI1_PIN08 | 38 | DAI1_PIN18 | 58 | USB_D0 | 78 | USB_DIR | 98 | MLB_SIG |
| 19 | DAI0_PIN09 | 39 | DAI0_PIN19 | 59 | NU | 79 | SPI3_MISO | 99 | MLB_DATN |
| 20 | DAI1_PIN09 | 40 | DAI1_PIN19 | 60 | USB_D1 | 80 | USB_CLK | 100 | MLB_DAT |

**Table 3-2:** SoM Interface B Connector (P20)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|---|---|
| 1 | GND1 | 21 | OSPI_D7 | 41 | TWI2_SDA | 61 | MSI_D3 | 81 | LINKPORT0_D7 |
| 2 | GND2 | 22 | SPI1_SEL2b | 42 | UART2_RXb | 62 | GND8 | 82 | LINKPORT1_D7 |
| 3 | SP2_OSPI_MISO | 23 | SPI2_SEL2b | 43 | UART0_TXb | 63 | MSI_D4 | 83 | LINKPORT0_D6 |

**Table 3-2:** SoM Interface B Connector (P20) (Continued)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|---|---|
| 4 | SPI0_CLK | 24 | GND3 | 44 | UART2_RTSb | 64 | CAN0_TX | 84 | LINKPORT1_D6 |
| 5 | SP2_OSPI_MOSI | 25 | GND4 | 45 | UART0_RXb | 65 | MSI_D5 | 85 | LINKPORT0_D5 |
| 6 | SPI0_MISO | 26 | SPI0_RDY | 46 | UART2_CTSb | 66 | CAN0_RX | 86 | LINKPORT1_D5 |
| 7 | SPI2_OSPI_D2 | 27 | SPI2_OSPI_DQS | 47 | UART0_RTSb | 67 | MSI_D6 | 87 | LINKPORT0_D4 |
| 8 | SPI0_MOSI | 28 | SPI1_RDY | 48 | GND6 | 68 | GND | 88 | LINKPORT1_D4 |
| 9 | SP2_OSPI_D3 | 29 | NU | 49 | UART0_CTSb | 69 | MSI_D7 | 89 | LINKPORT0_D3 |
| 10 | SPI0_SSb | 30 | SPI2_RDY | 50 | GPIO1 | 70 | CAN1_TX | 90 | LINKPORT1_D3 |
| 11 | SP2_OSPI_CLK | 31 | TWI0_SCL | 51 | GND5 | 71 | GND7 | 91 | LINKPORT0_D2 |
| 12 | SPI0_SEL2b | 32 | UART1_TXb | 52 | GPIO2 | 72 | CAN1_RX | 92 | LINKPORT1_D2 |
| 13 | SP2_OSPI_SSb | 33 | TWI0_SDA | 53 | NU | 73 | NU | 93 | LINKPORT0_D1 |
| 14 | SPI1_CLK | 34 | UART1_RXb | 54 | NU | 74 | NU | 94 | LINKPORT1_D1 |
| 15 | OSPI_D4 | 35 | TWI1_SCL | 55 | MSI_D0 | 75 | NU | 95 | LINKPORT0_D0 |
| 16 | SPI1_MISO | 36 | UART1_RTSb | 56 | MSI_CLK | 76 | NU | 96 | LINKPORT1_D0 |
| 17 | OSPI_D5 | 37 | TWI1_SDA | 57 | MSI_D1 | 77 | NU | 97 | LINKPORT0_ACK |
| 18 | SPI1_MOSI | 38 | UART1_CTSb | 58 | MSI_CMD | 78 | NU | 98 | LINKPORT1_ACK |
| 19 | OSPI_D6 | 39 | TWI2_SCL | 59 | MSI_D2 | 79 | GND9 | 99 | LINKPORT0_CLK |
| 20 | SPI1_SSb | 40 | UART2_TXb | 60 | MSI_CDb | 80 | GND10 | 100 | LINKPORT1_CLK |

