TinySine
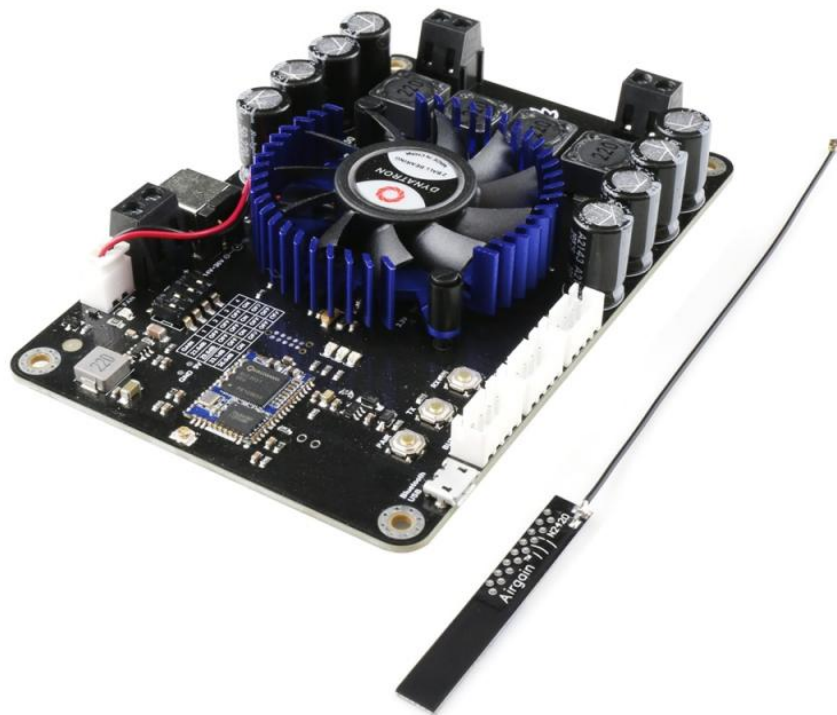
TSA2600

2 x 160W Bluetooth 5.0 Multi-point Audio Amplifier Board

Datasheet

1 Features:

- Wide-range 14V to 36V Supply Voltage Operation
- Size: 120*80*20mm
- Bluetooth programmable
- Multi-point connection
- Bluetooth 5.1
- Up to 100 boards can be linked together.
- Smart cooling system
- Effective transmission distance: 10-15m
- 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:

