NCP2993

The NCP2993 is an audio power amplifier designed for portable communication device applications such as mobile phone applications. The NCP2993 is capable of delivering 1.3 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 NCP2993 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 NCP2993 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 NCP2993 provides an externally€

Zero Pop Noise Signature with a Single Ended Audio Input

- Ultra Low Current Shutdown Mode: 10 nA
- 2.5 V−5.5 V Operation
- External Gain Configuration Capability
- External Turn−on Time Configuration Capability: 15 ms or 30 ms
- Thermal Overload Protection Circuitry
- This is a Pb−Free Device*

Typical Applications

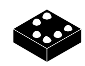
- Portable Electronic Devices
- PDAs
- Wireless Phones

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconducto

http://onsemi.com

MARKING DIAGRAM

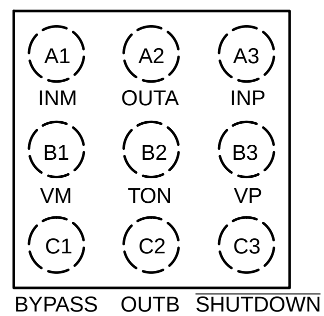


WLCSP9
FC SUFFIX
CASE 499BM

2993
AYWW
▪

2993	= Specific Device Code
A	= Assembly Location
Y	= Year
WW	= Work Week
▪	= Pb−Free Package

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 11 of this data sheet.

