

1. Description

The JAB6 is an advanced audio amplifier board featuring integrated MAT-ADAU1701 DSP & MAT-BM83 Bluetooth modules and high-performance dual TPA3255 amplifier ICs. Designed for versatile and customizable audio applications, the JAB6 offers flexible signal routing and extensive external control options via its dedicated J23 extension port.

Please be advised that J23 functionality varies among different MAT modules.
This document describes the functions of J23 port under the default JAB6 configuration.

With the default JAB6 setup (MAT-ADAU1701 & MAT-BM83), J23 provides multi-input selection (I2S, Bluetooth, Line Input), LED status feedback for Bluetooth and TWS pairing, external shutdown capability, and independent Volume, Treble and Bass adjustment using hardware potentiometers. External control can be implemented with off-the-shelf hardware like the WONDOM ACP1H6TP control panel, or user-custom hardware circuits.

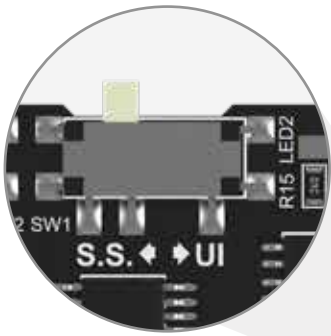
Furthermore, all analog control inputs (ADC0–ADC3) and audio processing routines are fully customizable using Analog Devices' SigmaStudio software.

2. External Control Port (J23) Pinout & Configuration

The J23 External Control Port provides multi-functional interface options for status indication, Bluetooth control, input selection, tuning and system control. This control interface is active only when JAB6 is in SigmaStudio mode.

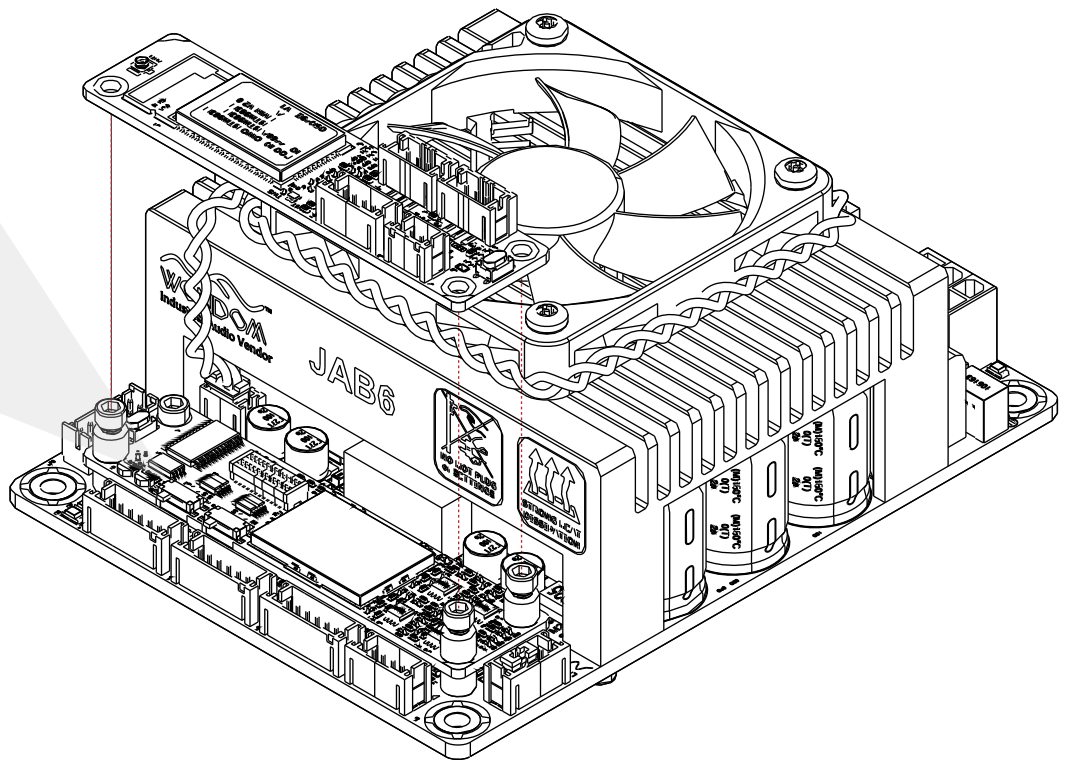
Note on Activation:

