
Class-D Audio Amplifier, 2 Channel, 125W/Channel

Model XAMP-D2 Operator's Manual

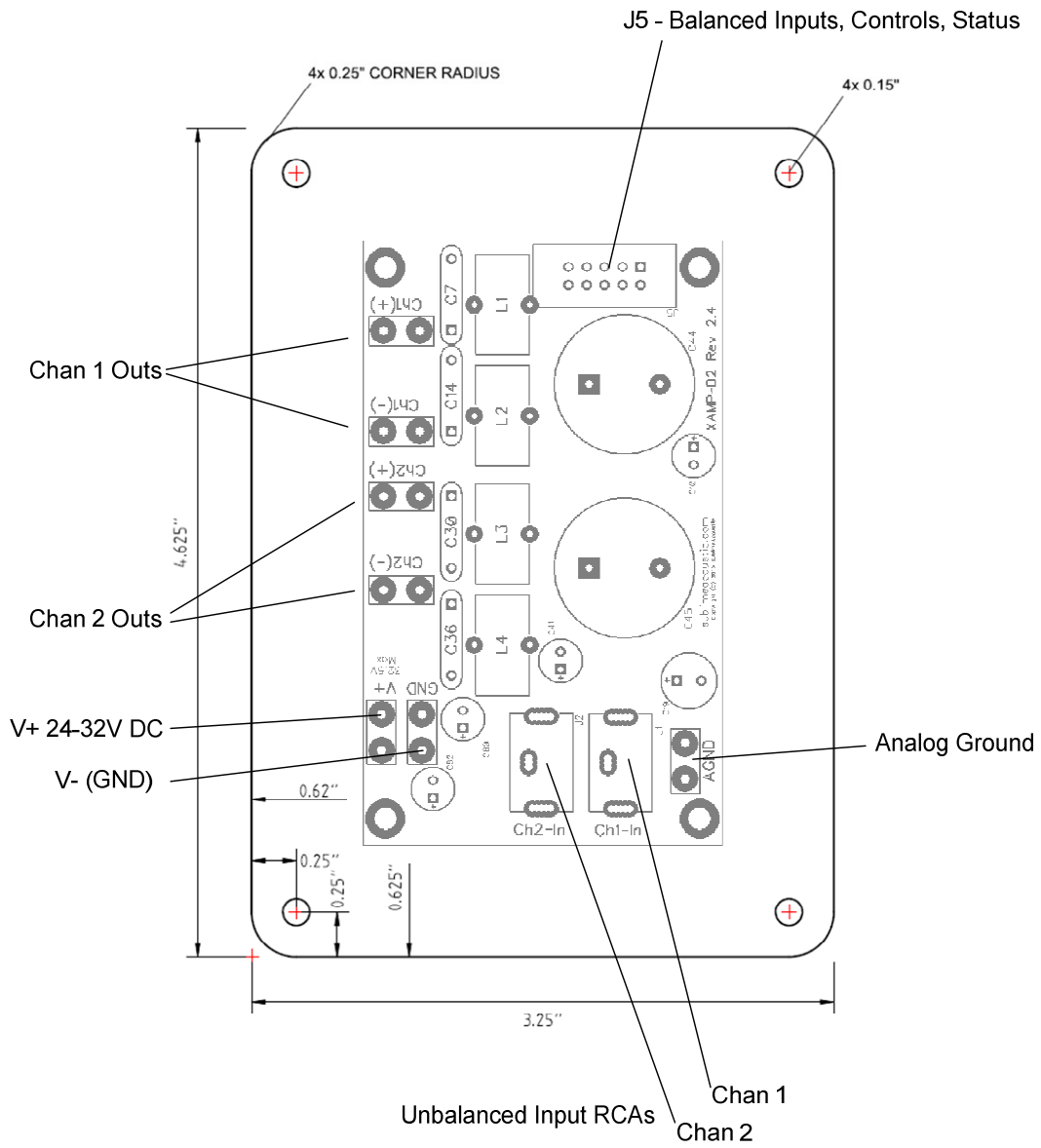
Rev 2.4

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Features

- Uses Texas Instruments TAS5611A chip in bridged configuration to produce 125W RMS per channel
- Plate mount with integrated heat sink, No fan required
- Small, compact design for use in small spaces
- Supports both balanced and unbalanced signal inputs
- Silent power ON/OFF
- Self protections: Over-Temperature, Under-Voltage, Clipping, Short Circuit
- Specifications:
 - Frequency Response Linear from 20Hz – 80KHz
 - Distortion Ultra low 0.03% THD at 1W into 4 ohms
 - Signal-to-Noise Ratio > 100dB
 - Power Supply Noise Rejection 80dB
 - Input Impedance 20K ohms unbalanced, 40K balanced
 - Input Overload: 3.8V peak-to-peak
 - Voltage Gain: 20dB
 - Power Output 125W RMS per channel into 4 ohms
 - Amplifier Type: Class D, Stereo Bridge Tied Load (BTL)
 - Power supply: 24V–32V DC, Single positive DC rail (no negative supply required)
- Applications:
 - Active speakers, sound bars and subwoofers
 - Portable boom-box
 - Portable guitar amplifier
 - Custom speaker systems
- Low power consumption and no negative supply needed - perfect for portable battery powered speakers
- Plate Dimensions: 4.625" x 3.25" x 1.5" High (117mm x 81mm x 38mm)
- Made in USA

