

EVAL-AD2437A1MZ Manual

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Part Number
EVAL-AD2437A1MZ

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Regulatory Compliance

The *EVAL-AD2437A1MZ* 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-AD2437A1MZ* 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

Preface

Purpose of This Manual.....	1-2
Manual Contents.....	1-2
Technical Support.....	1-3
Supported Integrated Circuit.....	1-3
Supported Tools.....	1-3
Product Information.....	1-3
Analog Devices Website.....	1-4
EngineerZone.....	1-4

Using the Board

Product Overview.....	2-1
Package Contents.....	2-2
Default Configuration.....	2-2
Reference Design Information.....	2-3
AD2437 - Audio Bus A ² B Transceiver.....	2-4
ADAU1452 - SigmaDSP Digital Audio Processor.....	2-4
AD1937 - Four ADCs/Eight DACs with PLL, 192 kHz, 24-Bit Codec.....	2-5
ADA4841 - Low Power, Low Noise and Distortion, Rail-to-Rail Output Amplifiers.....	2-5
ADG774 - CMOS 3 V/5 V, Wide Bandwidth Quad 2:1 Mux.....	2-5
ADM6315 - Open-Drain Microprocessor Supervisory Circuit.....	2-6
ADP2360 - 50 mA, 60 V, High Efficiency Buck Regulator.....	2-6
MAX16823AUE - High-Voltage, 3-Channel Linear High-Brightness LED Driver.....	2-6
MAX22503E -100Mbps Full-Duplex 3V/5V RS-485/RS-422 Transceiver with High EFT Immunity.....	2-7
MMICT390200012 - Digital Output MEMS Microphone.....	2-7

Hardware Reference

Switches.....	3-1
---------------	-----

Reset Pushbutton (SW1).....	3-1
Gain (S1).....	3-1
Connectors	3-1
Power Plug (P1).....	3-2
Wire-to-Board Terminal (P2).....	3-2
SPDIF Optical Input (P3).....	3-3
SPDIF Optical Output (P5).....	3-3
ADAU1452 AUX ADC Connector (P8).....	3-3
A ² B (P22 and P10)	3-3
Audio Input/Output (P29 and P28)	3-4
SigmaStudio+ (P30).....	3-4
AD2437 Signals Connector (P15)	3-4
A ² B Interface (P32)	3-4
Jumpers	3-4
PDM CLK Select and 2-Step Discovery (JP1).....	3-5
ADAU1452 I2C Bus Switch (JP2 and JP3).....	3-5
LTC4368 Wakeup (JP4).....	3-5
AD2437 SIO0 Routing (JP6).....	3-6
AD2437 SIO1 Routing (JP9).....	3-6
ADAU1452 CLK Select (JP38).....	3-6
USBi SPI Chip Select (JP42)	3-6
PWM Select (JP47)	3-7
LEDs	3-7
Reset (DS1).....	3-7
Power Status Indicator (DS2, DS7, DS8)	3-7
USBi (DS5).....	3-7
LTC4368 Circuit Breaker Status(DS3)	3-8
ADAU1452 Status(DS4)	3-8
RGB LED(DS6)	3-8