**Table 3-3:** SoM Interface C Connector (P16)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|---|---|
| 1 | GND1 | 21 | ETH0_RXCLK_REFCLK | 41 | GND7 | 61 | PPI_D05 | 81 | PPI_D15 |
| 2 | GND2 | 22 | GND4 | 42 | CLK1 | 62 | PPI_D17 | 82 | ~UART3_RX |
| 3 | ETH0_MDIO | 23 | ETH0_RXCTL_CRS | 43 | PPI_CLK | 63 | PPI_D06 | 83 | PPI_D16 |
| 4 | ETH1_MDIO | 24 | ETH0_PTPCLKIN0 | 44 | CLK2 | 64 | PPI_D18 | 84 | ~UART3_RTS |
| 5 | ETH0_MDC | 25 | GND3 | 45 | PPI_FS1 | 65 | PPI_D07 | 85 | GND11 |
| 6 | ETH1_MDC | 26 | ETH0_PTPAUX-IN0 | 46 | GND8 | 66 | PPI_D19 | 86 | ~UART3_CTS |
| 7 | ETH0_MD_INT | 27 | ETH0_TXD3 | 47 | PPI_FS2 | 67 | PPI_D08 | 87 | VDD_EXT |
| 8 | ETH1_RXD1 | 28 | ETH0_PTPPPS0 | 48 | JTG0_TMS/SWDIO | 68 | PPI_D20 | 88 | SYS_FAULT |

**Table 3-3:** SoM Interface C Connector (P16) (Continued)

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|---|---|---|---|
| 9 | ETH0_GPIO_1 | 29 | ETH0_TXD2 | 49 | PPI_FS3 | 69 | PPI_D09 | 89 | VDD_VREF |
| 10 | ETH1_RXD0 | 30 | ETH0_PTPPPS1 | 50 | JTG0_TCK/ SWCLK | 70 | PPI_D21 | 90 | GND12 |
| 11 | ETH0_GPIO_2 | 31 | ETH0_TXD1 | 51 | PPI_D00 | 71 | PPI_D10 | 91 | VDD_A |
| 12 | ETH1_TXEN | 32 | ETH0_PTPPPS2 | 52 | JTG0_TDO/SW0 | 72 | PPI_D22 | 92 | VDD_DMC |
| 13 | ETH0_RXD3 | 33 | ETH0_TXD0 | 53 | PPI_D01 | 73 | PPI_D11 | 93 | VDD_INT |
| 14 | ETH1_TXD0 | 34 | ETH0_PTPPPS3 | 54 | JTG0_TDI | 74 | PPI_D23 | 94 | $\overline{\text{SYS\_HWRST}}$ |
| 15 | ETH0_RXD2 | 35 | ETH0_TXCLK | 55 | PPI_D02 | 75 | PPI_D12 | 95 | PWR_SEQ_GOOD |
| 16 | ETH1_TXD1 | 36 | GND5 | 56 | $\overline{\text{JTG0\_TRST}}$ | 76 | GND10 | 96 | $\overline{\text{SoM\_Reset}}$ |
| 17 | ETH0_RXD1 | 37 | ETH0_TXEN | 57 | PPI_D03 | 77 | PPI_D13 | 97 | VDD1 |
| 18 | ETH1_CRS | 38 | SYS_CLKOUT | 58 | $\overline{\text{TARGET\_RESET}}$ | 78 | ETH1_R EFCLK | 98 | VSS1 |
| 19 | ETH0_RXD0 | 39 | GND6 | 59 | PPI_D04 | 79 | PPI_D14 | 99 | VDD2 |
| 20 | ETH1_INTb | 40 | AUDIO_CLK | 60 | GND9 | 80 | UART3_ TX | 100 | VSS2 |

**Table 3-4:** Mating Connector

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| 100-pin, 0.64 mm | SAMTEC | LSS-150-01-L-DV-A-K |
| *Mating Connector* | | |
| 100-pin, 0.64 mm | SAMTEC | LSS-150-01-L-DV-A-K |

