

250W Subwoofer Amplifier

From Rythmik Audio

www.rythmikaudio.com

Thanks for purchasing this 250W Subwoofer Amplifier. The amplifier is designed for home theater application. It features an extension (or rumble) filter set at 12hz with $Q=0.7$. In addition, the amplifier is packed with other standard features such as both speaker level and line level inputs, high-pass line outputs (12db/oct) for the satellite speakers, continuously adjustable crossover frequency (40-160hz) for the subwoofer output, automatic on/off switch (activated by left channel input signal), and a subwoofer volume control. Mated with a high quality and efficient subwoofer driver, its 250WRMS output @4ohm is enough to shake your room. Thermal protection and short circuit protection circuitry ensure long-lasting durability.



Technical specs

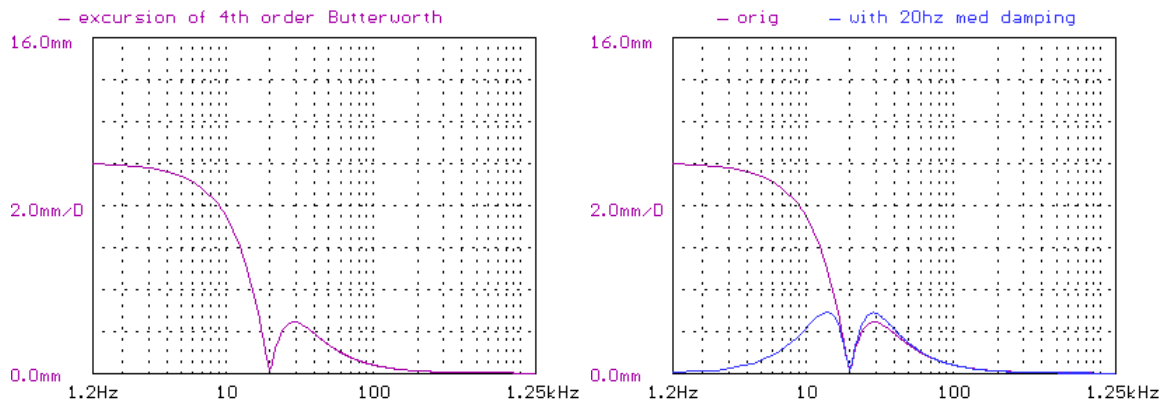
Crossover frequency control	Continuously variable for the subwoofer from 40hz to 160hz, 2 nd order characteristic (12db/oct).
Phase control	Continuously adjustable phase lag control on the subwoofer from 0 to 180 degrees. This control helps to align the phase shift of the subwoofer and the satellites for a smooth blending.
Power switch (Auto ON/OFF)	When the switch is in the auto position, the amplifier will turn on when the input signal is present. There are also ON and OFF positions that can override this function.
Volume control	Adjust the output level of subwoofer.
Line in	These are line level RCA inputs. When using line level inputs, connect them from pre-outs or preamplifier outputs. These inputs are summed into a mono signal. It is the preferred method of inputs. For a line level signal that is already mono (for instance, subwoofer output from home theater receiver), one can connect it to either channel input. See setup section for more explanation.
Line out	Connect them to the inputs, if available, of power amplifier that drives satellite speakers.
High Level in	These are inputs that accept speaker level signals. Use these inputs only when the line level inputs are not used. Connect them directly to the speaker outputs of the amplifier that drives satellites (or front channels).

High Level out

Speaker level outputs that connect to satellite speakers. Use these outputs only when speaker level inputs are used. Using speaker level outputs to drive satellites is not a recommended method because the impedance of satellite (or front channel) speakers interact with the speaker level crossover network on this amp so the frequency response will become wavy.

Extension (or rumble) Filter

The default extension filter (12hz with $Q=0.7$) is good for sealed box subwoofers. It provides a gradual attenuation at the bottom end. On the other hand, extension filter plays a very important role in preventing over-excursion (or bottoming) in vented box subwoofers. If you will be using this amplifier with a vented subwoofer, we strongly recommend that you let us know so that we can solder a resistor for you. To demonstrate how rumble filter help to prevent over-excursion in vented box, 2 graphs are shown below.