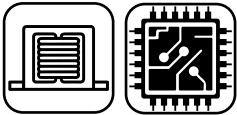
To activate the J23 control interface, ensure SW1 on the JAB6 (MAT-ADAU1701 DSP module) is set to the "S.S." position.
"S.S." refers to SigmaStudio mode. This control interface is active only when JAB6 is in SigmaStudio mode.



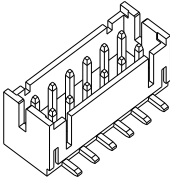
Set SW1 of MAT-ADAU1701 DSP module to "S.S." to activate the J23 control port.

"S.S." refers to SigmaStudio mode. This control interface is active only when JAB6 is in SigmaStudio mode.

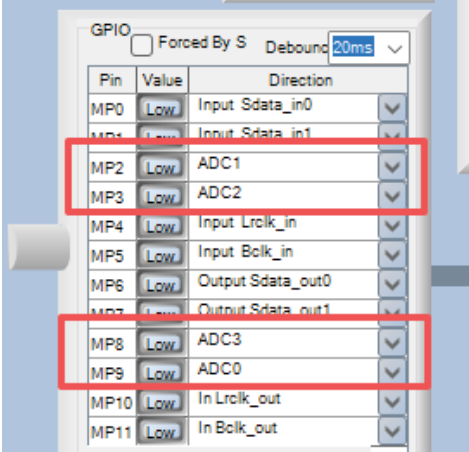




J23 External Port
12-pin expansion port
(PHD-2MM-12POS)

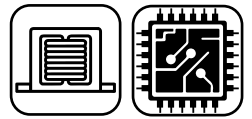


11	9	7	5	3	1	12	10	8	6	4	2
(11) VIN	(9) SKEY	(7) SHDN	(5) TWS_LED	(3) BT_BTN	(1) BT_LED	(12) +5V	(10) ADC3	(8) ADC2	(6) ADC1	(4) ADC0	(2) GND



The default pin definitions for J23 are structured as follows:

POS	Pin Name	Description / Function	Note
1	BT_LED	External Bluetooth Status Indicator	Refer to the connection diagram
2	GND	System Ground Reference	-
3	BT_BTN	External Bluetooth Control Button	Bluetooth unpairing & TWS control
4	ADC0	External Input Selector	Configured in SigmaStudio (MP9)
5	TWS_LED	External TWS Status Indicator	Refer to the connection diagram
6	ADC1	External Treble Adjustment	Configured in SigmaStudio (MP2)
7	SHDN	External Shutdown Switch	Enable: Active-low, short-to-GND
8	ADC2	External Bass Adjustment	Configured in SigmaStudio (MP3)
9	SKEY	Reserved for Future Use	Leave Floating, No VCC/GND/other pin connections
10	ADC3	External Master Volume Control	Configured in SigmaStudio (MP8)
11	VIN	Reserved for Future Use	Leave Floating, No VCC/GND/other pin connections
12	+5V	+5V Auxiliary Power Output	Max. Current 100mA



3. External Control via WONDOM ACP1H6TP Control Panel

The JAB6 can be seamlessly integrated with the WONDOM ACP1H6TP control panel to enable external line input, Bluetooth control, input selection, independent treble/bass control, and volume control. The default crossover frequency is 210Hz.

Connection & Configuration:

- 1) Set switch SW1 on the MAT-ADAU1701 DSP module to the "S.S." position to enable ACP1H6TP control mode.
- 2) The ACP1H6TP control panel includes two line-input ports (PH-2mm-4POS) with identical functions on its rear panel; use either for convenient wiring.

