



High-Definition Advanced Audio Coding – New MPEG Audio Codec Renders CD Collections Obsolete

Fraunhofer Institute for Integrated Circuits IIS

Executive Director
Prof. Dr.-Ing. Heinz Gerhäuser
Director
Prof. Dr.-Ing. Günter Elst

Am Wolfsmantel 33
91058 Erlangen, Germany
www.iis.fraunhofer.de

Contact
Virgilio Bacigalupo
Phone +49 9131 776-6161
amm-info@iis.fraunhofer.de
www.iis.fraunhofer.de/amm

Fraunhofer USA, Inc.
Digital Media Technologies*
100 Century Court
Suite 504
San Jose, California 95112
www.dmt.fraunhofer.org

Contact
Jan Nordmann
Phone +1 408 573 9900
codecs@dmf.fraunhofer.org

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**Convenience
Emotional Insurance
HD Quality**

Benefits

- Audio quality superior to CD (24-bit audio, up to 192 kHz)
- State-of-the-art lossless compression preserving every bit of information
- Compatible with many mobile phones and PMPs (i.e. Apple iPod®)
- Full Metadata support including cover art, ID3 tags and lyrics
- Based on the ISO MPEG-4 AAC-LC and SLS open standards
- Maximized sound quality under difficult network conditions
- High error robustness and boundless editing possibilities

The new HD-AAC codec offers music quality superior to the CD and compatibility with iPods and AAC-enabled mobile phones. Based on the MPEG-4 standards SLS and AAC-LC, Fraunhofer's HD-AAC provides future-proof, lossless compression of 16/24-bit quality music content. Today's CDs store uncompressed audio in 16-bit, 44.1 kHz quality, despite the fact that most music is now produced in the improved 24-bit, 96 kHz format. The underlying objective for HD-AAC, therefore, is to make this new high-quality sound experience conveniently available to consumers, electronic music distribution services and the consumer electronics industry.

Markets & Applications

Online Music Distribution

Consumers will be able to buy content at online music stores that sounds better than the Audio-CD. For casual listening, HD-AAC files can be played on all iPods and other AAC enabled devices.

Home Media Servers and Connected Devices

In the modern, digital music-ready home, songs stored on media servers in the HD-AAC format can be streamed to multiple devices at varying bit-rates. This maximizes the sound quality under difficult network conditions by matching the bit-rate to the available bandwidth. The same files stored on portable devices can also be enjoyed in the car when docked to high-end sound systems. In addition, car radios will be able to convert music contained on CDs into the HD-AAC format.

Digital Archiving

Consumers and digital archives have the opportunity to archive music productions and CD collections for the future by encoding content in the HD-AAC format. Every aspect of the original information is preserved and ready to be played back through compatible devices. HD-AAC combines lossless compression with maximum flexibility and avoids tandem coding artifacts known to result from lossy codec transcoding.

Broadcasting

For studio-to-studio or studio-to-transmitter IP links, content stored in HD-AAC lossless quality can be distributed over varying bandwidth and without the need to transcode.

HD-AAC –Product & Service Categories That Will Benefit:

- Home Media Servers
- Online & Mobile Music Distribution
- Pro Audio and Consumer Software Products
- AV Receivers
- Streaming Devices
- Multimedia PCs
- Gaming Consoles
- Portable Music and Video Players
- Mobile Phones
- Car Entertainment Systems

Technology

Based on the MPEG-4 Scalable to Lossless Coding (SLS) technology, HD-AAC extends AAC to a lossless and near-lossless audio coding scheme. Building upon MPEG-4 AAC, a scalable extension layer further enhances the signal representation progressively from perceptually transparent or near-lossless to a lossless representation. At the latter stage HD-AAC achieves an average compression ratio of about 50 percent (2:1), comparable or superior to other state-of-the-art pure lossless audio codecs.

