

Agilent EEsof EDA Agilent Division Delivers Early Test Solutions for LTE User Equipment

Case Study

Agilent SystemVue greatly accelerates
time-to-market for LTE Products



"MBD's LTE customers depend upon us, as their test equipment partner, to provide early access to LTE UE test tools," said Niels Faché, vice president and general manager of Agilent's Mobile Broadband Division. "With SystemVue, we shaved 3 months from the E6620A's baseband physical layer development time. Tools like SystemVue are crucial for MBD's success in creating the early test solutions required by our customers designing high quality, market leading LTE UE devices."

Niels Faché
Vice President and General Manager
of Agilent's Mobile Broadband
Division

Company: The Agilent Technologies Mobile Broadband Division

Agilent's Mobile Broadband Division near Spokane, Washington, developed the E6620 wireless communications test set, a one-box tester used by LTE mobile device and mobile chipset designers to create early LTE User Equipment (UE) devices. This new scalable platform offers real-time, system-rate network emulation for L1/L2/L3 uplink and downlink via RF or digital baseband. Designed to support MIMO and protocol conformance test, with full RF measurement capabilities, the E6620 provides a platform for building scalable test solutions to meet test needs for LTE UE designers across the R&D lifecycle.

Challenge: Designing LTE products for an emerging wireless standard

LTE is a new, rapidly evolving wireless standard. MBD's challenge was to provide early test solutions for customers based on a testing standard that was still evolving and subject to interpretation. Misinterpretation of LTE specifications can be costly, requiring additional development time to re-work designs.

The absence of available UE hardware to validate E6620A baseband implementation further magnified the challenge. Designing without UE hardware increases product integration risks and the possibility of finding issues late in the product development cycle, which could result in missing key test windows for MBD customers.

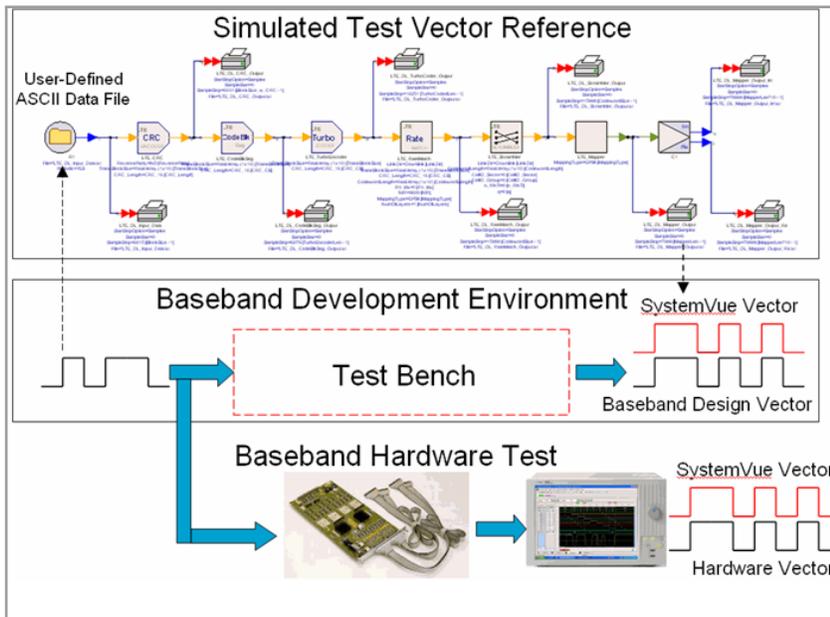
Solution: Agilent's SystemVue, from Agilent EEsof EDA

A commercial test vector reference solution was needed to validate the baseband design against the 3GPP LTE specifications--before the product integration phase. Furthermore, it was important that it be a truly independent commercial test vector reference solution, rather than one created by the MBD baseband development engineers, to catch potential misinterpretations of the LTE specifications in the baseband design. An example of an LTE commercial test vector reference is shown on page 2.

When simulated, test vectors are generated at each stage of the coding chain and stored as ASCII files for compatibility with other tools used in the baseband development flow. SystemVue vectors can be used for end-to-end baseband coding/decoding chain validation, or used as intermediate stage vectors to validate or debug individual coding/decoding blocks. Pre-configured SystemVue reference designs exist for the LTE Uplink (UL) and Downlink (DL) channel coding, and UL and DL channel decoding. LTE test vector configurations can be easily modified by the user by changing parameters to generate vectors for various LTE configurations such as QPSK, 16QAM, and 64QAM.



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Here's what Katie Blomster, MBD R&D engineer, says about using SystemVue:

"SystemVue helped me discover a typing error in my 16QAM scrambler which was failing tests. It has saved MBD at least 3 months of development time already, and is crucial for meeting-- and exceeding--our ongoing development time goals."

Results

Agilent MBD accelerated their baseband physical layer design using SystemVue's LTE reference vectors to validate baseband physical layer coding and decoding designs. SystemVue generated end-to-end vectors, as well as vectors at intermediate stages of the coding and decoding chains, expediting MBD's FPGA and DSP development flow.

The E6620A test set emulates a basestation for UE testing. SystemVue served as a 'virtual UE' for testing the baseband design until UE hardware was available for testing. This enabled early validation of baseband FPGA/DSP designs and hardware prior to UE hardware availability.

Results summary

- Validated baseband designs before UE mobile phone hardware was available
- Saved 3 months of R&D development time
- Greatly accelerated time-to-market before the LTE specifications finalize

Web Information

For more information, please refer to Agilent's LTE White Paper: http://eesof.tm.agilent.com/forms/lte_whitepaper_registration.html

For more information about Agilent Technologies SystemVue, visit our Website: www.agilent.com/find/eesof-systemvue

For more information about Agilent E6620A, go to: www.agilent.com/find/E6620A

For more information about other Agilent LTE products, go to: www.agilent.com/find/LTE

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Printed in USA, June 22, 2012
5990-3671EN