

# JAB Series

## 2 x 50 Watt Class D Audio Amplifier Board w DSP & BT 5.0 – JAB3+ (AA-JA32173)



### Key Features

- 3.60 x 2.70 Inches PCB Size
- Battery Board Supported
- Power Management Circuit
- DSP & Bluetooth 5.0 Integrated
- High Receive Sensitivity with RF power up to 9dBm and -90dBm
- Supporting Various Audio Decode Formats as APTX, APTX HD, APTX-LL, SBC & AAC
- Cascadable with Standard Amplifier Boards for Audio 4.0/2.1 System
- Bluetooth Pairing Cancellation
- External Control Potentiometers
- Supporting ICP5 for PC UI control

### Distributors:



All Audio Amplifier boards are complied with ROHS and they are pre-tested with our power supply solution to comply with FCC and CE. We could provide FCC, CE and RoHs certifications for customers' convenience. The test reports will be provided upon requests by e-mails only for customers who apply for bulky purchasement of MOV USD\$10,000 or MOQ 500pcs.

Ready for:



### Contact Info

• Email:  
info@wondom.com



### Overview

JAB3+ is audio amplifier boards integrated with high performance Bluetooth 5.0 (Supporting APT-X HD) and ADAU1701 DSP, covering stereo 50W or 30W models and mono 100W or 60W models, suitable for portable Bluetooth speakers, digital crossover and DIY audio applications.

JAB3+ supports both Bluetooth input and 3.5mm AUX IN. Signal would be mixed and delivered to speaker output. Besides speaker output, JAB3+ supports cascading with other WONDOM standard amplifier boards to build audio 4.0/2.1 systems.

Four connectors for external potentiometers are pre-mounted on the board for easy control of audio system. As for the details, please take reference of 'Function of Potentiometers' part. In addition to hardware control, with the connection of WONDOM ICP5 or higher versions, JAB3+ supports programming with SigmaStudio or remote control through APP or PC UI.

Signal Level Sensor System, Power Management Circuit and full protection are equipped in JAB3+ for lower power consumption, higher efficiency and stable operation.

### Electrical Specifications

Specifications typical @ +25°C, powered by 24V DC, unless otherwise noted. Specifications subject to change without notice.

Parameter	Conditions	Min.	Typ.	Max.	Units
Number of Channels	-	-	2	-	-
Minimum Load Impedance	-	3.2	4	-	Ω
Efficiency	2 x 50W@40hm, 1kHz	-	83	-	%
Nominal Power Requirement	@24V, 1kHz	-	133	-	W
Operating Voltage	@1kHz, 40hm	12	24	26	V
Idle Power	Signal detected	-	1.8	-	W
	No Signal detected	-	105	-	mW
Switching Frequency	SD Floating@24V	-	400	-	kHz
Power Consumption	1/4 of max output power@40hm, 24V, 1kHz	-	33	-	W
	1/8 of max output power@40hm, 24V, 1kHz	-	18	-	W
Control	Standby (Low = inputs enabled)	High-level Input Voltage	3.3	-	V
		Low-level Input Voltage	-	-	0.8
	Mute (High = outputs enabled)	High-level Output Voltage	3.3	-	V
		Low-level Output Voltage	-	-	0.8
Standby Power	SD short to GND, only when low power module available	-	100	-	mW

