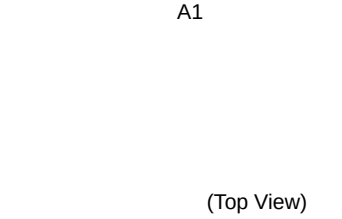
NCP2824

Non−Clip and Power Limit Mono Class D Amplifier with AGC

http://onsemi.com

9 PIN FLIP−CHIP
FC SUFFIX
CASE 499AL

PIN CONFIGURATION



(Top View)

Description

The NCP2824 is a Filterless Class D amplifier capable of delivering up to 2.4 W to a 4 Ω load with a 5 V supply voltage. With the same battery voltage, it can deliver 1.2 W to an 8 Ω load with less than 1% THD+N. The non−clipping function automatically adjusts the output voltage in order to control the distortion when an excessive input is applied to the amplifier. This adjustment is done thanks to an Automatic Gain Control circuitry (AGC) built into the chip. A simple Single wire interface allows to the non Clipping function to be enabled and disabled. It also allows the maximum distortion level in the output to be configured. A programmable power limit function is also embedded in order to protect speakers from damage caused by an excessive sound level.

Features

- Non Clipping Function with Automatic Gain Control Circuitry
- Programmable Power Limit Function
- Single Wire Interface. No Need for Additional Components
- Max THD+N Configurable by Swire Interface
- Only One Capacitor Required
- Fully Differential Architecture: Better RF Immunity
- No Need for Input Capacitors in Fully Differential Configuration
- High Efficiency: up to 90%
- Low Quiescent Current: 2.2 mA Typ
- Large Output Power Capability
- High PSRR: up to −80 dB
- Fully Differential Capability: RF Immunity
- Thermal and Auto Recovery Short−Circuit Protection
- CMRR (−80 dB) Eliminates Two Input Coupling Capacitors
- Pb−Free and Halide−Free Device

Typical Applications

Audio Amplifier for:

- Cellular Phones
- Digital Cameras
- Personal Digital Assistant and Portable Media Player
- GPS

Demo Board Available:

- The NCP2824GEVB/D evaluation board configures the device in typical application.

ORDERING INFORMATION

Device	Package	Shipping†
NCP2824FCT2G	WCSP−9 (Pb−Free)	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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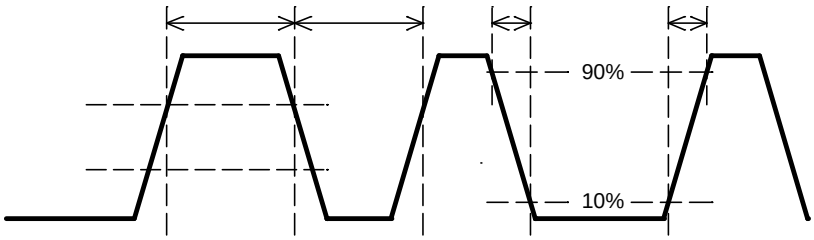
Table 1. PIN FUNCTION DESCRIPTION

Pin	Pin Name	Type	Description
A1	INP	Input	**Positive Input**
C1	INN	Input	**Negative Input**
A2	PVDD	POWER	**Power Supply:**


90%
10%

TYPICAL OPERATING CHARACTERISTICS

Table 4. NCP2824 CONFIGURATION

Pulse Counting	Register	Description
01	AGC	AGC disable
02		AGC Enable
03	Reset	Reset configuration
04	Gain Control	Gain = 12 dB
05		Gain = 18 dB
06	THD Control	1%
07		2%
08		4%
09		6%
10		8%
11		10%
12		15%
13		20%
14	NC+L	Non Clip + Power limit
15	NC	Non Clip only
16	Power Limit Control	0.45 V_{Peak}
17		0.9 V_{Peak}
18		1.35 V_{Peak}
19		1.8 V_{Peak}
20		2.25 V_{Peak}
21		2.7 V_{Peak}
22		3.15 V_{Peak}
23		3.6 V_{Peak}

NOTE: The given values are typical for Vdd = 3.6 V and T_A = 25°C characterized

Built−in Low Pass Filter

This filter allows the user to connect a DAC or a CODEC directly to the NCP2824 input without increasing the output noise by mixing frequency with the DAC/CODEC output frequency. Consequently, optimized operation with DACs or CODECs is guaranteed without additional external components.

Decoupling Capacitors

The NCP2824 requires a correct decoupling of the power supply in order to guarantee the best operation in terms of audio performances. To achieve optimum performance, it is necessary to place a 4.7 μF low ESR ceramic capacitor as

9 PIN FLIP−CHIP 1.45x1.45x0.596
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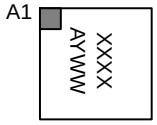
GENERIC
MARKING DIAGRAM*



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

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