Product Brief

SCALINX
THE MIXED-SIGNAL IC COMPANY

ADX03800DST65

3-bit, 800Msps, $\Delta\Sigma$ Modulator

General Description

The ADX03800DST65 is a 3-bit, 800 MSPS, Continuous-Time (CT) $\Delta\Sigma$ Modulator IP core with 10-bit ENOB up to 40MHz signal bandwidth and a 3th-order built-in anti-aliasing filter. It is ideally suited for applications that require simultaneously low cost, low area and ultra-low power while maintaining good dynamic performance at high-speed.

Due to the CT implementation of the $\Delta\Sigma$ modulator, no additional sample and hold (SAH) circuit or input buffer is needed which reduces the silicon area and power consumption of the acquisition chain.
The ADX03800DST65 achieves low noise and low distortion at ultra-low power which makes it ideal for portable communication systems.
Others IP blocks such a voltage reference, PLL, digital decimation filter and high-speed serializer may be used with the ADX03800DST65 to build a complete digitization sub-system.

Applications

- Portable communications
- Portable medical imaging
- Portable test equipment
- Data acquisition card

STATUS

Pre-development

Benefit and Features

- Process : 65nm CMOS LP/GP (1P7M)
- Output data-rate : 800 MSPS
- Analog bandwidth : 40MHz
- 10-bit ENOB up to 40MHz
- Low noise : SNR=63dB
- Excellent linearity : THD =74dBc
- Low power : 8mW
- 1.6 V_{pp_diff} input voltage range
- High tolerance to clock jitter
- Very easy to drive
- Resistive input impedance
- Third-order anti-aliasing filter
- -40°C to +125°C junction temperature
- <0.5 mm^2 area
- Power down mode
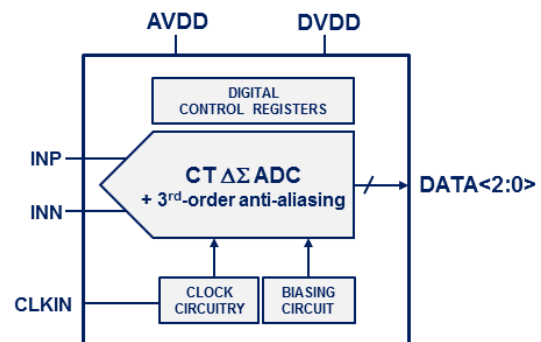
Functional Diagram

Figure 1. Functional block diagram

Deliverables

- Layout view (GDSII)
- Characterization report
- Behavioral model (Verilog-A)
- Data Sheet
- Characterization report
- Integration support

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Electrical Characteristics

(Temp=27°C, AVDD=1.2V, DVDD=1.0V, CLKIN=800MHz, A_{IN}=-2.5dBFS, V_{ICM}=0.8V)

PARAMETER	SYMBOL	CONDITIONS	VALUE	UNITS
ANALOG INPUT				
Analog Input Common-Mode	V_{ICM}		0.8	V
Differential analog input	V_{inp}-V_{inn}		1.6	V
AC CHARACTERISTICS				
Effective Number of Bits	ENOB	f_{in}=6MHz	10.1	bit
Signal to Noise Ratio	SNR	f_{in}=6MHz	65.5	dBFS
Total Harmonic Distortion	THD	f_{in}=6MHz	74	dBc
Signal to Noise plus Distorsion Ratio	SNDR	f_{in}=6MHz	65.1	dBFS
Spurious Free Dynamic Range	SFDR	f_{in}=6MHz	80	dBc
Worst case alias attenuation			40	dB
POWER SUPPLIES & POWER CONSUMPTION				
Supply voltage Analog Digital	 AVDD DVDD		 1.2 1.0	 V V
Total power consumption	P_{ower}	f_{in}=6MHz	8	mW

Customization and porting

The ADX03800DST65 will be evaluated and verified on silicon by our design team soon. This IP will be available as a hard macro-cell. It is scalable and portable with respect to manufacturing process and can be customized as necessary for the required application.

Our qualified approach greatly increases the probability of right-first-time designs while minimizing time-to-market and reducing developments costs.

About SCALINX

SCALINX is a fabless company designing state-of-the-art Analog and Mixed-Signal Integrated Circuits and Intellectual Property blocks for Communications and Industrial markets. Our core business is to provide tailored solutions to OEMs and semiconductor companies developing high-end systems and circuits with ultra-low power requirements and reduced Bill of Material.

Our expertise is in the field of signal conditioning, data conversion systems (ADC/DAC) and digital processing.

SCALINX's IC design team has a cumulated expertise of more than 100 years in the semiconductor industry with a proven track record of first-time right tape-outs that led to several successful business stories.