



DELTA/SIGMA CASCADE 20 BIT STEREO DAC

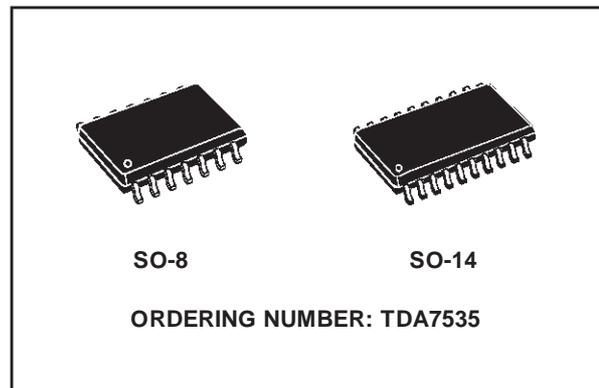
PRODUCT PREVIEW

- 20-bit resolution single ended output
- Analog reconstruction third order Chebyshev filter
- I2S input data format
- On chip PLL
- System clock: 64 fs
- 2 output channels
- 0.9 VRMS single ended output dynamic
- Single + 3.3V power supply

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 multibit Delta-Sigma DAC, a third order Chebyshev's reconstruction filter and a differential to single ended output converter. This device is fabricated on a highly advanced 0.35 μ m 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.

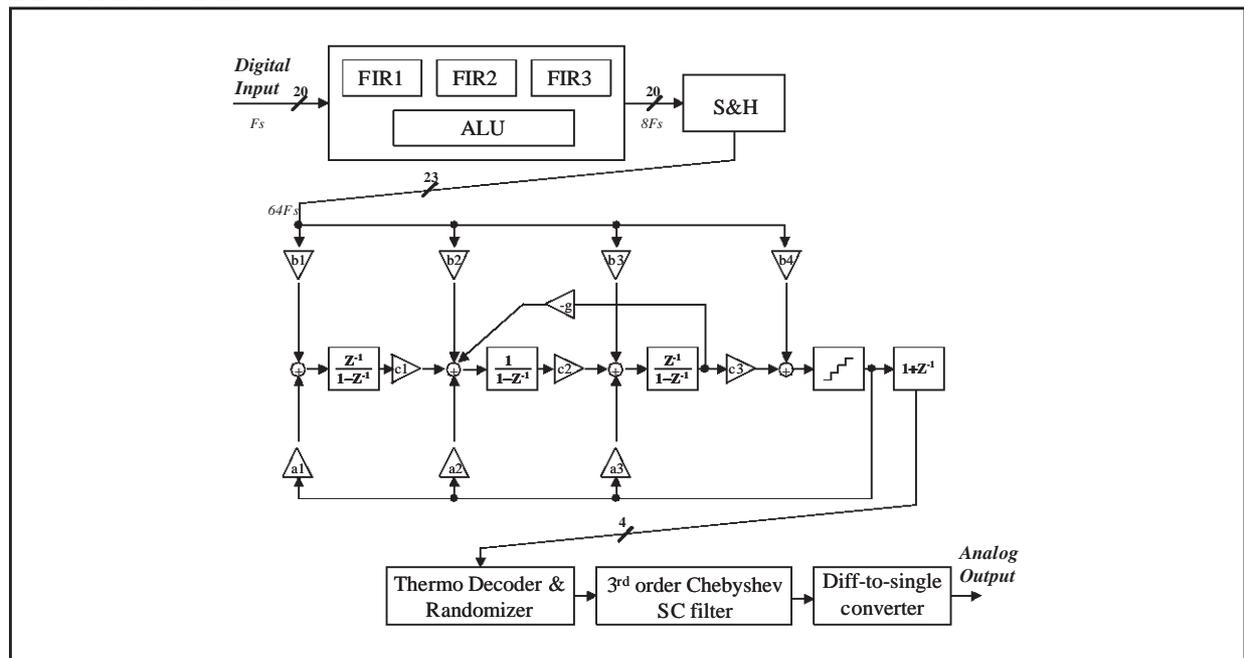
The TDA7535 is available in SO-8 and SO-14 pack-



ages. The total power consumption is 75mW.

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. An evaluation board is available to perform measurement and to make listening tests.

