

AIPO2X8

2 x 8W / 1 x 16W Class D Audio Amplifier Board

10-24VDC TPA3110

The AIPO2X8 audio amplifier board is a flexible solution for your audio needs. It provides two 8W channels for stereo configuration or a single 16W channel for mono configuration. The AIPO2X8 is define as composed of a motherboard, which houses the TPA3110 IC.

Features:

- Wide-Range Single-Supply Operation: DC 10V to 24V
- High Working Temperature: -20°C to 65°C
- Certified with FCC and CE
- Verified with Mean Time Between Failure (MTBF) Test
- Provided with 10 Years Long-Term Manufacturing Plan

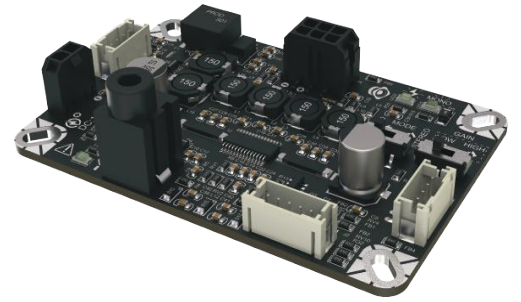
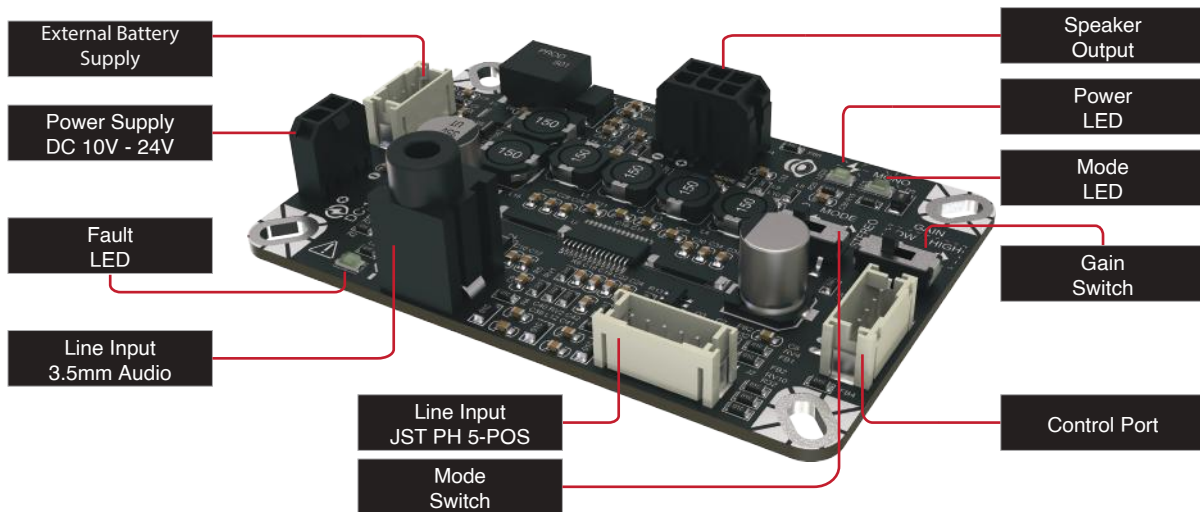


