



DESCRIPTION

The ES1918 *AudioDrive*® CODEC is a fully compliant AC'97 CODEC and mixer for a digital audio controller embodied in a single, mixed signal chip. The ES1918 is the perfect companion to ESS Technology's PCI audio solution, the Maestro™ family of digital controllers. The ES1918 is equipped with a stereo 16-bit DAC, a stereo 16-bit ADC, 7 inputs (4 stereo and 3 mono), 2 outputs (1 stereo and 1 mono), and a Time Division Multiplexed (TDM) serial AC-Link to a Maestro Digital Controller.

The ES1918 audio CODEC can record and play back voice, sound, and music at 48 kHz sample rate. The playback mixer has 5 stereo inputs (Line, CD, Video, Aux, and PCM digital audio) and 3 mono inputs (Mic, Phone, and PC beep). The record multiplexer has 5 stereo inputs (Line, CD, Video, Aux, Mixer) and 3 mono inputs (Mic, Phone, and Mono mix). The mixer has two outputs (Line and Mono). Line out can be used for stereo output to multimedia speakers while Mono out can be used to output to a telephony subsystem or DLP (Down Line Phone).

The ES1918 is available in an industry-standard 48-pin Low Quad Flat Pack (LQFP).

APPLICATIONS

- Multimedia PCs
- 3-D PC Games
- Music Synthesis
- Business Audio
- DVD-ROM/Consumer Video Audio Playback
- Audio Conferencing
- Voice Recognition

FEATURES

- Single, high-performance, mixed-signal, 16-bit stereo VLSI chip
- Meets or exceeds Audio Codec '97 analog performance specification
- AC-Link digital serial interface (TDM format) to the Maestro Digital Controller

Record and Playback Features

- Full-duplex stereo operation for simultaneous record and playback
- 16-bit stereo ADC and DAC
- 48 kHz sample rate

Inputs/Outputs

- 4 stereo inputs for line-in, CD, video, and auxiliary line-in
- 2 selectable mono inputs for microphone sharing a single mixer input and 1 mono input for phone
- PC speaker input
- 1 stereo output for line-out (for example, multimedia speakers)
- 1 mono output for use with a telephony subsystem or DLP

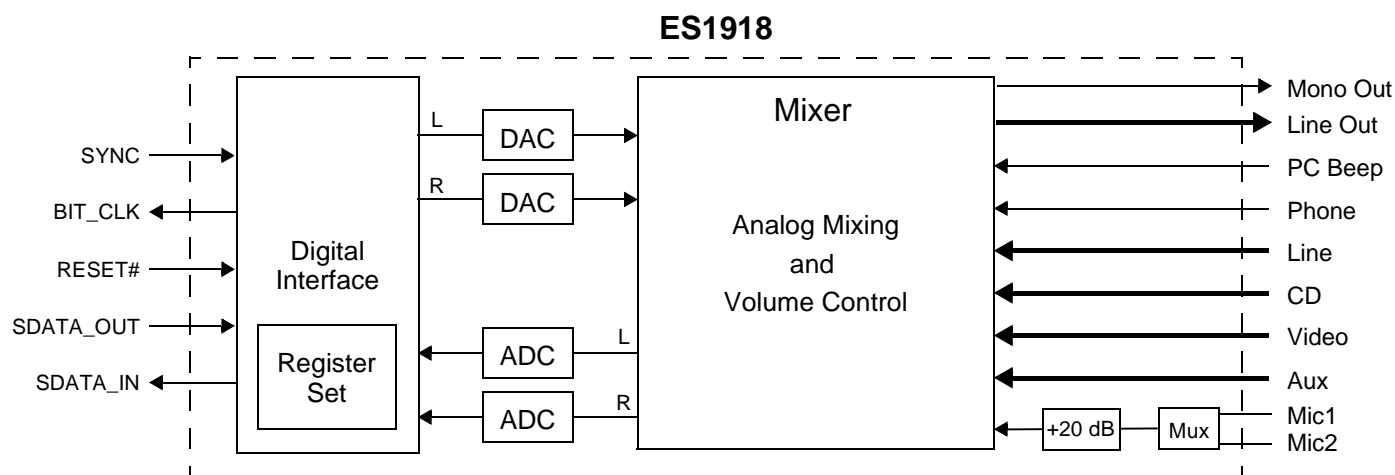
Power

- Advanced Configuration and Power Interface (ACPI) support.
- Single 5.0 V power supply

