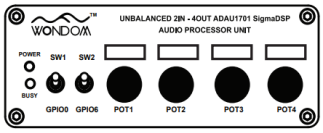
WONDOM ADSP1701-2.4U Unbalanced 2 In 4 Out ADAU1701 DSP Preamp 2 Way Digital Crossover User Manual

Designed by:

WONDOM™
Wondom Audio Technology

WONDOM ADSP1701-2.4U
User Manual
AA-AP23123



Contents

Unbalanced 2-In, 4-Out ADAU1701 DSP Preamp 2-Way Digital Crossover

The WONDOM ADSP1701-2.4U is an unbalanced 2CH input, 4CH output digital signal processor that uses Analog Device's high-performance ADAU1701 DSP chip. It features a 28 or 56-bit digital processing engine for audio signal processing, supports a 48 kilohertz sampling rate, and has built-in 24-bit resolution ADC and DAC with a high dynamic range of up to 98.5dB.

Features:

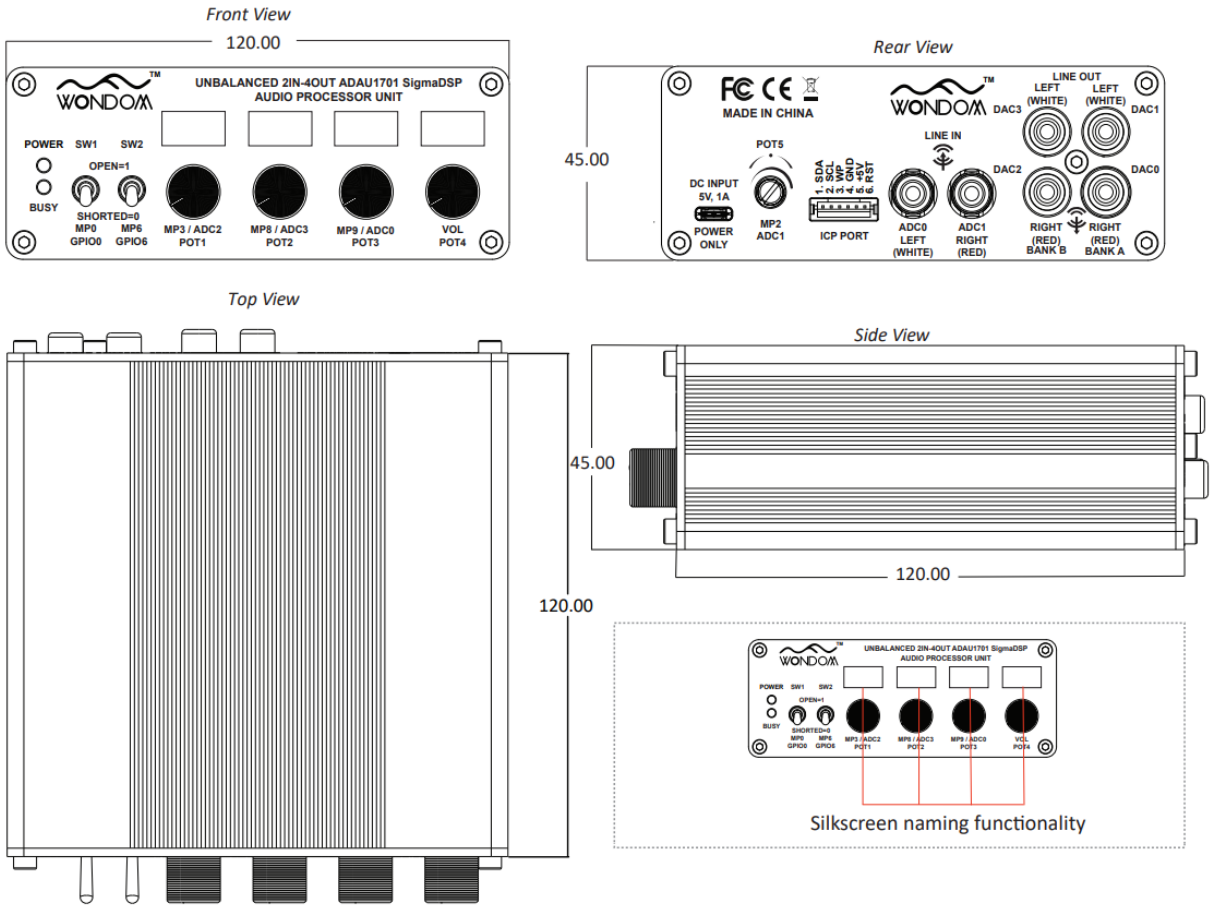
- 2-IN, 4-OUT with 2-way Digital Crossover.
- 4 Potentiometers, 2 Switches and 2 LEDs for Convenient Control and Monitoring.
- Supporting SigmaStudio Programming with Open-sourced Demo Program and HEX File.
- Exquisite Silkscreen Design and Comprehensive Programming Support.
- Aluminum Housing with Plug-N-Play Terminals.

