

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

| | | |
|------------------------------|---|----------------------------|
| AIDO LLC |) | |
| |) | |
| Plaintiff, |) | |
| |) | Civil Action No. _____ |
| v. |) | |
| |) | JURY TRIAL DEMANDED |
| ON SEMICONDUCTOR CORPORATION |) | |
| |) | |
| Defendant. |) | |
| _____ |) | |

COMPLAINT

For its Complaint, Plaintiff Aido LLC ("Aido"), by and through the undersigned counsel, alleges as follows:

THE PARTIES

1. Aido is a Texas limited liability company with a place of business located at 1400 Preston Road, Suite 400, Plano, Texas 75093.
2. Defendant ON Semiconductor Corporation is a Delaware company, with, upon information and belief, a place of business located at 768 N. Bethlehem Pike #301, Lower Gwynedd, Pennsylvania 19002.

JURISDICTION AND VENUE

3. This action arises under the Patent Act, 35 U.S.C. § 1 *et seq.*
4. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§ 1331 and 1338.
5. Upon information and belief, Defendant conducts substantial business in this forum, directly or through intermediaries, including: (i) at least a portion of the infringements alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct and/or deriving substantial revenue from goods and services provided to individuals

in this district.

6. Venue is proper in this district pursuant to § 1400(b).

THE PATENT-IN-SUIT

7. On August 30, 2005, U.S. Patent No. 6,937,090 (the "'090 patent"), entitled "Charge Injection Reduction Technique in Single and Multi-Reference Switching Amplifiers," was duly and lawfully issued by the U.S. Patent and Trademark Office. A true and correct copy of the '785 patent is attached hereto as Exhibit A.

8. Aido is the assignee and owner of the right, title and interest in and to the '090 patent, including the right to assert all causes of action arising under said patent and the right to any remedies for infringement of it.

COUNT I – INFRINGEMENT OF U.S. PATENT NO. 6,937,090

9. Aido repeats and realleges the allegations of paragraphs 1 through 8 as if fully set forth herein.

10. Without license or authorization and in violation of 35 U.S.C. § 271(a), Defendant has infringed and continues to infringe at least claim 1 of the '090 patent by making, using, importing, offering for sale, and/or selling a switching amplifier, including, but not limited to, NCP2820 Series 2.65 W Filterless Class-D Audio Power Amplifier (the "Accused Device"), because each and every element is met either literally or equivalently.

11. Upon information and belief, Defendant used the Accused Device via its internal use and testing in the United States, directly infringing one or more claims of the '090 patent.

12. More specifically and upon information and belief, the Accused Device is a switching amplifier that includes a load terminal, which is coupled with reference voltages V_p

and GND. The load terminal is connected through H-bridge CMOS Power Stage (e.g., "gated switch"), which is controlled by an input signal generator such as pulse width modulator.

