Low Distortion Audio Power Amplifier with Differential Output and Shutdown Mode

Product Description

The NCS2211 is a high performance, low distortion Class A/B audio amplifier. It is capable of delivering 1 W of output power into an 8 Ω speaker bridge-tied load (BTL). The NCS2211 will operate over a wide temperature range, and it is specified for single-supply voltage operation for portable applications.

It features low distortion performance, 0.2% typical THD + N @ 1 W and incorporates a shutdown/enable feature to extend battery life. The shutdown/enable feature will reduce the quiescent current to 1 μA maximum.

The NCS2211 is designed to operate over the -40° C to $+85^{\circ}$ C temperature range, and is available in an 8–lead SOIC package and a 3 X 3 mm DFN8 package. The SOIC package is pin compatible with equivalent function and comparable performance to competitive devices as is the DFN8 package. The DFN8 has a low thermal resistance of only 70°C/W plus has an exposed metal pad to facilitate heat conduction to copper PCB material.

Low distortion, high power, low quiescent current, and small packaging makes the NCS2211 suitable for applications including notebook and desktop computers, PDA's, and speaker phones.

Features

- Differential Output
- 1.0 W into an 8 Ω Speaker
- 1.5 W into a 4 Ω Speaker
- Single Supply Operation: 2.7 V to 5.5 V
- THD+N: 0.2% @ 1 W Output
- Low Quiescent Current: 20 mA Max
- Shutdown Current < 1.0 µA
- Excellent Power Supply Rejection
- Two Package Options: SOIC-8 Package and DFN8
- Pin Compatible with Competitive Devices
- NCV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q100 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Desktop Computers
- Notebook Computers
- PDA's
- Speaker Phones
- Games

PIN CONNECTIONS for SOIC-8 and DFN8



TYPICAL PERFORMANCE CHARACTERISTICS

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TYPICAL PERFORMANCE CHARACTERISTICS

Figure 20. Turn-on Time





TYPICAL PERFORMANCE CHARACTERISTICS



Figure 23. Power–Supply Rejection

APPLICATIONS INFORMATION

The NCS2211 is unity gain stable and therefore does not require any compensation, but a proper power–supply bypass is required as shown in Figure 24. Performance will be enhanced by adding a filter capacitor (C2) to the mid–supply node (pin 2). See Typical Performance Characteristics for details. It is preferable to AC couple the input to avoid a large DC output offset.

Both outputs can be driven to within 400 mV of either supply rail with an 8 Ω load.

Typical Application of the Device:



Figure 24.



SOIC-8 NB CASE 751-07 ISSUE AK

DATE 16 FEB 2011





SOIC-8 NB CASE 751-07 ISSUE AK

STYLE 1: PIN 1. EMITTER COLLECTOR 2. COLLECTOR 3. 4. EMITTER 5. EMITTER BASE 6. 7 BASE EMITTER 8. STYLE 5: PIN 1. DRAIN 2. DRAIN 3. DRAIN DRAIN 4. 5. GATE 6. GATE SOURCE 7. 8. SOURCE STYLE 9: PIN 1. EMITTER, COMMON 2. COLLECTOR, DIE #1 COLLECTOR, DIE #2 3. EMITTER, COMMON 4. 5. EMITTER, COMMON 6. BASE, DIE #2 BASE, DIE #1 7. 8. EMITTER, COMMON STYLE 13: PIN 1. N.C. 2. SOURCE 3 SOURCE GATE 4. 5. DRAIN 6. 7. DRAIN DRAIN DRAIN 8. STYLE 17: PIN 1. VCC 2. V2OUT V10UT 3. 4. TXE 5. RXE 6. VFF 7. GND 8. ACC STYLE 21: PIN 1. CATHODE 1 2. CATHODE 2 3 CATHODE 3 CATHODE 4 4. 5. CATHODE 5 6. COMMON ANODE COMMON ANODE 7. 8. CATHODE 6 STYLE 25: PIN 1. VIN 2 N/C REXT 3. 4. GND 5. IOUT 6. IOUT IOUT 7. 8. IOUT STYLE 29: BASE, DIE #1 PIN 1. 2. EMITTER, #1 BASE, #2 3. EMITTER, #2 4. 5. COLLECTOR, #2 COLLECTOR, #2 6.