A²B Interrupt (DS9)	3-8
SIO2 Status (DS10)	3-8
I2C Bus Switch (DS11)	3-8

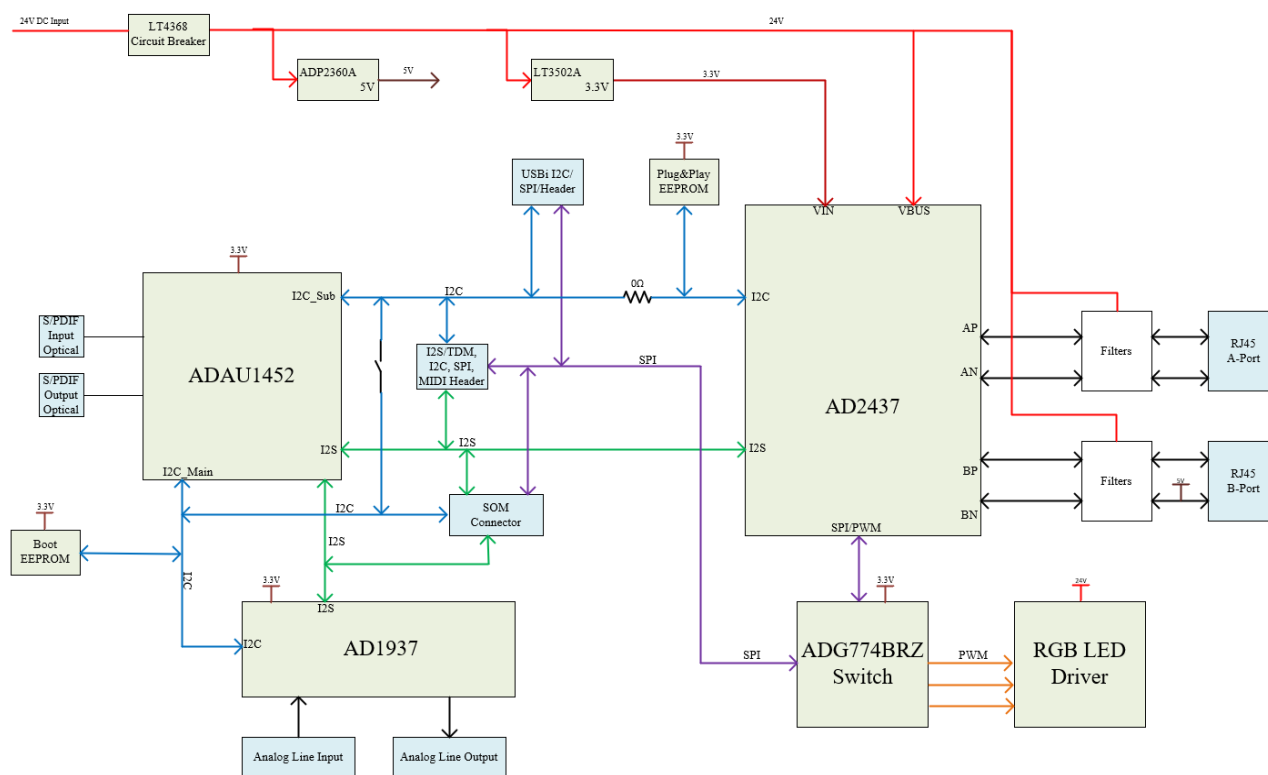
1 Preface

Thank you for purchasing the Analog Devices, Inc. *EVAL-AD2437A1MZ* evaluation board.

The *EVAL-AD2437A1MZ* is an evaluation board to evaluate various peripherals of the AD2437 A²B (Audio Bus) transceiver. Refer to the datasheet/manual to get more details about the AD2437.

The *EVAL-AD2437A1MZ* can be configured to be a Main Node or Local-Powered Sub (LPS) Node. The *EVAL-AD2437A1MZ* can be connected to a Main Node, Local Powered Sub (LPS) or a Bus Powered 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 A²B main node functionality for an A²B network.

A PC host controls the AD2437 A²B main transceiver I2C/SPI signals over the USB-to- I2C/SPI bridge, USBi(EVAL-ADUSB2EB). This allows SigmaStudio+ to directly discover and control an A²B network as well as to read back registers and monitor performance. Alternatively, the *EVAL-AD2437A1MZ* is controllable over a SOM interface through an external DSP host device like the SC594. In the main mode, AD2437 digital audio signals interface directly to the ADAU1452 SigmaDSP™, which provides the clock and frame sync signals to the A²B 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 the ADAU1937 and ADAU1452 for transmitting or receiving data. Four digital MEMS microphones interface directly with the transceiver, they can be either downstream or upstream.

The SigmaStudio+® graphical development tool is the programming, development, and tuning software for the SigmaDSP, A²B, 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-AD2437A1MZ.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-AD2437A1MZ.html>.

