

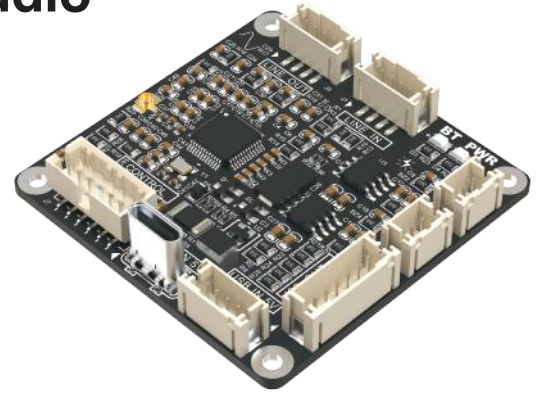
# 2x3W Class D USB Codec Input Audio Amplifier Board for Kiosks - KAB0

NS4168 x 2

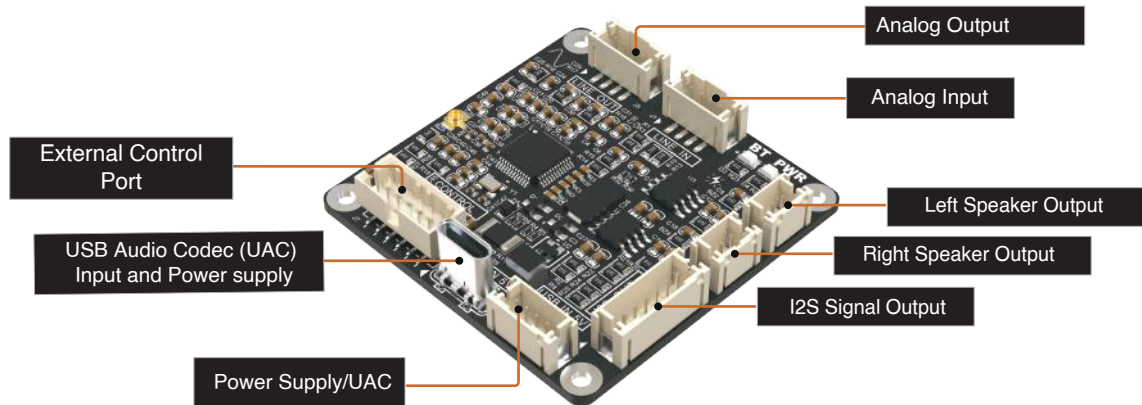
KAB0 is a 2" X 2" audio amplifier board designed for kiosks such as vending machines, guide machines and service robots. It features USB codec digital input via a single USB-C jack for both power and audio, reducing noise from ground loops and simplifying wiring. In addition to speaker output, KAB0 offers analog and I2S outputs for monitoring or connecting to another amplifier.

**Features:**

- Supporting USB Codec Input.
- Supporting Line Input.
- PC UI Control Optional.
- External Volume Control.
- Compact Size.



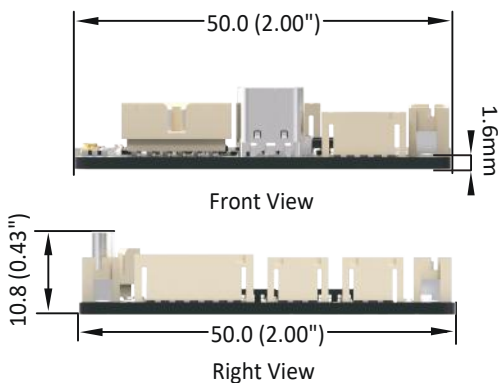
Specification(s) :		Output Connector : JST PH 4-Circuit (Single-Ended) : JST PH 6-Circuit (I2S)	
Supply Voltage	: DC 4.5 - 5.5V	Product Size	: 50.0 (W) x 50.0 (D) x 10.8 (H) mm : 2.00 (W) x 2.00 (D) x 0.43 (H) Inch
Audio Input	: UAC and Single-Ended	Net Weight	: 14 g ± 2 g / 0.48 oz ± 0.10 oz
Output Channel	: 2 x 3Watt		
Speaker Connector	: JST PH 2-Circuit		



