![dialog SEMICONDUCTOR]

DA7218

DA7218 is a high-performance, low-power audio codec optimized for use in portable applications or wearable devices. It has single-ended headphone outputs with headphone detect for use in accessories, offering excellent left to right channel separation and common mode noise rejection.

DA7218 also has a stereo DAC to headphone output path and ultra-low power operating modes to support always-on audio detect applications.

DA7218 contains two analog microphone input paths, or up to four digital microphone input paths, or a combination of both. The other chip in this family, the DA7217 has differential headphone outputs without headphone detect, and has been designed for use inside headset devices.
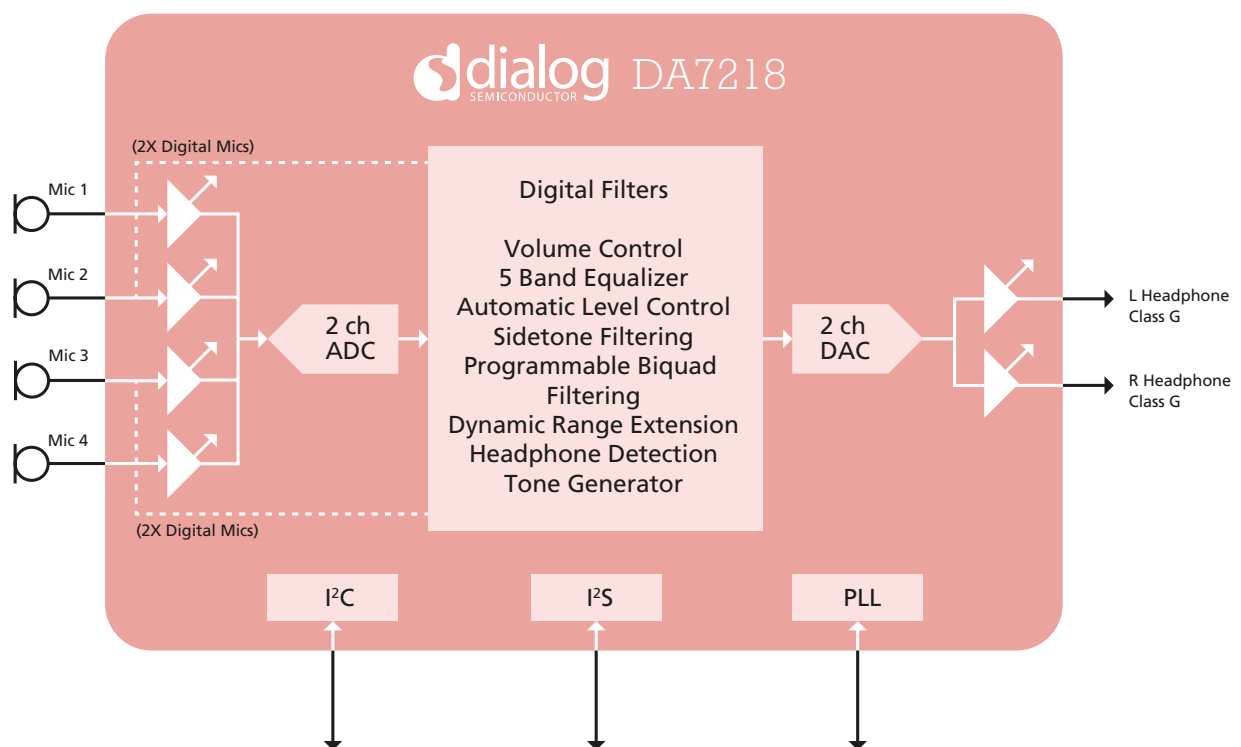
32 ball WLCSP package, 0.5 mm pitch

Features

▶ High performance stereo DAC to headphone playback path with 110 dB dynamic range
▶ 4 mW stereo playback power consumption
▶ DAC digital filters with audio and voice mode options, five-band equalizer and five programmable biquad stages
▶ Dedicated low-latency digital sideband filter with three programmable biquad stages
▶ High performance microphone to ADC record path with a 105 dB dynamic range
▶ 2.5 mW stereo record power consumption
▶ ADC digital filters with audio and voice mode options
▶ 500 µW always-on record mode with automatic level detection
▶ Hybrid analog / digital automatic level control to dynamically control the record level
▶ Shutdown mode offering current consumption during standby of 2.5 µA
▶ Two low-noise microphone bias regulators with programmable output voltage and ultralow power mode
▶ Ability to differentiate between stereo and mono headsets
▶ Automatic detection of headset removal and confirmation of headset insertion