BLOCK DIAGRAM



PIN FUNCTION (SO-8)

Pin Number	Pin Name	Input/Output Power	Description
1	SDATA	I	I2S Digital Data Input
2	SCK	I	I2S Clock Input
3	GND	P	Analog and Digital Ground (Double bonded)
4	OUTSR	O	Right Channel single ended Output
5	OUTSL	O	Left Channel single ended Output
6	VCM	P	Reference 1.65V externally filtered
7	VDD	P	Analog and Digital 3.3V-Supply (Double bonded)
8	FSYNC	I	I2S Left-Right Channel selector

PIN FUNCTION (SO14)

Pin Number	Pin Name	Input/Output Power	Description
1	N.C.	-	-
2	SDATA	I	I2S Digital Data Input
3	SCK	I	I2S Clock Input
4	N.C.	-	-
5	GND_DIG	P	Digital Ground
6	GND_ANA	P	Analog Ground
7	OUTSR	O	Right Channel single ended Output
8	OUTSL	O	Left Channel single ended Output
9	VCM	P	Reference 1.65V externally filtered
10	VDD_ANA	P	Analog 3.3V-Supply
11	N.C.	-	-
12	VDD_DIG	P	Digital 3.3V-Supply
13	FSYNC	I	I2S Left-Right Channel selector
14	RESETN	I	Reset (active low)

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	89	89	dB
	@-6dBb	94.2	94.2	dB
	@-40dB	96	96	dB
	@-60dB	96	96	dB
Total Harmonic Distortion	see note 2	94	94	dB
Dynamic range	see note 3	96	96	dB
Crosstalk 1	see note 4	-	-110	dB
Crosstalk 2	see note 5	-110	-	dB
Spurious 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.

PIN CONNECTIONS (Top views)

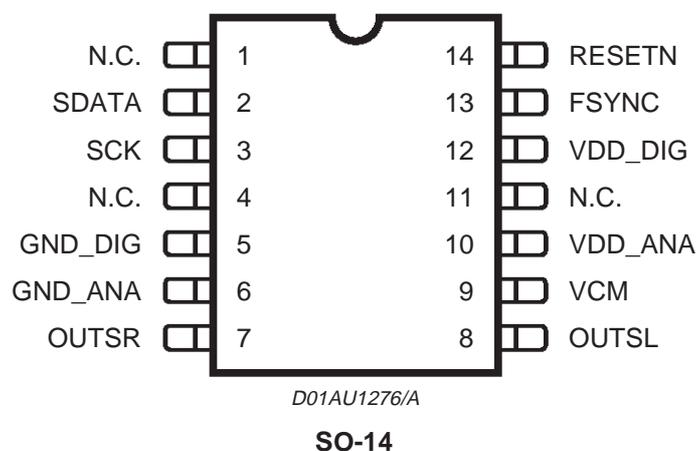
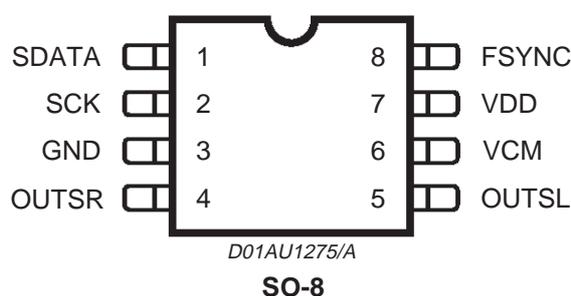