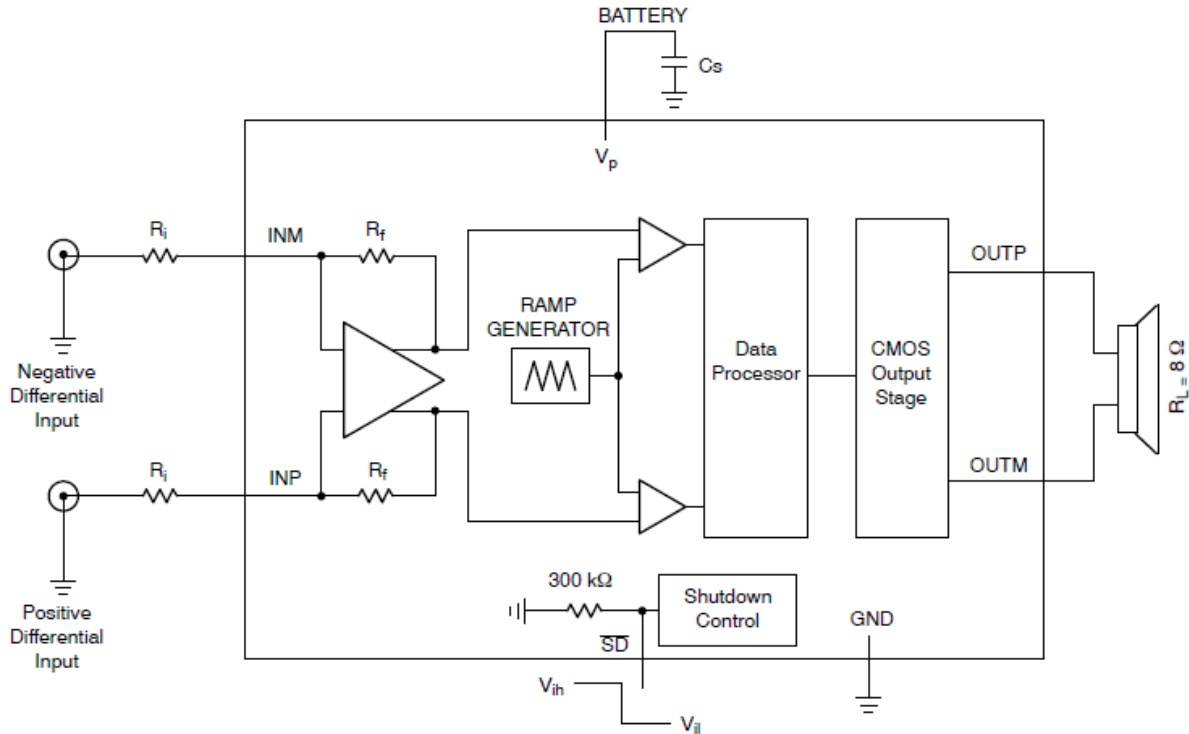


Figure 1. Typical Application

NCP2820 Series: 2.65 W Filterless Class-D Audio Power Amplifier at 2 (available at <https://www.onsemi.com/pub/Collateral/NCP2820-D.PDF>).

Detailed Description

The basic structure of the NCP2820 is composed of one analog pre-amplifier, a pulse width modulator and an H-bridge CMOS power stage. The first stage is externally configurable with gain-setting resistor R_i and the internal fixed feedback resistor R_f (the closed-loop gain is fixed by the ratios of these resistors) and the other stage is fixed. The load is driven differentially through two output stages.

Id. at 13.

13. The Accused Device uses pulse width modulation ("PWM") (e.g., adding a minimum pulse width), with each output switching (e.g., switching device) from 0 to the supply

voltage V_p . The added minimum pulse is equivalent to a differential output of OUTM and OUTP (e.g., having the same phase ("polarity")) that are provided as input to the connected load.

APPLICATION INFORMATION

NCP2820 PWM Modulation Scheme

The NCP2820 uses a PWM modulation scheme with each output switching from 0 to the supply voltage. If $V_{in} = 0\text{ V}$ outputs OUTM and OUTP are in phase and no current is flowing through the differential load. When a positive signal

is applied, OUTP duty cycle is greater than 50% and OUTM is less than 50%. With this configuration, the current through the load is 0 A most of the switching period and thus power losses in the load are lowered.

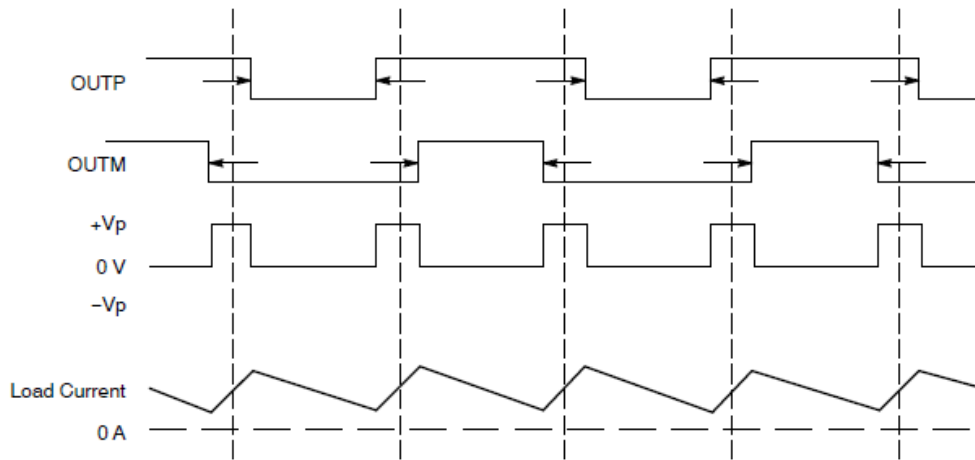


Figure 35. Output Voltage and Current Waveforms into an Inductive Loudspeaker DC Output Positive Voltage Configuration

Id. at 14.