Diagram [1]: The AIPO2X8 Analog Audio Amplifier Board

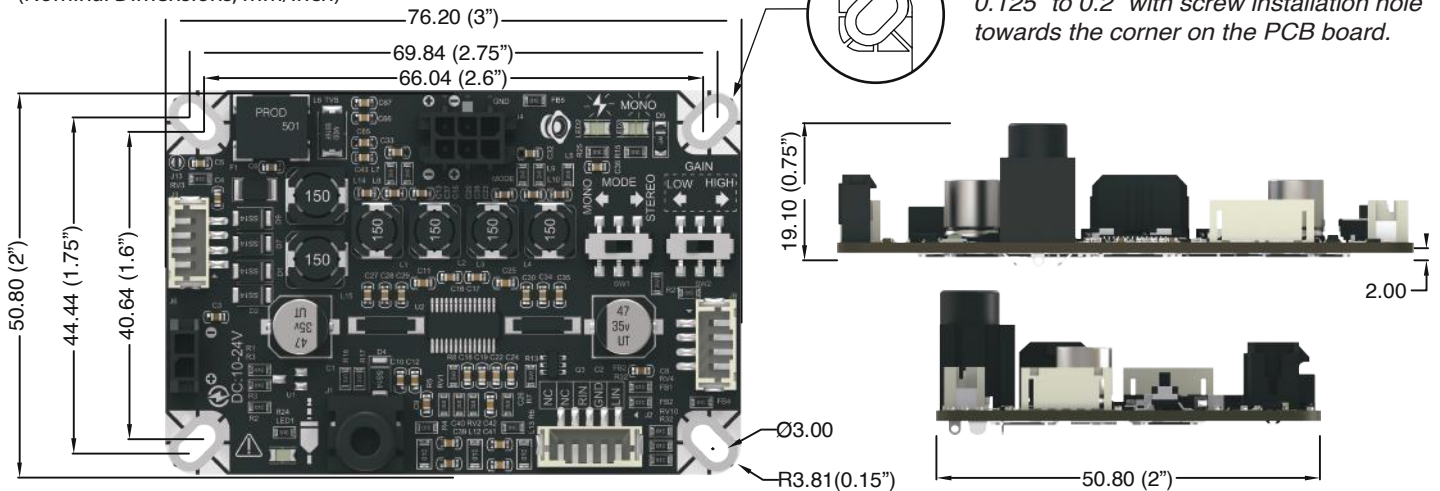
Specifications

Supply Voltage	: DC 10-24V (Micro-Fit 1x2 CKT)	Output Channel	: 2 Channel(s) / 1 Channel(s)
Audio Input Source	: JST PH 5-CKT and 3.5mm Audio Cable	Product Size (inch)	: 76.2 (W) x 50.8 (L) x 19.05 (H) mm 3.00 (W) x 2.00 (L) x 0.75 (H) inch
Output Power	: 2 x 8W for Stereo Mode 1 x 16W for Mono Mode	Weight (g)	: 82g ±10g / 3 oz ± ¼ oz

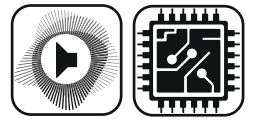


Mechanical Drawing

(Nominal Dimensions, mm/inch)

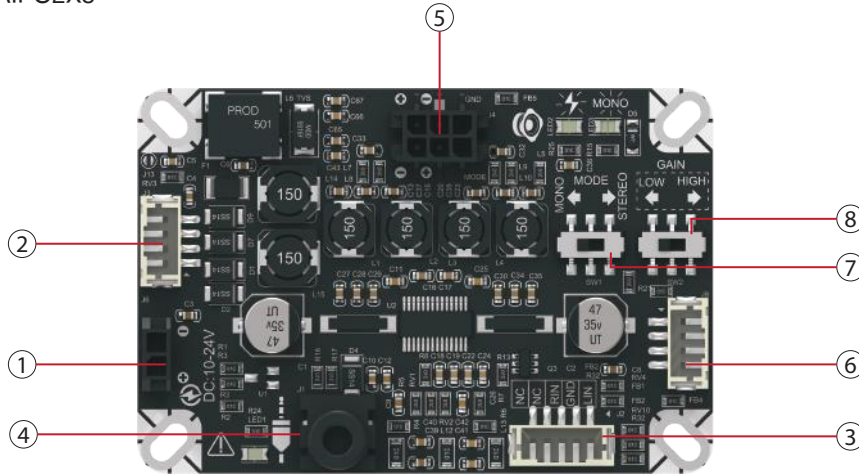


Note:
 [1] Please set print to 1:1. If not set correctly, there might be a difference from the actual size.



Connector(s) and Switch(s) Layout

Top View of AIPO2X8



- ① **Power Input Port (Micro-Fit 2x1 CKT):**
 The main power supply is connected through this port using a Micro-Fit 2x1 circuit connector. It delivers the required power to run the amplifier, supporting a DC input voltage range between 10V and 24V. This broad voltage range offers versatile power supply choices, ranging from small portable batteries to larger power adapters.
- ② **External Battery Supply Port (JST PH 4-CKT):**
 This port is designed to connect an external battery pack using a 4-circuit JST PH connector, allowing the amplifier to run on battery power, making it perfect for portable or off-grid use. For safe and efficient battery management, it can be paired with WONDOM's Lithium Battery Charging, Balance, and Protection Board series, for example.
- ③ **Audio Line Input Port (JST PH 5-CKT):**
 This port is designed for connecting external audio devices through a 5-circuit JST PH connector. It handles line-level audio input from various sources, including CD players, computers, or other audio equipment. The reliable connection ensures high-quality audio transfer, making it suitable for a wide range of audio setups.
- ④ **Audio Input Port (3.5mm Audio Cable):**
 A standard 3.5mm audio cable allows for easy connection to portable devices like smartphones, tablets, or MP3 players. This port is convenient for quick and straightforward audio input.
- ⑤ **Speaker Output Port (Micro-Fit 2x3 CKT):**
 This port connects to the speakers using a custom cable with bullet connectors. The port includes pins labeled "GND" and "MODE." By default, the AIPO2X8 operates in mono mode, providing a single 16W output. To switch to stereo mode, outputting 2 x 8W, you must short the "GND" and "MODE" pins. This setup provides flexibility in configuring the amplifier for different speaker setups.
- ⑥ **Control Port (JST PH 4-CKT):**
 This 4-circuit JST PH connector is used for various control functions, other user-defined control signals.
- ⑦ **Channel Selection Switch:**
 This switch allows you to select the desired audio output channel. You can choose between MONO and STEREO. This feature is useful for tailoring the audio output to specific speaker configurations or listening preferences.
- ⑧ **Gain Selection Switch:**
 The gain selection switch provides two options for setting the amplifier's gain: LOW or HIGH. This allows you to adjust the amplifier's output level to match the sensitivity of your speakers or to achieve the desired volume level in your listening environment.

