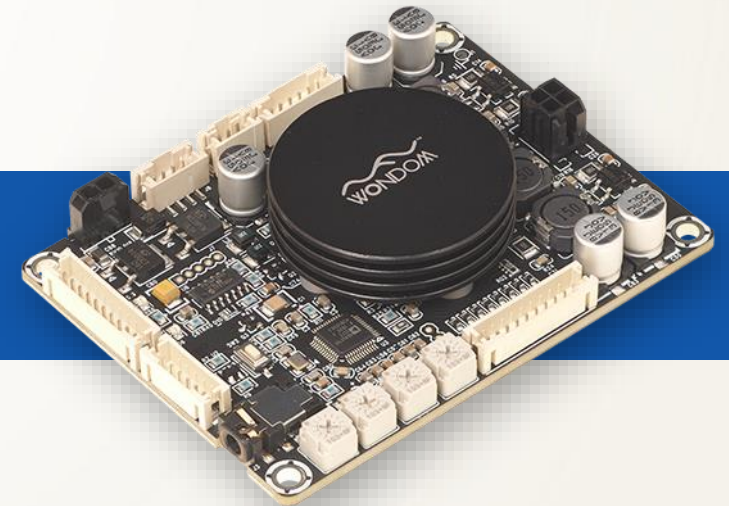
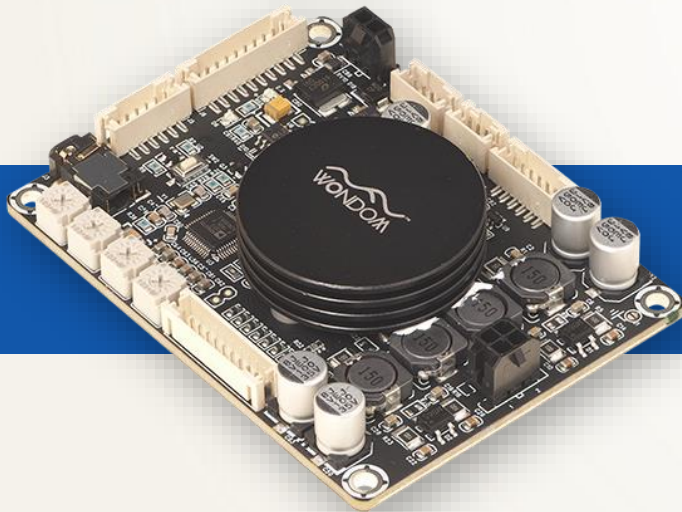
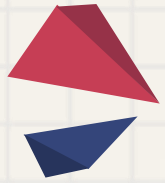


How to achieve I2S input & Output with WONDOM JAB3





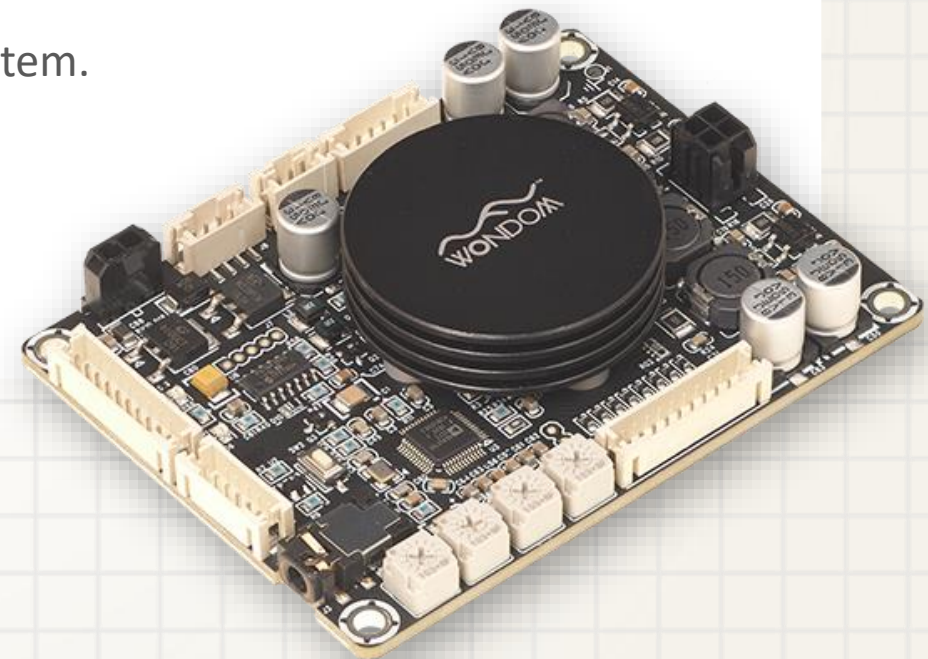
What is JAB3?

JAB3 are audio amplifier boards integrated with ADAU1701 DSP, covering four models as stereo 50W, stereo 30W, mono 100W and mono 60W. Four potentiometers are pre-mounted on JAB3 for easy control of the audio system, through which, customers can adjust volume, high-pass filter and gain. Please refer to the datasheet for detailed information.

In addition, with connection with stereo or mono JAB2, customers can get audio 4.0/2.1 system integrated with both DSP and Bluetooth.

It is recommended to use **MONO JAB3 as 0.1** when building audio 2.1 system.

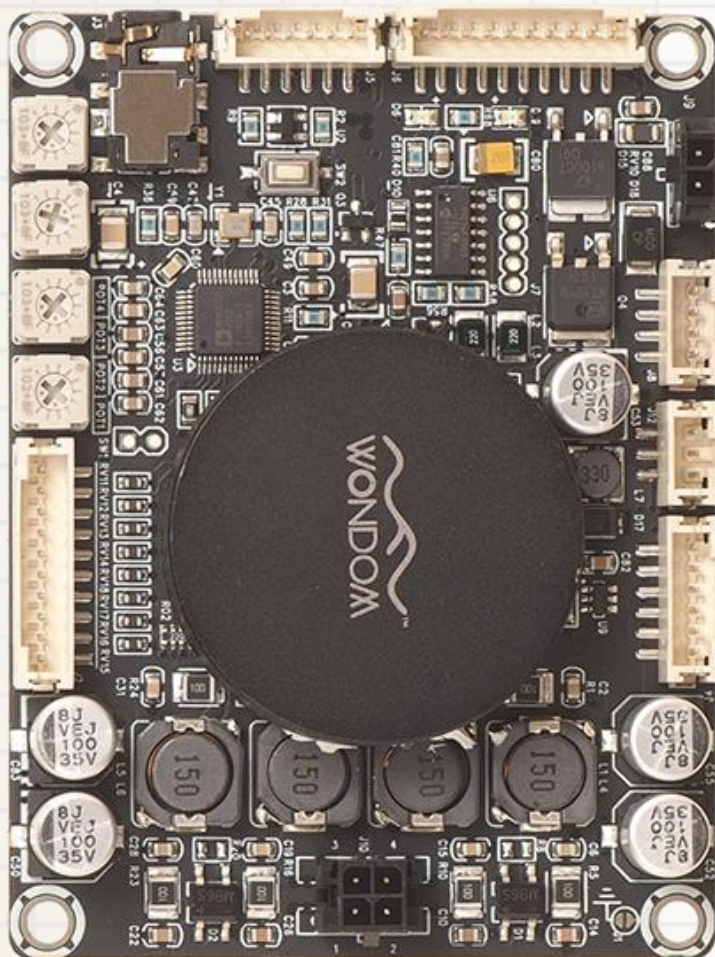
This document mainly describes how to achieve I2S input and I2S output with WONDOM JAB3, together with the required program configuration on SigmaStudio.





