Highlights

Ultimate audio experiences

QCS400 is designed to provide truly superior audio performance, with support for Dolby Atmos and DTS:X immersive home audio, Qualcomm® DDFA™ amplifier technology and Qualcomm® aptX™ audio for low-latency streaming, as well as a dedicated high-performance audio DSP with hardware enhancement capable of up to 32 channels of audio post processing.

Edge compute and AI

Our integrated AI Engine includes machine learning capabilities configured to help improve local Voice UI, noise reduction, automatic speech recognition and the flexibility to innovate by developing and running custom machine learned inferences.

Dramatically improved power performance

Designed specifically for low-power key-phrase detection, providing a 25 times longer standby with voice wakeup*. Supports new levels of performance for portable and battery-powered speakers, and helps reduce standby current requirements for mains-connected speakers or smart assistants.

Industry-leading connectivity

Advanced, highly-integrated connectivity designed to support low-latency music streaming in a room and throughout the home, as well as superior performance with coexistent Wi-Fi, Bluetooth and Zigbee. Designed with a scalable architecture to help meet various performance, functionality and price points.

*compared to previous generation of our Smart Audio Platform and other conventional architectures
Features

- Highly-integrated architecture, with up to four cores, Dual-DSP, Wi-Fi, Bluetooth, powerful audio features and our AI engine on a single chip
- Our AI engine supports highly efficient on-device inferences and machine learning-based, embedded automatic speech recognition
- Industry leading connectivity with advanced Wi-Fi, Bluetooth and Zigbee coexistence technology and low-latency streaming
- Qualcomm® Adreno™ GPU and display (QCS407 and QCS405 only)
- Superior audio performance, with support for Dolby Atmos and DTS:X immersive home audio
- High performance, low-power keyword detection pre-loaded and running on an integrated DSP
- Configurable multi-keyword detection with Local Automatic Speech Recognition for customizable user experiences
- Includes multi-mic beamforming noise suppression with mono, stereo and multi-channel echo cancellation
- Support for up to 32 channel audio output to help meet the evolving needs of AVR space
- Compatible with DDFA amplifier technology and aptX audio
- Help to reduce product development time and cost with our Audio Development Kit (ADK), and Software Evaluation Kit, as well as hardware reference designs
- SoC variants at multiple tiers to help OEMs scale across a range of end-product types and applications

To learn more visit: qualcomm.com

QCS400 Series Target Applications

- Smart Speakers
- Smart Assistants
- Home Hubs
- Smart Soundbars
- Audio Visual Receivers
- Premium Smart Speakers with Display

QCS400 Block Diagram

QCS400 Series SoC Variants

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>QCS407</th>
<th>QCS405</th>
<th>QCS404</th>
<th>QCS403</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compute</td>
<td>Quad Core</td>
<td>Quad Core</td>
<td>Quad Core</td>
<td>Dual Core</td>
</tr>
<tr>
<td>Adreno 306 GPU/Display</td>
<td>✓</td>
<td>✓</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Display</td>
<td>✓</td>
<td>✓</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Audio DSP</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Compute DSP with Qualcomm AI Engine</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Voice and Machine Learning</td>
<td>Multi-mic Qualcomm® Noise and Echo Cancellation</td>
<td>Simultaneous multi-keyword detection</td>
<td>ML based wake word detection</td>
<td>Local Automatic Speech Recognition</td>
</tr>
<tr>
<td>Security Features</td>
<td>Security rich boot</td>
<td>Debug security features</td>
<td>Cryptographic accelerators</td>
<td>Supports trusted execution environment</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Supports trusted execution environment</td>
<td>Crypto acceleration</td>
<td>Supports trusted execution environment</td>
<td>Support trusted execution environment</td>
</tr>
<tr>
<td>Audio I/F Channels</td>
<td>32</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Wired I/F</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

 Qualcomm Adreno, Qualcomm Hexagon and Qualcomm Noise and Echo Cancellation are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

©2019 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved. Qualcomm, Hexagon and Adreno are trademarks of Qualcomm Incorporated, registered in the United States and other countries. aptX and DDFA are trademarks of Qualcomm Technologies International, Ltd., registered in the United States and other countries. The Bluetooth® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by Qualcomm Technologies International, Ltd. is under license. Other products and brand names may be trademarks or registered trademarks of their respective owners.