Note: This page shows only the layout and pin definitions of the AIPO2X8 ports. For more detailed information about the speaker port, including specifications and how to use it, please check the next pages.

Pin(s) Definitions

① Power Input Port

-	GND
+	VCC



② External Battery Supply Port

4	GND
3	GND
2	VIN
1	VIN

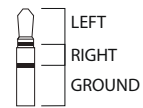


③ Audio Input Port

5	NC
4	NC
3	RIN
2	GND
1	LIN

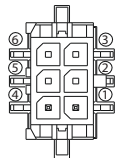


④ 3.5mm Audio Jack



⑤ Speaker Output Port

6	LCH+
5	RCH-
4	GND
3	LCH-
2	RCH+
1	MODE

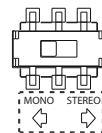


⑥ Control Port

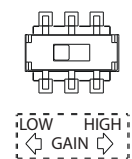
1	SDZ
2	FAULT
3	NC
4	GND

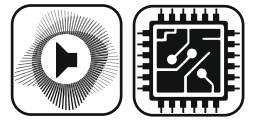


⑦ Channel Selection Switch



⑧ Gain Selection Switch



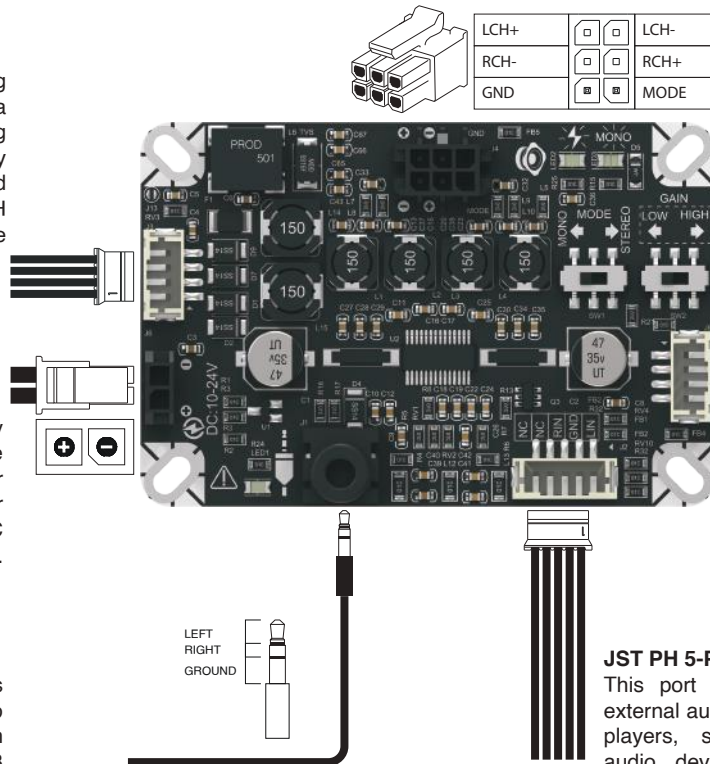


Port(s) Layout and Control

Connecting the AIPO2X8 Audio Amplifier Board

JST PH 4-POS

This port is intended for connecting an external battery pack via a 4-circuit JST PH connector, enabling the amplifier to operate on battery power, ideal for portable or off-grid applications. Use the JST PH 4-POS connector to ensure a secure connection and reliable input.



LCH+		LCH-
RCH-		RCH+
GND		MODE

Microfit 6-POS

Connect your speakers to the AIPO2X8 board using this port. The Microfit 6-POS connector ensures a secure connection between the amplifier board and your speakers, delivering high-quality audio output.

Microfit 2-POS

This port connects the power supply to the AIPO2X8 board. Use the Microfit 2-POS connector to deliver the required power for the amplifier board's operation. It supports a DC voltage input between 10V and 24V.

JST PH 4-POS

The 4-circuit JST PH connector is utilized for various control functions, including handling other user-defined control signals.

