Solution Brief

Oversampled Channelizer with Spatial Overlapping Inputs for Intel Agilex® 7 FPGA

Design Example

Description

The Intel Agilex® 7 FPGA provides ultra-high fabric performance and enhanced power efficiency, offers integrated Arm®-based processors, up to 116 Gbps transceivers, PCI Express* (PCIe) 5.0 and Compute Express Link (CXL). These features make the Intel Agilex® 7 FPGA ideal for a wide range of applications in many markets including data center, networking, broadcast, defense and industrial.

To showcase the capabilities of the Intel Agilex® 7 FPGA, Intel has developed a design example demonstrating an Oversampled Channelizer with Spatial Overlapping Inputs. The design features a Polyphase Filter Bank implemented with the DSP Builder for Intel FPGAs design tool which is ideal for DSP developers targeting an Intel FPGA. Data from the On-chip Signal Generator is streamed into the Channelizer block, where the Channelizer block includes Adapter, Scheduler, Polyphase Filter and FFT blocks. The output of the Channelizer is captured and then uploaded to the host and presented in a MATLAB-based viewer, which displays some key signal quality metrics.

The design includes an On-chip Signal Generator which can provide programmable stimulus to the Channelizer system, so that the design example can run without an external signal generator and ADC.

The design can be used as an out-of-the-box demo to evaluate the DSP Builder tool and the Intel Agilex® 7 FPGA. The design shows the ability of the Intel Agilex® 7 FPGA to perform sophisticated processing of data and serves as a potential starting point for customer applications.

Features

- Supported Sampling Rate: 10 GSPS
- Supported Channels: 32
- Polyphase Signal Processing Infrastructure
- Dynamic Spectrum/Spectrogram View
- Time Domain Waveform View
- RF Performance Measurements
- On-chip Signal Generator
- Requires:
  - Intel Agilex® 7 FPGA Development Kit
  - DSP Builder for Intel FPGAs
  - MATLAB™

Applications

- Radar and Electronic Countermeasures
- Test and Measurement Equipment
- Communication Systems

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