



SABRE PRO

# ES9027MPRO & ES9027PRO 32-bit High-Performance 8-Channel DAC

Analog Reinvented

Product Brief

The ESS Sabre® ES9027MPRO & ES9027PRO are 32-bit 8 Channel digital-to-analog converters (DAC) that target high end consumer devices, professional audio applications such as recording systems, mixer consoles and digital audio workstations (DAW), test equipment, instruments, audio processors applications. It was designed to create the new generation of the world's highest performing audio DAC series.

The ES9027PRO has 8 integrated DACs which use ESS' patented Hyperstream® IV DAC Architecture. Using the Dual modulator architecture, it delivers incredible audio sound quality and specifications, including +124dB DNR, -114dB THD+N per channel.

The ES9027PRO SABRE® DAC improves on previous designs to include:

- MQA Hardware renderer (ES9027MPRO) to reveal the original master resolution
- TDM & SPI support for more options in connectivity
- Lower power consumption than previous generations, including the Hyperstream IV DAC modulator
- New Hardware mode for simplified programming.

TDM, DSD, DoP, and I2S, LJ, RJ master/slave interfaces as well as synchronous S/PDIF are supported.

The ES9027MPRO & ES9027PRO have 7 built-in pre-programmed digital filters which allows the most discerning user to tune the SABRE sound to their own personal sound signature.

The ES9027MPRO includes a built-in stereo hardware MQA renderer that helps recreate the natural sound of the recording.

FEATURE	DESCRIPTION
Patented 32-bit HyperStream® IV Architecture DAC Technology	32-bit audio DAC with high dynamic range & ultra-low distortion
+124db DNR per channel -114dB THD+N per channel	Unprecedented dynamic range and ultra-low distortion
MQA Renderer (ES9027MPRO only)	Stereo MQA Renderer Built-In Easily paired with software MQA core decoder Eliminates the need for complicated DAC filter tuning
High Sample Rates	Up to PCM 768kHz & native DSD1024
Customizable filter characteristics	7 predefined digital filters optimized for latency or sound color for each channel to allow for a unique sound signature
Multiple Input formats are available	I2S, LJ, RJ, TDM, DSD, DoP and S/PDIF
I2C, SPI, and Hardware interface control	Configured by microcontroller or other I2C/SPI source, or pins through Hardware Mode
Lower Power Consumption than Previous Gen.	Simplifies power supply design
Standardized Packaging	7mm x 7mm, 48 pin QFP/QFN for reduced PCB board space

## APPLICATIONS

- Professional digital audio workstations (DAW) Audio Playback
- AV Receivers
- Personal Audio Devices & Media Streamers
- High End Audiophile Equipment
- Any equipment that requires the very best audio digital to analog conversion