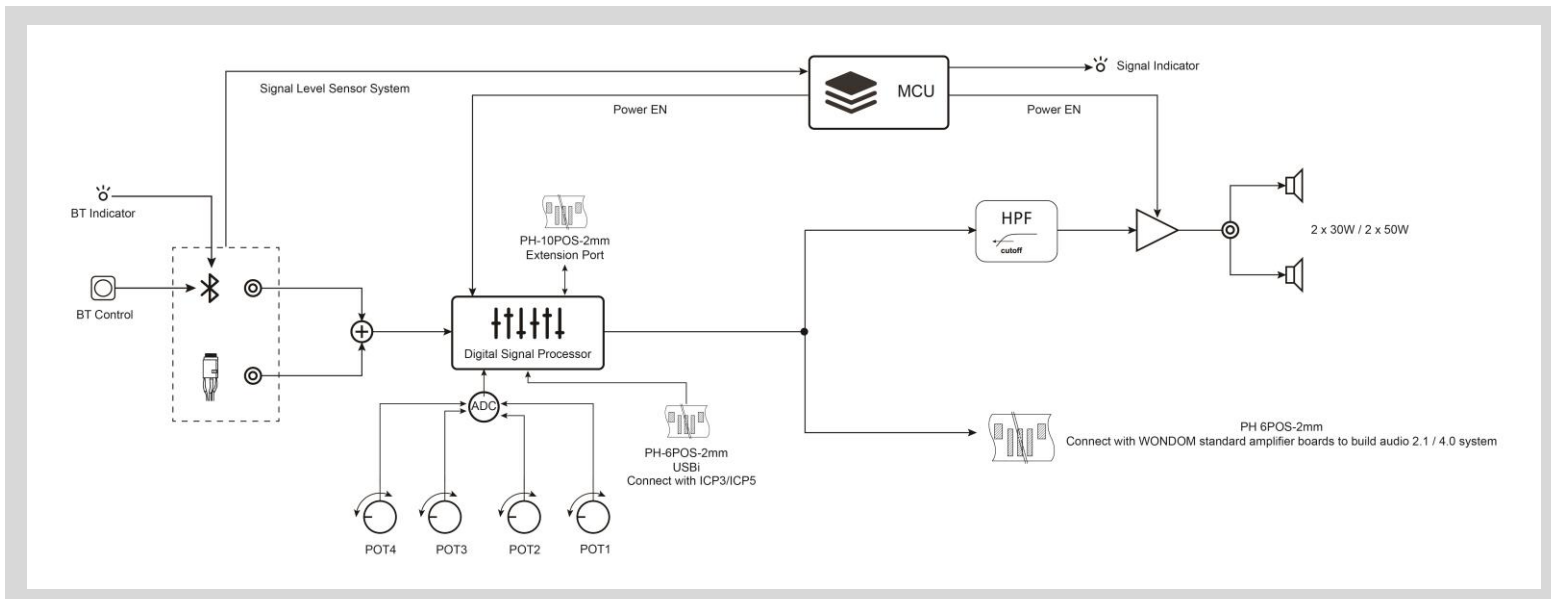
### Audio Performance

Specifications typical @ +25°C, powered by 24V DC, unless otherwise noted. Specifications subject to change without notice.

Parameter	Conditions	Min.	Typ.	Max.	Units	
Amp Gain	@40hm, 20Hz - 20kHz	-	25.8	-	dB	
DSP Gain	SE1 (Single Amp)	@40hm, 1kHz	-60	-	0	dB
	SE2 (Line Output)	@40hm, 1kHz	-60	-	6.5	dB
Input Sensitivity	2 x 50W@40hm, 1kHz, 23.5dB	-	770	-	mV	
Filter Gain	Butterworth, Q= 0.707	-	4	-	dB	
Cutoff Frequency	HFP	0.25	-	2	kHz	
	LFP	-	20	-	kHz	
SNR	2 x 50W@40hm, THD+N=1%, 25.8dB, A-weighting	-	91	-	dB	
THD+N	5W@40hm, 1kHz, 25.8dB	-	0.037	-	%	
	10W@40hm, 1kHz, 25.8dB	-	0.039	-	%	
Input Impedance	-	-	10	-	kΩ	
Supported Sampling Rates	-	-	48	-	kHz	
Output Noise Level	A-weighting, Input Connected to GND, 25.8dB	-	163	-	uV	
DC Offset	-	-	10	-	mV	
Max output Level	J7, Line Output Connector	-	1.94	-	dBu	
Crosstalk Separation	20Hz-20kHz, Gain=26dB	-	-60	-	dB	

All parameters were tested with Rohde & Schwarz UPV audio analyzer (AES17 filter enabled) and Audio Precision AUX0025 filter. For authorized distributors and OEM customers who need more detailed performance graphs and parameter settings, please send an inquiry e-mail to us. (Not available for retail customers)

## Block Diagram



### Notes:

1. Please kindly be noted that there is no charging circuit equipped in JAB3+. If customers want to power JAB3+ with batteries, it is recommended to use WONDOM BCPB series.
2. JAB3+ supports cascade with other WONDOM audio amplifier boards to build audio 4.0/2.1 systems.
3. Signal Level Sensor System has been employed in JAB3+ for low power consumption. JAB3+ will enter into standby mode when audio signal is not detected for long time (5min). Once audio signal is detected under this circumstance, JAB3+ will restart to work. It is not malfunction if JAB3 enters into standby mode.
4. The basic cable package of JAB3+ contains: one power cable, one speaker cable. If you have special requirements of cables, please contact us at [store@sure-electronics.com](mailto:store@sure-electronics.com).