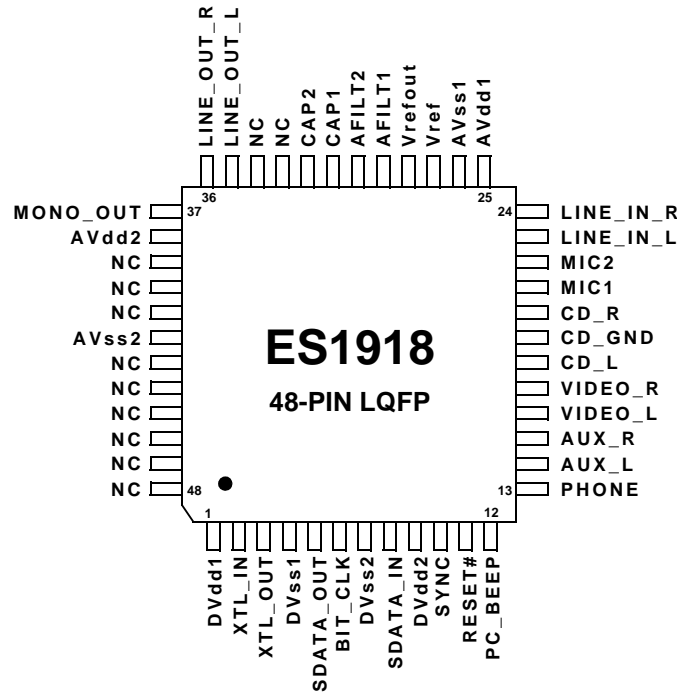
Compatibility

- Meets Microsoft PC97 1.0 specifications with FAQ updates
- Meets Intel's Audio Codec '97 1.03 specifications

BLOCK DIAGRAM



PINOUT



DIGITAL CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Unit
VIN	Input voltage range	-0.30	–	6.0 or VA + 0.3 ^a	V
VIL	Input low voltage All except XTAL_IN	–	–	0.8	V
	Input low voltage XTAL_IN	–	–	0.3 x DVdd	V
VIH	Input high voltage All except XTAL_IN	0.7 x DVdd	–	–	V
	Input high voltage XTAL_IN	2.2	–	–	V
VOH	Output high voltage	2.6	–	–	V
VOL	Output low voltage	–	–	0.55	V
–	Input leakage current	-10	–	10	µA
–	Output leakage current	-10	–	10	µA
–	Output buffer drive current	–	5	–	µA

a. The maximum voltage is 6.0 or analog supply voltage + 0.3, whichever is greater.

ANALOG CHARACTERISTICS

Parameter	Pins	Min	Typ	Max	Unit
Reference voltage	Vref (AVdd = 5.0V)		2.25 to 2.75		V
Input impedance	LINE_IN_L, LINE_IN_R, AUX_L, AUX_R, VIDEO_L, VIDEO_R, PHONE, MIC1, MIC2	10	50		kΩ
	MIC1, MIC2	30			kΩ
	PCBEEP only	100			kΩ
Output impedance	LINE_OUT_L, LINE_OUT_R, MONO_OUT max load for full-scale output range		5		kΩ
Input voltage range	MIC1, MIC2 w/boost		0.1		Vrms
	LINE_IN_L, LINE_IN_R, AUX_L, AUX_R, VIDEO_L, VIDEO_R, MIC1, MIC2 w/o boost		1.0	1.12	Vrms
Output voltage range	LINE_OUT_L, LINE_OUT_R, MONO_OUT full-scale output range		1.0	1.12	V
Gain	Mic preamp		20	22	dB

PIN DESCRIPTION

Name	Number	I/O	Description
DVdd2:1	9, 1	I	Digital supply voltage (5.0 V).
XTL_IN	2	I	Input from Maestro Digital Controller.
XTL_OUT	3	O	Output to Maestro Digital Controller.
DVss2:1	7, 4	I	Digital ground.
SDATA_OUT	5	I	Serial, Time Division Multiplexed (TDM) AC'97 input stream.
BIT_CLK	6	O	12.288 MHz serial data clock.
SDATA_IN	8	O	Serial, Time Division Multiplexed (TDM) AC'97 output stream.
SYNC	10	I	48 KHz fixed rate sample sync.
RESET#	11	I	AC'97 hardware master reset input.
PC_BEEP	12	I	PC speaker beep pass-through.
PHONE	13	I	Mono input from telephony subsystem speakerphone or Down Line Phone (DLP).
AUX_L, AUX_R	14, 15	I	Auxiliary inputs left and right.
VIDEO_L, VIDEO_R	16, 17	I	Video audio inputs left and right.
CD_L, CD_R	18, 20	I	CD audio inputs left and right.
CD_GND	19	I	CD input ground.
MIC1	21	I	Desktop microphone input.
MIC2	22	I	Second microphone input.
LINE_IN_L, LINE_IN_R	23, 24	I	Line inputs left and right.
AVdd2:1	38, 25	I	Analog supply voltage (5.0 V).
AVss2:1	42, 26	I	Analog ground.
Vref	27	O	Reference voltage
Vrefout	28	O	Reference voltage out. 5 mA drive. Intended for mic bias.
AFILT2:1	30:29	O	Anti-aliasing filter cap for the ADC channel.
CAP2:1	32:31	O	ADC and DAC reference caps.
NC	33-34, 39-41, 43-48	-	No connection.
LINE_OUT_L, LINE_OUT_R	35, 36	O	Master volume outputs, left and right.
MONO_OUT	37	O	Mono output from master volume. Output to telephony subsystem or Down Line Phone (DLP).

