

## 125mW Direct Drive Line Drivers/Headphone Amplifiers

### FEATURES

- 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 Performance  
 $V_N: 7\mu V$
- Differential or Single-Ended Input
- Wide 2.5V to 5.2V Operating Range
- Output Power: 125mW ( $f_{IN} = 1\text{kHz}$ ,  $V_{DD}=5V$ ,  $R_L=32\Omega$ , THD+N=1%);
- Pb Free Packages, QFN16L-PP 3mm\*3mm, Extremely Simple BOM Needed

### APPLICATIONS

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

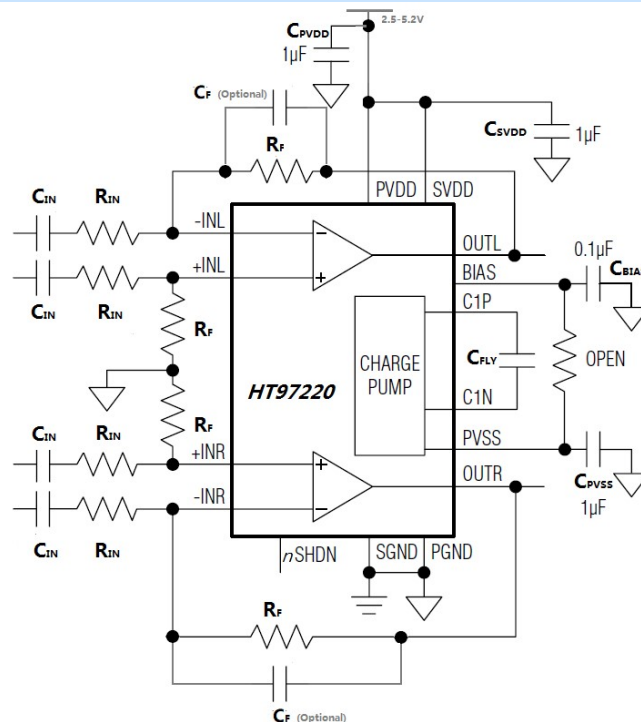
### DESCRIPTION

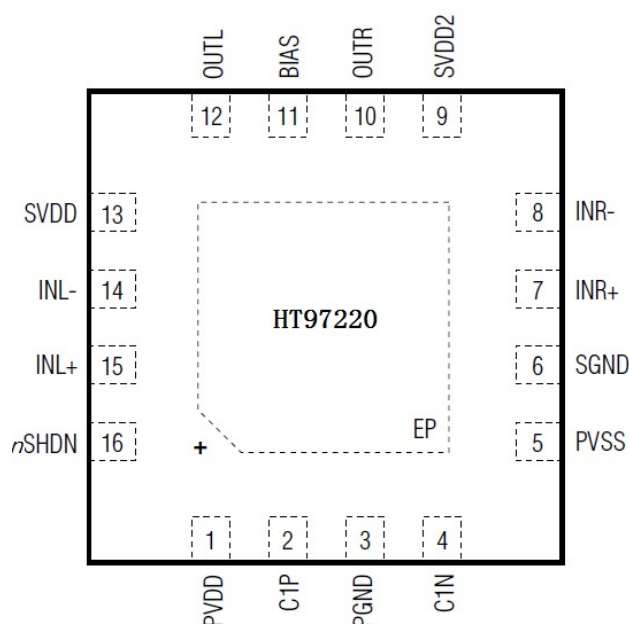
The HT97220(L) is a differential input Direct Drive line driver/headphone amplifier, which can also drive single-ended input signal. It is capable of being driven with 125mW into 32Ω with a 5V supply. The IC is offered with an externally set gain through external resistors (or an internally fixed 6dB 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 4.2ms 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 3mm x 3mm, 16-pin QFN-PP and is specified over the extended  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$  temperature range.

### TYPICAL APPLICATION



**■ TERMINAL CONFIGURATION**

**■ TERMINAL FUNCTION**

PIN	NAME	Description
1	PVDD	Charge-Pump Power-Supply Input. Bypass to PGND with 1 $\mu$ F.
2	C1P	Positive Flying Capacitor Connection. Connect a 1 $\mu$ F 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 1 $\mu$ F capacitor between C1P and C1N.
5	PVSS	Negative Charge-Pump Output. Bypass to PGND with 1 $\mu$ F.
6	SGND	Signal Ground. Connect PGND and SGND together at the system ground plane.
7	INR+	Right Positive Polarity Input
8	INR-	Right Negative Polarity Input
9	SVDD2	Signal Path Power-Supply Input. Bypass to PGND with 1 $\mu$ F. Connect directly to PVDD.
10	OUTR	Right Direct Drive Output
11	BIAS	Internal Supply Node. Bypass to PGND with 0.1 $\mu$ F.
12	OUTL	Left Direct Drive Output
13	SVDD	Signal Path Power-Supply Input. Bypass to PGND with 1 $\mu$ F. Connect directly to PVDD.
14	INL-	Left Negative Polarity Input
15	INL+	Left Positive Polarity Input
16	nSHDN	Active-Low Shutdown. Drive nSHDN high for normal operation.
—	EP	Exposed Pad. Electrically connect to PGND or leave unconnected.

**ORDERING INFORMATION**

Part Number	Package Type	Marking	Operating Temperature Range	MOQ/Shipping Package
HT97220	QFN16L-PP	HT97220 UVWXYZ *1	-40°C ~ 85°C	Tape & Reel 5000PCS
HT97220L	QFN16L-PP	HT97220 UVWXYZ *1	-40°C ~ 85°C	Tape & Reel 5000PCS

\*1 WXYZ/UVWXYZ is production track code.

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