Functions:

LINE IN: External line input to JAB6

BT UNPAIRING: Bluetooth unpairing and TWS pairing control

INPUT: Input selection, connecting the audio cable to either J3 or J1 on the JAB6 determines the input switching logic as follows*:

Option 1: Connection to J3 (Recommended Logic)

Position A: I2S Input

Position B: Bluetooth Input/Line Input (via J1)*

Position C: Line Input (via J3)

Option 2: Connection to J1 (Auto-Switching Logic)

Position A: I2S Input

Position B: Bluetooth Input/Line Input (via J1)*

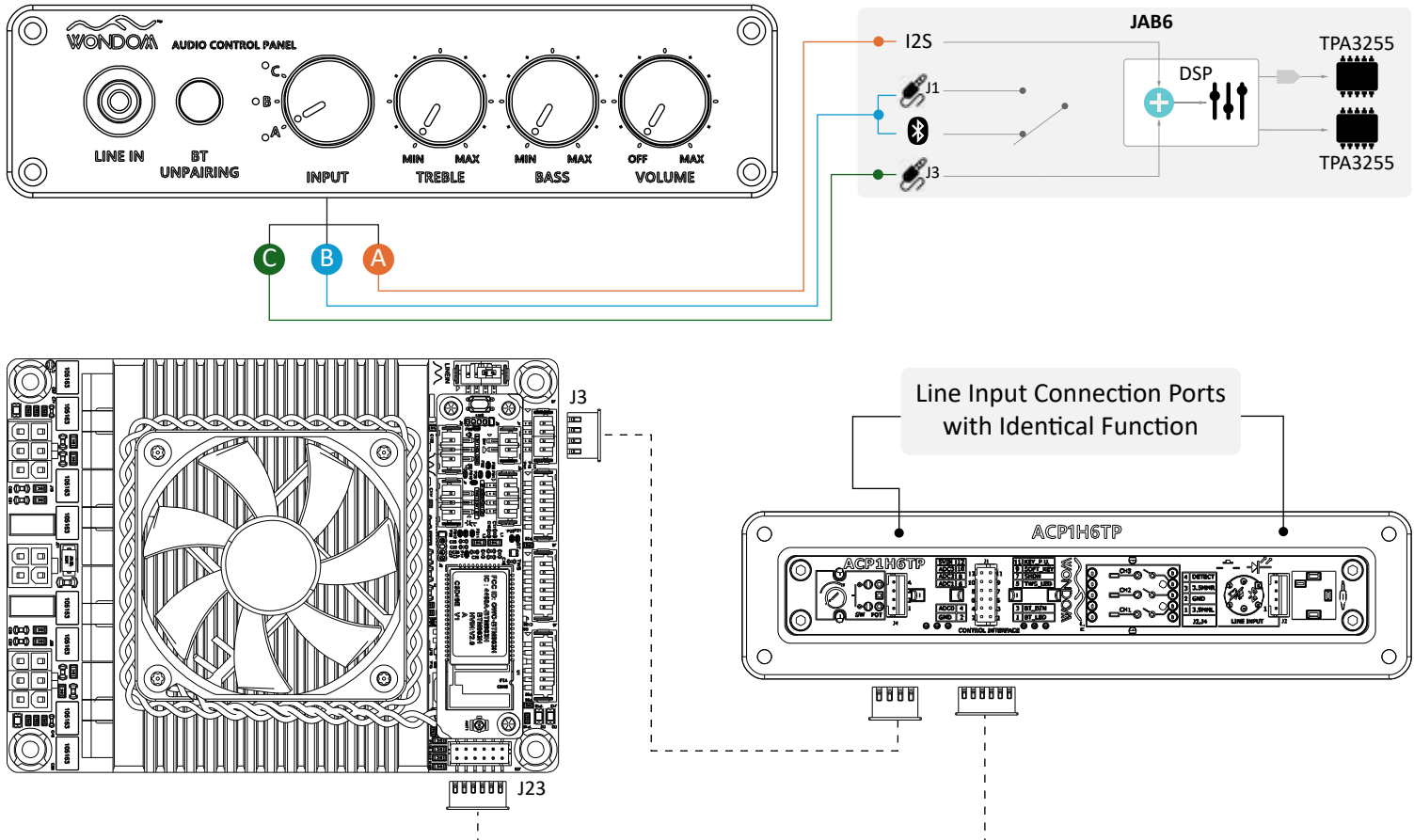
Position C: Unavailable

*Note: Bluetooth and J1 Line Input share an auto-switching circuit. The signal switches automatically to J1 Line Input when a 3.5mm audio cable is inserted, which disables Bluetooth.