TSA2600 is a 2x160W Stereo Bluetooth 5 multi-point audio amplifier board. It has a perfect class-D architecture (Based on TDA7498E) and each channel has a maximum 160W power output. Both channels are capable of outputting nominal power simultaneously and continuously. This board can be powered by any DC14V-36V 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 TSA2600 boards paired and work together. TSA2600 can remember the pairing info. You don't need pair them each time after you turn the amplifier board on. This makes it possible to build a wireless surround sound system by using the TSA2600.
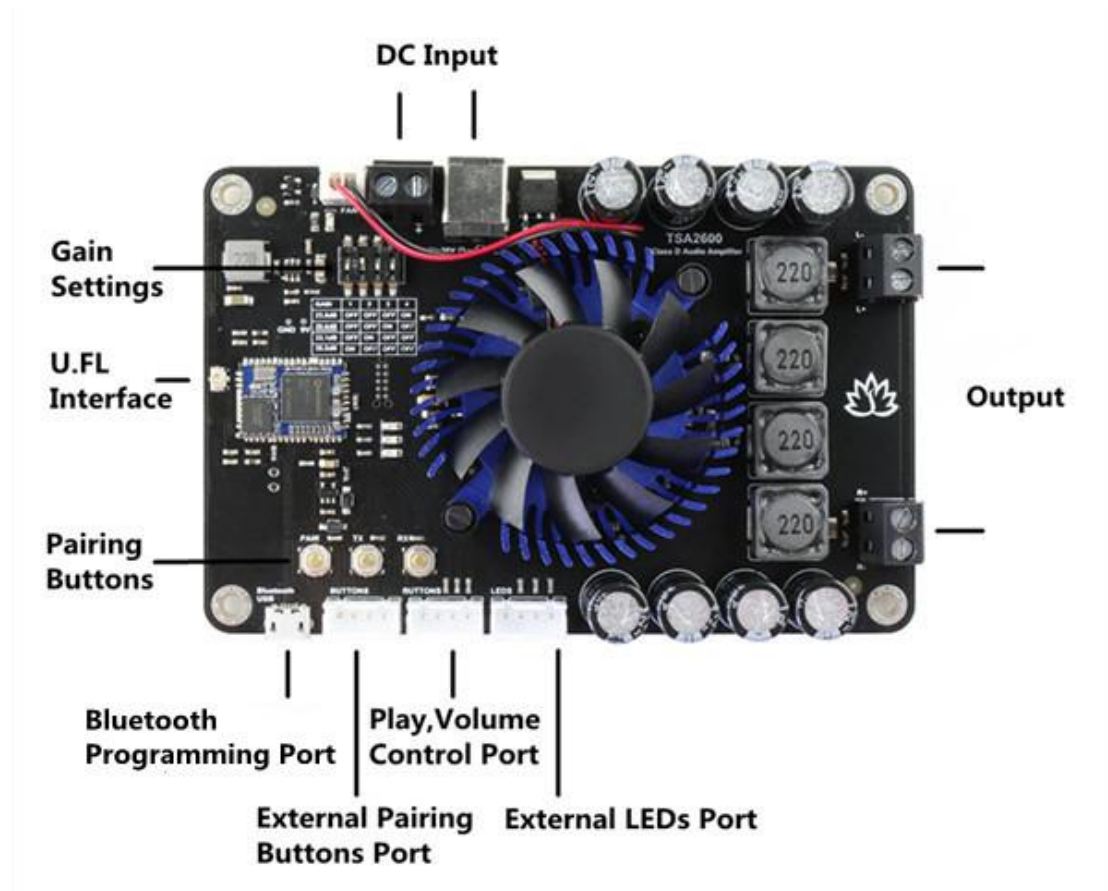
If you only use one TSA2600, it can work like a common Bluetooth amplifier board. Power the amplifier board. Double click PAIR button to set the board into Pairing mode. Use your phone or PC (etc.) to search for a new Bluetooth device. The module will appears as "TSA2600". You don't need a PIN, pair it and then you can play music.

TinySine

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4 Device function diagram:

5 Specifications

Specifications typical @ +25℃, Powered by 36VDC, unless otherwise noted. Specifications subject to change without notice.

Parameter	Condition	Min	Typ	Max
Supply Voltage (VDC)		14	-	36
Input Impedance (Kohm)			69	
Under-voltage protection threshold (VDC)				8
Output Power (W)	THD = 10%	-	160	-
	THD = 1%	-	125	-
Efficiency (%)		-	85	-
THD (%)	Po = 1 W	-	0.05	-
Gain (dB)	GAIN < 0.25*VDD	-	23.6	-
	0.25*VDD < GAIN < 0.5*VDD	-	29.6	-

		-	33.1	-
0.5*VDD < GAIN < 0.75*VDD				
	GAIN > 0.75*VDD	-	35.6	-
Minimum Load (ohm)		-	4	-
Operating Temperature (℃)		0	20	50

