TinySine TSA1701

TSA1701 Audio DSP Board User Manual

Model: **TSA1701** | Brand: **TinySine**

1. PRODUCT OVERVIEW

The TSA1701 is a comprehensive audio digital signal processing (DSP) module designed around the ADAU1701 chip. This versatile board is suitable for various audio applications, including active loudspeaker concepts such as digital 3-way 3-unit or 2-way 2-unit crossover systems, bass enhancement, and transforming 2.0 channel audio to 2.1.

It comes pre-loaded with a default program and features four integrated potentiometers, allowing users to easily adjust gain, bass, midrange, and treble settings. For advanced customization and functionality, the module can be programmed using SigmaStudio via its dedicated debug port and a USBi programmer.
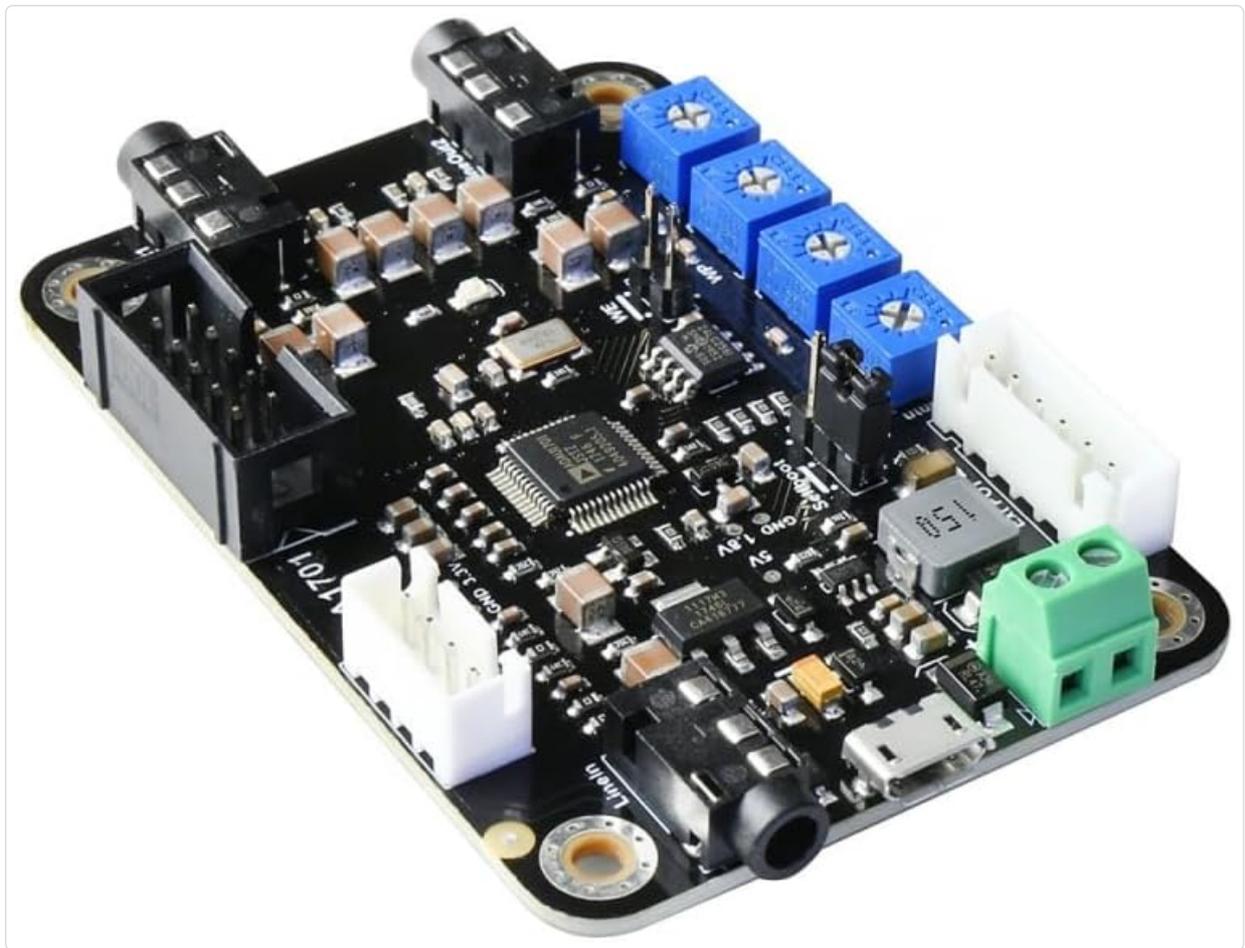
Figure 1: Front view of the TSA1701 Audio DSP Board, showcasing its compact design and integrated components.

