AC'97 Revision 2.3 Codecs

AC'97 rev 2.3 Audio Codecs with Internal Jack-Sense and Paging Registers

INTRODUCTION

The **STAC9752/53** are the industry's first *AC'97 2.3* Audio Codecs for the PC and portable segment. Both codes are **20-Bit** AC'97 devices adhering to **Intel's newly released 2.3 specification**. The new version adds important usability features like integrated **Jack-Sense** and **Paging Registers** to the already rich feature set that includes integrated headphone amplifier, SPDIF output, and the Crystal elimination Circuit. *The most important aspect of AC'97 version 2.3 is the cost saving potential of the Internal Jack Sense capability.* The Internal Jack-Sense can determine what has been plugged into the audio connectors and alert end-users when they have made a mistake. This helps the end-user get their system setup quickly, and it keep audio technical support call costs down for the OEM. Right now the largest support call item is audio setup … 2.3 codecs with Internal Jack-Sense can really help keep that cost down.

BEFORE YOU CALL
… Please Select
Another Connector

Properly Connected

($40/hour for call support) x (15minutes per call) = $10 Savings

*OEM cost savings from **Internal Jack-Sense** is the drive for AC'97 2.3*

MARKET OPPORTUNITY

Audio has moved full force to the motherboard in the last year, especially with the introduction of 20-bit south bridge controllers such as the **845 chipset from Intel**. This is a very important development for SigmaTel's line of 20-bit codecs. With the STAC9752/53, and the soon to be announced 6-ch STAC9758/59, SPDIF output, standard motherboards can now more easily become part of today's home entertainment system with a full 6-channels audio playback from the PC. Given the growing importance of multi-channel games, DVD playback and home theater, the AC'97 2.3 Internal Jack-Sense codecs are becoming essential to help end-users set their systems up for the first time. **Every time someone calls the OEM for technical support, it costs the OEM $40 per hour on lost profits. With average call times of 15 minutes, each call costs the OEM roughly $10 per confused end-user.** The family of AC'97 2.3 parts from SigmaTel help eliminate the confusion, the poor end-user experience, and the lost OEM profits.

AC97 REVISION 2.3 TECHNICAL FEATURES

The newly released **AC'97 revision 2.3 specification** has recently been upgraded with several new features that greatly improve the end-user experience. These new features include **Internal Jack-Sense** that lets the PC determine what type of device … such as speaker, headphones, and various microphones … is actually plugged into the audio connectors. **The headphone, line-out, and microphone all incorporate SigmaTel's Internal Jack-sense capability that does not require any external components**. This means that SigmaTel's Jack-Sense works on existing MBs without any modifications. In addition to the Jack-Sense, the new AC'97 2.3 specification provides for **Paging Registers** that store key audio sub-system information like external amplifier settings, gain, phase, and location of connectors. This type of information is very important to Microsoft in their progress for improved business audio. Without this type of **Analog Plug-n-Play information** the key features of business audio are very difficult to implement for voice record, speech recognition, and better use of the PC for telephony. The standard GPIO Jack-Sense pins are still available for designs that have previously implemented the older style mechanical approach to jack-sense that depended on special high-cost connectors with customer

MB designs and drivers. The internal **crystal elimination circuit** allows standard motherboard clocks to replace the costly 24.576MHz crystal for direct savings for all systems. SigmaTel's implementation of this crystal elimination circuit keeps the critical BIT_CLK at it's official and precise 12.288MHz frequency, protecting modem codecs and other audio devices that might also be on the AC-Link (Intel required and approved), while also guaranteeing that the SPDIF output and the internal hardware SRCs (Sample Rate Converters) are not affected. 2.3's **Digital PC_BEEP** (only requires a simple register write from BIOS to create the system beep) greatly simplifies the POST testing program code.

SUMMARY ADVANTAGES

The STAC9752/53 provide outstanding performance as well as some very new features, like the **Internal impedance sensing Jack-Sense** to allow the PC to determine whether speakers, microphone or headphones are plugged in. SigmaTel offers a Jack-Sense applet to help guide the end-user through the audio setup process. This *wizard* is available from the extranet web site. Now the built-in **SigmaTel Equalizer** can switch automatically between the speaker compensation mode and a bass boost mode for headphones. Most importantly, the technical support costs for OEMs will be reduced since end-users can now be notified if they make a setup mistake.

Outstanding Technical and Driver Support - SigmaTel provides extensive driver customization and support for our customers. One of our most popular services is the in-house audio quality and logo certification testing program for our customers which is part of the Microsoft "Quick Sign" program for the fastest logo certifications … on our customer's schedules. The hardware support team routinely provides schematic evaluations, layout recommendations, reference design schematics, and general debug/performance enhancement advice.

AVAILABILITY AND TECHNICAL SUPPORT

The STAC9752/53 is in production and available now. The STAC9766/67CC1 is a 100 dB SNR codec with 2.3 upgrades will be available in August, and the new 6-channel STAC9758/59 will be sampling in September 2002. Evaluation boards for ACR, CNR, MDC and AMR are available to qualified customers, and schematics, datasheets, and other technical documents can be downloaded from SigmaTel's web site at www.sigmatel.com.