

NCP2991FCT2GEVB

NCP2991 - 1.35 Watt Audio Power Amplifier with Selectable Fast Turn On Time Evaluation Board User's Manual



ON Semiconductor®

<http://onsemi.com>

EVAL BOARD USER'S MANUAL

Goal of Document

The purpose of the document is to explain how to use the NCP2991 Evaluation Board User's Manual.

Applicable & Reference Documents

NCP2991/D: NCP2991 Datasheet

Overview

The NCP2991 is an audio power amplifier designed for portable communication device applications such as mobile phone applications. The NCP2991 is capable of delivering 1.35 W of continuous average power to an 8.0 Ω BTL load from a 5.0 V power supply, and 1.1 W to a 4.0 Ω BTL load from a 3.6 V power supply.

The NCP2991 provides high quality audio while requiring few external components and minimal power

consumption. It features a low-power consumption shutdown mode, which is achieved by driving the SHUTDOWN pin with logic low.

The NCP2991 contains circuitry to prevent from 'pop and click' noise that would otherwise occur during turn-on and turn-off transitions. It is a zero pop noise device when a single ended or a differential audio input is used.

For maximum flexibility, the NCP2991 provides an externally controlled gain (with resistors). In addition, it integrates 2 different Turn On times (15 ms or 30 ms) adjustable with the TON pin.

Due to its superior PSRR, it can be directly connected to the battery, saving the use of an LDO.

This device is available in a 9-Pin Flip-Chip CSP (Lead-Free).

