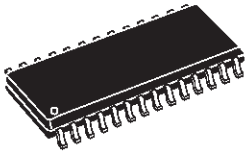
TDA7535

DELTA/SIGMA CASCADE 20 BIT STEREO DAC

PRODUCT PREVIEW

- 20-bit resolution differential output
- Analog reconstruction fourth order bessels filter
- I2S input data format
- System clock: 128 fs
- 2 output channels
- 4 Vpp differential output dynamic
- Single + 3.3V power supply



SO28 or SO20
ORDERING NUMBER: TDA7535

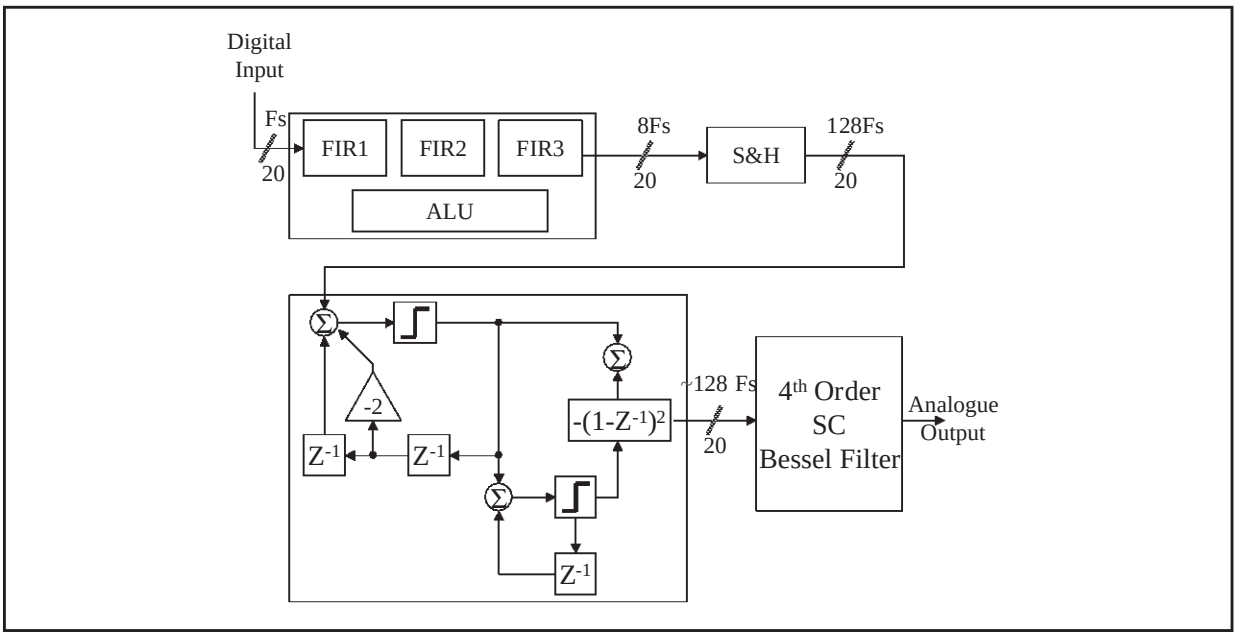
DESCRIPTION

The TDA7535 is a complete low cost stereo, audio digital-to-analog converter designed for audio application, including digital interpolation filter, a third order cascade Delta-Sigma DAC, a fourth order Bessel's reconstruction filter and a differential output analog amplifier. This device is fabricated on a highly advanced 0.35µm CMOS double-poly process, where high speed precision analog circuits are combined with high density logic circuits. The TDA7535, according to standard audio converters, can accept any IIS data format.

The TDA7535 is available in a SO28 but it's possible to use a SO20. The total power consumption is 174.9mW.

TDA7535 is suitable for a wide variety of cost-sensitive applications where good performances are required. Its low cost and single 3.3V power supply make it ideal for several applications, such as CD players, MPEG audio, MIDI applications, CD-ROM drives, CD-Interactive, digital radio applications and so on. This stereo-DAC cell is also integrated inside the TDA7500 digital radio. An evaluation board is available to perform measurement and to make listening tests.

