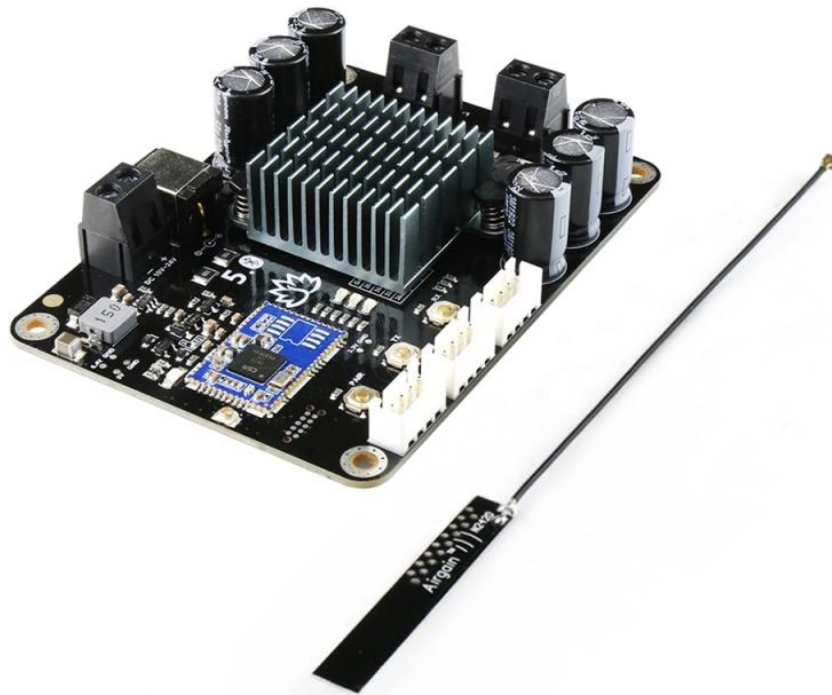




TSA2400

2 x 50W Bluetooth 5.0 Multi-point Audio Amplifier Board

Datasheet





1 Features:

- Wide-range 10V to 24V Supply Voltage Operation
- Size: 95*68*20mm
- Bluetooth programmable
- Multi-point connection
- Bluetooth 5.0
- Up to 100 boards can be linked together.
- Effective transmission distance: 80-15m
- Compatible with all Bluetooth devices that support media audio, including iPhone

2 Applications:

- Wireless and Powered Speakers
- Soundbars
- Car audio
- Subwoofers
- Wireless Surround Sound System
- Bookshelf Stereo Systems
- Professional and Public Address (PA) Speakers

3 Description:

TSA2400 is a 2x50W Stereo Bluetooth 5 multi-point audio amplifier board. It has a perfect class-D architecture (Based on TPA3116D2) and each channel has a maximum 50W power output. Both of channels are capable of outputting nominal power simultaneously and continuously. This board can be powered by any DC10V-24V power supply. it can be used to drive any 4Ω or 8Ω passive speakers.

The highlight point is BT 5 integrated. You can make many TSA2400 boards paired and work together. TSA2400 can remember the pairing info. You don't need pair them each time you turn the amplifier board on. This makes it possible to build a wireless surround sound system by using the TSA2400.