TREBLE: Treble control, $\pm 12\text{dB}$

BASS: Bass control, $\pm 12\text{dB}$

VOLUME: Master Volume Control



4. External Control Interface Connection Guide

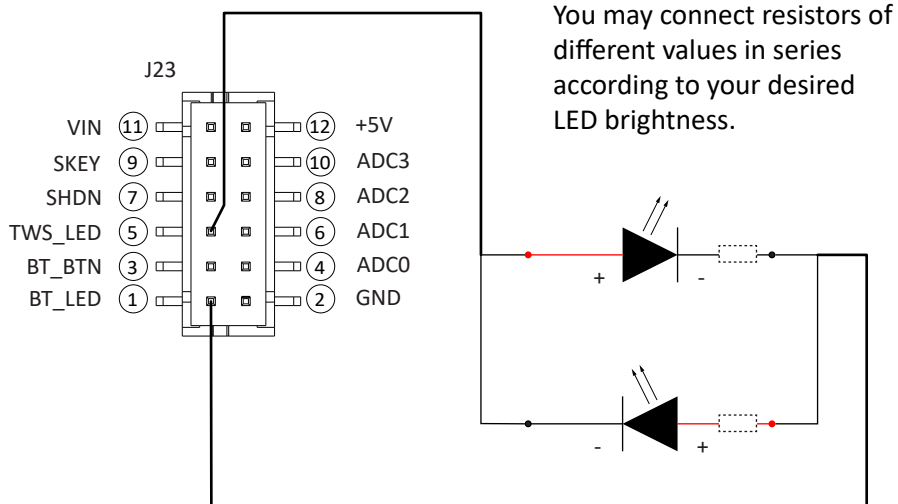
If you don't want to use the ACP1H6TP, you can achieve external control functionalities as well.

4.1 External Bluetooth & TWS LEDs

Please refer to the wiring diagram below for connection.

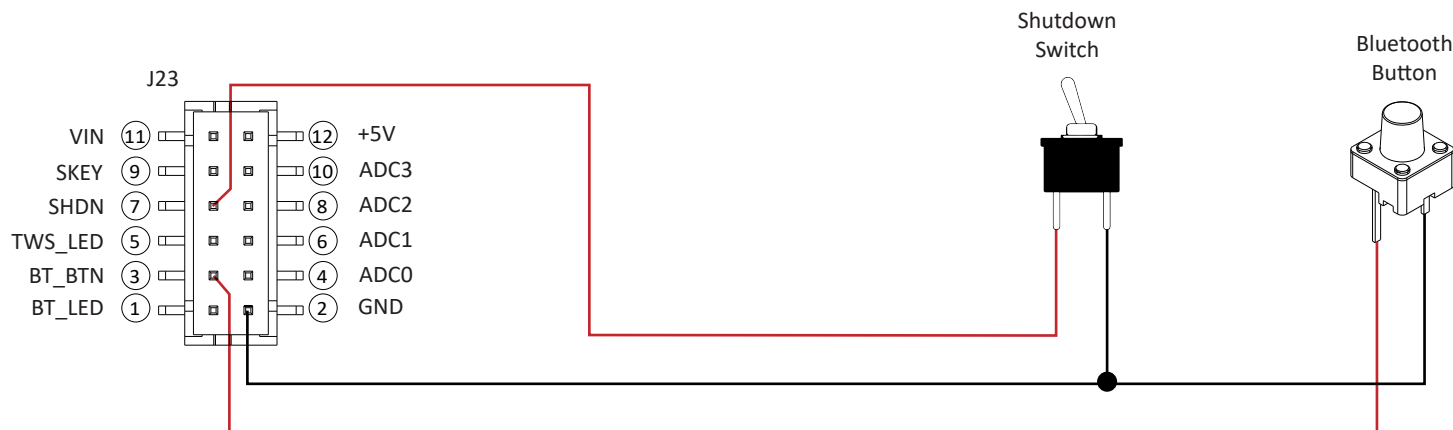


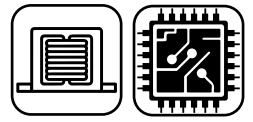
J23



4.2 External Bluetooth Control & Shutdown Control

Please refer to the wiring diagram below for connection.



