

ADAU1701 Audio Digital Signal Processor Kernel Board (AA-AP23122)

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Applications:

Speaker Equalization
Active Crossovers
Subwoofer Integration
Noise Cancellation System
Digital Car Audio System
Home Theater, Karaoke, Musical Instruments

Introduction:

This Audio DSP Board comes with all the necessary components installed and demonstration firmware, and what customers only need to do is to connect and play. Select AA-AP23111 or AA-AP23122 and you will get this DSP board shown in Figure 1 or 2.

Customers will also need an Audio DSP Extension Board with ADAU1701 2 in x 3 out which is used to connect the stereo audio player and the audio amplifier (or headphone) by 3.5mm and RCA jack. And most of all, it employs the flexible audio DSP connector (10Pin Extension cable attached with Extension board). After connecting the Kernel board with interface extension board, just power up the kernel board with a universal microUSB cable, and then turn the potentiometers on board to adjust main volume, treble volume, bass volume and cut off frequency, besides that toggle the slide switch on board to mute or enable the audio output. Select AA-AA11428 to get this interface extension board.

Thanks for all the available interface of the Audio DSP, including analog and digital audio input and output, control IOs and I2C programming interface, this Audio DSP board can provide a platform with the ADAU1701 for easy integration of digital audio applications with an affordable price.

Benefits:

High Sound Quality

This Audio DSP board employs the Analog Device ADAU1701 whose signal processing is comparable to that found in high end studio equipment. The dynamic range of its Two Σ - Δ ADCs and four Σ - Δ DACs reaches high up to 98.5dB. Each ADC has a THD + N of -83 dB, and each DAC has a THD + N of -90 dB. Besides, the optimal PCB layout of power filtering and signal loop as well as the capacitive components also contribute to the high sound quality.

Frequency Response

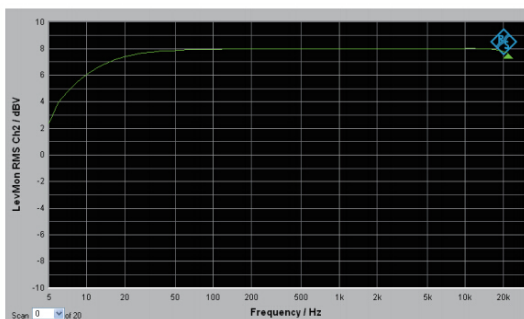


Figure 3

Distortion Spectrum

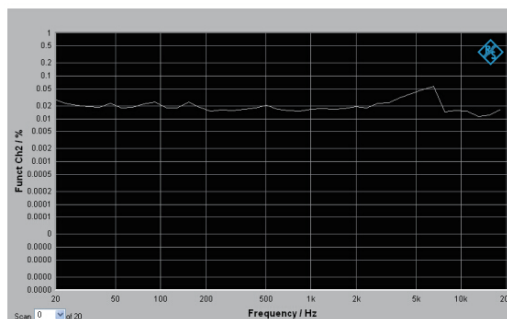


Figure 4

Affordable price

Selecting a proper audio DSP module for DIY applications with reasonable speed, cost, precision, data word length, I/O capabilities and SNR is not an easy task usually, especially when budget is only several or tens of dollars. A simplest but available DSP system will only cost you \$9.99. The Audio DSP board serves as a cost effective platform for those new to the digital signal processing with interest in digital audio. Simple connection but rich potential configurations and low cost without hidden cost but high performance are the reasons of the affordable price.

Easy for integration

If you plan to develop a high performance audio systems, whether a car or a home theater focused application, using Kernel Audio DSP board is a turn-key approach to the system development that free up your development resources to focus on the global performance instead of spending time developing the audio DSP. All the necessary interfaces have been rearranged according to signal chain and the programming requirement. With the headers or a 10 pin cable, the kernel board will be integrated to the motherboard quickly.

Transparent to design resources

For sake of saving the development investment, we've also attached the schematics, demonstration project resources and datasheet for the reference. All the files can be downloaded from our website store www.sure-electronics.com. If you have further OEM requirement or application questions, please contact our technical support.

Fully protected

The ESD and TVS components and resistors arrays are used throughout input and output interface in order to avoid plug-in play damage to the ports.

We also use JST PH side entry connector and IDC connectors to prevent pin connection mistake.

Differences between application and evaluation version

The differences between application and evaluation version don't just lie in the prices, which are \$9.90 and \$19.90 respectively.

There are two control ports on both sides of the evaluation version, each of which has 20 PINs to help you integrate the board into your system more easily. Please refer to the PIN definition chapter for more details. There is also a reset button on the board to help you restore the settings. A molex Micro-Fit 10-PIN is provided to make it more convenient for you to connect it to SigmaStudio graphical tool. Besides, it has 4 potentiometers on board for more functions. In comparison, there are only 2 potentiometers on the application version board, and it has no functions mentioned above.