Figure 1. Output spectrum with 1KHz, -20dB input signal

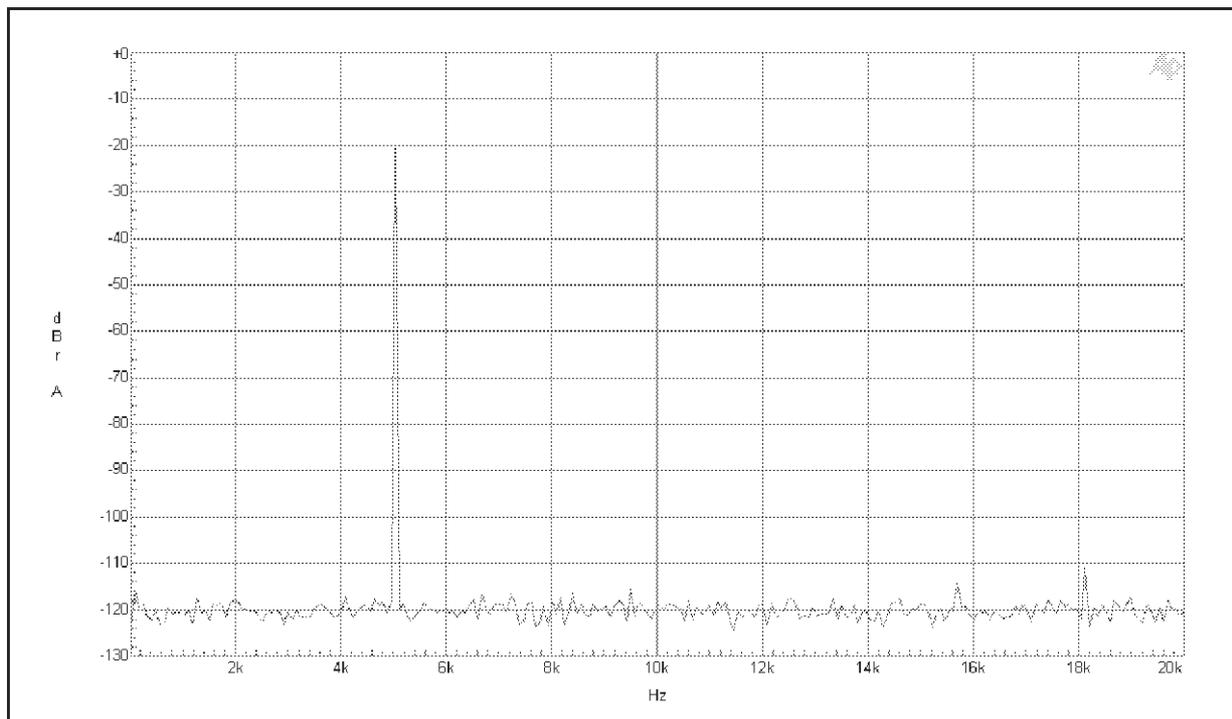
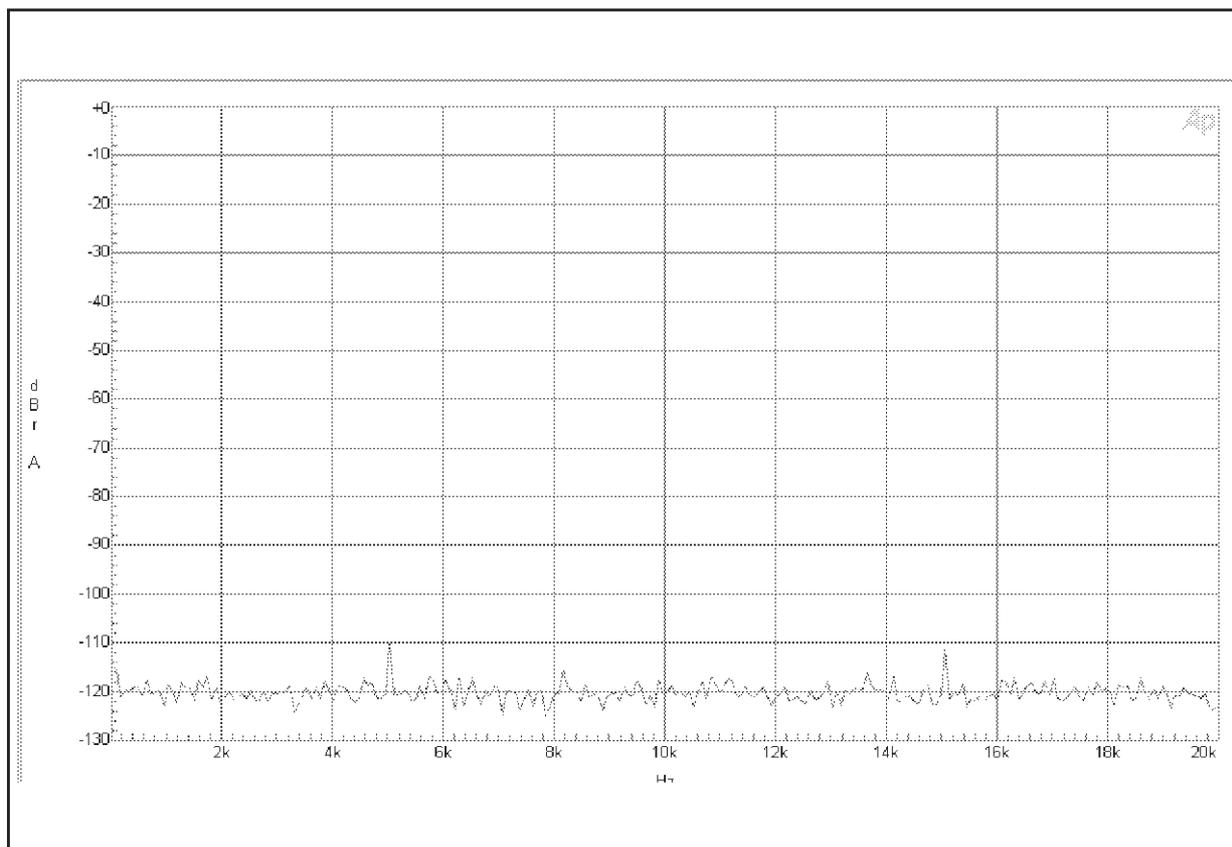
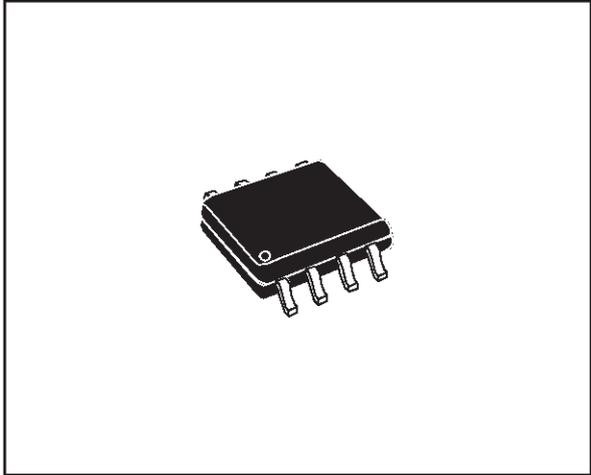


