

ARC AUDIO KS125.2 MINI

Text by Dave MacKinnon



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You'd think that in almost every scenario, no matter the subject, bigger would be better, wouldn't you? In terms of amplifiers, there is no such thing as too much power and there is certainly no such thing as too much efficiency, but with fuel prices rising and people buying smaller and smaller cars, size and efficiency matters more than ever.

If you are a regular reader of PAS, then you know that Arc Audio stands at the forefront of the car audio industry as a leader in the development of amplifier technologies that allow for excellent efficiency while retaining sound quality. Their latest offering and the third product from their newly launched Kar Series for me to review is the KS125.2 Mini.

DESIGN

The KS125.2 is a two channel amp with a basic, but solid feature set. The amp is rated at 2x70W into 4Ω and 2 x 125W into 2Ω. When bridged into a 4Ω net load it is said to produce 250W. But this isn't what the KS125.2 Mini is all about – this sucker is about size and the total lack of it. The dimensions for this amp are 4.8 inches wide by 8.25 inches long by 1.7 inches thick. It's hard to completely comprehend how small this amplifier is unless you have it in your hands, but you could easily install it in a glove box and have room to run wiring around it neatly. I would think eight of these could fit on the back of the average fold-down seat-backs and an amp rack on the trunk of your floor? Well, you don't need that many different channels of amplification in most systems, or speakers!. Needless to say, this sucker is very small.

Why are most amplifiers big? The heat sink of an amplifier needs to radiate whatever energy the amplifier wastes into the air around it. So, for a 250W amplifier that is 66% efficient, the heat sink needs to convert 129W of energy into heat. The larger the heat sink, the easier it is to perform this conver-

sion, as there is more surface area. This example is a bit of a segue into another major feature of this amplifier – its power supply.

This amplifier was designed by Nikola Engineering which is headed up by none other than Robert Zeff. Zeff and his crew lead the industry in the implementation of Class H power supplies, and if you have been reading PAS, then you know that this is a fantastic design with no real drawbacks, unlike Class D and its variants which wreak havoc with the signal. Class H is actually a simple Class AB audio output stage that is powered by a power supply whose output voltage tracks the audio signal. The result is increased efficiency without any detrimental acoustic effects.

So, how does Class H compare to a conventional Class AB amplifier in terms of efficiency? At full power, these amplifiers are very close in terms of efficiency; running at around between 65 and 75%. Where this technology really shines is at lower power levels – the kind of levels that 99% of people listen to music at. Figure 1 shows the efficiency of the KS125.2 Mini with respect to output power. Note the rapid rise in efficiency at the bottom end of the range

and the small peak around 40W. This is where the output level catches up with the minimum power supply rail voltage. At output levels above this point, the power supply starts to track the audio signal. Efficiency continues to improve as power levels increase as the power required to drive the amplifiers circuitry become less and less of a percentage of the amplifiers output power. The real kicker is that these measurements were taken with the amp bridged into a single 4Ω load, the amp is even more efficient at 4Ω stereo (as are most).

In terms of feature, the KS125.2 Mini includes a defeatable high- or low-pass second order (12dB/Octave) crossover that is adjustable from 55Hz to 550Hz. A bass boost control is included and will allow you to add up to 15dB of boost centered around 45Hz. The input sensitivity controls are adjustable to be able to provide full power from sources producing between 0.25 and 4Vrms on their preamp outputs. The labels on the sensitivity controls state only Max. and Min., rather than a voltage range. But no matter, as this are independent left and right controls, you'll have your scope and/or volt meter out to set this amp up and ensure sure channel imbalance is non-existent and the amp isn't clipping.

