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**INDUSTRY STANDARD OF THE
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**Test methods of network layer of LTE-based vehicular
communication
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Abbreviations...	4

1 Scope

This Standard specifies the test methods of network layer of LTE-based vehicular communication, and regulates the test parameters and indicators, test methods, and test cases of network layer of LTE-based vehicular communication.

This Standard applies to the network layer of LTE-based vehicular communication.

2 Normative references

The following documents are indispensable for the application of this document.

For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

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

YD/T 3400-2018, General technical requirements of LTE-based vehicular communication

YD/T 3707-2020, Technical Requirements of Network Layer of LTE-based Vehicular Communication

3 Abbreviations

The following abbreviations apply to this document.

AID Application ID

DUT Device Under Test

DME Dedicated Management Entity

DSM Dedicated Short Message

DSMP Dedicated Short Message Protocol

LLC Logical Link Control

LTE Long Term Evolution

LTE-V2X LTE Vehicle to Everything

MIB Management Information Base

MAC Media Access Control

OBU On Board Unit

RSU Road Side Unit

SAP Service Access Point

TS Test System

TTCN-3 Testing and Test Control Notation-3

TCP Transmission Control Protocol

UDP User Datagram Protocol

4 LTE vehicular communication technology network

layer detection environment

4.1 Test system architecture

The test system architecture of the LTE-based vehicular communication is shown in Figure 1. The test system is mainly composed of a PC host and a system simulator; the two communicate via Ethernet.

The PC host is the upper computer in the test system, which implements equipment operation, system self-checking and TTCN-3 executable test case operation, and can realize automated testing and control of the tested terminal through the relevant command interface.

The system simulator implements the underlying protocol stack function of the LTE-based vehicular communication; the system simulator and the terminal communicate through the air interface.

If the test system requires the device under test to feed back relevant information of test status or test result during the test, the device under test feeds back relevant information through the Ethernet.

Figure 2 - Test process status

5.1.1 Adaptation layer protocol type test

Test number: TC_NL_DSM_MST_BV_01

Test item: DSM message test

Test purpose: to verify whether the adaptation layer frame header protocol type information in the DSM message sent by DUT is correct

Preconditions:

- 1) DUT has been powered on and started;
- 2) DUT has locked the GNSS-based position, and completed clock synchronization with GNSS;
- 3) There is no other equipment of the same type within the range of the wireless signal capture tool of DUT or the test system;
- 4) DUT does not actively send messages except for receiving related instructions from the test system

Test structure: see 4.1 test system architecture

Test steps:

Step 1: Configure DUT to send a DSM message.

Step 2: Verify whether DUT sends a DSM message.

Step 3: Verify the DSM message adaptation layer protocol type information value

Expected results:

In step 2, the TS system receives the DSM message;

In step 3, the DSM message contains the adaptation layer frame header, and the frame header protocol type field value is 4 (DSMP)

5.1.2 DSMP version number information test

Test number: TC_NL_DSM_MST_BV_02

Test item: DSM message test

Test purpose: to verify whether the DSMP version information in the DSM message sent by DUT is correct

Preconditions:

- 1) DUT has been powered on and started;

- 2) DUT has locked the GNSS-based position, and completed clock synchronization with GNSS;
- 3) There is no other equipment of the same type within the range of the wireless signal capture tool of DUT or the test system;
- 4) DUT does not actively send messages except for receiving related instructions from the test system

Test structure: see 4.1 test system architecture

Test steps:

Step 1: Configure DUT to send a DSM message.

Step 2: Verify whether DUT sends a DSM message.

Step 3: Verify whether the Version value of the DSM message version is correct.

Step 4: Verify whether the DSM message 'reserved domain' value is correct

Expected results:

In step 2, the TS system receives the DSM message;

In step 3, the Version value of the DSM message version is '0';

In step 4, the value of "reserved domain" in the DSM message is '0';

5.1.3 Application identification information test

Test number: TC_NL_DSM_MST_BV_03

Test item: DSM message test

Test purpose: to verify whether the application ID (AID) information in the DSM message sent by DUT is correct

Preconditions:

- 1) DUT has been powered on and started;
- 2) DUT has locked the GNSS-based position, and completed clock synchronization with GNSS;
- 3) There is no other equipment of the same type within the range of the wireless signal capture tool of DUT or the test system;
- 4) DUT does not actively send messages except for receiving related instructions from the test system

Test structure: see 4.1 test system architecture