Key Features:

- 28-/56-bit, 50 MIPS Digital Audio Processor (ADAU1701).
- Audio output level: 0.9Vrms.
- Audio input signal range: 2Vrms.
- Input resistance: 20Kohm.
- Fully Programmable with SigmaStudio Graphical tool.
- Four integrated potentiometers for gain, bass, midrange, and treble control.
- Debug port for USBi programmer connectivity.

2. SETUP AND CONNECTIONS

Before operating the TSA1701 Audio DSP Board, ensure all necessary connections are made correctly. The board requires a power supply and audio input/output connections.

Connecting External Potentiometers:

If you plan to use external potentiometers instead of the onboard ones, it is crucial to **disconnect the soldering pads on the board's backside**. Failure to do so may damage the ADC port. Recommended potentiometer values range from 1Kohm to 100Kohm.
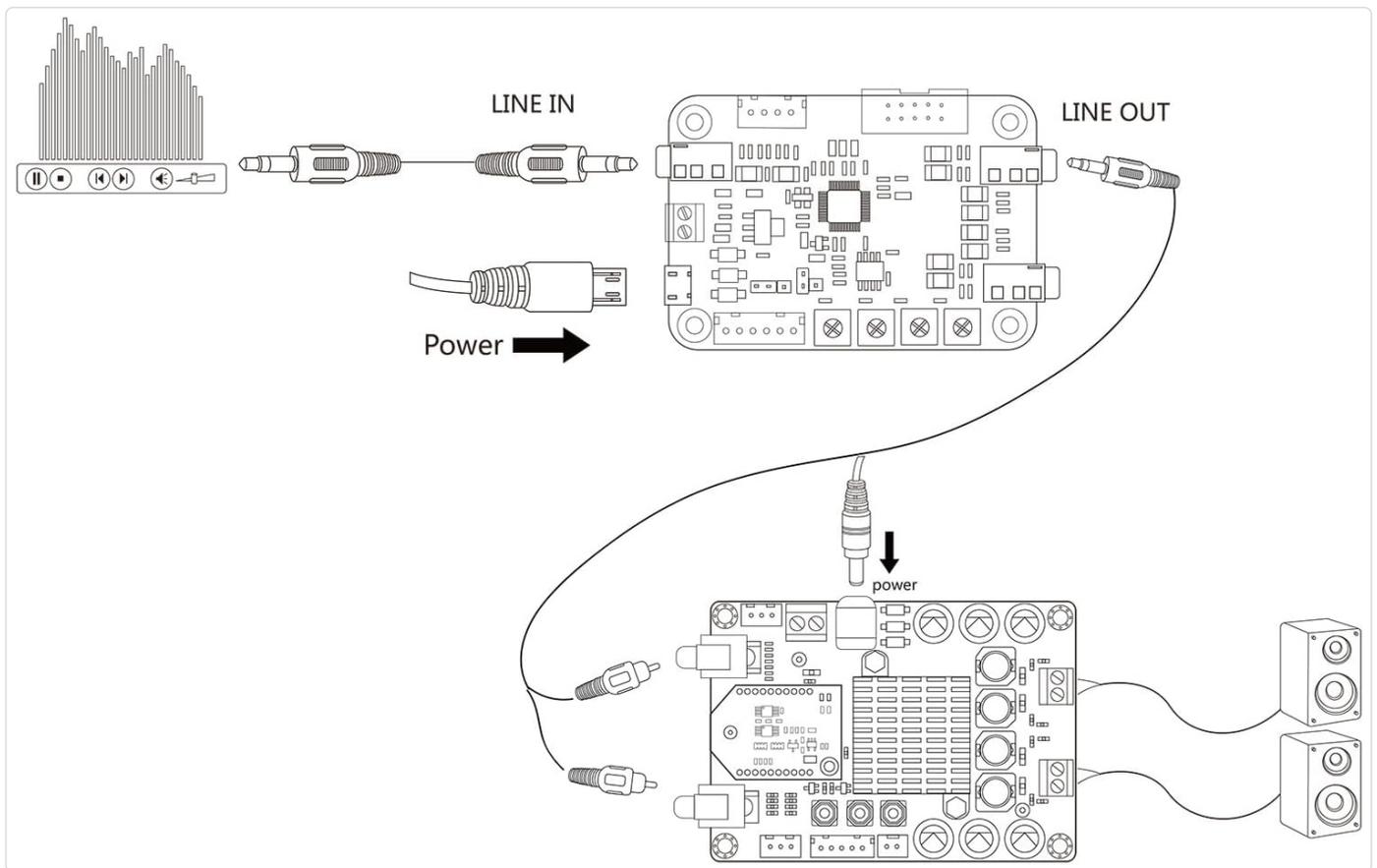
Basic Connection Diagram:

Figure 2: Illustrative diagram showing typical audio input (Line In), power, and audio output (Line Out) connections for the TSA1701 board.

