

Amended

Exhibit 12

Exhibit 12

Claim 23 of U.S. Patent No. 10,771,111

"23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the m

23. A mobile device in an Orthogonal Frequency Division Multiplexing (OFDM) communication system, the mobile device comprising:

VW's Accused Products include vehicles equipped with components and/or 4G/LTE networks and services, including services sold and provided by VW

To the extent the preamble is considered a limitation, VW's Accused Product patent. *E.g.*,

The LTE specification (Series 36, Release 8) supports user equipment (UE) signal (SRS) procedure.

For clarity, release 8 of the 36 series 3GPP specifications was frozen in December 2009 and used as the basis for the first wave of LTE equipment. The LTE marketplace includes releases from Release 8 through Release 17. Though for ease of review releases cited below, the same or functionally identical content exists in each corresponding release.

An LTE communication system has user equipments (UEs) transmit to and receive from

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4 Overall architecture

The E-UTRAN consists of eNBs, providing the E-UTRA user plane (PDCP/RLC/MAC/PHY) and protocol terminations towards the UE. The eNBs are interconnected with each other by means of the X2 interface. eNBs are also connected by means of the S1 interface to the EPC (Evolved Packet Core), more specifically to the Mobility Management Entity (MME) and to the Serving Gateway (S-GW) by means of the S1-MME and S1-MB interfaces respectively. The S1 interface supports a many-to-many relation between MMEs / Serving Gateways and eNBs.

The E-UTRAN architecture is illustrated in Figure 4 below.

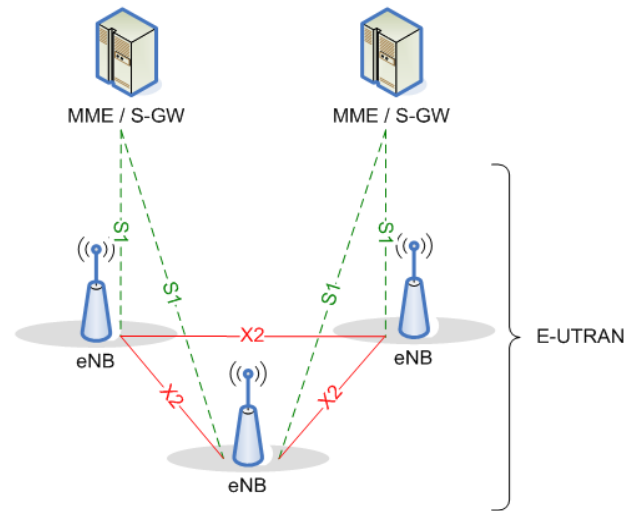


Figure 4-1: Overall Architecture

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 15.

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4.3.1 User plane

The figure below shows the protocol stack for the user-plane, where PDCP, RLC and MAC (in the UE and eNB on the network side) perform the functions listed for the user plane in subclause 6, e.g. ciphering, scheduling, ARQ and HARQ;

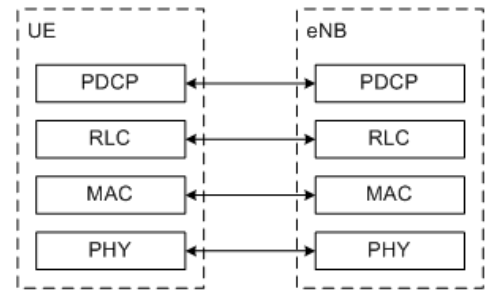


Figure 4.3.1-1: User-plane protocol stack

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 18.

LTE uses OFDM for both the downlink and the uplink. For the uplink, LTE is referred to a discrete Fourier Transform Spread (DFTS)-OFDM.

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink resource block. In the frequency domain, the number of resource blocks, N_{RB} , can range from $N_{RB-min} = 6$ to N_{RB-max} .

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 25.

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