Analog Reinvented

The Sabre ES9080 High Performance Audio DAC is a 32-Bit, 8-channel audio DAC that brings professional, digital audio quality to the consumer home entertainment market.

Using ESS' patented HyperStream II® architecture, the Sabre ES9080 delivers studio quality audio with 120dB DNR and –108dB THD+N to digital audio applications such as media streaming.

With the integrated line drivers, the ES9080 reduces BOM costs by eliminating the need for external amplifier to produce a line level 2V$_{rms}$ output.

The Sabre ES9080 flexible input architecture accepts up to serial 32 bit serial PCM data to 768kHz sample rate & DSD512. The ES9080 also has a 2 S/PDIF outputs which supports up to 192k @ 24 bits for a PCM to S/PDIF solution.

The Sabre Premier DAC sets a new standard for high-quality audio performance in a cost-effective, compact, easy to use form factor for today's most demanding digital audio applications.

FEATURE	DESCRIPTION
+120dB DNR per channel -108dB THD+N per channel	Unprecedented dynamic range and ultra-low distortion
High Sample Rates	Support for up to PCM 768kHz & DSD512
8-channel DAC + Line Driver in 40-QFN	Reduced footprint and simplifies board layout
Multiple formats available	PCM, TDM, DSD, DoP, with support for S/PDIF output
Customizable filter characteristics	8 preset filters, with de-emphasis 32kHz, 44.1kHz & 48kHz filters
I2C interface control	Configured by microcontroller or other I2C source
Integrated low noise DAC reference regulators	Reduced BOM cost, PCB area and improved DNR.
Dual PCM to SPDIF transcoding	Encode PCM data into SPDIF format
Low Pin Count standardized Packaging	5mm x 5mm, 40 pin QFN
2Vrms Integrated Line Driver	Reduces BOM costs w/o required external opamp required for line driver levels

APPLICATIONS

- Media Streamer Applications
- Gaming Motherboards
- Audio Receivers
- Professional Audio Equipment