STYLE 2: PIN 1. COLLECTOR, DIE, #1 2. COLLECTOR, #1 COLLECTOR, #2 3. 4 COLLECTOR, #2 BASE, #2 5. EMITTER, #2 6. 7 BASE #1 8. EMITTER, #1 STYLE 6: PIN 1. SOURCE 2. DRAIN 3. DRAIN SOURCE 4. 5. SOURCE 6. GATE GATE 7. 8. SOURCE STYLE 10: PIN 1. GROUND BIAS 1 OUTPUT 2. 3. GROUND 4. 5. GROUND 6 BIAS 2 INPUT 7. 8. GROUND STYLE 14: PIN 1. N-SOURCE 2. N-GATE 3 P-SOURCE P-GATE 4. 5. P-DRAIN 6. 7. P-DRAIN N-DRAIN N-DRAIN 8. STYLE 18: PIN 1. ANODE 2. ANODE SOURCE 3. GATE 4. 5. DRAIN 6 DRAIN CATHODE 7. CATHODE 8. STYLE 22: PIN 1. I/O LINE 1 2. COMMON CATHODE/VCC 3 COMMON CATHODE/VCC 4. I/O LINE 3 COMMON ANODE/GND 5. 6. I/O LINE 4 7. I/O LINE 5 8. COMMON ANODE/GND STYLE 26: PIN 1. GND 2 dv/dt 3. ENABLE 4. ILIMIT 5. SOURCE SOURCE 6. SOURCE 7. 8. VCC STYLE 30: DRAIN 1 PIN 1. DRAIN 1 2 GATE 2 3. SOURCE 2 4 5. SOURCE 1/DRAIN 2 SOURCE 1/DRAIN 2 6.

STYLE 3: PIN 1. 2. DRAIN, DIE #1 DRAIN, #1 DRAIN, #2 3. 4. DRAIN, #2 GATE, #2 5. SOURCE, #2 6. 7 GATE #1 8. SOURCE, #1 STYLE 7: PIN 1. INPUT 2. EXTERNAL BYPASS THIRD STAGE SOURCE GROUND 3. 4. 5. DRAIN 6. GATE 3 SECOND STAGE Vd 7. FIRST STAGE Vd 8. STYLE 11: PIN 1. SOURCE 1 GATE 1 SOURCE 2 2. 3. GATE 2 4. 5. DRAIN 2 6. DRAIN 2 DRAIN 1 7. 8. DRAIN 1 STYLE 15: PIN 1. ANODE 1 2. ANODE 1 ANODE 1 3 ANODE 1 4. 5. CATHODE, COMMON CATHODE, COMMON CATHODE, COMMON 6. 7. CATHODE, COMMON 8. STYLE 19: SOURCE 1 PIN 1. 2. GATE 1 SOURCE 2 3. 4. GATE 2 5. DRAIN 2 6. MIRROR 2 DRAIN 1 7. 8. **MIRROR 1** STYLE 23: PIN 1. LINE 1 IN COMMON ANODE/GND COMMON ANODE/GND 2. 3 LINE 2 IN 4. LINE 2 OUT 5. COMMON ANODE/GND COMMON ANODE/GND 6. 7. LINE 1 OUT 8. STYLE 27: PIN 1. ILIMIT 2 OVI 0 3. UVLO 4. INPUT+ 5. 6. SOURCE SOURCE SOURCE 7. 8. DRAIN

DATE 16 FEB 2011

STYLE 4: PIN 1. 2. ANODE ANODE ANODE 3. 4. ANODE ANODE 5. 6. ANODE 7 ANODE COMMON CATHODE 8. STYLE 8: PIN 1. COLLECTOR, DIE #1 2. BASE, #1 3. BASE, #2 COLLECTOR, #2 4. COLLECTOR, #2 5. 6. EMITTER, #2 EMITTER, #1 7. 8. COLLECTOR, #1 STYLE 12: PIN 1. SOURCE SOURCE SOURCE 2. 3. 4. GATE 5. DRAIN 6 DRAIN DRAIN 7. 8. DRAIN STYLE 16: PIN 1. EMITTER, DIE #1 2. BASE, DIE #1 EMITTER, DIE #2 3 BASE, DIE #2 4. 5. COLLECTOR, DIE #2 6. 7. COLLECTOR, DIE #2 COLLECTOR, DIE #1 COLLECTOR, DIE #1 8. STYLE 20: PIN 1. SOURCE (N) 2. GATE (N) SOURCE (P) 3. 4. GATE (P) 5. DRAIN 6. DRAIN DRAIN 7. 8. DRAIN STYLE 24: PIN 1. BASE 2. EMITTER 3 COLLECTOR/ANODE COLLECTOR/ANODE 4. 5. CATHODE 6. CATHODE COLLECTOR/ANODE 7. 8. COLLECTOR/ANODE STYLE 28: PIN 1. SW_TO_GND 2. DASIC_OFF DASIC_SW_DET 3. 4. GND 5. 6. V MON VBULK 7. VBULK 8. VIN

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SOURCE 1/DRAIN 2

7.

8. GATE 1

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rights of others

COLLECTOR, #1

COLLECTOR, #1