I2S Input Steps

Brief Introduction



Step 1: Connect JAB3 with AA-AB41161

Connection between JAB3 and AA-AB41161 - CS5343
Analog to I2S Decode Board



Step 2: MCLK Setting

MCLK required
No MCLK required



Step 3: Program Configuration

MCLK required
No MCLK required



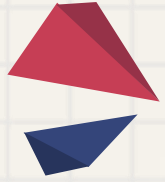
Step 4: JAB3 Configuration

Turn off signal level sensor system employed in JAB3



Step 5: Power supply

Power Adapter
Battery board

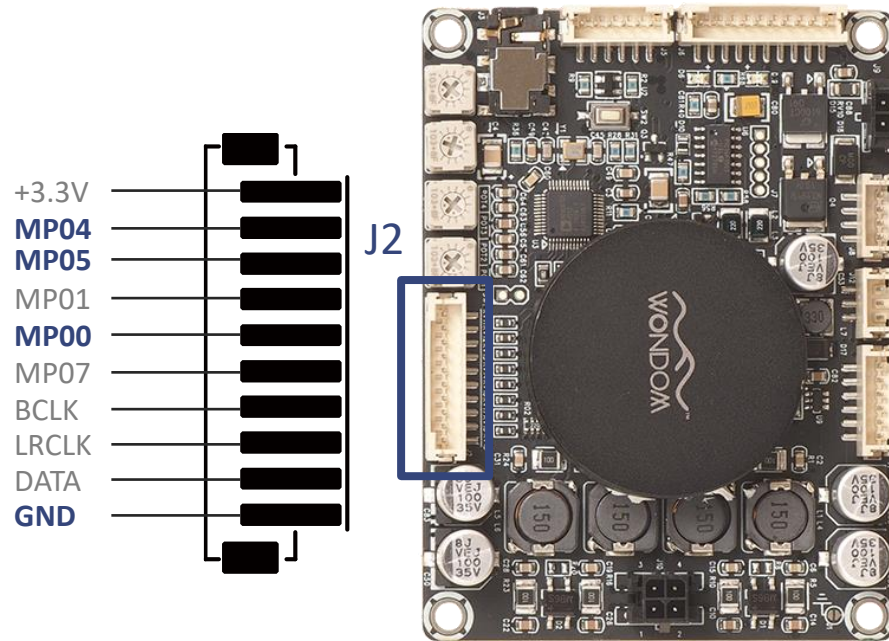


Connect JAB3 & AA-AB41161

I2S input connection

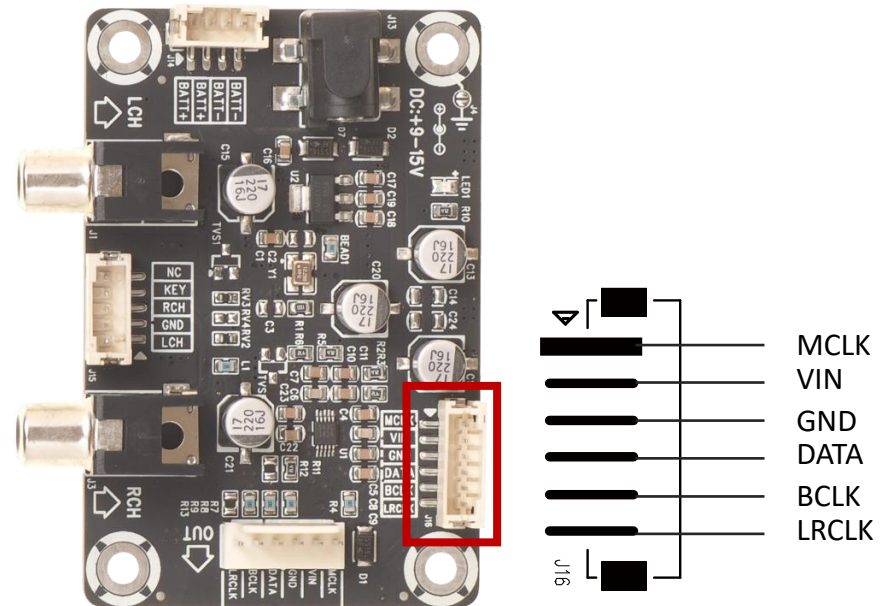
I2S input position on JAB3

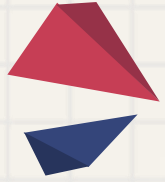
Position 2 (MP04), 3(MP05), 5(MP00) and 10(GND) of J2 on JAB3 are used for I2S input.



CS5343 Analog to I2S Decode Board - AA-AB41161

AA-AB41161 is a decode board to convert analog signal to I2S signal. J16 and OUT are used for I2S output.

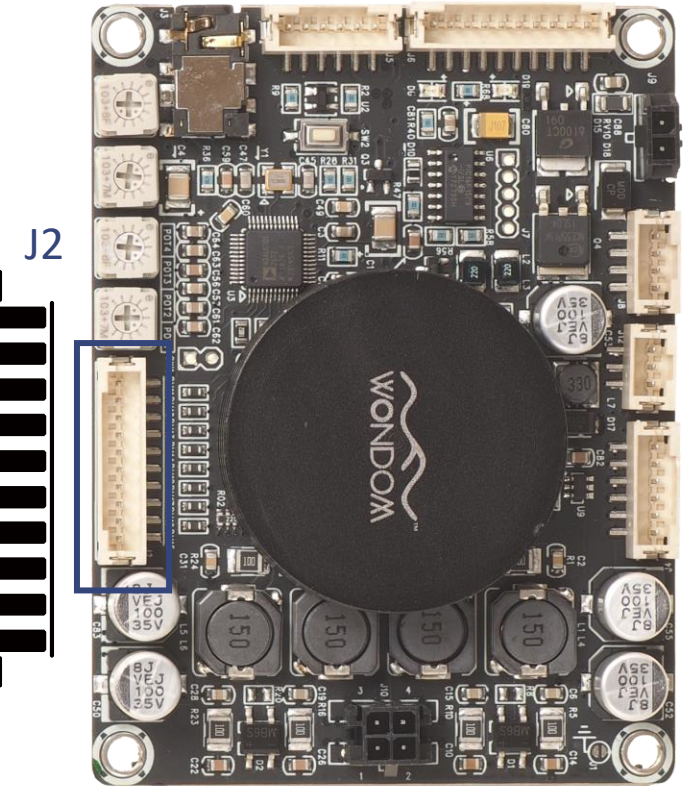
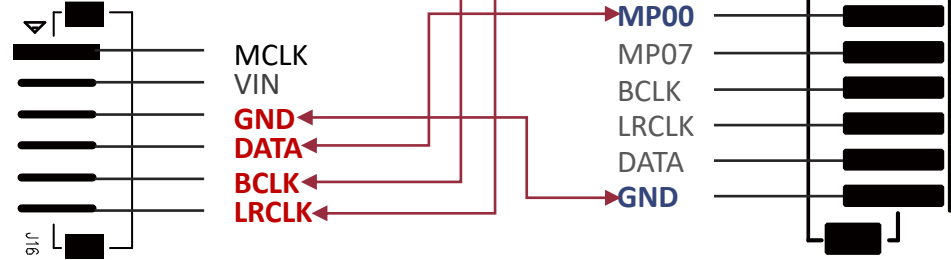
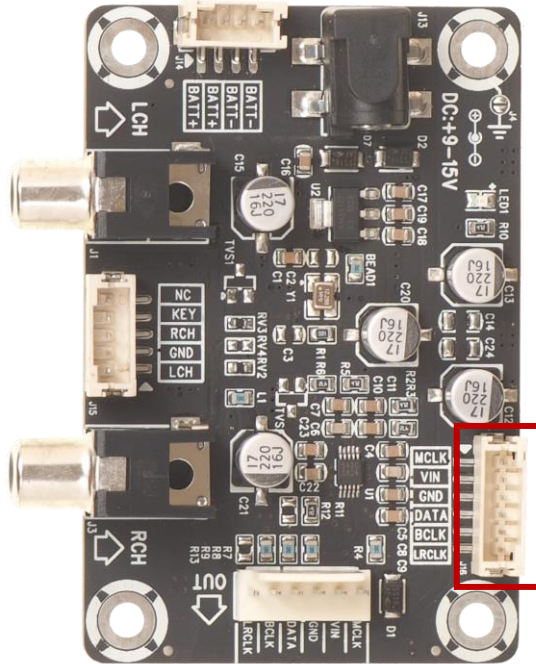




Connect JAB3 & AA-AB41161

I2S input connection

Pin-to-Pin Connection

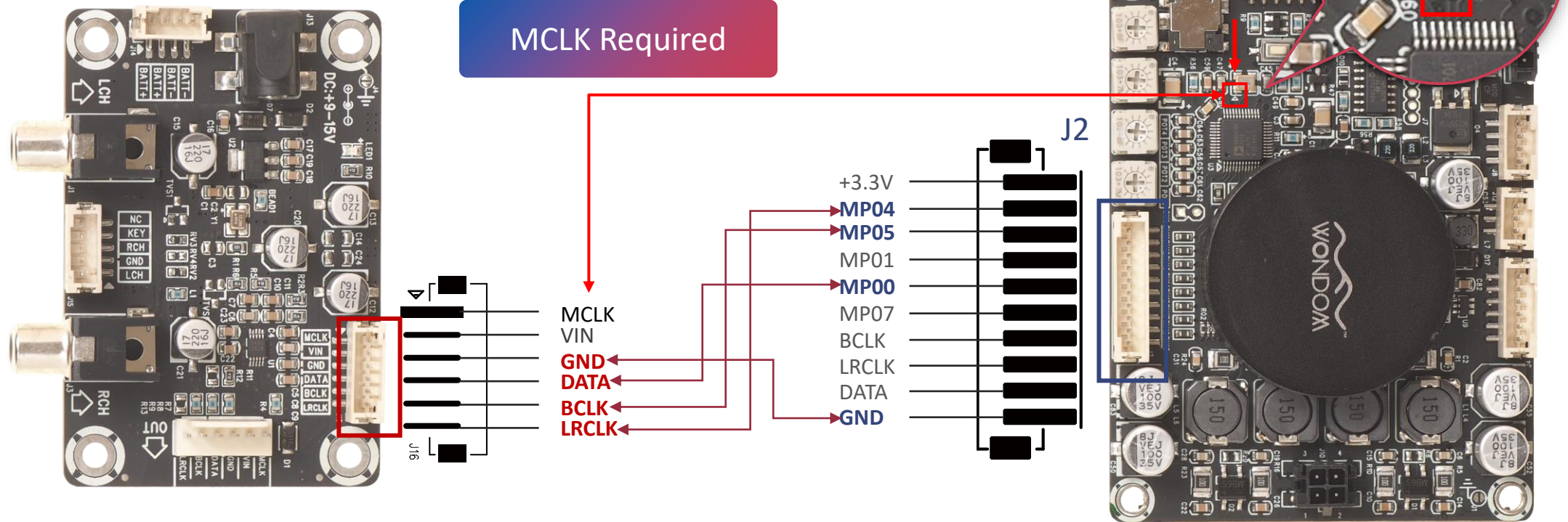




MCLK Setting

MCLK required / No MCLK required

If your audio source or ADC has MCLK output, please connect your 'MCLK' to pin1 of Y1 on JAB3 (the position in red box) and set the device as Master Mode, set JAB3 as Slave Mode.





Program Configuration

VIDEO TUTORIAL >>

MCLK required

Analogue Devices - SigmaStudio - [*Design 1]

File Edit View Tools Format Action Window Help

48 kHz

TreeToolBox

- Processors (ICs / DSPs)
- AD1940
- AD1941
- ADAV4x
- AD193x
- AD195x
- E2Prom
- ADAU1701
- ADAU1702
- ADAU1401
- ADAU144x
- ADAV4x
- ADAV46xx
- ADAU176x
- ADAU1461
- ADAU1361
- ADAU1961
- ADAU1781
- ADAU1373
- SSM2518
- ADAU1772
- ADAU1966
- ADAU1451
- ADAU1452
- ADAU1450
- SSM3525
- ADAU1372
- ADAU1462
- ADAU1463
- ADAU1466
- ADAU1467
- ADAU1777
- SSM2529

Hardware Configuration

Serial Input

SDATA_IN0

SDATA_IN1

SDATA_IN2

SDATA_IN3

LRCLK polarity

BCLK data change

DSP Core

Program Length

1x (1024 Instructions)

RAM Module

8

Zero In/Out Registers

Serial Output 1 (channels 0-7)

Master Mode

LRCLK polarity

Frame Sync Type

LRCLK

Frame Sync Freq

internal clock/1

MSB Position

delay by 1

Word length

24 bits

BCLK Frequency

internal clock/1

SDATA_OUT1

SDATA_OUT2

SDATA_OUT3

SDATA_OUT0

TDM Enable

GPIO

Forced By SPI

Debounce 20ms

Pin	Value	Direction	Inv
MP0	Low	Input Sdata_in0	
MP1	Low	Input GPIO Debounce	
MP2	Low	Input GPIO Debounce	
MP3	Low	Input GPIO Debounce	
MP4	Low	Input Lrclk_in	
MP5	Low	Input Bclk_in	
MP6	Low	Input GPIO Debounce	
MP7	Low	Input GPIO Debounce	
MP8	Low	Input GPIO Debounce	
MP9	Low	Input GPIO Debounce	
MP10	Low	Input GPIO Debounce	
MP11	Low	Input GPIO Debounce	