Technical Support

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

- Post your questions in the A²B 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 A²B 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 A²B software plug-in for the *EVAL-AD2437A1MZ* 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
- Analog Devices [ADA4841](#) - Low Power, Low Noise and Distortion, Rail-to-Rail Output Amplifiers
- Analog Devices [ADG774](#) - CMOS 3 V/5 V, Wide Bandwidth Quad 2:1 Mux
- Analog Devices [ADM6315](#) - Open-Drain Microprocessor Supervisory Circuit
- Analog Devices [ADP2360](#) - 50 mA, 60 V, High Efficiency Buck Regulator
- Analog Devices [MAX16823AUE](#) - High-Voltage, 3-Channel Linear High-Brightness LED Driver
- Analog Devices [MAX22503E](#) -100Mbps Full-Duplex 3V/5V RS-485/RS-422 Transceiver with High EFT Immunity
- TDK [MMICT390200012](#) - Digital Output MEMS Microphone
- Audio
 - Analog Devices [ADAU1452](#) - SigmaDSP Digital Audio Processor
 - Analog Devices [AD1937](#) - Four ADCs/Eight DACs with PLL, 192 kHz, 24-Bit Codec
 - Input and Output SPDIF Connectors with galvanic isolation
 - ADC Input and DAC Output 3.5mm connectors
- A²B
 - Two RJ45 Shielded Terminals
- LEDs
 - 11 LEDs: more details will be in LED section

- Switches
 - Two Switches: Reset and Gain
- Barrel Jack and Wire-to-Board Terminal
 - 24V @3 Amps

Package Contents

Your *EVAL-AD2437A1MZ* package contains the following items.

- *EVAL-AD2437A1MZ* board
- EVAL-ADUSB2EBZ (Rev 1.5 or above)
- 1m RJ45 Cable
- Universal 24V DC power supply
- A²B Software - Online Request Document

Contact the vendor where you purchased your *EVAL-AD2437A1MZ* 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.

