EtherMind Audio Codecs

SBC/mSBC for Classic , LC3 Codec for Bluetooth LE
and LC3 Plus for DECT standard

Introduction

LTIMindtree has invested over 500 person-years in Bluetooth technology since 2000. We have implemented several Bluetooth specifications that have been licensed and proven in production by semiconductor companies, audio and automotive OEMs. Audio codecs are one of the building blocks for any audio solution, and LTIMindtree has been a pioneer in building and licensing the standard codecs defined by Bluetooth SIG for Classic and Bluetooth low energy. Our SBC/mSBC implementation has been licensed and is in production with multiple customers. Our LC3 and LC3 Plus codec implementation is licensed by multiple semiconductor companies.

SBC Codec Feature

- Fixed point implementation, optimized for ARM

- Developed as per the Bluetooth SIG defined A2DP specifications

- All Sampling Frequencies (16 kHz, 32 kHz, 44.1 kHz and 48 kHz), as specified in A2DP

- All Channel Modes (Mono, Dual, Stereo and Joint Stereo), as specified in A2DP

- All Block Lengths (4, 8, 12 and 16), as specified in A2DP

- All Subbands (4 and 8), as specified in A2DP

- All Bit Allocation Methods (SNR and Loudness), as specified in A2DP

- All Bitpool values ranging from 2 to 250. The decoder and encoder will support all possible values that do not result in excess of the maximum bit rate. The Advanced Audio Distribution Profile limits the available maximum bit rate to 320 kb/s for mono, and 512 kb/s for two channel modes.

mSBC Codec Feature

- Fixed point implementation, optimized for ARM
  (Easily portable to other MCU/DSP ofchoice from the customer).

- Built to support Wide Band Speech with the Hands Free Profile (HFP),

- Sampling Frequency (16 kHz), as specified in HFP

- Channel Mode (Mono), as specified in HFP

- Block Lengths (15), as specified in HFP

- Subband (8), as specified in HFP

- Bit Allocation Method (Loudness), as specified in HFP

- Bitpool value (26) , as specified in HFP 1

LC3 Codec Features

- Developed as per the Bluetooth SIG defined LC3 specifications

- LC3 Codec is certified by Bluetooth SIG

- Fixed point implementation, optimized for ARM, ARC,Cadence Tensilica, Qualcomm Kalimba, RISC-V and many other custom DSPs (Easily portable to other MCU/DSP of choice from the customer)

- Optimized for MCPS, code and data memory

- Supports all defined configurations (sampling frequency, bit pool value etc.)

- Supports all the mandatory and optional features from the specification.

- Supports all Sampling Frequencies (8kHz, 16 kHz, 32 kHz, 44.1 kHz and 48 kHz)

- Supports 7.5ms and 10ms frame interval

- Supports 16, 24 and 32 bits per audio sample

- For 10ms frame interval, supports 16,000 to 320,000 bits per second per channel, complete range as specified in LC3

- For 7.5ms frame interval, supports 21,334 to 426,667 bits per second per channel, complete range as specified in LC3

- Packet Loss Concealment as defined in LC3 specification

- No restrictions with number of supported channels

- For details on MIPS and memory requirements, please contact: bluetooth@ltimindtree.com

LC3 Plus Codec

- Developed as per the LC3 Plus specifications from ETSI

- Fixed point implementation, optimized for ARM and Qualcomm Kalimba (Easily portable to other MCU/DSP of choice from the customer)All Sampling Frequencies (8kHz, 16 kHz, 32 kHz, 44.1 kHz and 48 kHz, For high resolution Mode LC3 Plus also supports 96 kHz)

- Supports 16, 24 and 32 bits per audio sample

- Supports 2.5ms, 5 ms and 10ms frame interval

- Supports 20 to 400 bytes per frame and channel for 10 ms

- Supports 20 to 200 bytes per frame and channel for 5 ms

- Supports 20 to 100 bytes per frame and channel for 2.5 ms

- LC3plus decoder accept up to 400 bytes per frame independent of frame duration

- Packet Loss Concealment as defined in LC3 Plus specification

- Error correction modes are available

- No restrictions with number of supported channels

Get in Touch

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About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 82,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale.
For more information, please visit https://www.ltimindtree.com/