Ctrl_IN0

Control ADC

Ctrl_IN1

Enable

Forced By SPI

Interface Register

Force By SPI

Register	Address	Value
Core	2076	b 0000000011100
GpioAll	2056	b 0000000000000
RAM	2077	b 1000
SerialOut1	2078	b 000000000000000
SerialInput	2079	b 000000
MpCfg0	2080	b 01000100000000000000000000000000
MpCfg1	2081	b 00000000000000000000000000000000
AnalogPower	2082	b 000000000000
Reg3	x 00000000	
AnalogInterfa	2084	b 10000000000000000000000000000000
AnalogInterfa	2085	b 00000000000000000000000000000000

IC 1 - 170x140x Register Control

IC 2 - WinE2PromLoader

Output

Action Output

Action

Capture

Mode	Time	Cell Name	Parameter Name	Address	Value	Data	Bytes
Block Write	16:1:29 - 458ms	IC 1.MpCfg0	0x0820	0x00, 0x00, 0x04	3		

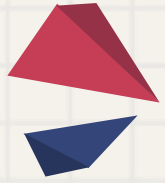
Output

IC 1: Params

IC 2: Params

100%

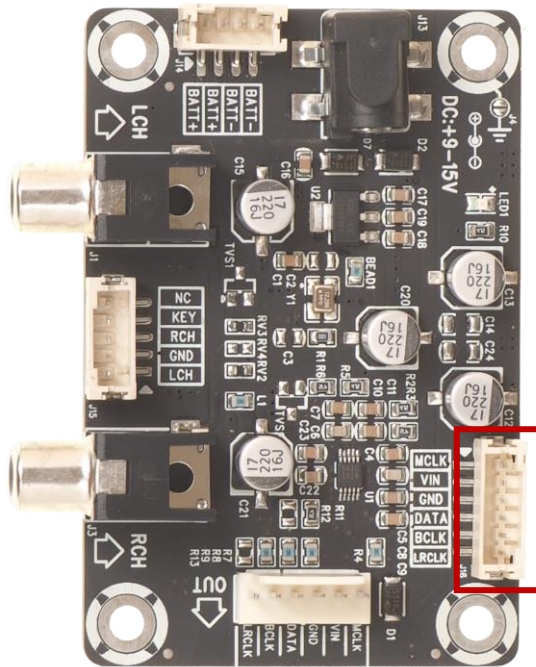
Compiled, Comms Fa...



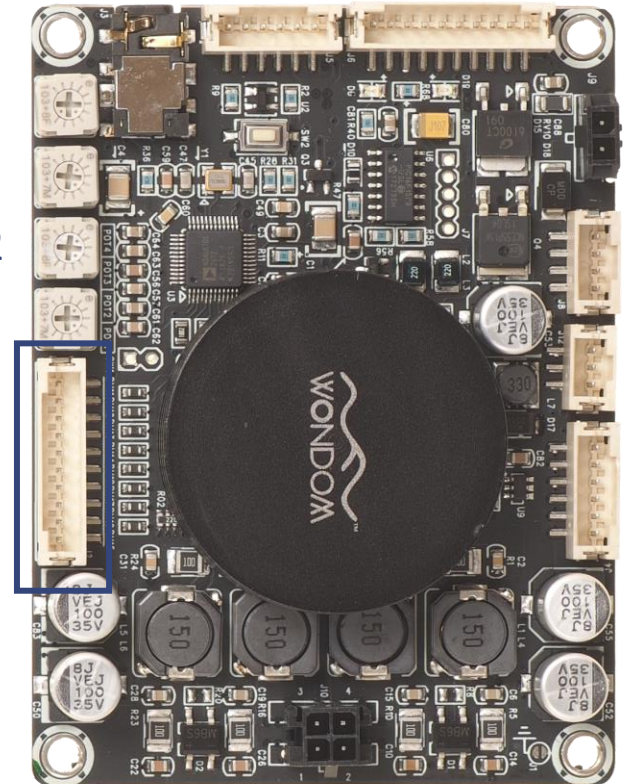
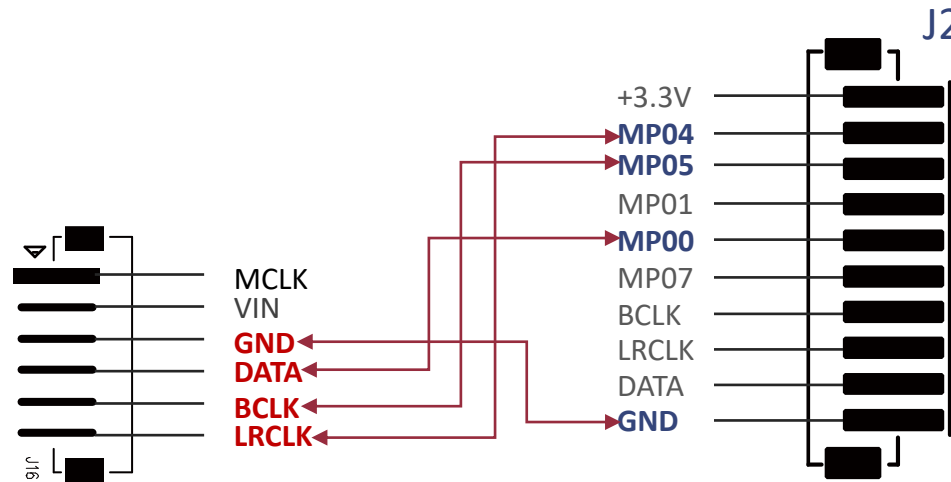
MCLK Setting

MCLK required / No MCLK required

If your audio source or ADC has no MCLK output, keep the following connection and move on to next step directly. Set JAB3 as Master Mode and your device as Slave Mode.



No MCLK Required





Program Configuration

VIDEO TUTORIAL >>

No MCLK required

Analogue Devices - SigmaStudio - [*Design 1]

File Edit View Tools Format Action Window Help

48 kHz

TreeToolBox

- Processors (ICs / DSPs)
 - AD1940
 - AD1941
 - ADAV4x
 - AD193x
 - AD195x
 - E2Prom
 - ADAU1701
 - ADAU1702
 - ADAU1401
 - ADAU144x
 - ADAV4x
 - ADAV46xx
 - ADAU176x
 - ADAU1461
 - ADAU1361
 - ADAU1961
 - ADAU1781
 - ADAU1373
 - SSM2518
 - ADAU1772
 - ADAU1966
 - ADAU1451
 - ADAU1452
 - ADAU1450
 - SSM3525
 - ADAU1372
 - ADAU1462
 - ADAU1463
 - ADAU1466
 - ADAU1477
 - SSM2529

Hardware Configuration

Serial Input

SDATA_IN0

SDATA_IN1

SDATA_IN2

SDATA_IN3

LRCLK polarity

BCLK data change

DSP Core

Program Length: 1x (1024 Instructions)

RAM Module: 8

Zero In/Out Registers

Serial Output 1 (channels 0-7)

Master Mode

LRCLK polarity

Frame Sync Type: LRCLK

Frame Sync Freq: internal clock/1

MSB Position: delay by 1

Word length: 24 bits

BCLK Frequency: internal clock/1

SDATA_OUT1

SDATA_OUT2

SDATA_OUT3

SDATA_OUT0

TDM Enable

GPIO

Forced By SPI

Debounce: 20ms

Pin	Value	Direction	Inv
MP0	Low	Input Sdata_in0	
MP1	Low	Input GPIO Debounce	
MP2	Low	Input GPIO Debounce	
MP3	Low	Input GPIO Debounce	
MP4	Low	Input Lrclk_in	
MP5	Low	Input Bclk_in	
MP6	Low	Input GPIO Debounce	
MP7	Low	Input GPIO Debounce	
MP8	Low	Input GPIO Debounce	
MP9	Low	Input GPIO Debounce	
MP10	Low	In Lrclk_out	
MP11	Low	In Bclk_out	

Ctrl_IN0

Control ADC

Ctrl_IN1

Enable

Forced By SPI

IC 1 - 170x140x Register Control

IC 2 - WinE2PromLoader

Interface Register

Force By SPI

Register	Address	Value
Core	2076	b 0000000011100
GpioAll	2056	b 000000000000
RAM	2077	b 1000
SerialOut1	2078	b 00100000000000
SerialInput	2079	b 000000
MpCfg0	2080	b 0100010000000000000000100
MpCfg1	2081	b 0100010000000000000000000
AnalogPower	2082	b 000000000000
AnalogInterfa	2084	b 100000000000000000
AnalogInterfa	2085	b 0000000000000000

Output

Action Output

Action

Capture

Mode	Time	Cell Name	Parameter Name	Address	Value	Data	Bytes
Block Write	16:1:29 - 458ms	IC 1.MpCfg0	0x0820	0x00, 0x00, 0x04	3		

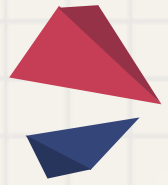
Output

IC 1: Params

IC 2: Params

100%

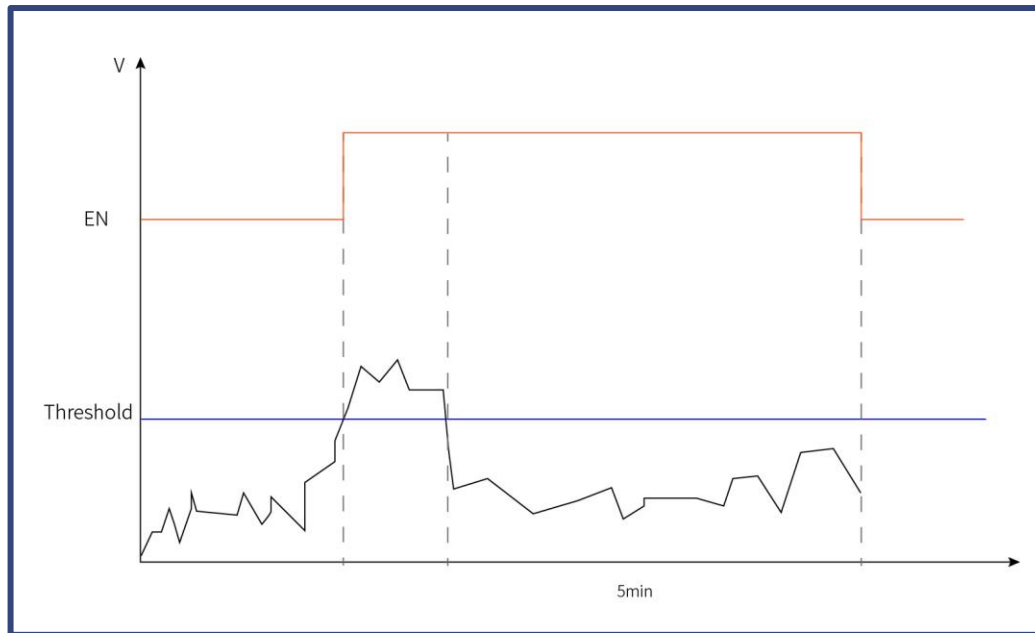
Compiled, Comms Fa...