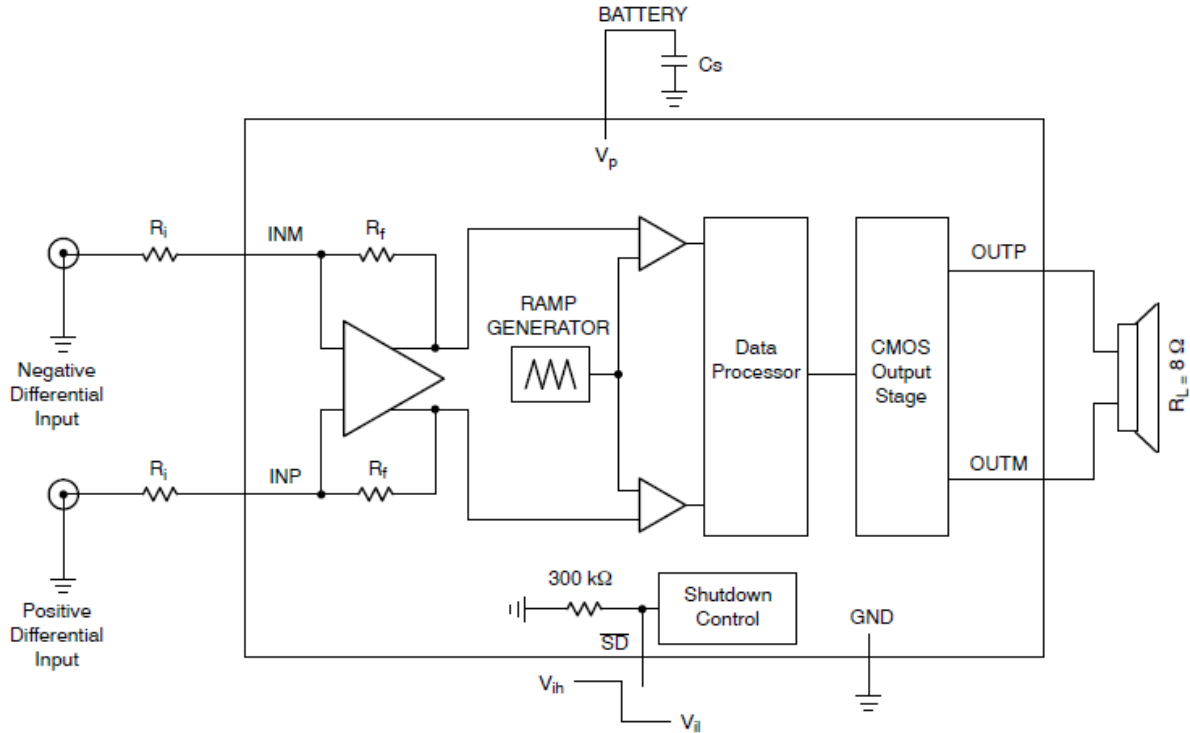


Figure 1. Typical Application

Id. at 2

14. The Accused Device uses differential design that eliminates the need of two input coupling capacitor. The differential design causes the current through the load to be 0 ampere (to "null the common-mode output presented to the load") at most of the switching period.

Features

- Optimized PWM Output Stage: Filterless Capability
- Efficiency up to 90%
 - Low 2.5 mA Typical Quiescent Current
- Large Output Power Capability: 1.4 W with 8.0 Ω Load (CSP) and THD + N < 1%
- Ultra Fast Start-up Time: 1 ms for NCP2820A Version
- High Performance, THD+N of 0.03% @ $V_p = 5.0\text{ V}$, $R_L = 8.0\ \Omega$, $P_{out} = 100\text{ mW}$
- Excellent PSRR (-65 dB): No Need for Voltage Regulation
- Surface Mounted Package 9-Pin Flip-Chip CSP and UDFN8
- Fully Differential Design. Eliminates Two Input Coupling Capacitors
- Very Fast Turn On/Off Times with Advanced Rising and Falling Gain Technique

Id. at 1.

APPLICATION INFORMATION

NCP2820 PWM Modulation Scheme

The NCP2820 uses a PWM modulation scheme with each output switching from 0 to the supply voltage. If $V_{in} = 0$ V outputs OUTM and OUTP are in phase and no current is flowing through the differential load. When a positive signal

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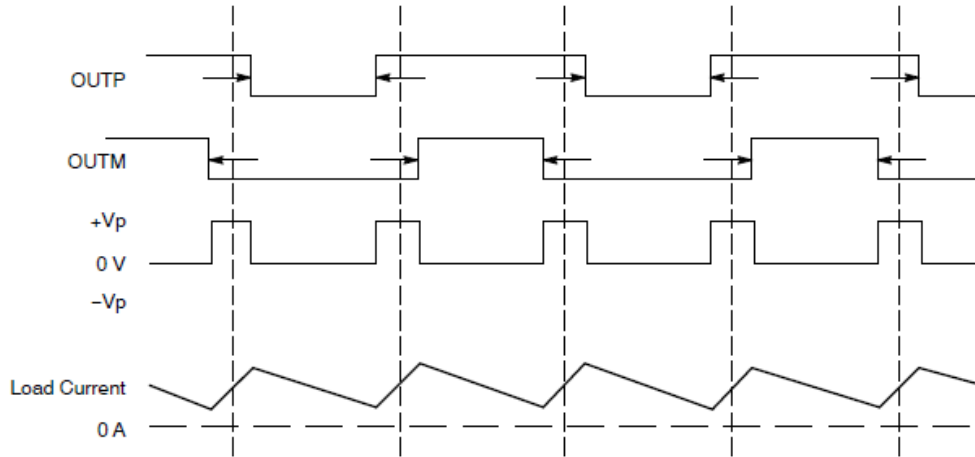


Figure 35. Output Voltage and Current Waveforms into an Inductive Loudspeaker DC Output Positive Voltage Configuration

Id. at 14.

15. Aido is entitled to recover from Defendant the damages sustained by Plaintiff as a result of Defendant's infringement of the '090 patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

JURY DEMAND

Aido hereby demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Aido requests that this Court enter judgment against Defendant as follows:

- A. An adjudication that Defendant has infringed the '090 patent;
- B. An award of damages to be paid by Defendant adequate to compensate Aido for Defendant's past infringement of the '090 patent and any continuing or future infringement

through the date such judgment is entered, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of Aido's reasonable attorneys' fees; and

D. An award to Aido of such further relief at law or in equity as the Court deems just and proper.

Dated: June 17, 2019

STAMOULIS & WEINBLATT LLC

/s/ Richard C. Weinblatt

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