6 Connection Ports and Functions

6.1 Power input

TSA2600 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.
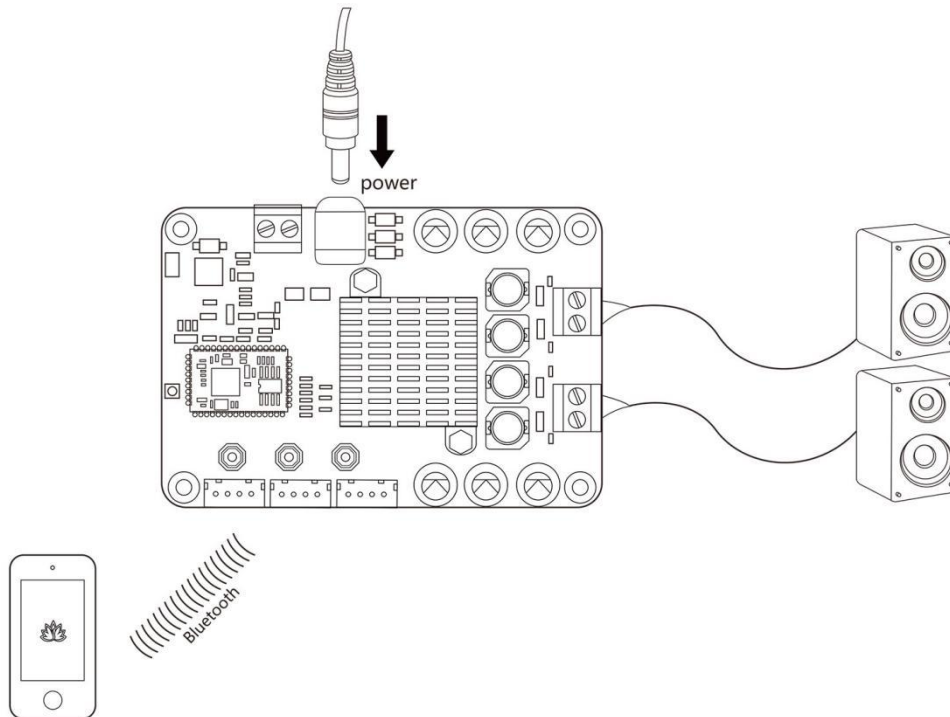
- DC input voltage: DC14V-36V.
- Power reverse connection protection

The recommended input voltage is DC14V-36V. Higher input voltage can get full power output. But the board will have more heat output. This will cause the fan to run frequently. Lower input voltage will have less heat output.

6.2 Control buttons

- PAIR Button
  - Double click into pairing mode
  - click into normal mode
  - Long press 5 seconds to clear pairing info
- TX Button
  - Click into transmitter mode.
  - Double click to search slave
- RX Button
  - Click into receiver mode
  - Double click to search master
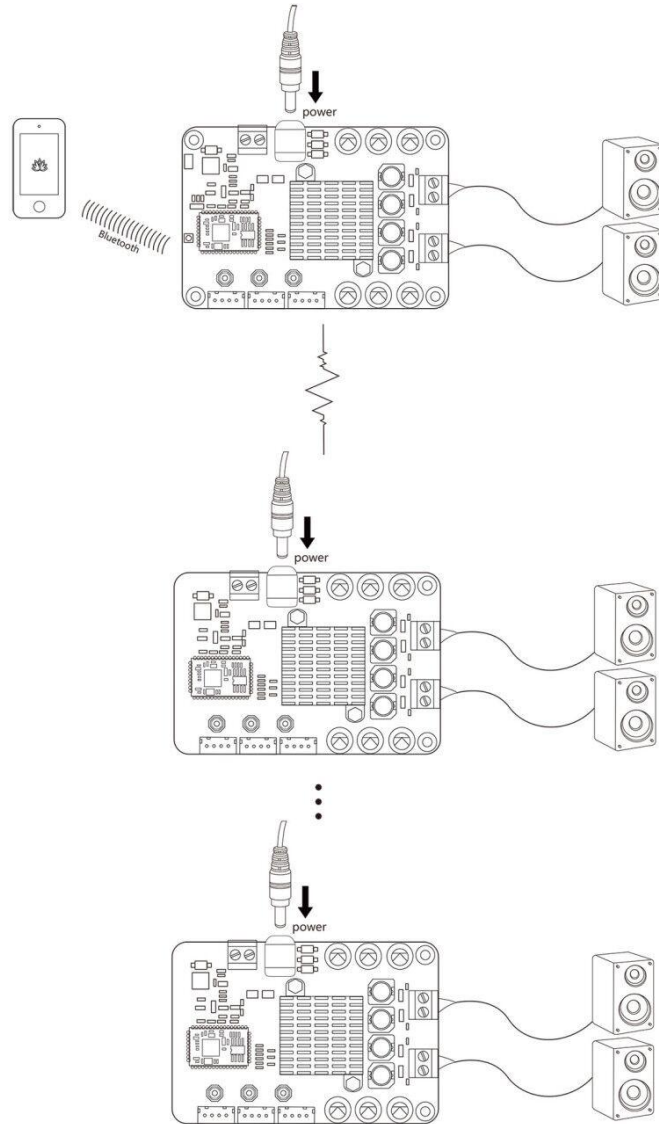
6.2.1 Standard working mode

