



Qualcomm® DDFA™ CSRA6620 Controller/Feedback Processor

Next-generation DDFA Controller and Feedback Processor for superior sound quality in consumer audio devices - including speakers, soundbars and networked audio amplifiers.

The CSRA6620 SoC is a highly-integrated digital stereo amplifier controller, designed to combine the power efficiency of Class D technologies with the audio performance of linear amplifiers, and is the first of our new generation of DDFA devices.

Direct Digital Feedback Amplifier (DDFA) technology is founded on a patented digital closed-loop modulation and feedback technique, which corrects the distorting influences present in all Class D switching amplifiers and helps deliver premium audio quality. DDFA has earned widespread recognition in high-end audio for supporting superior sound quality, including at high volumes.

The device integrates a very low-noise digital PWM modulator, analog feedback processor and configurable DSP alongside multiple other features, in a comprehensive single-chip 9x9mm QFN package.

CSRA6620 is designed for high-power audio applications where low noise and low distortion levels are required and is compatible with a range of discrete and integrated output stages.

Product Highlights

Designed to deliver superior performance

DDFA true digital and patented closed-loop architecture is engineered to provide a solution for designing speakers and amplifiers with low-noise, low-distortion and high dynamic range.



Highly-integrated, single-chip solution

Digital modulator, feedback processor, microcontroller, memory, configurable DSP and additional features all integrated on a single-chip solution helps deliver superior amplifier performance in a low complexity, cost effective way.



Advanced DSP features

The advanced configurable DSP with high-resolution support, automatic sample rate conversion, and mixing and filtering capabilities can help manufacturers build high-quality devices without the need for additional, external components.



Renowned DDFA technology

DDFA has been associated with high-end audio devices for more than ten years and is used by industry leading brands in the audio market today. As a result, DDFA technology and branding is recognised as a sign of excellent sound quality among audio-enthusiasts and consumers.



Qualcomm® DDFA™

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CSRA6620

CSR6620 DDFA Applications

- Speakers
- Soundbars
- Hifi Amplifiers
- Networked Audio Products
- Headphone Amplifiers

Features

Highly integrated single-chip architecture:

- DDFA Digital PWM modulator and analogue feedback processor
- Integrated microcontroller & OTP Memory
- Power management unit with single input power supply
- Configurable multichannel High-Resolution DSP with 384kHz PCM, TDM and DSD64/128 input support
- Integrated digital PLL and sample rate conversion
- Bass and treble tone control
- 15 biquad filters per channels
- Choice of interpolation filters with different sound characters
- Independent volume controls
- Delay lines for driver alignment
- Dynamic compression and soft clipping management
- Integrated master clock generation

Advanced control:

- Serial control interface over SPI/I²C
- Tuning tools for PCs
- GPIO resources

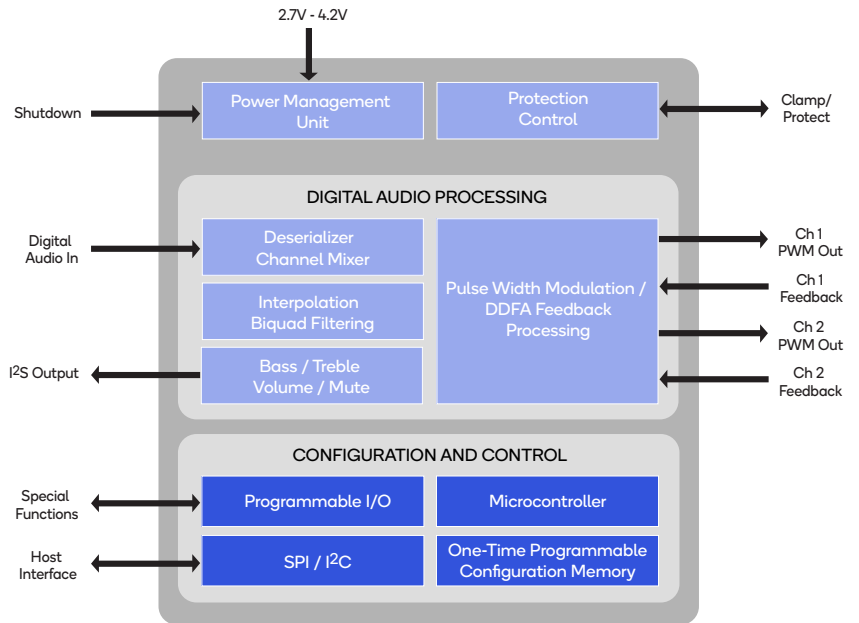
Wide choice of PWM, power supply and output configurations:

- 400kHz and 800kHz modulation
- AD and BD modulation options
- Shift frequency & spread frequency modes
- Single-ended and BTL outputs
- Flexible rail voltage support
- Support for discrete and monolithic output stages

Additional features:

- Coordinate operation of up to 4 devices (8 channels)
- External thermal sense management

CSRA6620 Block Diagram



CSRA6620 Specifications*

THD+N < 0.002% (8 Ohms, AD 400Khz modulation, 1kHz, -1dBFS)

Signal-to-Noise Ratio > 114dB (AD 400kHz modulation, A-wt, 1kHz, 0dBFS)

Dynamic Range > 114dB (AD modulation, A-wt, 1kHz, 0dBFS)

Noise Floor Modulation < 2dB (-60dBFS to -1dBFS)

Residual Noise < 35µVrms (AD modulation)

Package Size 9mm x 9mm x 0.9mm
0.4 mm pitch, 76-pin QFN

* These specifications are based on typical performances, and may vary based on your design.

Ordering Information

Product	Part Number
CSRA6620 SoC	CSRA6620C06-IQQO-R

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To learn more visit: qualcomm.com

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