High-Power Audio Amplifiers

Big sound. Small footprint. Great listening experience.

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.

### Advanced Signal Path
Innovative new modulation schemes and advanced feedback loop design to achieve nothing but the best device performance.

### High-Resolution and Bandwidth
Deliver audio as it was recorded all the way to the speaker. The TPA32xx family supports 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.

### 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, scalable power options, and pin-to-pin compatibility.

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

www.ti.com/audio
The High Power Audio benefit

High-Resolution Audio

High-resolution audio offers listeners the ability to hear audio as it was originally recorded and higher bandwidth amplifiers are the key to delivering hi-res audio all the way to the speaker.

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

Efficiency

High efficiency at full output power
Nearly twice as efficient as Class-AB amplifiers

High power, low idle loss
Output up to 650W, idle losses as low as 0.3W

Play music longer from battery
Industry leading low idle losses save power

Peak Power vs. Continuous Power

Audio consists of low average power with few peaks that may allow eliminating the heatsink to save space.

The TPA32xx family offers pad-up and pad-down package options that allow either a heatsink or just the PCB to be used for dissipating heat.

Integrated Protection

The TPA32xx family integrates many protection features to save space and ensure the safety of your product and speakers.

Flexible Design Options

The TPA32xx devices support multiple output configurations all in the same package:

- 4-channels - Single-ended (SE)
- Stereo - Bridge-tied load (BTL)
- Mono – Parallel bridge-tied load (PTBL) in post- or pre-filter

Family devices are pin-to-pin compatible for fast and easy reuse.
TPA324x/5x
The highest performing monolithic Class-D in the industry

Ultra HD Audio
To achieve the best and most accurate audio quality we designed the TPA324x/5x with the lowest noise floor and total harmonic distortion (THD+N) of any integrated Class-D.

Combined with a Signal to Noise ratio (SNR) of >110dB, the TPA324x/5x sets a new quality standard for audio amplification while achieving efficiency levels well above 90%.

<table>
<thead>
<tr>
<th>Device</th>
<th>Max Power to BTL/Ch (W)</th>
<th>Max Power to PBTL (W)</th>
<th>Power Stage Supply Max (V)</th>
<th>Thermal Pad Location</th>
<th>Package</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPA3244</td>
<td>110 (4Ω)</td>
<td>160 (3Ω)</td>
<td>31.5</td>
<td>Bottom</td>
<td>44HTSSOP2</td>
<td>6.1 x 14mm</td>
</tr>
<tr>
<td>TPA3245</td>
<td>145 (3Ω)</td>
<td>230 (3Ω)</td>
<td>31.5</td>
<td>Top</td>
<td>44HTSSOP1</td>
<td>6.1 x 14mm</td>
</tr>
<tr>
<td>TPA3250</td>
<td>130 (4Ω)</td>
<td>190 (3Ω)</td>
<td>38</td>
<td>Bottom</td>
<td>44HTSSOP2</td>
<td>6.1 x 14mm</td>
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<tr>
<td>TPA3251</td>
<td>220 (3Ω)</td>
<td>355 (2Ω)</td>
<td>38</td>
<td>Top</td>
<td>44HTSSOP1</td>
<td>6.1 x 14mm</td>
</tr>
<tr>
<td>TPA3255</td>
<td>315 (4Ω)</td>
<td>605 (2Ω)</td>
<td>53.5</td>
<td>Top</td>
<td>44HTSSOP1</td>
<td>6.1 x 14mm</td>
</tr>
</tbody>
</table>

TPA322x
Lowest idle loss, rich features and an outstanding value

Innovate Your Design
The TPA322x family is packed with integration and features to make designs simpler yet far more efficient. The TPA322x family can stretch the runtime of a battery with its high efficiencies and incredibly low idle losses.

TPA322x features selectable gains, single rail supply or optional 5V gate drive, a mute pin, integrated protection including cycle-by-cycle current limiting, and support for the new HEAD modulation scheme.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>TPA3220</td>
<td>110 (4Ω)</td>
<td>155 (3Ω)</td>
<td>32</td>
<td>Bottom</td>
<td>44HTSSOP2</td>
<td>6.1 x 14mm</td>
</tr>
<tr>
<td>TPA3221</td>
<td>105 (4Ω)</td>
<td>208 (2Ω)</td>
<td>32</td>
<td>Top</td>
<td>44HTSSOP1</td>
<td>6.1 x 14mm</td>
</tr>
</tbody>
</table>

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

www.ti.com/audio
Setup and Listen for Yourself.
Experience TI Class-D amplifiers by listening to the performance for yourself with an Evaluation Module (EVM). EVMs are available for all Class-D amplifiers. Pair it with an Audio Plug-in Module (APM) and evaluate the whole signal chain fast and easy.

Guides and Application Notes

Device Configuration Tools
Choose your setup and we’ll do the math.

A step-by-step setup guide and configuration tool for all TI Class-D amplifiers.

LC Filter Designer
Calculate and design your Class-D LC filter.

ti.com/tool/lcfilter-calc-tool

Application and Tech Notes
Expand your knowledge and become an expert.

TI TechNotes
- Post-Filter Feedback (SLAA788)
- LC Filter Design (SLAA701A)
- Multi-Device Configuration (SLAA787)
- HEAD Modulation (SLAA810)
- Analog Input Grounding (SLAA719)

TI Designs for Audio
Complete reference designs with schematic, layout and design guide.

- Dolby Atmos® Soundbar (TIDA-01414)
- Digital-Input Amplifier (TIDA-00874)
- Automotive External Amp (PMP11769)
- Universal 3.3V/12V/36V PSU (PMP10215)
- Wireless Subwoofer (TIDA-00232)
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