Application:

• Gaming • Home Theater	• Audio DIY • Active DSP Crossover	• Musical instrument • Customizable Active Bookshelf Speaker

Mechanical Drawing

(Nominal Dimension,mm)

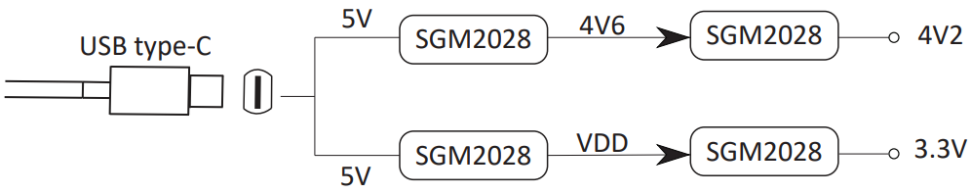


The empty space in the silkscreen on the front panel, as depicted in the picture, can be filled with the functional name of the potentiometer using a marker or sticker for your reference.

Specification

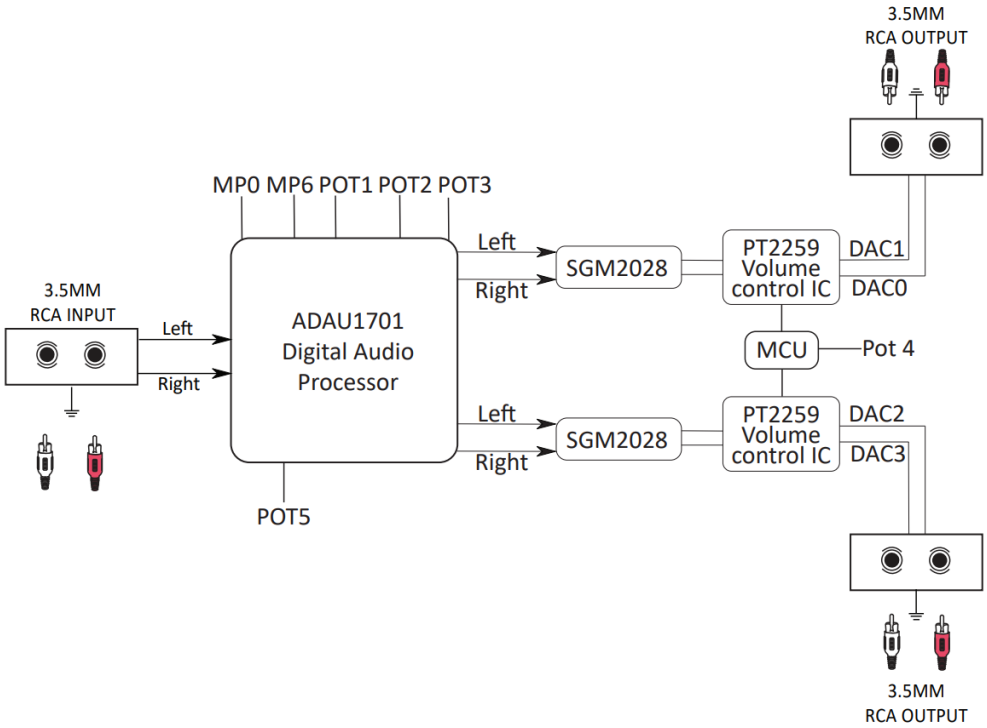
Item	Description
Digital Signal Processor	Analog Device ADAU1701 DSP IC
Analog Audio Input	• Unbalanced stereo (2 channels) analog audio on RCA connectors • Max input of 2V RMS • Input impedance: 10kΩ
Analog Audio Output	• Unbalanced analog audio (4 channels) on RCA connectors • DAC0 & DAC1 (BANK A) for bass output • DAC2 & DAC3 (BANK B) for mid-range output • Max output: 0.9V RMS • HD+N: 0.006% (RCA to RCA)
ADC/DAC Sample rate	• Resolution: 24 bit • Sample rate: 48KHz
Power Supply	DC5V/1A USB Type-C
POT1 (MP3/ADC2)	• High-pass filter of mid-range output channel (BANK B) • Default frequency adjustment range: 3k-20kHz (supporting modifica - tion in Sigmastudio)
POT2 (MP8/ADC3)	• Low-pass filter of mid-range output channel (BANK A) • Default frequency adjustment range: 210-3kHz (supporting modifica - tion in Sigmastudio)
POT3 (MP9/ADC0)	• High-pass filter of mid-range output channel (BANK A) • Default frequency adjustment range: 10-310Hz (supporting modifica - tion in Sigmastudio)
POT4 (VOL)	Overall volume control
SW1 (MP0/GPIO0)	Mute control
SW2 (MP6/GPIO6)	Phase control
Product Size (mm)	120 x 120 x 45 (Body only)
Unit Weight (g)	430.00g