In addition, a service of programming can be provided for the application version with a MOQ of 500 pieces. Feel free to contact with info@sure-electronics.com for more detailed information.

Transparent to SigmaStudio

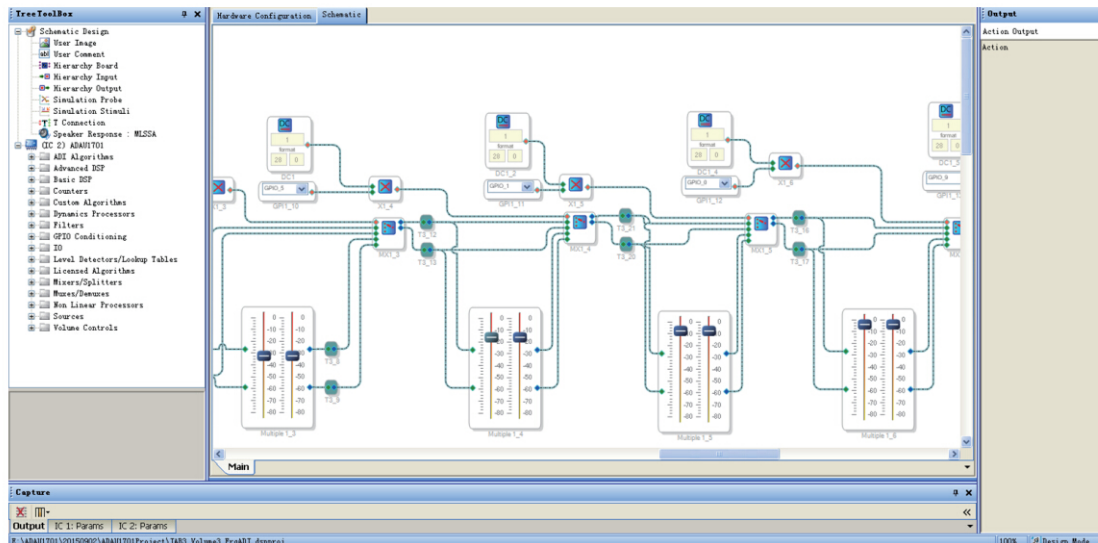
(Fully programmable with SigmaStudio graphical tool)

The SigmaStudio development environment Analog Device provides a graphical user interface to help you build and deploy signal processing systems quickly and efficiently.

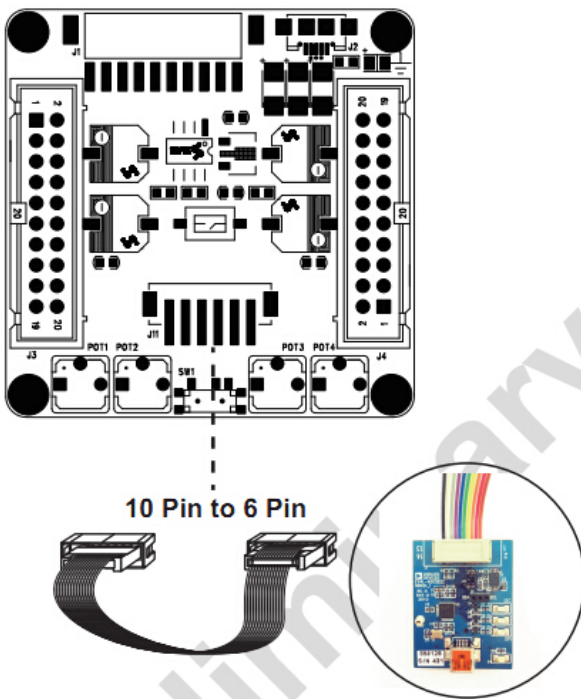
A wide variety of signal processing blocks can be wired together, as in a schematic, and the SigmaStudio compiler generates production-ready code while providing a control interface for setting and tuning parameters.

With the programmer USBi connected from PC to the kernel board, real time audio application debugging and programming may be implemented flexibly.

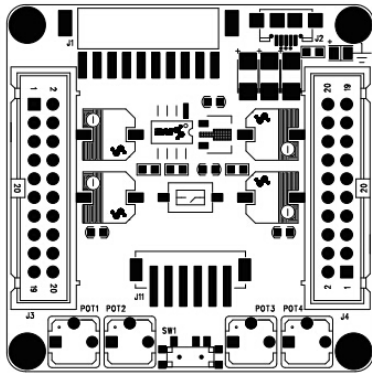
Figure 5. SigmaStudio graphical tool



Sure Electronics can provide customers with Analog Devices EVAL-ADUSB2Z for programming. A 10Pin to 6 Pin cable will be provided for easy connection. The Programming kit costs \$99.9. Sure Electronics can also provide another programming device which provides a high cost ratio solution for customers. Please feel free to contact with info@sure-electronics.com for more detailed information. Sure Electronics can provide programming service for OEM customers, 500 pieces MOQ and engineering cost will be requested. Please send your requirement document to info@sure-electronics.com for confirmation.



