Solution Brief

Wideband and Agility Features for Intel® FPGA Device

Design Example

Description

The Intel FPGA provides unparalleled technological capabilities that enable the use of wideband Intel® Direct RF-Series FPGA systems. In many applications, it is necessary not only to have wideband monitoring capabilities, but also to perform fast frequency hopping. The time required to tune into a new band of interest can be critical, as it directly affects the system's ability to operate in congested and contested environments, as well as the system's response time.

To assist users in evaluating the agility characteristics and features of the Intel FPGA, Intel has developed the Wideband and Agility Features example design. This design demonstrates the ability of frequency hopping and how this capability, combined with wideband monitoring, can be a significant advantage for certain applications.

In this example, once the wideband primary receiver detects the signal of interest, it sends a tuning command to the narrower band secondary receiver. The secondary receiver tunes its center frequency and adjusts its RF calibration parameters to the new required frequency using a dedicated hardware control mechanism. As a result, this process achieves a very short response time.

Furthermore, this design features a graphical user interface (GUI) that displays the agility hopping latency measurement result in real-time. The captured outputs of the wideband and narrowband spectra are uploaded to the host and presented in viewers to demonstrate the agility experience as well as provide key signal quality metrics.

Features

- Wideband primary receiver: 32GHz IBW
- Narrow band secondary: 4GHz IBW
- Agility frequency hopping
- Agility ADC Calibration flow
- Latency Measurement in run-time
- Signal Viewer
- Sampling rate support: 64 GSPS
- Intel® Stratix® 10 AX FPGA Development Kit / Intel Agilex® 9 FPGA Direct RF-Series Development Kit (AGX027 | 2xA-Tile, 2xF-Tile)

Applications

- Radar systems
- Electronic Warfare (EW) systems
- Communication systems

For more information about Intel® FPGA design example, [contact Intel.](#)