

Synaptics® CX22721 I²S 2W CODEC

AudioSmart® Product Brief

High Performance Stereo Class-D Amplifier for Advanced In-Air Playback

The Synaptics CX22721 is a high performance, stereo class-D amplifier designed to enable advanced in-air playback functionality for systems that use Synaptics Voice Processors.

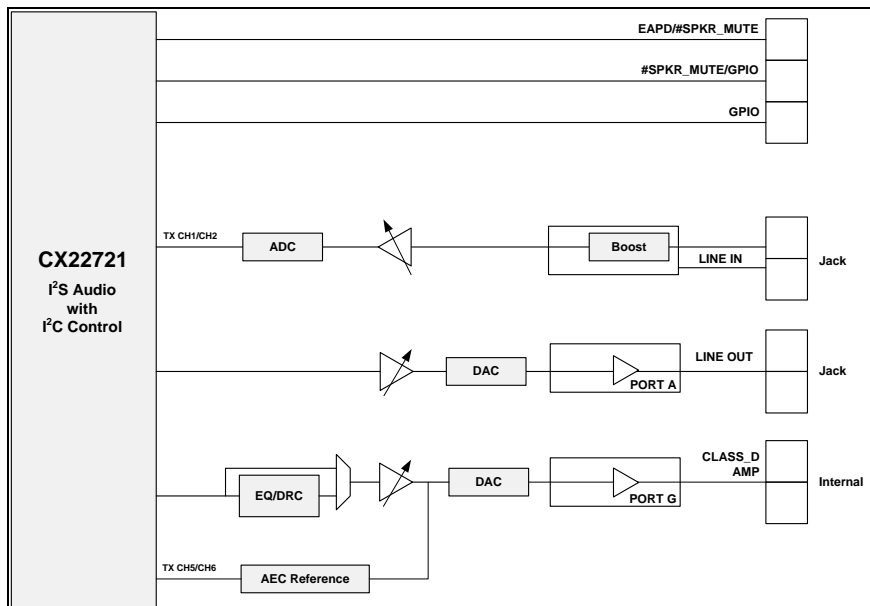
The CX22721 features I²S audio I/O with I²C control, dedicated hardware DSP effects for speaker tuning, and an Acoustic Echo Canceler (AEC) reference output optimized for Synaptics Voice solutions.

The CX22721 provides 2W per channel output with 1% distortion at 5V PVDD with a 4Ω speaker, and 1.3W per channel output with an 8Ω speaker. The Class-D amplifier uses programmable signal dynamics management and power-averaging technology to safely maximize sound pressure level.

The Synaptics SpeakerShield provides industry-leading, real-time protection with features including load-based DC detection, short-circuit, near-short, high temperature, and over-temperature protection. The device also supports a high-quality Line Out port with Headphone Drive capability.

The host interface provides selectable signaling levels of 1.8V and 3.3V. The Digital-to-Analog converters (DACs) support sampling frequencies of 44.1k, 48k, 96k, and 192kHz. Multiple General Purpose Input/Outputs (GPIOs) are available, as well as a bi-directional External Amplifier Power-Down (EAPD) function for advanced Power Management.

System Block Diagram



Dedicated hardware DSP capabilities enable a high-quality audio experience, especially as part of a closed-loop system with a Synaptics Voice Processor. This includes a 7-band/channel hardware EQ and a single-band DRC (with a single knee) which, independent of any host-based effects, can be combined to optimize speaker response and increase device loudness while simultaneously minimizing distortion.

A programmable high-pass filter on the Class-D output removes DC offset from the I²S audio channels, protecting the speakers from overheating.

Key Features

- Stereo AudioSmart Class-D Speaker Amplifier
 - Speaker Amp companion device for Synaptics Voice Processors
 - Digital I²S input and 44.1k, 48k, 96k, and 192kHz sample rate support
 - 2W output @ 1%THD (PVDD=5V, 4Ω load)
 - 1.3W output @ 1%THD (PVDD=5V, 8Ω load)
 - Programmable Dynamic Range Compression (DRC) for SPL maximization and speaker protection
 - Programmable 7-band Equalizer (EQ) for speaker/chassis tuning and distortion control
- 42-pin QFN package

Applications

- Voice-controlled STB
- Smart Bluetooth/WiFi speaker
- Voice interactive smart appliances
- Internet of Things (IoT) devices

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Additional Features


- Stereo AudioSmart Class-D Speaker Amplifier
 - Post processed I²S reference output for advanced echo cancellation with a Synaptics Voice Processor
 - High quality, Stereo Line Out port with headphone drive capability
 - GPIOs and bi-directional EAPD for advanced power management
 - Host interface supports 1.8V or 3.3V signaling levels
- SpeakerShield real-time, load-based monitoring for DC, (near) short-circuit, and temperature protection

System Compatibility

- Stereo AudioSmart Class-D Speaker Amplifier
- I²S for Audio Streaming and I²C for control
- Windows 8.x/10
- Linux®
- Android™

Ordering Information

Ordering Part Number	Part Number	Revision	Audio Stereo Amplifier Package Type	AudioSmart Class-D	Conditions
CX22721-11Z	CX22721	-11Z	42-QFN, 5x5 mm	Yes	0 to 70°C

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