BLOCK DIAGRAM



PIN FUNCTION

Pin #	Pin name	I/O	Description
1	OUTSL	O	Analogue Single-ended output (left channel).
2	OUTSR	O	Analogue Single-ended output (right channel).
3	VCOMR	I	Analogue VDD/2 reference voltage (right channel).
4	VHIR	I	Analogue high reference voltage (right channel).
5	VDD Analog Core-R	P	Analogue VDD core (right channel).
6	VLOR	I	Analogue low reference voltage (right channel).
7	GND Analog Core-R	P	Analogue GND core (right channel).
8	VCMPH	I	Analogue VDD/2 reference voltage for D2S converter (both L/R channels)
9	GND Digi Core	P	Digital GND core.
10	VDD Digi Core	P	Digital VDD core.
11	GND Digi Core	P	Digital GND core.
12	SDATA	I	I2S Digital data input.
13	SCK	I	I2S clock input.
14	GND PLL	P	GND PLL.
15	VDD PLL	P	VDD PLL.
16	FSYNC	I	I2S Left/Right Channel selector.
17	-	-	n.c.
18	-	-	n.c.
19	-	-	n.c.
20	VDD Digi Ring	P	Digital VDD ring.
21	GND Digi Ring	P	Digital GND ring.
22	-		n.c.
23	GND Analog Ring	P	Analogue GND ring.
24	GND Analog Core	P	Analogue GND core.
25	VLOL	I	Analogue low reference voltage (left channel).
26	VDD Analog Ring/Core-L	P	Analogue VDD ring and Analogue VDD core left chan nel double-bonded.
27	VCOML	I	Analogue VDD/2 reference voltage (left channel).
28	VHIL	I	Analogue high reference voltage (left channel).

ELECTRICAL CHARACTERISTICS Vdd = 3.3V; Tamb = 25°C; Input signal frequency = sinus wave generated by Audio Precision Sys.2; Input Signal Amplitude = see notes; Noise Integration Bandwidth = 20Hz to 22KHz (not weighted)

Parameter	Test Condition	Left channel	Right channel	Unit
Noise + Distortion	see note 1 @0dB @-6dBb @-40dB @-60dB	 89 92.5 93 93	 89 92.5 93 93	 dB dB dB dB
Total Harmonic Distortion	see note 2	94	94	dB
Dynamic range	see note 3	93	93	dB
Crosstalk 1	see note 4	-	-110	dB
Crosstalk 2	see note 5	-110	-	dB
Spurius tones		free	free	-

Note1: It is the ratio between the maximum input signal and the integration of the in-band noise after deducing the power of signal fundamental. It depends on the input signal amplitude. In this case 0dB means full scale digital, 1kHz frequency used.

Note 2: It is the ratio of the rms value of the signal fundamental component at 0dB (full scale digital) to the rms value of all of the harmonic components in the band.

Note 3: measured using the SNR at -60dB input signal, with 60dB added to compensate for small input signal.

Note 4: Left channel on with 0dB/1kHz input signal, Right channel on with DC input signal.

Note 5: Right channel on with 0dB/1kHz input signal, Left channel on with DC input signal.