MAXIMUM RATINGS

Rating	Symbol	Value
Analog supply voltage	VA	-0.3 to 6.0 V
Digital supply voltage	VD	-0.3 to 6.0 or VA + 0.3 ^a
Input voltage	VIN	-0.3 to 7.0
Operating temperature range	TA	-10 to 70 °C
Storage temperature range	TSTG	-50 to 125 °C

a. The maximum voltage is 6.0 or analog supply voltage + 0.3, whichever is greater.

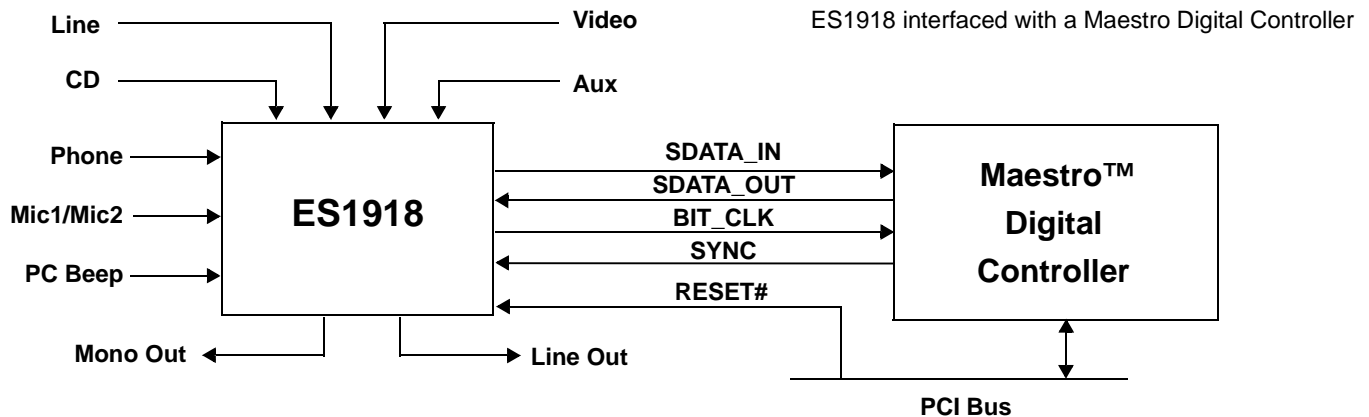
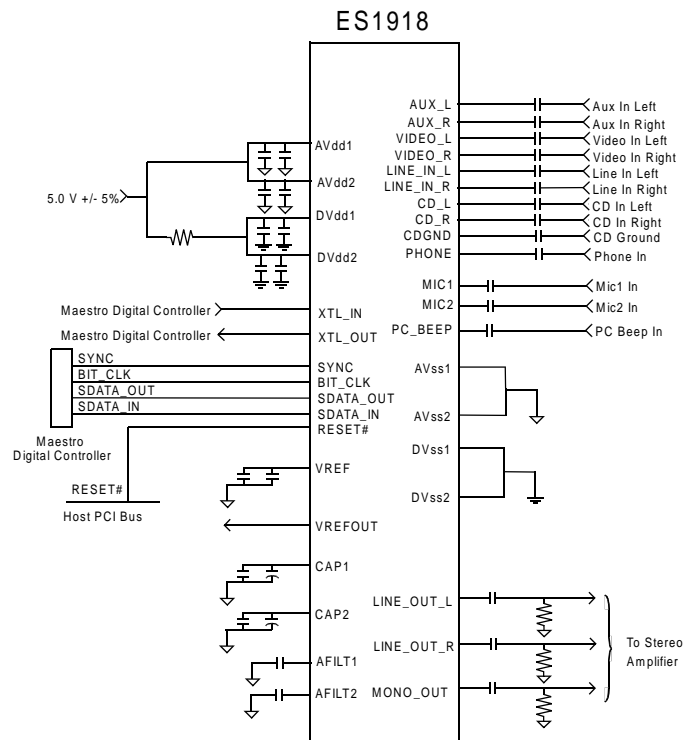
SERVICE AND SUPPORT

- Evaluation Kit
- Manufacturing Kit
- Reference Design

IMPLEMENTATION PLATFORMS

- Desktop PCs
- Notebook PCs
- Multifunction Cards
- Sound Cards
- Voice/Fax/Modem Cards

TYPICAL APPLICATION



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