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# ST-NXP Wireless

## IMPORTANT NOTICE

Dear customer,

As from August 2<sup>nd</sup> 2008, the wireless operations of STMicroelectronics have moved to a new company, ST-NXP Wireless.

As a result, the following changes are applicable to the attached document.

● **Company name - STMicroelectronics NV** is replaced with **ST-NXP Wireless.**

● **Copyright** - the copyright notice at the bottom of the last page "© STMicroelectronics 200x - All rights reserved", shall now read: "© ST-NXP Wireless 200x - All rights reserved".

● **Web site** - http://www.st.com is replaced with http://www.stnwireless.com

● **Contact information** - the list of sales offices is found at http://www.stnwireless.com under Contacts.

If you have any questions related to the document, please contact our nearest sales office. Thank you for your cooperation and understanding.

ST-NXP Wireless

# STw5095

## Low Power Asynchronous Stereo Audio Codec with Integrated Power Amplifiers

**DATA BRIEF**

## Features

- 20 bit audio resolution, 8kHz to 96kHz independent rate ADC and DAC

- Asynchronous sampling ADC and DAC: they do not require oversampled clock and information on the audio data sampling frequency (fs). Jitter tolerant fs

- Wide master clock range: from 4MHz to 32MHz

- I$^2$C/SPI compatible control I/F.

- Stereo headphones drivers, handsfree loudspeaker driver, line out drivers

- Mixable analog line inputs

- Voice filters: 8/16kHz with voice channel filters

- Automatic gain control for microphone and line-in inputs

- Two programmable master/slave serial audio data interfaces (I$^2$S, SPI, PCM compatible and other formats)

- Frequency programmable clock outputs

- Multibit $\Sigma\Delta$ modulators with data weighted averaging ADC and DAC

- DSP functions for bass-treble-volume control, mute, mono/stereo selection, voice channel filters, de-emphasis filter and dynamic compression.

- 93 dB dynamic range ADC, 0.001% THD with full scale output @ 2.7V

- 95 dB dynamic range DAC, 0.02% THD performance @ 2.7V over 16Ω load

### Analog inputs

- Selectable stereo differential or single-ended microphone amplifier inputs with 51dB range programmable gain.

- One microphone biasing output.

- Microphone plug-in and push-button detection input

**TFBGA 5x5 (64 pins)**
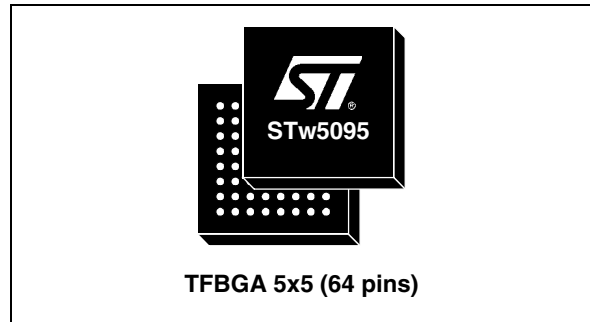
- Selectable stereo differential or single-ended line inputs with 38 dB range programmable gain

### Analog output drivers

- Stereo headphones outputs driving capability: 40 mW (0.1% THD) over 16Ω with 40 dB range programmable gain

- Common mode voltage headphones driver (phantom ground)

- Balanced loudspeaker output driving capability: up to 500mW (V$_{CCLS}$>3.5V; 1% THD) over 8Ω with 30dB range programmable gain

- Transient supression filter during power up and power down

- Balanced/unbalanced stereo line outputs driving capability 1kΩ

## Applications

- Digital cellular telephones with mp3 player, stereo recorder, fm radio stereo listening and recording functions, live music recording.

- Portable digital players and recorders.

Rev 1

October 2005 CD00059404 1/4

For further information contact your local STMicroelectronics sales office. *www.st.com*

# Description

STw5095 is a Low Power Asynchronous Stereo Audio CODEC device with Headphones Amplifiers for high quality audio listening and recording.

The STw5095 control registers are accessed through a selectable I$^2$C-bus compatible or SPI compatible interface.

The STw5095 Asynchronous Stereo Audio Codec is designed to easily fit in most audio systems because it supports an extended master clock range (any value between 4 MHz and 32 MHz) and at the same time it supports any audio data rate (independent in AD and DA paths) from 8 kHz to 48 kHz and from 88 kHz to 96 kHz, moreover it can tolerate jitter on audio data without degrading performance. The audio data serial interfaces (for AD and DA) can be Master or Slave, are I$^2$S compatible and they support other formats that can easily interface to standard serial ports. The two audio interfaces can be used as a single bidirectional interface. Two frequency programmable Clock Sources are available to generate the master clock for the audio sub-system of other devices. The internal D to A and A to D converters work with up to 24 bit resolution.

The supply voltage can be the same for the whole device, in the range 2.4 V to 2.7 V, or it can be differentiated for digital ($V_{CC}$: 1.8 V to 2.7 V), analog ($V_{CCA}$: 2.4 V to 3.3 V) and loudspeaker driver ($V_{CCLS}$: $V_{CCA}$ to 5.5 V) to obtain best performance and maximum power to the loudspeaker (up to 500 mW).

