High-Power Audio Amplifiers

Big sound. Small footprint. Great listening experience.

Texas Instruments



At Texas Instruments, we believe in empowering our customers to design systems with the highest quality listening experience. Our history in audio, our best-in-class system expertise, and our commitment to customer satisfaction enables us to design products and ecosystems that make it easier for you to develop audio solutions.

HR

High-Resolution
Deliver audio as it was recorded all the way to the speaker. The TPA32xx family supports high-resolution audio.

High-Bandwidth
The TPA32xx family of devices support up to 100 kHz audio bandwidth.

High-Power
Devices with 35 W to 650 W of output power that deliver large sound in a compact size.

Low-Distortion
A new closed-loop design enables ultra-low THD across all frequencies.

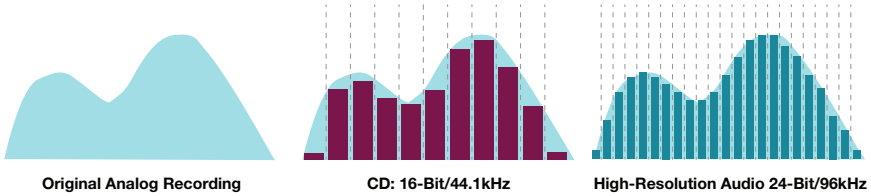
Efficient Design
Best power efficiency and idle losses enable low power consumption and a smaller heat sink.

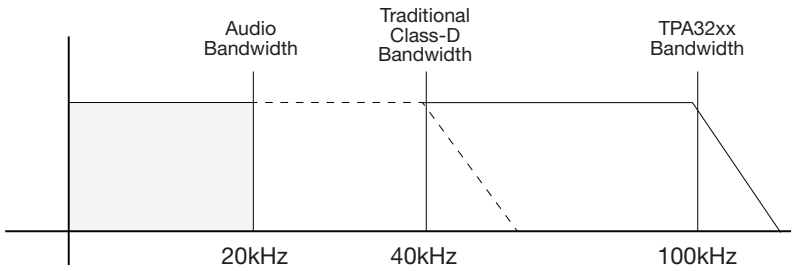
Easy to Use
Simplify PCB design with fewer external components, integrated protection, and scalable power options.

High-Resolution Audio

High-resolution audio offers listeners the ability to hear audio as it was originally recorded. Higher sampling rate Digital-to-Analog Converters (DAC) and higher bandwidth amplifiers are key to delivering hi-res audio all the way to the speaker.

The TPA32xx series of amplifiers support high-resolution audio playback with a large audio bandwidth (100 kHz) and unique features that reduce distortion.

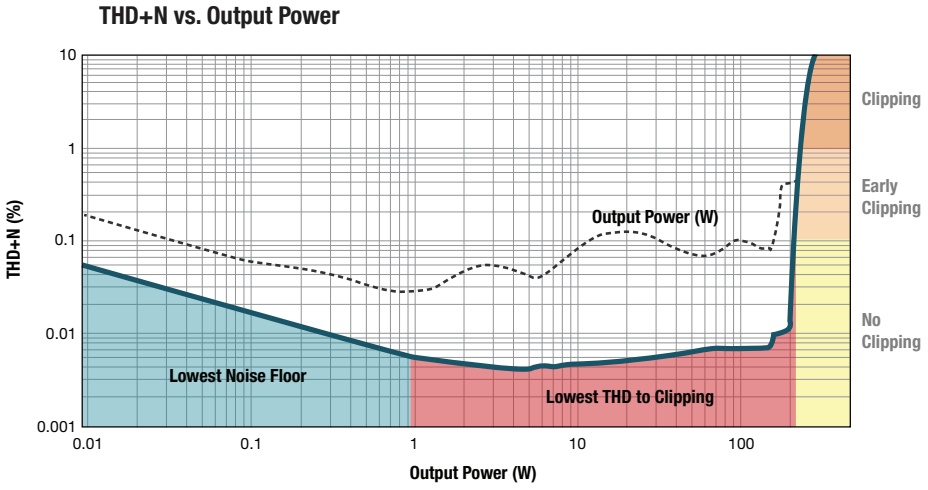




Total Harmonic Distortion and Noise (THD+N)