Block Diagram of WONDOM ADSP1701-2.4U



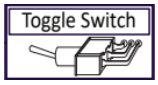
Unleashing the Capabilities of Digital Audio Processor IC Chipset (ADAU1701)

The ADAU1701 is a single-chip audio system with a 28-/56-bit audio DSP, ADCs, DACs, and micro- controller-like control. It features two ADCs and four DACs, providing a 98.5 dB dynamic range. ADC THD + N is –83 dB, and DAC THD + N is –90 dB. It supports easy connections to additional ADCs and DACs via digital ports, and communication occurs through I2C® or 6-pin JST **PH.**



Note: LED in WONDOM ADSP ADAU1701 Platiorm. The LED colour can be **customized.**

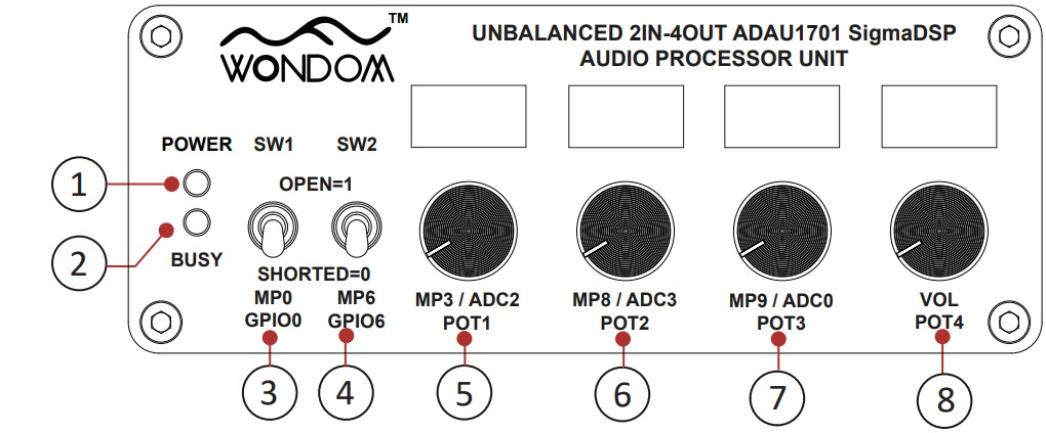
Note: Potentiometer and toggle switch function

Potentiometer functionality Sigmastudio software defined.	
Toggle Switch functionality Sigmastudio software defined.	