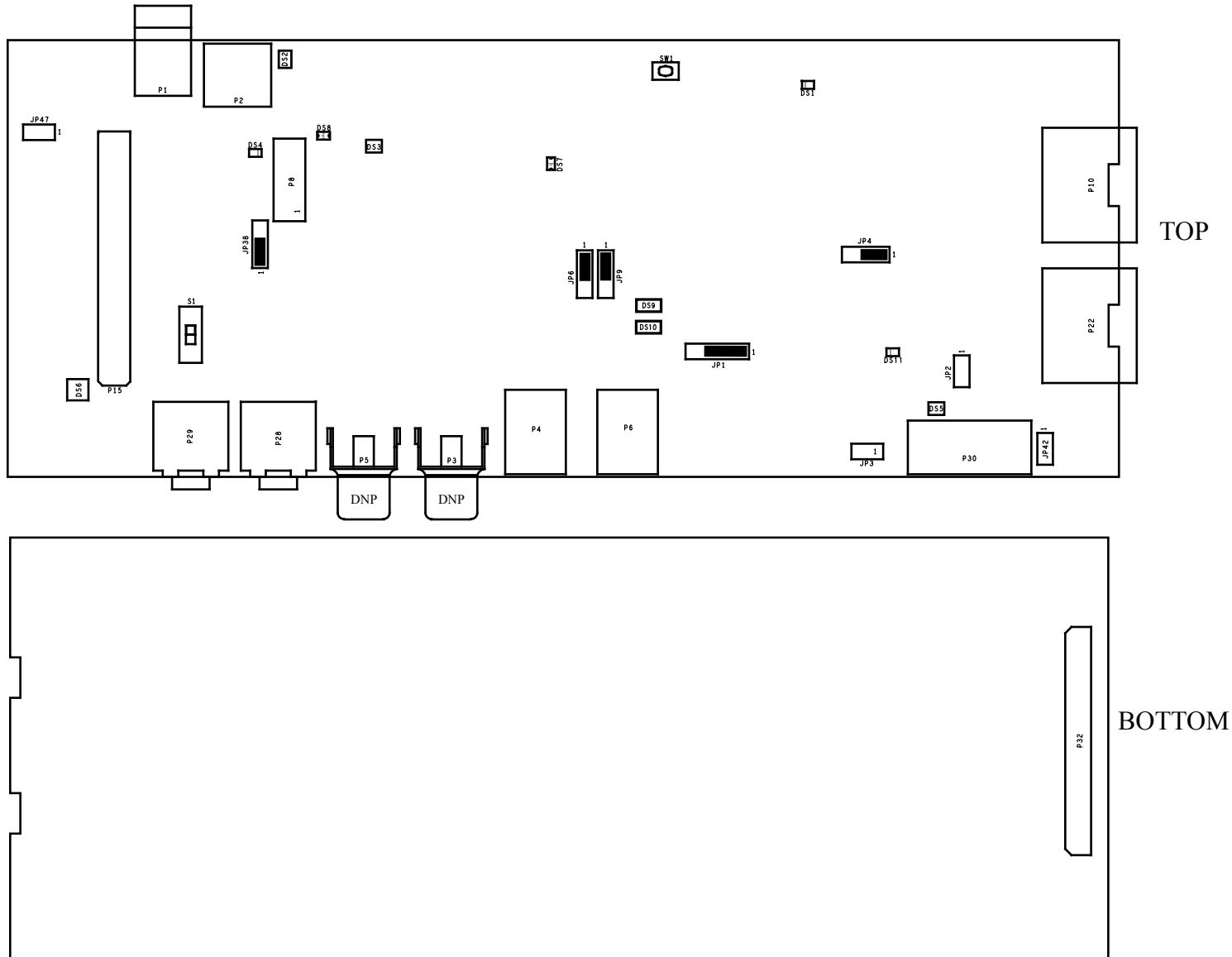


Figure 2-1: Default Hardware Setup

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-AD2437A1MZ.html>

AD2437 - Audio Bus A²B Transceiver

The [AD2437](#) provides a multi-channel, I²S/TDM link over distances of up to 30 m between nodes. It embeds bi-directional synchronous pulse-code modulation (PCM) data (for example, digital audio), clock, and synchronization signals onto a single differential wire pair. A²B supports a direct point to point connection and allows multiple, daisy-chained nodes at different locations to contribute and/or consume time division multiplexed channel content.

A²B is a single-main, multiple-sub system where the transceiver at the host controller is the main node and generates clock, synchronization, and framing for all sub nodes. The main A²B device is programmable over a control bus (I²C and SPI) for configuration and read back. An extension of this control bus is embedded in the A²B data stream, which grants direct access of registers and status information on sub transceivers as well as I²C and SPI communication over distance.

The transceiver can connect directly to general-purpose digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), microphones, analog-to-digital converters (ADCs), digital-to-analog converters (DACs), and codecs through a multi-channel I²S/TDM interface. It also provides a pulse density modulation (PDM) interface for direct connection of up to four PDM digital microphones.

Finally, the transceiver also supports an A²B bus powering feature, where the main node supplies voltage and current to the sub nodes over the same daisy-chained, twisted pair cable as used for the communication link. Please refer to the datasheet for more details.

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.

ADA4841 - Low Power, Low Noise and Distortion, Rail-to-Rail Output Amplifiers

The [ADA4841-1/ADA4841-2](#) are unity gain stable, low noise and distortion, rail-to-rail output amplifiers that have a quiescent current of 1.5 mA maximum. In spite of their low power consumption, these amplifiers offer low wide-band voltage noise performance of 2.1 nV/ $\sqrt{\text{Hz}}$ and 1.4 pA/ $\sqrt{\text{Hz}}$ current noise, along with excellent spurious-free dynamic range (SFDR) of -105 dBc at 100 kHz. To maintain a low noise environment at lower frequencies, the amplifiers have low 1/f noise of 7 nV/ $\sqrt{\text{Hz}}$ and 13 pA/ $\sqrt{\text{Hz}}$ at 10 Hz. The ADA4841-1/ADA4841-2 output can swing to less than 50 mV of either rail. The input common-mode voltage range extends down to the negative supply. The ADA4841-1/ ADA4841-2 can drive up to 10 pF of capacitive load with minimal peaking.

ADG774 - CMOS 3 V/5 V, Wide Bandwidth Quad 2:1 Mux

The [ADG774](#) is a monolithic CMOS device comprising four 2:1 multiplexer/demultiplexers with high impedance outputs. The CMOS process provides low power dissipation yet gives high switching speed and low on resistance. The on resistance variation is typically less than 0.5 Ω with an input signal ranging from 0 V to 5 V.