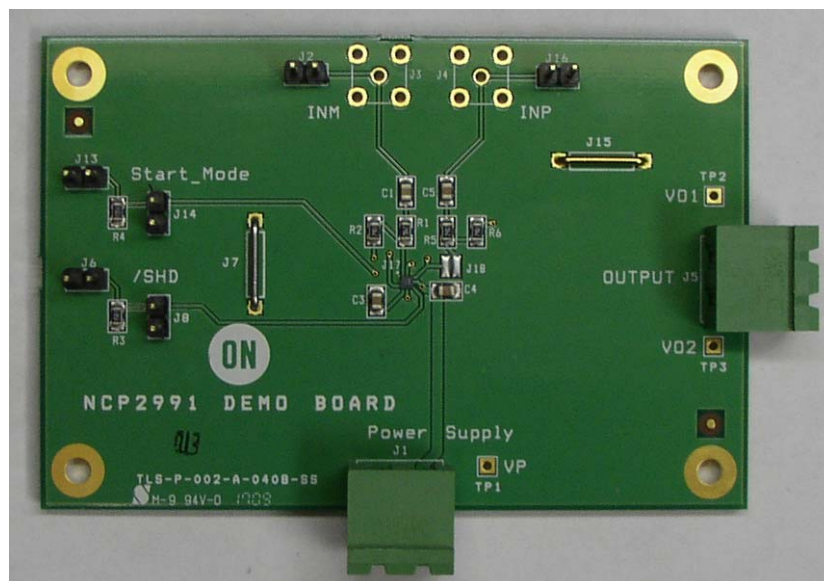


Figure 1. NCP2991FCT2GEVB Board Picture

NCP2991FCT2GEVB

BOARD SCHEMATIC

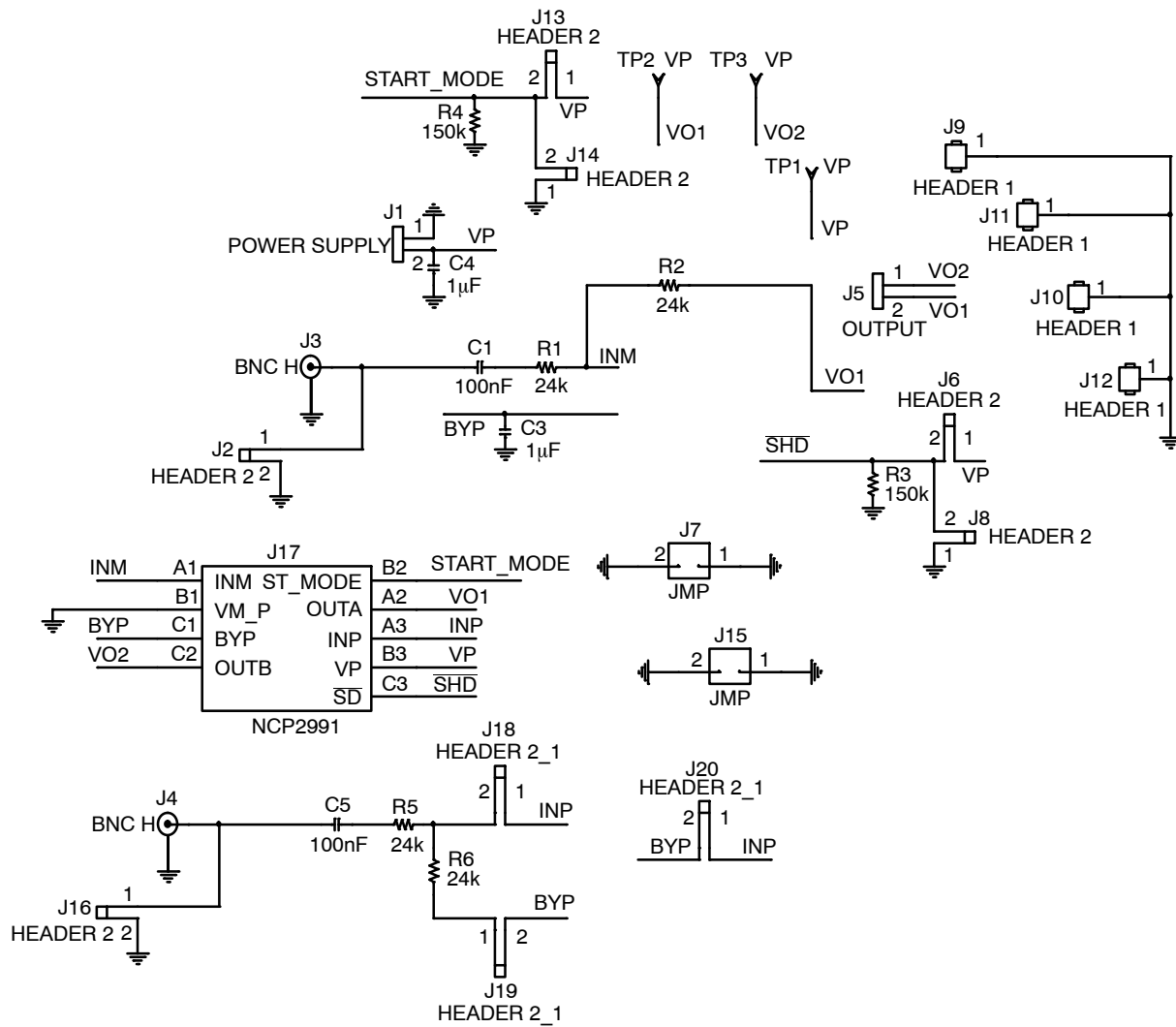


Figure 2. Evaluation Board Schematic

NCP2991FCT2GEVB

