Solution Brief

Wideband Channelizer for Intel® Direct RF-Series FPGA

Design Example

Description

Intel® Direct RF-Series FPGA provides unprecedented technological capabilities that allow wideband and SWAP-sensitive systems. Its unrivaled analog/digital sampling capabilities can be key enabler in many applications.

To utilize enormous, sampled data bandwidth, such wideband data converter must be coupled with computational engine that can operate at rates and capable of processing such volumes of data in real time.

To showcase Intel Direct RF-Series FPGA capabilities, Intel developed a Wideband Channelizer design example. This design features a polyphase filter bank developed using a DSP Builder for Intel® FPGAs' design tool oriented for DSP developers. Data from the analog-to-digital converter (ADC) is streamed into the channelizer block that includes prototype polyphase filter and 64 phases FFT block. Captured output of the channelizer is uploaded to the host and presented in viewers, while showing some key signal quality metrics.

The Wideband Channelizer design includes an RF calibration flow to obtain a captured signal at best quality.

This design can be used as an out-of-the-box demo to evaluate Intel Direct RF-Series FPGA capabilities, show the ability of FPGAs performing sophisticated processing of data, and serve as a potential starting point for customer applications.

Features

- Modes: x1 (raw)
- RF calibration flow for ADC
- Sampling rate support: 64 GSPS
- Dynamic spectral viewer
- Spectrogram viewer
- RF performance measurements
- Supports Intel Stratix 10 AX FPGA and Intel Agilex® 9 FPGA development kit

Applications

- Radar and electronic countermeasures
- Test and measurement equipment
- Communication systems

For more information about Intel® FPGA design example, contact Intel.