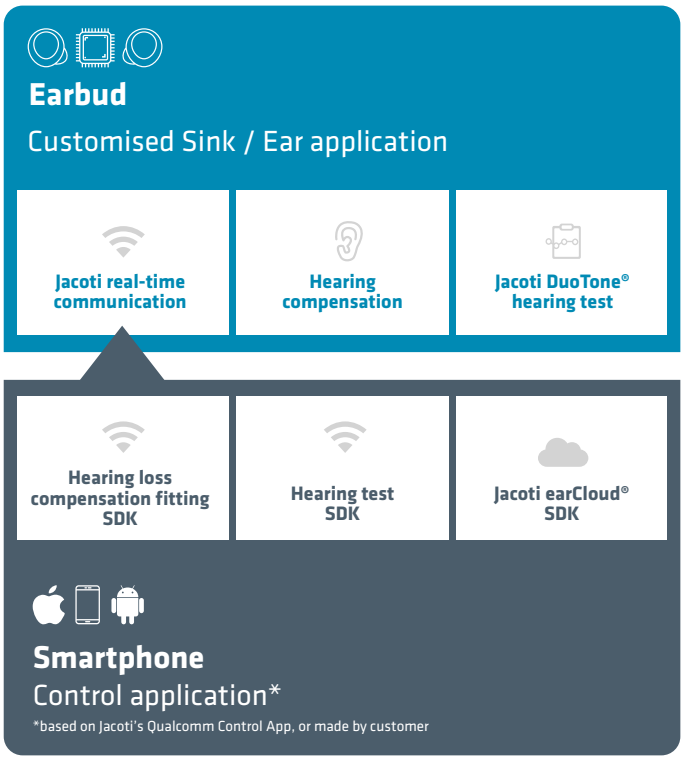
Jacoti Inside

Jacoti personalise hearing experiences on QCC51xx series Bluetooth Audio SoCs

Overview

- Jacoti brings its hearing technologies to embedded platforms based on QCC51xx series.
- Hearing devices such as headsets or hearing aids based on this chip family can perform hearing test, hearing loss compensation and audio personalization.
- Jacoti has ported and optimised its processing engine for the QCC51xx series resulting in a low processing and RAM footprint, allowing Jacoti Technologies to be integrated on-chip in a range of use cases and applications.



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

DuoTone® is a 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 earCloud® is 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 initialisation

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
QCC512x: Bluetooth 5.1
QCC514x: Bluetooth 5.2

Audio DSP
Dual 120MHz Kalimba audio DSP cores
Flexible clock speed from 2MHz up to 120MHz

Applications subsystem
32-bit firmware processor
32-bit 32/80MHz developer processor

Memory
QCC512x: 80KB program RAM, 256KB data RAM
QCC514x: 112KB program RAM, 448KB data RAM

Interfaces
UART, 2x Bit Serializers (I2C/SPI), USB 2.0, SDIO, QSPI, NOR flash, up to 55x PIO

Power Management
Integrated power management unit (PMU)
Dual switch-mode power supply (SMPS)

Jacoti brings medical grade precision to Qualcomm's Bluetooth Audio SoCs, helping to meet increasing consumer demand for hearing enhancement.

Jacoti HEARING WITHOUT BARRIERS

Jacoti's hearing solutions can be deeply embedded in any consumer electronics device with an audio output. Our technology enhances audio experiences tailored to every customer's individual needs & preferences.

Contact us: business@jacoti.com | press@jacoti.com