CONNECTION DIAGRAM

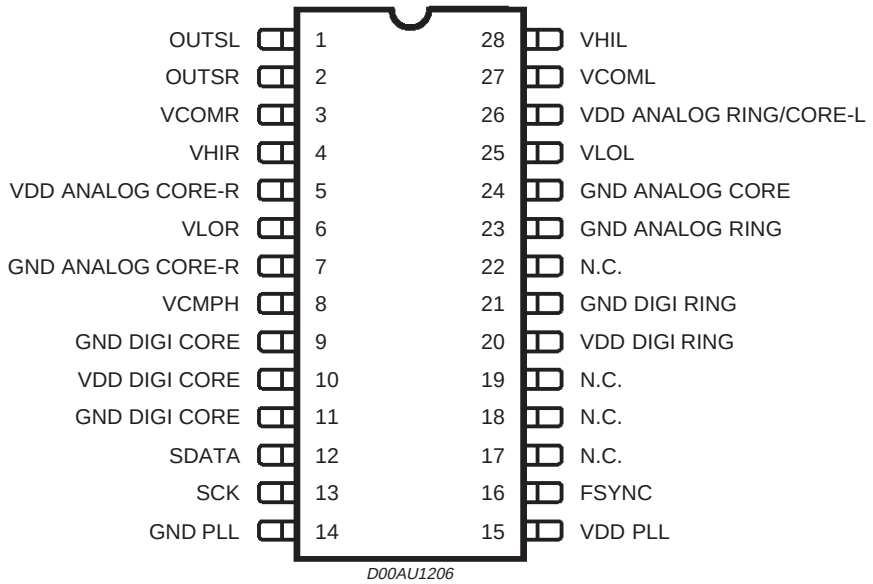


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Figure 1. Output spectrum with 1KHz, 0dB input signal (in band resolution: 8192 points)

