JAB Series

1 x 100 Watt Class D Audio Amplifier Board w DSP & BT 5.0 – JAB3+ (AA-JA31183)



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 2.1 System
- Bluetooth Pairing Cancellation
- External Control Potentiometers
- Supporting ICP5 for PC UI control

Distributors:

PARTS EXPRESS YOUR ELECTRONICS CONNECTION

MCM

AXIOMEDIA

boomaudio!

AUDIOPHONICS

Yokohama Bayside Net

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:

FC CE

Contact Info

- **Email:**
  info@wondom.com

WONDOM™

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℃, powered by 24V DC, unless otherwise noted. Specifications subject to change without notice.

Parameter		Conditions	Min.	Typ.	Max.	Units
Number of Channels		-	-	1	-	-
Minimum Load Impedance		-	-	2	-	Ω
Efficiency		1x 100W@2Ohm, 1kHz	-	78	-	%
Nominal Power Requirement		@24V, 1kHz	-	128	-	W
Operating Voltage		@1kHz, 2Ohm	12	24	26	V
Idle Power		Signal detected	-	1.92	-	W
		No Signal detected	-	1.68	-	W
Switching Frequency		SD Floating@24V	-	400	-	kHz
Power Consumption		1/4 of max output power@2Ohm, 24V, 1kHz	-	33	-	W
		1/8 of max output power@2Ohm, 24V, 1kHz	-	17	-	W
Control	Standby (Low = inputs enabled)	High-level Input Voltage	3.3	-	-	V
		Low-level Input Voltage	-	-	0.8	V
	Mute (High = outputs enabled)	High-level Output Voltage	3.3			V
		Low-level Output Voltage	-	-	0.8	V
Standby Power		SD short to GND, only when low power module available	-	240	-	mW

