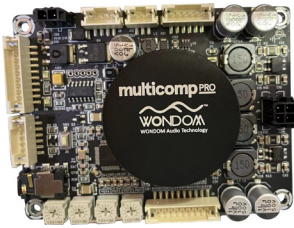


# 2 × 50 Watt Class D Audio Amplifier Board w DSP

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RoHS  
Compliant

FCCE



## Features

- 3.6 × 2.7 Inches PCB Size
- Battery Board Supported
- Power Management Circuit
- DSP Integrated
- Gain of Speaker Output Adjustable
- High-pass Filter of Speaker Output Adjustable
- High-pass Filter of 3.5mm Headphone Output Adjustable
- Overall Volume Adjustable
- Signal Level Sensor System
- External 3.5mm AUX IN Port
- Power Switch Port
- 3.5mm Headphone Output
- Compatible with JAB2

## 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 × 50W@4Ω, 1kHz	-	84	-	%
Nominal Power Requirement		@24V, 1kHz	-	130	-	W
Operating Voltage		@1kHz, 4Ω	12	24	26	V
Idle Power		Signal detected	-	2	-	W
		No Signal detected	-	60	-	mW
Switching Frequency		SD Floating@24V	-	400	-	kHz
Power Consumption		1/4 of max output power@4Ω, 24V, 1kHz	-	35	-	W
		1/8 of max output power@4Ω, 24V, 1kHz	-	20	-	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	-	-	
		Low-level Output Voltage	-	-	0.8	
Standby Power		SD short to GND, only when low power module available	-	120	-	mW
Under Voltage Protection		-	10	10.4	10.8	V

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# 2 × 50 Watt Class D Audio Amplifier Board w DSP

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## 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	@4Ω, 20Hz - 20kHz	-	26	-	dB	
DSP Gain	SE1 (Single Amp)	@4Ω, 1kHz	-60	-	0	dB
	SE2 (Headphone)	@4Ω, 1kHz	-60	-	6.5	dB
Input Sensitivity	2 × 50W@4Ω, 1kHz, 26dB		770		mV	
Filter Gain	Butter worth, Q= 0.707	-	4	-	dB	
Cutoff Frequency	HFP	0.25	-	2	kHz	
	LFP	-	20	-	kHz	
SNR	2 × 50W@4Ω, THD+N=1%, 26dB, A-weighting		88		dB	
THD+N	5W@4Ω, 1kHz, 24dB		0.04		%	
	10W@4Ω, 1kHz, 24dB		0.06		%	
Input Impedance	-		10		kΩ	
Supported Sampling Rates	-	-	48	-	kHz	
Output Noise Level	A-weighting, Input Connected to GND, 26dB		260		uV	
DC Offset	-		10		mV	
Max output Level	J3, 3.5mm Headphone Output Connector		7.8		dBu	
Crosstalk Separation	20Hz-20kHz, Gain=26dB	-	-60	-	dB	

### Notes:

- JAB3 can be powered by 3S18650 Lithium Battery Balance and Protection Extension Board (AA-JA11113), which is designed for protecting batteries and balancing voltage. Please kindly be noticed that the battery charging circuit is integrated in JAB1/2, which means that JAB1/2 is a requisite if you want to charge battery board.
- Sure Electronics will update the hardware of JAB2 to make it fully compatible with JAB3. This means, when using JAB3 with this version JAB2 (PCB Version: AA-JA13217V150), some compatibility problem, like popping noise, may occur but will not affect the normal use. For more information about JAB2, contact at [www.multicomp.com](http://www.multicomp.com).
- 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 (1min). Once audio signal is detected under this circumstance, JAB3 will restart to work. It is not malfunction if JAB3 enters into standby mode.
- JAB3 can be connected with JAB2 through J5 port on JAB3 with a 6pin cable. This cable is provided in the Functional Cables Package for JAB3.
- The basic cable package of JAB3 contains: one power cable, one speaker cable, one control cable and one 3.5mm AUX IN cable.

## Function of Potentiometers

### Functions of potentiometers based on specific applications

Port	Function	JAB3S	JAB3M	JAB3S+ JAB2	JAB3M+ JAB2
POT1	CH1 Gain	Gain of Speaker Output	Gain of Speaker Output	Gain of Speaker Output of JAB3	Gain of Speaker Output of JAB3

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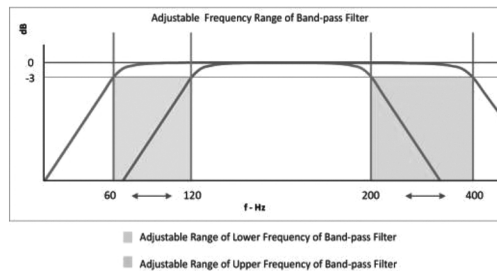
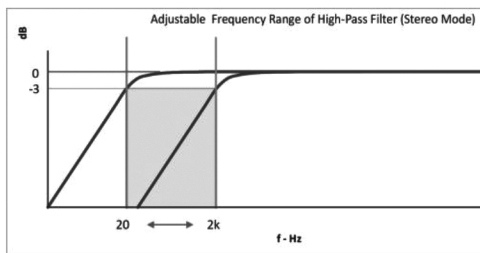
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# 2 × 50 Watt Class D Audio Amplifier Board w DSP

Port	Function	JAB3S	JAB3M	JAB3S+ JAB2	JAB3M+ JAB2
POT2	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
POT3	CH2 HPF	High-pass Filter of 3.5mm Headphone Output	High-pass Filter of 3.5mm Headphone Output	High-pass Filter of Stereo of JAB2	High-pass Filter of Stereo of JAB2
POT4	CH1 & CH2 Volume	Volume of Speaker & 3.5mm Headphone Output	Volume of Speaker & 3.5mm Headphone Output	Overall Volume of JAB3 & JAB2	Overall Volume of JAB3 & JAB2