3.5mm Audio Cable

You can also connect audio devices using a standard 3.5mm audio cable. This port accepts input from devices like smartphones, MP3 players, or computers, providing flexibility for various audio sources.

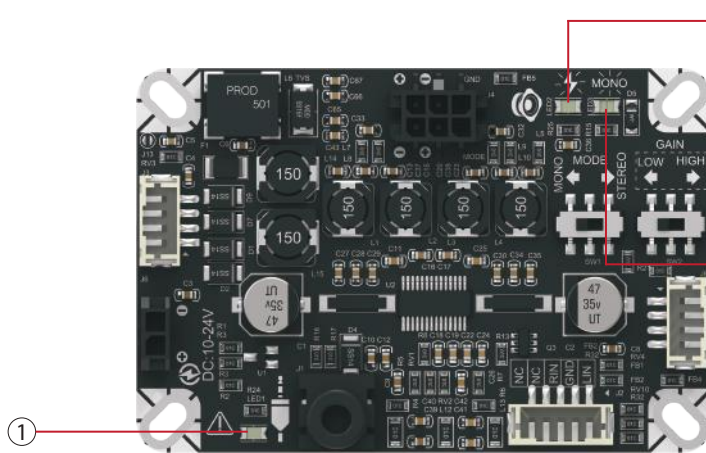
LEFT
 RIGHT
 GROUND

JST PH 5-POS

This port allows you to connect external audio sources, such as CD players, smartphones, or other audio devices, to the AIPO2X8 board. Use the JST PH 5-POS connector to ensure a secure connection and reliable audio input.

LED(s) Layout

AIPO2X8 Audio Amplifier Board



Power LED Indicator -

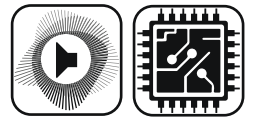
This LED indicates the power status of the AIPO2X8 board. When the board is powered on, this LED lights up, providing a visual confirmation that the board is receiving power.

MONO Mode LED Indicator -

This LED indicates the MONO mode of audio output when the channel selection switch slides to MONO mode.

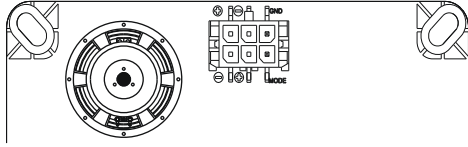
Fault LED Indicator -

This LED indicates the faulty status of the AIPO2X8 board. When there is an error of board occurred, this LED lights up, providing a visual confirmation that the board having an error.



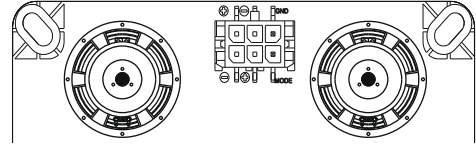
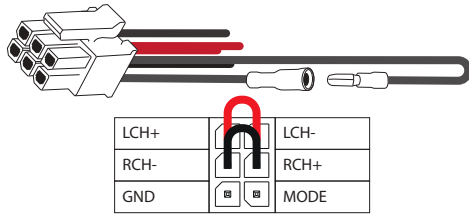
Configuring Mono and Stereo Modes on the AIPO2X8 Audio Amplifier Board

Unlocking Audio Versatility: Understanding Mono and Stereo Configurations



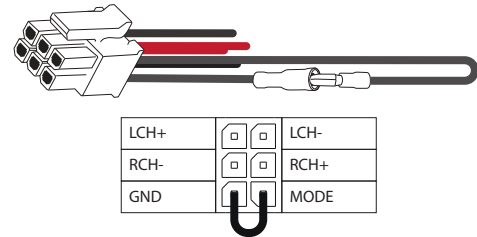
When operating in mono mode, the AIPO2X8 audio board delivers a powerful 16W output, ideal for applications where a single-channel audio signal is preferred or required. When the output lines are disconnected, the mode switch allows you to toggle between single-channel and dual-channel modes.

Mono Mode Configuration



Upon shorting the 'GND' and 'MODE' pins using bullet connectors, the AIPO2X8 audio board seamlessly transitions into stereo mode. When the output lines are shorted, the amplifier remains permanently in dual-channel mode, rendering the mode switch inactive and unable to change modes.

Stereo Mode Configuration



Electrical and Audio Specifications

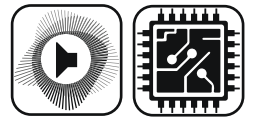
Electrical and audio performance specifications are typical at +25°C, powered by 24V DC, unless otherwise noted specifications subject to change without notice.