PIN definition



Extension Kit

Connector:

J1 PH-10PIN-2MM

Pin	Definition
1	AINI
2	SGND
3	AINR
4	SGND
5	OUTR1
6	OUTL1
7	OUTR2
8	OUTL2
9	GND
10	VIN

Program Port:

J11 PH-6PIN-2MM

Pin	Definition
1	AINI
2	SGND
3	AINR
4	SGND
5	OUTR1
6	OUTL1
7	OUTR2
8	OUTL2
9	GND
10	VIN

Control Port:

J3

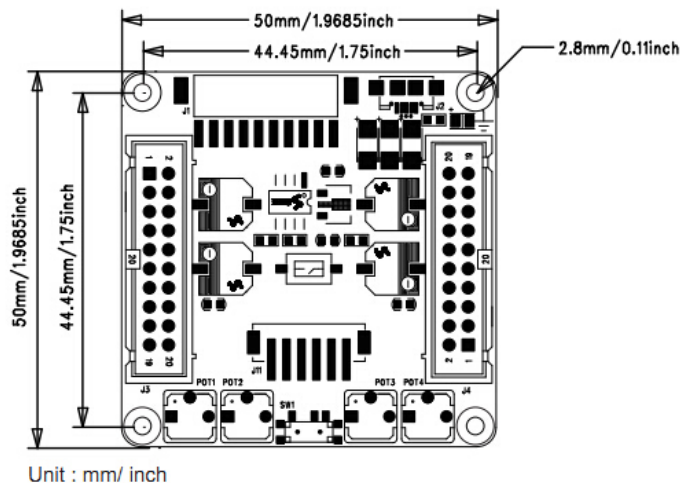
Pin	Definition	Pin	Definition
1	AD0	2	GND
3	AD1	4	GND
5	SCL	6	WB
7	SDA	8	WP
9	RST	10	OR1
11	MP2	12	OL1
13	MP3	14	OR2
15	MP8	16	OL2
17	MP9	18	GND
19	DPW	20	3.3V

Control Port:

J4

Pin	Definition	Pin	Definition
1	GND	2	MCLK
3	GND	4	MP11
5	GND	6	MP10
7	GND	8	MP6
9	GND	10	MP7
11	GND	12	MP0
13	GND	14	MP1
15	GND	16	MP5
17	GND	18	MP4
19	GND	20	VIN

Dimensional drawing



ADAU1701 Audio Digital Signal Processor Interface Extension Kit (AA-AA11428)

Introduction:

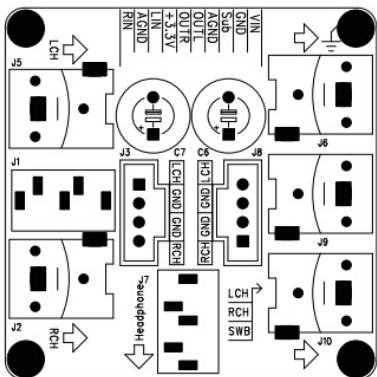
Sure Electronics has released one interface extension board to provide a simple connection solution for customer's applications. The extension board only costs \$4.99. Interfaces on board include 2CKT RCA input jacks, 2CKT RCA output jacks, 2CKT3.5mm AUX jack, 2CKT moxley Micro-Fit vertical headers. With the headers and a 10 pin cable, the interface extension board can be integrated to the DSP Kernel board quickly. For more detailed connection information, please refer to "Connection" chapter.

Features:

- 2 x 2 inches Compact PCB Size
- 2CKT RCA input, 3CKT RCA output
- 1CKT AUX input, 1CKT AUX output

1CKT molex Micro-Fit input, 1CKT molex
Micro-Fit output,
Powered by DSP kernel board

PIN Definition



Extension Kit
Connector:
J4

Pin	Definition
1	AINI
2	SGND
3	AINR
4	SGND
5	OUTR1
6	OUTL1
7	OUTR2
8	OUTL2
9	GND
10	VIN

AUX In:

J1 3.5mm AUX Jack

Headphone Output:

J7 3.5mm AUX Jack

Input (molex):

J3 molex Micro-Fit 4 Pin
Vertical Header

Pin	Definition
1	LIN
2	GND
3	GND
4	RIN

Output put (molex):