power

One board works like a normal Bluetooth amplifier

How to use:

1. Connect speakers with TSA2600 and Power up, Blue LED slow blinks.
2. Double click PAIR button to set the TSA2600 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 "TSA2600". 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 TSA2600 paired and work together. One of these TSA2600 works as master (transmitter) and the other boards work as slave (receiver). Smartphone only connect with the master board. All TSA2600 have audio output when your smartphone is playing the music.

Multiple boards work together

How to use:

Master board:

1. Power up the TSA2600, Blue LED slow blinks. (Voice: Power ON)
2. Double click PAIR button to set the TSA2600 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 "TSA2600". Connect it. (Voice: Pairing successful)
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, Set the module to transmitter mode, Red LED ON.(Voice: Broadcast mode)

Slave board:

1. Power up another TSA2600. 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 auto searching the master board. Green LED ON (Voice: Broadcast audio enabled)

3. Double click the RX button on the Slave board, 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: Pairing successful)

4. The slave board can play music now.

5. If a new board joins as a slave board, just click RX on new board into receiver mode then Double click RX, and Double click TX 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.
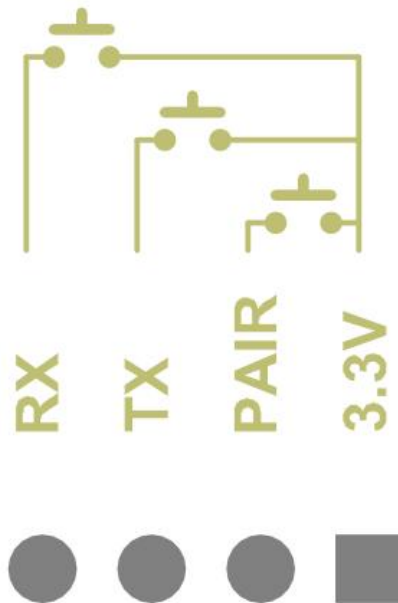
6.3 External LEDs port

Wiring:

Pin functions

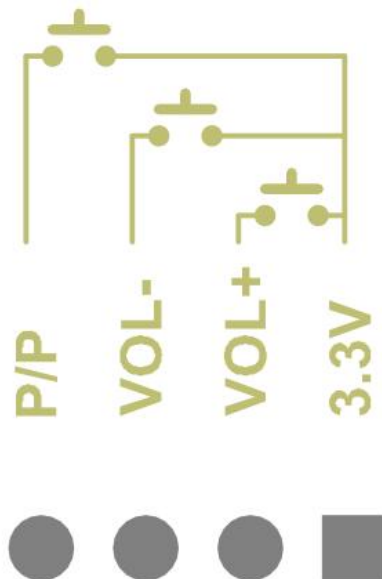| Pin#	Name	Description
1	COMMON+	Connect the positive terminals of all LEDs
2	GREEN-	Connect the GREEN LED negative terminal
3	RED-	Connect the RED LED negative terminal
4	BLUE-	Connect the BLUE LED negative terminal

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

6.6 Fan connector

TSA2600 has a smart cooling integrated. There is a temperature sensor on the board that monitors the temperature of the board in real-time. The fan will automatically run/stop according to the board temperature.

