nAD10120-13m

10-bit 120 MSPS Analog-to-Digital Converter IP

FEATURES

- CSM 013M 1.2 V Technology
- 10-bit Pipeline ADC
- 10 to 120 MSPS Conversion Rate
- Excellent Dynamic Performance
  58 dBFS SNR at Fin = 10 MHz
  75 dBc SFDR at Fin = 10 MHz
- Dynamic Power Scaling
  ~0.75 mW per MSPS
- Low Power Consumption
  90 mW at 120 MSPS
  20 mW at 20 MSPS
- Power Saving Idle Modes
- 1.34 mm^2 Core Area
- Internal Voltage Reference
- Programmable Input Swing
  0.5 to 1 V p-p Differential
- Input Clock Duty Cycle Restorer

APPLICATIONS

- Communication Receive Channel
  WLAN 802.11x / WiMAX 802.16x
- TV / Video / Radio Decoders
- Digital Imaging
- Graphic Capture

GENERAL DESCRIPTION

The nAD10120-13m is a monolithic, high-speed, low power, analog-to-digital converter silicon IP. It uses a fully differential multistage pipeline architecture with digital error correction. The core includes a sample-and-hold and an internal voltage reference that provides a nominal full-scale range of 1.0 V peak-to-peak.

The ADC is designed for high dynamic performance at input frequencies up to Nyquist. It thus represents an ideal solution for demanding applications like graphic capture, broadband communication and TV/Video decoders.

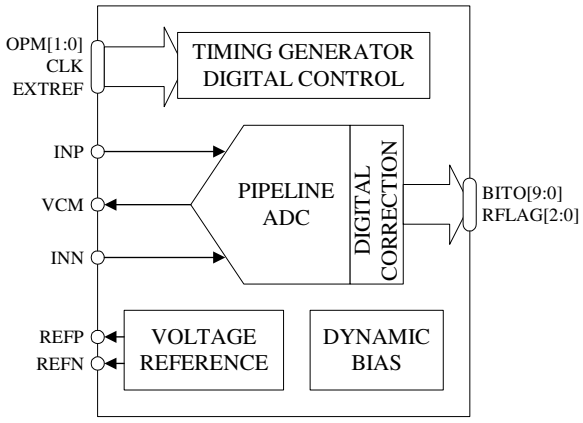

Figure 1. Functional block diagram

The ADC consumes only 90 mW at 120 MSPS operation. Dynamic power scaling means that the power consumption scales linearly with approximately ~0.75 mW per MSPS. Combined with power saving idle modes the ADC is suitable for battery powered devices. Output data is available in a binary offset coded format. Three out-of-range indicator bits are also available for determining if the input signal is over-range, under-range or out-of-range.

Implemented in a generic 0.13 µm CMOS process, employing a fully differential architecture and no required external reference decoupling it represents an ideal ADC for highly integrated mixed-signal systems.

QUICK REFERENCE DATA

IP Type / Technology	Hard Macro / CSM 013M 1.2 V 1P8M			
IP Area / Dimensions	1.34 mm^2 / 1.40 × 0.93 mm			
Parameter	**Min.**	**Typ.**	**Max.**	**Unit**
Power Dissipation, at 120 MSPS		90		mW
Signal-to-Noise Ratio, at 120 MSPS F_{IN} = 10 MHz		58		dBFS
Spurious-Free-Dynamic Range, 120 MSPS F_{IN} = 10 MHz		75		dBc
Differential Non Linearity		± 0.5		LSB
Integral Non Linearity		± 1		LSB

Table 1. nAD10120-13m quick reference data

ABOUT NORDIC SEMICONDUCTOR

Founded in 1983, Nordic Semiconductor ASA (OSE:NOD) is a Fabless Semiconductor specializing in short-range radio communication and high-speed data conversion. Nordic is head quartered in Trondheim, Norway,

MIXED SIGNAL IP OFFERINGS

Leading and emerging Fabless Semiconductor companies around the globe leverage Nordic's portfolio of off-the-shelf mixed signal intellectual property for the design of highly integrated circuits for broadband communication, digital imaging and video.

Our IP portfolio includes medium resolution (8 to 12-bit), high-speed (40 MSPS+) data converters (ADC and DAC) and low jitter clock generation (PLL) implemented in the latest deep submicron CMOS technologies. Featuring low power consumption, low-silicon area, and a minimum of required external components and technology options our products offers cost efficient integration of high-performance data converters in cost sensitive, high volume integrated circuit designs.

DELIVERABLES

Our mixed signal intellectual property is delivered as technology specific hard macros. Upon licensing we provide a complete design-kit and documentation that enables efficient, low risk, design-in and integration. The design kit for our off-the-shelf IPs includes:

- Full datasheet
- Evaluation board and samples
- Silicon validation report
- Integration Guidelines
- Physical design database (flat gds2)
- LVS Netlist (spice compatible)
- Footprint (.lef format)
- HDL model (verilog model)
- Timing model (.lib)
- Design-in and integration support

FURTHER INFORMATION

For further information about this product, such as full datasheet, silicon validation report, availability and licensing terms please contact us at: datacon@nordicsemi.no

DOCUMENT INFO	
Brief Product Specification:	nAD10120-13m
Product description:	10-bit 120 MSPS Analog-to-Digital Converter IP
Revision:	1.0
Revision Date:	2005-02-07
Template ID:	1159140_045 r.1.1A

MAIN OFFICE
Vestre Rosten 81, N-7075 Tiller, Norway
Phone: +47 72 89 89 00, Fax: +47 72 89 89 89
E-mail: datacon@nordicsemi.no
Visit the Nordic Semiconductor ASA website at http://www.nordicsemi.no