### Functional Block Diagram

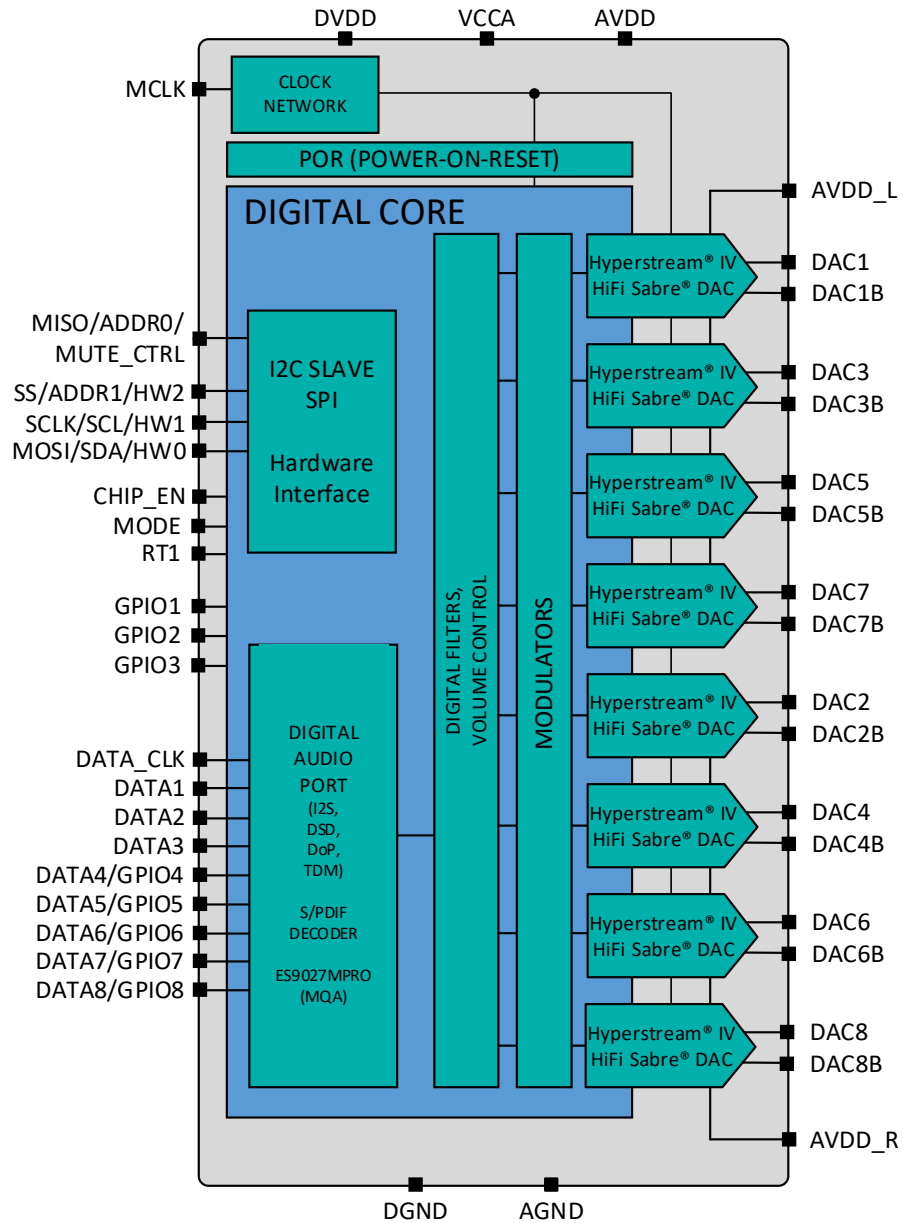
