



FLEXIBILITY AND SCALABILITY FOR
NEXT GENERATION WIRELESS
BASESTATION DESIGN

LTE BASEBAND TARGETED DESIGN PLATFORM

Industry Challenges

- Need for dramatic and sustained reductions in both capital and operating expenditures
- Rapidly changing market dynamics
- Demand for new applications and higher-bandwidth services
- Constant evolution of air interface standards
- Increasing semiconductor and ASIC development costs

Xilinx Baseband Solution

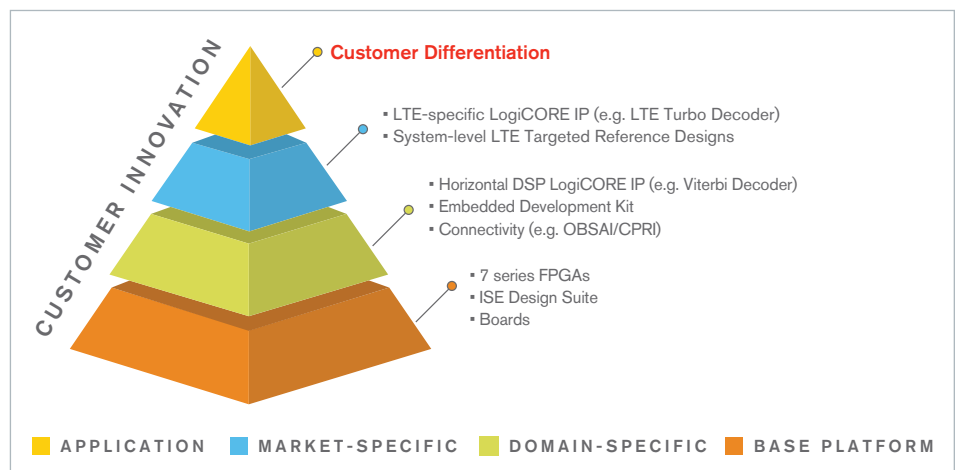
- Highly integrated to reduce cost, power dissipation and form factor
- Processing bandwidth for advanced baseband algorithms
- Reconfigurable architecture to futureproof designs
- Scalable for all basestation configurations and air interfaces
- Common platform for baseband development

Xilinx® FPGAs are the ideal platforms for addressing the evolving technical and commercial requirements of wireless basestation designs. Inherently scalable and reconfigurable, the devices reduce the risk of expensive redesigns in a dynamic market. The massive levels of parallel processing power offered simplify channel card designs, reducing system cost, power dissipation and form factor.

Accelerated 3GPP-LTE Development

Building on the market-leading Xilinx 7 series FPGA families, the Xilinx LTE Baseband Targeted Design Platform brings together an extensive range of both generic and LTE-specific air interface IP, a comprehensive design environment and pre-validated Targeted Reference Designs. By providing pre-built, highly optimized 3GPP-LTE layer-1 components, the LTE baseband platform lets developers focus on product differentiation rather than the implementation of complex physical-layer functions.