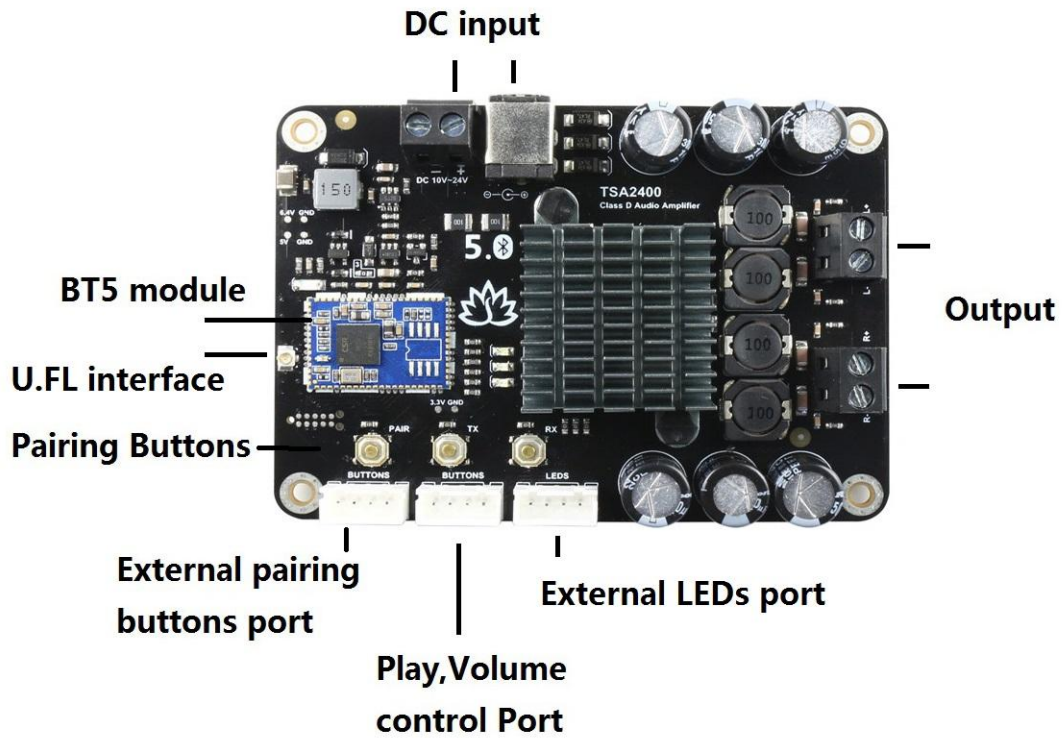
If you only use one TSA2400, it can work like a common Bluetooth amplifier board. Power the amplifier board. Double click PAIR button to set the board into Pairing mode. Use your phone or PC (etc.) to search for a new Bluetooth device. The module will appears as "TSA2400". You don't need a PIN, pair it and then you can play music.



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4 Device function diagram:



5 Specifications

Specifications typical @ +25°C, Powered by 21VDC, unless otherwise noted. Specifications subject to change without notice.

Parameter	Condition	Min	Type	Max
Supply Voltage (VDC)	-	10	21	24
Idle Power	SD Floating	-	1.3W	2.5W
Standby Power	SD Connected to GND	-	0.1W	0.3W
Maximum Current	100W @ 4Ohm	-	5.29A	-
Efficiency	50W @ 4Ohm	87%	-	92%
Minimum Load Impedance		3.2Ω	-	-
Switching Frequency	SD Floating	-	394KHZ	-
Gain		24dB	25dB	26dB
Input Sensitivity (RMS)	@4Ω, 50W, 1KHz	-	808mV	-
Input Impedance		-	22KΩ	-
Output Power (W)	@4Ω THD+N 1%	-	36	-
	@4Ω THD+N 10%	-	50	-



Bandwidth @ $\pm 3\text{dB}$	@4 Ω	20Hz	-	20kHz
THD	@4 Ω , 1W, 1KHz	-	0.0299%	-
	@4 Ω , 10W, 1KHz	-	0.073%	-

