



12V smart audio amplifier for deeper bass

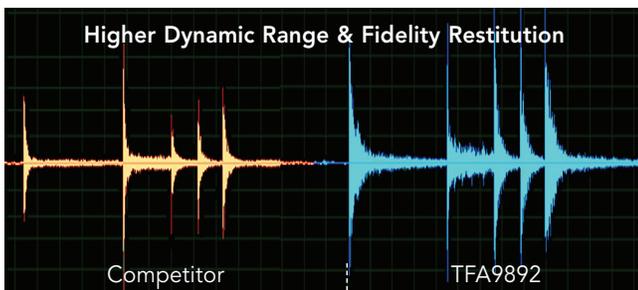
## TFA9892 Smart Power Amplifier



With the first 12V peak voltage on the market, the NXP TFA9892 smart amplifier offers superior loudness capability. Smart PA greatly enhances user experience, the user interface, sensing and more.

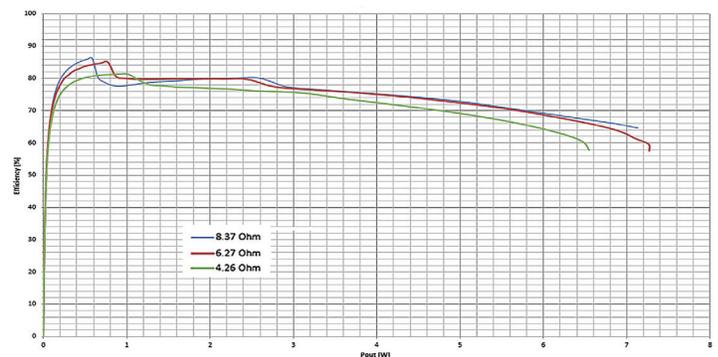
### FEATURES AND BENEFITS OF TFA9892

- ▶ Higher output power
  - 6.6W output on 8 Ohm speaker
  - 12V boost voltage
- ▶ State-of-the-art mixed IC performance
  - Low Noise: 16  $\mu$ Vrms
  - >80% Efficiency when playing standard audio
  - Adaptive boost
- ▶ Multi-band DRC
- ▶ Speaker protection 2.0
- ▶ Proposed with NXP® Audio Software suite
- ▶ PCB compatible with TFA9891 and TFA9911
- ▶ Package size 3.13 x 3.63 mm



**12V PEAK VOLTAGE** – Exceptional power efficiency enables highest capability and dynamic range on 8 Ohm speaker

### EFFICIENCY vs P<sub>OUT</sub>



**HIGH EFFICIENCY** – Intelligent adaptive boost mechanisms which enable boost and track audio signal.

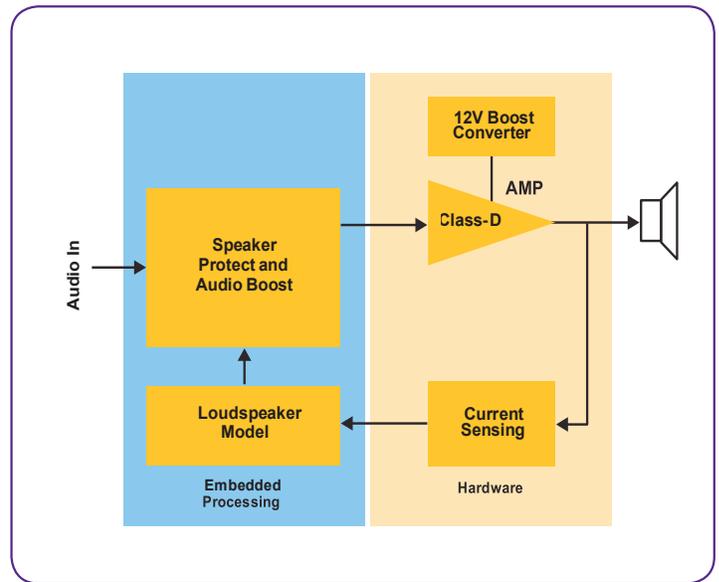
**BETTER DRUMS RESTITUTION FOR DEEPER BASS** – Reproduce lower audio frequencies than traditional systems with less clipping in the amplifier and less distortion from speaker