Parameter	Conditions	Min.	Typ.	Max.	Unit
Power Supply	-	10	-	24	V
Idle Power	No Audio Input (± 0.2 W)	1.48	1.68	1.88	W
Standby Current	SD short to GND (± 0.2 mA)	3.8	4.0	4.2	mA
Maximum Current	2x8W @ 4Ω (± 0.02 A)	0.99	1.01	1.03	A
Minimum Load Impedance	-	2(PBTL)	4	8	Ω
Output Power	@4Ω (BTL, Stereo Mode)	2x8			W
	@2Ω (PBTL, Mono Mode)	1x16			

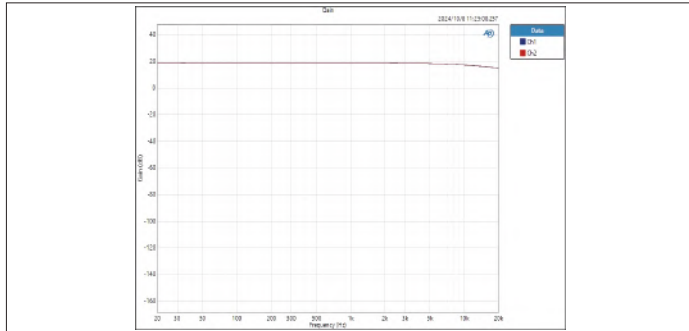
Audio Performance

Electrical and audio performance specifications are typical at +25°C, powered by 24V DC, unless otherwise noted specifications subject to change without notice.

Parameter	Conditions	Min.	Typ.	Max.	Unit
Amp Gain	SW2 at Low, 1W @4Ω, 1kHz (± 1 dB)	17.6	18.6	19.6	dB
	SW2 at High, 1W @4Ω, 1kHz (± 1 dB)	23.6	24.6	25.6	dB
SNR	Gain = Low, 2x8W @4Ω, A-weighting (± 3 dB)	100	103	-	dB
	Gain = High, 2x8W @4Ω A-weighting (± 3 dB)	98	101	-	dB
THD	Gain = Low, 2x8W @4Ω A-weighting	-	0.029	-	%
	Gain = High, 2x8W @4Ω A-weighting	-	0.035	-	%
Output Noise Level	Gain = Low, A-weighting, Input Short to GND	-	58	68	uV
	Gain = High, A-weighting, Input Short to GND	-	78	88	uV
Bandwidth @±3dB	@4Ω (Breakdown at 2kHz)	20	-	20k	Hz

