



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.

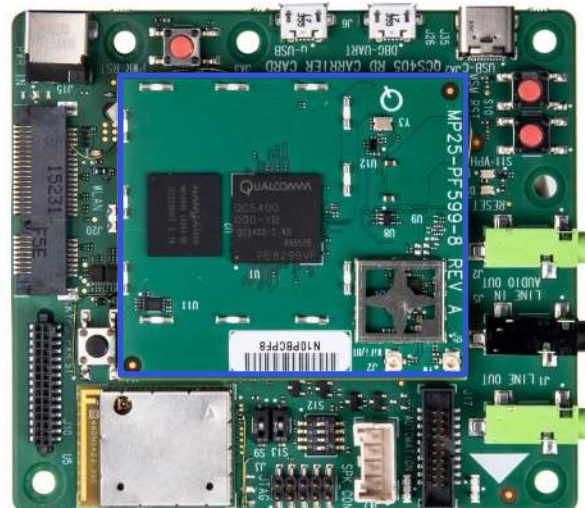
Configuration of the kit is supported by our new Audio Development Kit (ADK), which helps simplify product set-up and customization.

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



* Subject to license from Dolby.
This material is subject to change without notice.
87-CE935-1 Rev. D

Qualcomm Smart Audio Platform 400, Qualcomm QCS400, Qualcomm QCS403, Qualcomm QCS404, Qualcomm aptX, Qualcomm DDFA, Qualcomm low-latency multi-room audio, Qualcomm Far Field Voice, Qualcomm Local Automatic Speech Recognition and Qualcomm CSRA6640 are products of Qualcomm Technologies, Inc. and/or its subsidiaries.



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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 technologies¹
- Pre-integrated low-latency whole home audio for superior in-room and multi-room audio streaming
- Support for major cloud-based voice assistants²
- 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 update may be necessary for some cloud vendors.

* Subject to license from Dolby.

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, I ² C, SPI, USB 2.0, USB 3.0, TDM mode capable I ² S, 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.

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

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.