**Note:**

- The speaker output (J10) of the board with potentiometers is defined as CH1; 3.5mm headphone output (J3) or other integrated circuit output of the board with potentiometers is defined as CH2.
- JAB3S refers to JAB3 in stereo mode, namely 2 x 50 Watt Class D Audio Amplifier Board w DSP - JAB3 (AA-JA32172) and 2 x 30 Watt Class D Audio Amplifier Board w DSP - JAB3 (AA-JA32473); JAB3M refers to JAB3 in mono mode, namely 1 x 100 Watt Class D Audio Amplifier Board w DSP - JAB3 (AA-JA31181) and 1 x 60 Watt Class D Audio Amplifier Board w DSP - JAB3 (AA-JA31211).
- HPF refers to High-pass Filter; BPF refers to Band-pass Filter.  
When CH1 is stereo output, the function of POT2 is HPF; when CH1 is mono output, the function of POT2 is BPF.
- Four applications are exemplified in this datasheet. For the functions of potentiometers when used in other applications, please check [www.multicomp.com](http://www.multicomp.com).

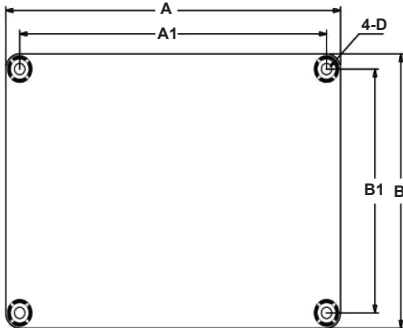


Function	Range of Frequency
High-pass Filter (Stereo Mode)	20Hz- 2kHz
High-pass Filter (Mono Mode)	250Hz- 2kHz
Band-pass Filter	60HZ-120Hz (High-pass)
	200Hz-400Hz (Low-pass)

# 2 × 50 Watt Class D Audio Amplifier Board w DSP



## Mechanical Dimensions

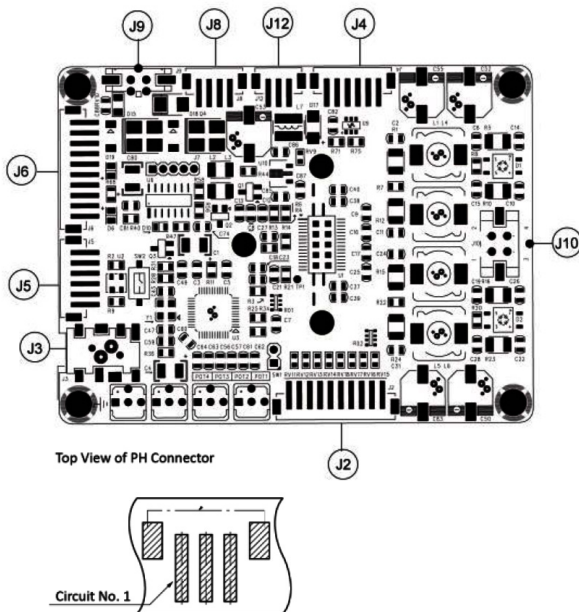


A (inch/mm)	A1 (inch/mm)	B (inch/mm)	B1 (inch/mm)	D (inch/mm)
3.6/91.44	3.3/83.8	2.7/68.6	2.4/61	0.14/3.6

### Notes

All dimensions are typical in inches/mm  
Tolerance x.xx = ±0.02(±0.5)

## Connections



### DSP Extension Port

J2, PH- 10Pin- 2mm

Pin	Definition	Pin	Definition
1	GND	6	MP00
2	DATA	7	MP01
3	LRCLK	8	MP05
4	BCLK	9	MP04
5	MP07	10	+3.3V

### Programming Connector

J4, PH- 6Pin- 2mm

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

### Power Supply Connector

J9, Molex- 2Pin- 3mm

Pin	Definition
1	VCC
2	GND



# 2 × 50 Watt Class D Audio Amplifier Board w DSP



## Switch Control Connector

J12, PH- 3Pin- 2mm

Pin	Definition
1	STBY
2	GND
3	MUTE

## Audio Output Connector

J10, Speaker Output Connector

J3, 3.5mm Headphone Output Connector

## Audio Extension and Compatible Port

J5, PH- 6Pin- 2mm

Pin	Definition	Pin	Definition
1	LIN	4	GND
2	LOUT	5	ROUT
3	GND	6	RIN

## Extension Connector

J6, PH- 10Pin- 2mm

Pin	Definition	Pin	Definition
1	VCC	6	LIN
2	VCC	7	GND
3	GND	8	RIN
4	LED1	9	KEY2
5	KEY1	10	LED2

## Battery Board Connection Connector

J8, PH- 4Pin- 2mm

Pin	Definition	Pin	Definition
1	VBAT	3	GND
2		4	

## Notes:

1. Short circuit 'STBY' and 'GND' to enter into 'Standby' mode.
2. Don't short circuit 'MUTE' and 'GND' at any time. This position is used to synchronize with 'MUTE' pin on JAB2 to eliminate the popping noise.
3. When JAB3 is used separately, the 'MUTE' position will malfunction; when JAB3 is used together with JAB2, J12 must be connected with the 3pos control port on JAB2 for controlling the whole system. Short circuit 'EN' with 'GND' on JAB2 for system control.

## Part Number Table

Description	Part Number
2 × 50 Watt Class D Audio Amplifier Board w ADAU1701 DSP	SURE-JAB3-250

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