RGADC-12B-2G-RH

PRODUCT BRIEF

Ridgetop Group Inc

ENGINEERING INNOVATION

Rad-Hard SiGe ADC, 12-bit, 2 GS/s, IBM 130 nm

InstaCell™ Semiconductor IP

Features and Benefits

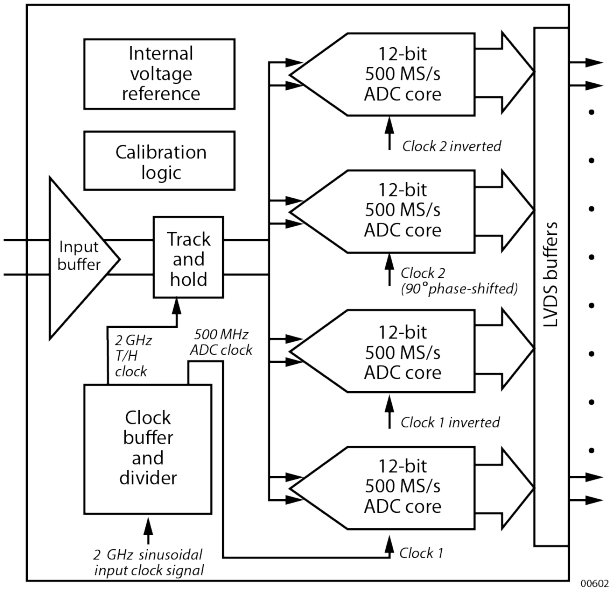
- Time-interleaved pipeline architecture
- 12 bits resolution (11-bit ENOB)
- 2 GS/s sampling speed
- SiGe process
- 3 GHz input analog bandwidth
- 950 mW power
- Hard to 300 krads (Si) of TID
- Hard to 120 MeV-cm^2/mg of SEL
- 3.3 V analog supply voltage
- Power supply tolerance ±5%
- 1.2 V digital I/O supply voltage
- Input voltage range 0.6 to 1.8 V

General Description

Ridgetop's high performance radiation-hardened analog-to-digital converter (ADC) with high bit precision can be used in low bit error rate (BER) 16-quadrature amplitude modulation (QAM) demodulator applications, such as high-speed digital signal processing (DSP) systems. This ADC achieves the system performance targets of high speed and high performance for communication systems, and it incorporates QAM demodulator subsystems that require digitization with extremely high linearity and dynamic range. With the added radiation hardness, the ADC meets demanding standards. Accordingly, Ridgetop's ADC is highly linear with an INL and DNL of no more than ±0.5 LSB, a flat gain of <0.1 dB, a channel-to-channel isolation of >80 dB, an operating temperature range of at least -55 to 125 °C, a very high effective number of bits (ENOB) of 11, and a TID tolerance better than 300 krad(Si).

This innovative time-interleaved silicon germanium (SiGe)-based ADC will improve the resolution, linearity, power consumption and radiation hardness of current state-of-the art ADCs used in advanced communication systems. As a modular, self-contained building block from a popular trusted foundry, this ADC will become an important library element in future system designs.

ADC block diagram; IP sub-blocks are also available



Specifications of RGADC-12B-2G-RH

PARAMETER	SPECIFICATION
Topology	Time-interleaved pipeline
Resolution	12 bits
Sampling speed	2 GS/s
Power consumption	950 mW
Input analog bandwidth	3 GHz
Digital output data format	LVDS
Analog supply voltage	3.3 V
Digital supply voltage	2.5 V
Digital I/O supply voltage	1.2 V
Analog input voltage	1.2 V peak-to-peak (differential)
Input capacitance	5 pF
Input reference voltage	1.2 V (typ.)
Input voltage range	0.6 to 1.8 V
Temperature range	-55 to 125 degrees C
Latency (# clock cycles)	12
INL	<0.5 bit
DNL	<0.5 bit
Area	2.0 mm^2
Process	SiGe
Foundry*	IBM 130 nm
Radiation hardness**	TID: 300 krad, SEL: 120 MeV-cm^2/mg
THD	-62 dB
ENOB	11 bits
Power supply	1.2, 2.5, 3.3 V
Power supply tolerance	±5%

*May be ported to other foundries or nodes
**IP may also be available in non-rad-hard form

IP Sub-blocks Available With Separate License

- Extremely fast track-and-hold amplifier
- Ultra-fast operational amplifiers
- Complete pipeline stages

Applications

The full ADC and its constituent IP blocks can be used to achieve the highest level of performance in many applications including:

- Satellite communication (SATCOM) systems
- Space-based radar
- Medical imaging devices
- Software-defined radio
- Linear power amplifiers
- HIgh-speed data acquisition
- High-speed test and instrumentation equipment
- High-speed digital signal processing (DSP) systems

Ridgetop is AS9100C/ ISO9001:2008 certified and has Trusted IC Design Supplier accreditation from U.S. Defense Microelectronics Activity (DMEA)

Need modified or custom design? Contact Ridgetop at 520-742-3300 to discuss your ideal solution!

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