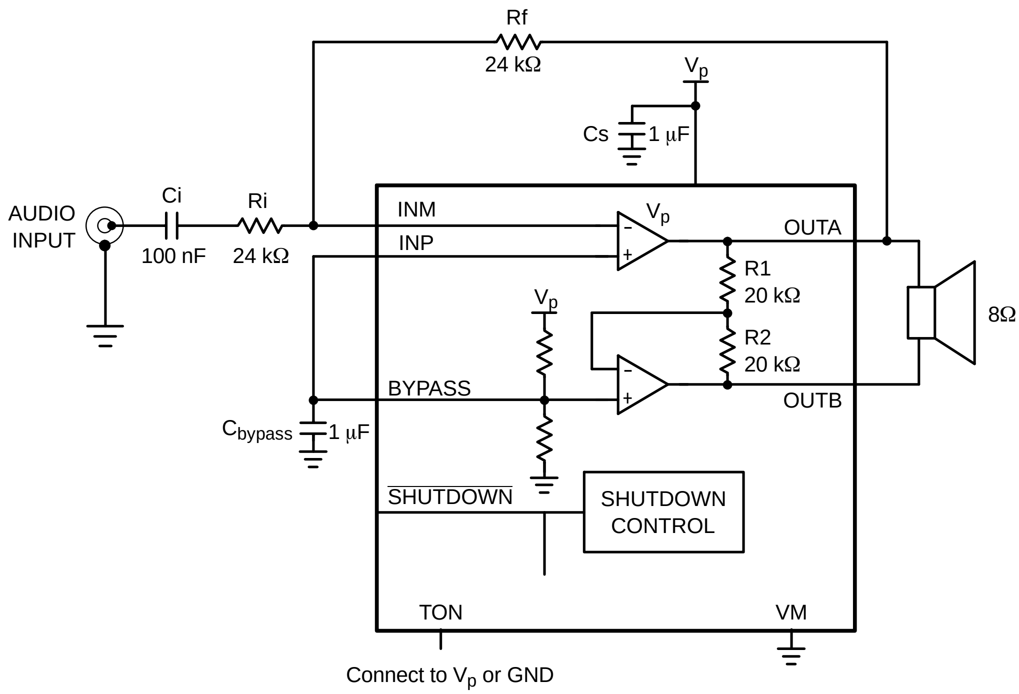


Figure 1. Typical Audio Amplifier Application Circuit with Single Ended Input

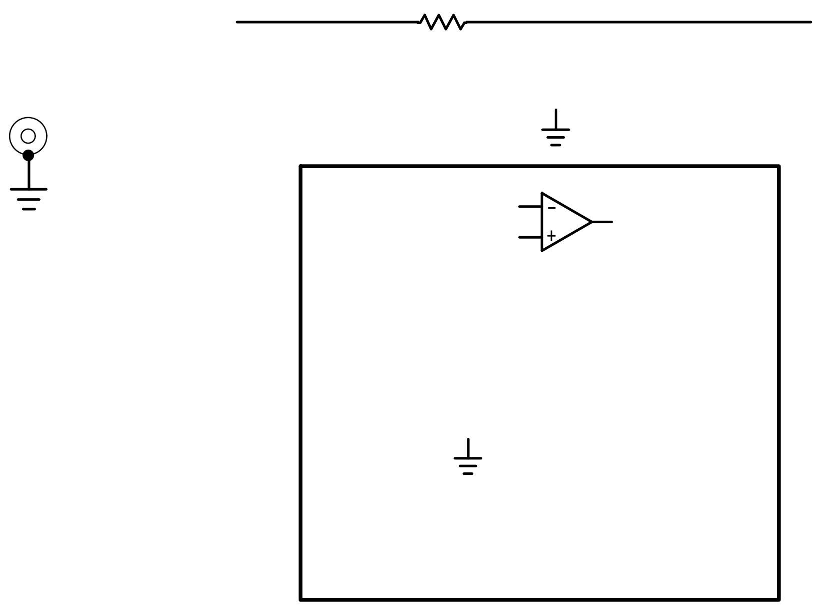
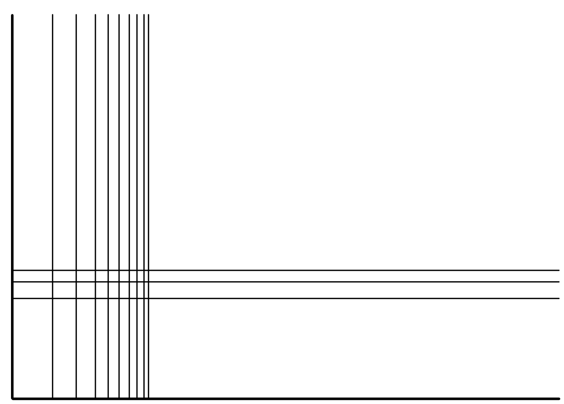


Figure 2. Typical Audio Amplifier Application Circuit with a Differential Input

ELECTRICAL CHARACTERISTICS Limits apply for T_A between −40°C to +85°C (Unless otherwise noted).

Characteristic	Symbol	Conditions	Min (Note 6)	Typ	Max (Note 6)	Unit
Supply Quiescent Current	I_{dd}	V_p = 2.5 V, No Load V_p = 5.0 V, No Load	− −	1.8 1.95	3.5	