DRAWN BY	VERIFIED BY	COUNTERSIGNED BY	TITLE	BLOCK DIAGRAM OF WONDOM ADSP ADAU1701 PLA TFORM
H. NAYLIE	N. ZULNAZME	Z. CHENG		
ISSUED 19DEC2023	Designed by: Wondom Sdn.Bhd. For		DRAWIN G NO.	ADSP1701-2.40-01-01

Default Cofiguration

Front Panel



1. **Power LED**

   Indicating the power

   When the device is powered, this LED will be ON.

2. **BUSY LED**

   BUSY LED is controlled by MP7.

   When MP7 is used as GPIO pin, set at high level, the BUSY LED will be OFF; set at low level, the BUSY LED will be ON. MP7 is not defined now. You can customize its function in SigmaStudio.

   When MP7 is set as 12S1 data input, the LED will be ON when there is signal, OFF when there is no signal.

3. **SW1 – Mute Control**

   SW 1 functions as mute control.

   When set at 1, device will mute, set at 0, device will unmute.

   The port corresponds to MP0/GPIOO, where OPEN is 1 and SHORTED is 0.

4. **SW2 – Phase Control**

   SW2 functions as phase control.

   When set at 1, phase is 180°; when set at 0, phase is 0°.

   The port corresponds to MP6/GPIO6, where OPEN is 1 and SHORTED is 0.

5. **POT1 – HPF of BANK B**

   Potentiometer 1 functions as the High-pass filter for Mid-range output channel (BANK B) and is correspondent with MP3 or ADC2 in program. The default frequen cy adjustment range is 3kHz to 20kHz.

   The adjustable frequency range can be modified through SigmaStudio.

6. **POT2 – LPF of BANK A**

   Potentiometer 2 serves as the controller for MP8/ADC3. POT2 works as the Low-pass filter for Bass output channel (BANK A). The default frequency adjust ment range is 210Hz to 3kHz.

   The adjustable frequency range can be modified through SigmaStudio.

7. **POT3 – HPF of BANK A**

   Potentiometer 3 operates as the controller for MP9/ADCO. POT3 serves as the High-pass filter for Bass output channel (BANK A). The default frequency adjust ment range is 10Hz to 310Hz.

   The adjustable frequency range can be modified through SigmaStudio.

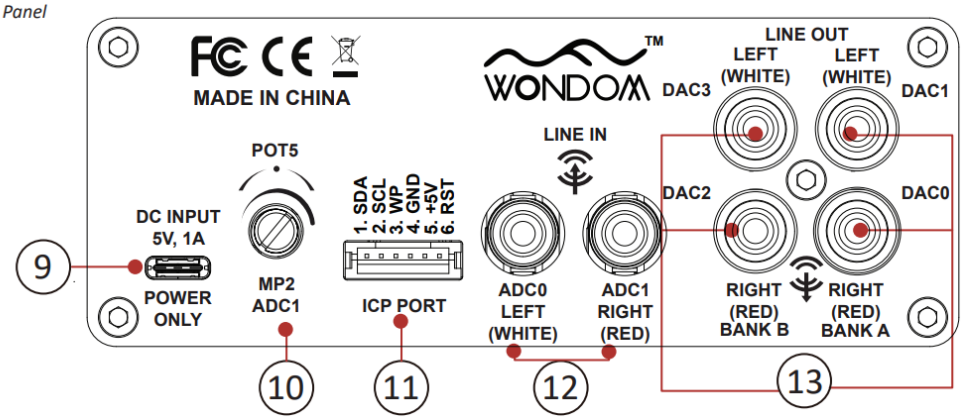
8. **POT4 – Overall Volume**

   Potentiometer 4 functions as Master volume control.

   When rotating POT4 clockwise, the overall volume will increase.

   When rotating POT4 anticlockwise, the overall volume will decrease.

Rear Panel



9. **Power Supply**

   A USB Type-C port is mounted on the rear panel for powering the ADSP1701-2.4U.

   Power supply requirement: DCSV, 1A

10. **POTS – Relative Gain Control**

    POTS is defined as the Relative Gain Control potentiometer. The control range is -GOdB to OdB.

