DATA SHEET

Jacoti Inside

Qualcomm QCC51XX

Enhanced Performance And Integration For Next-Gen Devices

Overview

Jacoti's processing engine is designed for optimal performance with Qualcomm's QCC51xx. This integration empowers various hearing devices, including earbuds, headsets, and hearing aids, to conduct personalized hearing tests and tailor audio output to individual preferences.

Our technology provides a practical solution for manufacturers seeking to incorporate Jacoti's hearing assessment and audio personalization capabilities seamlessly into their products at the chip level. Placing Jacoti's technology directly within the device allows for efficient and streamlined processing of audio signals. This leads to reduced latency and an overall improvement in performance, ensuring that users experience enhanced clarity and responsiveness in their auditory interactions.

This alignment addresses the increasing demand for hearing-enhancing devices by embedding Jacoti Inside into the devices. With the technology seamlessly integrated into the device itself, users experience less dependence on external accessories or connectivity. This integration elevates convenience, making the device a self-contained and user-centric solution.

Key features

- Hearing Loss Compensation: The HLC uses Jacoti HearingKit® audio signal processing technology focused on compensating the hearing loss of individuals by applying a series of algorithms such Automatic Gain Control, Spectral Shaping and Limiter.
  Compensation suitable for normal hearing to moderate hearing loss: -20 dB to 60 dB, tuneable for Hi-Quality or Low-DSP footprint, can be used standalone with the Live Sound feature.
- DuoTone® hearing test procedure: patented pure tone audiometry procedure that employs pairs of pure-tone stimuli at different frequencies. Different frequency pairs are tested (along with an additional silent condition) which determine pure-tone thresholds from 125Hz up to 12000Hz.
- Integration with Jacoti earCloud®: Jacoti's Cloud platform that allows to store audiological medical data and is prepared to connect hearing experts with users.
- Companion mobile control app: Jacoti Connect+ showcase the interaction of a smartphone remote control app with Jacoti Inside running on-chip.

Headset Integration Specifications

Integration options	Kymera Capability
Audio Codec	Codec-independent
Configuration	GAIA protocol

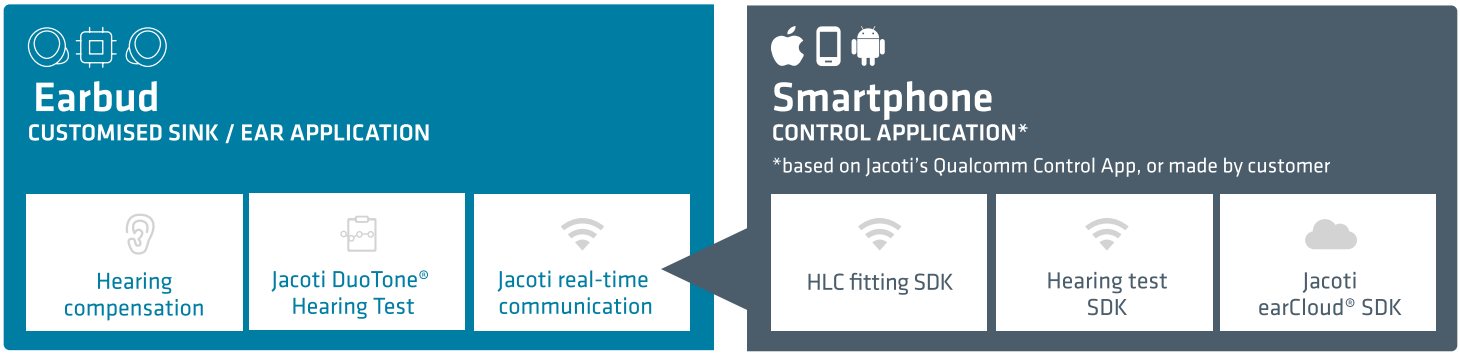
Power consumption	Current (mA)
Sink+HLC (A2DP)	5.5
Sink + HLC (HFP)	6.7
Sink + DuoTone®	7.6
Sink Live Sound	3.9

DSP Utilization	MIPS
Sink + HLC,A2DP	28.7
HLC, A2DP	13.0
Sink + HLC, HFP	21.8
HLC, HFP	4.0
Sink + Hearing test full noise monitoring	21.3
Sink + DuoTone®	11.3
Sink Live Sound	21.5

Resource usage	Memory (kiB)
PM usage	33
DM, HLC	24.3
DM, DuoTone®	42.9

Notes:

- MIPS are computed using ACAT `profiler.run_clks(30)`
- For MIPS, we show measurements for Sink using our Kymera Capability, and estimated requirements for our capability, shown in bold. Estimates are computed using the following formula: MIPS (Sink+QC Capability) – MIPS (Sink Vanilla)
- Hearing test use cases use a separate processing graph that solely involves the QC capability and audio I/O.
- PM and DM are computed using ACAT `heapmem.run_all(),heappmmem.run_all()`
- PM figures include peak consumption at initialization



Integration into on-board

Hearing Loss compensation can be used as a Kymera capability in all Sink application headset use cases: A2DP streaming, HFP voice call along Qualcomm technologies such as Acoustic Echo Cancellation or Clear Voice Capture (cVc) (1, 2 or 3 microphones), and ambient mode.

Our solution runs on a single Kalimba DSP for all use cases in Low-Power and Hi-Quality processing graphs.

QCC51xx Specifications

Bluetooth	QCC514x: Bluetooth 5.2 QCC515x: Bluetooth 5.2 QCC517x: Bluetooth 5.3 + LE Audio use cases including Auracast
Audio DSP	Dual 120MHz (240MHz) Kalimba audio DSP cores Flexible clock speed from 2MHz up to 120MHz (240MHz)
Applications subsystem	32-bit firmware processor 32-bit 32/80MHz developer processor
Memory	QCC514x: 112KB program RAM, 448KB data RAM QCC515x: 112KB program RAM, 448KB data RAM QCC517x: 384KB program RAM, 1408KB data RAM
Interfaces	UART, USB 2.0, SDIO, QSPI, 2x bit serializers (QCC515x), 3x bit serializers (QCC517x) (I2C/SPI), NOR flash, up to 55x PIO
Power management	Integrated power management unit (PMU) Dual switch-mode power supply (SMPS)

Jacoti is a member of the Qualcomm Voice & Music Extension Program: Chipsets supporting Jacoti Hearing Technologies

About Jacoti

Jacoti BV | Hearing Technologies is a science-based company that develops hearing enhancement solutions embeddable in consumer devices. Its flagship product, Jacoti Inside, optimizes audio to each individual hearing requirement from consumer technologies to fully-fledged medical devices.

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