Figure 2. Output spectrum with no input signal



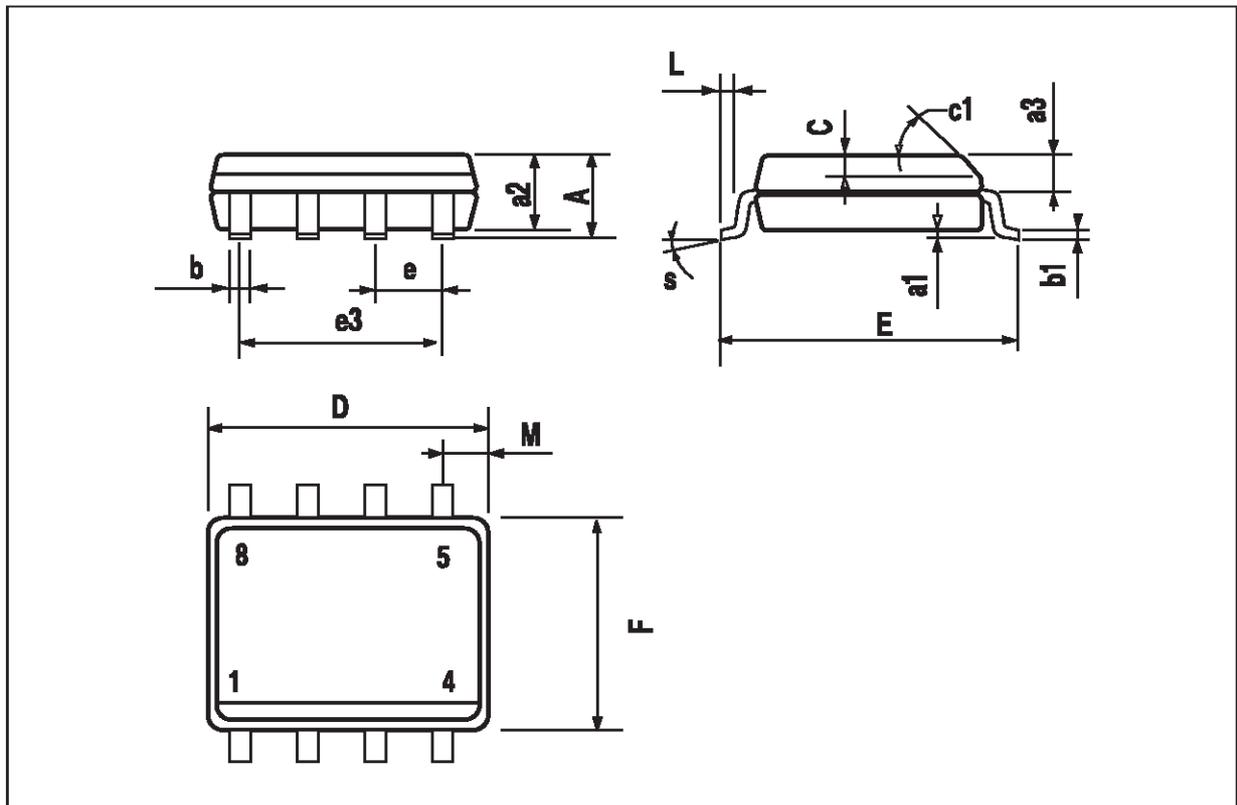
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D (1)	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F (1)	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					