## KEY FEATURES

- ▶ **SPK Class-D**
  - 6.6W into 8 Ohm (THD <1%; VBAT = 4V)
  - >7W into 4 Ohm (THD <1%; VBAT = 4V)
  - Low noise: 16  $\mu$ Vrms
  - Efficiency >80% (Pout=0.4W)
  - Dedicated low-power output stage to reduce power consumption
- ▶ **Up to 12V DC-DC Boost**
  - Signal Adaptive Boost
  - Single coil support for stereo left and right device
- ▶ **Four TDM/I2S I/O pins**
  - Support for 8 slots
  - Input for main audio stream
  - Stereo sync between left and right devices
  - Input for selected secondary audio stream
- ▶ **Ultrasonic support on TDM (16 kHz/192 kHz)**
- ▶ **PDM interface**
  - Input for ANC and sidetone
- ▶ **SpeakerBoost 2.0 Integrated**
- ▶ **NXP® Audio Software suite**
- ▶ **Enhanced battery safeguard**
- ▶ **Sinewave generator for ultrasound generation**

## TFA9892 BLOCK DIAGRAM



## SMART AMPLIFIER PORFOLIO

		Size Optimized Products	
		TFA9895	TFA9896
Product Information	Embedded DSP	Yes	Yes
	Package type	WLCSP29	WLCSP30
	Package size	3.19 x 2.07 x 0.6	2.72 x 2.06 x 0.5
Interfaces	Audio input interface	2 x TDM-I2S	TDM-I2S 2 Data
	Inter-chip communication	TDM-I2S	TDM-I2S 2 Data
	AAEC feedback	Yes	Yes
Performance	Boost voltage	5.3 V	6.1 V
	RMS output power (8 $\Omega$ )	1.65 W	2.1 W
	RMS output power (4 $\Omega$ )	2.65 W	3.2 W
	Speaker channels	Mono	Mono
	Typical speaker load ( $\Omega$ )	4-8	4-8-32
	PSRR (dB)	90	90
	SNR (dB)	97	100
	MB-DRC	(On Host)	(On Host)
	TDH+N	0.03%	0.03%
Noise ( $\mu$ V)/receiver mode	45/31	27/18	
Special Features	Speaker as microphone	No	No
	Smart tap detection	No	No

Premium Products			
TFA9891	TFA9892	TFA9872	TFA9888
Yes	Yes	No	Yes
WLCSP49	WLCSP49	WLCSP42	WLCSP99
3.43 x 2.98 x 0.6	3.63 x 3.13 x 0.5	3.13 x 2.46 x 0.5	4.37 x 3.82 x 0.5
2 x TDM-I2S or 1 x PDM	2 x TDM-I2S or 1 x PDM	TDM-I2S 2 Data	TDM-I2S 3 Data and PDM
TDM-I2S, PDM	TDM-I2S, PDM	TDM-I2S 2 Data, PDM, Aux SAM	TDM-I2S 3 Data, PDM, 4 GPIOs
Yes	Yes	Yes	Yes
9.5 V	12 V	9.5 V	9.7 V
3.7 W	6.6 W	5.1 W	2 x 2.4 W
3.7 W	7 W	6 W	2 x 2.4 W
Mono	Mono	Mono	Stereo
4-8	4-8-32	4-8-32	8-32
75	75	80	80
97	115	100	103
Yes (3-band)	Yes (3-band)	(On host)	Yes (7-band)
0.03%	0.04%	0.04%	0.03%
66	16	19	42/11
No	No	(On host) V2.0	No
No	No	(On host) V2.0	No