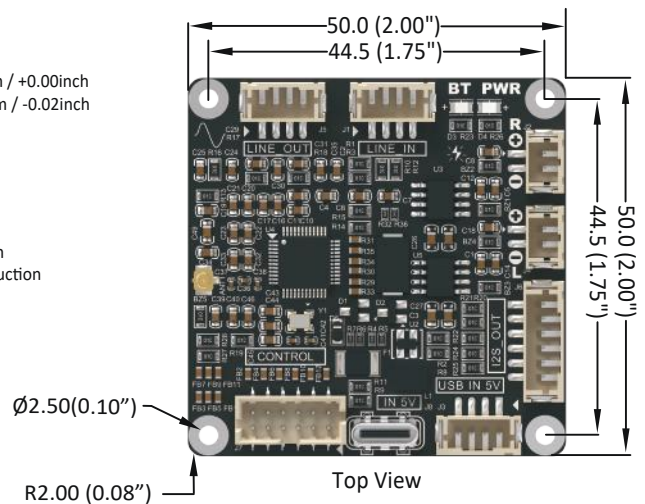
## Mechanical Drawing (Nominal Dimension, mm(inch))

**Note:** Designed to be compatible with 0.125" to 0.20" with screw installation hole towards the corner on the PCB board.

Note: Positive tolerance: +0.0mm / +0.00inch  
 Negative tolerance: -0.5mm / -0.02inch



Note: PCB thickness 1.6mm or 2.0mm depend on production batch.



**Note:** Please ensure that the printing configuration is set to 1:1 ratio to maintain accurate document proportions.

## Precautions

### Safety Precautions

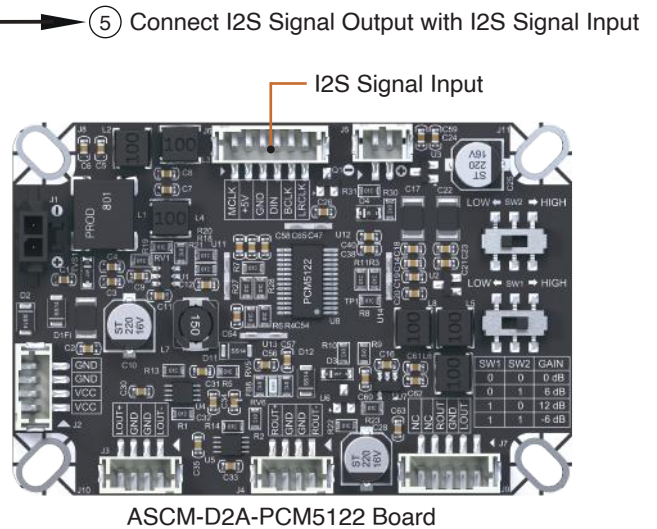
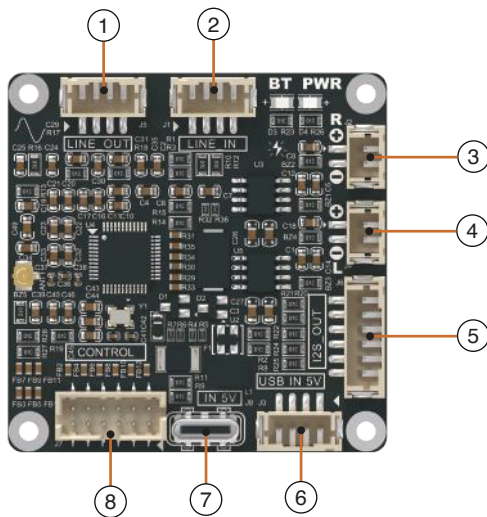
# ⚠ CAUTION

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

When using the KAB0 audio amplifier board, prioritize safety for the board, connected devices, and user well-being. Verify power supply voltage and current meet specifications to prevent damage or hazards. Disconnect power before handling cables to avoid electric shock. When connecting external audio sources, ensure they're powered off to prevent surges or interference. Verify compatibility with board's input specs to avoid overload or distortion. Handle the board carefully to avoid damage from moisture or dust. Follow assembly instructions closely, checking connections to prevent issues, ensuring safe operation, and maximizing performance and lifespan.

## Connector(s) & Switch(s) Layout

### KAB0 Audio Amplifier Board



### Connector(s):

- 1. Analog Signal Output Port (JST PH 4-Circuits):**
  - Used for single-ended audio output signal.
- 2. Analog Input (JST PH 4-Circuits):**
  - Used for single-ended audio input signal.
- 3. Speaker Output (JST PH 2-circuits):**
  - Right channel speaker.
- 4. Speaker Output (JST PH 2-circuits):**
  - Left channel speaker.
- 5. I2S Signal Output (JST PH 4-Circuits):**
  - Connect with ASCM-D2A-PCM5122.
  - Used for differential audio output signal.
- 6. Power Supply/UAC (JST PH 4-Circuits):**
  - DC supply voltage range (4.5V - 5.5V).
  - Reduce the risk of power interruptions.
- 7. UAC Input (Type C):**
  - Used to supply power.
  - DC supply voltage range (4.5V - 5.5V)
- 8. External Control Port :**
  - Consist of 12 pins.
  - Control bluetooth pairing and shutdown.
  - 3.3 VDC.
  - Balance control.
  - Bass control.
  - Crossover control.
  - Volume control.

