A10B5G

10-bit, 5 GSPS Analog-to-Digital Converter IP block

General Description

The A10B5G is an ultra low-power, high-speed analog to digital converter (ADC) intellectually property (IP) block. It is a successive approximation register (SAR) ADC, with a 10-bit resolution, and a sampling speed of 5 gigasamples per second (GSPS).

The A10B5G is a unique solution that provides the dual benefit of reaching an extremely high bandwidth while maintaining an exceptionally low power consumption (<20 mW), making it a perfect fit for designs with high efficiency, low power and high performance requirements.

The cost-effective IP block has been designed and verified for the GF22FDX fabrication process with FDSOI technology to provide superior performance/power specifications.

The ADC IP is also available in a radiation-tolerant version, that can function under harsh environmental constraints.

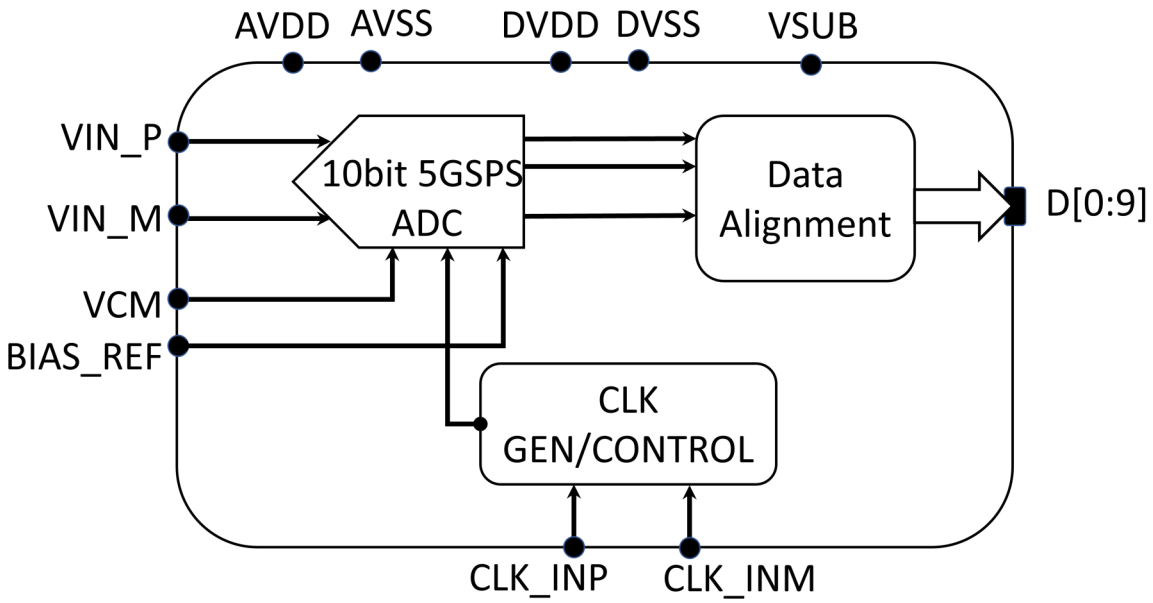
Key features

- 10 bit resolution
- 5 GSPS sampling rate
- 10 GHz Input Bandwidth
- 19 mW power
- Static Performance:
  - DNL: +0.5/-0.4 LSB
  - INL: +1.9/-2.2 LSB
- Dynamic Performance:
  - SFDR: 63 dBc
  - SNDR: 53.2 dB
  - ENOB: 8.5
- Hard IP block
- Radiation-tolerant design available: A10B5GRH

Applications

- High Performance Data Acquisition
- Direct RF Down Conversion
- High-speed test and measurement systems
  - Oscilloscopes, spectrometers & digitizers
  - LiDAR
- Wideband Communications and Networking
  - Microwave Receivers
  - Software-defined Radio
- Phased Array and Radar

Functional Block Diagram



Specifications

Resolution (bits)	10
Sampling rate (GSPS)	5
SFDR (dBc)	63
SNDR (dB)	53.2
ENOB	8.5
Input Bandwidth (GHz)	10
Power (mW)	19.8
FOM (fJ/conv)	2.2
INL (Integral Non-Linearity) (LSB)	+1.9/-2.2
DNL (Differential Non-Linearity) (LSB)	+0.5/-0.4
Architecture	SAR
Layout area (um x um)	350 x 420
Foundry	GlobalFoundries GF22FDX FDSOI
Node	22nm
Maturity	Verified, Tapeout in December 2019

About Alphacore

Alphacore enables engineers to develop ultra-high-performance and ultra-low power microelectronic components and systems with our products and IP design services. Our robust designs serve the **defense**, **aerospace**, **automotive**, **communications**, and **scientific instrumentation** markets. Let us supply you with state-of-the-art designs to satisfy your product and system needs.

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