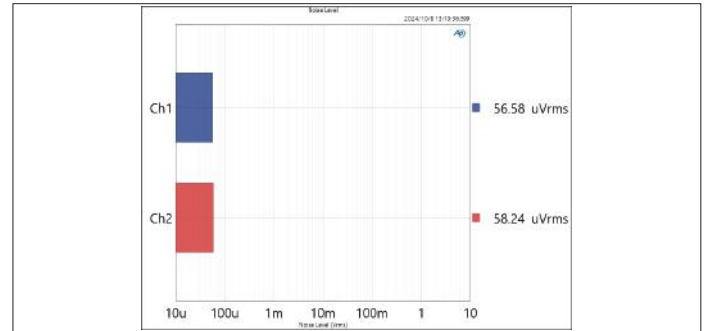


Audio Performance
Condition 1: Low Gain



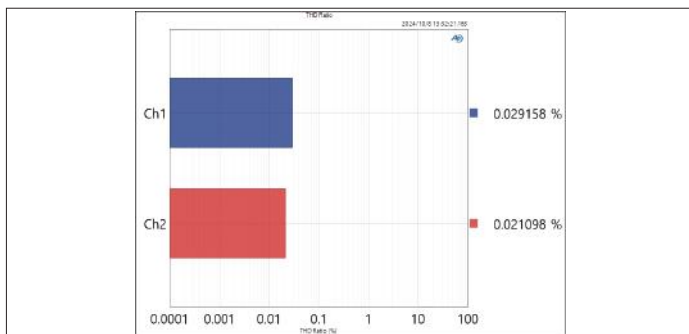
Frequency Response

Conditions: Input Signal Voltage = 100mV, Rload = 4Ω



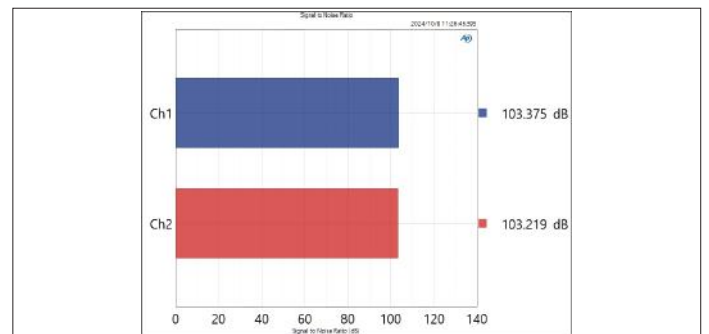
Noise Level

Conditions: Input short to GND, Rload = 4Ω A-weighting



THD+N Ratio

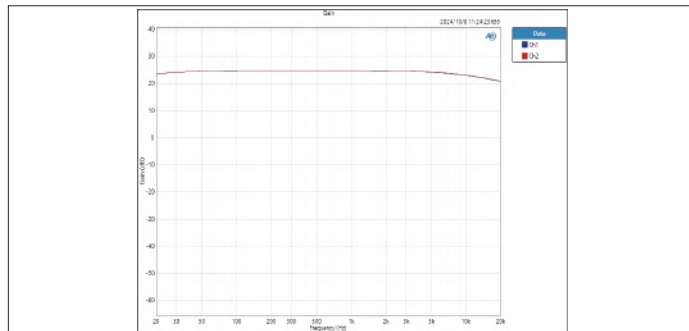
Conditions: Pout = 1W, Rload = 4Ω



Signal to Noise Ratio

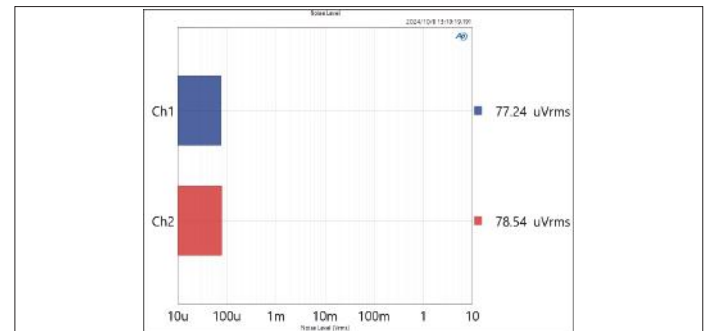
Conditions: THD=1%, Rload = 4Ω A-weighting

Audio Performance
Condition 2: High Gain



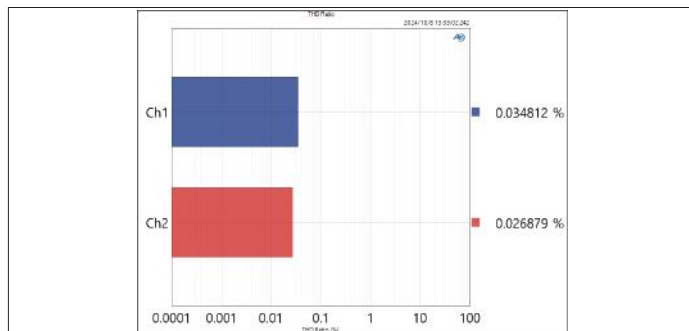
Frequency Response

Conditions: Input Signal Voltage = 100mV, Rload = 4Ω



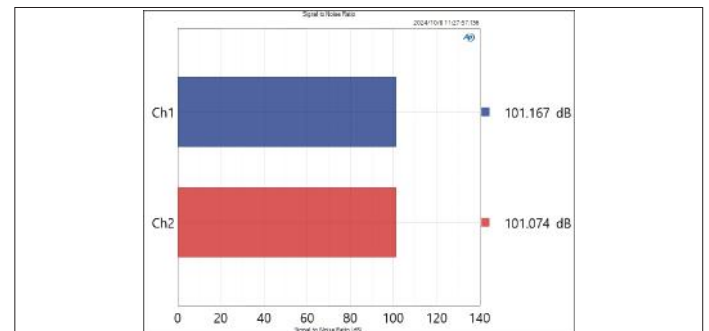
Noise Level

Conditions: Input short to GND, Rload = 4Ω A-weighting



THD+N Ratio

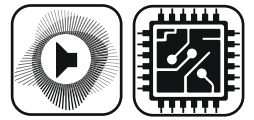
Conditions: Pout = 1W, Rload = 4Ω



Signal to Noise Ratio

Conditions: THD=1%, Rload = 4Ω A-weighting

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 For more information please visit www.wondom.com



Precautions

Safety Precautions

CAUTION

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

When using the AIPO2X8 audio amplifier board, it's essential to observe safety precautions to prevent damage to the board, connected devices, and ensure user safety. First, ensure that the power supply voltage and current rating are within the specified range to avoid damaging the board or causing electrical hazards. Always disconnect the power supply before connecting or disconnecting any cables to prevent electric shock.

When connecting external audio sources, ensure they are powered off to prevent electrical surges or interference. Check the compatibility of the audio sources with the board's input specifications to avoid overloading or distortion. Before connecting speakers, verify that their impedance and power ratings match the manufacturer's recommendations to prevent damage. Securely connect speaker wires to avoid short circuits.

