Engineering Perspective

Joey White

Hephaestus Audio

What sets a great class-D amplifier apart from a good class-D amplifier is *execution*. The ideal is not necessarily to be the best in any one particular area – the ideal is to be good in *all* of the important areas:

- **Sound quality**
- **Noise level**
- **Efficiency**
- **Size/weight**
- **Reliability**
- **Simplicity**
- **Value**

Unfortunately, many designs optimize one particular parameter at the expense of others. This does not yield the best overall solution from a system-level point of view. However, it is much easier to market a cool new "technology" than a simple, solid execution.

One of the reasons that this is such an important issue is that flaws in execution have a cascade effect. For example, a poor choice in circuit board layout not only affects that part of the circuit, but as the remaining layout is built up around it, it too is negatively affected, due to the compromises made in accommodating the bad decision made early on.

An important part of the execution is a focus on *simplicity*. Simplicity is the best general strategy to achieve reliability and excellent sound quality. Unfortunately, it is far too easy to make something overly complicated in an effort to optimize a given parameter, or to simply "get it done". Blaise Pascal once wrote "I made this letter longer than usual because I lack the time to make it short". This is precisely the issue with simple designs – although it is counterintuitive, the fact is that they take tremendous time and effort, but in the end it pays off.

It is important to bear in mind that there will always be a new amplifier class, or a new modulation scheme, or a new direct-digital amplifier, etc. However, none of these will really offer value to the customer if the execution is not solid.