



High performance DAC with MQA, PLL, Differential ADC, and Audio Mixing

ES9068A

The ES9068A is a feature-rich 32-bit, 2-channel audio D/A converter with PLL, ADC and support for both analog and digital mics, and analog/digital mixing. It has been designed for professional applications (mixer consoles, digital audio workstations), audiophile-grade portable applications (headphones, headphone adapters and digital music players), and consumer applications (DACs and A/V receivers). Using the critically acclaimed ESS patented HyperStream® II architecture, QUAD DAC™ technology, Time Domain Jitter Eliminator, and advanced SABRE HIFI® technology, the ES9068A delivers a performance level that will satisfy the most demanding audio enthusiast.

The versatile audio input port accepts PCM, DSD, DoP, S/PDIF and MQA formats. The integrated SABRE DAC supports up to 32-bit 384kHz PCM, 96k S/PDIF and DSD1024 audio data via master/slave interface in synchronous and asynchronous sampling modes. ES9068A is a licensed and standard-compliant MQA native hardware renderer.

Integrated low-noise DAC reference regulator reduces PCB area and BOM cost. Aux Mix mode allows analog signals to be seamlessly overlaid onto digital audio even during DSD, DoP or MQA playback. ES9068A may be customized for any application with firmware-controlled behavior and both volatile and non-volatile memory options.

FEATURE	DESCRIPTION
Patented 32-bit HyperStream® II Architecture and QUAD DAC™ Technology, and SABRE HIFI® Technology	32-bit audio DAC with high dynamic range & ultra-low distortion
+130dBA SNR +126dBA DNR -120dB THD+N	Industry's highest performance 32-bit mobile audio DAC with unprecedented dynamic range and ultra-low distortion. Supports synchronous and asynchronous sampling modes
Hardware MQA Renderer	Automatic 'stream lock' to unfold decoded MQA stream Easily paired with software MQA core decoder Eliminates the need for complicated DAC filter tuning
Analog PLL with programmable clock muxing	Provides multiple clocking options and reduces PCB size and BOM cost
64-bit accumulator & 32-bit processing	Distortion free signal processing
Versatile digital audio input port	Supports master/slave PCM (I2S, LJ 16-32-bit), DSD, DoP, S/PDIF and MQA formats.
Customizable filter characteristics	3 preset filters, programmable filter coefficients for custom sound signature
Integrated differential ADC 100dBA DNR, -87dB THD+N 1Vrms, PDM decoder	Side-tone and UI sound overlay on digital audio 2 stereo PDM inputs, 1 differential analog input
Integrated low noise DAC reference regulator	Reduced BOM cost and improved DNR
Patented Time Domain Jitter Eliminator	Unmatched audio clarity free from input clock jitter
Integrated mic bias regulator	Reduced BOM cost, supports a wide range of analog microphones.
33mW operating power consumption <11uW standby power consumption	Maximizes battery life
THD Compensation	Minimize distortion from DAC resistors, PCB components and layout.

APPLICATIONS

- Professional digital audio workstations and mixer consoles
- Digital music players, Portable multimedia players
- Consumer and Audiophile DAC headphone amplifiers and A/V receivers