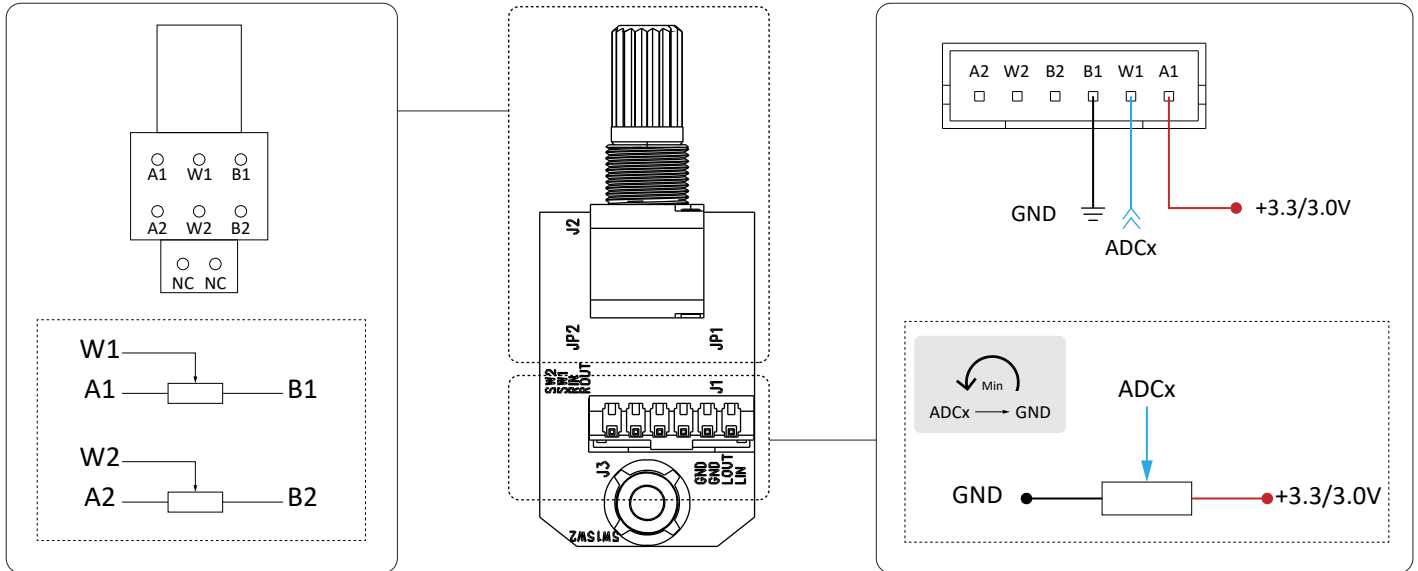


4.3 External Potentiometers

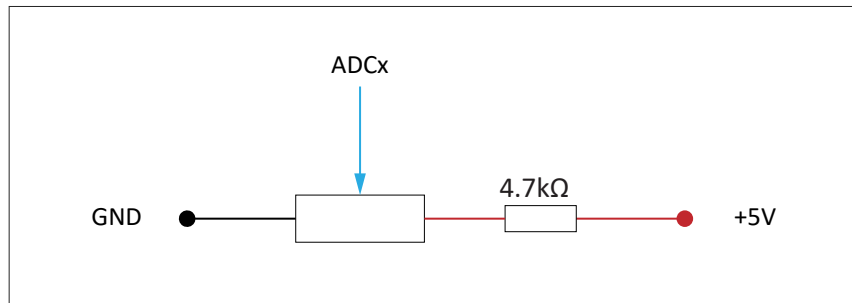
You can connect external potentiometers for treble, bass and volume control directly.