## Port(s) Layout

Connecting the KAB0 Module

### 1. JST PH 4-Circuits (J5)

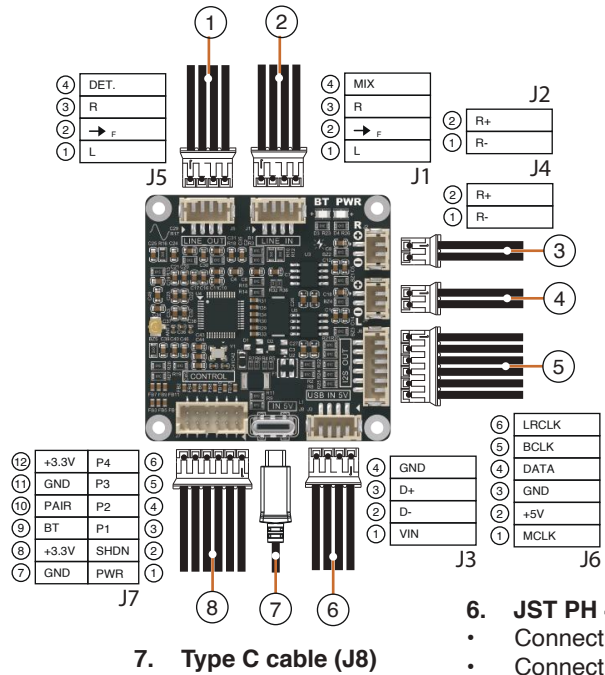
- Connect Pin-1 to L (Left) and Pin-3 to R (Right).
- Connect Pin-2 to → F (Ground) and Pin-4 to DET.

### 2. JST PH 4-Circuits (J1)

- Connect Pin-1 to L (Left) and Pin-3 to R (Right).
- Connect Pin-2 to → F (Ground) and Pin-4 to MIX.

### 8. JST PH 12-Circuits (J7)

- Connect Pin-1 to PWR, Pin-2 to SHDN, Pin-3 to P1 (Balance Control), Pin-4 to P2 (Bass Control), Pin-5 to P3 (Crossover Control) and Pin-6 to P4 (Volume Control).
- Connect Pin-7 to GND, Pin-8 to 3.3V, Pin-9 to BT, Pin-10 to PAIR, Pin-11 to GND and Pin-12 to 3.3V.



### 3. JST PH 2-Circuits (J2)

- Right speaker output.
- Connect Pin-1 to negative and Pin-2 to positive.

### 4. JST PH 2-Circuits (J4)

- Left speaker output.
- Connect Pin-1 to negative and Pin-2 to positive.

### 5. JST PH 6-Circuits (J6)

- Connect Pin-1 to MCLK, Pin-2 to +5V and Pin-3 to GND.
- Connect Pin-4 to DATA, Pin-5 to BCLK and Pin-6 to LRCLK.

### 6. JST PH 4-Circuits (J3)

- Connect Pin-1 to VIN and Pin-4 to GND.
- Connect Pin-2 to D- and Pin-3 to D+.

## Electrical and Dynamic Performance Parameters

Electrical and dynamic performance specifications are typical at +25°C, powered by 5.0 VDC, unless subject to change without notice. Combination with any add-on module(s) are not tested:

Parameter	Conditions	Min.	Typ.	Max.	Unit
Power Supply	USB Type-C Input	4.5	5.0	5.5	VDC
Idle Current	Power supply=5V, test after 20 seconds without input signal	0.07	0.08	0.09	A
Idle Power	Power supply=5V, test after 20 seconds without input signal	0.35	0.40	0.45	W
Operating temperature	-	-20	-	65	°C
Storage temperature	-	-10	-	55	°C

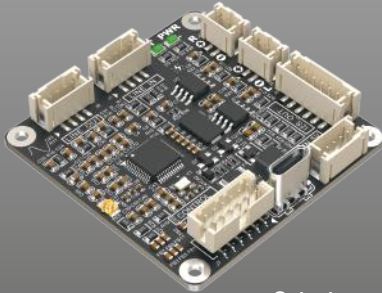
Audio Performance Parameters:

