

APPLICATION NOTE

WAU8814 vs NAU8814

Mono Audio Codec with
Speaker Driver

Delta Sheet

WAU8814 vs NAU8814 Delta Sheet

The NAU8814 is an advanced version of the WAU8814. This document is designed for WAU8814 customers who want to migrate to the NAU8814.

1. Power up Sequence

The output boost stage for the Speaker and MONO output drivers are powered by the speaker power supply (V_{DDSPK}). Both NAU8814 and WAU8814 has 3V or 5V mode of operation which is selected by MOUT3V[3] and SPK3V[2] bits at (0x31) but with the following changes.

1.1. WAU8814

WAU8814 by default powers up at 5V mode for both Speaker and Mono output driver. MOUT3V[3] and SPK3V[2] bits are set to "0".

In addition, WAU8814 has an extra bit called BIASGEN[4] bit at (0x03) to turn on a protection bias to allow safe operation in 5V mode. In 5V mode this bit must be set to 1 for optimal bias conditions, otherwise THD may degrade. By default this bit powers up at 0. The table below shows the power up sequence.

1.2. NAU8814

NAU8814 by default powers up at 3V mode for both Speaker and Mono output driver. MOUT3V[3] and SPK3V[2] bits are set to "0". There is no BIASGEN bit required in the power up sequence.

WAU8814 Power up Sequence				
Address	WAU8814	Default Setting	Setting for	
			3V mode	5V mode
0x31	SPK3V[2]	0	1	0
	MOUT3V[3]	0	1	0
0x03	BIASGEN[4]	0	0	1

NAU8814 Power up Sequence				
Address	NAU8814	Default Setting	Setting for	
			3V mode	5V mode
0x31	SPK3V[2]	0	0	1
	MOUT3V[3]	0	0	1
0x03	BIASGEN[4]	This bit is not required anymore which is why this bit does not exist in the device.		

2. Unused Analog Input Impedance

2.1. WAU8814

WAU8814 unused analog input impedance are $1k\Omega$ for the MIC-, MIC+ and the AUX pins.

2.2. NAU8814

NAU8814 unused analog input impedance is $30k\Omega$ for the MIC-, AUX pins and $40k\Omega$ for MIC+ pin.

3. ABIASEN[3] bit (0x01) can only be set to “1”

3.1. WAU8814

In WAU8814 ABIASEN[3] (0x01) must be set to “1” in order to bias all the analog blocks of the device.

3.2. NAU8814

In NAU8814 ABIASEN[3] (0x01) can be toggled after the power up and also during operation. ABIASEN bit can be used to go to sleep mode without resetting the device or any of its register setting.

4. Speaker Output 3-stage/ 2-stage Class-AB Amplifier

4.1. WAU8814

In WAU8814 the speaker driver power up in 3-stage class-AB amplifier mode. This may be changed to a 2-stage class-AB amplifier by setting LPSPKA[8] bit at (0x3A).

4.2. NAU8814

In the NAU8814 the speaker driver power up in 2-stage class-AB amplifier only. This may be changed to a 3-stage class-AB amplifier by setting LPSPKA[7] bit at (0x4B).

5. NAU8814 ENHANCED FEATURES

Several new features have been added to NAU8814 of which some help reduce pops and clicks and others give more flexibility to the part. The following section outlines the new features. Please see NAU8814 datasheet for detailed explanation.

5.1. New Features

- 5.1.1. Additional Silicon revision ID
- 5.1.2. Dither Control
- 5.1.3. Output Driver Control (3V/5V)
- 5.1.4. Mono output Mute control
- 5.1.5. ALC Enhancements
- 5.1.6. Right channel data is same as Left channel data
- 5.1.7. Digital pass-through
- 5.1.8. Soft-mute Enhancement
- 5.1.9. Notch Filter Enhancements
- 5.1.10. VREF Control Enhancement
- 5.1.11. Output Tie-off Direct Manual Control
- 5.1.12. Enhanced programmability when no MCLK present

5.2. Moved Bit Location

Bit	WAU8814		NAU8814	
	Bit Location	Bit Address	Bit Location	Bit Address
BIASEN	4	0x03	Removed	
SPIEN	8	0x07	8	0x49
MICBIASM	0	0x28	4	0x3A
LPDAC	4	0x3A	5	0x3A
LPSPKD	5	0x3A	6	0x3A
LPADC	6	0x3A	7	0x3A
LPIPBST	7	0x3A	8	0x3A
LPSPKA	8	0x3A	7	0x3B

6. VERSION HISTORY

VERSION	DATE	PAGE	DESCRIPTION
A0.1	December 2009		- Preliminary Revision

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