Fan RUN/STOP temperature value and working voltage:

- RUN: >50℃
- STOP:<35℃
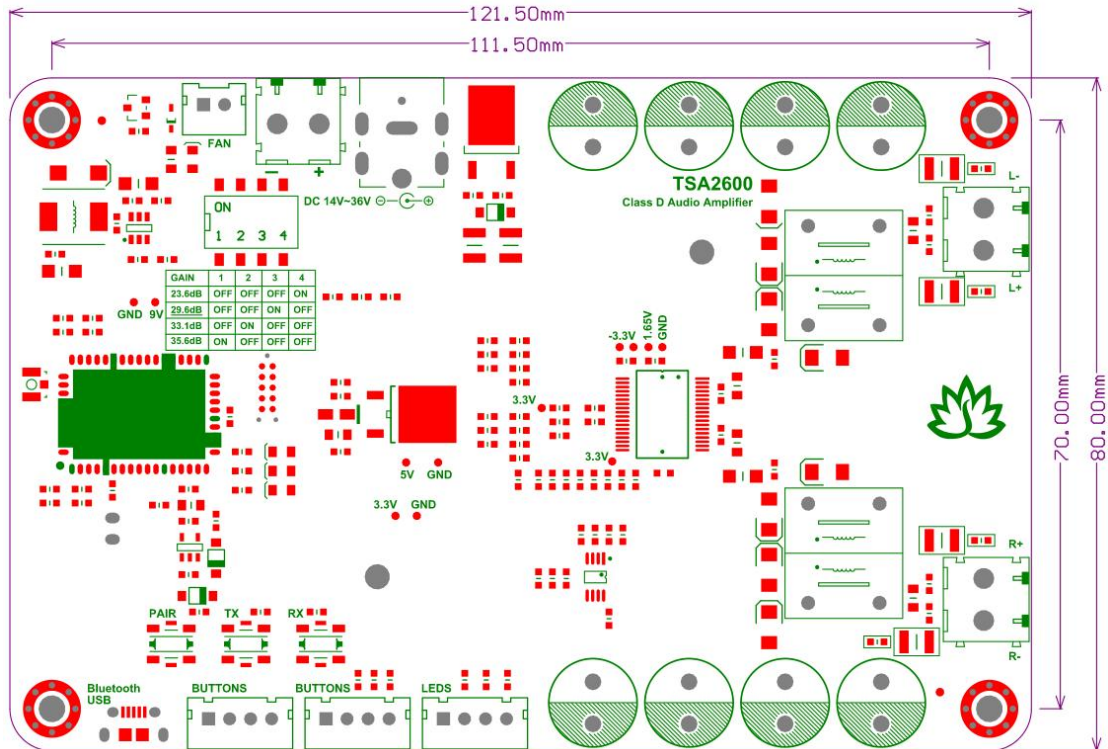- Working voltage: 9VDC

6.7 Amplifier chip Gain settings

GAIN	DIP SWITCH			
	1	2	3	4
23.6dB	OFF	OFF	OFF	ON
29.6dB	OFF	OFF	ON	OFF
33.1dB	OFF	ON	OFF	OFF
35.6dB	ON	OFF	OFF	OFF

7 Bluetooth programming

TSA2600 uses Qualcomm QCC3031 as the main Bluetooth chip. User can do the programming via the USB port on the board. You can change the BT name, Audio tones, Firmware ect... by using the Official Qualcomm software.

- Bluesuite3.3
- ADK_QCC512X_QCC302X_WIN_6.4.2.26
- How to change the BT name

![TinySine logo]

8 Dimensions

9 Revision history

Document revision history

Date	Revision	Changes
2-Aug-2024	1	Initial release