CommAgility

APPLICATION BRIEF

5G New Radio Solutions

5G New Radio (NR) is the 3GPP's response to the commercial challenges of enhanced Mobile Broadband (eMBB) gigabit-per-second bandwidths, ultra-reliable and low-latency communications (uRLLC) for mission-critical applications and massive machine type communications (mMTC).

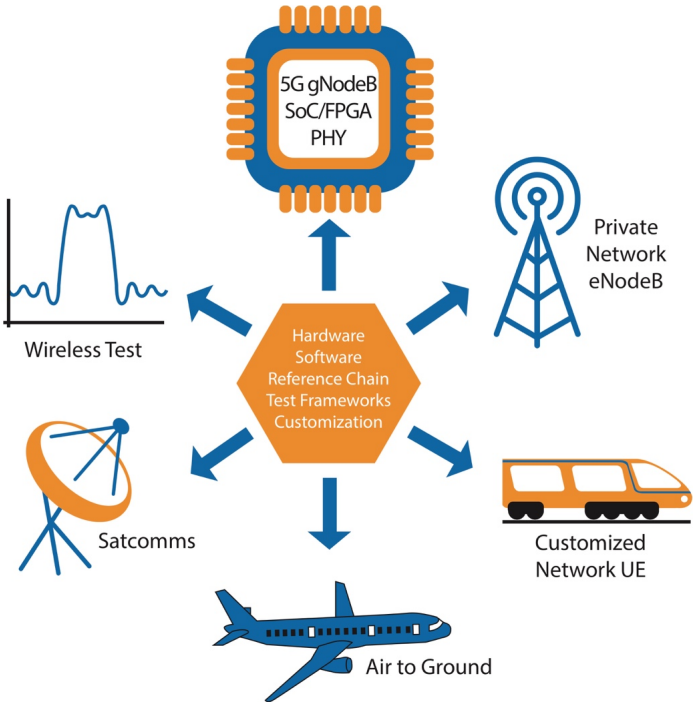
5G NR, established in 3GPP Rel-15 and expanded in Rel-16, introduces key improvements on LTE, including:

- More efficient modulation
- Waveform optimization
- Scalable numerology

CommAgility Expertise for 5G RAN

CommAgility has over 10 years' experience of implementation and verification of 3GPP specifications to enable small cell and terminal product developers. Because 5G builds on the earlier LTE releases, we can leverage this vast and deep experience to deliver robust, flexible products from individual software blocks, as well as a full, production ready, 5G gNodeB reference design.

The capabilities and experience CommAgility brought to enabling successful commercial LTE small cell as well as private network deployments are



concentrated on enabling our customers to evolve their networks to 5G. For customers who have creative ideas to expand 5G capabilities, our engineers are ready to work with them to architect the optimal solution for maximum differentiation and performance.

Hardware Platform Technologies

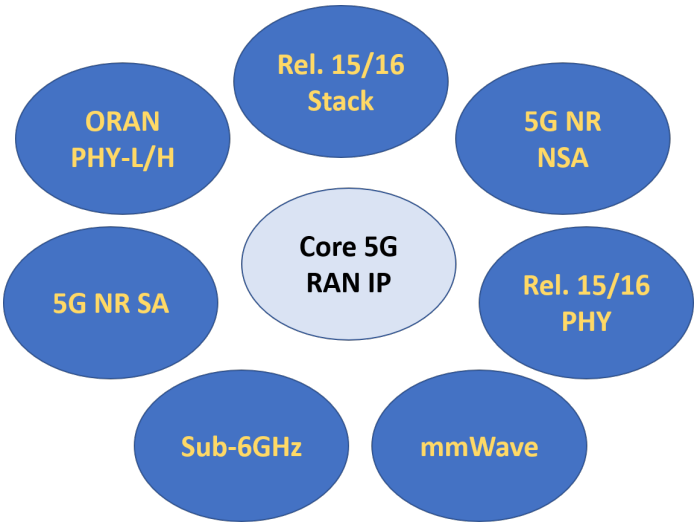
The computational complexity of 5G baseband solutions will require higher performance and more flexible hardware architectures.

Alongside RAN software development, CommAgility is developing a complementary range of hardware platforms, from board level to a complete, production ready gNodeB.

Technology Foundation for Multiple RAN Scenarios

The foundation of our 5G portfolio is the 3GPP Rel-15/16 RefChain: a complete and bit-accurate non-real time PHY, including the algorithm development and validation associated with the 3GPP specifications. The RefChain is the foundation of a real-time physical layer for baseband SoCs.

In creating the RefChain, we are developing hundreds of test vectors for physical layer and radio validation which can be applied to standard and customized gNodeB and UE test frameworks.



From this foundation, a real-time 3GPP Rel-15/16 Physical Layer has been developed for NXP's Layerscape® Access architecture. The modular architecture for our 5G PHY allows product developers flexibility for supporting any ORAN PHY-L/H section 7.x splits. Alternatively, combining the PHY with our 5G NR Protocol Stack or a third-party stack supports creation of D-RAN products on customer or CommAgility hardware. We have also developed a 5G Core (5GC) for private networks and demonstration purposes.

While CommAgility's integrated gNodeB solution will focus on Sub-6GHz, it also supports mmWave frequencies, when integrated with a suitable RF.

5G Hardware Solutions

As well as the main 5G NR software IP blocks, CommAgility provides production ready reference solutions with integrated and validated 5G software. CommAgility's integrated 5G NR gNodeB is based on NXP SoC devices – Layerscape® for the Protocol Stack, and Layerscape Access® for the PHY - to achieve optimum performance and cost.

CommAgility products support 5G StandAlone (SA), as well as supporting 5G Sub-6GHz Non-StandAlone (NSA) when paired with CommAgility's CA-K2L-RF2 ENB, an integrated and cost-effective 4G product for the anchor channel.

As well as delivering 3GPP standards-compliant products, CommAgility's team of highly experienced engineers are available to customize CommAgility's products to meet special requirements. Although 5G will ultimately expand to cover what today in 4G are customized products, only companies with deep wireless knowledge and capabilities can actually support customers to successful product deployment for niche applications.

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