What's in the Box:

- TSA1701 Audio DSP Board
- Four potentiometers (integrated)
- Debug port for SigmaStudio
- USBi programmer (may be sold separately or included depending on package)

3. OPERATING INSTRUCTIONS

The TSA1701 board is designed for ease of use with its default program and integrated controls.

Basic Operation:

- **Power On:** Connect the appropriate power supply to the board.
- **Audio Input:** Connect your audio source to the "Line In" port.
- **Audio Output:** Connect your speakers or amplifier to the "Line Out" ports.
- **Adjusting Audio:** Use the four onboard potentiometers to adjust the gain, bass, midrange, and treble according to your audio preferences.

Advanced Programming with SigmaStudio:

For advanced users, the TSA1701 can be fully programmed using Analog Devices' SigmaStudio graphical development tool. This allows for extensive customization of audio processing functions.

- Connect a USBi programmer to the debug port on the TSA1701 board.
- Install SigmaStudio software on a Windows-compatible computer.
- Utilize SigmaStudio to implement functions such as equalization, crossover networks, bass enhancement, multiband

dynamics processing, and delay compensation.

- Refer to the SigmaStudio documentation and tutorials for detailed programming instructions.

4. MAINTENANCE

To ensure the longevity and optimal performance of your TSA1701 Audio DSP Board, follow these general maintenance guidelines:

- **Keep Clean:** Regularly clean the board with a soft, dry, anti-static cloth. Avoid using liquids or abrasive cleaners.
- **Handle with Care:** Electronic components are sensitive. Avoid dropping the board or subjecting it to physical shock.
- **Environmental Conditions:** Operate and store the board in a dry environment, away from extreme temperatures, humidity, and direct sunlight.
- **Power Supply:** Always use a stable and appropriate power supply as specified for the board to prevent damage.
- **Static Electricity:** Take precautions against electrostatic discharge (ESD) when handling the board, especially when making connections or modifications.

5. TROUBLESHOOTING

If you encounter issues with your TSA1701 Audio DSP Board, consider the following troubleshooting steps:

- **No Audio Output:**
  - Verify all audio input and output cables are securely connected.
  - Check the power supply connection and ensure the board is receiving power.
  - Ensure the gain potentiometer is not set to minimum.
  - If using external potentiometers, confirm that the onboard soldering pads have been disconnected as per setup instructions.

- **Distorted Audio:**
  - Check the input signal level; ensure it does not exceed the board's maximum input signal range (2Vrms).
  - Adjust gain and tone controls to prevent clipping.
  - Verify the impedance matching between the audio source/destination and the board.

- **Programming Issues with SigmaStudio:**
  - Ensure the USBi programmer is correctly connected to both the board and your computer.
  - Verify that the correct drivers for the USBi programmer are installed on your Windows system.
  - Consult SigmaStudio documentation for specific error codes or connection issues.