Functional Block Diagram

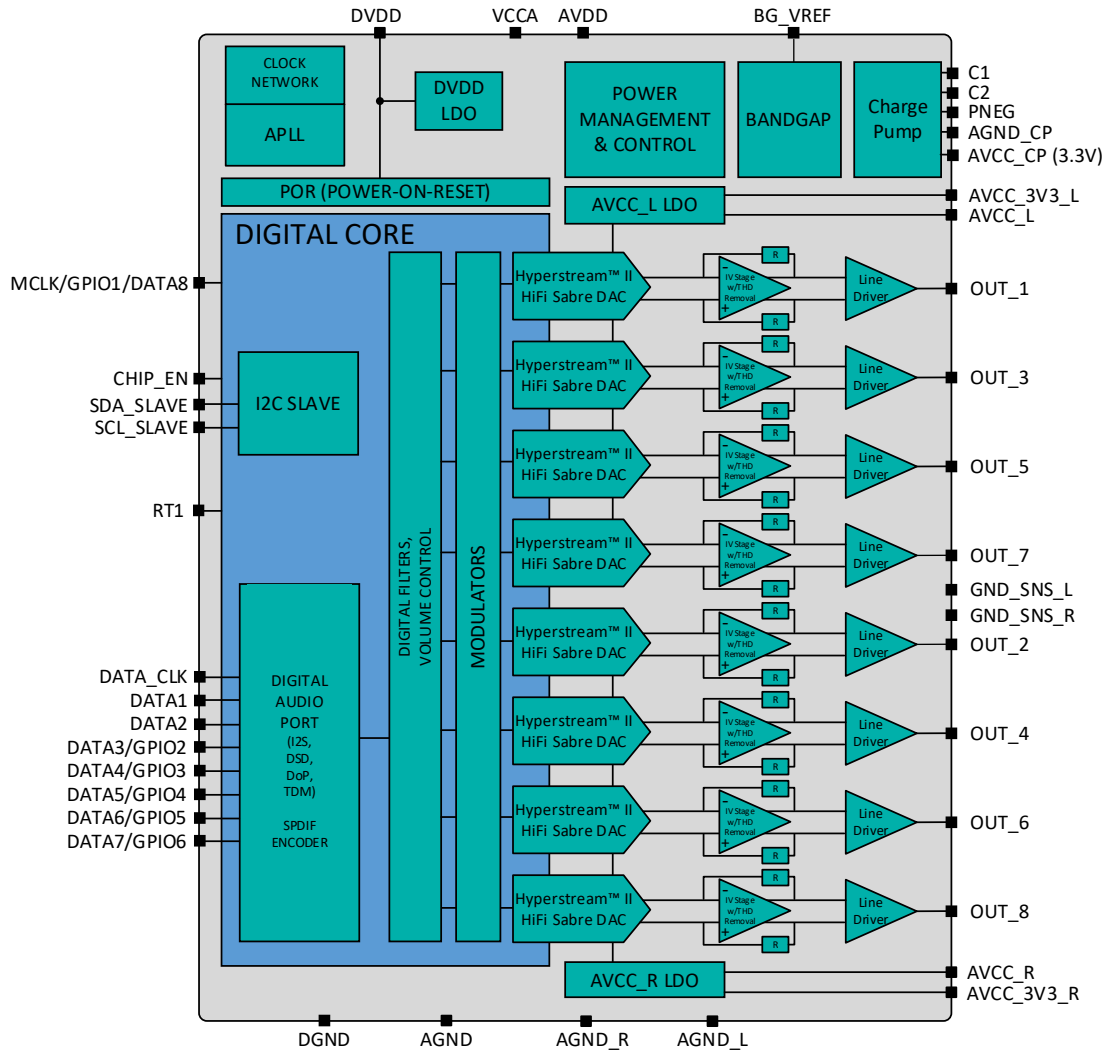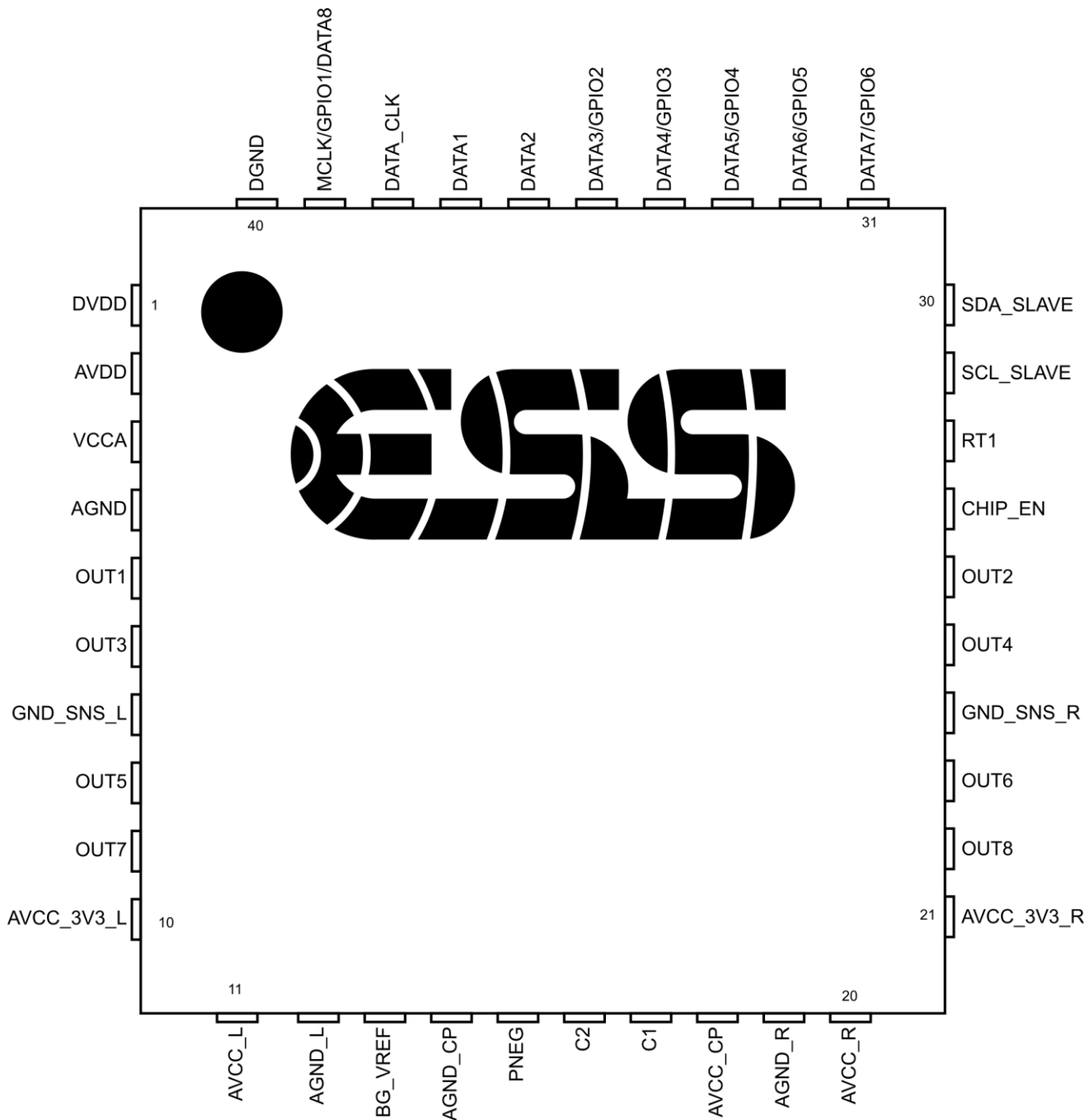Figure 1. ES9080 Block Diagram

