P19800B Spectrometer ASIC EVAL3

Keywords: Spectrometer ASIC, Earth observation, polyphase filter, FFT, ADC

ASIC Summary

The P19800B EVAL3 board contains a socket which can be used for screening parts. The EVAL3 board is a demo-ready board, which comes with control software (Fig.2). The P19800B spectrometer ASIC processes up to 5.5GHz bandwidth input signals provided by microwave front ends. The ASIC (Fig.1) includes a VGA, a 6-bit ADC, an FFT based on polyphase filtering and an accumulator capable of accumulating up to 34 seconds of frequency-domain data. The chip also includes an output data interface, a PLL based frequency synthesizer and a SPI interface for the ASIC's programming and data interchange at low speed. The chip is offered in a BGA package and as an IP block for integration into SoCs. (One P19800B ASIC is included with purchase of EVAL3)

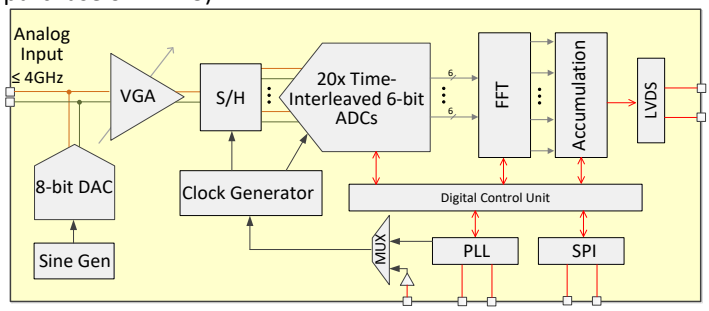

Figure 1. A block diagram of the P19800B ASIC.

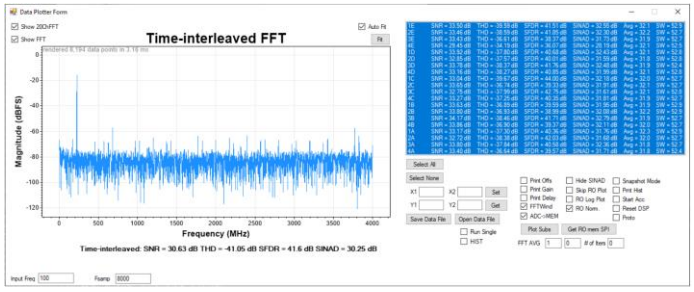

Figure 2. Evaluation software for the P19800B EVAL3 PCB.

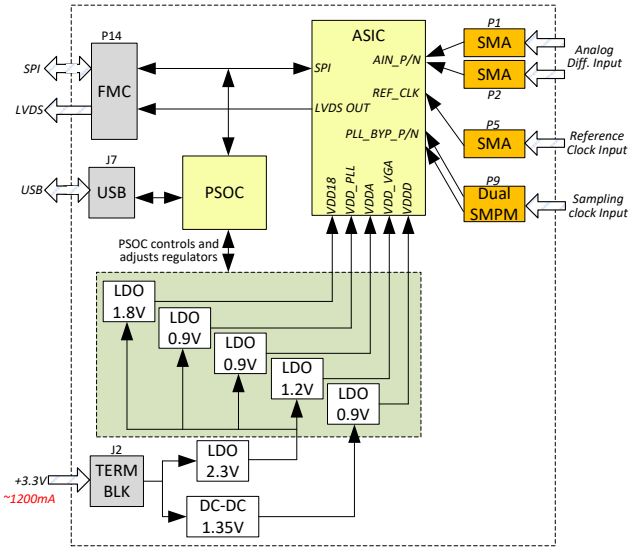

Figure 3. Block diagram of EVAL3 Evaluation Board.

ASIC Capabilities

The ASIC digitizes the RF signal and splits the spectrum into 8192 frequency bins. The power or magnitude is computed for each bin and the result accumulated.

- Sampling rate up to 8GS/s
- Input signal bandwidth up to 5.5GHz
- Digitizer ENOB > 4.5-bit to 4GHz
- Power consumption < 1.6W (full functionality)
- Up to 8192 Frequency bins within 0 to 4GHz
- Accumulation time programmable from 2us to 34s
- An integrated 16GHz PLL with selectable Fref

Figure 4. Picture of EVAL3

EVAL3 Operation requirements:

- +3.3V @ 2.0A single supply.
- P19800B ASIC inserted in the socket.
- USB connection to PSOC for control.
- External balun for differential input signal.
- Reference clock source from 34MHz up to 2GHz.
- Optional FMC connector on bottom side to mate with LPC FMC connectors on FPGA development boards.

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