

# TFA9894D High-Efficiency Audio Amplifier

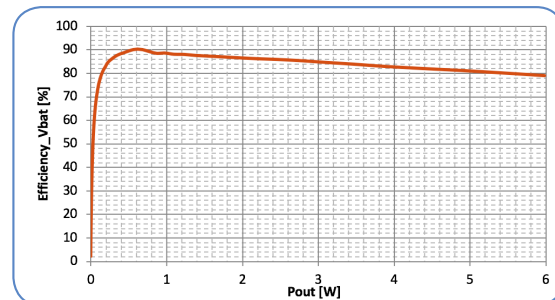
High-power, efficient-smart amplifier with easy-routing capability for a single-layer PCB design for today's IoT and consumer applications

TFA9894D is a high efficiency 10 V boosted Class-D audio amplifier with a sophisticated SpeakerBoost and protection algorithm, delivering up to 5.6 W (AVG) output power into an 8  $\Omega$  speaker, and up to 6.2 W (AVG) output power into 4  $\Omega$  speaker at a battery supply voltage of 4 V.

## FEATURES AND BENEFITS

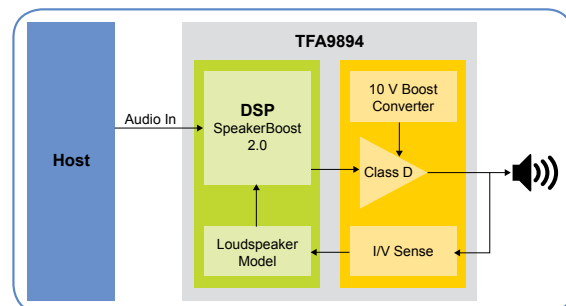
- ▶ High output power with 10V boost voltage
  - 5.6 W with 8 ohm load
  - 6.2 W with 4 ohm load
- ▶ Best-in-class efficiency
  - 91% peak efficiency for 600 mW sinewave
- ▶ Exceptional power efficiency enables highest capability and dynamic range
  - Up to 112dB on 8 ohm speaker
- ▶ Small package size
  - 2.51 mm x 3.55 mm x 0.525 mm
- ▶ Easy routing pinning support
  - One layer PCB possible layout design
- ▶ Audio enhancement and speaker protection algorithm
  - SpeakerBoost 2.0 algorithm embedded for drums and audio quality improvement

## EFF VS PWR



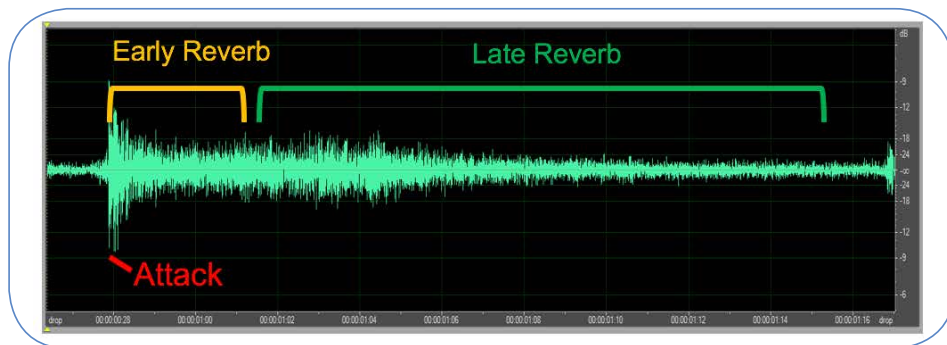
High efficiency – Intelligent adaptive boost mechanisms which enable boost and track audio signal

## TFA9894



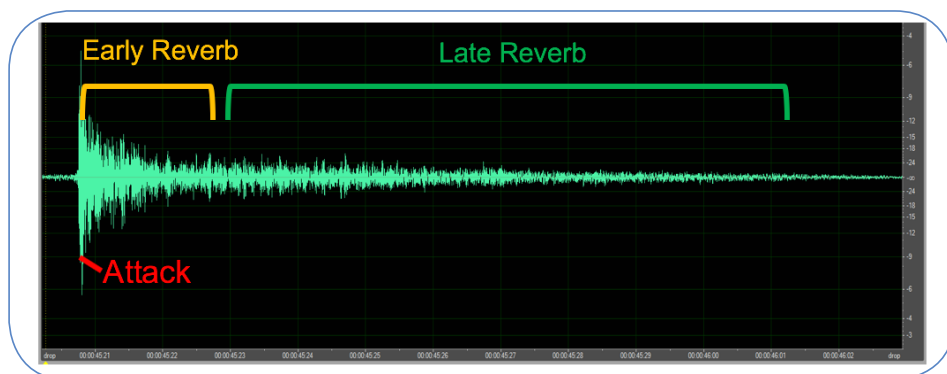
## KEY SPECIFICATIONS

- ▶ SPK Class-D
  - 5.6 W with 8 ohm load (THD <1%;  
 $V_{BAT} = 4\text{ V}$ )
  - 6.2 W with 4 ohm load (THD <1%;  
 $V_{BAT} = 4\text{ V}$ )
  - 14  $\mu\text{Vrms}$  noise floor
  - 91% peak efficiency for 600 mW  
sinewave
- ▶ Four TDM/I2S I/O pins
  - Support for 8 slots
  - Input for main audio stream
  - Input for selected secondary audio  
stream
- ▶ Multiple sample rate support
  - 16 k/32 k/44.1 k/48 kHz sample rate  
support
- ▶ MCU platform digital I/O support
  - 3.3 V digital I/O required
- ▶ SpeakerBoost 2.0 Integrated
- ▶ NXP® audio software suite
- ▶ Enhanced battery safeguard



## COMPETITION — WEAKER DRUMS REPRODUCTION

- ▶ Attack – less impact
- ▶ Early reverb – less bass due to protection limiter
- ▶ Early reverb – more background noise



## TFA9894 — IMPROVED DRUMS REPRODUCTION

- ▶ Attack – sharper, more impact
- ▶ Early reverb – more bass
- ▶ Early reverb – less background noise

Smart Amplifier Product Overview				
Features	TFA9892	TFA9894D	TFA9874	TFA9896
Embedded DSP	Yes	Yes	No	Yes
Package Size (mm <sup>2</sup> )	10/11	8	6	6
Customer Sample	Available	Available	Available	Available
Audio Input Interfaces	I <sup>2</sup> S/PDM	I <sup>2</sup> S/TDM	I <sup>2</sup> S/TDM	I <sup>2</sup> S/TDM
Boost Voltage	12 V	10 V	10 V	6.1 V
RMS Output Power ( 8 ohm)	6.6 W	5.6 W	5.6 W	2.1 W
RMS Output Power ( 4 ohm)	7 W	6.2 W	6.2 W	3.2 W
Speaker Channels	Mono	Mono	Mono	Mono
Typical Speaker Load (Ω)	4/8/32	4/8/32	4/8/32	4/8/32
SNR (dB)	115	113	113	102
MB-DRC	Yes (3-band)	Yes (Multiband)	(On Host)	None
Noise (μV) / Receiver Mode	16	14	14	30/18