Functional Block Diagram

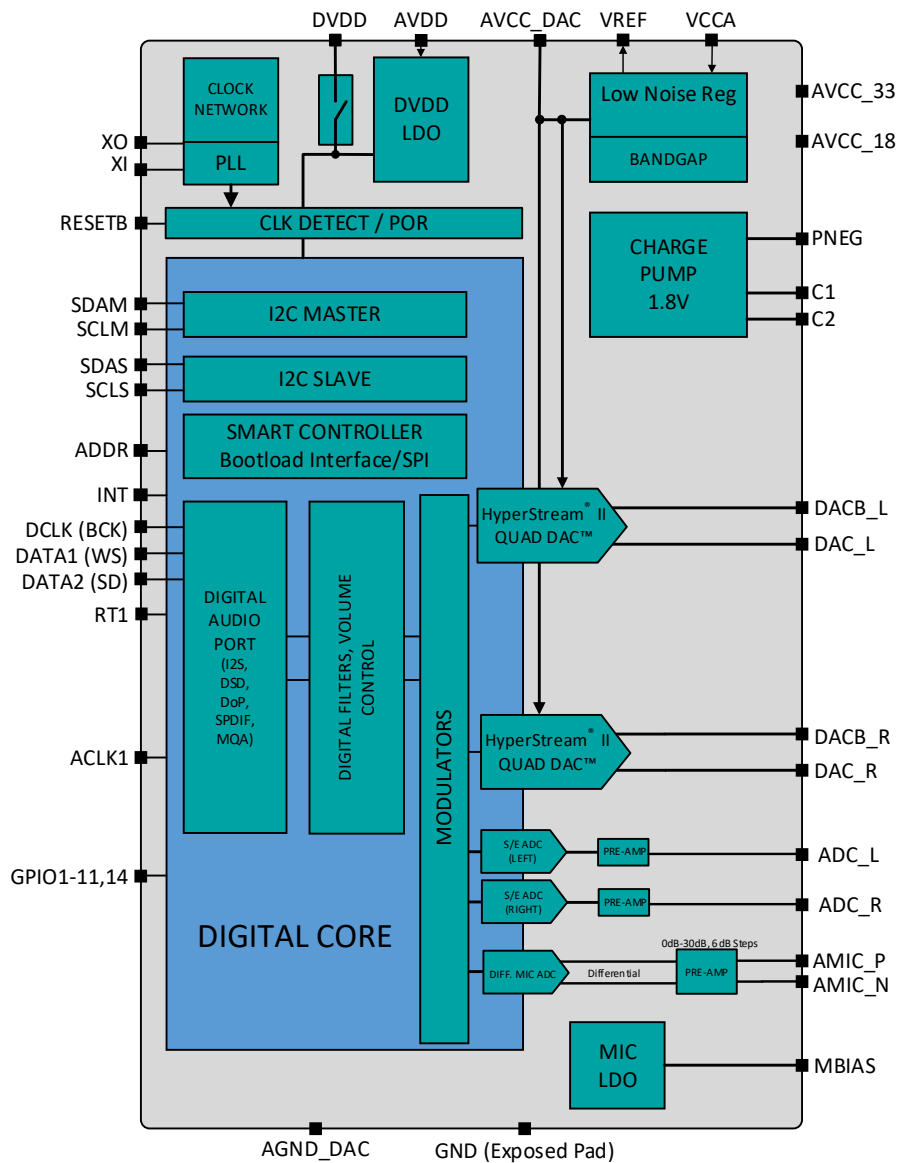


Figure 1 - ES9068A Block Diagram



Typical Application

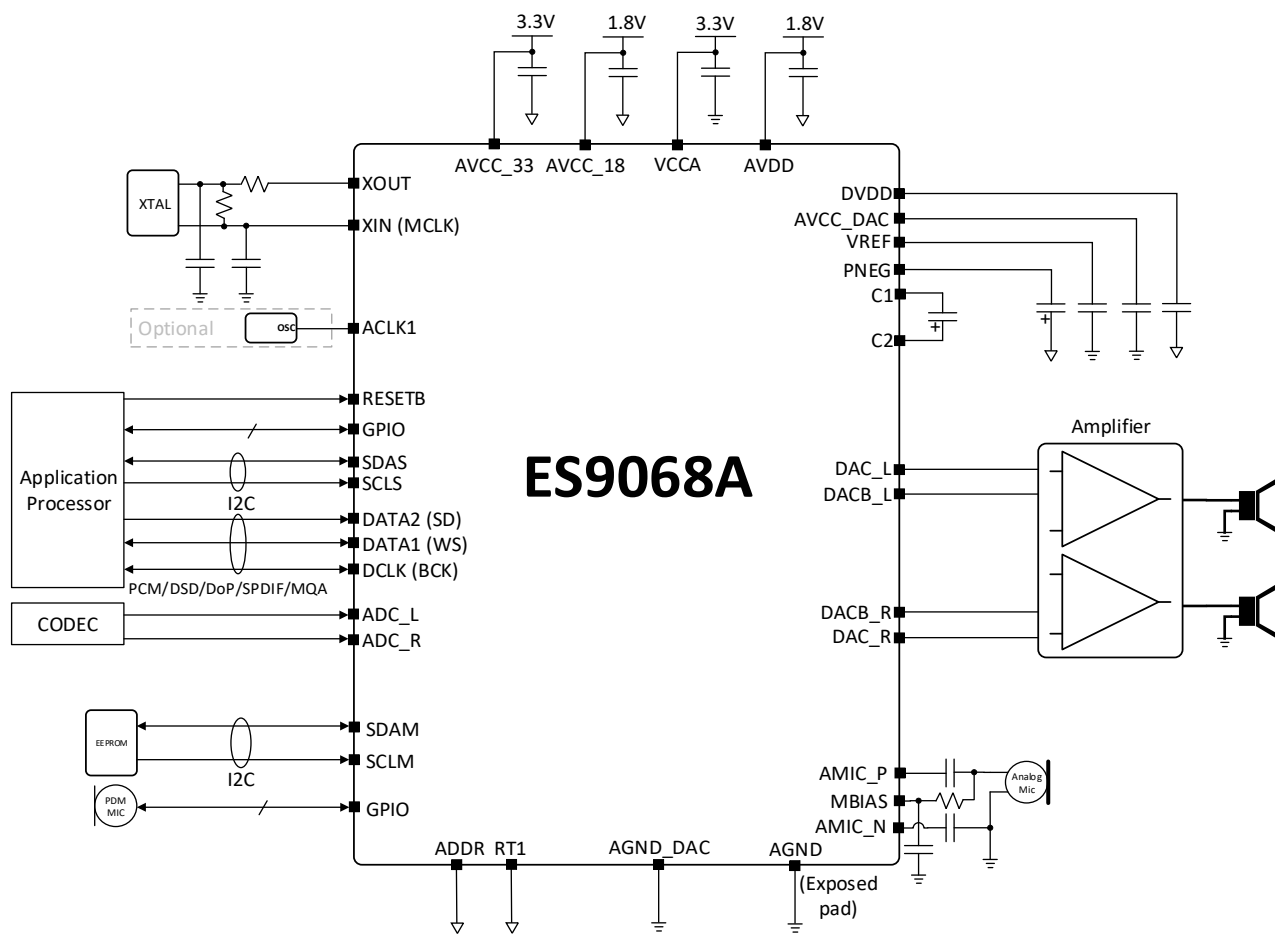


Figure 2. Typical Application Diagram



Revision History

Current Version 0.3

Rev.	Date	Notes
0.3	August 31,2022	<ul style="list-style-type: none">• Updated features list• Minor formatting• Updated company address

© 2022 ESS Technology, Inc.

ESS IC's are not intended, authorized, or warranted for use as components in military applications, medical devices or life support systems. ESS assumes no liability and disclaims any expressed, implied or statutory warranty for use of ESS IC's in such unsuitable applications.

No part of this publication may be reproduced, stored in a retrieval system, transmitted, or translated in any form or by any means, electronic, mechanical, manual, optical, or otherwise, without the prior written permission of ESS Technology, Inc. ESS Technology, Inc. makes no representations or warranties regarding the content of this document. All specifications are subject to change without prior notice. ESS Technology, Inc. assumes no responsibility for any errors contained herein. U.S. patents pending.