

**125mW Direct Drive Line Drivers/Headphone Amplifiers
with 3D-Surround and Bass-Boost**

FEATURES

- Adjustable 3D Surround Function
- Adjustable Bass Boost Function
- Direct Drive Outputs Eliminate DC-Blocking Capacitors, Save Space
- Excellent Bass Fidelity
- Shutdown and Startup without any Click-Pop Noise
- Exceptional Low THD+N: 0.001% Minimum
- Absolutely Low Noise and High SNR Performance, $V_N: 7\mu V$, SNR: 112dB
- Differential or Single-Ended Input
- Wide 2.5V to 5.5V Operating Range
- Output Power: 125mW ($f_{IN} = 1kHz, V_{DD}=5V, R_L=32\Omega$, THD+N=1%);
- Output Voltage Swing:
3Vrms ($f_{IN} = 1kHz, V_{DD}=5V, R_L=1k\Omega$, THD+N<0.1%);
2Vrms ($f_{IN} = 1kHz, V_{DD}=3.3V, R_L=600\Omega$, THD+N<0.1%);
- Pb Free Packages, QFN24L-PP 4mm*4mm, Extremely Simple BOM Needed

APPLICATIONS

- Headphones
- Set-Top Boxes
- Simple Multimedia Interfaces
- Blue-ray and DVD Players
- Prosumer Audio Devices
- Televisions

DESCRIPTION

The HT97230 is a differential input Direct Drive line driver/headphone amplifier, which can also drive single-ended input signal. It is capable of driving line level loads with 3VRMS into 1k Ω with a 5V supply and 2VRMS into 600 Ω loads from a 3.3V supply. A headphone load is capable of being driven with 125mW into 32 Ω with a 5V supply.

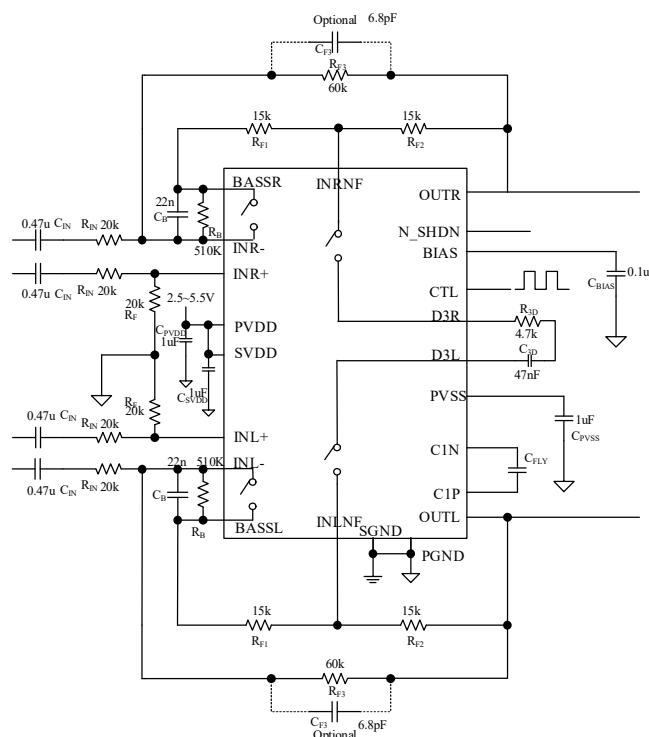
The IC performs excellent 3D surround technology realizing natural surround sound field regarded center orientation. The IC also integrates dynamic bass boost technology to provide graceful bass sound with low distortion. Both 3D surround and bass boost function is adjustable through external resistors and capacitors.

The IC is offered with an externally set gain through external resistors (or an internally fixed 6dB gain which needs to be pre-booked). The external gain setting nodes can also be used to configure filters for set-top box applications. The IC has exceptional THD+N over the full audio bandwidth.