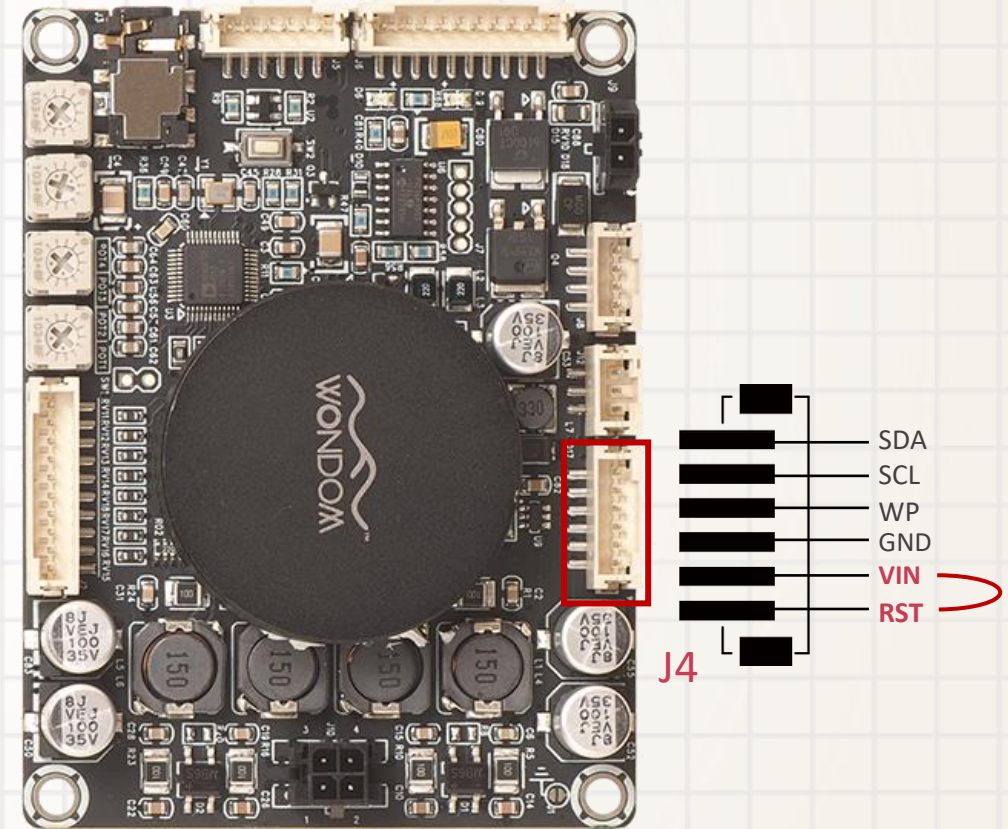
JAB3 Configuration

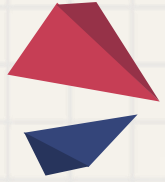
Turn off Signal Level Sensor System

Signal level sensor system is employed in JAB3 for lower power consumption.



Short circuit “VIN” and “RST” position of J4 on JAB3 to turn off signal level sensor system.



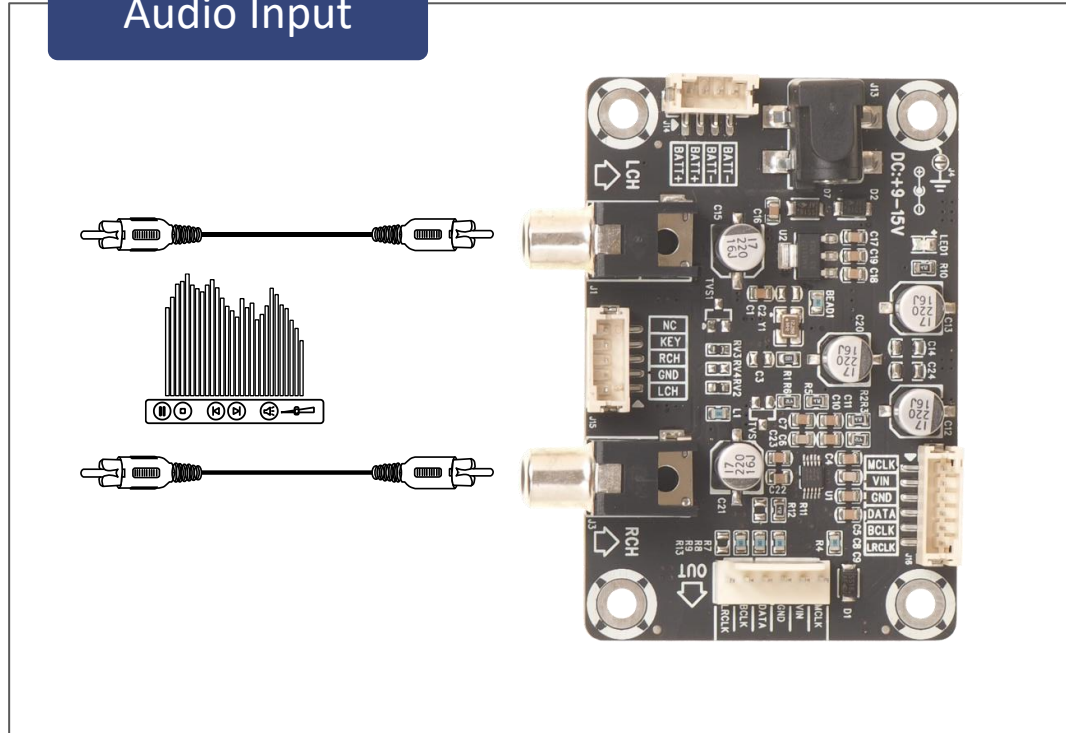


Audio Connection

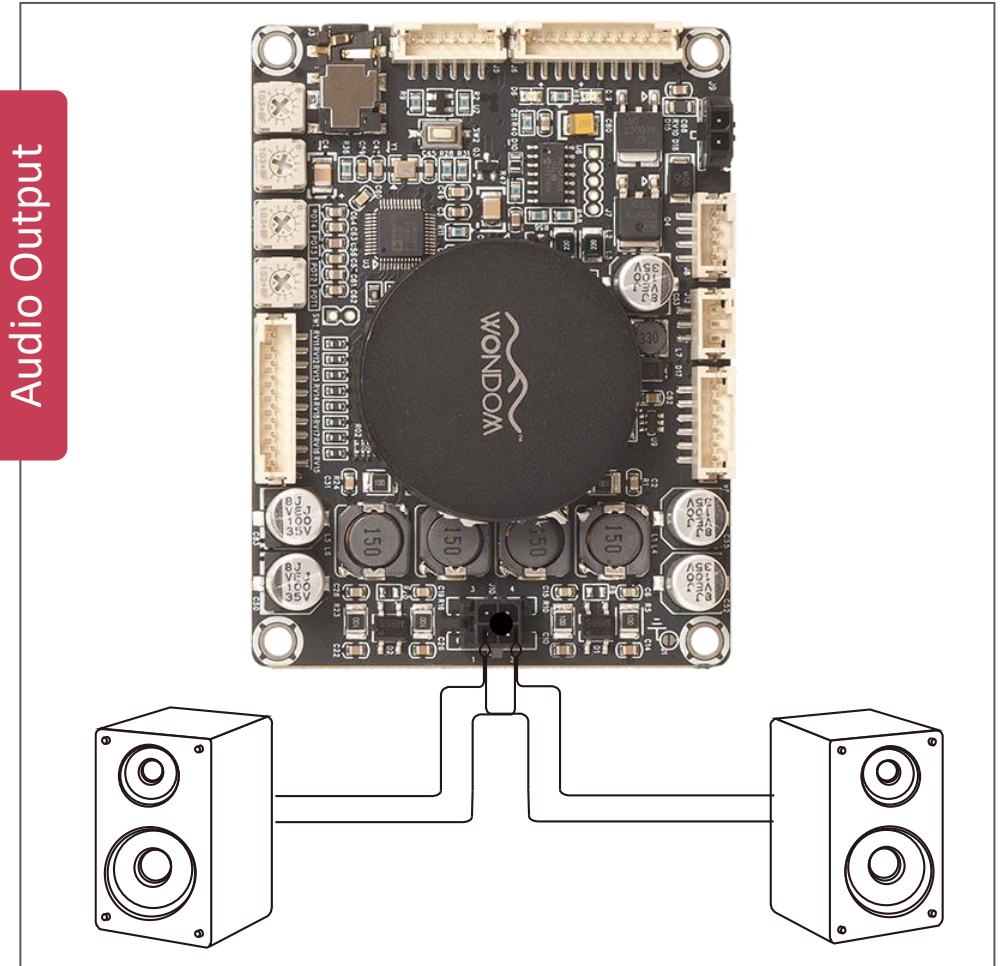
Audio input & output

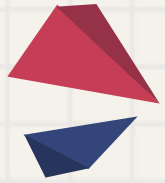
Input audio to AA-AB41161 through line input.
Output audio through the speaker interface on JAB3.

