OVERVIEW

Xilinx® Zynq® RFSoC DFE is a breakthrough adaptable radio platform that hardens the digital front-end (DFE) for 5G mass radio deployment and a breadth of other RF applications.

Built on the only production-proven, adaptive single-chip radio platforms that integrate the entire signal chain from RF to baseband, Zynq RFSoC DFE represents a new class of devices that integrates hardened DFE IP along with Xilinx’s proven Programmable Logic. Zynq RFSoC DFE offers the best balance of technologies - the cost economies of an ASIC using hardened blocks with the flexibility, scalability and time-to-market benefits of a programmable and adaptive SoC.

HIGHLIGHTS

Fully Hardened Radio Subsystem for 5G NR Performance and Power
> Validated 3GPP Standards compliant radio cores
> Half the power of Zynq RFSoC Gen 3 for typical radio applications
> Up to 7.125GHz RF bandwidth
> Industry’s only 400MHz iBW for 8T8R
> Supports both FR1 and FR2 radio DFE with flexible and scalable DFE
> Flexibility to enhance hardened IP with adaptive logic

Multi-Band, Multi-Mode Operation for Flexibility and Scalability
> Up to 8 component carrier per-antenna path (8T8R FDD/TDD)
> 400MHz iBW support enables RAN sharing (e.g., MORAN)
> Ability to support multi-mode, multi-band radios with a single device

Complete Adaptive SoC for Fully Software-Defined Radio
> Based on the proven 16nm UltraScale™ architecture
> Arm® processing subsystem for DFE configuration and control
> Adaptive logic for differentiation and future market requirements
> 32G transceivers with RS-FEC for CPRI, eCPRI, and ORAN FH interfaces
> 100G Ethernet integrated cores

TARGET APPLICATIONS

5G New Radio (5G NR)
> Massive MIMO Macrocell
> Multi-Mode (4G/5G) Macrocell
> Fixed Wireless Access
> Small Cell Nodes

Aerospace & Defense
> 5G for Government / Private Spectrum
> Digital Phased Array Radar
> Milcom and Satcom Modems
> Data Links
> Positioning, Navigation, and Timing (e.g., GPS Anti-Jam)

Test & Measurement
> Portable Test Equipment
> UE Emulation / RF Testers
Zynq RFSoC DFE integrates much of the DFE and RF processing required by both 4G and 5G NR.

## FEATURES

### HARDENED RADIO SUBSYSTEM

| Direct RF Data Converters | > 8x 10GSPS DACs | > 8x 2.95GSPS ADCs and 2x 5.9GSPS ADCs |
| - | > Direct RF support for all FR1 bands, optimal IF for mmWave FR2 bands |
| - | > Up to 7.125GHz RF bandwidth |
| - | > Integrated mixer, NCO, interpolation & decimation for digital frequency conversion |

| RF Signal Processing | > Specialist signal processing including resampling and equalization |

| Digital Pre-Distortion | > Supports up to 400MHz iBW and the latest RF power amplifier technologies |
| - | > Reduced weight and thermal management complexity in the radio |
| - | > Based on production-proven Xilinx IP |

| Crest Factor Reduction | > Supports up to 400MHz instantaneous bandwidth (iBW) |
| - | > Based on production-proven Xilinx IP |

| Digital Up-Conversion (DUC) | > Support for up to 8 component carriers (CCs) |
| Digital Down-Conversion (DDC) | > Supports a wide range of carrier bandwidths and 400MHz iBW |

| Channel Filtering | > Support for up to 8 component carriers (CCs) |
| - | > Supports a wide range of carrier bandwidths for 4G and 5G NR |

Covering a wide range of radio requirements from small cell and DAS to macro and massive MIMO

### TAKE THE NEXT STEP