STw5095 has multiple analog mixable inputs and outputs. It can directly drive Stereo Headphones without external capacitors and it has a Loudspeaker driver that can also be used for monophonic group listening. Stereo differential and single ended microphones, auxiliary line in stereo and mono signals can be mixed and connected to the ADC or directly to the drivers, mixed also with DAC audio signals.

STw5095 Stereo Audio Codec main applications include multimedia handheld devices such as cellular phones with added low-power high-quality MP3 and∕ or FM radio listening/recording features, or any battery powered equipment such as PDAs, Camcorders, etc. that require Stereo Audio Codec with Headphones drivers.

# Order codes

| Part Number | Details |
|---|---|
| STw5095 | TFBGA 64 Tray |
| STw5095T | TFBGA 64 Tape and Reel |

# Functional block diagram
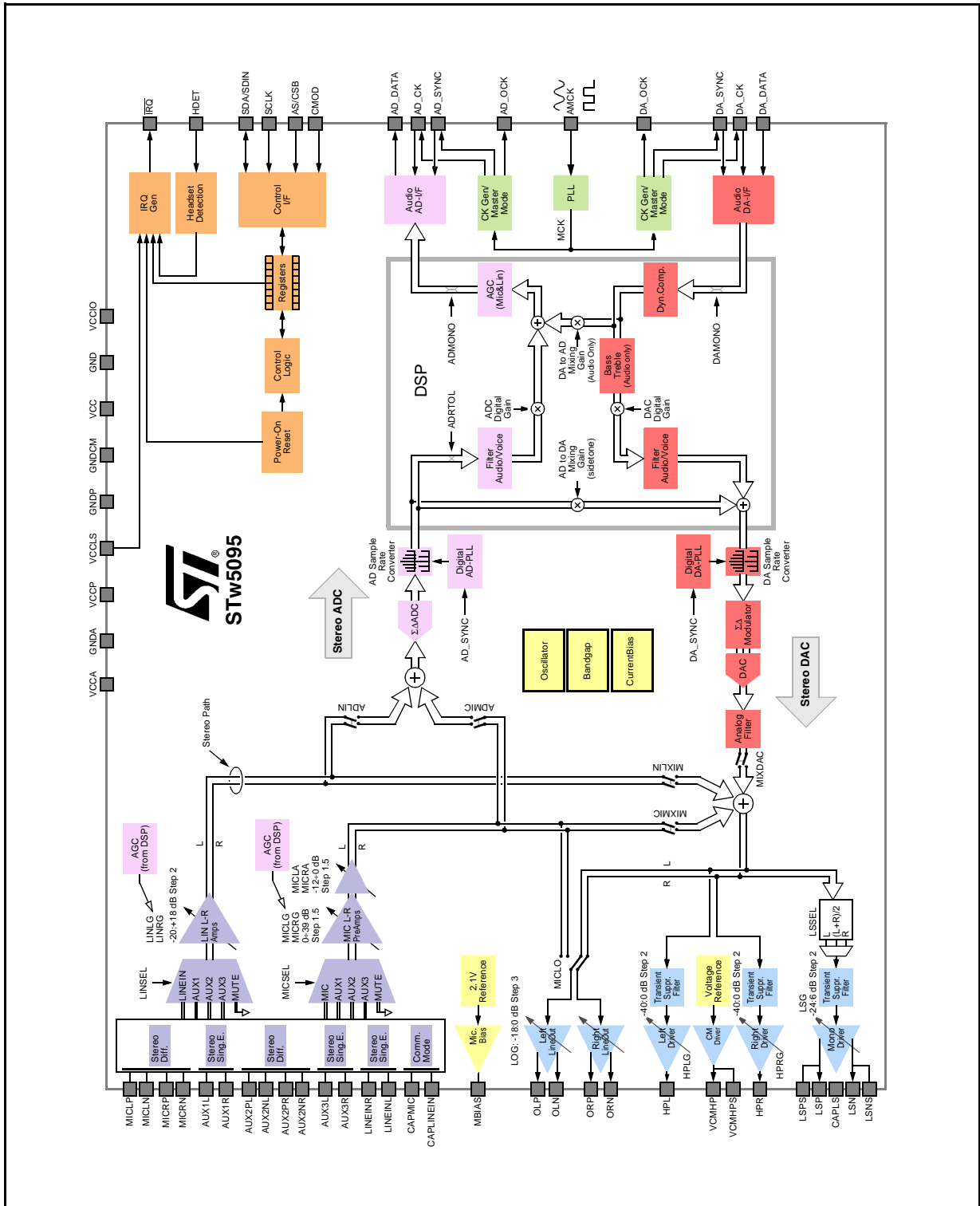
# Revision history

| Date | Revision | Changes |
|------|----------|---------|
| 3-Oct-2005 | 1 | Initial release. |