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Hilitand IRS2092S

Hilitand IRS2092S High Power Amplifier Board User Manual

Model: IRS2092S

1. Introduction

This manual provides essential information for the safe and effective use of your Hilitand IRS2092S High Power Amplifier Board. This Class D digital power amplifier board is designed for audiophiles and DIY enthusiasts seeking crisp, powerful, and efficient audio output for custom audio systems and projects. Please read this manual thoroughly before installation and operation.

2. Product Overview

The Hilitand IRS2092S amplifier board is a high-performance, single-channel (mono) digital power amplifier. It features a Class D design for high efficiency and minimal heat generation. The PCB layout is designed for easy installation and integration into various audio setups.

- High-performance IRS2092S amplifier delivers crisp and powerful sound.
- Class D digital design ensures efficient operation with minimal heat and energy loss.
- Single-channel configuration provides stable and reliable audio output.
- Easy-to-install PCB layout with clearly labeled components.
- Equipped with multiple protection functions including output short circuit protection, output DC bias protection, and horn protection.



Figure 2.1: Top view of the Hilitand IRS2092S High Power Amplifier Board, showing the cooling fan and main components.

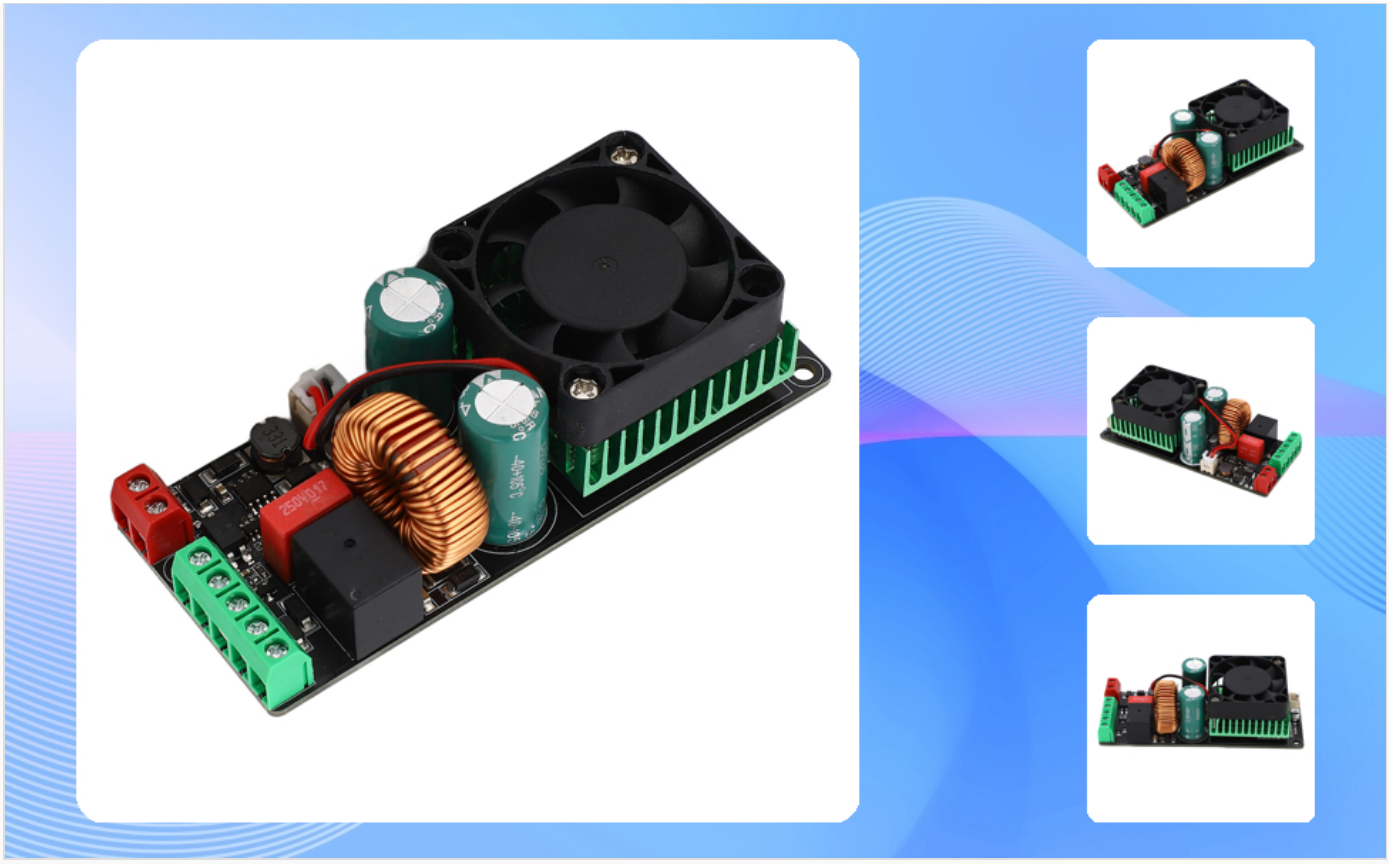


Figure 2.2: The amplifier board features multiple protection functions, including output short circuit protection, output DC bias protection, and horn protection.