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS

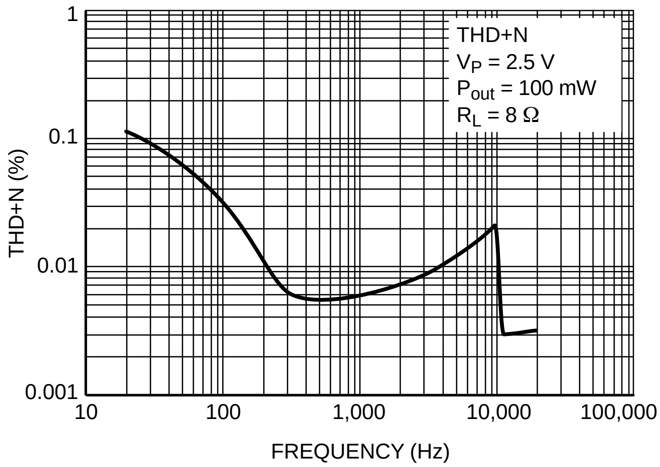


Figure 9. THD+N vs. Frequency, Differential Input

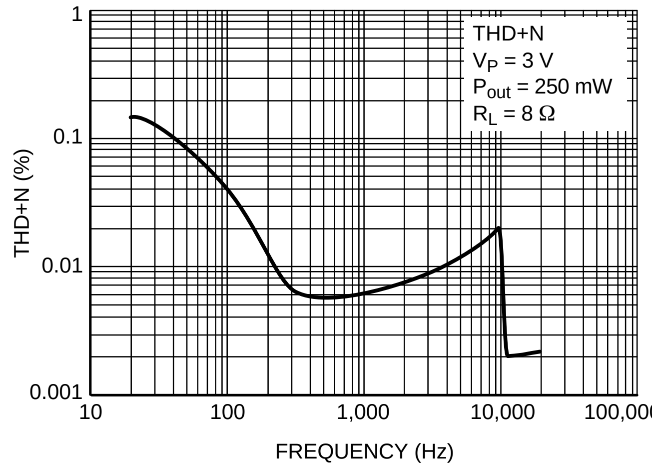


Figure 10. THD+N vs. Frequency, Differential Input

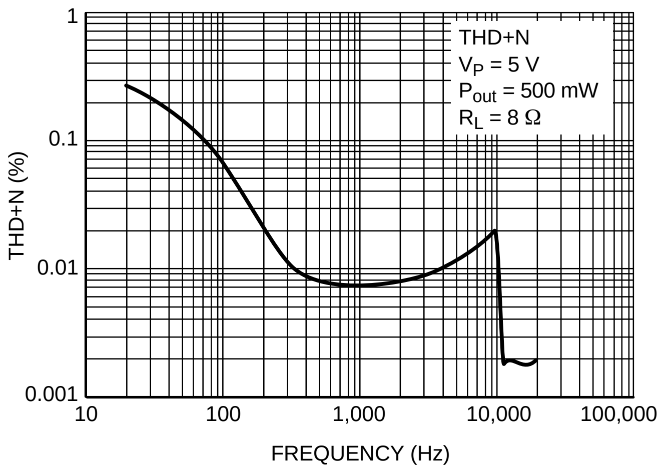


Figure 11. THD+N vs. Frequency, Differential Input

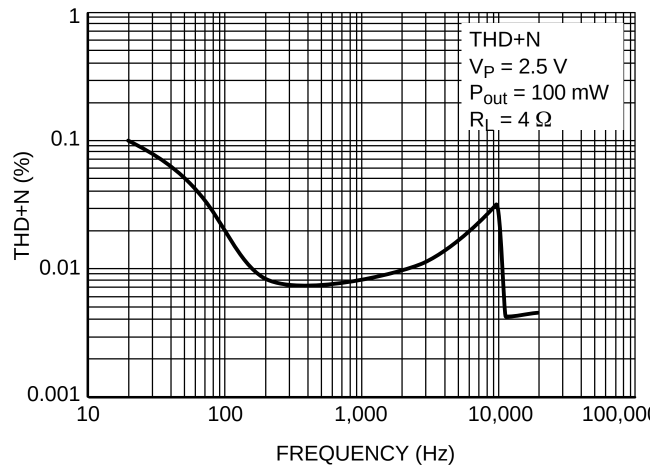


Figure 12. THD+N vs. Frequency, Differential Input

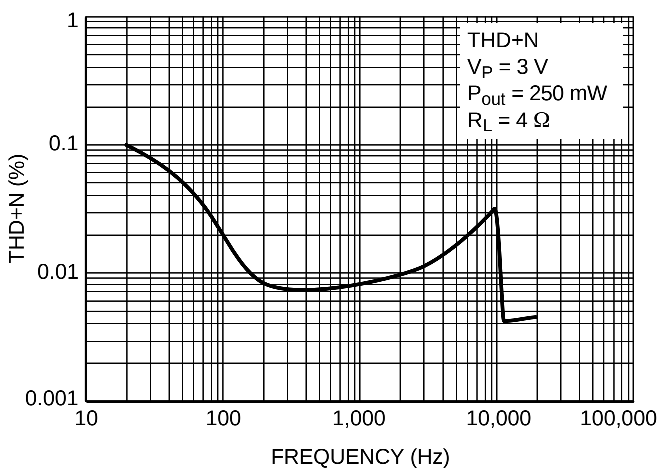


Figure 13. THD+N vs. Frequency, Differential Input

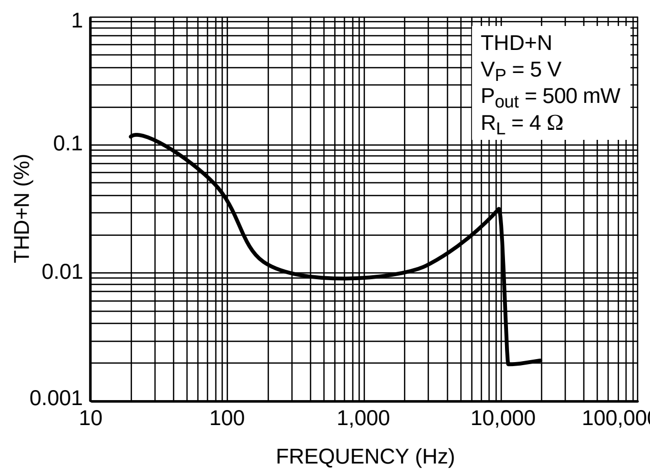


Figure 14. THD+N vs. Frequency, Differential Input

TYPICAL CHARACTERISTICS

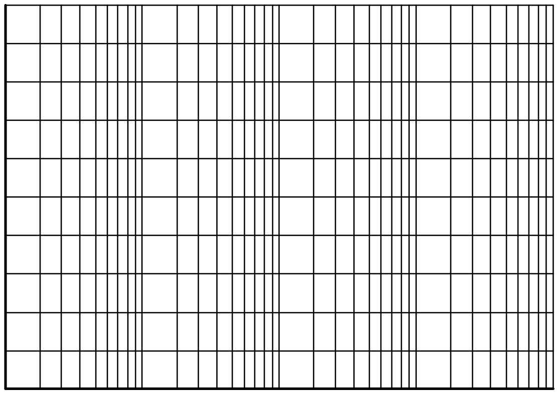


Figure 19. PSRR vs. Frequency

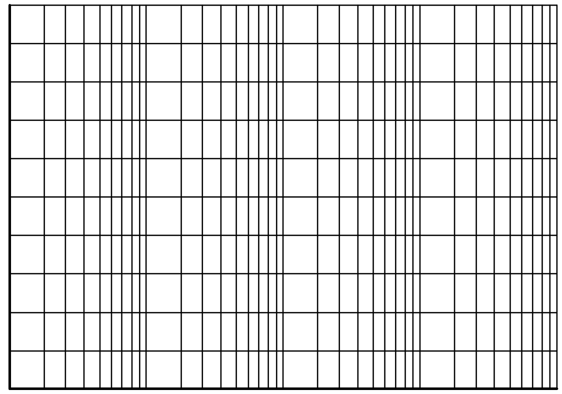


Figure 20. PSRR vs. Frequency

