Low Complexity Communication Codec (LC3)

Higher audio quality and lower power consumption for Bluetooth audio products

Fraunhofer IIS and Ericsson jointly developed the LC3 audio codec to solve fundamental shortcomings in Bluetooth audio. LC3 is standardized in SIG Bluetooth and is the codec for Bluetooth LE Audio. It enables super-wideband speech quality via Bluetooth headsets in VoLTE calls and takes the music streaming experience on wireless accessories to the next level.

Bluetooth LE Audio is LC3

The operation modes of LC3, range from medium bit rates for optimal voice transmission to high bit rates for music streaming services. At the same time, the codec operates at low latency, low computational complexity, and low memory footprint, thus meeting the requirements of wireless audio accessories.

Reduced Power Consumption

By reducing the required bit rate by roughly 50 percent compared to legacy codecs, LC3 paves the way for low-energy services that prolong battery life and facilitate the creation of smaller products.
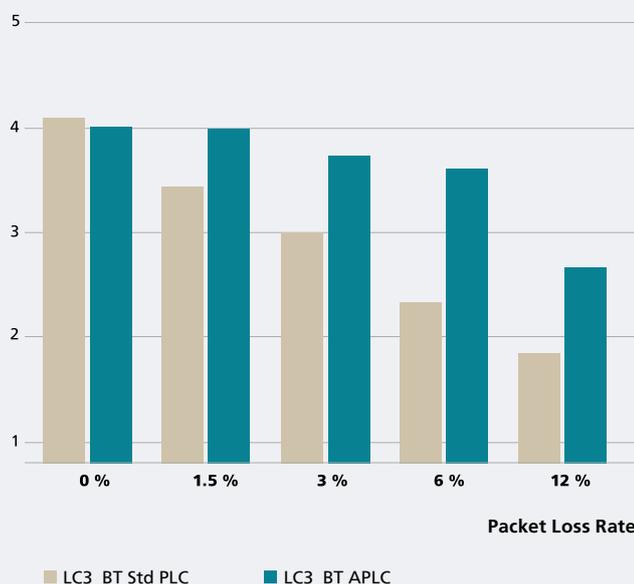
High-Resolution Audio streaming with LC3plus

For those who want to stay firmly ahead of the game, LC3's sibling LC3plus allows streaming of High-Resolution content over Bluetooth A2DP with up to 96 kHz and bit depths up to 32-bit – and that again at significantly lower bitrates compared to similar solutions.

Advanced Packet Loss Concealment

LC3 as standardized in Bluetooth includes basic Packet Loss Concealment (PLC). In order to provide a stable and uninterrupted connection in error-prone environments, Fraunhofer IIS provides powerful Advanced PLC as add-on to LC3 for Bluetooth.
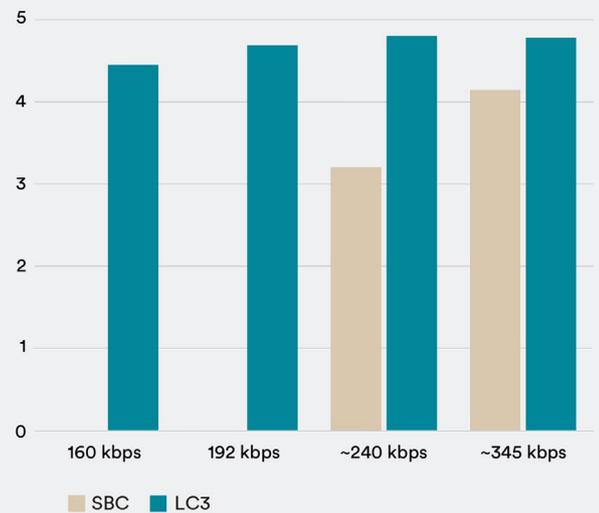
Bluetooth Codec Comparison
Standard Stereo Listening Test for Music

Source: Bluetooth SIG study based on ITU-R BS.1116-3

LC3 software for Bluetooth is available for licensing from Fraunhofer IIS. Additionally, Fraunhofer IIS offers licenses for Advanced Packet Loss Concealment as an add-on to the Bluetooth-standardized LC3. Fraunhofer IIS has pre-qualified its LC3 implementation as a Bluetooth component (Declaration ID D056040, QDID 167204). Software licensees can refer to this pre-qualification.

LC3 PLC Technologies Comparison
Bluetooth Standard PLC and Fraunhofer APLC for Speech

Source: listening test based on ITU-T Rec. P.800

Contact

Fraunhofer Institute for Integrated Circuits IIS

Management of the institute
Prof. Albert Heuberger
(executive)
Prof. Bernhard Grill
Prof. Alexander Martin

Am Wolfsmantel 33
91058 Erlangen, Germany
Phone +49 9131 776-0
info@iis.fraunhofer.de

Mandy Garcia
Phone +49 9131 776-6178
lc3-licensing@iis.fraunhofer.de

www.iis.fraunhofer.de/lc3
www.iis.fraunhofer.de