PCB LAYOUT

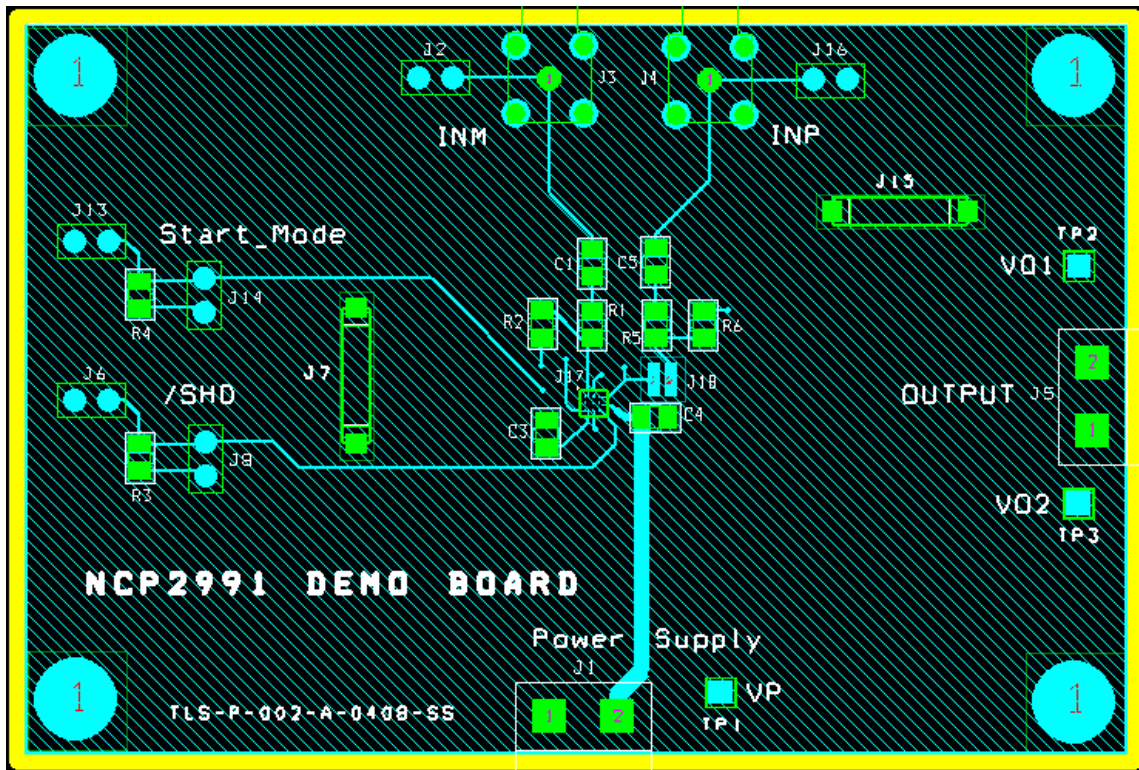


Figure 3. Evaluation Board Layout – Top View

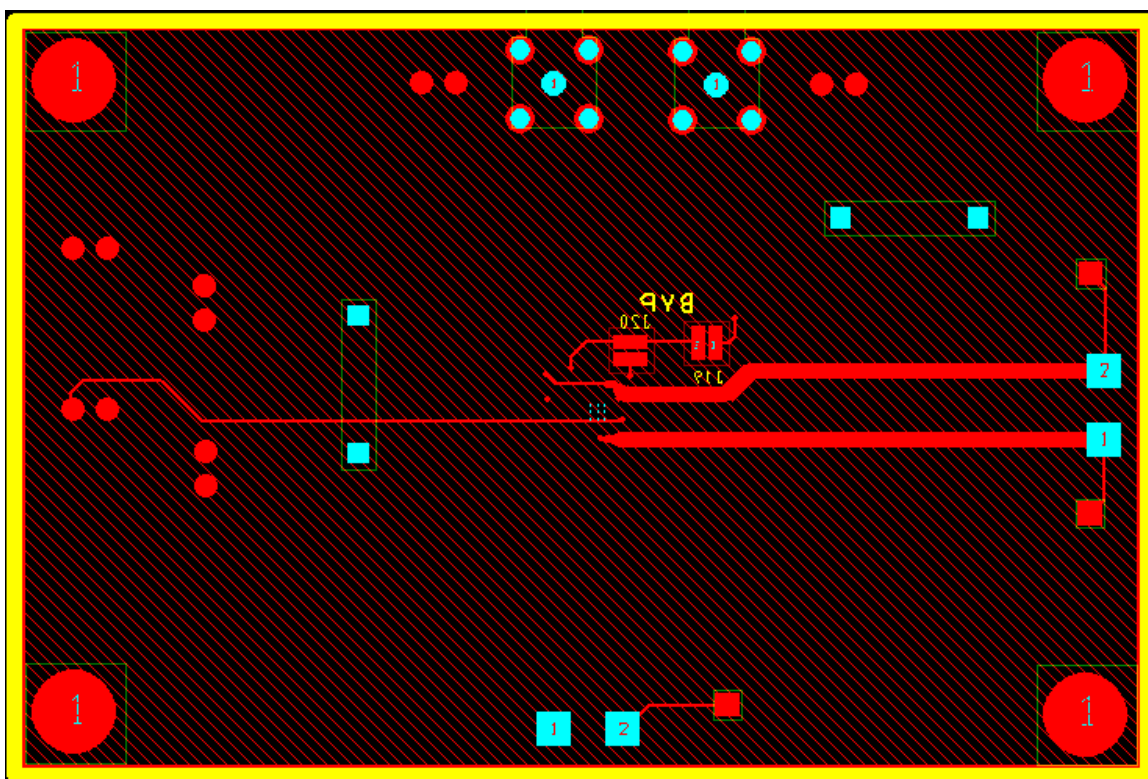


Figure 4. Evaluation Board Layout – Bottom View

NCP2991FCT2GEVB