## Function of Potentiometers

### Functions of potentiometers based on specific applications

Port	Function	JAB3+S	JAB3+M	(JAB3+S)+ SAB	(JAB3+M)+ SAB
POT1	CH2 Gain	Gain of Line Output	Gain of Line Output	Gain of Power Sage of SAB	Gain of Power Sage of SAB
POT2	CH2 HPF	High-pass Filter of Line Output	High-pass Filter of Line Output	High-pass Filter of Power Sage of SAB	High-pass Filter of Power Sage of SAB
POT3	CH1 HPF or BPF	High-pass Filter of Speaker Output	Band-pass Filter of Speaker Output	High-pass Filter of Speaker Output of JAB3+	Band-pass Filter of Speaker Output of JAB3+
POT4	CH1 & CH2 Volume	Volume of Speaker & Line Output	Volume of Speaker & Line Output	Overall Volume of JAB3+ & SAB	Overall Volume of JAB3+ & SAB

### Note:

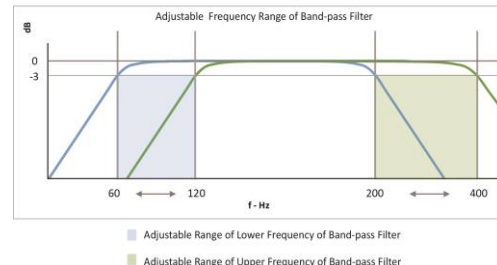
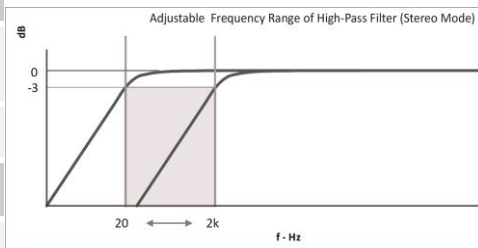
1. The speaker output (J10) of JAB3+ is defined as CH1; line output for cascading (J7) of JAB3+ is defined as CH2.
2. JAB3+S refers to JAB3+ in stereo mode, namely 2 x 50 Watt Class D Audio Amplifier Board w DSP & BT5.0 – JAB3+ or 2 x 30 Watt Class D Audio Amplifier Board w DSP & BT5.0 – JAB3+; JAB3+M refers to JAB3+ in mono mode, namely 1 x 100 Watt Class D Audio Amplifier Board w DSP & BT5.0 – JAB3+ or 1 x 60 Watt Class D Audio Amplifier Board w DSP & BT5.0 – JAB3+. SAB refers to WONDOM Standard Amplifier Board.
3. HPF refers to High-pass Filter; BPF refers to Band-pass Filter.

When CH1 is stereo output, the function of POT3 is HPF; when CH1 is mono output, the function of POT3 is BPF.

4. Four applications are exemplified in this datasheet. For the functions of potentiometers when used in other applications, please contact us at [store@sure-electronics.com](mailto:store@sure-electronics.com).

5. Four connectors for connection with external potentiometers are pre-mounted on the JAB3+. If you want hardware control, please connect with the external potentiometers for adjustment.

Function	Range of Frequency
High-pass Filter (Stereo Mode)	20Hz- 2kHz
High-pass Filter (Mono Mode)	250Hz- 2kHz
Band-pass Filter	60Hz-120Hz (High-pass)
	200Hz-400Hz (Low-pass)



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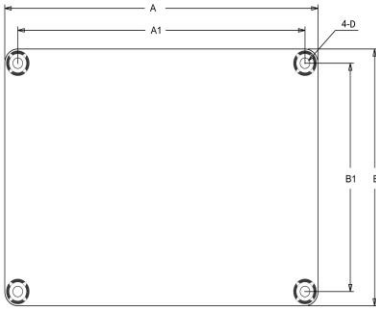
**Make Your Audio Application Simple!**

