

Technical Summary

Pacific Microchip Corp. is developing a spur energy suppressing, 6-bit 20GS/s ADC. The application specific integrated circuit (ASIC) harnesses rapid advancements in fine-geometry semiconductor processes. In addition to the high sampling rate (20GSps), the ADC features >10GHz signal bandwidth. The ADC has a built-in ESI (E2V) data interface compatible with the space compliant FPGAs. In addition, the ADC is offered as an IP block for integration into ASICs and SoCs.

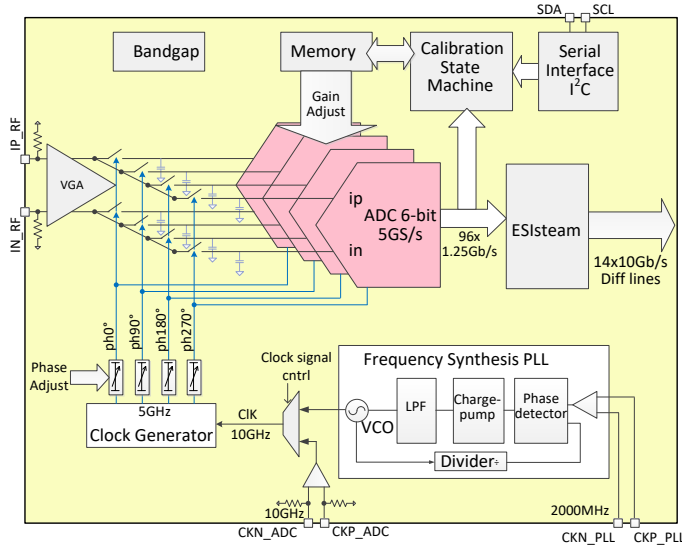


Figure 1. A block diagram of the ADC chip.

The ADC is assembled in a 225 BGA package (Figure 2).



Figure 2. A BGA package for the ADC.

The evaluation board (Fig.3) will be sampled to select customers.

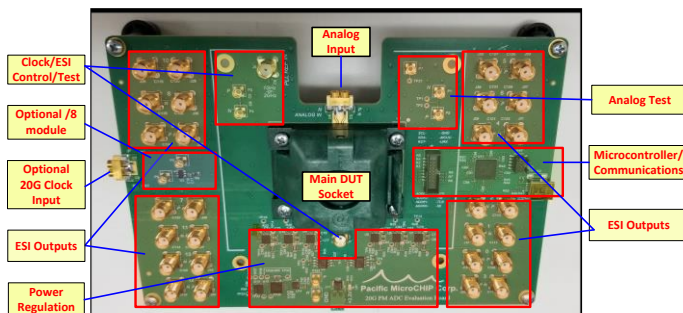


Figure 3. Test/Eval Board.

Expected Operational Capabilities

The following features/capabilities are incorporated into the spur-suppressing, rad-tolerant ADC:

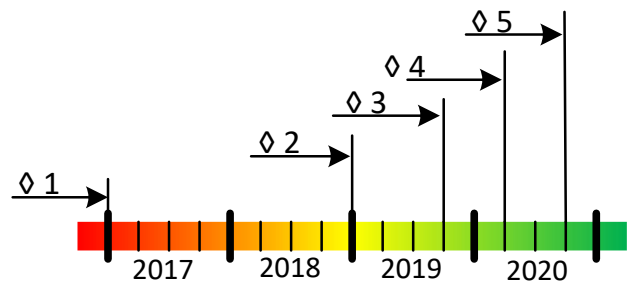
- Sampling rate of 20 GS/s
- 6-bit resolution
- ENOB > 4-bit
- Input signal bandwidth > 10GHz
- Power consumption < 500mW
- Ability to suppress spurious response
- On-chip memory of 0.2 Mb for storing digitized data
- I2C interface for control and diagnostics
- ESI compatible data output at 16x10 Gb/s
- 15 x 15 BGA package (12.8mm x 12.8 mm)
- High fidelity, self-calibration
- TID and SEE immunity

Development Objectives & Milestones

Pacific Microchip Corp. has demonstrated the feasibility, designed, fabricated, packaged and currently is testing the 20G 6-bit ADC. Further, the ADC part will be sampled to selected customers. Based on the testing results, the chip will be redesigned, retested and started to be produced.

The project includes the following milestones:

1. Feasibility is proven based on simulations
2. Prototype ADC chip is designed and taped out
3. Prototype chip is fabricated/tested and being sampled
4. Final chip is designed and taped out
5. Final chip is fabricated, tested, and sales will start



Current TRL: 3, Estimated final TRL: 5

Applications

- Radio telescopes
- Systems for Earth observation from space
- Phased antenna array systems, SAR/MIMO
- Software definable radios
- Wireless network infrastructure
- Fiber optic transceivers
- Spectrum/frequency analyzers
- High sampling rate oscilloscopes
- Satellite communication systems