SINGLE-ENDED OR DIFFERENTIAL CONFIGURATION

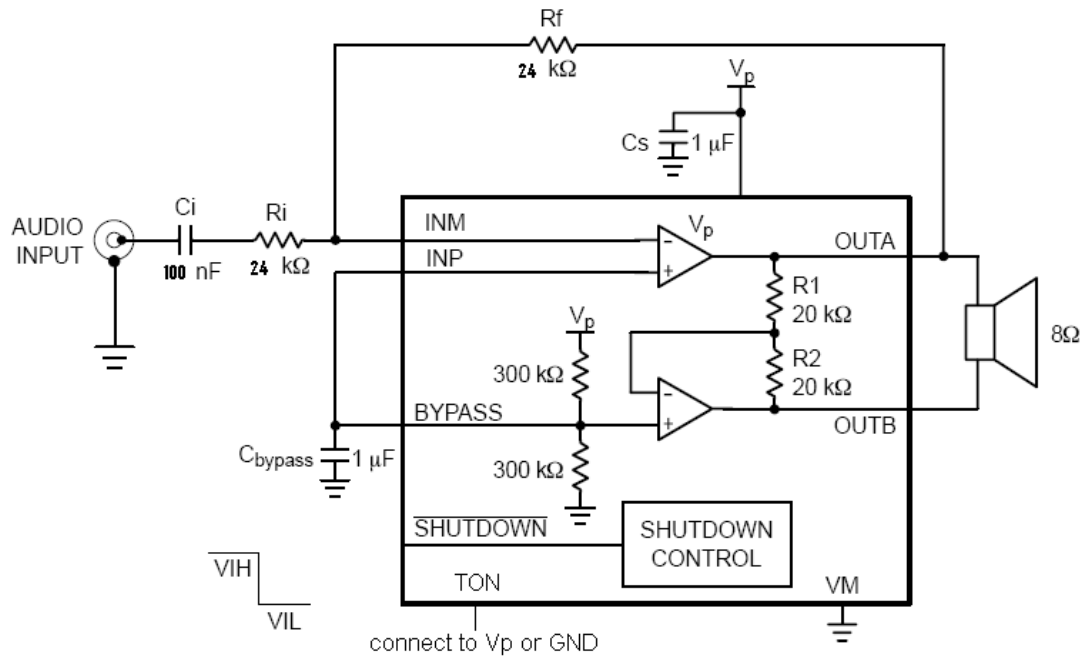


Figure 5. Single-ended Configuration

Connect J20, disconnect J18 and J19 to use the evaluation board in Single-ended configuration.