Audio Input



Audio Output



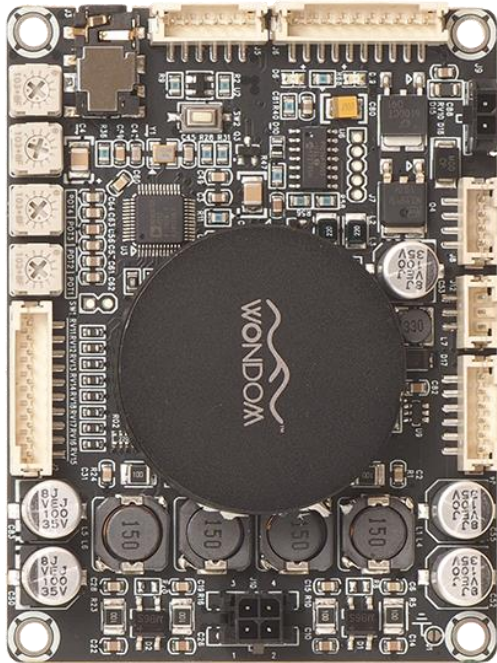


Power Supply

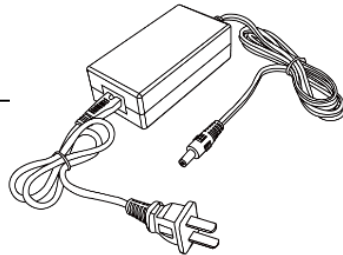
Power Supply

JAB3

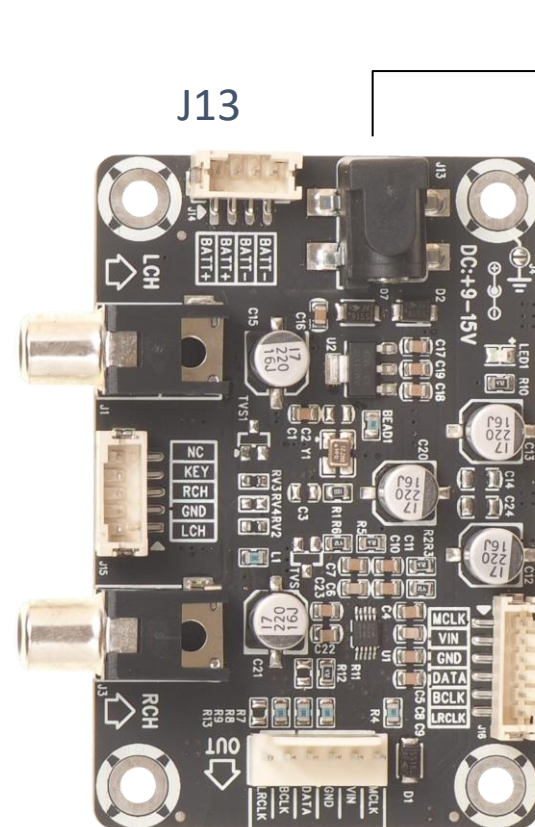
JAB3 supports DC 12-26V power supply.



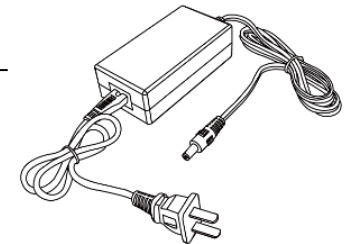
J9



AA-AB41161



J13



AA-AB41161 supports
DC 9-15V power supply.

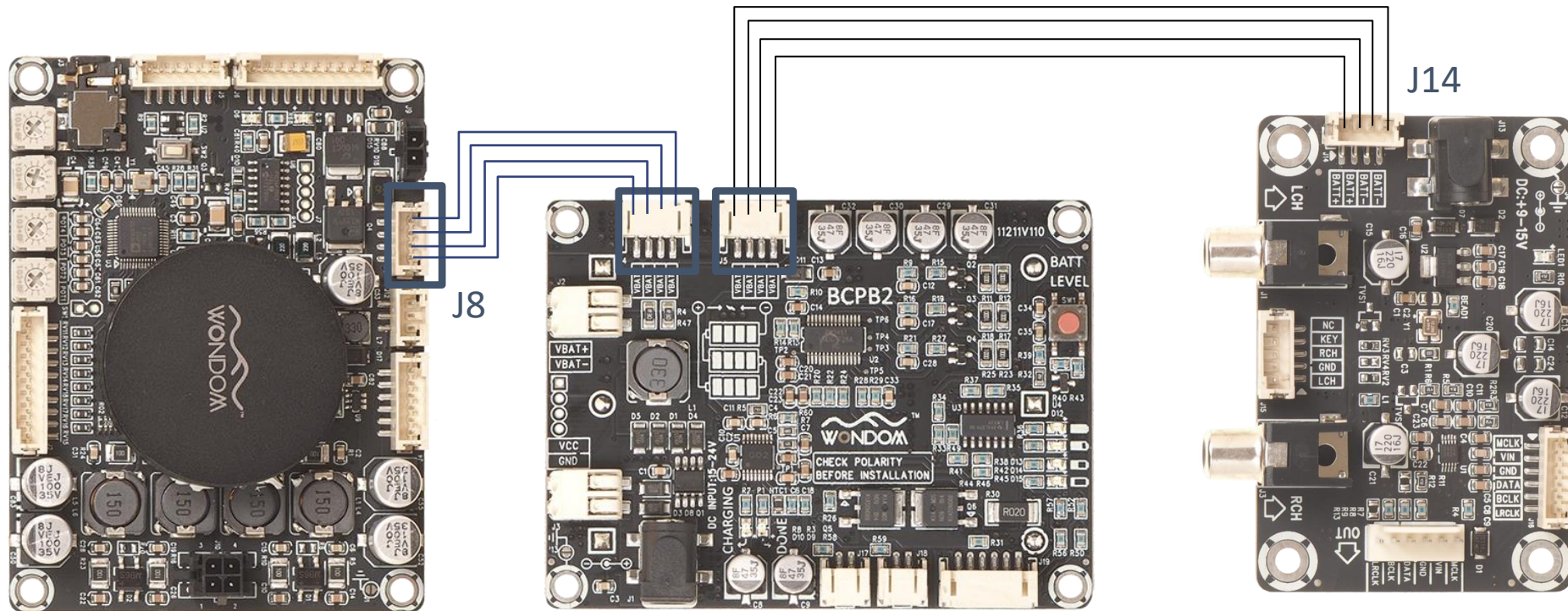


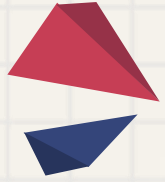
Power Supply

Battery Board

Both JAB3 and AA-AB41161 support battery power.

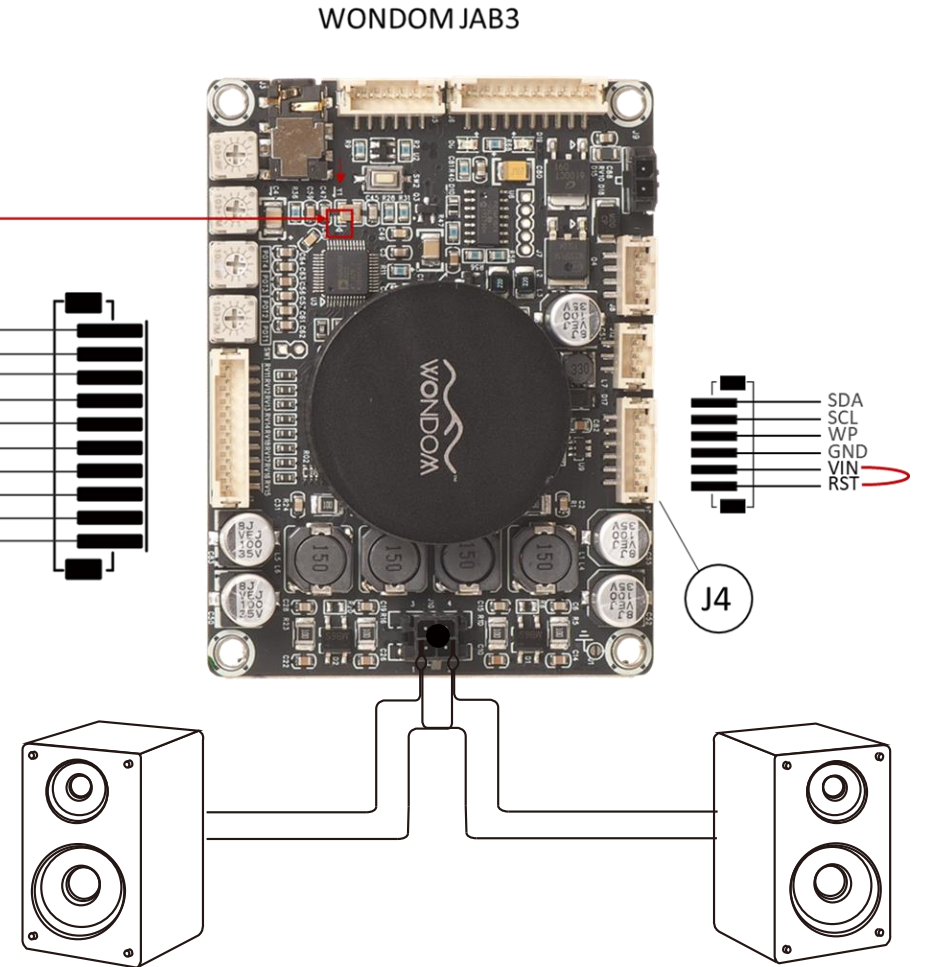
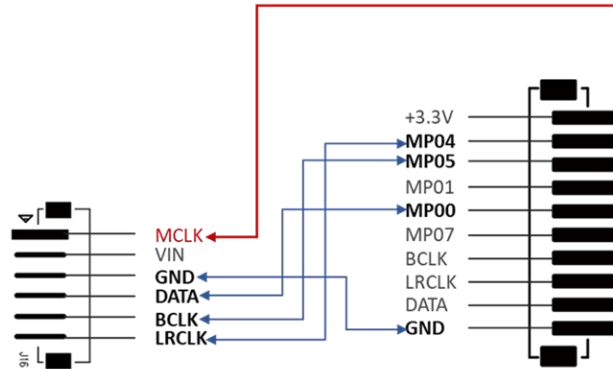
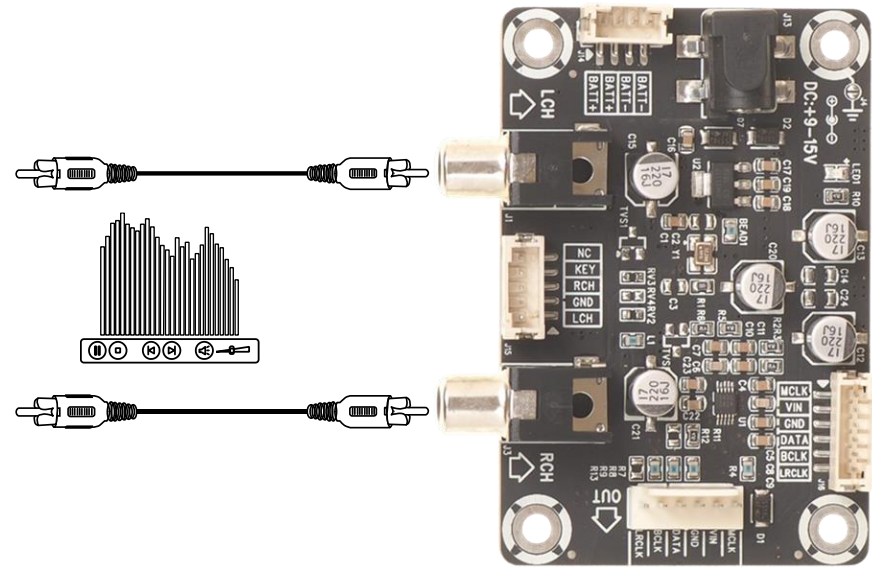
With multiple discharging ports, BCPB3 can power JAB3 and AA-AB41161 at the same time.