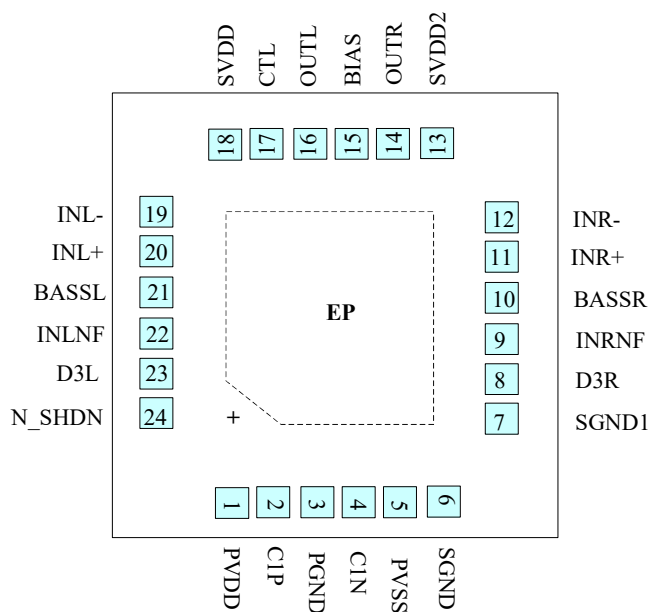
Two versions of the IC can be chosen with different turn-on times (t_{ON}). The versions for headphone applications feature a t_{ON} of 5.5ms while the version, intended for set-top-box applications, which needs to be pre-booked, feature a 130ms t_{ON} . An on-chip charge pump inverts the power-supply input, creating a negative rail. The output stage of the amplifier is powered between the positive input supply and the output of the charge pump. The bipolar supplies bias the output about ground, eliminating the need for large, distortion-introducing output coupling capacitors. The IC shutdowns and startups without click-pop noise.

The IC is available in a 4mm x 4mm, 24-pin QFN-PP and is specified over the extended -40 $^{\circ}C$ to +85 $^{\circ}C$ temperature range. 20-pin QFN-PP is also available only when pre-booked.

TYPICAL APPLICATION



■ TERMINAL CONFIGURATION



■ TERMINAL FUNCTION

PIN	NAME	Description
1	PVDD	Charge-Pump Power-Supply Input. Bypass to PGND with 1uF.
2	C1P	Positive Flying Capacitor Connection. Connect a 0.1uF capacitor between C1P and C1N.
3	PGND	Power Ground. Connect PGND and SGND together at the system ground plane.
4	C1N	Negative Flying Capacitor Connection. Connect a 0.1uF capacitor between C1P and C1N.
5	PVSS	Negative Charge-Pump Output. Bypass to PGND with 1uF.
6	SGND	Signal Ground. Connect PGND and SGND, SGND1 together at the system ground plane.
7	SGND1	Signal Ground. Connect PGND and SGND, SGND1 together at the system ground plane.
8	D3R	3D Control Pin
9	INRNF	Right Channel Feedback.
10	BASSR	Right Channel Bass Control Output.
11	INR+	Right Positive Polarity Input
12	INR-	Right Negative Polarity Input
13	SVDD2	Signal Path Power-Supply Input. Bypass to PGND with 1uF. Connect directly to PVDD.
14	OTR	Right Direct Drive Output
15	BIAS	Internal Supply Node. Bypass to PGND with 0.1uF.
16	OUTL	Left Direct Drive Output
17	CTL	Mode Control Terminal
18	SVDD	Signal Path Power-Supply Input. Bypass to PGND with 1uF. Connect directly to PVDD.
19	INL-	Left Negative Polarity Input
20	INL+	Left Positive Polarity Input
21	BASSL	Left Channel Bass Control Output
22	INLNF	Left Channel Feedback
23	D3L	3D Control Pin
24	nSHDN	Active-Low Shutdown. Drive nSHDN High for Normal Operation.
—	EP	Exposed Pad. Connect to System Ground.

ORDERING INFORMATION

Part Number	Package Type	Marking	Operating Temperature Range	MOQ/Shipping Package
HT97230	QFN24L-PP	HT97230 UVWXYZ *1	-40°C ~ 85°C	Tape & Reel 5000PCS

*1 WXYZ/UVWXYZ is production track code.

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