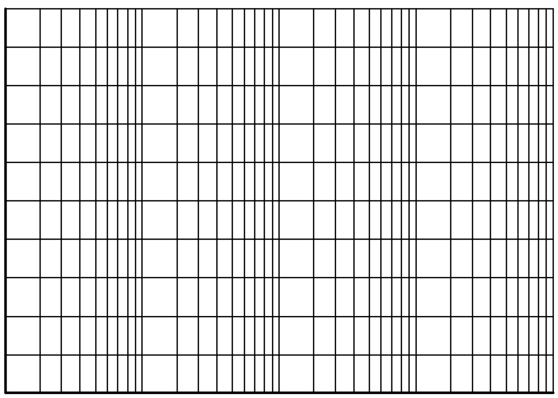


Figure 21. PSRR vs. Frequency

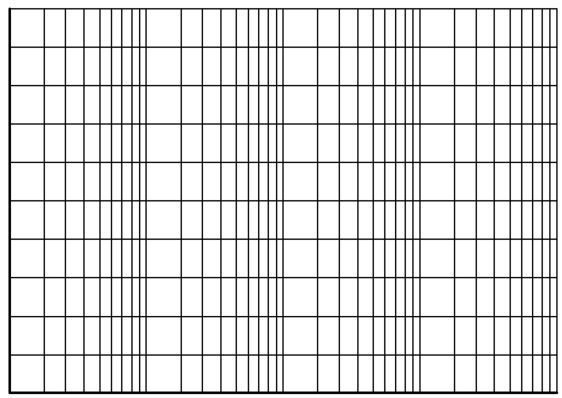


Figure 22. PSRR vs. Frequency

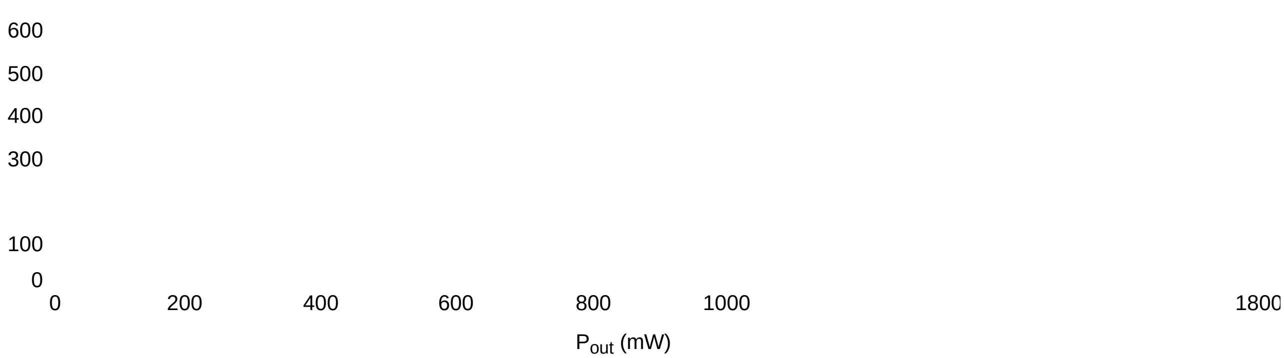


Figure 23. Power Dissipation vs. P_{out}

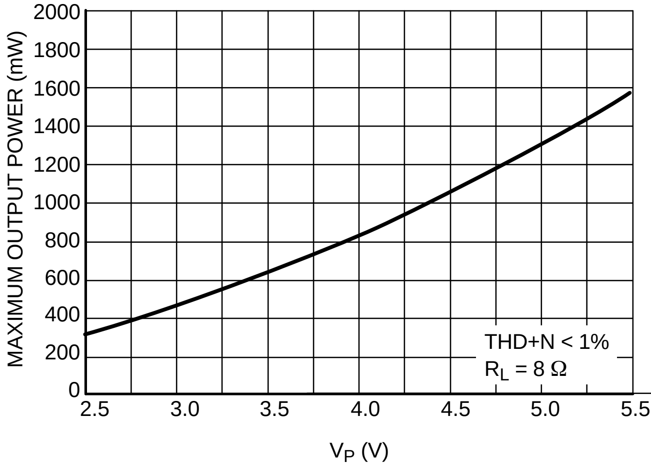


Figure 24. Maximum Output Power vs. V_P

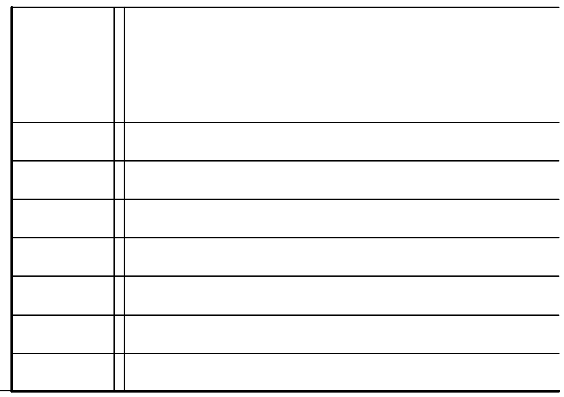


Figure 25. SNR vs. Frequency

APPLICATION INFORMATION

Detailed Description

high−pass filter with R_{in}, the cut−off frequency is given by $fc = \frac{1}{2 * \Pi * R_{in} * C_{in}}$.

The size of the capacitor must be large enough to couple in low frequencies without severe attenuation.

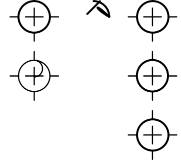
IEC 61000-4-2 Level 4

In some particular applications, NCP2993 may need extra ESD protection to pass IEC 61000-4-2 Level 4 qualification.

Depending on the test, user can consider different level of protection:

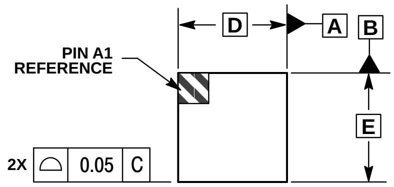
– up to 22 pF capacitor connected between each amplifier output terminals and ground.
– Dedicated IEC filters such as ESD7.0 series from ON Semiconductor.

In any case, the protection should be placed as close as possible to the ESD stress entry point. Proper and carefull layout is a key factor to ensure optimum protection level is achieved. Designer should make sure the connection impedance between protection and



WLCSP9, 1.22x1.22
CASE 499BM−01
ISSUE O

DATE 27 SEP 2010



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

DIM	MILLIMETERS MIN	MILLIMETERS MAX
A	−−−	0.66
A1		

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DESCRIPTION: