CONN-RFSOC (v1.0)

Course Description
This course provides an overview of the hard block capabilities for the Zynq® UltraScale™+ RFSoc family with a special emphasis on the RF Data Converter and Soft-Decision FEC blocks.

The focus is on:
- Describing the RFSoc family in general
- Identifying applications for the RF Data Converter and SD-FEC blocks
- Configuring, simulating, and implementing the blocks
- Verifying the RF Data Converter on real hardware
- Reviewing power estimation to help identify the power demands of the RFSoc device in various operating modes
- Identifying proper layout and PCB considerations since the Zynq UltraScale+ RFSoc is both a high-speed and an analog and digital device

What’s New for 2019.1:
- RFSoc ADC
  - RF direct sampling parameters added
- RFSoc DAC
  - RF direct sampling parameters added
- RFSoc Hardware (new)
  - Kit overview and all steps for hardware and software setup for labs and practices (new module)

RFSoc Data Converter Design
- New example design and SDK steps now included
- RFSoc Data Converter Practice (new)
  - Evaluation tool and RF analyzer tool overview
  - Introduction to the open-source project PYNQ
  - Sampling frequency planning details
- PCB Design for RFSoc Devices
  - PCB design challenges introduction (new module)
  - RF data converter power estimation (new module)
  - Parameter update Gen1; parameter Gen2 added
  - Insertion loss parameters clarification
  - Clocking clarification; PCB routing guidelines added

Course Outline
- Zynq UltraScale+ RFSoc Overview
  - Overview of the Zynq UltraScale+ RFSoc architecture, including brief introductions to RF, RF data converter solutions, SD-FEC solutions, driver support, and tool support. (Lectures)
- RFSoc ADC
  - Covers the basics of RF-ADCs. Reviews RF-ADC architecture, functionality, interfaces, configuration, and driver support. (Lectures, Demo, Lab)
- RFSoc DAC
  - Covers the basics of RF-DACs. Reviews RF-DAC architecture, functionality, interfaces, configuration, and driver support. (Lectures, Demo, Lab)
- RFSoc Hardware
  - Provides an overview of the ZCU111 board and describes board setup. (Lecture, Practice)
- RFSoc Data Converter Design
  - Describes common features, the design flow, utilizing the example design by simulation and implementation, and verification of RF data converter functionality on real hardware. Includes practice of using a software driver to modify RF data converter parameters. (Lectures, Labs)
- RFSoc Data Converter Practice
  - Provides practical RF data converter experience using the the ZCU111 evaluation tool and the RF analyzer tool. Demonstrates a PYNQ-based application to validate QPSK streams. Describes RF data converter frequency planning. (Lectures, Practices)
- PCB Design for RFSoc Devices
  - Describes power requirements, performing power estimation, and utilizing the power design. Analog signal requirements, PCB materials and layer stackup options, and analog trace design are also covered. (Lectures)

Level – Connectivity 3
Course Duration – 3 days
Price –
Course Part Number – CONN-RFSOC

Who Should Attend? – Hardware designers interested in understanding the architecture and capabilities of the Zynq UltraScale+ RFSoc data converter and SD-FEC hard blocks.

Prerequisites
- Suggested: Understanding of the Zynq UltraScale+ MPSoC architecture
- Basic familiarity with data converter terms and principles
- Basic familiarity with forward error correction terms and principles

Software Tools
- Vivado® Design Suite 2019.1
- SDK 2019.1

© 2019 Xilinx, Inc. All rights reserved. All Xilinx trademarks, registered trademarks, patents, and disclaimers are as listed at http://www.xilinx.com/legal.htm. All other trademarks and registered trademarks are the property of their respective owners. All specifications are subject to change without notice.
• **RFSoC SD-FEC**
  Covers the basics of forward error correction. Reviews SD-FEC architecture, functionality, interfaces, configuration, and driver support. [Lectures, Demo, Lab]

**Register Today**
Visit the Xilinx Customer Training Center to view schedules and register online.