Cognovo and Rohde & Schwarz Collaborate in LTE-Advanced

Cognovo and Rohde & Schwarz demonstrate real-time LTE Advanced baseband and test equipment at Mobile World Congress 2012.

Cognovo and Rohde & Schwarz will demonstrate a real time 3GPP Release 10 LTE Advanced downlink scenario using the previously announced Cognovo Software Defined Baseband chip, the R&S®SMU200A Vector Signal Generator, the R&S®EX-IQ-BOX Digital Interface Module and the R&S®FSW Signal and Spectrum Analyzer.

The demonstration – hosted on the Rohde & Schwarz stand in Hall1 at 1E51 – shows the R&S®SMU200A providing a fully 3GPP Release 10 compliant carrier aggregation signal, where two 20 MHz OFDM carriers are decoded by the Cognovo baseband device to deliver data bandwidth equivalent to 40MHz. The R&S®FSW provides the RF characterization of the signal using its up to 160MHz analysis bandwidth.
The Cognovo CDC160 chip and associated development platform (CDP) enables wireless developers to create a complete multi-mode modem design in software, before they have finalised their production baseband device and is currently being used by customers developing modems for LTE and LTE Advanced.

Pascal Herczog, CTO at Cognovo said “Bringing any new wireless standard to market presents a significant engineering challenge, since reliable test equipment and a real time platform are both needed early on in the program, to move beyond simulation models and explore real-world performance and optimisation. This has become critical with newer standards such as LTE-A where die size, cost, power consumption and performance must be optimised at the design stage. The Cognovo CDP and integrated tool-chain enables optimisation and validation of the modem at an early stage.”
The R&S®SMU200A Vector Signal Generator enables creation of arbitrary intra- and inter-band carrier aggregation scenarios using its two basebands. The new SW Option K85 allows to generate a signal with up to five LTE-A component carriers, whereas each carrier can be configured with a flexible bandwidth from 1.4 up to 20MHz as well as with an individual Cell ID, power, time offset and frequency offset. Cross carrier scheduling in accordance with 3GPP Release 10 is also supported. The new R&S®FSW Signal Analyzer provides all relevant RF measurements on each individual carrier including e.g. modulation accuracy, power vs. time, and spectrum mask. Additionally the large 12.1 inch touch screen allows a free configuration of the measurements and can display multiple measurement results simultaneously.

Wolfgang Kernchen, Director of the Signal Generators, Audio Analyzers and Power Meters Subdivision at Rohde & Schwarz commented “Closing the loop between simulation, development and validation is essential in maintaining the industry’s pace of innovation. Rohde & Schwarz has a reputation for working at the edge of

innovation and this partnership with Cognovo enables us to demonstrate real life testing as early as possible in the design flow."

LTE Advanced specifies several extensions to the LTE standard driving up bandwidth to 1GB/s in downlink direction.

These are known as carrier aggregation, extended MIMO, enhanced ICIC supporting heterogeneous network deployments and enhanced uplink transmission. The most talked about of these – carrier aggregation – is seen by many as the key to realising the mobile broadband promise of LTE and is already being planned into service roll-out as early as 2013.

3GPP LTE Release 8 enables up to 150Mb/s downlink – shared by each user within a given sector – but in many cases, mobile carriers can only realise a fraction of this. In North America, for example, where spectrum is fragmented, only 5 or 10MHz channels are commonly available rather than the maximum defined 20MHz. Furthermore, spectrum is often non-contiguous, with channels being spread across several bands and as demand for new services drives new spectrum allocation, it often becomes available in yet more bands.

Carrier Aggregation is important because it allows the baseband device to receive multiple parallel streams and aggregate them to create a wider channel e.g. 5+5 MHz, 5+10 MHz, 20+20 MHz, etc. This scalability operates across contiguous and non-contiguous bands allowing carriers to exploit their spectrum efficiently and dynamically to deliver the user required bandwidth and Quality of Service regardless of the size or location of individual radio channels. Several carriers have already announced deployment as early as next year.

Herczog added "LTE Advanced significantly increases the complexity of the UE baseband and many developers have signalled that a new design approach is necessary. Carrier Aggregation requires n parallel LTE downlink streams to be processed simultaneously and in a traditional ASIC design, this dramatically increases both silicon cost (die size) and power consumption. The front-end modem also becomes more complex with enhanced MIMO schemes and ICIC. We see many people now moving to our software modem platform in order to address this. Parallel data processing tasks run efficiently on our distributed multi-processor architecture. The result is lower clock speed, power consumption and die size as all resources can be fully re-used from frame to frame.

More details are available at: www.cognovo.com/products [1].

Posted by Janine E. Mooney, Editor

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Links:
[1] http://www.cognovo.com/products