## Power Plug ( P14)

This powers up the board with a 24V supply. Power is required when the board is operating in both main and sub mode.

| *Part Description* | *Manufacturer* | *Part Number* |
|---|---|---|
| 2.1 mm power jack | CUI | PJ-102AH |
| *Mating Cable* | | |
| 24.0VDC @3A power supply | Kaga Electronics USA | KTPS65-2430DT-3P-VI-C-P1 |

# Jumpers

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

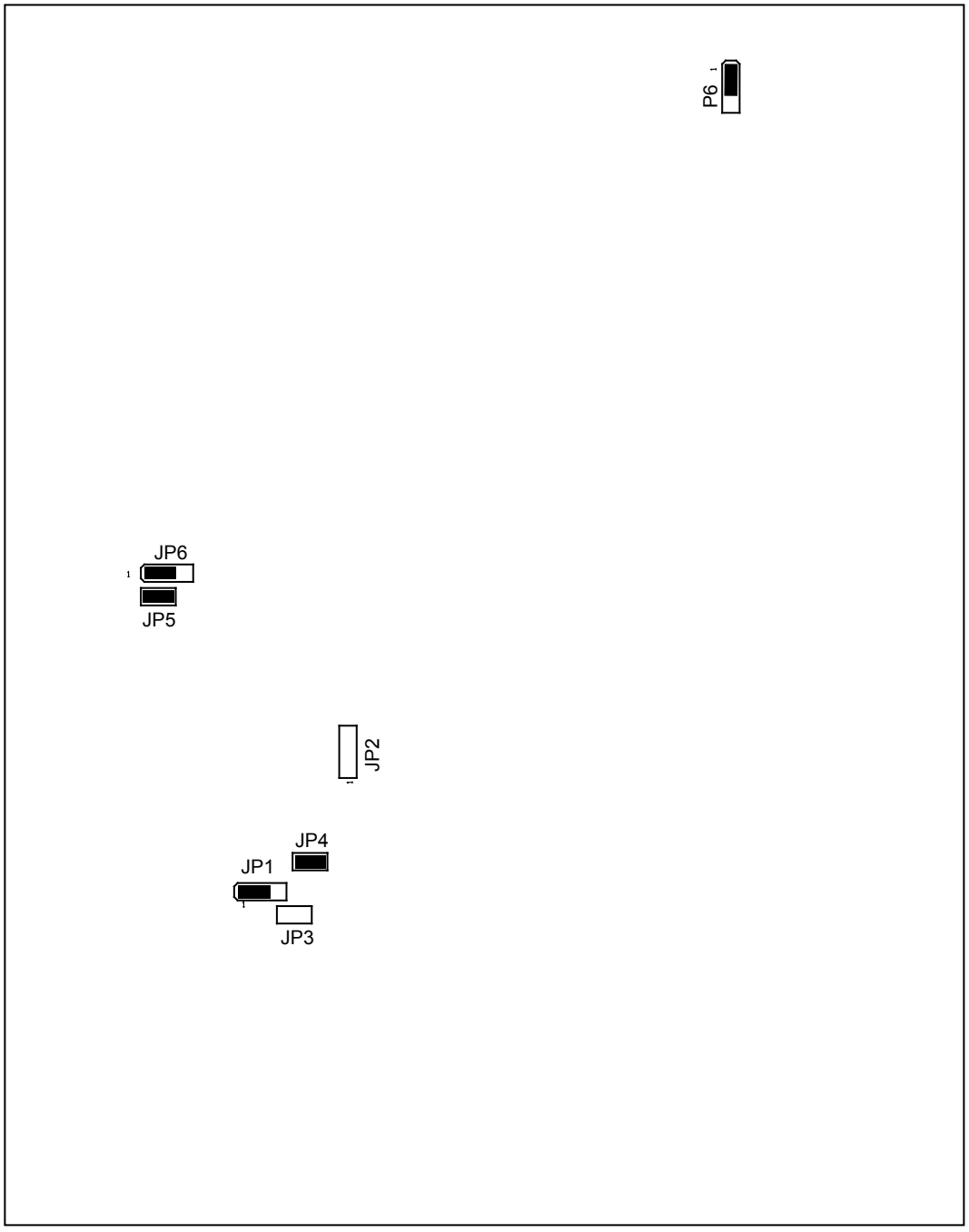



**Figure 3-3:** Jumper Locations

## A2B Address Select ( `JP3 and JP4`)

The A2B address Select jumper will be used to choose which address is being used on A2B chip. The default address is 0X68.

| Address | JP3 | JP4 |
|---|---|---|
| 0X68 | OFF | ON (Default) |
| 0X6A | OFF | OFF |
| 0X6B | ON | ON |
| 0X6C | ON | OFF |

## Self Discovery ( JP1)

The Self Discovery jumper is used to select the self discovery mode of the AD2437. The default setting for the jumper is pins 1 and 2. Self Discovery Mode will not be enabled by default

| Jumper | Clock Routing |
|---|---|
| 1 and 2 (DEFAULT) | Normal Power Mode |
| 2 and 3 | Self Discovery Mode |