6 Connection Ports and Functions

6.1 Power input

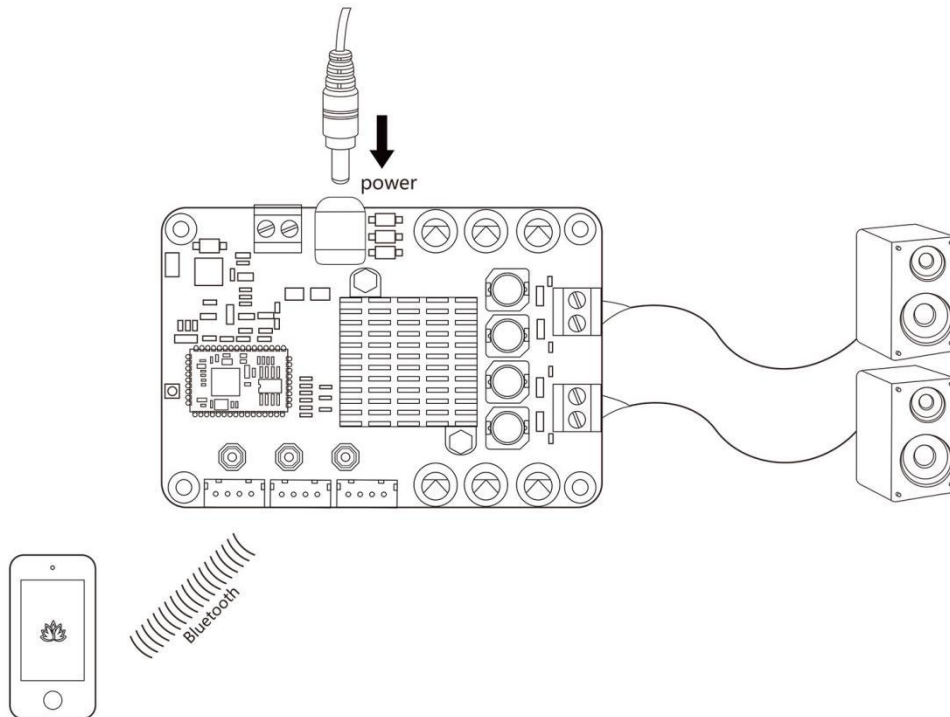
TSA2400 has 2 power input ports. One is a screw terminal connector and another one is a DC Jack connector. The DC input jack is 2.5mm with positive core polarity. These two ports are connected in parallel. You can only connect power to one of them at the same time.

- DC input voltage: DC10V-24V.
- Power reverse connection protection

6.2 Control buttons

- PAIR Button
 - Double click into pairing mode
 - click to exit party mode
- TX Button
 - Click into transmitter mode.
 - Double click to search slave
- RX Button
 - Click into receiver mode

6.2.1 Standard working mode



One board works alone

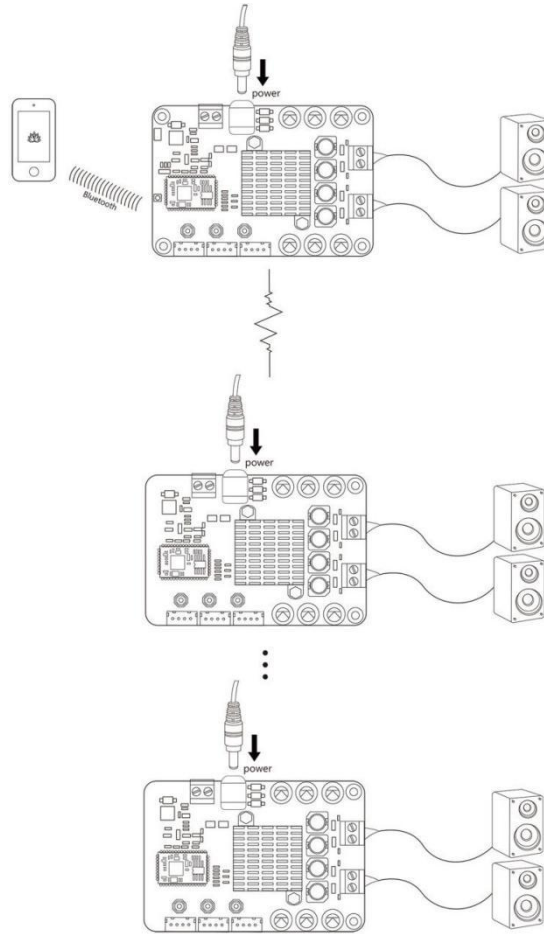
How to use:

1. Connect speakers with TSA2400 and Power up, Blue LED slow blinks.
2. Double click PAIR button to set the TSA2400 into Pairing mode. Blue LED fast blinks.
(Voice: Pairing)
3. Now, your smartphone will be able to find a new Bluetooth device whose name is "TSA2400". Connect it. (Voice: Pairing successful)
4. You can play the music now.