Connection Diagram

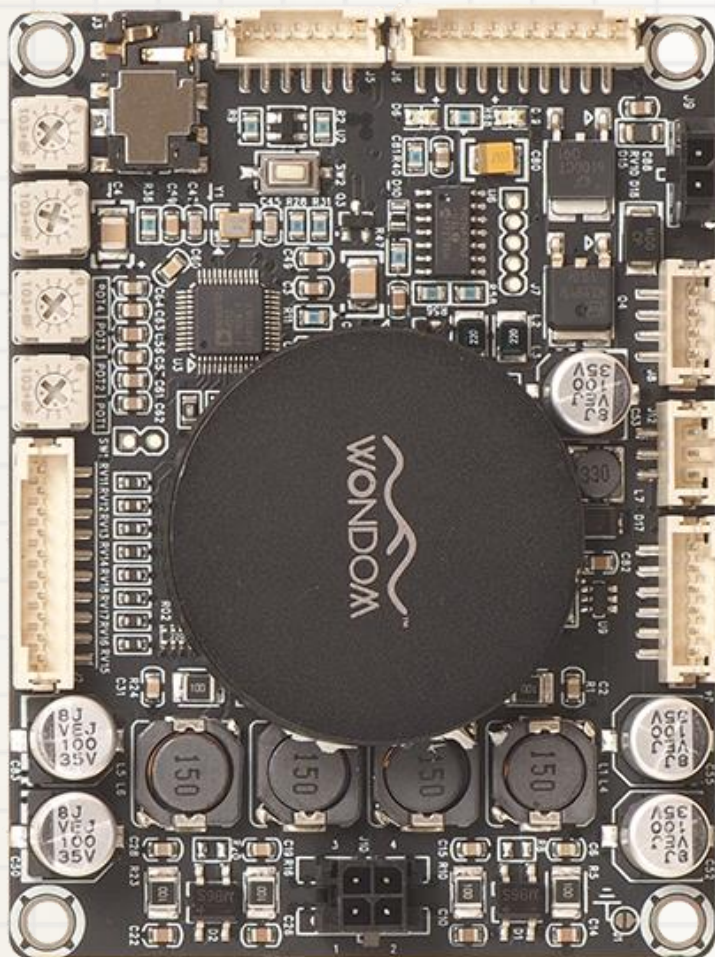
JAB3 & AA-AB41161





I2S Output Steps

Brief Introduction



Step 1: Connect JAB3 with AA-AB32256

We will use AA-AB32256 – 2 X 30 Watt Digital Input Class D Audio Amplifier Board & DAC - TAS5754



Step 2: Program Configuration

Program configuration with SigmaStudio for I2S output



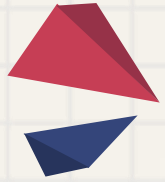
Step 3: Audio Connection

Audio input & audio output



Step 4: Power Supply

Power Adapter
Battery board

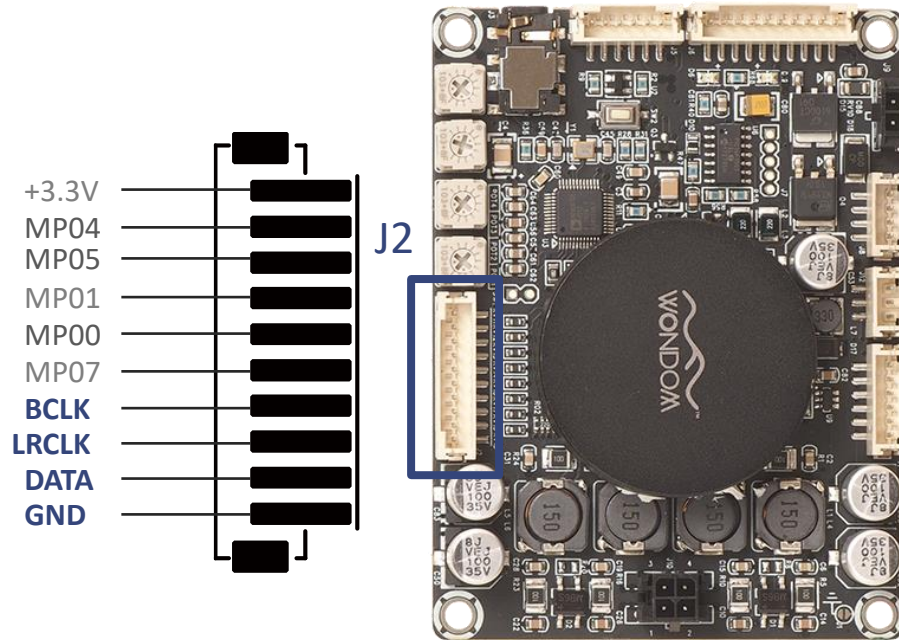


Connect JAB3 & AA-AB32256

I2S output connection

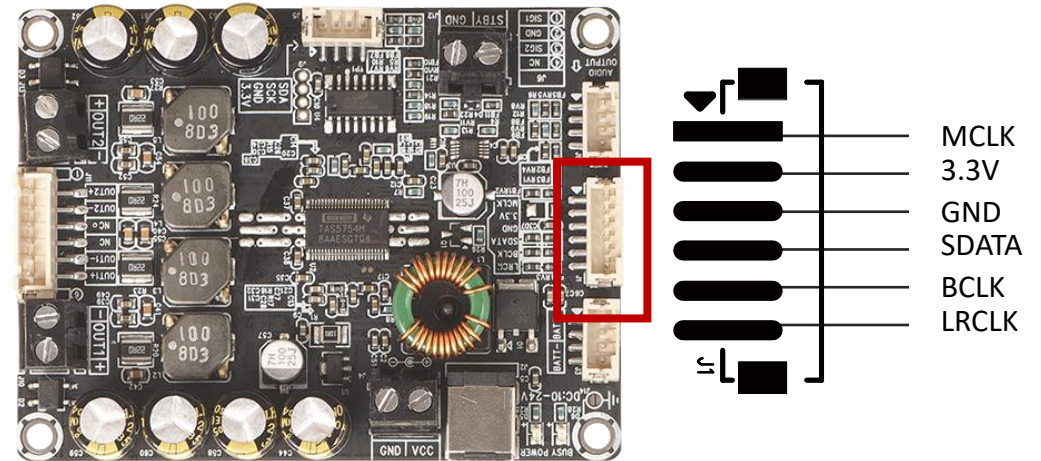
I2S output position on JAB3

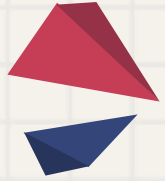
Position 7 (BCLK), 8(LRCLK), 9(DATA) and 10(GND) of J2 on JAB3 are used for I2S output.



AA-AB32256

AA-AB32256 supports **no MCLK** required **3-wire I2S** input.
J1 is I2S input port.

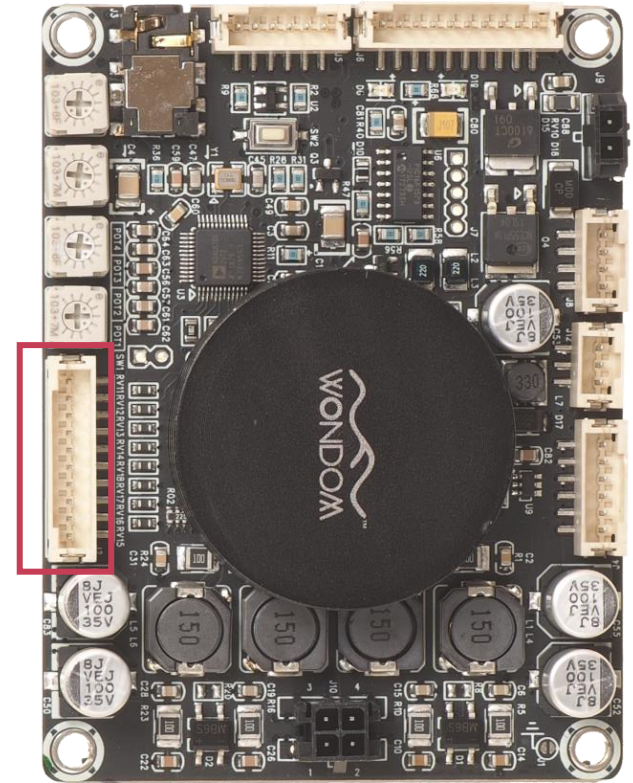
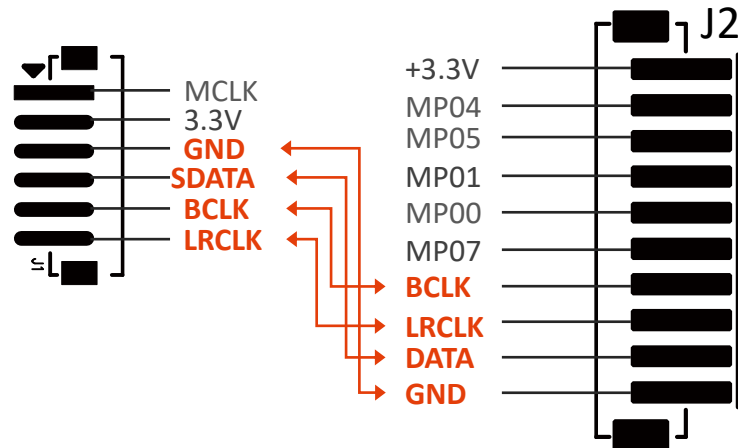
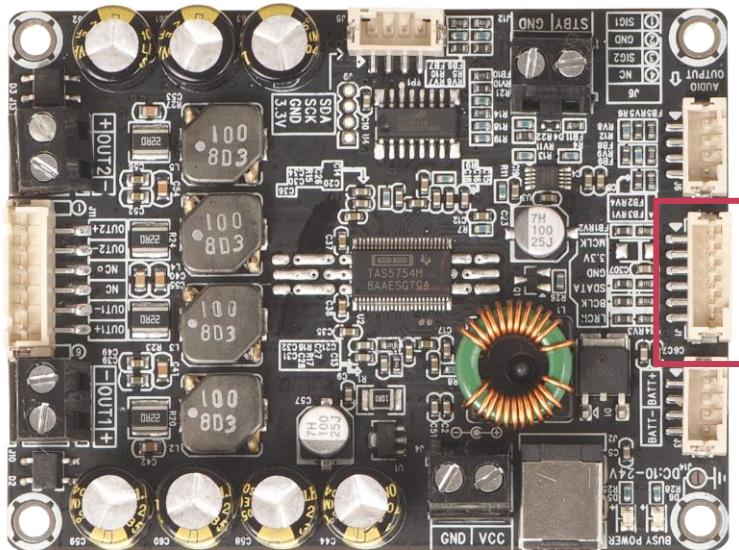