The left end panel of the amp is home to the speaker output terminal block as well as the RCA inputs, a speaker-level input plug and source selector switch. The terminal block will accept cables up to 10awg in size and uses Phillips head set screws for a rock solid connection that doesn't require hunting around your tool box for the right hex key. The opposite side of the amp has the power connection block and a 30A ATC fuse. The power block will also accept 10awg cable. An LED lets users know the status of the amplifier. This amplifiers on-board microcontroller will also

FIGURE 2 - EFFICIENCY

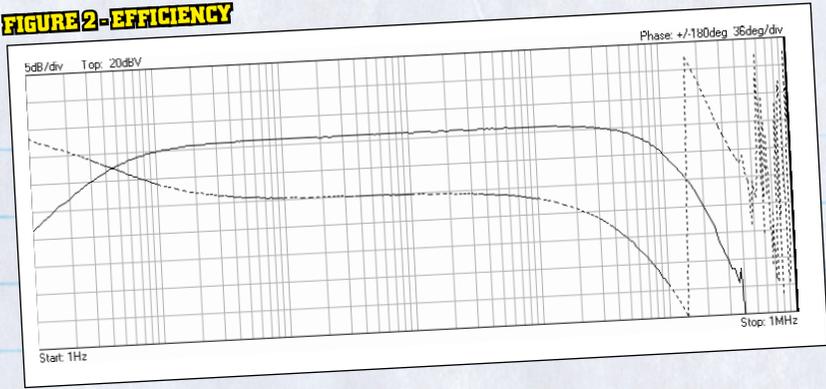
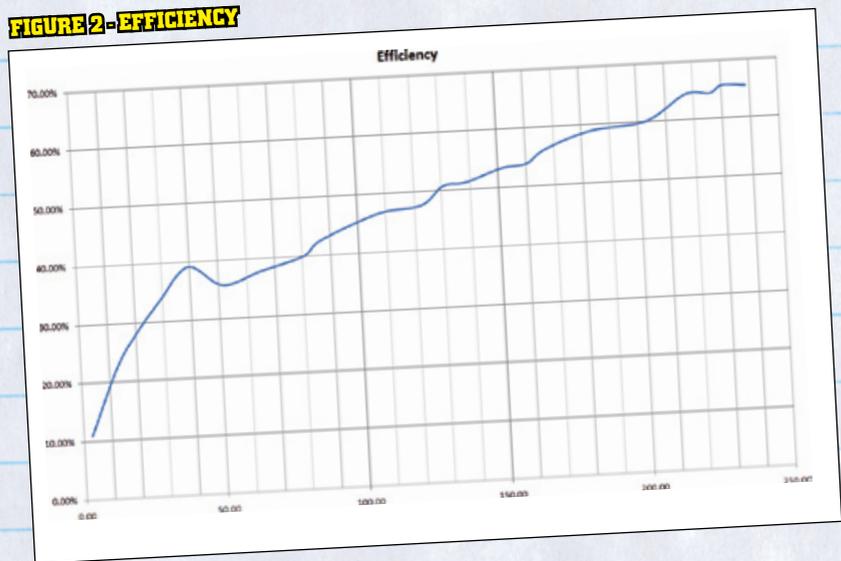


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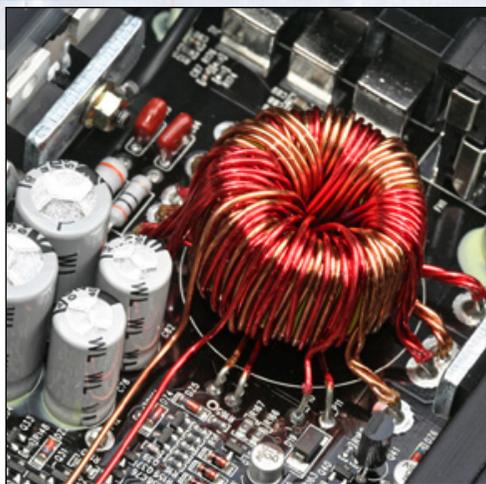


blink errors codes via this LED in the event something goes wrong. These fault conditions include thermal protection, short circuit protection, repeated short circuit protection and over-voltage protection.

On top of the amp are the signal processing controls. Independent left and right sensitivity controls, the crossover frequency adjustment, crossover function control and the bass boost control. A small cast aluminum Arc Audio Mini

badge adorns the amp and white silk-screening takes care of the function setting information and the amps model number.

The chassis of the amp is a small (I mentioned that already, right?) aluminum extrusion that wraps around the bottom of the amp. The top plate and end panels are aluminum and secured with Phillips head screws. Shallow fins run horizontally across the length of the amps sides to help dissipate heat. ➤



▶ If your car audio plans involve a great sounding system that doesn't take over every square inch of free space in your car, then you truly need to audition the Kar Series Mini amps!