- **Board Not Powering On:**
  - Confirm the power supply voltage and current meet the board's requirements.
  - Check for any visible damage to the power input port or power regulation components.
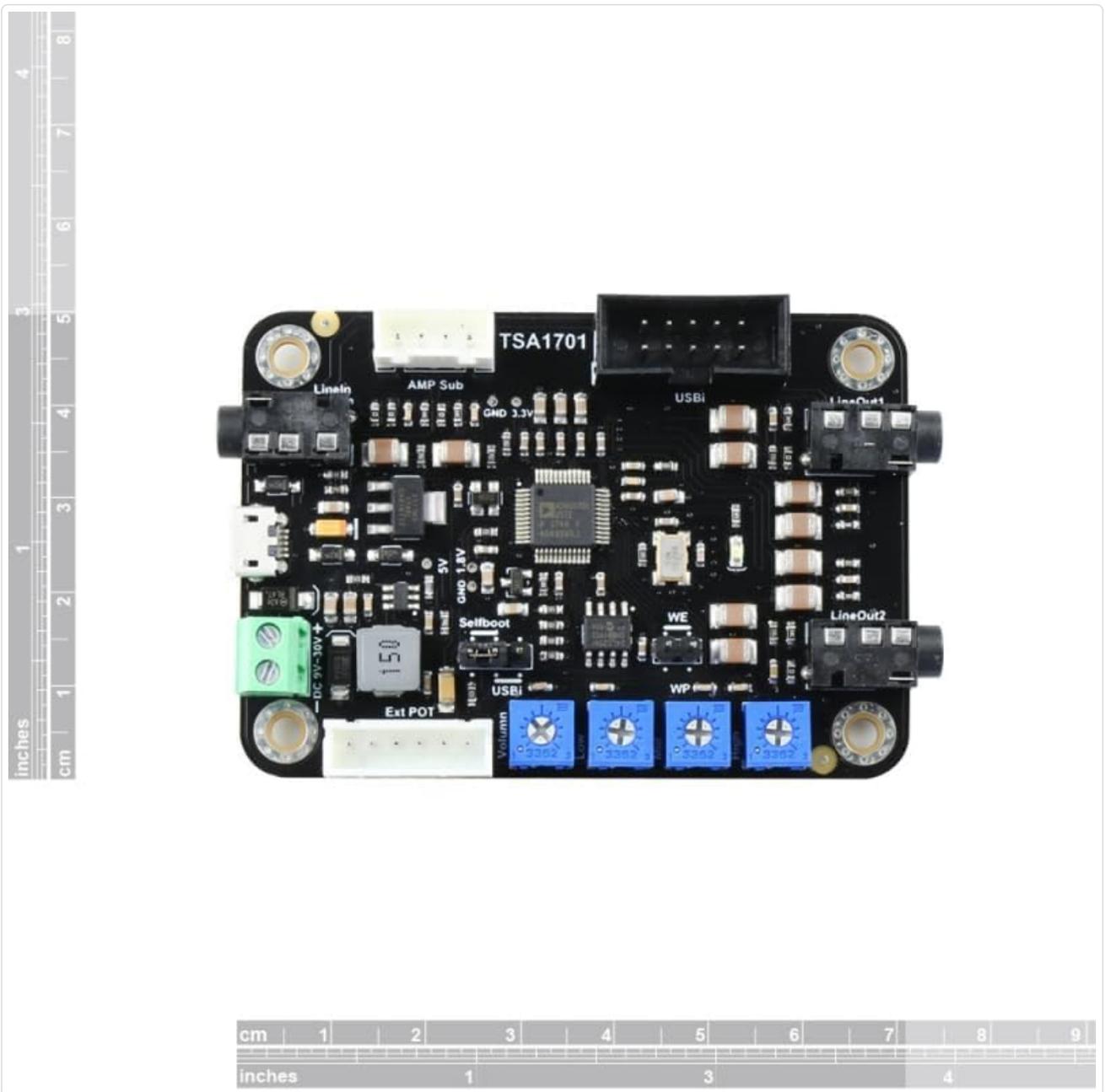
6. SPECIFICATIONS

Figure 3: Top-down view of the TSA1701 Audio DSP Board, illustrating its compact dimensions.

Feature	Detail
Processor	ADAU1701 (28-/56-bit, 50 MIPS Digital Audio Processor)
Audio Output Level	0.9Vrms
Audio Input Signal Range	2Vrms
Input Resistance	20Kohm
Potentiometer Values (External)	1Kohm - 100Kohm
Connectivity	USB (for programming via USBi)
Operating System Compatibility	Windows (for SigmaStudio)
Package Dimensions	4.65 x 3.15 x 0.6 inches
Item Weight	0.96 ounces

Feature	Detail
Manufacturer	Tinysine
Model Name	TSA1701

7. WARRANTY AND SUPPORT

Warranty Information:

Specific warranty details for the TSA1701 Audio DSP Board are provided by the manufacturer, TinySine. Please refer to the documentation included with your purchase or visit the official TinySine website for the most current warranty policy and terms.

Technical Support:

For technical assistance, programming inquiries, or troubleshooting beyond the scope of this manual, please contact TinySine customer support. Support resources, including FAQs and contact information, are typically available on the manufacturer's official website.

Manufacturer: **TinySine**

For further information, you may visit the product page on Amazon:[TSA1701 Audio DSP Board on Amazon](#)