6.2.2 Multi-point mode (Party mode)

Multi-point mode is also called as party mode. In this mode. User can make multiple TSA2400 paired and work together. One of these TSA2400 works as master (transmitter) and the other boards work as slave (receiver). Smartphone only connect with the master board. All TSA2400 have audio output when your smartphone is playing the music.

TinySine



Multiple boards work together

How to use:

Master board:

1. Power up the TSA2400, Blue LED slow blinks.
2. Double click PAIR button to set the TSA2400 into Pairing mode. Blue LED fast blinks. (Voice: Pairing)
3. Now, your smartphone will be able to find a new Bluetooth device whose name is "TSA2400". Connect it.
4. You can play the music now. If you only use one amplifier board, you don't need do the following steps.
5. Click TX button, and set the module to transmitter mode. (Voice: transmitter mode)

Slave board:

1. Power up another TSA2400. Blue LED slow blinks.
2. Make sure master board works correctly and in transmitter mode. Click RX button to set slave board into receiver mode. It will automatically search the master board. (Voice: receiver mode, searching)



3. Double click the TX button on the Master board. The master board will automatically search (30s) slave board. Both master and slave board will be connected. (Voice: searching)
4. The slave board can play music now.
5. If a new board joins as a slave board, just click RX on new module and Double click on Master module.
6. If a slave board wants to quit, click TX or PAIR button on that module.

Note: If you don't hear the voice prompt when clicking TX. Please click the RX to switch the mode and then click TX again.

6.3 External LEDs Port

Wiring:

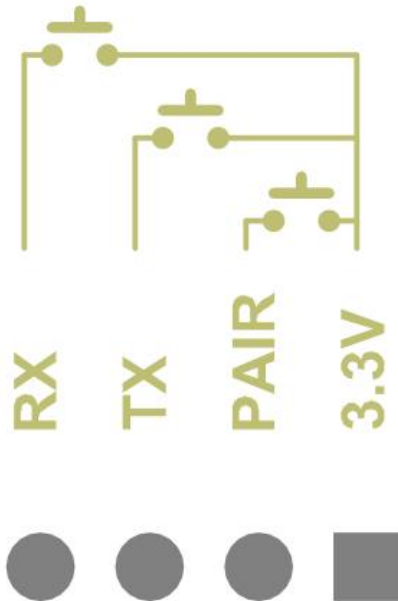


Pin functions

Pin#	Name	Description
1	COMMON+	Connect the positive terminals of all LEDs
2	GREEN-	Connect the GREEN LED negative terminal
3	RED-	Connect the RED LED negative terminal
4	BLUE-	Connect the BLUE LED negative terminal

6.4 External pairing Buttons Port

Wiring:

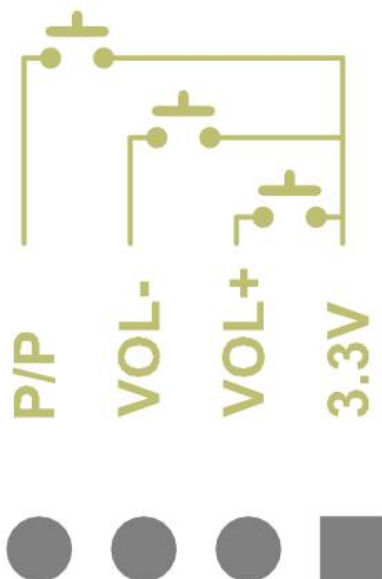


Pin functions

Pin#	Name	Description
1	3.3V	Provides voltage to the IO port of the Bluetooth module
2	PAIR	Pairing button, Double click button into pairing mode
3	TX	TX button, Click button into transmitter mode
4	RX	RX button, Click button into receiver mode

