

# Class-D Efficiency

Joey White

*Hephaestus Audio*

Many class-D efficiency specifications include only the efficiency of the amplifier itself and neglect losses incurred in the power supply and other components of the system. Some specifications go so far as to include only the MOSFET stage in the amplifier, which is potentially very misleading when attempting to compare alternate solutions.

Differences in rating class-D efficiency aside, a class-D amplifier is capable of much higher efficiency than a linear amplifier with typical program material. Here is an example using typical values for a class-D amplifier and a linear amplifier:

Representative output signal:	1/8 <sup>th</sup> power pink noise
Linear amplifier total system efficiency:	20%
Class-D amplifier total system efficiency:	70%
Output power:	250W
Linear amplifier losses:	1000W
Class-D amplifier losses	107W

The losses of the class-D amplifier are roughly 1/10<sup>th</sup> that of the linear amplifier for this example.

The efficiency at full rated output is usually specified, which fails to illustrate the great difference between class-D and linear amplifiers with real-world use. The following example uses typical full-power ratings for a class-D amplifier and a linear amplifier:

Representative output signal:	full-power sine wave
Linear amplifier total system efficiency:	65%
Class-D amplifier total system efficiency:	85%
Output power:	2000W
Linear amplifier losses:	1076W
Class-D amplifier losses	353W

The losses of the class-D amplifier are roughly 1/3<sup>rd</sup> that of the linear amplifier for this example.