OUTLINE AND MECHANICAL DATA



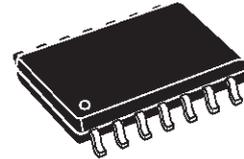
SO8

(1) D and F do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (.006inch).



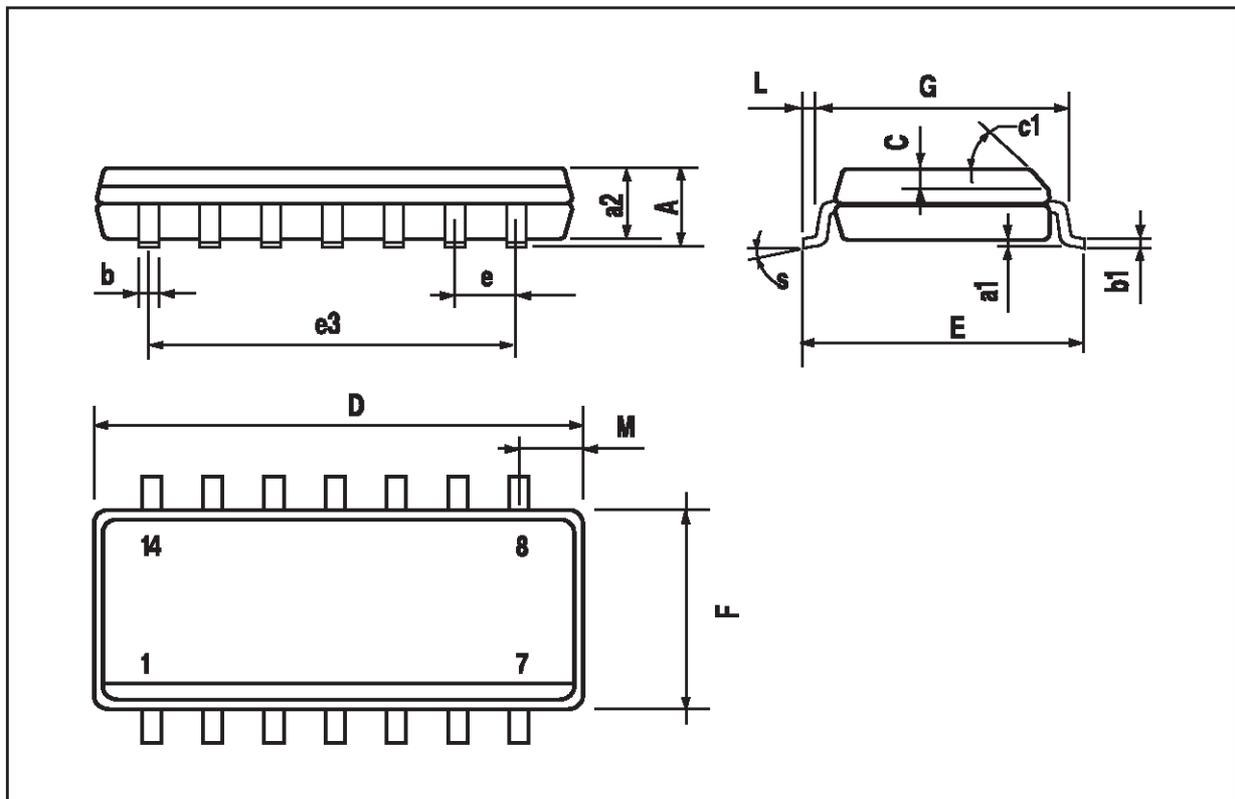
DIM.	mm			inch		
	MIN..	TYP.	MAX..	MIN..	TYP..	MAX..
A			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° (typ.)					
D (1)	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F (1)	3.8		4	0.150		0.157
G	4.6		5.3	0.181		0.209
L	0.4		1.27	0.016		0.050
M			0.68			0.027
S	8° (max)					

OUTLINE AND MECHANICAL DATA



SO14

(1) D and F do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (.006inch).



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