Figure 1. Connector Placement and Dimensions



Input Signals – Balanced or Unbalanced

There are two basic systems used to connect the audio signal on consumer and pro audio equipment; unbalanced lines and balanced lines. Unbalanced lines use one wire for signal and the other for ground. Balanced lines, on the other hand, have two signal wires and a shield ground wire.

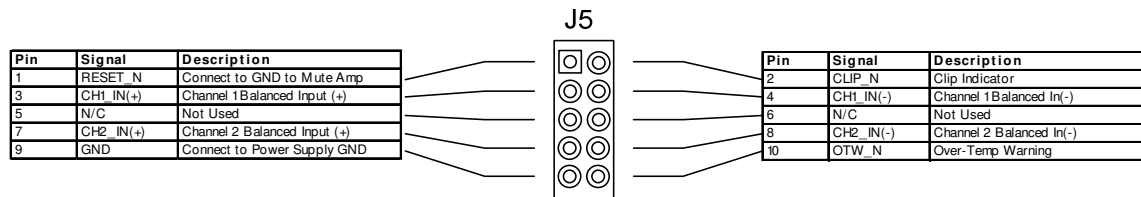
Unbalanced lines are most common in consumer grade audio, and are generally much more susceptible to audio noise like 50/60Hz hum. Unbalanced lines will also pick up any electro-magnetic noise in the nearby environment (such as computers, cell phones, microwaves, etc.) and adds it to your audio signal, making it audible in your speakers. Unbalanced lines can also lead to ground loops, which are the major source of 50/60Hz hum in your sound system. Ground loops arise whenever there is more than one path from any piece of audio equipment to earth ground. Your equipment will always be grounded through your AC line. Adding another path to ground through your unbalanced audio cable adds a second path to ground, and this can cause audible 50/60Hz hum.

Balanced signals are more common in high end consumer and professional audio systems and are much less susceptible to noise. Balanced lines allow you to run very long audio cables without allowing electro-magnetic noise to couple into your signal. They're also not susceptible to 50/60Hz hum; there is no connection to ground in the audio signal cable, so they can't create ground loops in your sound system.

For unbalanced signal input, connect your signals to the RCA jacks.

The figure below shows the wiring of 2x5 connector J5, which has the balanced (+) and (-) inputs, and controls and status flags.

Figure 2. J5 Connector - Balanced signal Inputs, and controls



Important Note! Differential Speaker Outputs!!!

The speaker outputs of the XAMP-D2 are differential. In other words both the (+) and (-) speaker outputs are actively driven by the amplifier chip, and **neither is connected to ground**. This means that if you measure the voltage of the (+) and (-) speakers outputs, you'll see that each will be sitting at about $\frac{1}{2}$ of your power supply voltage with respect to the power supply ground. This is due to the fact that there is just a single positive power supply, not (+) and (-) supply like some other power amplifiers. But the speaker drivers don't care about this DC offset, they only care about the differential voltage between the (+) and (-) terminals.

When scoping the speaker outputs, **be sure to ground the scope to the power supply ground (NOT the (-) speaker output!)**, and probe the speaker (+) and (-) outputs with separate scope channels. You'll see that the (+) and (-) speaker outputs are 180 degrees out of phase. You'll also want to put your scope in AC mode, since the baseline quiescent voltage levels of the speaker outputs will be sitting at $\frac{1}{2}$ of your supply voltage.

Power Supply

The XAMP-D2 requires only a single positive DC voltage from 24V to 32V. The amplifier will only operate properly in this voltage range. The higher the voltage, the more audio power the amp can produce. Higher supply voltages will also produce cleaner audio, even if you're not running it loud, but it will consume more power.

For portable applications, consider our XRPS-250W Lithium-Ion Battery Power supply, or our XDC-250W DC/DC converter to boost 12V DC to the required 24V-32V. Either of these power supplies will supply the required 250W DC voltage.

If you plan to run the amplifier from AC mains voltage, either 120V or 240V AC, consider our Audio Grade 200W DC power supply: the XAPS-200W. It takes in AC from a power transformer and creates very clean, well regulated DC voltage for your amplifier.