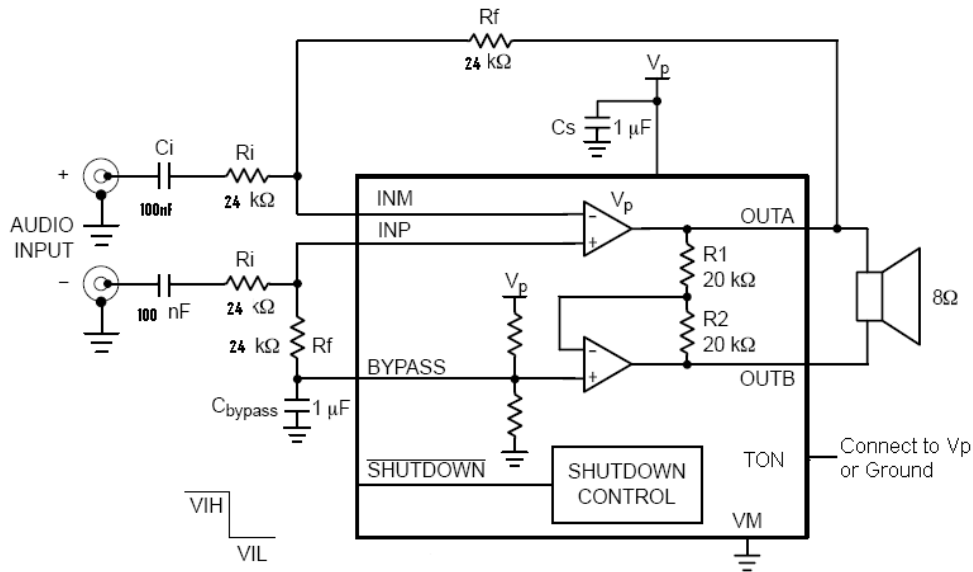


Figure 6. Differential Configuration

Connect J18 and J19, disconnect J20 to use the demoboard in Differential configuration.

NCP2991FCT2GEVB

Table 1. BILL OF MATERIALS

Item	Part Description	Ref.	PCB Footprint	Manufacturer	Manufacturer Reference
1	NCP2991 Audio Amplifier			ON Semiconductor	NCP2991
2	SMD Resistor 24 K Ω	R1, R2, R5, R6	0805	Panasonic	ERJ-6GEYJ243V
3	SMD Resistor 150 K Ω	R3, R4	0805	Panasonic	ERJ-6GEYJ154V
4	Ceramic Capacitor 100 nF 16 V X5R	C1, C5	0805	Murata	GRM21BR71E104KA01
5	Ceramic Capacitor 1 μ F 16 V X5R	C3, C4	0805	Murata	GRM216R61C105KA88
6	Jumper Header Vertical Mount, 2 positions, 100 mils	J2, J6, J8, J13, J14, J16	100 mils	Tyco Electronics / AMP	58266290
7	I/O Connector, 2 positions	J1, J5	200 mils	Phoenix Contact	1757242
8	Jumper Connector	J7, J15	400 mils	Harwin	D3082B01
9	Not Mounted	J3, J4			

TEST PROCEDURE


Output Power:

1. Set $V_p = 5$ V to power supply connector (J1).
2. Set an 8 Ω load (resistance) on the output connector (J5).
3. With the function generator, set a single ended signal at 1 kHz and 0.5 V_{rms} input signal on the negative input. Apply this signal either on J2 or J3 connector. As $R1 = R2 = 24$ k, VO1 will see 0.5 V_{rms}. As VO1 signal is inverted by the second amplifier, VO2 will also see 0.5 V_{rms} with 180° delay. Thus, the load between VO1 and VO2 will see 1 V_{rms}.

4. Place 2 oscilloscope probes on the output (differential measurement). You should get 1 V_{rms} output signal with a “perfect sine wave”. That is to say no clipping at the minima and maxima of the sine wave.

Quiescent Current:

Check the quiescent current. Place an 8 Ω load, no input signal. V_p set to 5 V and J6 closed. You should measure around 1.9 mA.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
 Literature Distribution Center for ON Semiconductor
 P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
 USA/Canada
Europe, Middle East and Africa Technical Support:
 Phone: 421 33 790 2910
Japan Customer Focus Center
 Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
 For additional information, please contact your local Sales Representative