We will take WONDOM potentiometer as an example.

WONDOM potentiometer is a 10k Ohm Type-B dual-gang potentiometer, its schematic diagram is shown below.

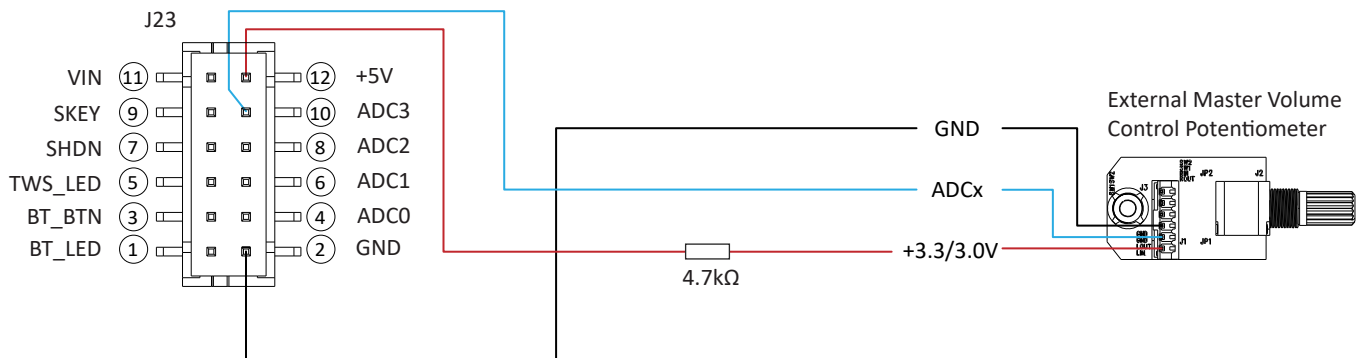


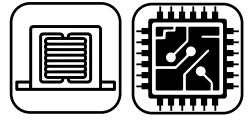
If no +3.3 V / 3.0 V auxiliary supply is available in the system, connect position A1 of the potentiometer to pin 12 (+5 V) on J23 of JAB6. Insert a 4.7kΩ series resistor as illustrated below.



4.3.1 External Volume Control Potentiometer

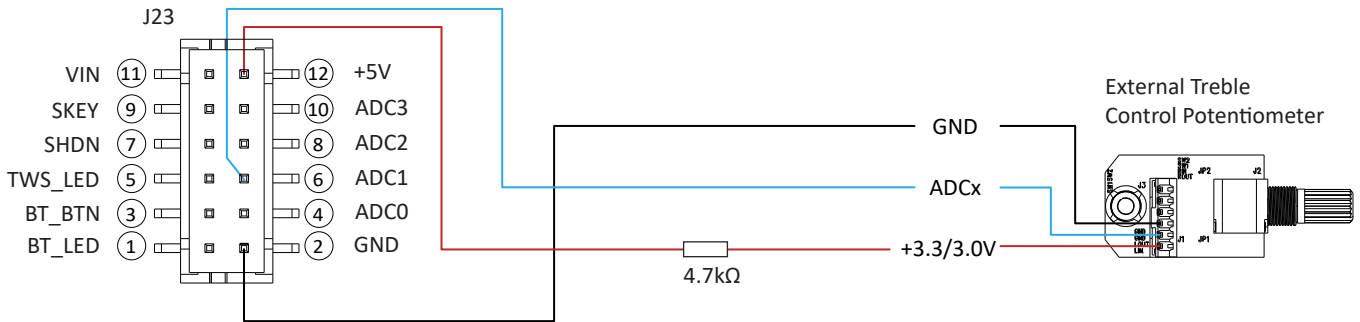
Pin 10 (ADC3) of J23 on JAB6 is for master volume control.