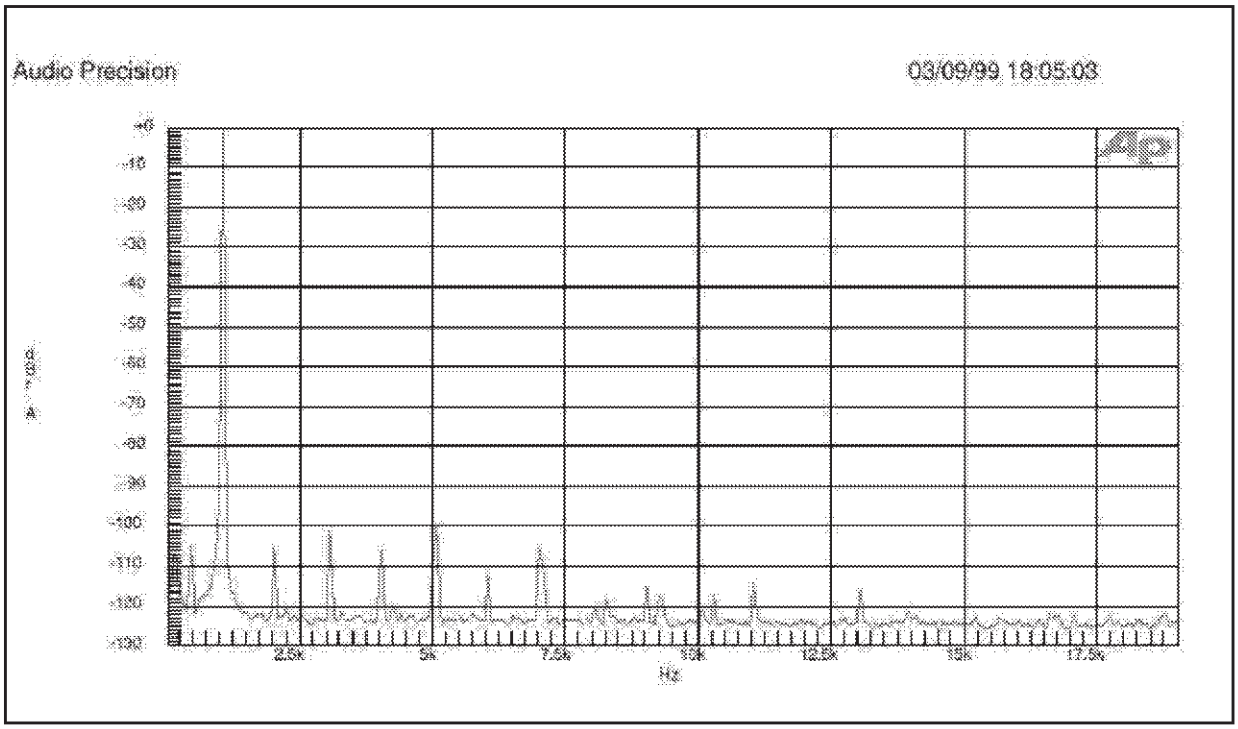
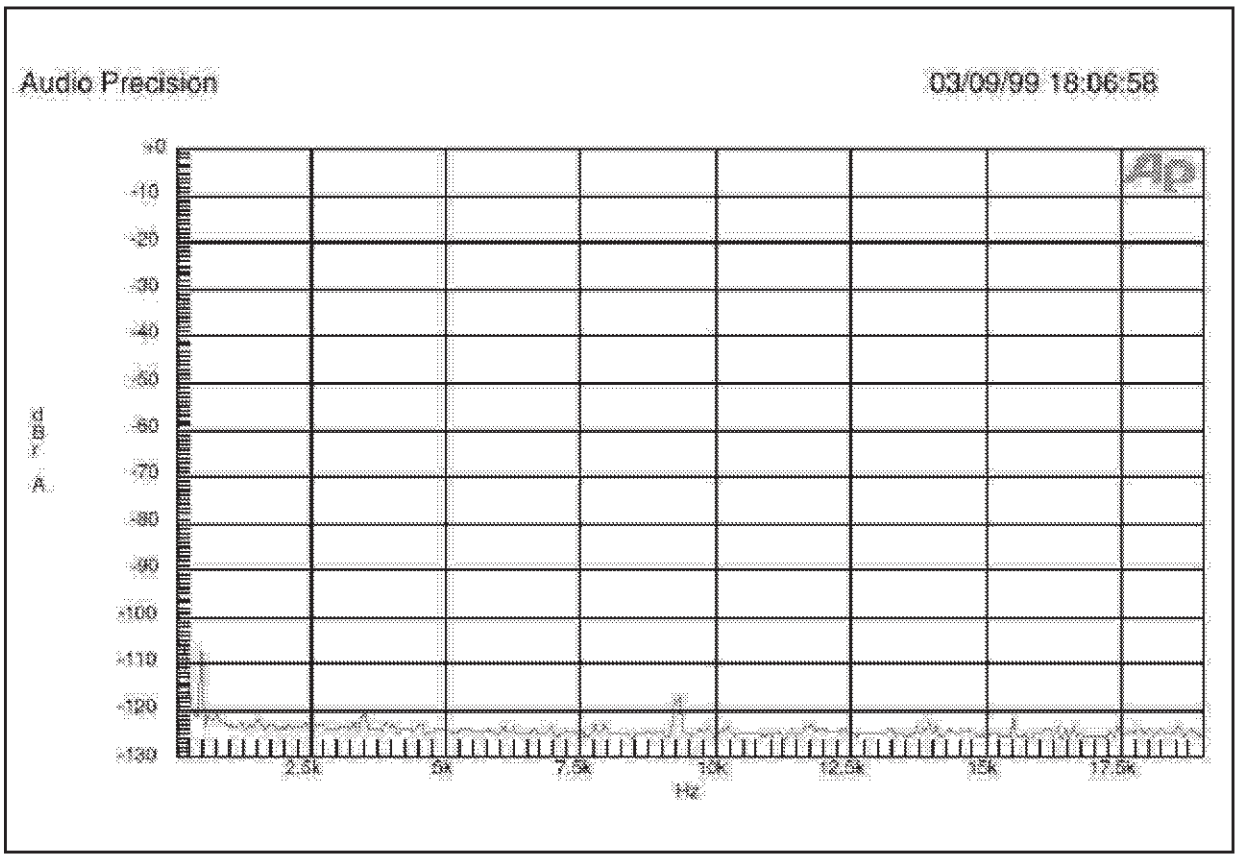
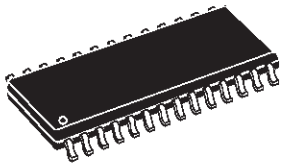


Figure 2. Output spectrum with no input signal (in band resolution: 8192 points)



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.3	0.004		0.012
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1	45° (typ.)					
D	17.7		18.1	0.697		0.713
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		16.51			0.65	
F	7.4		7.6	0.291		0.299
L	0.4		1.27	0.016		0.050
S	8 ° (max.)					

OUTLINE AND MECHANICAL DATA



SO28