Availability and Licensing

With more than 20 years of experience in audio coding, Fraunhofer IIS offers reliable, high-quality HD-AAC software implementations. Fraunhofer licenses its codecs in object or source code form to manufacturers of hardware or software products. Command line or plugin-based encoders and decoders are available to end-users such as online stores content aggregators or labels.

HD-AAC is offered by Fraunhofer IIS in the form of product-ready libraries for PC/Mac (Windows, Linux or Mac OS), and as Core Design Kits (CDKs) for embedded solutions based on fixed-point or floating-point architectures.

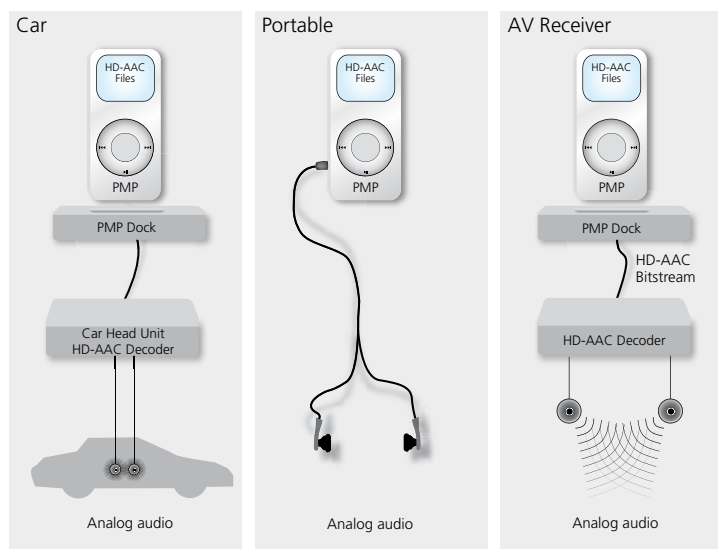


Fig.1: HD-AAC Nomadic Connectivity

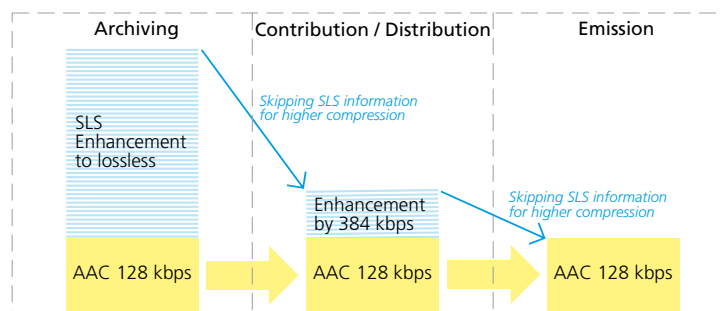


Fig.2: Depending on the needs of the different stages of a broadcasting chain, the data rate of HD-AAC can be adjusted in fine increments.

For information on HD-AAC (MPEG-4 AAC and SLS) patent licensing please contact VIA Licensing, Inc. at info@vialicensing.com.

About Fraunhofer IIS

The Fraunhofer Institute for Integrated Circuits IIS, based in Erlangen, Germany, is home of the organization's Audio and Multimedia division that has been working in compressed audio technology for more than 20 years. Fraunhofer IIS is universally credited with the development of the seminal mp3 coding algorithms and co-development of AAC (Advanced Audio Coding) as well as MPEG Surround technology standards. Throughout more than two decades, Fraunhofer IIS has licensed its audio codec software to more than 1,000 companies. Fraunhofer estimates that it has enabled more than 1 billion commercial products worldwide using its mp3, AAC and other media technologies. The Fraunhofer IIS organization is part of Fraunhofer-Gesellschaft, based in Munich, Germany. Fraunhofer-Gesellschaft is Europe's largest applied research organization and is partly funded by the German government. With nearly 13,000 employees worldwide, Fraunhofer-Gesellschaft is composed of 56 Institutes conducting research in a broad range of research areas.