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## Mechanical Dimensions

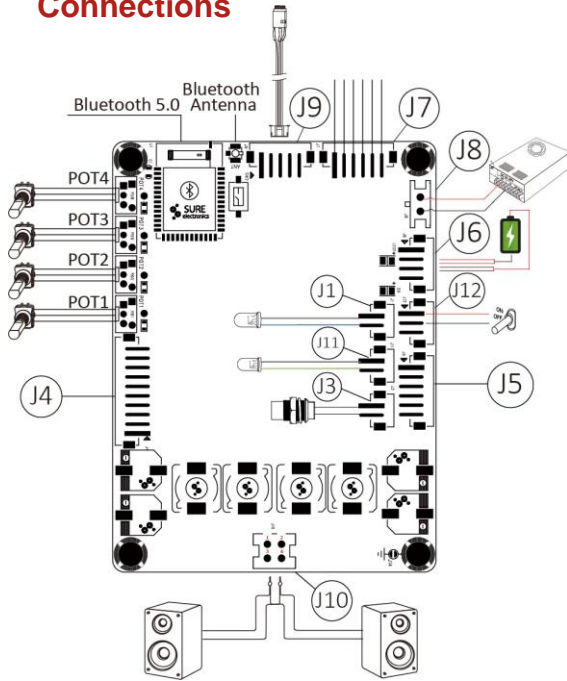


Dimensions	A (inch/mm)	A1 (inch/mm)	B (inch/mm)	B1 (inch/mm)	D (inch/mm)
	3.60/91.44	3.30/83.8	2.70/68.6	2.40/61.0	0.14/3.6

### Notes:

- All dimensions are typical in inches/mm, Height = 0.79inch / 20mm
- Tolerance x.xx = ±0.02(±0.50)

## Connections



## Power Supply

### Power Supply Connector:

·J8, Molex- 2Pos- 3mm

Pin	Definition
1	VCC
2	GND

### Battery Board Connector\*:

·J6, PH- 4Pos- 2mm

Pin	Definition
1	VCC
2	VCC
3	GND
4	GND

## Audio Input

### Bluetooth Input:

·U1

### 3.5mm AUX IN Connector:

·J9, PH- 5Pos- 2mm

Pin	Definition
1	RIN
2	AGND
3	LIN
4	NC
5	NC

You can find the 3.5mm AUX IN cable in the Functional cables kit for JAB3+ (AA-JA11117).

## Extension Port

### DSP Extension Port:

·J4, PH- 10Pin- 2mm

Pin	Definition	Pin	Definition
1	GND	6	MP00
2	MP11	7	DATA
3	MP10	8	BCLK
4	MP06	9	LRCLK
5	MP07	10	+3.3V

This port can be used for I2S input and I2S output. Please note JAB3+ is set as master mode when using I2S. The mapping of ADAU1701 is as follows.

### For I2S input:

Pin	I2S Input	ADAU1701
6	I2S DATA0	MP0
7	I2S DATA1	MP1
8	I2S BCLK	MP5
9	I2S LRCLK	MP4

### For I2S output:

Pin	I2S Output	ADAU1701
2	I2S BCLK	MP11
3	I2S LRCLK	MP10
4	I2S DATA0	MP6
5	I2S DATA1	MP7

Besides, if you want to develop more functions, you can make use of Pin 4, 5, 6 of J4. Other positions are not available.

## Audio Output

### Speaker Output Connector:

·J10, Speaker Output Connector

Pin	Definition
1	ROUT1+
2	LOUT2-
3	ROUT1-
4	LOUT2+

### Line Output Connector:

·J7, PH-6Pos-2mm

Pin	Definition
1	LOUT
2	NC
3	GND
4	GND
5	NC
6	ROUT

This port can be used to cascade with other WONDOM standard amplifier boards to build audio 4.0/2.1 system.

## Control

### BT Pairing Cancellation Connector:

·J3, PH- 2Pos- 3mm

Pin	Definition
1	Cancel
2	+3.3V

When Bluetooth is paired, short circuit 'Cancel' and '+3.3V' to cancel pairing.

After cancellation, please release short circuit.

### Standby and Mute Control Connector:

·J12, PH- 3Pin- 2mm

Pin	Definition
1	STBY
2	GND
3	MUTE

Short circuit "STBY" and "GND" to enter into standby mode;

"Mute" is for control synchronization with the cascading amplifier board so that their control logic can be consistent. Do not short circuit "Mute" and "GND" when using JAB3+ separately.

### Programming Connector:

·J5, PH- 6Pin- 2mm

Pin	Definition	Pin	Definition
1	RST	4	WP
2	+5V	5	SCL
3	GND	6	SDA

This port is for connection with WONDOM ICP5 to achieve programming and remote control functions.

## External LED Indicator

### External Bluetooth Indicator Connector:

·J1, PH-2Pos-2mm

Pin	Definition
1	LED-
2	LED+

When Bluetooth is paired, the LED will be ON;

When Bluetooth is searching, the LED will BLINK.

### External Signal Detection Indicator

#### Connector:

·J11, PH-2Pos-2mm

Pin	Definition
1	LED-
2	LED+

When there is signal detected, the LED will be ON;

When there is no signal detected for 5min, the LED will be OFF.

## Potentiometers

Four connectors are provided on the JAB3+ board for external potentiometers. The cables are included in the Functional cables kit for JAB3+ (AA-JA11117).



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