    When rotating POTS clockwise, the gain of BANK A output remains at OdB, while that of BANK B output channel will gradually attenuate to -60dB.

    When rotating POTS anticlockwise, the gain of BANK B output remains at OdB, while that of BANK A output channel will gradually attenuate to -60dB.

    Please refer to the functional diagram.

    In addition, the functionality of POTS can be customized with SigmaStudio.

    As is shown in the label, POTS is controlled by MP2/ADC1.

11. **ICP PORT**

    This port is for connection with WONDOM ICP programmer. The unit will support SigmaStudio programming after connection with ICP programmer.

    The PH-6Pos cable comes with ICP programmer.

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

12. **2CH Audio Input**

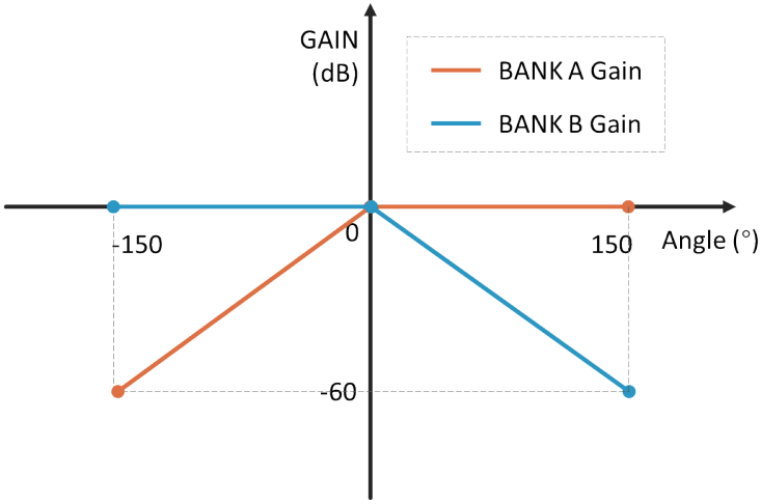
    The ADSP1701-2.4U supports 2CH analog input with RCA connectors, correspondent to ADCO and ADC1 in the program.

13. **4CH Audio Output**

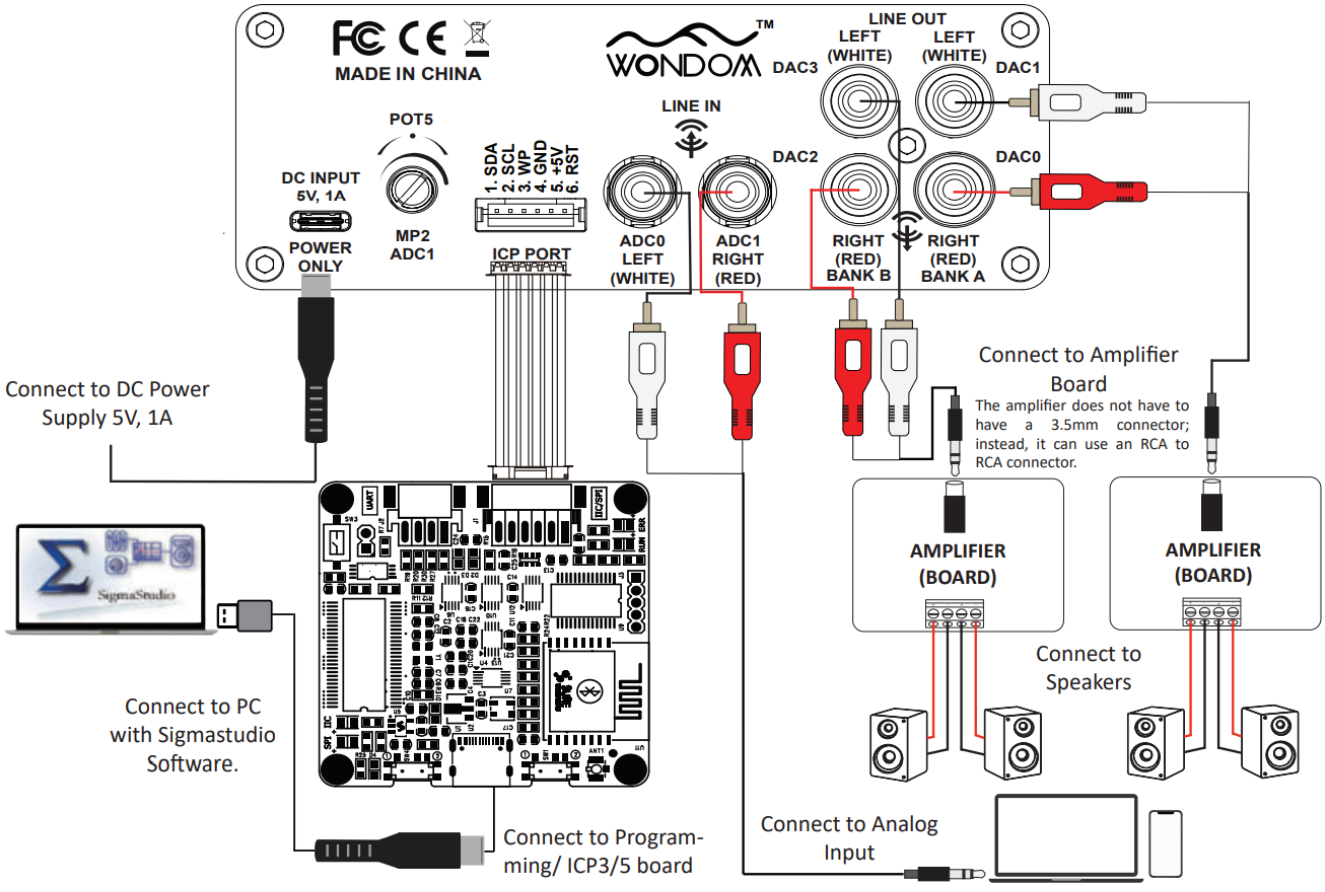
    ADSP1701-2.4U comes with 4 output channels and is integrated with 2-way digital crossover.