The on resistance profile is very flat over the full analog input range ensuring excellent linearity and low distortion when switching audio signals. Fast switching speed, coupled with high signal bandwidth, also makes the parts suitable for video signal switching. CMOS construction ensures ultralow power dissipation, making the parts ideally suited for portable and battery-powered instruments.

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.

ADP2360 - 50 mA, 60 V, High Efficiency Buck Regulator

The [ADP2360](#) is a high efficiency, high input voltage, discontinuous conduction mode (DCM) synchronous, step-down, dc-to-dc switching regulator. The ADP2360 operates with a wide input voltage supply range from 4.5 V to 60 V and can source up to 50 mA continuous output current, making it ideal for regulating power from a variety of voltage sources in space-constrained applications. The ADP2360 is available with an adjustable output (0.8 V to VIN) or in 3.3 V and 5.0 V factory-programmable fixed output voltage models.

MAX16823AUE - High-Voltage, 3-Channel Linear High-Brightness LED Driver

The [MAX16823](#) three-channel LED driver operates from a 5.5V to 40V input voltage range and delivers up to 100mA per channel to one or more strings of highbrightness LEDs (HB LEDs). Each channel's current is programmable using an external current-sense resistor in series with the LEDs. Three DIM inputs allow a wide range of independent pulsed dimming in addition to providing the on and off control of the outputs. Wave shaping circuitry reduces EMI while providing fast turn-on and turn-off times. The MAX16823 is well suited for automotive applications requiring a high-voltage input and is able to withstand load-dump events up to 45V. On-board pass elements minimize external components while providing $\pm 5\%$ LED current accuracy. Additional features include an active-high, open-drain LEDGOOD output for open LED detection, a +3.4V ($\pm 5\%$) regulated output with 4mA output current capability, short-circuit and thermal protections. The MAX16823 is available in thermally enhanced 5mm x 5mm, 16-pin TQFN-EP and 16-pin TSSOP-EP packages and is specified over the -40°C to $+125^{\circ}\text{C}$ automotive temperature range.

MAX22503E - 100Mbps Full-Duplex 3V/5V RS-485/RS-422 Transceiver with High EFT Immunity

The [MAX22503E](#) full-duplex, ESD-protected, RS-485/ RS-422 transceiver for high-speed communication operates up to 100Mbps. This transceiver features larger receiver hysteresis for high noise rejection and improved signal integrity. Integrated hot-swap protection and a fail- safe receiver ensure a logic-high on the receiver output when input signals are shorted or open for longer than 10 μ s (typ). The MAX22503E is available in 14-pin SOIC package and operates over the -40°C to +125°C ambient temperature range.

MMICT390200012 - Digital Output MEMS Microphone

The [T3902](#) is a low-power, low-noise digital MEMS microphone in a small package. The T3902 consists of a MEMS microphone element and an impedance converter amplifier followed by a fourth-order Σ - Δ modulator. The pulse density modulated (PDM) interface allows two microphones to be time multiplexed on a data line using a single clock.

3 Hardware Reference

This chapter describes the hardware design of the *EVAL-AD2437A1MZ*.