3. Specifications

Feature	Specification
Model	IRS2092S
Material	PCB
Power Supply Voltage	Dual DC power supply ±45V to ±70V (±65V recommended)
Rated Output Power	500W (±65V power supply, 4Ω load, 1% distortion)
Efficiency	≥90%
Signal to Noise Ratio	90dB
Total Harmonic Distortion (THD)	380W (±70V power supply, 4Ω speaker, <0.1% THD) 280W (±70V power supply, 8Ω speaker, <0.1% THD)
Frequency Response Range	20Hz to 20KHz
Speaker Impedance	4Ω to 8Ω
Voltage Magnification	50 times (fixed)
Input Sensitivity	1V (RMS)
Protection Features	Output DC Bias Protection, Horn Protection, Short Circuit Protection
Board Dimensions (L x W x H)	Approx. 105 x 43 x 28mm / 4.13 x 1.69 x 1.1in

Feature	Specification
Operating Temperature	Up to 100 °C
Certifications	FCC



Figure 3.1: Dimensional drawing of the amplifier board, showing key measurements in millimeters.

4. Setup Instructions

Follow these steps to correctly set up your IRS2092S amplifier board:

1. **Power Supply Connection:** Connect a dual DC power supply within the range of ±45V to ±70V. A ±65V filtered DC dual power supply is recommended for optimal performance. Ensure the polarity is correct. Connecting a voltage exceeding ±70V will damage the board.
2. **Audio Input Connection:** Connect your audio source to the 'Audio input+' and 'Audio input-' terminals. The board has an input sensitivity of 1V (RMS).
3. **Speaker Connection:** Connect your speaker(s) to the 'Audio output+' and 'Audio output-' terminals. The recommended speaker impedance is 4Ω to 8Ω.
4. **Pre-Power On Check:** Before applying power, carefully double-check all wiring connections to ensure they are correct and secure. Incorrect wiring can cause damage to the amplifier board or connected components.



Figure 4.1: Wiring diagram illustrating connections for audio input, audio output, and power supply.



Figure 4.2: Close-up view of the amplifier board showing the clearly labeled audio input, audio output, and power supply terminals.

5. Operating Instructions

Once the amplifier board is correctly wired and checked, you can proceed with operation:

1. **Power On:** Apply power to the board using the recommended dual DC power supply.
2. **Audio Playback:** Begin playing audio from your connected source. The amplifier will process and output the audio to the connected speaker.
3. **Volume Control:** Adjust the volume from your audio source. This amplifier board has a fixed voltage magnification of 50 times. If the output power is insufficient, consider increasing the amplification at the pre-amplifier stage of your audio system.
4. **Power Off:** To power off, disconnect the power supply from the board.

6. Maintenance

The Hilitand IRS2092S amplifier board is designed for reliable operation with minimal maintenance. To ensure longevity and optimal performance:

- Keep the board clean and free from dust and debris. Use a soft, dry brush or compressed air for cleaning.
- Ensure adequate ventilation around the board, especially around the cooling fan, to prevent overheating.
- Avoid exposing the board to moisture or extreme temperatures.
- Regularly inspect connections for any signs of loosening or corrosion.

7. Troubleshooting

If you encounter issues with your amplifier board, refer to the following troubleshooting tips:

Problem	Possible Cause	Solution
No audio output	Incorrect power supply voltage or polarity. Loose or incorrect audio input/output connections. Faulty audio source or speaker.	Verify power supply is within ±45V to ±70V and polarity is correct. Check all wiring connections for tightness and correctness. Test audio source and speaker with another device.
Low output power	Insufficient input signal. Speaker impedance mismatch.	Increase amplification at the pre-amplifier stage. Ensure speaker impedance is between 4Ω and 8Ω.
Board overheating	Poor ventilation. Excessive load or short circuit.	Ensure adequate airflow around the board. Check for short circuits in the output wiring; avoid prolonged short circuits.
Board damaged after power on	Power supply voltage exceeded ±70V. Incorrect wiring (e.g., reverse polarity).	Always verify power supply voltage and wiring before connecting. This type of damage is typically irreversible.

8. Safety Information

- **Power Supply:** Use only a dual DC power supply within the specified range of ±45V to ±70V. Exceeding ±70V will cause irreversible damage to the board.
- **Wiring:** Always double-check all wiring connections for correctness and polarity before applying power. Incorrect wiring can lead to damage or electrical hazards.
- **Short Circuits:** Although the output is short-circuit protected, avoid intentionally shorting the output terminals. Prolonged short circuits can stress components.
- **Environment:** Operate the board in a dry, well-ventilated area. Avoid exposure to moisture, dust, and extreme temperatures.
- **Handling:** Handle the PCB with care to avoid damaging components or creating static discharge.

9. Warranty and Support

For warranty information and technical support, please refer to the official Hilitand store or contact your retailer. You can visit the Hilitand store at Hilitand Store on Amazon.

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