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

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
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

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<tr>
<th>Ordering Part Number</th>
<th>Part Number</th>
<th>Revision</th>
<th>Audio Stereo Amplifier Package Type</th>
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The devices in this publication are lead-free (Pb-Free) and China RoHS compliant.

Contact your local Synaptics sales office for advanced software options.

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