## Boot Disable ( JP5)

The Boot jumper allows the ADAU1452 to perform a self boot, in which it loads its RAM and register settings from an external EEPROM. When the jumper is installed no self boot operation is initiated. When the jumper is removed a self boot operation is initiated the next time there is a rising edge on the RESET signal of the ADAU1452. This jumper is installed by default.

## ADAU1452 CLK Select ( JP6)

The CLK Select jumper is used to select the CLK source for the ADAU1452 Main Clock. For Main Mode jumper must be between 1 and 2 and for Local Powered Sub mode it should be between 2 and 3. The default position is 1 and 2.

| Jumper | Routing |
|---|---|
| 1 and 2 (DEFAULT) | External Oscillator |
| 2 and 3 | AD2437 ADR2/IO2/MCLK |

## USBi SPI SEL ( JP2 )

Jumper option to use SPI signals from SOM module or AD2437 chip.

| Jumper | Source |
|---|---|
| Hang on 1 (DEFAULT) | SCL and SDA |
| 1 and 2 | AD2437 SPI |
| 2 and 3 | SOM SPI |

## AD1937 Clock Select ( P6 )

The AD1937 codec supports MCLK clock input from either ADAU1452 SigmaDSP clock out, or from SOM module. Refer to schematic for further details and jumper arrangements.

| Jumper | Routing |
|---|---|
| 1 and 2 (DEFAULT) | ADAU1452 clock |
| 2 and 3 | SOM clock |