    Two channels (DACO&DAC1, BANK A) are dedicated to delivering bass reproduction, while the remaining two channels (DAC2&DAC3, BANK B) handle the mid-range signals.

POTS (MP2 / ADC1) Functional Diagram



Connection Diagram



Comprehensive Programming Support

Thanks to the integrated ADAU1701 DSP, the ADSP1701-2.4U supports SigmaStudio programming after connection with ICP5 through the ICP port on the rear panel. You can customize the ports functionality according to your requirements.

To enhance the programming experience, we have implemented improvements on the silkscreen design of our preamp unit. Each interface is now labeled with its corresponding program resources, making it easier for you to locate and modify the program as needed.

WONDOM provides comprehensive support for customers' use with ADSP1701-2.4U, including open-sourced demo program, HEX file for restoring factory settings, programming guide and video tutorials. Scan the QR codes to get more details.

Open-sourced Files Download link: http://files.sure-electronics.com/download/ADAU1701_2IN4OUTUNIT_OpenSource_DemoProgram&HEX.zip

Program Guide Video (Basic Programming Guide)	Demo Program Video (Demo Program Explanation)	How to Program Application Note (How to Program)	Demo Program Explanation Application Note (Demo Program)
https://www.youtube.com/watch?v=VI-2oGFB9Ws	https://www.youtube.com/watch?v=D-KdT6aHIDc	https://store.sure-electronics.com/document/application-note/58	https://store.sure-electronics.com/document/application-note/59

