High-fidelity headphone amplifier maximizes battery life

This highly efficient Class G, 2x25 mW headphone amplifier features dynamic power management and uses the I²C bus for volume control. It saves power and extends music playback in a range of portable applications.

**Key features**
- Output power: 2x25 mW into 16 or 32 Ω at THD+N = 1%
- Class G dynamic power management for high efficiency
- Power supply range: 2.3 to 5.5 V
- Very low THD+N at 0.02% at V_OC of 0.7 V_{CMOS} and RL of 47 Ω
- Integrated charge pump eliminates DC blocking capacitors, reducing cost and PCB space while improving audio fidelity at low frequencies
- Excellent PSRR: >100 dB
- S/N performance: 100 dB (min)
- I²C bus interface for volume control (-59 dB to ±4), independent channel enable, mute, and software shutdown
- Low supply current: 1.5 mA (typ)
- Low shutdown current: 5 μA (max)
- Self-limiting current with thermal protection and ground-loop noise suppression
- Pop-and-click suppression
- RoHS-compliant and 100% lead (Pb)-free packaging – 0.4 mm pitch WL-CSP (1.7 x 1.7 mm)

**Applications**
- Mobile handsets/music phones
- Portable media players
- Portable CD/DVD players
- Notebook PCs
- High-fidelity applications
The NXP Class G headphone amplifier SA58635UK delivers highly efficient operation in a small form factor and is ideal for use in a range of portable applications, including mobile phones, MP3/4 players, portable media players, and portable DVD players.

The I²C-bus volume control allows maximum flexibility with digital volume control, independent channel enable, and mute control.

A unique power-management technique provides Class G power efficiency by using a buck converter to step-down the battery supply from a typical Li-ion battery.

To increase efficiency even further, the output amplifier/driver is allowed to operate at multiple voltage rails based on the output/input swing.

To ensure reliability, the SA58635 provides self-limiting short-circuit protection and thermal overload protection.

**SA58635 Eval Board**

![SA58635 Eval Board](image)

More information:
www.nxp.com/i2c