Parameter	Conditions	Min.	Typ.	Max.	Unit
Gain	1kHz, 4Ω, Test signal = 0 dBFS, ASIO drive, L&R Channel	-	8.2	-	dB
Noise Level	1kHz, 4Ω, Test signal= -100dBFS, ASIO drive, L&R Channel, A-weighted	-	75	-	μVrms
Total Harmonic Distortion (THD + N)	1kHz, 4Ω, Power out= 2X1W, L&R Channel, A-weighted	-	0.2	-	%
Channel Separation	1kHz, 4Ω, Test signal = 0 dBFS, ASIO drive, L&R Channel	-	72	-	dB
Signal-to-Noise Ratio (SNR)	1kHz, 4Ω, Test signal = 0 dBFS, ASIO drive, L&R Channel, A-weighted	-	90	-	dB
Frequency Response	1kHz, 4Ω, Test signal = 0 dBFS, 20Hz - 20kHz, L&R Channel	-	± 1	-	dB(Vrms/FS)



Note: KAB0 do provide reverse polarity protection, BUT extreme caution must be exercised to ensure correct polarity during connection. Permanent damage caused by reverse polarity will not be covered under warranty.

## Kiosk Amplifier Board Series



KAB0

**2x3W Class D USB Codec Input Audio Amplifier Board for Kiosks**

**Amplifier IC:**  
NS4168 x 2

**DSP:**  
BP1048B2

**Input:**

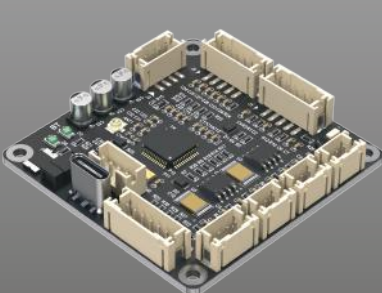
- **Analog** (JST PH 4 Circuits)
- **Digital** (USB Type C & JST PH 4 Circuits)

**Output:**

- **Analog** (JST PH 12 Circuits)
- **I2S** (JST PH 6 Circuits)

**Control:**

- **Multiple Control** (JST PH 12 Circuits)



KAB1

**2x3W 4 Ohm USB Codec Input Class D Audio Amplifier Board**

**Amplifier IC:**  
NS4168

**DSP:**  
NCP120D

**Input:**

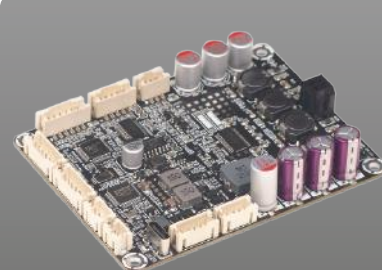
- **Analog** (JST PH 4 Circuits)
- **Digital** (USB Type C & JST PH 4 Circuits)

**Output:**

- **Analog** (JST PH 6 Circuits)
- **I2S** (JST PH 6 Circuits)

**Control:**

- **None**



KAB2

**2x8W Peak Class D USB Codec MIC & I2S Input Audio Amplifier Board**

**Amplifier IC:**  
AD82110

**DSP:**  
NCP120D + DU562 ADAU1701

**Input:**

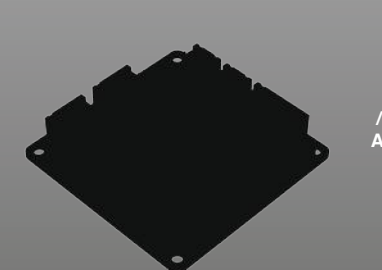
- **Analog** (JST PH 4 Circuits)
- **Digital** (USB Type C & JST PH 4 Circuits)

**Output:**

- **2x8W@5V**
- **2x15W@12V**

**Control:**

- **Shutdown** (JST PH 6 Circuits)



KAB3

**2x20W USB/Optical /Bluetooth/Line Input Audio Amplifier Board**

**Amplifier IC:**  
TPA3118

**DSP:**  
BP1048B2

**Input:**


- **Analog** (JST PH 4 Circuits)
- **Digital** (USB Type C & JST PH 4 Circuits)

**Output:**

- **2x20W @8Ohm, 24V**

**Control:**

- **None**

 Note: Kindly be aware that this display features only selected product series and does not include our entire collection. For more information or any inquiry, please contact us through email [info@sure-electronic.com](mailto:info@sure-electronic.com)

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 (Please use phone calls or email instead of WhatsApp or iMessage.)



## Warranty Terms and Product Usage Restrictions

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 through 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. The rated operating temperature range is -20°C to 65°C.

## Origin and Design Location

All WONDOM products are designed, manufactured, and assembled in Malaysia. They may be shipped from either Malaysia or China. The country of origin for these product is Malaysia.