

Sonic surprises

Dissecting the high-resolution hype

Late August 2005 brought a killer deal from Philips' online store: a PSC805 Aurilium 5.1-channel external sound processor at 60% off its previous \$50 asking price. What do \$20 plus sales tax and free shipping translate to in terms of included hardware? If you rely on the company's DSP heritage and the product's documentation, it's not what you might think. The PSC805 isn't a bad deal at \$20 (or even \$50), but don't mate it with an anemic or pre-Windows 2000-powered PC or rely on it to accurately capture your next high-resolution-audio masterpiece.

One big surprise: This high-volume, cost-sensitive consumer-electronics product contains a Lattice Semiconductor 64-macrocell CPLD. Extrapolating from the pc-board traces, it performs a number of gatekeeper functions, such as:

- translating I²C audio to S/PDIF,
- driving front-panel LEDs and generating outgoing commands that route to the PC over USB, and
- responding to incoming commands from the PC over USB and consequently controlling other PSC805 circuitry.

The PSC805 claims to enable you to experience "high-definition 5.1 audio on your laptop or PC." Indeed, the Philips UDA1338H's audio codec's DACs (which work in tandem with amplifiers to drive as many as six speakers) accept 24-bit input sources, and its ADCs output 24-bit I²C-formatted data. But eight of those bits largely go to waste because of the 16-bit-sample-size limitation of the USB connection to the PC, coupled with a reliance on PC-based software for most audio processing.

Another big surprise: The PSC805 also contains discrete logic in the form of two Philips 74HCT541 line-driver ICs that work in tandem with the CPLD to selectively illuminate the front-panel LEDs. The final surprise (or maybe not, given the unit's price tag): no dedicated audio DSP. Instead, bass and treble boost (as well as more general equalization), two-channel audio expansion, six-channel audio virtualization, reverberation, and other audio-processing algorithms run on the host PC.

The unit's packaging touts USB 2.0 support but neglects to include the "full-speed" (12-Mbps) qualifier. The Texas Instruments TUSB3200 streaming-audio controller (with corresponding crystal above it), which the company identifies as a USB 1.1-to-I²C transceiver, reveals the truth behind the marketing propaganda.

Philips' product brief trumpets that the PSC805 includes "24-bit/96-kHz audio hardware," and indeed it does—the AKM Semiconductor AK4353 DAC for the headphone jack. However, the USB interface's 16-bit sample-size limitation, along with its 48-kHz sampling-rate constraint, attenuates the hype.