Switches

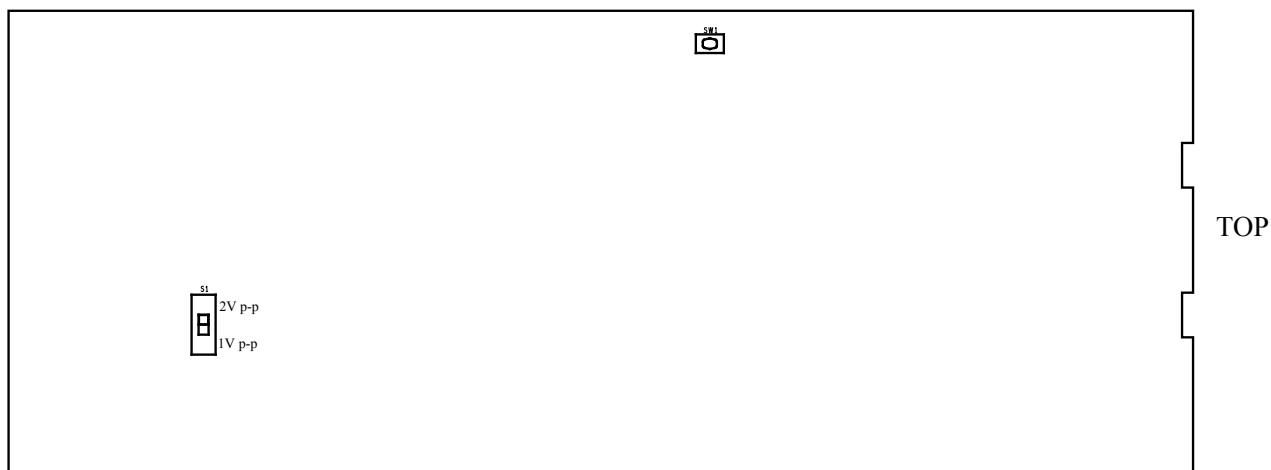


Figure 3-1: Switch Locations

Reset Pushbutton (sw1)

The reset pushbutton resets AD2437, ADAU1452 and AD1937 ICs. The Reset LED (DS1) is used to indicate when the board is in reset.

Gain (s1)

Gain switch sets the gain of the ADC input. By default the switch will be on 2V p-p. The switch can also be configured in 1V p-p mode to match the input audio source.

Connectors

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

Connector Locations:



Figure 3-2: Connector Locations

Power Plug (P1)

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

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
2.1 mm power jack	CUI	PJ-102AH
<i>Mating Cable</i>		
24.0VDC@3A power supply	CUI	KTPS65-2430DT-3P-VI

Wire-to-Board Terminal (P2)

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

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
5.08mm power jack	Weidmuller	1716020000
<i>Mating Cable</i>		
24.0VDC discrete wires		

SPDIF Optical Input (P3)

The SPDIF Input connector is connected to the SPDIFIN on the ADAU1452. The SPDIF connection offers galvanic isolation for equipment safety.

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
RCA Jack	CUI	RCJ-011
<i>Mating Cable</i>		
Standard SPDIF cable (non optical)		

SPDIF Optical Output (P5)

The SPDIF Output connector is connected to the SPDIFOUT on the ADAU1452. The SPDIF connection offers galvanic isolation for equipment safety.

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
RCA Jack	CUI	RCJ-011
<i>Mating Cable</i>		
Standard SPDIF cable (non optical)		

ADAU1452 AUX ADC Connector (P8)

A²B (P22 and P10)

P10 is used to connect towards the sub board and P22 is used to connect towards the main board. These connectors allow the AD2437 on the eval board to communicate with other A²B devices on the bus.

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
RJ45 - Ethernet	Amphenol ICC	RJE73-188-00210
<i>Mating Cable</i>		
Ethernet cable assembly		

Audio Input/Output (P29 and P28)

The analog audio ADC input P29 and DAC output P28 connectors are configured as a stereo single ended signal for connection to the first two inputs and outputs of the AD1937.

<i>Part Description</i>	<i>Manufacturer</i>	<i>Part Number</i>
3.5mm Stereo Jack	CUI	SJ1-3525NG
<i>Mating Cable</i>		
Standard 3.5mm stereo audio male cable		

SigmaStudio+ (P30)

This connector interfaces with SigmaStudio+ through the [EVAL-ADUSB2EBZ](#) board. The pinout can be found in the schematic.

AD2437 Signals Connector (P15)

This connector has multiple signals interfaced with AD2437 IC. This connector can be interfaced with external custom boards if required or used for probing. The connector is a 0.1" header. The pinout can be found in the schematic.

A²B Interface (P32)

This connector has A²B processor signals. It can be interfaced with external custom boards if required. The pinout can be found in the schematic.

Note that when using this connector on the SOMCRR board, please ensure that the evaluation board is set as a main node and JP1 is not connected if 2 step discovery is required.

Jumpers

This section describes functionality of the configuration jumpers. The *Jumper Locations* figure shows the jumper locations. Please refer A²B Software quick start guide for final Jumper settings.