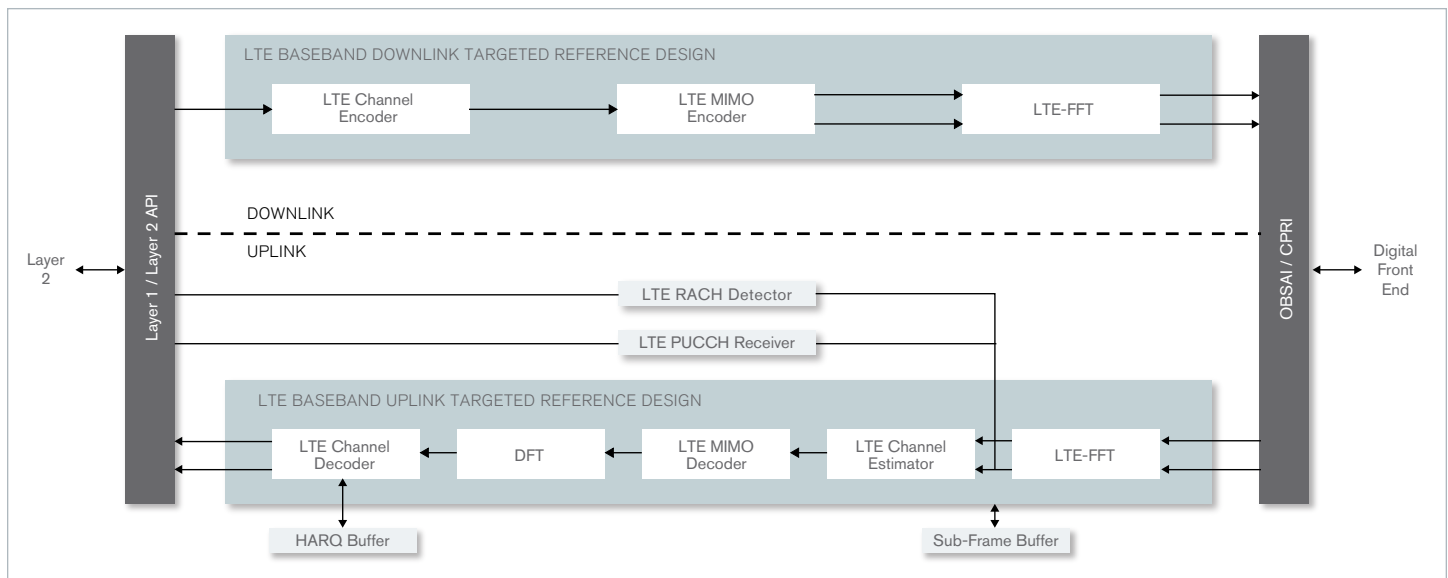
LTE BASEBAND TARGETED DESIGN PLATFORM



Processing Power for Differentiated 4G Basestations

With much increased data rates and reduced latencies, LTE is pushing conventional DSP based architectures to the limit. In particular, the use of higher order antenna systems are driving algorithmic demands forward at an exponential rate. In such an environment, it is crucial to select a hardware platform that scales easily to meet evolving and unpredictable market requirements. Ranging from the cost-efficient Artix-7 family, through the Kintex-7 family, to the market-leading signal processing power of the Virtex-7 family, Xilinx 7 series devices deliver the optimal solution, from enterprise femtocells through to the most challenging advanced macrocell basestations. With a common architecture and tool chain, Xilinx FPGAs significantly decrease the risk and effort associated traditionally associated with porting to new hardware as system requirements evolve.

LTE BASEBAND TARGETED DESIGN PLATFORM COMPONENTS



LTE Baseband Targeted Design Platform

To accelerate product development, Xilinx has developed an extensive platform for LTE applications: the LTE Baseband Targeted Design Platform. Designed for maximum flexibility, the platform provides all key LTE baseband functions as independent and configurable LogiCORE IP blocks. These LogiCORE IP blocks are in turn integrated into Downlink and Uplink Targeted Reference Designs, which are delivered free of charge to qualified customers. Built as an Embedded Development Kit project around a MicroBlaze™ processor, these reference designs serve as example systems, intended for modification according to meet the needs of specific applications. A message-based API supports the communication needs between the reference designs and the higher layers, while shielding developers from the low-level details of LogiCORE IP configuration. Implemented on the Xilinx MicroBlaze processor, the API is portable to any processing element and is designed to adapt to all common connectivity options.

Key LogiCORE IP Features:

- Support for both TDD and FDD LTE frame structures
- Optimized for the full range of basestation form factors
- Supported by bit accurate C models
- Evaluation versions available