Connect JAB3 & AA-AB32256

I2S input connection

Pin-to-Pin Connection





Program Configuration

[VIDEO TUTORIAL >>](#)

I2S Output

Analogue Devices - SigmaStudio - [*Design 1]

File Edit View Tools Format Action Window Help

48 kHz

TreeToolBox

- Processors (ICs / DSPs)
- AD1940
- AD1941
- ADAV4x
- AD193x
- AD195x
- E2Prom
- ADAU1701
- ADAU1702
- ADAU1401
- ADAU144x
- ADAV4x
- ADAV46xx
- ADAU176x
- ADAU1461
- ADAU1361
- ADAU1961
- ADAU1781
- ADAU1373
- SSM2518
- ADAU1772
- ADAU1966
- ADAU1451
- ADAU1452
- ADAU1450
- SSM3525
- ADAU1372
- ADAU1462
- ADAU1463
- ADAU1466
- ADAU1467
- ADAU1777
- SSM2529

Hardware Configuration | Schematic

Serial Input

SDATA_IN0

SDATA_IN1

SDATA_IN2

SDATA_IN3

LRCLK polarity

BCLK data change

DSP Core

Program Length: 1x (1024 Instructions)

RAM Module: 8

Zero In/Out Registers

GPIO

Forced By SPI

Debounce: 20ms

Pin	Value	Direction	Inv
MP0	Low	Input GPIO Debounce	
MP1	Low	Input GPIO Debounce	
MP2	Low	Input GPIO Debounce	
MP3	Low	Input GPIO Debounce	
MP4	Low	Input GPIO Debounce	
MP5	Low	Input GPIO Debounce	
MP6	Low	Input GPIO Debounce	
MP7	Low	Output Sdata_out1	
MP8	Low	Input GPIO Debounce	
MP9	Low	Input GPIO Debounce	
MP10	Low	In Lrclk_out	
MP11	Low	In Bclk_out	

Ctrl_IN0

Ctrl_IN1

Control ADC

Enable

Forced by SPI

IC 1 - 170x140x Register Control

IC 2 - WinE2PromLoader

Output 1 (channels 0-7)

Master Mode

LRCLK polarity

Frame Sync Type: LRCLK

Frame Sync Freq: internal clock/1

MSB Position: delay by 1

Word length: 24 bits

BCLK Frequency: internal clock/1

SDATA_OUT1

SDATA_OUT2

SDATA_OUT3

SDATA_OUT0

TDM Enable

Register

Register	Address	Value
Core	2076	b 00000000011100
GpioAll	2056	b 00000000000000
RAM	2077	b 1000
SerialOut1	2078	b 0010000000000000
SerialInput	2079	b 000000
MpCfg0	2080	b 00000000000000000000000000000000
MpCfg1	2081	b 01000100000000000000000000000000
AnalogPower	2082	b 00000000000000
Reg3	x 00000000	
AnalogInterfa	2084	b 10000000000000000000000000000000
AnalogInterfa	2085	b 00000000000000000000000000000000

Output

Action Output

Action

Capture

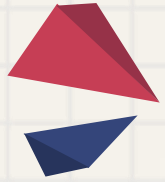
Mode	Time	Cell Name	Parameter Name	Address	Value	Data	Bytes
Block Write	16:1:29 - 458ms	IC 1.MpCfg0	0x0820	0x00, 0x00, 0x04	3		

Output

IC 1: Params

IC 2: Params

100% Compiled, Comms Fa...

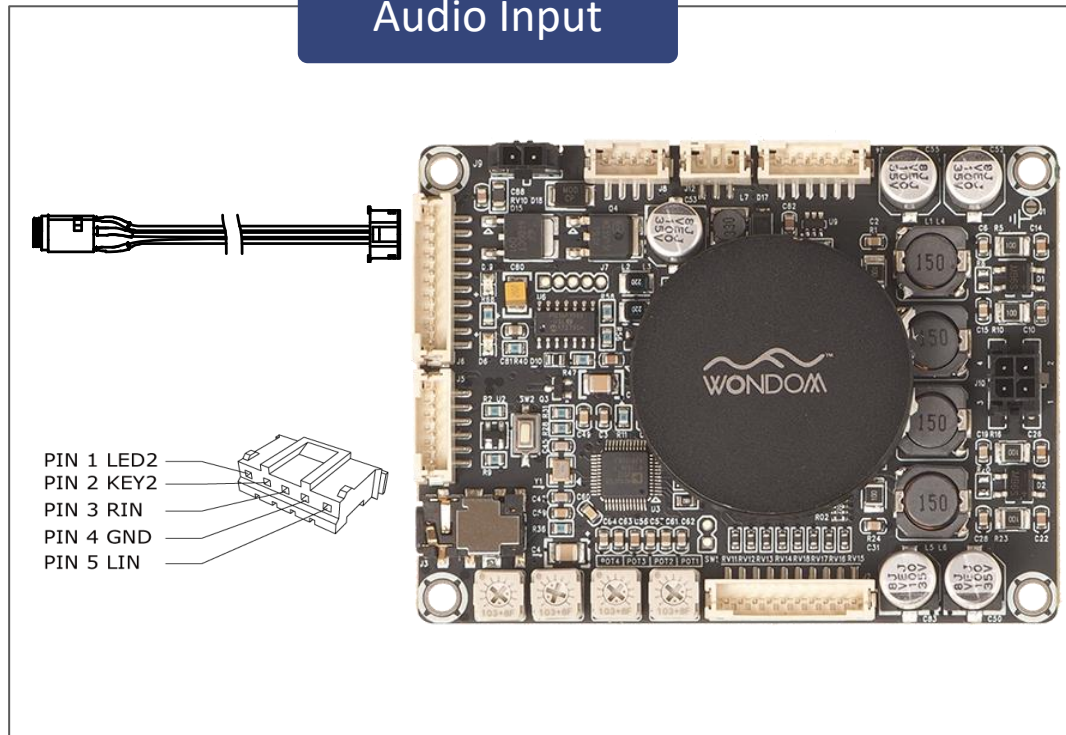


Audio Connection

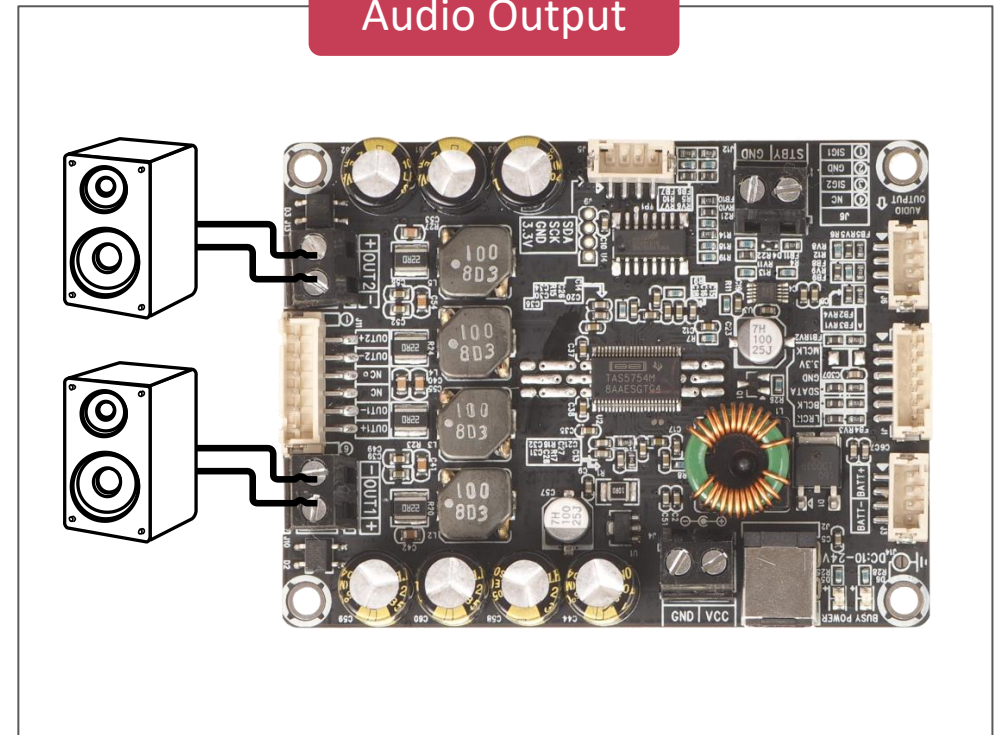
Audio input & output

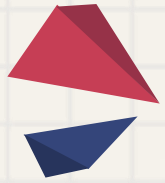
Input audio to JAB3 through 3.5mm AUX IN. Output audio through the speaker interface on AA-AB32256.