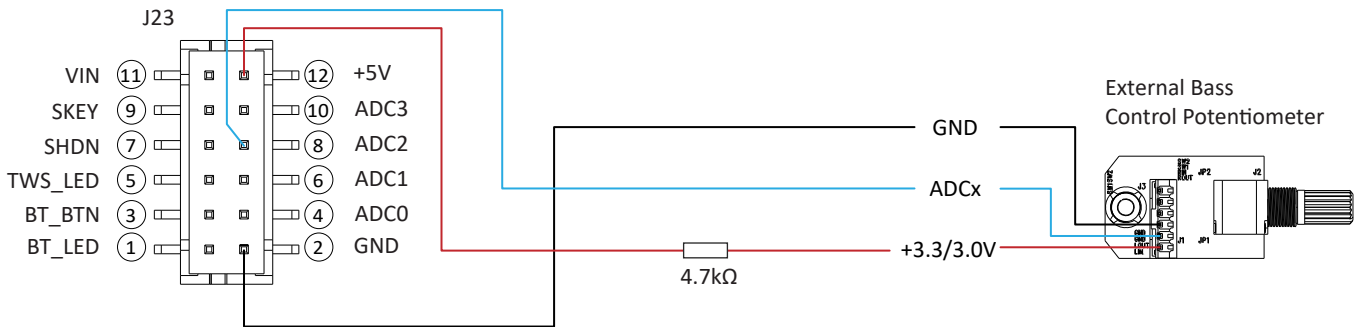
4.3.2 External Treble Control Potentiometer

Pin 6 (ADC1) of J23 on JAB6 is for treble control.



4.3.3 External Bass Control Potentiometer

Pin 8 (ADC2) of J23 on JAB6 is for treble control.

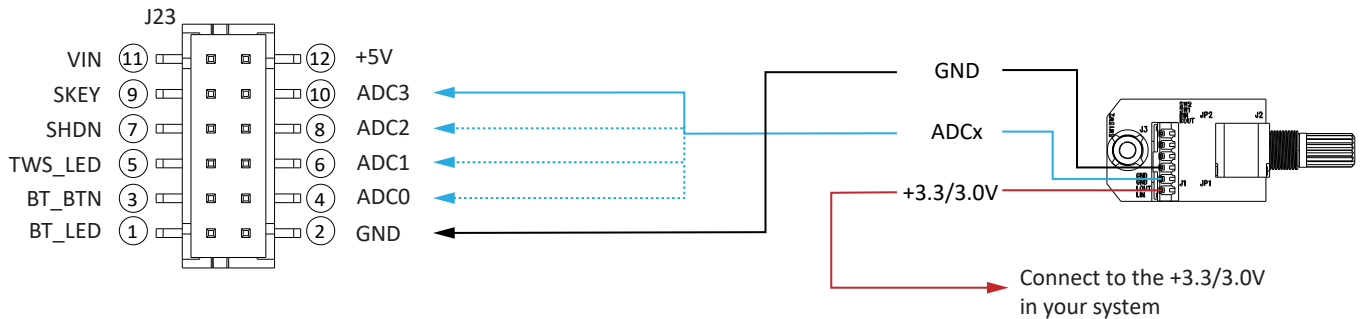


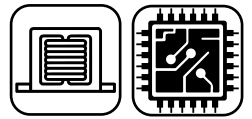
4.3.4 External Input Selector

Pin 4 (ADC0) of J23 on JAB6 is for input selection in default.
You can customize this pin for other functions.

5.3.5 External Potentiometer Connection for System with +3.3/3.0V Auxiliary Power

If your system features a +3.3/3.0V auxiliary power supply, you can simplify the peripheral circuit design: only two interfaces are required for each potentiometer.





5. Function Customization via SigmaStudio

The functions assigned to pins ADC0 through ADC3 can be fully modified and reprogrammed using Analog Devices' SigmaStudio software.

Default SigmaStudio Pin Mapping:

ADC0 (MP9): Input Selection

ADC1 (MP2): Treble Control

ADC2 (MP3): Bass Control

ADC3 (MP8): Volume Control



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Scan the QR code
to download
demo programs
of JAB6.

Customization: Users can modify audio processing routines, crossover filters, gain stages, and control curves based on the official demo program.