Troubleshooting

Problem	How-to-Solve
Cannot install the Sigmastudio	1. Confirm that you downloadd and installed the right software.
ICP3/5 cannot be recognized by the PC	1. Ensure that you have updated the firmware to the ICP5. 2. Make sure the type-C cable is in good condition and support data communication. 3. Make sure ICP5 is not connected to other device when connected to the PC. 4. Ensure that the WONDOM ICP3/5 board is connected following the correct steps. 5. Ensure that the control pin on the WONDOM ICP5 board is in the correct position.
Amplifier no output sound	1. Make sure the amplifier is powered at the correct voltage. 2. Make sure the signal I/0 interface connection are correct. 3. Ensure the amplifier is working. 4. Ensure that the amplifier volume is not set to mute.
WONDOM ADSP ADAU1701 cannot work properly (cannot play music) under powering condition when connect with WONDOM ICP5 board	1. Make sure follow the steps and check the input/ output cable are in correct position. 2. Disconnect from the WONDOM ICP5 board and reconnect following the correct steps.
Project cannot be download/ write to the WONDOM ADSP ADAU1701	1. Make sure the ICP5 is recognized by the PC. 2. Make sure the USB mode of the WONDOM ICP5 board is at ② (IIC) and the USB mode is at ① (USBi). 3. Try to “Link Compile Download” the project in the Sigmastudio. Make sure it shows “Active Downloaded” in the lower right corner in Sigmastudio. 4. If the download is unsuccessful, troubleshoot the project connection and then reconnect the WONDOM ICP3/5 board using the correct steps. (refer to our YouTube video)

Warranty Terms and Product Usage Restriction

Wondom products come with a one-year warranty starting from the date of purchase. Customers are responsible

for the cost of returning the goods to the seller, and by making a purchase, you agree to this condition. Due to the nature of DIY products, visible damage or use on screw holes or tinning of solder pads directly invalidates the warranty. Damage caused by the use of incorrect power sources, such as exceeding the specified voltage range or reverse polarity, is not covered under warranty. All Wondom products undergo thorough testing before shipment. We do not accept bulk returns after a bulk purchase. If you are unsure of the quantity you need, please purchase the appropriate quantity as needed. All Wondom products are intended for DIY use only and do not support any industrial applicafions. The rated operating temperature range is -10-50°C.

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Bulk Purchase Rights

When you're considering buying our product in large quantities, here's what you need to know:

Bulk Purchase Rights: The number of products you can buy at once is determined by your single purchase, not your total annual purchases.

Customization and Pricing: The WONDOM ADSP1701-2.4U is 100% fully customizable. If you wish to customize our product, the options and costs depend on the quantity you purchase in a single transaction. The pricing information is also available on the Quotation page of our WONDOM ADSP1701-2.4U sales sheet.

Retail Purchases: For individual purchases, you can only buy our product through our authorized distributor platforms. Please note that the listed prices on these platforms may change over time.

Bundled Pricing for 100 Units: When you buy a minimum of 100 units in one transaction, you may qualify for a special bundled price for that quantity.

Customization for 500 Units or More: If you're planning to purchase 500 units or more, you have the option to customize various aspects of the product. This includes changes to the product's appearances, such as color, size, logo, cable length, and packaging materials. Additionally, you can customize the firmware by altering the product string. We also offer a range of services, which encompass wire kit, panel, cabinet, and mount bracket design. To explore these customization options further, please contact us via email for detailed information and to discuss your specific requirements.

Standard Price List: For orders of 500 units or more, you can request our standard price list by reaching out to our customer support.

Pricing for Bulk vs. Bundled: It's important to note that the price for buying in bulk is not significantly different from the bundled price for 100 units.

Origin and Design Location

All Wondom products are designed, manufactured, assembled, and shipped from China. The products' country of origin is China. We do not provide any services for sales, shipping, or manufacturing from other regions.

– Have Fun with Us –

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

www.wondom.com

For more information please visit **www.wondom.com**

Designed by:

Wondom Audio Technology

ADSP1701-2.4U-07

Documents / Resources

	WONDOM ADSP1701-2.4U Unbalanced 2 In 4 Out ADAU1701 DSP Preamp 2 Way Digital Crossover [pdf] User Manual ADSP1701-2.4U Unbalanced 2 In 4 Out ADAU1701 DSP Preamp 2 Way Digital Crossover, ADSP1701-2.4U, Unbalanced 2 In 4 Out ADAU1701 DSP Preamp 2 Way Digital Crossover, ADAU1701 DSP Preamp 2 Way Digital Crossover, 2 Way Digital Crossover, Digital Crossover

References

- WONDOM OFFICIAL SHOP - ADAU1701 - Sure Electronics - 200 Watt Class D Amplifier Board - 18650 charger - Sigmastudio
- User Manual