ARC AUDIO KS125.2 MINI

Inside the amp is a single 6,800µF, 16V, 105 C capacitor to filter the input signal after the fuse. The toroidal transformer is a multi-tap unit that has been impregnated with grey epoxy to keep the windings tight. The output of the power supply is stiffened by two 1,200µF, 35V, 105 C caps. Beside them are two 1,000µF, 25V, 105 C caps. The components on the 2-sided circuit board are small surface mount devices for resistors, transistors and diodes. There are four vertical daughter boards in the amp, two of which are dedicated to the signal processing controls on the top of the amp and the other two appear to be related to biasing and/or driving the output devices. The output devices are of course Nikola-standard TIP-35C and TIP-36C Darlington Transistors. The power supply uses MOSFETS. The large capacitors are also glued in place to prevent vibration from damaging them. Overall, this is top-notch design and construction.

TESTING

I set the amp up on my bench and brought it to life via one of my Kinetik KIPS12-80 power supplies. The amp behaved very well during all testing, clipping gracefully and without any sign of power supply weakness (no saddle-back or angled waveform at the top). Figure 2 shows the amplifiers power measurements. All of them are within 0.2dB of rated power. You can see that the amp is very efficient at full power with a 76% measurement.

Channel imbalance was not measured as the amp has independent gain controls. Damping factor at 1kHz at an output level of 1 Watt into a 4Ω load was very good at 290.4. Figure 3 shows

FIGURE 2-POWER

LOAD	SUPPLY	SUPPLY CURRENT	MAIN CHANNEL POWER	EFFICIENCY
4 Ω x 2	13.56 V	14 A	72.3 WPC	76%
2 Ω x 2	13.48 V	27 A	120.1 Wpc	66%
4 Ω x 1	13.48 V	27 A	239.8 Wpc	66%

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frequency response was good, measuring at 10.8Hz to 35.6kHz within 1dB and 5.45Hz to 64.3kHz within 3dB. The phase plot shows fairly smooth response with a common roll-off on the top and bottom.

LISTENING

I inserted the KS125.2 Mini into my reference system. The amp was fed from my DRZ9255 source unit and was driving a set of LSi9 bookshelf speakers. Source material was the Focal Demonstration Disc 1 and Disc 6.

The width of the soundstage easily matched that of my reference amplifier, extending about 10% outside of the boundaries set by the placement of my speakers. In terms of depth, the shakers that come in half way through Spanish Harlem by Rebecca Pidgeon were clearly 20 inches back of the lead vocal and placed right of center. The amplifier was very good in terms of locating each instrument across the soundstage, though the focus wasn't as sharp as my

reference amplifier. Where a voice was about the size of a compact disc, the KS125.2 mini offered something more the size of a medium pizza. No matter, this is still exemplary performance.

In terms of frequency response, the amp offers very good extension at both the top and bottom of the frequency range. Highs such as cymbals and shakers were clear and defined. Many amplifiers muddy these sounds and makes them sound fake – the KS125.2 Mini had no problem. In spite of its diminutive size, it also produced a very solid bottom end. With its good damping factor and adequate power, it had no problem with the bass line of any song, even at quite enthusiastic listening levels.

There was some small emphasis on the letters 'l' and 'E' in Spanish Harlem, but hardly anything that would draw attention to a frequency response problem. This would also be overshadowed by speaker selection, location and the fact that this is intended to be used in a car where it's already noisy.

CONCLUSION

The KS125.2 Mini combines very good sound quality performance, 'right on the money' power output measurements and a compact size that makes finding a home for this amp in your car a pleasure rather than a burden. The fact that the amp isn't power hungry also means you can get away with an 8awg power kit instead of 4awg, saving you some money for a second amp for your system. Speaking of extra amps, the KS Mini series also includes the KS125.4 4x70W amplifier and will soon be joined by a mono-block amp around 500W. Imaging a complete amp rack with two amps the size of a 12-inch subwoofer? Freaking' awesome! If your car audio plans involve a great sounding system that doesn't take over every square inch of free space in your car, then you truly need to audition the Kar Series Mini amps! **PAS**



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