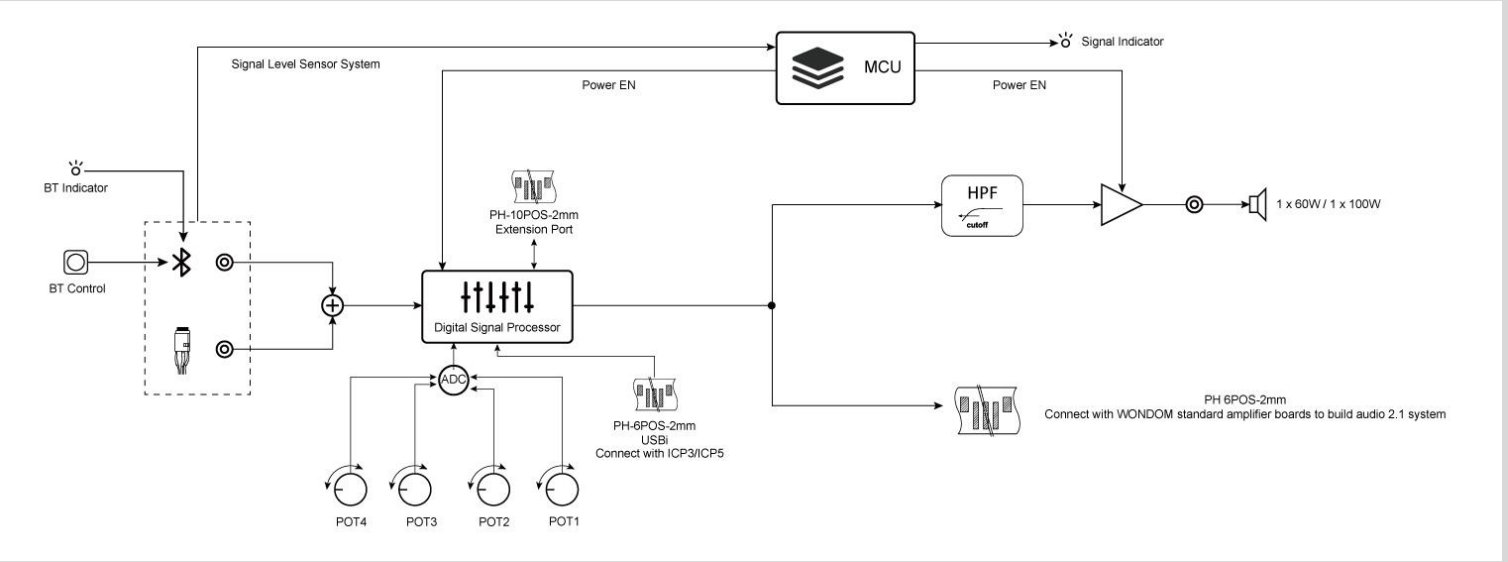
Audio Performance

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

Parameter		Conditions	Min.	Typ.	Max.	Units
Amp Gain		@2Ohm, 20Hz - 20kHz	-	26	-	dB
DSP Gain	SE1 (Single Amp)	@2Ohm, 1kHz	-60	-	0	dB
	SE2 (Line Output)	@2Ohm, 1kHz	-60	-	6.5	dB
Input Sensitivity		1x 100W@2Ohm, 1kHz, 25.8dB		775		mV
Filter Gain		Butterworth, Q= 0.707	-	4	-	dB
Cutoff Frequency		HFP	0.25	-	2	kHz
		LFP	-	20	-	kHz
SNR		1x 100W@2Ohm, THD+N=1%, 25.8dB, A-weighting		99		dB
THD+N		5W@2Ohm, 1kHz,25.8dB		0.04		%
		10W@2Ohm, 1kHz, 25.8dB		0.06		%
Input Impedance		-		10		kΩ
Supported Sampling Rates		-	-	48	-	kHz
Output Noise Level		A-weighting, Input Connected to GND, 25.8dB		174		uV
DC Offset		-		10		mV
Max output Level		J7, Line Output Connector		1.90		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 WONODM 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.

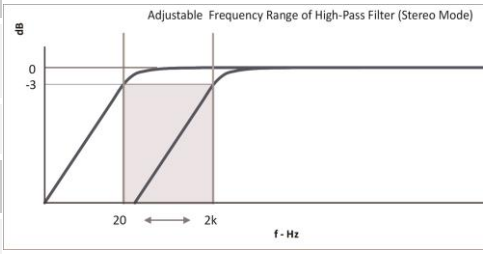
Function of Potentiometers

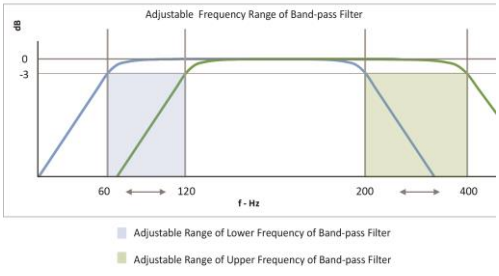
Functions of potentiometers based on specific applications					
Port	**Function**	JAB3+S	JAB3+M	(JAB3+S)+ SAB	(JAB3+M)+ SAB
POT1	CH2 Gain	Gain of Line Output	Gain of Line Output	Gain of Power Sage of SAB	Gain of Power Sage of SAB
POT2	CH2 HPF	High-pass Filter of Line Output	High-pass Filter of Line Output	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 exampled in this datasheet. For the functions of potentiometers when used in other applications, please contact us at 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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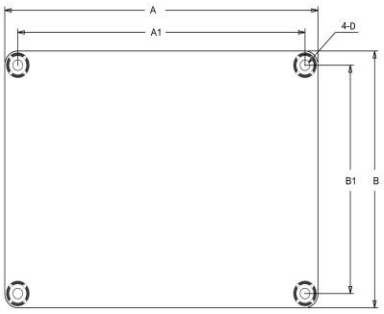
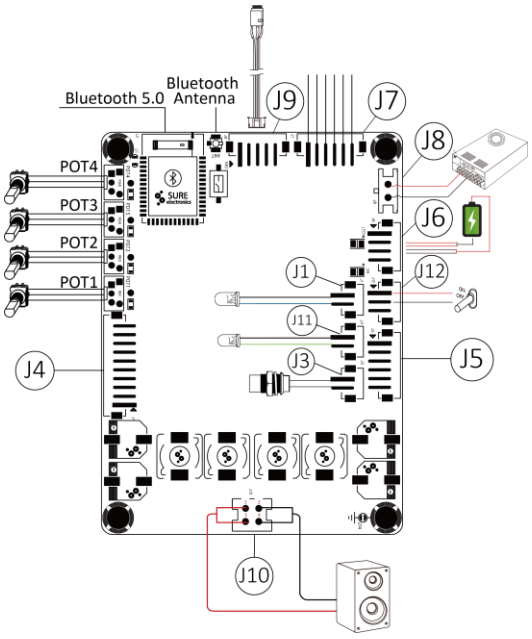
Mechanical Dimensions



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



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).

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 DATAO0	MP6
5	I2S DATAO1	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.

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