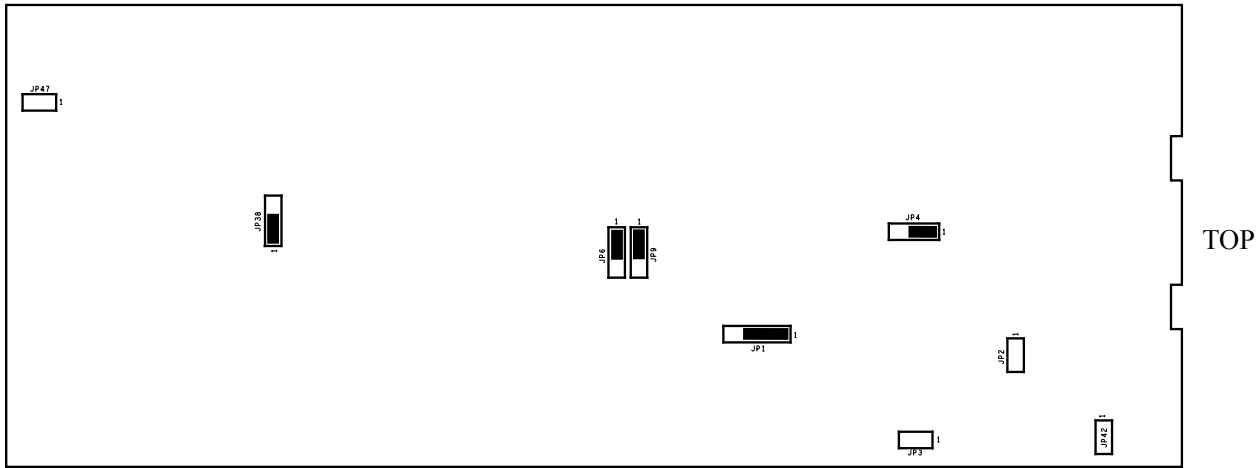


Figure 3-3: Jumper Configurations

PDM CLK Select and 2-Step Discovery (JP1)

This 4-way jumper is used for 2-Step Discovery as well as the PDM CLK source for the on-board microphones from the A²B transceiver.

Jumper	Routing
1 and 2 (DEFAULT)	2-Step Discovery through GPIO7
2 and 3	Alternate PDM clock source from GPIO7
3 and 4	PDM clock source from AD2437 BCLK

ADAU1452 I2C Bus Switch (JP2 and JP3)

These jumpers are used to enable the I2C bus for ADAU1452 SigmaDSP. The table below lists the options to program or parameter write from AD2437 chip, USBi to ADAU1452 or EEPROM. Refer to the schematic for further information.

Jumper JP2	Jumper JP3	ADAU1452_MP6	I2C Bus Switch (U26 , U27)	Use Case and Action
OPEN (DEFAULT)	OPEN (DEFAULT)	X	CLOSED	Program/Parameter write from AD2437 or USBi to ADAU1452 or Boot EEPROM
CLOSED	OPEN	X	CLOSED	Program/Parameter write from AD2437 or USBi to ADAU1452
X	CLOSED	1 -> 0	OPEN -> CLOSED	SELFBOT of ADAU1452 from Boot EEPROM
X	X	1	OPEN	Parameter write from ADAU1452 to BOOT EEPROM

LTC4368 Wakeup (JP4)

The purpose of the jumper is to set whether the board is a Main Node or Sub Node. If Main Node is selected, the LTC4368 will close once appropriate voltage levels are detected. If Sub Node is selected, the LTC4368 will only close if woken up by an upstream Main Node or Sub Node.

Jumper	Routing
1 and 2 (DEFAULT)	Main Node
2 and 3	Sub Node

AD2437 SIO0 Routing (JP6)

The AD2437 SIO0 jumper is used to select the routing of the AD2437 SIO0 signal. The default setting for the jumper is pins 1 and 2.

Jumper	Routing
1 and 2 (DEFAULT)	I2S SDATA_OUT0 from ADAU1452
2 and 3	PDM_DATA0

AD2437 SIO1 Routing (JP9)

The AD2437 SIO1 jumper is used to select the routing of the AD2437 SIO1 signal. The default setting for the jumper is pins 1 and 2.

Jumper	Routing
1 and 2 (DEFAULT)	I2S SDATA_OUT1 from ADAU1452
2 and 3	PDM_DATA1

ADAU1452 CLK Select (JP38)

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. For Sub Mode, it should be between 2 and 3. The default position is 1 and 2.