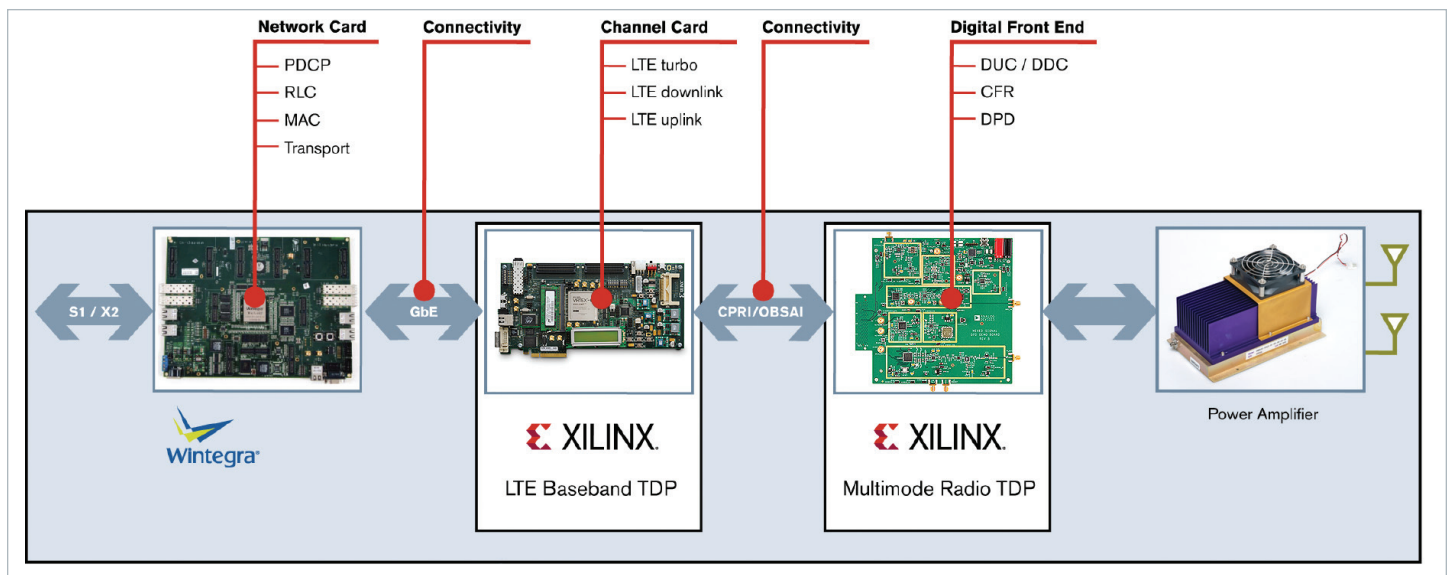
Cost and Power Optimized Solutions

Xilinx 7 series FPGAs, combined with the optimized IP offered in the LTE Baseband Targeted Design Platform, enable dramatic simplifications in basestation system architectures—reducing device counts, system cost and power dissipation. At the system level, the implementation of all Layer 1 processing in a single device avoids the unnecessary and wasteful data transfers often seen with less streamlined traditional DSP based architectures. Significant reductions are seen in power dissipation, both through the inherently low power design of the 7 series FPGAs and the superior efficiency obtained by implementing the baseband signal processing chain in hardware.

Complete LTE Basestation Design

Combined with the Xilinx Multi-mode Radio Targeted Design Platform and solutions from industry-recognized partners, the LTE Baseband Targeted Design Platform and solutions from our partners such as Wintegra and Analog Devices creates an end-to-end LTE basestation design including radio, baseband, media access control (MAC), and transport functions. These modular platforms simplify development and reduce costs for both frequency-division duplex (FDD) and time-division duplex (TDD) LTE. With a common platform for the design and development of programmable LTE baseband processing and digital front end (DFE) radio subsystems, developers have the flexibility and scalability to meet evolving product and time-to-market requirements of 4G basestation architectures.

COMPREHENSIVE LTE ENODEB REFERENCE DESIGN



Xilinx LTE Baseband Targeted Reference Designs

- LTE Downlink Transmitter
- LTE Uplink Receiver

Xilinx LTE Baseband Targeted Design Platform LogiCORE IP Components

- LTE Baseband System Hardware
- LTE Baseband System Software
- LTE Turbo Decoder
- LTE Turbo Encoder
- LTE Channel Decoder
- LTE Channel Encoder
- LTE MIMO Decoder
- LTE MIMO Encoder
- LTE-FFT
- DFT/iDFT
- LTE RACH Detector
- Convolutional Encoder
- Viterbi Decoder
- LTE Channel Estimator
- LTE PUCCH Receiver

Visit www.xilinx.com/esp/wireless.htm#baseband and www.xilinx.com/ipcenter/fec_index.htm to find:

- Reference design material
- Evaluation versions LTE Baseband Targeted Design Platform LogiCORE IP components
- Supporting documentation

Take the NEXT STEP

For more information about Xilinx solutions for Radio, please visit: www.xilinx.com/esp/wireless.htm

Corporate Headquarters

Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
USA
Tel: 408-559-7778
www.xilinx.com

Europe

Xilinx Europe
One Logic Drive
Citywest Business Campus
Saggart, County Dublin
Ireland
Tel: +353-1-464-0311
www.xilinx.com

Japan

Xilinx K.K.
Art Village Osaki Central Tower 4F
1-2-2 Osaki, Shinagawa-ku
Tokyo 141-0032 Japan
Tel: +81-3-6744-7777
japan.xilinx.com

Asia Pacific Pte. Ltd.

Xilinx, Asia Pacific
5 Changi Business Park
Singapore 486040
Tel: +65-6407-3000
www.xilinx.com



© Copyright 2011 Xilinx, Inc. XILINX, the Xilinx logo, Virtex, Spartan, ISE and other designated brands included herein are trademarks of Xilinx in the United States and other countries. All other trademarks are the property of their respective owners.

Printed in the U.S.A. PN 2438-2