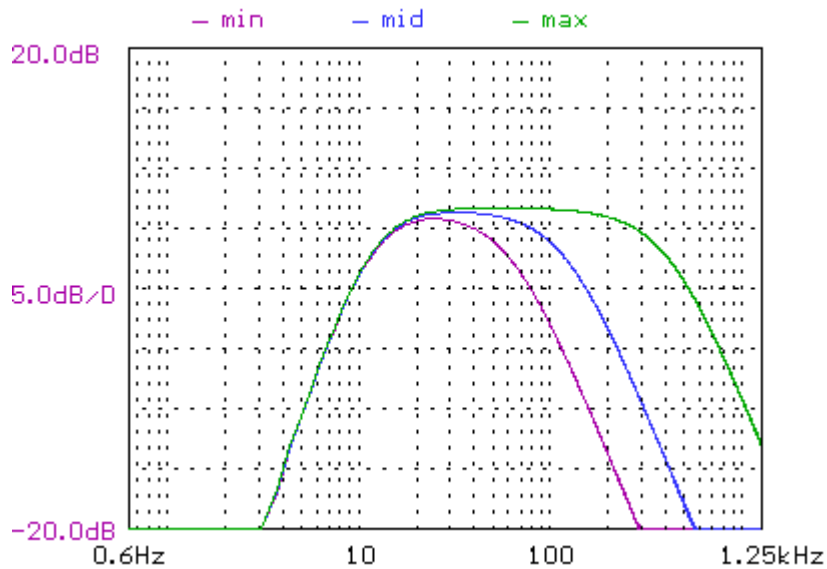
The graph on the left shows the excursion plot of a perfectly designed 4th order Butterworth vented box tuned to 20hz without any rumble filter. The largest excursion occurs at frequency below 20hz. On the right hand side, we apply a rumble filter of 20hz, $Q=1.0$. The result is compared with the original. As one can see the improvement is quite dramatic. For small vented box (3 cu ft or below), we recommend Q value around 1.0. For large vented box (more than 3 cu ft), we recommend Q around 0.7.

System hookup

Home Theater Receiver

The hook-up is as simple as connecting the subwoofer output to the left channel RCA input on the plate amp. Fix the phase control to 0 degree and gradually change the crossover control on the plate amp from max to min until the blending between front speaker and sub becomes smooth. Most likely, the sweet spot is when the crossover control is around 12 o'clock position. Some people have commented that why this amp does not have a bypass switch. The crossover control serves two purposes. First, it provides additional attenuation for midrange frequency response anomalies of the subwoofer. Most subwoofers are not very good at reproducing midrange signal. The crossover control on this amp provides additional attenuation up to 20db at 1kHz. This is not double filtering because, when the crossover is set to max, the plate amp is flat up to 300hz. Second, it provides a means to fine-tune the blending between satellite speakers and subwoofer.

Next, the graph of frequency response at 3 different xover positions is shown as a reference.



The min is when the knob is at 7 o'clock position. The mid is at 12 o'clock position, and the max is at 5 o'clock position. The attenuation below 20hz shows the effect of rumble filter.

Other Recommendations

This subwoofer amplifier is **NOT** recommended for sealed box speakers with DC voice coil resistance of less than 2.5 ohm, nor for vented box (passive radiator) speakers with DC voice coil resistance of less than 3.0 ohm. Otherwise, the thermal protection circuitry will be activated more often.

Auto-off

It takes about 20 minutes to enter the standby mode even after the input signal is shut-off. This is a feature, not a bug, because it prevents unnecessary on and off switches.

Reset the amp

After triggering the protection circuitry, one can reset the amp by either 1) turn the power switch on the plate to off position and then back to on position, or 2) unplug the power core and then plug in again. The former is recommended.

Support

Your satisfaction is paramount to us. Please feel free to ask us questions or give us feedback.