

TS4962

Class D audio amplifier offers high quality sound coupled with outstanding efficiency



Today's mobile phones offer more media features than ever before – such as visiophone modes, FM radio reception, MP3 players and video clip players.

Quality audio is an essential part of these media features. The challenge is to provide the best sound possible, with the minimum power consumption and in the smallest amount of physical space.

Class D audio amplifiers have clear advantages in applications such as mobile phones. They offer up to 30% greater efficiency than traditional Class AB audio amplifiers, which translates into more output power per mA of battery used.

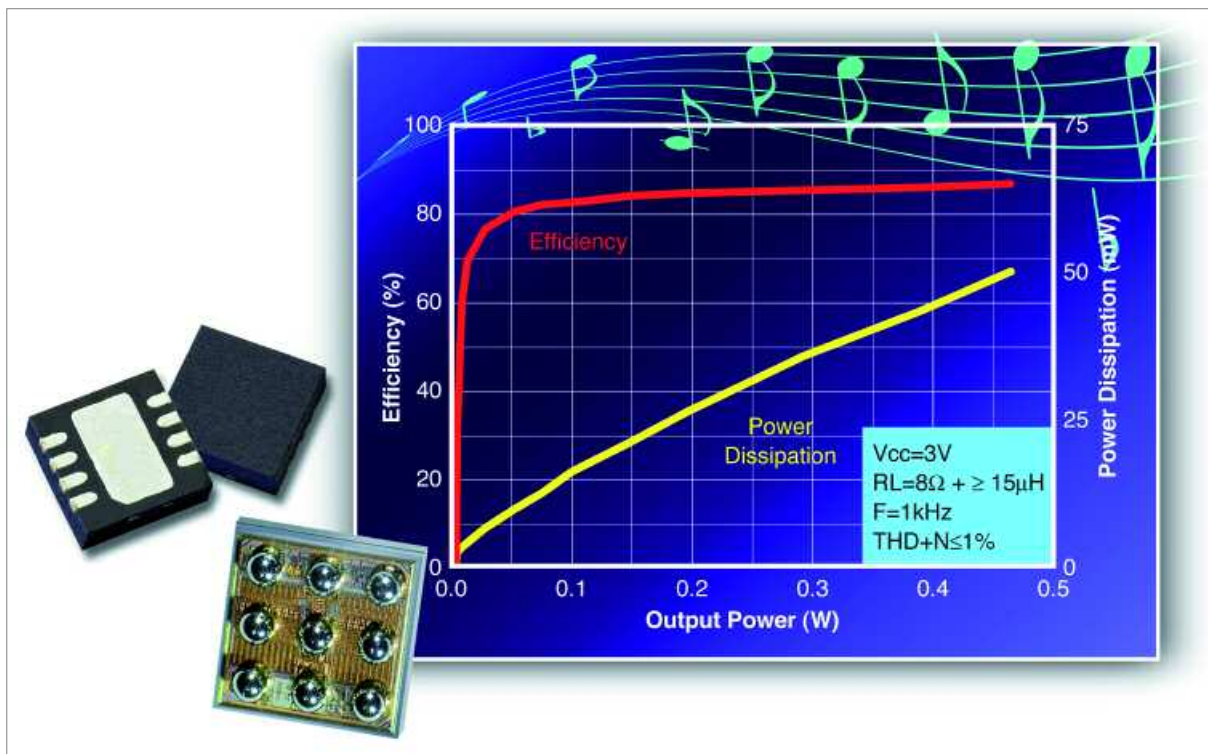
In addition, Class D audio amplifiers do not require output signal filtering, which reduces component count, cost and board space.

Key features

- >88% efficiency (as compared to approximately 60% efficiency for a Class AB audio amplifier)
- Up to 3W output power
- Very low distortion
- No external filtering required
- Optional input capacitors
- Available in Flip-Chip (9-bump 1.6 x 1.6mm) and DFN8 (3 x 3mm) packages

Benefits

- Longer battery life for a given output power
- Excellent signal quality
- Reduced bill of materials translates into cost and board space savings



What makes Class D amplifiers so special?

Class D audio amplifiers can offer greatly increased efficiency compared to Class AB amplifiers due to their circuit topology. Similar in scheme to a switching regulator, a Class D amplifier pulse width modulates the audio input signal with a higher frequency square wave so that the audio signal becomes the variations in pulse width of this modulated signal.

The frequency of the PWM oscillator is important as it determines both the output filter requirements and the sampling rate for the audio input. In STMicroelectronics' TS4962M, the best balance between performance and component size is achieved with an oscillator frequency that is at least 10 times the maximum signal frequency (which is typically 20kHz).

Theoretically, the optimum efficiency for a traditional Class AB linear-amplifier output stage is 78%, but linear amplifiers exhibit this efficiency only at their peak output power. However, the output stage of a Class D amplifier – because it uses a pulse-modulated signal to transport the audio signal – can be amplified with very low distortion (under 1% THD) and with theoretically limitless gain. The speakers themselves provide low pass filtering necessary to remove the PWM frequency of the signal, leaving just a pure, amplified audio signal. This means that Class D amplifiers not only offer high efficiency in terms of gain per power consumption, but also eliminate the need for additional filtering, thereby reducing total component count.



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