When adjust the gain and mode selection switch on the panel, it is recommended to turn off the power. Handle the board with care, avoiding exposure to moisture, dust, extreme temperatures, and physical damage. Follow assembly and installation instructions carefully, double-checking all connections before powering on the board to avoid incorrect wiring or short circuits. These precautions aim to ensure the safe and proper operation of the AIPO2X8 audio amplifier board for optimal performance and longevity.

Caution & Warning

Power Supply Compatibility

- Ensure the power supply voltage and current ratings match the specifications of the AIPO2X8 amplifier. Using an incorrect power supply can damage the amplifier. It is recommended to use an adapter with a 12V to 24V output and a 3A or higher current rating. Do not use an adapter with more than 24V, or connect it to a truck, bus, or lorry battery system. These battery systems may have voltages higher than 24V and can float up to 29V, which will cause permanent damage to the amplifier.
- Do not connect speakers with an impedance lower than recommended. Overloading the amplifier can lead to damage or reduced performance.

10 Years Long-Term Manufacturing Plan

- A 10-year long-term manufacturing plan outlines the strategic goals and initiatives aimed at ensuring sustainable growth, innovation, and efficiency in production over the next decade. It typically includes projections for capacity expansion, technology integration, workforce development, and cost management to remain competitive in the market.
- A 10-year long-term manufacturing plan includes detailed terms and conditions outlining production commitments, quality standards, and delivery timelines to ensure consistent operations. It also accounts for stock preparation, ensuring inventory is available for the entire 10-year period from the time the product is released, allowing for sustained market supply and fulfillment of demand over time.

Distributed by:

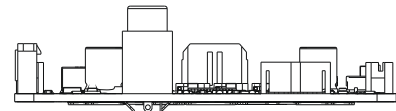
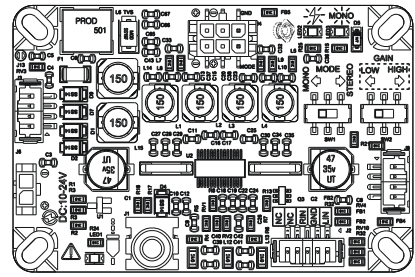


Sure Electronics Co., Ltd.
Professional Industrial Audio Solution Provider
3F, Building F6, No. 9, Weidi Road,
Xianlin, Qixia Dist., Nanjing, China.
+86(25)8526-0046 | info@sure-electronics.com

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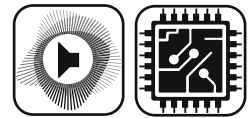
58-7-2, Jalan Cantonment,
Wisma Fortune Heights, 10250, Pulau Pinang, Malaysia.
+60(4)2189323 | info@wondom.com
(Please use phone calls or email instead of WhatsApp
or iMessage.)



www.wondom.com


About the Manual

This manual displays general installation guidelines. However, please note that proper installation of wired cables for the AIPO2X8 audio amplifier board requires qualified experience. If you do not have the knowledge and tools to successfully perform this installation, we strongly recommend consulting an authorized WONDOM dealer about your installation options. Keep all instructions and sales receipts for reference.




FCC Report


Supplier's Declaration of Conformity



Supplier's Declaration of Conformity
 47 CFR § 2.1077 Compliance Information



Manufacturer information:
 Name : Sure Electronics Co., Ltd.
 Address : 58-7-2, Jalan Cantonment, Wisma Fortune Heights, 10250, Penang, Malaysia


Product information:
 Name : 2 x 8W / 1 x 16W Class D Audio Amplifier Board 10-24VDC TPA3110 - AIPO2X8
 Trade Mark : 
 Model No. : AA-AB32145

FCC Compliance Statement
 This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 (1) This device may not cause harmful interference, and
 (2) this device must accept any interference received, including interference that may cause undesired operation.


The test result has been evaluated by Shenzhen CTB Testing Technology Co., Ltd. (AZLA Certificate No. 5599.01) laboratory and showed in the test report.
Report number: CTB240921015EX

It is understood that each unit marketed is identical to the device as tested, and any changes to the device that could adversely affect the emission characteristics will require retest.


47 CFR § 2.909 Responsible Party – U.S. Contact Information
 Corporation:
 Address:
 Signature: _____ Date:
 Contact Name: _____ Title:
 Telephone: _____ Fax:
 Number: _____
 E-mail: _____



Test lab by



Shenzhen CTB Testing Technology Co., Ltd.
 Add: 182/F, Building A, No.28, Xixue Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China.
 Web: www.ctb-lab.net Tel: 4008-707-283 Email: cb@ctb-lab.net



Shenzhen CTB Testing Technology Co., Ltd.
 Add: 182/F, Building A, No.28, Xixue Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China.
 Web: www.ctb-lab.net Tel: 4008-707-283 Email: cb@ctb-lab.net