J3 molex Micro-Fit 4 Pin
Vertical Header

Pin	Definition
1	ROUT
2	GND
3	GND
4	LOUT

RCA Right Input:

J2 RCA Jack

RCA Left Input:

J5 RCA Jack

RCA Left Output:

J6 RCA Jack

RCA Right Output:

J9 RCA Jack

Subwoofer Output:

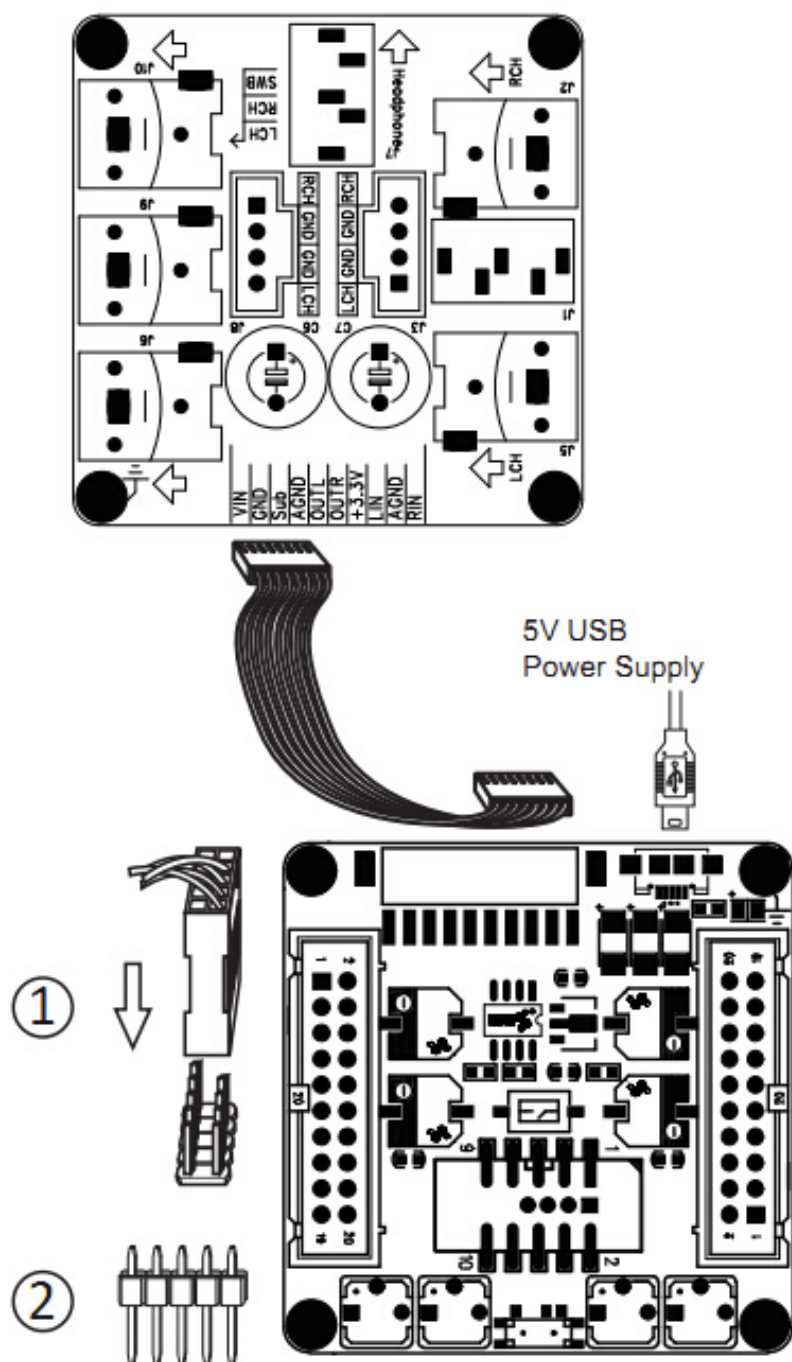
J10 RCA Jack

Connection:

How to connect audio DSP kernel board with interface extension board ?

All useful Pins of ADAU1701 have been included in 2 sockets on both sides of Kernel board. It is easy for customers to integrate this board into their projects. A 10Pin terminal on board is also provided to connect with Analog Devices EVAL-ADUSB2Z for programming.Choose our extension board for more generic connector interfaces. 2 pieces RCA and a 3.5mm AUX jack are provided for input, 3 pieces RCA and a headphone jack for output. Also Molex 4Pin terminals have been provided on board for more complex application solutions.

A 10Pin extension cable which is attached with extension kit package is provided to connect these two boards.Installation kit is also help for a quick connection and convenient programming.



Dimensional drawing

