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**Technical requirements of air interface of LTE-based vehicular
communication
(English Translation)**

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1 Scope

This standard specifies the air interface technical requirements for the LTE- based vehicular communication technology, including the PC5 interface technical requirements for the sidelink communication mode between terminals, as well as the Uu interface technical requirements for the uplink/downlink communication mode between the terminal and the base station. It specifies the physical layer, MAC layer, RLC layer, PDCP layer, RRC layer as well as the

UE process in idle mode under these two working modes.

This standard applies to LTE-based vehicular communication systems, including V2V, V2I, V2P, V2N communication scenarios.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

YD/T 3340-2018 Technical requirements of air interface of LTE-based vehicular communication

3GPP TS 23.285 (Release 14) Technical Specification Group Services and System Aspects; Architecture enhancements for V 2X services

3GPP TS 24.334 (Release 14) Proximity-services (ProSe) User Equipment (UE) to ProSe function protocol aspects; Stage 3

3GPP TS 24.386 (Release 14) User Equipment (UE) to V2X control function; protocol aspects; Stage 3

3GPP TS 36.101 (Release 14) Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception

3GPP TS 36.133 (Release 14) Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio management

3GPP TS 36.211 (Release 14) Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation

3GPP TS 36.212 (Release 14) Evolved Universal Terrestrial Radio Access

3 Abbreviations

The following abbreviations apply to this document.

3GPP. The 3rd Generation Partnership Project

AM. Acknowledged Mode

BSR. Buffer Status Report

CBR. Channel Busy Ratio

CR. Channel Occupancy Ratio

CRC. Cyclic Redundancy Check

CSI. Channel Status Indicator

DCI. Downlink Control Information

DL. Downlink

DFN. Direct Frame Number

DMRS. Demodulation Reference Signal eNB. E-UTRAN Node B

E-PDCCH. Enhanced Physical Downlink Control Channel

E-UTRA. Evolved Universal Terrestrial Radio Access

E-UTRAN. Evolved Universal Terrestrial Radio Access Network

FDD. Frequency Division Duplex

FDM. Frequency Division Multiplex

GNSS. Global Navigation Satellite System

IE. Information Element

4 Overview

The LTE-based wireless communication technology for vehicular networking is divided into two working modes. One is the sidelink communication between terminals, where the air interface between the terminals is called the PC5 interface; the other is the uplink/downlink communication mode between the terminal and the base station, where the air interface between the terminal and the base station is called Uu interface.

5.1.1.3 Physical shared channel of sidelink

5.1.1.3.1

Scrambling

The bit block (where Mbit is the number of bits sent) transmitted on the PSSCH in a subframe shall be scrambled according to 5.3.1 of 3GPP TS 36.211 (Release 14).

5.1.1.9 Timing

A sidelink radio frame numbered i sent by the UE shall start from the seconds before the UE's corresponding timing reference frame. The UE does not need to receive the sidelink or downlink transmission before 624Ts after the end of a sidelink transmission, where. The timing relationship of the sidelink is as shown in Figure 4.

5.1.3.2.3. Here refers to the resource reservation time interval indicated by the higher layer.

If the UE is configured with the high-level parameter $cr\text{-Limit}$ and transmits

PSSCH on subframe n , for any priority value k , the UE shall meet the restriction conditions of formula (5).

5.1.3.2.2 UE process for receiving PSSCH

For the sidelink transmission mode 3, by detecting SCI format 1 on the PSCCH, the UE shall decode the PSSCH according to the detected SCI format 1, meanwhile the corresponding PSSCH resource is configured by the higher layer.

5.2.2.1 Data transmission of sidelink share channel (SL-SCH)

5.2.2.1.1

Data transmission of sidelink shared channel

5.5.5.2 Sidelink pre-configuration parameters

5.5.5.2.1

Specified parameters

This clause only lists the parameters with specified values in the standard, see Table 23 for details.

5.5.5.2.2

Pre-configured parameters

This ASN.1 part is the beginning of the definition of pre-configured sidelink parameters in E-UTRAN.

6.1.1 Physical channel and modulation

The physical channel and modulation of the uplink/downlink communication mode between the terminal and the base station based on the Uu interface shall comply with the Chapter 1 to Chapter 8 of 3GPP TS 36.211 (Release 14) on the physical layer channel and modulation.

6.1.2.1 Overview

The uplink/downlink communication method between the terminal and the base station based on the Uu interface can support uplink semi-persistent scheduling (SPS) transmission; the uplink SPS configuration is activated or released through DCI format 0. In addition to the provisions in 6.1.2, it shall also comply with the provisions of 3GPP TS 36.211 (Release 14) on multiplexing and channel coding.

6.1.4 Physical layer measurement

The physical layer measurement of the uplink/downlink communication mode between the terminal and the base station based on the Uu interface shall comply with the provisions of 3GPP TS 36.214 (Release 14).