CE Report

VERIFICATION OF CONFORMITY



VERIFICATION OF CONFORMITY
 EU - Electromagnetic Compatibility (EMC) -
 No.: CTB240921010EX-ZS



Applicant : Sure Electronics Co., Ltd.
Address : 3F, Building F6, No.9, Weishi Road, Qixia Dist., Nanjing, China
Manufacturer : Sure Electronics Co., Ltd.
Address : 58-7-2, Jalan Cantonment, Wisma Fortune Heights, 10250, Penang, Malaysia
Product : 2 x 8W / 1 x 16W Class D Audio Amplifier Board 10-24VDC TPA3110 - AIPO2X8
Trade Mark : 
Model(s) : AA-AB32145
Test Report No. : CTB240921010EX
Test Standards : EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021

The tests that base on the above designated product Complies with the essential requirements of Directive 2014/30/EU relating to Electrical Equipment designed for use within Electromagnetic Compatibility.
 The test results apply only to the particular sample tested and the applicative tests carries out.
 The CE marking as shown below can be affixed on product after manufacturer carries out all stipulation activities integrally of above-mentioned Regulation (Directive) and preparation of necessary technical documentation as well as the conformity declaration.
 This statement is based on a single evaluation of sample of above-mentioned product. It does not imply an assessment of the whole production process.
 Other relevant Regulation (Directive) requirement have to be observed.

CE



Sep. 23, 2024



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 Add: 182/F, Building A, No.28, Xixue Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China.
 Web: www.ctb-lab.net Tel: 4008-707-283 Email: cb@ctb-lab.net



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 Add: 182/F, Building A, No.28, Xixue Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China.
 Web: www.ctb-lab.net Tel: 4008-707-283 Email: cb@ctb-lab.net



AIPO2X8 Audio Amplifier: FCC and CE Certified

We are pleased to inform you that the AIPO2X8 audio amplifier has successfully passed both FCC and CE certification. This ensures that our product meets the highest standards for electromagnetic compatibility and performance.

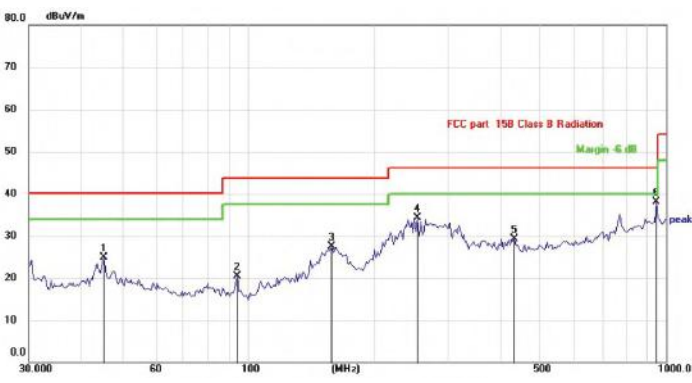
If you would like to view the full certification documents, they are available for download on our website. Alternatively, you can request them from our customer service team.



Product Name: 2 x 8W Class D Audio Amplifier Board 10-24VDC TPA3110
Model(s): AA-AB32145
Test Lab by: Shenzhen CTB Testing Technology Co., Ltd

Radiated Emission Measurement

Project No.: KA240902012X Data :#1 2024/9/23 18:00:29



Site: Limit: FCC Part15B Class B Radiation
 EUT: AA-AB32145
 M/N:
 Mode: Working
 Note:

Polarization: **Vertical**
 Power: DC19V
 Distance: 3m

Temperature: 23 (C)
 Humidity: 54 %RH

Note: The CE report is also available for review. Please request it from our customer service.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	43.3534	31.78	-6.81	24.97	40.00	-15.03	QP	100	0	P	
2	85.1486	30.33	-9.46	20.87	40.00	-19.13	QP	100	0	P	
3	157.2829	30.18	-1.38	28.80	43.50	-14.70	QP	100	0	P	
4	254.7284	35.42	-3.72	31.70	46.00	-14.30	QP	100	0	P	
5	504.7062	28.97	-2.21	31.18	46.00	-14.82	QP	100	0	P	
6 *	768.7481	29.26	-6.77	36.03	46.00	-9.97	QP	100	0	P	



AIPO2X8 Audio Amplifier: EMI Test Passed

We are excited to share that the AIPO2X8 audio amplifier has passed the rigorous EMI (Electromagnetic Interference) test conducted by an accredited laboratory.

Notably, even when tested as a bare board (without installation in a housing), the EMI results were successful. This is a strong indicator of the board's excellent design and electromagnetic compatibility. It proves that if you purchase a bare board from WONDOM and integrate it into your own housing or system, we can guarantee with 99% confidence that it will pass EMI certification.

For more details on the test results or technical documentation, feel free to visit our website or reach out to our customer service team.