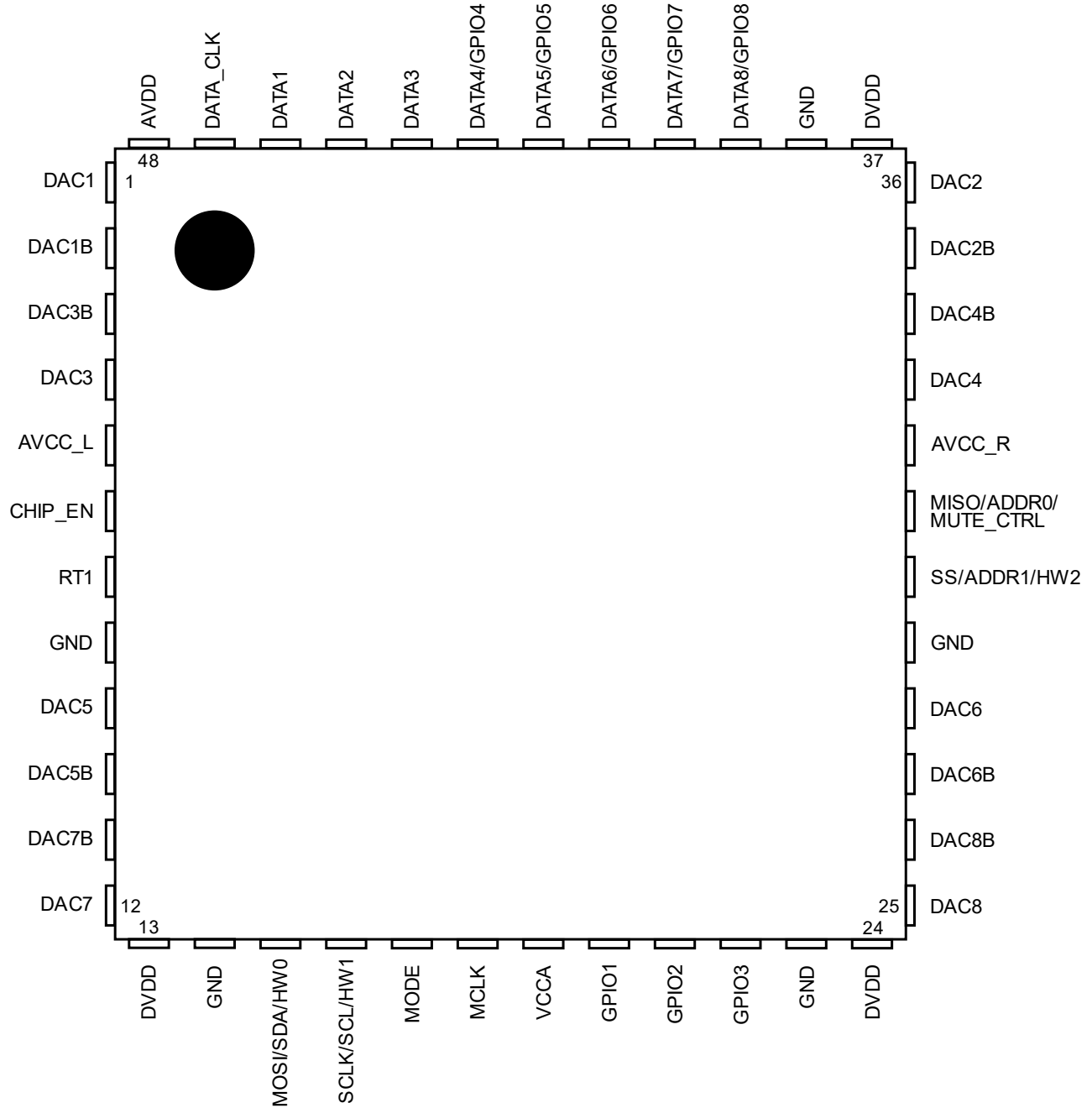


