Fairchild Semiconductor’s Class-G Headphone and Class-D Speaker Amplifiers Help Audio Designers Balance Audio Power Versus Battery Life

Designers of mobile devices, such as smartphones, tablets/multimedia internet devices (MID), and portable media players, are faced with the challenge of making the small speakers in their devices sound louder and better, while minimizing impact on battery life.

To meet this challenge, Fairchild developed the FAB1200 stereo Class-G ground-referenced headphone amplifier with integrated buck converter, as well as the FAB2200 audio subsystem with stereo Class-G headphone amplifier and 1.2W Class-D mono speaker amplifier.

The FAB1200 features a charge pump which generates a negative supply voltage that allows the headphone output to be ground-centered and capacitor-free, eliminating up to two external capacitors. An integrated inductive buck regulator provides direct battery connection and adjusts the supply voltage between two different levels based on the output signal level resulting in reduced power consumption. The result of these features is reduced systems cost and extended battery runtime, while maintaining a high level of audio quality.

The device, available in a 16-bump, 0.4mm pitch, 1.56mm x 1.56mm WLCSP package, offers excellent audio performance for better sounding audio headsets and is ideal for mobile handsets, tablets/MIDs, MP3 and portable media players.

The FAB2200 is an audio subsystem that combines a capacitor-free stereo Class-G headphone amplifier with a Class-D speaker amplifier. A proprietary integrated charge pump generates multiple supply rails for a ground-centered Class-G headphone output significantly reducing power dissipation when compared to Class-AB design implementations, while offering high power supply rejection ratio.

The filterless Class-D amplifier can be connected directly to a speaker without the need for two external filter networks, reducing the overall solution systems cost. The device also features Automatic Gain Control which limits the maximum speaker output levels to protect speakers without introducing distortion. It can also dynamically limit clipping as the battery voltage falls.

The FAB1200 and FAB2200 mobile audio ICs make handsets, tablets/MIDs, and other portable audio applications sound louder and better while reducing overall systems cost and minimizing the impact on battery runtime.

The FAB2200, available in a 25-bump, 0.4mm pitch, WLCSP package, is ideal for cellular handsets, notebook computers and tablets.

To contact Fairchild Semiconductor about this product, please go to: http://www.fairchildsemi.com/cf/sales_contacts/ [1].

For information on other products, design tools and sales contacts, please visit: http://www.fairchildsemi.com [2].

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