6.5 Play, Volume Control Port

Wiring:



Pin functions

Pin#	Name	Description
1	3.3V	Provides voltage to the IO port of the Bluetooth module



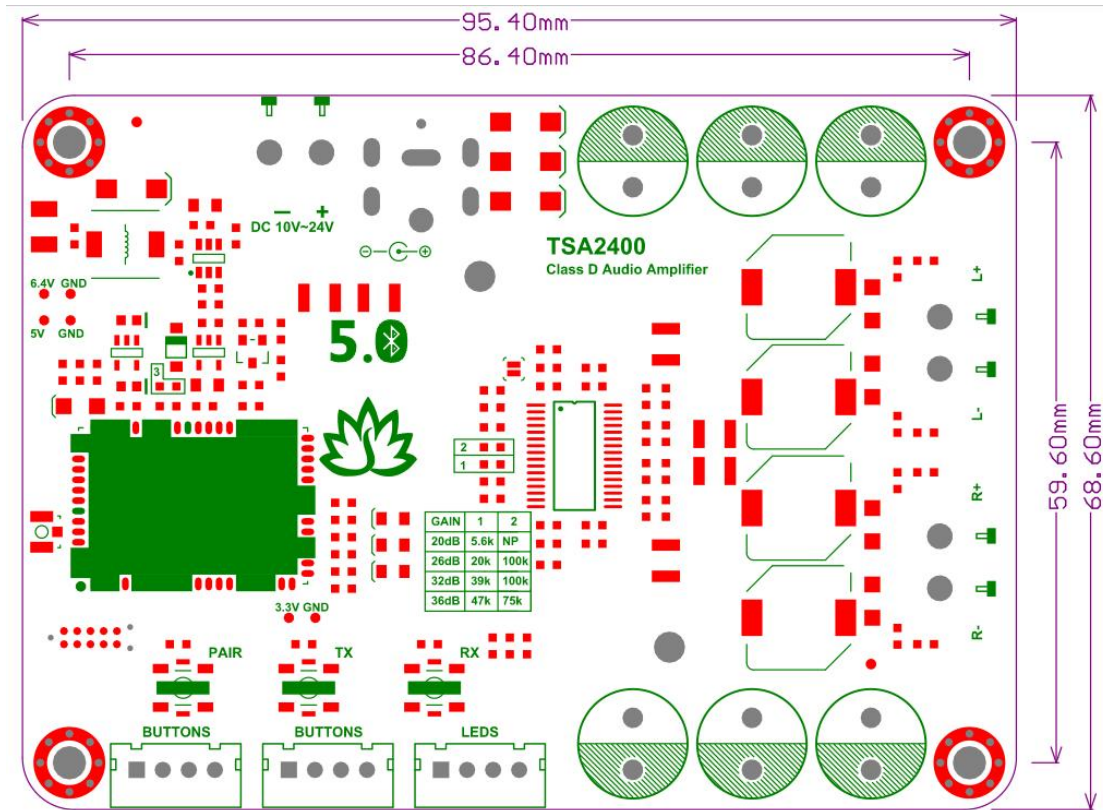
2	VOL+	VOL+ button 1.Short click: Next track 2.Long press: Audio volume +
3	VOL-	VOL- button Short click: Previous track Long press: Audio volume -
4	P/P	Play/Pause button

7 Bluetooth programming

TSA2400 uses Qualcomm CSR8675 as the main Bluetooth chip. User can do the programming via the [CSR USB-SPI programmer](#). You can change the BT name, Audio tones, Firmware ect... by using the Official Qualcomm software.

- [ADK_CSR867X.WIN4.3.1.5](#)
- [How to set the CSR8675 party mode go straight into paring mode](#)
- [How to change the BT name](#)
- [Firmware](#)
- [How to change the EQ](#)
- [No need push button into pairing mode](#)
- [How to disable the audio tones](#)

8 Dimensions



9 Revision history

Document revision history

Date	Revision	Changes
2-Aug-2024	1	Initial release