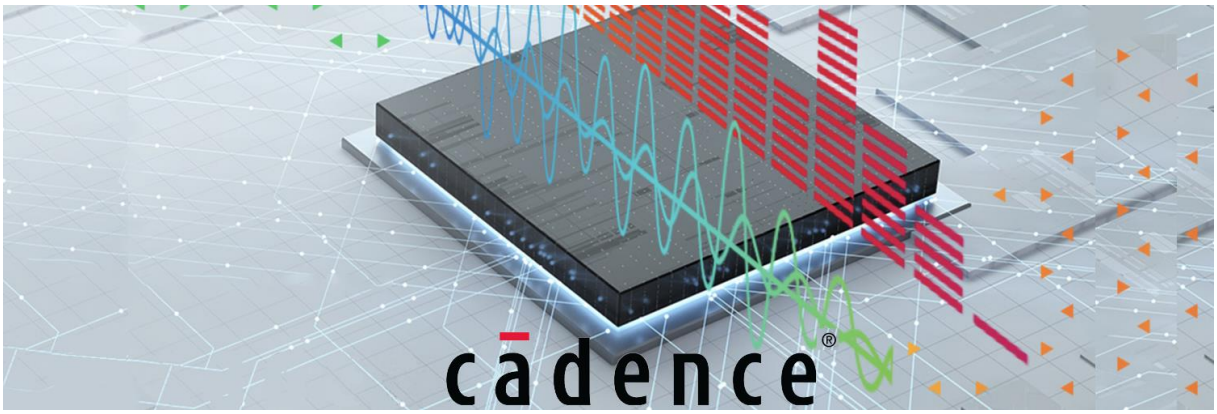
New Tensilica HiFi 1 DSP Features LC3/LC3plus



December 20, 2021

New Cadence DSP features the LC3/LC3plus codec wich enables extended battery life and improved UX for next-generation hearables, wearables and always-on devices

Cadence Tensilica HiFi 1 DSP improves the user experience by delivering breakthrough audio/voice innovation for small battery devices such as TWS earbuds, hearing aids, Bluetooth headsets, smart watches and other wearables. A number of converging trends are driving the need for low-energy audio/voice capabilities in a small form factor. Increasingly, hearables and wearables are adopting the Low Complexity Communications Codec (LC3) standardized by the Bluetooth Special Interest Group (SIG) in 2020. In addition, consumer preference for hands-free and touch-free control is driving demand for always-on, or always-listening, devices that respond to voice wake-up commands, and appliances are even adopting these capabilities. Finally, to enable these devices and applications, a small form factor and longer battery life are crucial.

“The Low Complexity Communication Codecs (LC3 and LC3plus) co-invented by Fraunhofer help minimize energy consumption for battery-constrained Bluetooth devices. Fraunhofer and Cadence have a long history partnering on various codecs including LC3/LC3plus, which Cadence has optimized on its Tensilica HiFi DSPs,” said Manfred Lutzky, Head of Audio for Communications department at Fraunhofer IIS. “We’re pleased to see them building upon that experience with the new HiFi 1 DSP that is energy- and cycle-optimized for LC3 and LC3plus. The HiFi 1 DSP embodies the codec’s unprecedented ultra-low energy levels, which should bring relief to small battery hearable and wearable devices with added features and help accelerate the widespread adoption of LC3 and LC3plus.”

The HiFi 1 DSP delivers ultra-low energy encoding and playback of LC3 and other Bluetooth codecs and ultra-low energy keyword spotting for voice wake-up, all in the smallest footprint HiFi DSP. Compared to the HiFi 3 DSP, the most popular audio DSP in the industry for the target applications, the HiFi 1 DSP offers:

- 11 to 16% lower area

- 60 to 73% greater cycle and energy efficiency for ML-based “OK Google” keyword spotting and person detect applications
- Greater than 18% cycle efficiency and 14% energy efficiency for LC3 decoding

“HiFi DSPs enjoy wide adoption in current-generation TWS earbuds and Bluetooth headsets,” said David Glasco, vice president of research and development for Tensilica IP at Cadence. “The advent of LC3 and wider market trends set the stage for next-generation hearables to offer a superior user experience and longer battery life. With many speech and voice algorithms migrating towards AI, we’re also seeing vastly expanding use cases for analytics and better sound quality in TWS earbuds. The compact HiFi 1 DSP enables these new use cases with ultra-low energy consumption, bringing to the mass market always-on and always-listening capabilities that were until now the privilege of premium products.”

About Cadence

Cadence is a pivotal leader in electronic design, building upon more than 30 years of computational software expertise. The company applies its underlying Intelligent System Design strategy to deliver software, hardware and IP that turn design concepts into reality. Cadence customers are the world’s most innovative companies, delivering extraordinary electronic products from chips to boards to systems for the most dynamic market applications, including consumer, hyperscale computing, 5G communications, automotive, mobile, aerospace, industrial and healthcare. For seven years in a row, Fortune magazine has named Cadence one of the 100 Best Companies to Work For. Learn more at cadence.com.

This article is based on a press release by Cadence:
https://www.cadence.com/en_US/home/company/newsroom/press-releases/pr/2021/cadence-extends-battery-life-and-improves-user-experience-for-ne.html

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Link: https://www.audioblog.iis.fraunhofer.com/tensilica-hifi-1-dsp-lc3-lc3plus