# LEDs

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

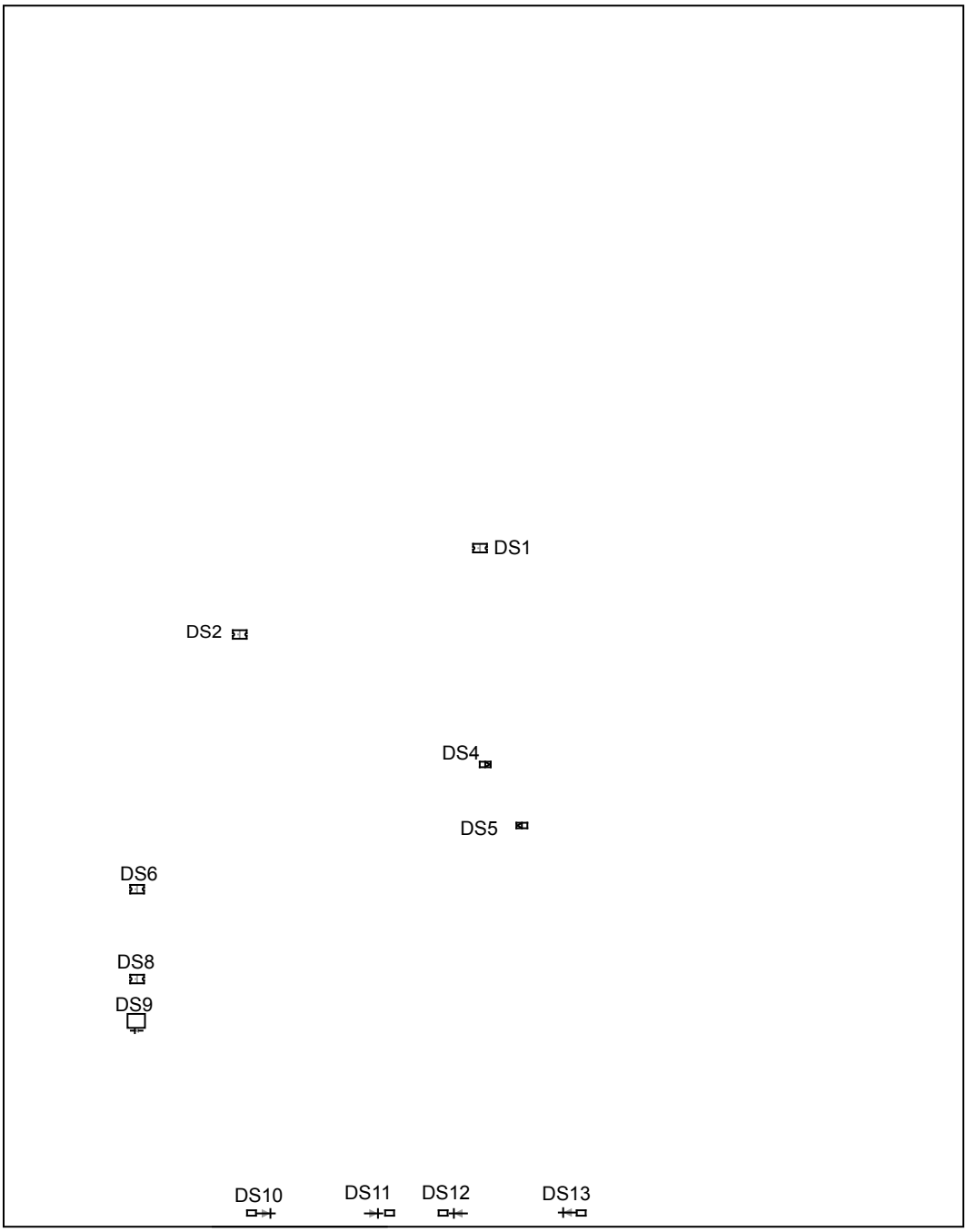



**Figure 3-4:** LED Locations

## A²B Interrupt ( DS4)

The A²B interrupt LED is driven by the AD2437. The LED is turned on when the IRQ pin drives it high. Refer to the TRM for further info on using interrupts.

## ADAU1452 Status ( DS1)

The ADAU1452 Status is used to indicate the ADAU1452 has been successfully programmed by asserting MP5 high in DSP programming. Please see ADAU1452 programming guide for more information.

## USBi ( DS2)

The USBi LED is used to indicate the USBi is connected and powered.

## User I/O Status ( DS5)

General purpose LED connected to SIO2. Asserting this pin low will turn on the LED.

| LED | PORT |
|---|---|
| DS5 | SIO2 |

## Port Connection Status ( DS10, DS11, DS12, and D13)

When there is a successful discovery and the bus power is activated, these LEDs will illuminate the XLR light rings.

| LED | Port |
|---|---|
| DS10 and DS11 | A towards MAIN |
| DS12 and DS13 | B towards SUB |

## Reset LED ( DS7)

When ON (red), it indicates that the board is in reset. A master reset is asserted by pressing S1, which activates the LED.

## Power Status LED Indicator

LED indication for the individual power regulation circuits.

DS8: +3.3V @1.5A

DS6 : +5.0V @1.5A

DS9 : +24.0V @3.0A