ES9080 Product Brief

ES9080 40 QFN Pinout

ES9080Q
(Top View)

ES9080 Product Brief

40 QFN Pin Descriptions

Pin	Name	Pin Type	Reset State	Pin Description
1	DVDD	Power	Power	Digital core supply, internally supplied
2	AVDD	Power	Power	3.3V or 1.8V I/O supply
3	VCCA	Power	Power	Analog Supply
4	AGND	Ground	Ground	Analog ground
5	OUT1	AO	Ground	Output channel 1
6	OUT3	AO	Ground	Output channel 3
7	GND_SNS_L	AI	Ground	Line driver load ground voltage sense (left, CH 1,3,5,7)
8	OUT5	AO	Ground	Output channel 5
9	OUT7	AO	Ground	Output channel 7
10	AVCC_3V3_L	Power	Power	Analog Regulator 3.3V Supply (left)
11	AVCC_L	Power	Power	Analog Regulator Output (left), internally supplied
12	AGND_L	Ground	Ground	Analog Ground (left)
13	BG_VREF	AO	Ground	Bandgap Voltage reference
14	AGND_CP	Ground	Ground	Analog Ground for charge pump
15	PNEG	Power	Ground	Integrated chargepump output. Line driver negative supply.
16	C2	-	-	Line driver negative flying capacitor
17	C1	-	-	Line driver positive flying capacitor
18	AVCC_CP	Power	Power	Analog Supply for charge Pump
19	AGND_R	Ground	Ground	Analog Ground (right)
20	AVCC_R	Power	Power	Analog regulator output (right), internally supplied
21	AVCC_3V3_R	Power	Power	Analog Regulator 3.3V Supply (right)
22	OUT8	AO	Ground	Output channel 8
23	OUT6	AO	Ground	Output channel 6
24	GND_SNS_R	AI	Ground	Line driver load ground voltage sense (right, CH 2,4,6,8)
25	OUT4	AO	Ground	Output channel 4
26	OUT2	AO	Ground	Output channel 2
27	CHIP_EN	I/O	HiZ	Active-high chip enable.
28	RT1	I	HiZ	Reserved. **Must be connected to DGND for normal operation**.
29	SCL_SLAVE	I/O	HiZ	I2C slave interface serial clock input
30	SDA_SLAVE	I/O	HiZ	I2C slave interface data input/output
31	DATA7/GPIO6	I/O	HiZ	Serial DATA7, General I/O 6
32	DATA6/GPIO5	I/O	HiZ	Serial DATA6, General I/O 5
33	DATA5/GPIO4	I/O	HiZ	Serial DATA5, General I/O 4
34	DATA4/GPIO3	I/O	HiZ	Serial DATA4, General I/O 3
35	DATA3/GPIO2	I/O	HiZ	Serial DATA3, General I/O 2
36	DATA2	I/O	HiZ	Serial DATA2
37	DATA1	I/O	HiZ	Serial DATA1
38	DATA_CLK	I	HiZ	Serial data clock
39	MCLK/GPIO1/DATA8	I/O	HiZ	MCLK input, General I/O 1, Serial DATA8
40	DGND	Ground	Ground	Digital core ground
41*	Package PAD	-	-	Not electrically connected, used for heat dissipation

* Note: Pin 41 is the package pad.

ES9080 Product Brief

Ordering Information

Part Number	Description	Package
ES9080Q	SABRE 32-bit 8 Channel DAC with built in line driver & digital filters	5mm x 5mm 40 QFN
ES9080QT	SABRE 32-bit 8 Channel DAC with built in line driver & digital filters Extended temperature range -40 to 125deg Celsius	5mm x 5mm 40 QFN

Revision History

Current Version 0.2

Rev.	Date	Notes
0.2	Dec 1, 2020	Initial release