▶ Voice mode filtering up to 32 kHz
▶ Flexible digital mixing from all seven inputs to all six outputs with independent gain on each mixer path
▶ Ability to run the ADCs at a different sample rate to the DACs on a single I2S interface
▶ Digital tone generator with built-in support for DTMF
▶ System controller for simplified, pop-free startup and shutdown
▶ Phase-locked loop with sample rate tracking supporting MCLK frequencies from 2 MHz to 54 MHz
▶ Automatic tuning of on-chip reference oscillator for clock-free operation in low-power modes
▶ 4-wire digital audio interface with support for I²S, four-channel I²S, TDM and other audio formats
▶ 2-wire I²C compatible control interface with support for High Speed mode up to 3.4 MHz
▶ 24-bit data at up to 96 kHz sample rate
▶ A high efficiency two-level, true-ground charge pump for generating class-G headphone supplies

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Applications

- ► Wired Headsets
- ► Wired Headphones
- ► Gaming Console Controller
- ► Audio Accessories
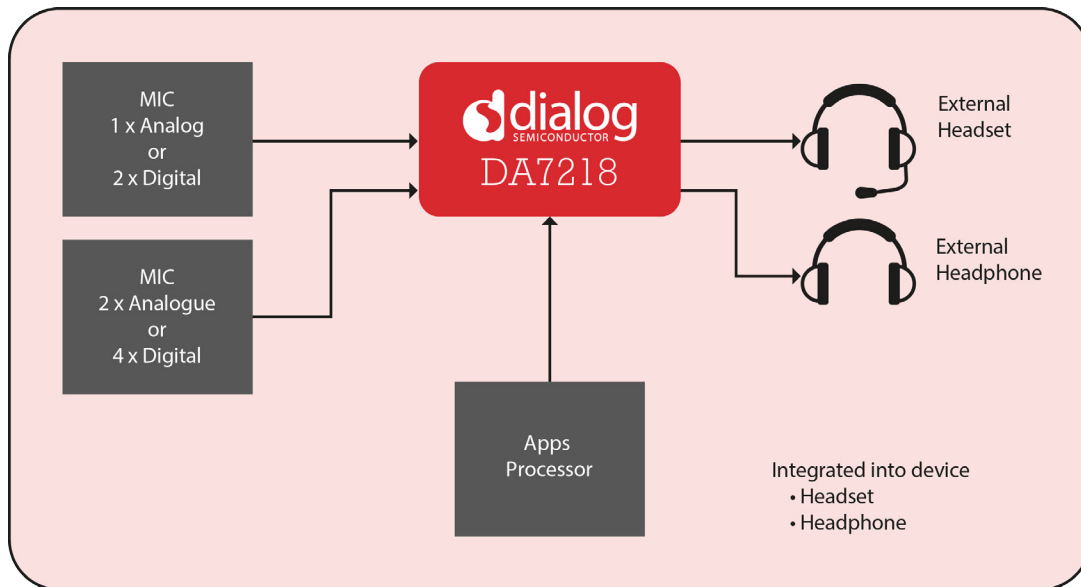- ► Portable Media Player
- ► Tablet & ebooks

Block Diagram

dialog SEMICONDUCTOR DA7218

(2X Digital Mics)

Mic 1
Mic 2
Mic 3
Mic 4

2 ch ADC

Digital Filters

Volume Control
5 Band Equalizer
Automatic Level Control
Sidetone Filtering
Programmable Biquad
Filtering
Dynamic Range Extension
Headphone Detection
Tone Generator

(2X Digital Mics)

2 ch DAC

L Headphone Class G

R Headphone Class G

I²C   I²S   PLL

Feature highlights

- ► Superior hi-fidelity audio performance for immersive record and playback
- ► Sub 500 µW always-on power extends battery life for audio activity detection
- ► Flexible programming filtering (sideband, voice) enhances voice and audio playback
- ► Mixed sample rate support for wideband applications
- ► Supports the latest generation of low power analog and digital microphones
- ► Small package footprint with an optimized ball-out conducive to low cost PCB manufacturing

Audio System diagram