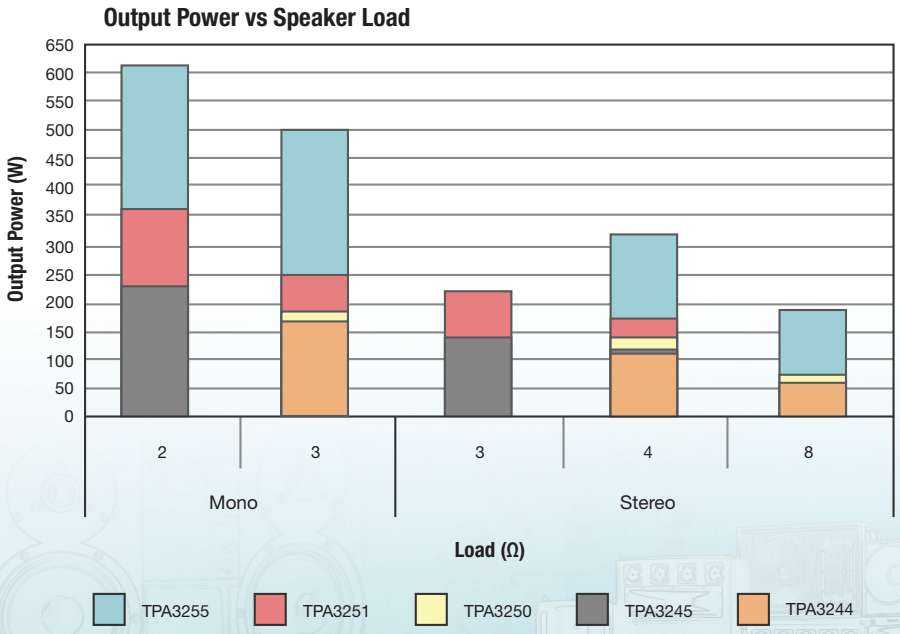
To achieve the best and most accurate audio quality we have designed the TPA32xx with the **lowest noise floor and total harmonic distortion (THD+N)** of any integrated Class-D.

Compared to other Class-D amplifiers (dashed line), the TPA32xx THD+N (blue) is well below the competition.



High-Power Audio

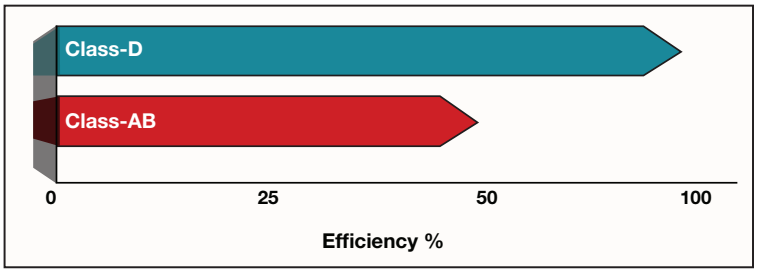
The TPA32xx family provides output options from 35 W to 650 W. Start your design by selecting the right part for your audio output power level.



www.ti.com/highpoweraudio

Efficiency

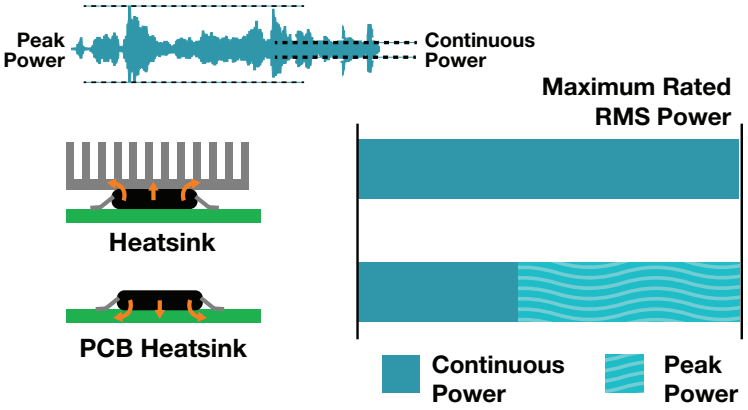
- **High efficiency at full output power**
  Nearly twice as efficient as Class-AB amplifiers.
- **Lowest idle power loss ratio**
  Up to 650 W output power with only 1 W of idle power loss.



Peak Power vs. Continuous Power

Audio consists of a small number of peaks with low average power that may allow you to eliminate the heatsink and save space.

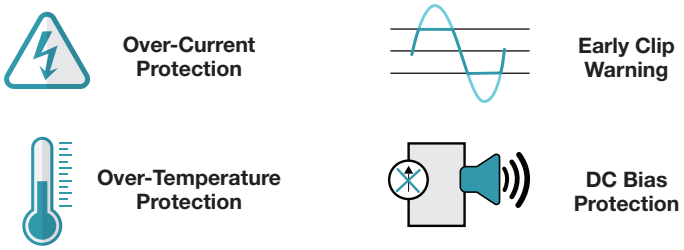
Selecting the correct package and thermal management is easier with the TPA32xx family. Choose from pad-up or pad-down package options that allow either a heatsink or the PCB to be used for dissipating heat.



Integrated Protection

Reduce the solution size by half with integrated fault protection.

The TPA32xx family includes a number of protection features to ensure your product and speakers are safe.