Jumper	Routing
1 and 2 (DEFAULT)	24.576 MHz Crystal Oscillator
2 and 3	AD2437 MCLK

USBi SPI Chip Select (JP42)

The USBi Chip Select jumper is used to select the SPI communication for the A²B transceiver using USBi. This will enable Chip Select of AD2437 to be connected to USBi SPI port. The default position is not connected. Please ensure that PWM select jumper (JP47) is open when configuring the USBi SPI Chip select jumper. The default address id 0x6A.

PWM Select (JP47)

The PWM Select jumper is used to enable the SPI signals of the AD2437 to use their alternate function of driving the RGB LED (DS6). Note that when JP47 is installed SPI Protocol can not be used to interface between AD2437 and other devices. Jumper JP47 is not installed by default.

LEDs

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

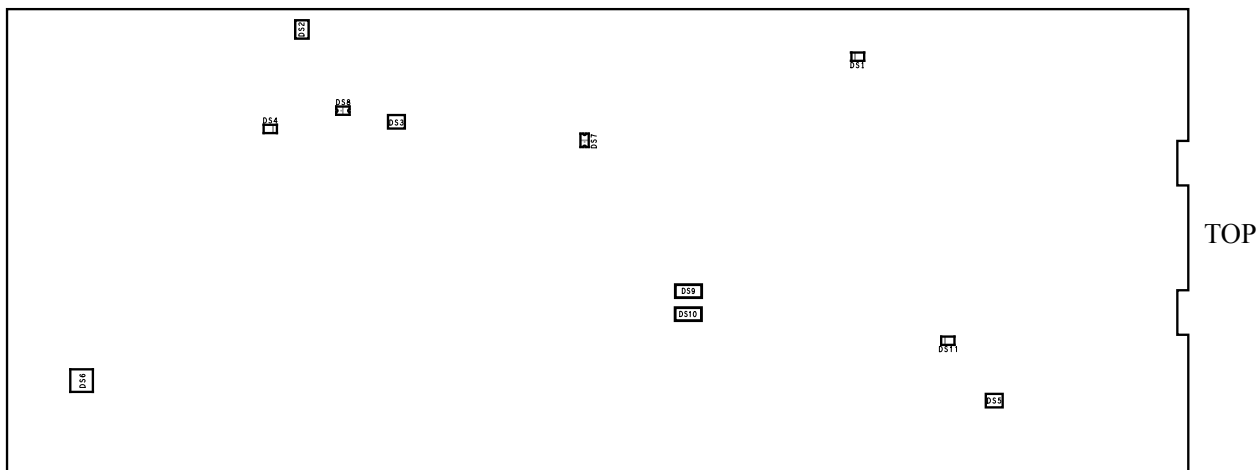


Figure 3-4: LED Locations

Reset (DS1)

When ON (red), it indicates that the board is in reset. A master reset is asserted by pressing SW1, which activates the LED. The LED Can also come on if activated via a HW_RESET or USB_RESET. For more information, see [Reset Pushbutton \(SW1\)](#).

Power Status Indicator (DS2, DS7, DS8)

The Status Indicators indicate Supplies health i.e. They will be on when respective supply will be available on board.

DS7 : +5.0V

DS8 : +3.3V

DS2 : +24V

USBi (DS5)

The USBi LED indicates that USBi or Aardvark is connected and on.

LTC4368 Circuit Breaker Status(DS3)

LED indicating when LTC4368 circuit breaker is closed.

ADAU1452 Status(DS4)

The ADAU1452 Status is used to indicate the ADAU1452 has been successfully programmed when it is lit.

RGB LED(DS6)

RGB LED is used to demonstrate the alternate function of the SPI pins on the AD2437 IC as PWM outputs. Refer to the PRM to understand how each of the 3 SPI signals can manipulate the RGB colors.

A²B Interrupt (DS9)

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

SIO2 Status (DS10)

LED status indication driven by AD2437 SIO2.

I2C Bus Switch (DS11)

The I2C Bus Switch LED is used to indicate that the ADAU1452 and its EEPROM are connected to the boards I2C bus.

