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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Road vehicles - Diagnostic communication over Internet
Protocol (DoIP) - Part 3: Wired vehicle interface based on IEEE
802.3**

(English Translation)

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020, Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.

This document is part 3 of GB/T 43258 Road vehicles - Diagnostic communication over Internet Protocol (DoIP). The following parts have been issued for GB/T 43258:

- Part 2: Transport protocol and network layer services;
- Part 3: Wired vehicle interface based on IEEE 802.3;

- Part 4: Ethernet-based high-speed data link connector.

This document adopts ISO 13400-3:2016 Road vehicles - Diagnostic communication over Internet Protocol (DoIP) - Part 3: Wired vehicle interface based on IEEE 802.3 by modification.

Compared with ISO 13400-3:2016, this document makes the following structural adjustments:

- 4.2 corresponds to Clause 4 of ISO 13400-3:2016;
- Figures 3 ~ 8 correspond to Figures 2 ~ 7 in ISO 13400-3:2016;
- Tables 1 ~ 4 correspond to Tables 2 ~ 5 in ISO 13400-3:2016.

The technical differences between this document and ISO 13400-3:2016, and the causes for these differences are as follows:

- REMOVE the reference and description of ISO 13400-1 which has been abolished;
- USE the normatively referenced GB/T 40822-2021 to replace ISO 14229 (see Clause 3), to adapt to technical conditions in China and improve the operability;
- ADD "4.1 Symbol", to improve the usability of the document;
- ADD the definition of VpullupSource (see 4.1), to improve the usability of the document;
- ADD the abbreviated terms GND, WoL and XFRM (see 4.2), to improve the usability of the document.

1 Scope

This document specifies the vehicle communication interface and test equipment requirements for a physical and data link layer based on IEEE 802.3 100BASE-TX.

This document applies to the design for the physical and data link layer in vehicle communication interface and test equipment based on IEEE 802.3 100BASE-TX.

This interface serves as the physical basis for IP-based communication between the vehicle and test equipment. This document specifies the following aspects:

- requirements for signal and wiring schematics in order to ensure physical layer compatibility of the vehicle interface and Ethernet networks and test equipment

communication interfaces;

- discovery/identification of the in-vehicle diagnostic Ethernet interface;
- activation and deactivation of the in-vehicle diagnostic Ethernet interface;
- mechanical and electrical diagnostic connector requirements;
- this edition has been modified to include the identification of two Ethernet pin assignments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 40822-2021 Road vehicles - Unified diagnostic services [ISO 14229-1:2020, ISO 14229-2:2013, ISO 14229-3:2012, ISO 14229-4:2012, ISO 14229-5:2013, ISO 14229-6:2013, ISO 14229-7:2015, ISO 14229-8:2020, MOD]

IEC 60950-1, Information technology equipment - Safety - Part 1: General requirements

port of the patch cable are connected to the Rx pins on the destination port and vice versa.

Depending on the Auto-MDI(X) capabilities of the Ethernet implementation, it is possible that cross-linked connections or 1:1 connections can be used interchangeably.

This depends on the Auto-MDI(X) capabilities of the PHY. The Auto-MDI(X) feature was developed to allow for plug and play use of both types of patch cable.

7.2 Ethernet physical layer requirements

This subclause specifies the requirements for implementation of the physical layer of Ethernet by the DoIP Edge Node, including stub length in the vehicle and maximum cable length between test equipment and the DoIP Edge Node PHY so as to allow for guaranteed operation even in noisy environments.

[DoEth-001] The DoIP Edge Node shall support the 100BASE-TX (100 Mbit/s

Ethernet) standard as specified in IEEE 802.3.

[DoEth-002] The DoIP Edge Node shall support the 10BASE-T (10 Mbit/s Ethernet) standard as specified in IEEE 802.3.

Note: The requirement to support 10 Mbit/s is intended as a fall-back solution in environments where a 100 Mbit/s connection cannot be established between the two Ethernet interfaces. In such cases, the connection can still be established at a reduced speed.

[DoEth-003] The DoIP Edge Node shall provide for isolation of 1 500 V for 1 min between the transformer coils, in accordance with IEC 60950-1 (TNV1 circuit) and IEEE 802.3, on the link to the outside network.

7.3 Ethernet data link layer requirements

This subclause specifies the requirements for implementation of the data link layer of Ethernet by the DoIP Edge Node so as to allow for backwards-compatible communication with older versions of Ethernet at the best achievable data rate.

[DoEth-004] The DoIP Edge Node shall support 10 Mbit/s Ethernet on the link to the external network.

[DoEth-005] The DoIP Edge Node shall support 100 Mbit/s Ethernet (100BASE-TX).

[DoEth-006] The DoIP Edge Node shall support Auto-Negotiation as specified in IEEE 802.3, which is an Ethernet procedure for automatic handshaking of two directly networked interfaces to connect with identical parameters (i.e., transmission rate and duplex mode).

[DoEth-007] The test equipment shall support the 100BASE-TX standard as specified in IEEE 802.3.

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