Qualcomm

Qualcomm® Smart Audio 400 Platform Development Kit

Streamline the process for developing a smart speaker with this comprehensive, customizable development kit and example design built around the Qualcomm® QCS400 smart audio System-on-Chips (SoCs).

The Qualcomm Smart Audio 400 Platform Development Kit is a unique end-to-end solution designed specifically to help reduce the development time and complexity associated with creating smart speaker and smart home assistant products.

It brings together a System-on-Module (SoM) designed to be ready for mass-production and many pre-integrated technologies needed to develop a smart speaker into a single, flexible development kit.

With this development kit, manufacturers can more easily create differentiated smart speaker products and capitalize on growing smart speaker opportunities across a range of tiers.
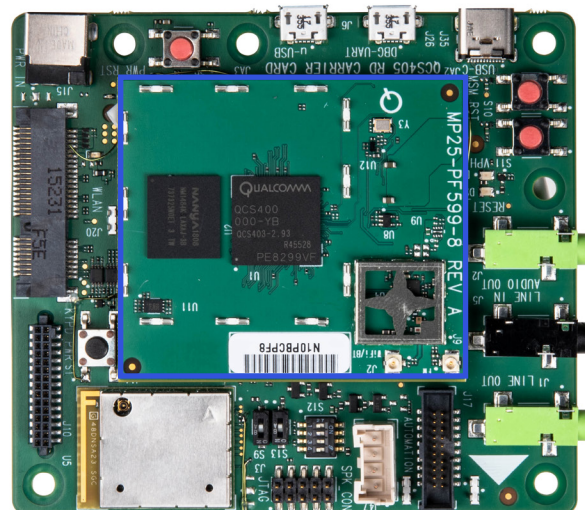
Configuration of the kit is supported by our new Audio Development Kit (ADK), which helps simplify product set-up and customization.

Qualcomm® aptX™ audio, Qualcomm® DDFA™ Amplifier Technology, Qualcomm® low-latency multi-room audio, Qualcomm® Far Field Voice and Qualcomm® Local Automatic Speech Recognition technologies are available as optional add-ons for further differentiation. The software supports Linux OS and the major cloud-based smart assistants and is qualified for Amazon Alexa Voice Services.

Development Kit Contents

- Qualcomm® QCS404-based SoM (DK-SMART-AUDIO-QCS404-2-A) or Qualcomm® QCS403-based SoM (DK-SMART-AUDIO-QCS403-0-A)

- Carrier board with 4W on-board stereo amplifier, Zigbee module, USB/JTAG for debug and line-in/line-out connectors

- Configurable (2-8) microphone and LED array board

- Speaker casing with dual-drivers

- 12V power supply

- Power cable, carrier board to speaker cable, carrier board to microphone cable

- 2x antennas for Wi-Fi, Bluetooth and Zigbee

- Quick Start Guide

- Hardware/software documentation/resources via online portal (including libraries approved by Dolby* and DTS, respectively)

- Qualcomm® CSRA6640 based 2-ch a 2x20W amplifier daughter card (QCS404 SoM only)

SoM and Carrier Board

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Features

- QCS400 SoC with advanced Qualcomm® Hexagon DSPs and integrated Qualcomm® Artificial Intelligence (AI) Engine
  - Dedicated low-power DSP to support low power wake-word detection
  - Dedicated AI Engine to support advanced noise and echo cancellation, user identification and local ASR technologies
- Alexa Built-in - build products that respond to the "Alexa" wake word and work with Alexa skills and Alexa-compatible devices
- Integrated Wi-Fi and Bluetooth connectivity
- Premium audio with 384 kHz/32-bit 12 multichannel audio processing
- Pre-integrated 2 and 4-mic machine-learning based low-power multi-channel Qualcomm far field voice and Local ASR technologies[1]
- Pre-integrated low-latency whole home audio for superior in-room and multi-room audio streaming
- Support for major cloud-based voice assistants[2]
- Pre-integrated Dolby* and DTS libraries
- New Audio Development Kit (ADK) for more simplified set up and customization (e.g. LED patterns)
- Low cost SoM with key system components (PMIC, SoC, Wi-Fi/Bluetooth, memories) to help reduce development time
- Mobile App to support Wi-Fi/ Bluetooth/ Zigbee device on-boarding, device grouping, music streaming and on-boarding for Amazon Alexa Voice Services

[1] Algorithm is expandable from 2 to 8 mics.
[2] A software updatemay be necessary for some cloud vendors.
* Subject to license from Dolby.

Ordering Information

Product	Part Number
Qualcomm Smart Audio 400 Platform Dev Kit (QCS403) with acoustics	DK-SMART-AUDIO-QCS403-2-A
Qualcomm Smart Audio 400 Platform Dev Kit (QCS404) with acoustics	DK-SMART-AUDIO-QCS404-0-A

Qualcomm

Speaker Casing

- 360 degree audio
- Bi-amped, 2-way speakers
- Detachable Mic Array Module
- Includes PDM (default), Analog and I2S microphones
- Buttons: Power/Vol+/Vol-/Activate/Mute
- RGB LEDs with LED controller
- Dedicated Mute LED indication

SoM Specifications

FEATURES	QCS403 SoM	QCS404 SoM
Dimensions	46.5 x 50mm	37 x 37mm
CPU	**QCS403** Dual Core Arm A53 64b at up to 1.4GHz	**QCS404** Quad Core Arm A53 64b at up to 1.4GHz
Memory /Storage	4 Gb NAND + 4 Gb RAM	
Connectivity	**Qualcomm® WCN3980** 1x1 802.11ac, Bluetooth 5.0 A2DP, aptX, HFP, AVRCP, HOGP, GATT profiles	
DSP	Dual Hexagon V66 DSP	
PMIC	**Qualcomm® PMS405**	
Interfaces	UART, I2C, SPI, USB 2.0, USB 3.0, TDM mode capable I2S, GPIOs, Aux input and Line out	
Operating System	Linux Embedded	

Qualcomm Hexagon, Qualcomm Artificial Intelligence Engine, Qualcomm WCN3980 and Qualcomm PMS405 are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

Software Development Kit

A rich set of tools and software is available for download to help reduce development effort. Visit the QCS400 product page for further information.