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SKARAB ADC4X3G-14

**Four Channel,
3.0 GSPS,
14-bit
Analog-to-Digital
Converter**
For
SKARAB
Agile, Extreme-scale
Networked FPGA
Compute Platform

Technical Description

Product Description

The SKARAB ADC4X3G-14 is a four channel analog-to-digital converter (ADC) mezzanine for the Skarab FPGA compute platform. The mezzanine provides up to four 3.0 GSPS, 14-bit ADC channels capable of digitizing signals from near-DC to 3.2/4.0 GHz, at a bandwidth of up to 1.5 GHz.

An optional programmable gain amplifier (PGA) on each ADC input allows input level optimization.

Each ADC is supported by up to two digital down-converters that provide programmable bandwidth and frequency selection, supporting programmable decimation factors from 4 to 32.

On-board clock generators derive high quality GHz sampling clocks from a user-supplied stable reference (typically 10 MHz).

The mezzanine supports external triggering and I/O to allow gated acquisition based on external event detection as well as time/event stamping.

An on-board ARM microcontroller offloads low-level ADC sub-system management from the Skarab FPGA.

The ADC4X3G-14 includes a board support package/reference design to accelerate firmware application development.

Applications

- ❑ RF spectrum sensing
- ❑ Microwave and Millimeter Wave Receivers
- ❑ Radio astronomy
- ❑ Software Defined Radio
- ❑ Multi-band, multi-mode 2G, 3G, 4G cellular receivers

Features

- ❑ Four 14-Bit, 3.0 GSPS ADC channels
- ❑ On-chip dither, PGA (optional)
- ❑ On-board digital down-converters:
  - – Up to 8 DDCs (two per ADC; dual-band mode)
  - – 3 independent NCOs per DDC
- ❑ High performance 3 GHz sample clock generator
- ❑ External trigger and GPIO
- ❑ Dedicated ADC sub-system management processor
- ❑ Phase-synchronous data acquisition across multiple channels/boards

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Block Diagram
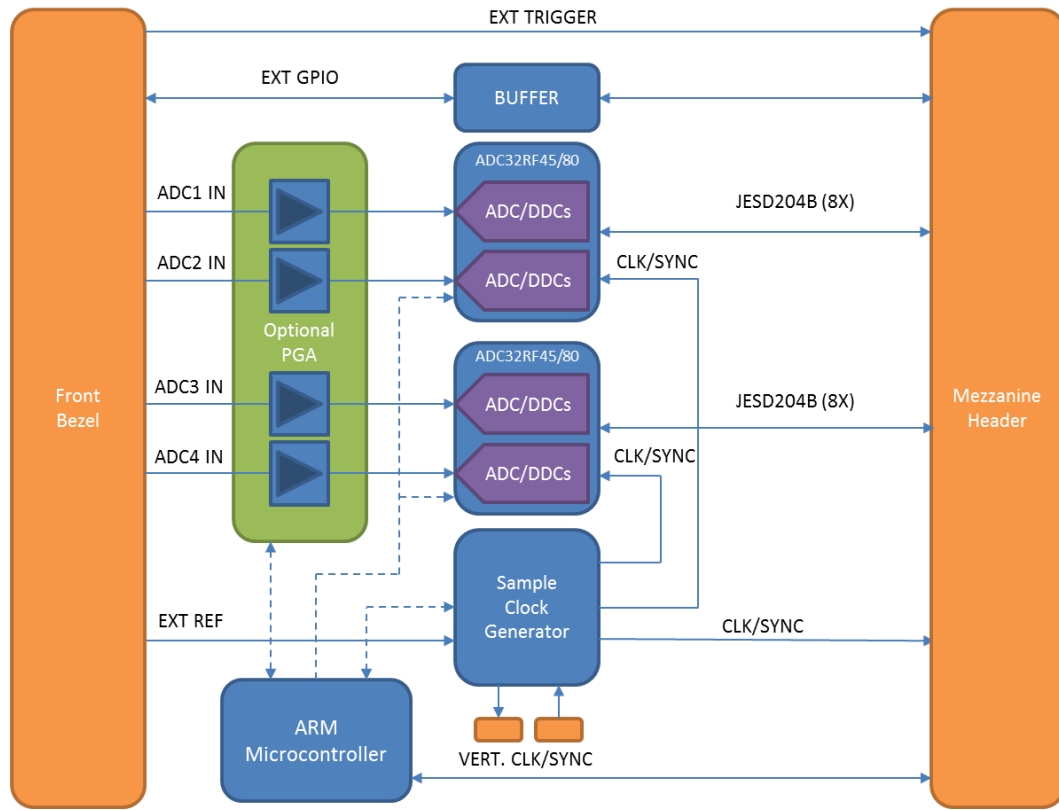
Product Specifications:	
Parameter	**Specification**
Power Consumption (Typ.)	22 W (3.0 GSPS, 600 MHz BW)
Operating temperature range	+5°C to +40°C (Extended temperature ranges available on request)
Storage temperature range	-10°C to +70°C
Form Factor	Skarab Mezzanine

Ordering Information	
Ordering Variant	**Description**
PI-12533.01C	4 x 3 GSPS ADC+DDCs. Supports ADC full output rate via DDC bypass.[1]
PI-12533.01D	2 x 3 GSPS ADC+DDCs. Supports ADC full output rate via DDC bypass.[1]
PI-12533.01E	4 x 3GSPS ADC+DDCs. Output up to 600 MHz (750 MSPS), 16 bit I/Q. No DDC bypass.
PI-12533.01F	2 x 3GSPS ADC+DDCs. Output up to 600 MHz (750 MSPS), 16 bit I/Q. No DDC bypass.

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[1] When using DDC bypass mode, sample rate /resolution limitations may apply. Consult Peralex for details.

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skarab adc spec-03.doc
This specification is subject to change without notice.