Audio Input



Audio Output



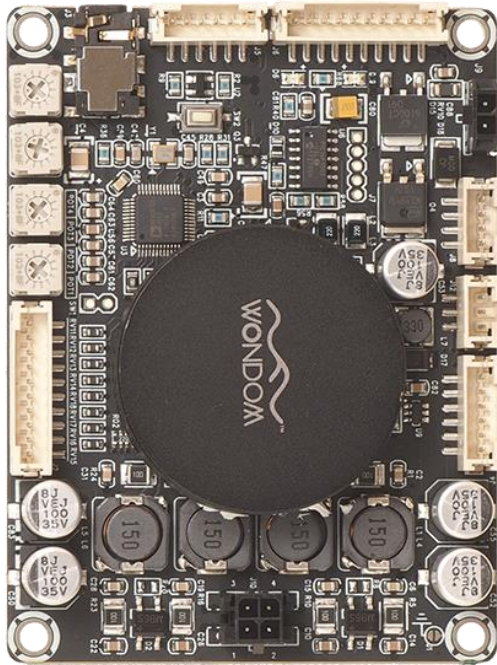


Power Supply

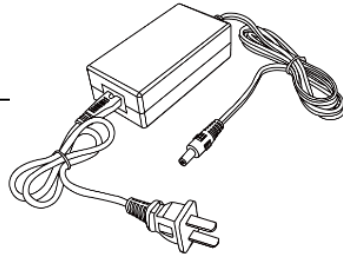
Power Supply

JAB3

JAB3 supports DC 12-26V power supply.

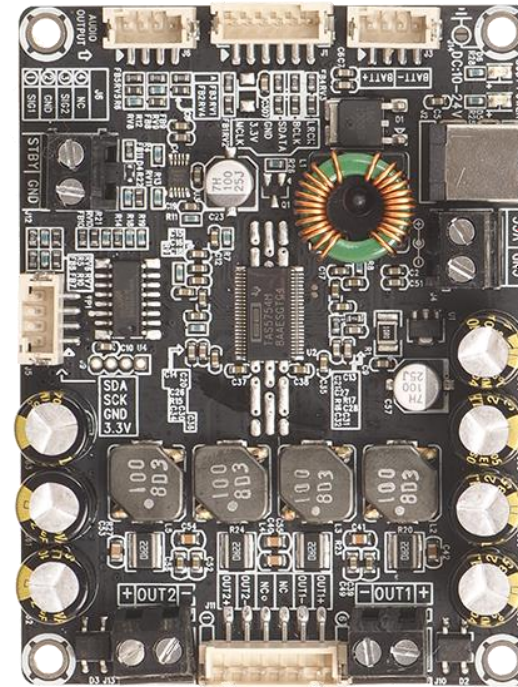


J9

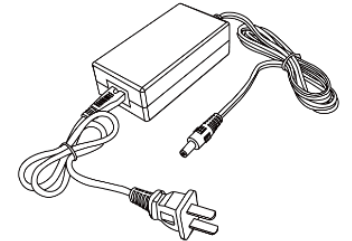


AA-AB32256

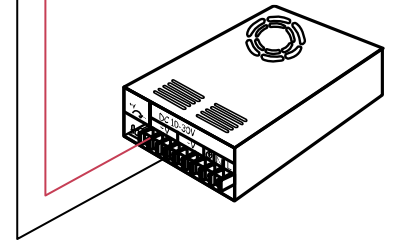
AA-AB32256 supports DC 10-24V power supply.



J2



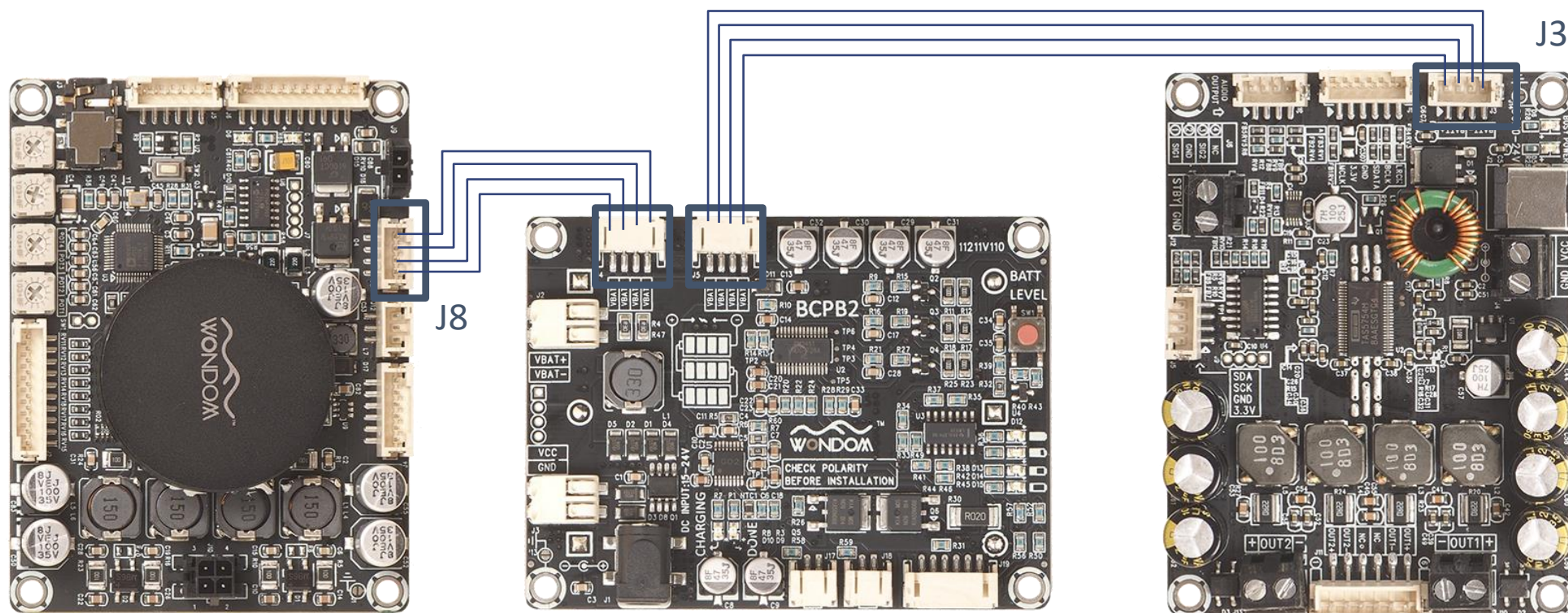
J4

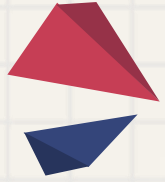


Power Supply

Battery Board

Both JAB3 and AA-AB32256 support battery power.
With multiple discharging ports, BCPB3 can power JAB3 and AA-AB32256 at the same time.

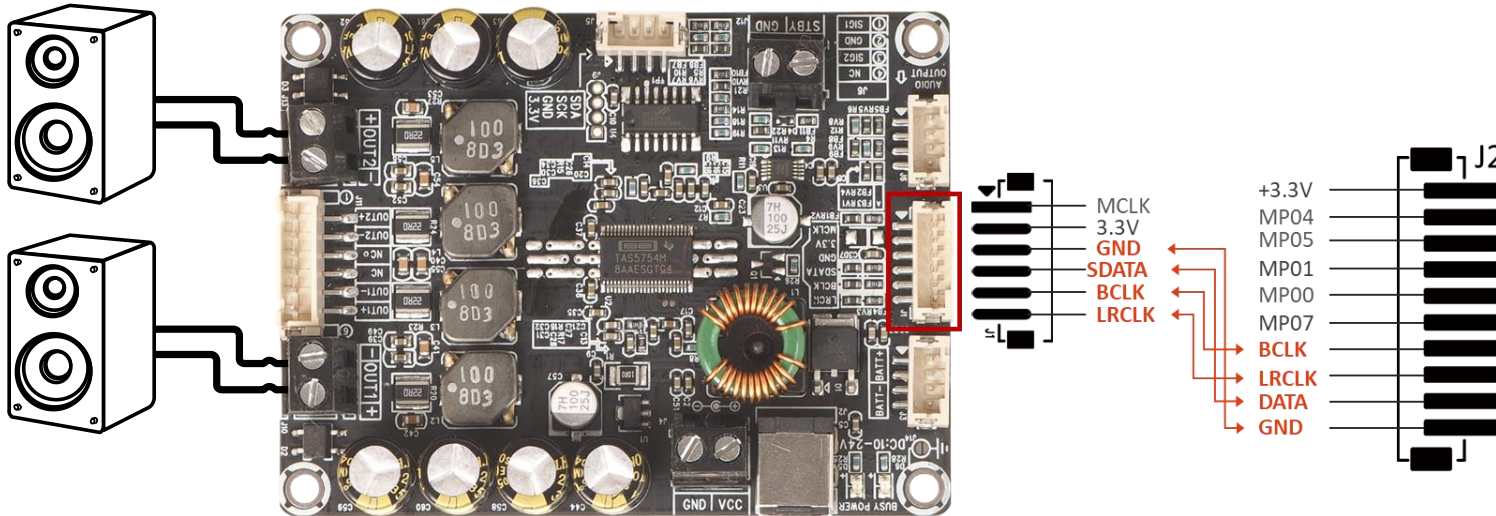




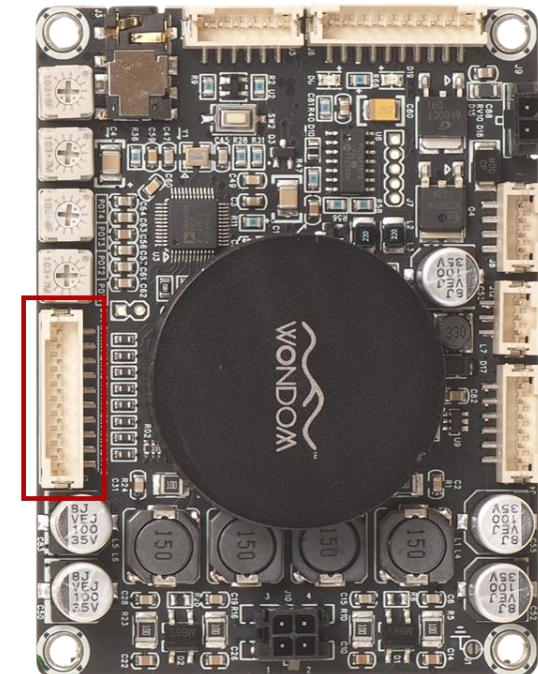
Connection Diagram

JAB3 & AA-AB32256

If your device needs MCLK, connect “MCLK” position on JAB3 with “MCLK” position on your device.



3.5mm AUX IN



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