

CASE STUDY

SBC Codec

TOP AMERICAN SMARTWATCH BRAND ENHANCES ITS APPEAL AND DELIVERS OUTSTANDING USER EXPERIENCE WITH ITTIAM'S SBC CODEC



ENGAGEMENT BACKGROUND

One of the leading OEMs for smart wearables was looking to sustain its competitive advantage and market share by delivering outstanding audio quality in its next-gen products.

The company chose Ittiam as its partner to harness our proven audio expertise for its smartwatches and smart activity trackers.



KEY CHALLENGES

The smart wearables brand sought a suitable codec to address the following key challenges:

- ▶ Ensure low CPU consumption
- ▶ Ensure low memory usage
- ▶ Support on ARM Cortex™-M4 with severe constraints on available processing and memory resources
- ▶ Support on multiple SoC platforms (ARM Cortex™-Ax and x86) running Linux, Windows 10 UWP, Windows 7 or MAC OS
- ▶ Provide a high quality audio experience



SUMMARY

CUSTOMER

Industry-leading brand of activity trackers and wireless-enabled smart wearables

REGION

USA

INDUSTRY

Consumer Electronics

SOLUTION

SBC Codec



ITTIAM SOLUTION

Ittiam thoroughly analyzed the OEM's requirements and recommended the low power, low complexity **Sub Band Coding (SBC)** as the best fit for the intended use cases.

[SBC is the de facto codec for Bluetooth Advanced Audio Distribution Profile \(A2DP\) Version 1.3 mandated by the Bluetooth Special Interest Group \(SIG\).](#)



SOLUTION HIGHLIGHTS

Unique aspects of Ittiam’s SBC encoder and decoder:

- Available on ARM and x86 platforms and multiple OS
- High quality encoding
- Extensive decoder testing for robustness with erroneous bit-streams
- Comprehensive validation for quality over a wide range of test vectors

Highly optimized implementation with low processing requirement and memory footprint:

SBC Decoder: <29MCPS, <3kb RAM on ARM Cortex™- M4
SBC Encoder: <18MCPS on ARM Cortex™-A8, <13MCPS for x86 (64-bit), <3kb RAM



THE ITTIAM IMPACT

Ittiam’s optimized implementation of the SBC codec enabled the following:

- Low-bitrate streaming & playout of audio over Bluetooth headphones or loudspeakers that the smart activity trackers are connected to
- 50% lesser MCPS than Open Source, resulting in significantly higher performance & longer battery life
- Low memory usage
- Rich audio quality

The global wearables brand was thus able to fulfill its promise of ‘**outstanding quality of experience**’ and delight customers with great sound.



CODE FEATURES

- 4 and 8 sub-band encoding
- SNR mode
- Mono and stereo channel encoding
- Joint-stereo and dual-channel modes
- Sampling rate of 16kHz, 32kHz, 44.1kHz and 48 kHz

OTHER HIGHLIGHTS

- 4 and 8 sub-band encoding
- Simple C-callable APIs
- Flexible memory allocation
- Multi-channel re-entrant libraries

For more information explore our [Audio Codec Products](#) or contact us at mkt@ittiam.com

ABOUT ITTIAM

Ittiam Systems is a trusted solutions provider to world leaders in multimedia, enabling next generation video experiences through its complete suite of intelligent video technologies, systems and solutions. Backed by its proven video expertise and insights, Ittiam’s products deliver real intelligence to solve its customers’ most complex technology challenges, empowering them to deliver high performance, efficient and reliable video products in rapid time. Ittiam’s solutions are at the heart of millions of lifestyle products that drive mobility, content access, networking and sharing.

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