Figure 1. ES9027MPRO & ES9027PRO Block Diagram

# ES9027MPRO & ES9027PRO Product Brief



## ES9027MSPRO/ES9027SPRO/ES9027MQPRO/ES9027QPRO Pinout



ES9027MPRO & ES9027PRO  
(Top View)

Note: For QFN package only, pin 49 package pad is connected to ground



## 48 QFP/QFN Pin Descriptions

Pin	Name	Pin Type	Reset State	Pin Description
1	DAC1	AO	Ground	Differential Positive Output for Channel 1
2	DAC1B	AO	Ground	Differential Negative Output for Channel 1
3	DAC3B	AO	Ground	Differential Negative Output for Channel 3
4	DAC3	AO	Ground	Differential Positive Output for Channel 3
5	AVCC_L	Power	Power	3.3V DAC analog output stage reference supply for the Left side
6	CHIP_EN	I	HiZ	Active-high Chip Enable
7	RT1	I	HiZ	Reserved. Must be connected to DGND for normal operation.
8	AGND	Ground	Ground	DAC analog output stage ground
9	DAC5	AO	Ground	Differential Positive Output for Channel 5
10	DAC5B	AO	Ground	Differential Negative Output for Channel 5
11	DAC7B	AO	Ground	Differential Negative Output for Channel 7
12	DAC7	AO	Ground	Differential Positive Output for Channel 7
13	DVDD	Power	Power	Digital Core Supply, 1.2V
14	DGND	Ground	Ground	Digital Ground
15	MOSI/SDA/HW0	I	HiZ	Serial communication for SPI/I2C & HW0 interface pin, controlled by MODE
16	SCLK/SCL/HW1	I	HiZ	Serial Clock for SCLK (SPI), SCL (I2C), also HW1 controlled by MODE pin
17	MODE	I	HiZ	I2C/SPI Control selection or HW mode
18	MCLK	I	HiZ	Oscillator input
19	VCCA	Power	Power	Analog Supply, 3.3V
20	GPIO1	I/O	HiZ	General I/O w/extended functions
21	GPIO2	I/O	HiZ	General I/O w/extended functions
22	GPIO3	I/O	HiZ	General I/O w/extended functions
23	DGND	Ground	Ground	Digital Ground
24	DVDD	Power	Power	Digital Supply, 1.2V
25	DAC8	AO	Ground	Differential Positive Output for Channel 8
26	DAC8B	AO	Ground	Differential Negative Output for Channel 8
27	DAC6B	AO	Ground	Differential Negative Output for Channel 6
28	DAC6	AO	Ground	Differential Positive Output for Channel 6
29	AGND	Ground	Ground	DAC analog output stage ground
30	SS/ADDR1/HW2	I	HiZ	Serial communication for SPI/I2C & HW2 interface pin, controlled by MODE pin
31	MISO/ADDR0/ MUTE_CTRL	I	HiZ	Serial communication for SPI/I2C & MUTE_CTRL interface pin, controlled by MODE pin
32	AVCC_R	Power	Power	3.3V DAC analog output stage reference supply for the Right side
33	DAC4	AO	Ground	Differential Positive Output for Channel 4
34	DAC4B	AO	Ground	Differential Negative Output for Channel 4
35	DAC2B	AO	Ground	Differential Negative Output for Channel 2
36	DAC2	AO	Ground	Differential Positive Output for Channel 2
37	DVDD	Power	Power	Digital Supply, 1.2V
38	DGND	Ground	Ground	Digital Core Ground
39	DATA8/GPIO8	I/O	HiZ	Serial DATA8, General I/O 8
40	DATA7/GPIO7	I/O	HiZ	Serial DATA7, General I/O 7
41	DATA6/GPIO6	I/O	HiZ	Serial DATA6, General I/O 6
42	DATA5/GPIO5	I/O	HiZ	Serial DATA5, General I/O 5
43	DATA4/GPIO4	I/O	HiZ	Serial DATA4, General I/O 4
44	DATA3	I	HiZ	Serial DATA3 pin
45	DATA2	I	HiZ	Serial DATA2 pin
46	DATA1	I	HiZ	Serial DATA1 pin
47	DATA_CLK	I	HiZ	Serial Data Clock pin
48	AVDD	Power	Power	3.3V I/O Supply
49	Package Pad (QFN only)	-	-	Connect to ground

\* Note: AO = Analog Output, I = Digital Input, I/O = Digital Input/Output

## ES9027MPRO &amp; ES9027PRO Product Brief



## Ordering Information

Part Number	Description	Package
ES9027MSPRO	SABRE PRO 32-bit 8 Channel DAC with MQA renderer	7mm x 7mm 48 QFP
ES9027SPRO	SABRE PRO 32-bit 8 Channel DAC	
ES9027MQPRO • Inquire for availability	SABRE PRO 32-bit 8 Channel DAC with MQA renderer	7mm x 7mm 48 QFN
ES9027QPRO • Inquire for availability	SABRE PRO 32-bit 8 Channel DAC	

## Revision History

Current Version 0.3.1

Rev.	Date	Notes
0.1.2	Feb 22 <sup>nd</sup> , 2022	Initial release
0.1.3	Mar 4 <sup>th</sup> , 2022	<ul style="list-style-type: none"> <li>Minor correction to Block Diagram</li> </ul>
0.1.4	Mar 10 <sup>th</sup> , 2022	<ul style="list-style-type: none"> <li>Updated to cover all 3 versions of package</li> </ul>
0.2	Mar 17 <sup>th</sup> , 2022	<ul style="list-style-type: none"> <li>Corrected pinout to current package affecting pins 6-8, 29-31</li> <li>Updated Performance specification</li> </ul>
0.2.2	May 13 <sup>th</sup> , 2022	<ul style="list-style-type: none"> <li>Updated feature list</li> </ul>
0.3	May 31 <sup>st</sup> , 2022	<ul style="list-style-type: none"> <li>Updated Functional Block diagram</li> <li>Added QFN pin 49 information</li> <li>Updated pin 31 naming (MUTE_CTRL)</li> <li>Updated Ordering information</li> </ul>
0.3.1	June 29 <sup>th</sup> , 2022	<ul style="list-style-type: none"> <li>Updated feature list</li> </ul>

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