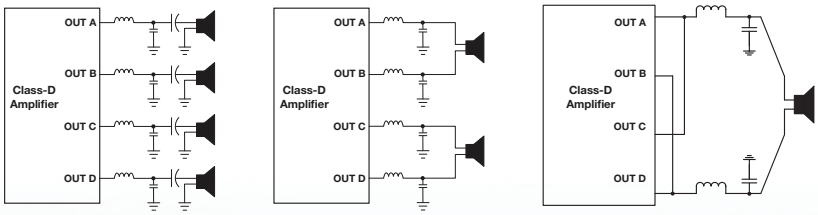


Flexible Design Options

The TPA32xx family supports multiple output configurations all in the same pin-compatible package:

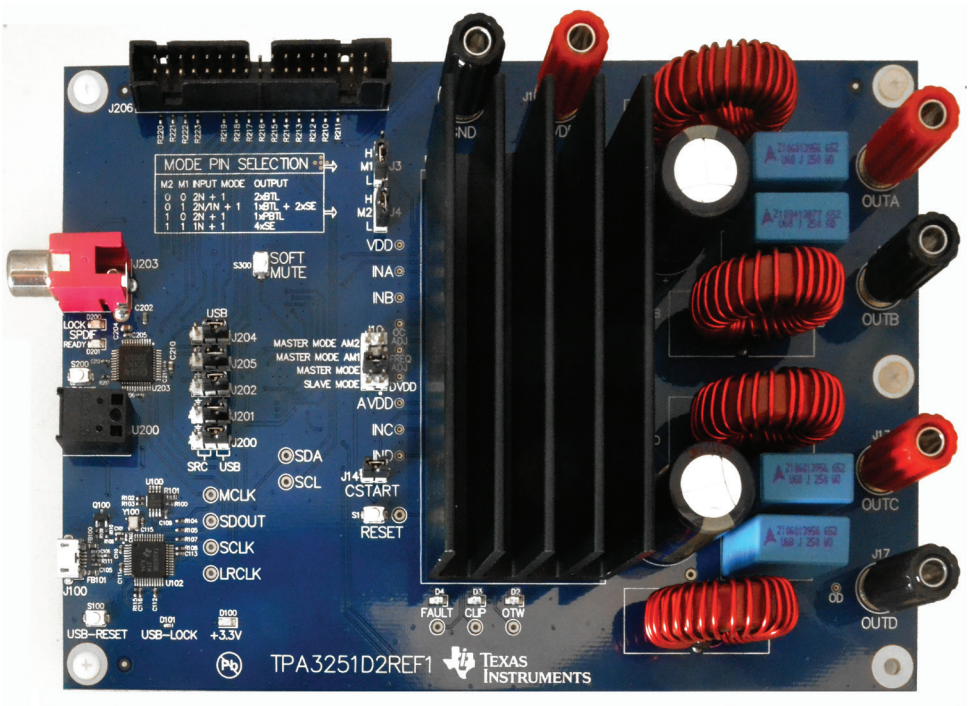
- 4-channels - Singled ended (SE)
- Stereo - Bridge-tied load (BTL)
- Mono - Parallel bridge-tied load (PBTL)

The TPA32xx family is pin-to-pin compatible for simple and easy reuse.



Reference Design

The TIDA-00874 TI Design turns the extremely high-performance analog input TPA3251 Class-D amplifier into a digital input system with audio processing, using the highly versatile PCM5242 differential output DAC. The design accepts USB, optical, SPDIF, and I^{2}S digital formats. The PCM5242 DAC includes a mini-DSP for processing flexibility and a fully differential output that directly connects to the TPA3251.



175 W Class-D Amplifier with Digital Input TI Design.

Target Applications

- Wireless speakers
- Sound bar
- Audio-video receiver (AVR)
- Subwoofers
- Professional home cinema
- PA speakers
- Distributed audio amplifier

TPA32xx High-Power, High-Performance Class-D Amplifiers

	TPA3244	TPA3245	TPA3250	TPA3251	TPA3255
Max Power to BTL/ Ch (W)	110	145	130	220	315
Max Power to PBTL (W)	160	230	190	355	605
Min Supported BTL Load (Ω)	4	3	4	3	4
Power Stage Supply Max (V)	31.5	31.5	38	38	53.5
Thermal Pad Location	Bottom	Top	Bottom	Top	Top
Package	44HTSSOP[2]	44HTSSOP[1]	44HTSSOP[2]	44HTSSOP[1]	44HTSSOP[1]
Dimensions	6.1 x 14mm				

[1]Pad-Up, pin-compatible package
[2]Pad-Down, pin-compatible package
Power numbers taken at 10% THD+N

More Information

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- Technical Documents
- Support & Training
- Product Selection Tool

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Audio Amplifiers Support Forum
Search for solutions, get help and share knowledge with fellow engineers

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