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

GB/T 48022.1-2026

**Road vehicles - In-vehicle Ethernet - Part 1: General information
and definitions**

道路车辆 车载以太网 第1部分：通用信息和定义
(English Translation)

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Foreword

This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting is scheduled.

This document is Part 1 of GB/T 48022 "Road Vehicles - Onboard Ethernet". GB/T 48022 has published the following...

part.

--Part 1: General Information and Definitions;

--Part 2: General Physical Entity Requirements;

--Part 3.1 Gbit/s Fiber Optic Physical Entity Requirements and Conformity Test Procedures;

--Part 5: Requirements and Test Procedures for 1 Gbit/s Fiber Optic Physical Layer Systems;

--Part 6.100 Mbit/s Electrical and Physical Layer Entity Technical Requirements and Conformity Test Procedures.

This document is equivalent to ISO 21111-1:2020 "Road vehicles - Ethernet onboard - Part 1: General information and definitions".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Automotive Standardization Technical Committee (SAC/TC 114).

Introduction

GB/T 48022 (all parts) includes the requirements and test procedures for automotive Ethernet as defined in international standards, and supplements the test methods.

The resulting requirements and test procedures are structured into distinct documents according to the Open Systems Interconnection (OSI) reference model, and are based on...

The physical medium and bit rate used are used to group the files.

Ethernet requirements are typically specified in ISO/IEC/IEEE 8802-3. GB/T 48022 (all parts) provides for in-vehicle Ethernet.

Additional specifications required by the application (e.g., wake-up, I/O functions). Different bit rates are needed for Ethernet used by road vehicles depending on their intended purpose.

Rate. Currently, GB/T 48022 (all parts) specifies 1 Gbit/s optical fiber and 100 Mbit/s electrical physical layer.

GB/T 48022 (all parts) contains requirements and test methods related to automotive Ethernet. This includes requirements for physical layer entities (e.g., Suppliers of connectors, physical layer implementations, equipment (e.g., electronic control units, gateway units), and systems (e.g., network systems).

The requirements for engineers are specified. In addition, test methods for conformance and interoperability testing are defined.

GB/T 48022 (all parts) does not cover safety (electrical safety, protection, fire protection, etc.) and electromagnetic compatibility (EMC) requirements.

The document structure given in GB/T 48022 (all parts) conforms to the specifications in ISO/IEC 7498-1 and ISO/IEC 10731.

GB/T 48022 is proposed to consist of 11 parts.

--Part 1: General Information and Definitions. This document defines the terminology used in the standard and provides an overview of the automotive Ethernet standard.

This section elucidates the complementary relationship between GB/T 48022 and ISO/IEC/IEEE 8802-3 and their amendments, and elaborates on the document structure.

The structure, physical entity types, and specific functions of vehicle-mounted Ethernet are

described in detail, providing an overall explanation of the composition of GB/T 48022 and the relationships between its parts.

The relationship.

--Part 2: General Physical Entity Requirements. This document defines the interface between the coordination sublayer and the physical entity, including simplified gigabit...

Media Independent Interface (RGMI), and universal physical entity wake-up and synchronization link sleep independent of physical medium and bit rate.

Functionality. This section aims to provide a holistic overview of the general requirements for physical layer entities.

--Part 3.1 Gbit/s Fiber Optic Physical Entity Requirements and Conformity Test Procedures. This document defines requirements conforming to ISO/IEC/IEEE 8802-3.

Supplementary requirements for the physical layer of 1 Gbit/s plastic optical fiber transmission used in road vehicle in-vehicle communication, and physical entity consistency.

The test procedure aims to provide the physical layer requirements and test methods for transmission media made of plastic optical fiber.

--Part 4: General Requirements and Test Methods for 1 Gbit/s Fiber Ethernet Components. This document defines the requirements and test methods for 1 Gbit/s fiber optic vehicle-mounted...

Requirements and testing methods for optical components in Ethernet. This aims to provide specific technical specifications for link channels using plastic optical fibers as the transmission medium.

Requirements and test methods.

--Part 5.1 Gbit/s Fiber Optic Physical Layer System Requirements and Test Procedures. This document defines the requirements and test procedures for 1 Gbit/s fiber optic automotive Ethernet.

Requirements for the system-level physical layer, requirements for interoperability test setup, and interoperability test specifications for checking the physical layer at the system level.

The process outlines the requirements for setting up device-level physical layer conformance tests, and can be used to check device-level OSI related aspects of equipment vendors.

Physical layer compliance test procedures. This aims to provide the technical requirements and test protocols for system-level and device-level fiber optic automotive Ethernet.

Verification method.

Advanced features of the automotive Ethernet physical layer (often also called a transceiver) according to ISO/IEC/IEEE 8802-3, such as those for automotive applications.

Ethernet physical layer diagnostics. This document defines advanced physical layer functions, wake-up and sleep functions, physical layer test suites, and physical layer...

Control requirements and conformance test procedures, physical sublayer test suite, physical sublayer requirements and conformance test procedures. Designed to provide...

Provide comprehensive transceiver-level technical requirements, test procedures, and test cases.

--Part 7: Requirements and Test Procedures for 100 Mbit/s Electrical and Physical Layer Systems. This document specifies requirements conforming to ISO/IEC/IEEE 8802-3.

The implementation methodology defines the interface implementation for automotive applications and the component requirements for implementing the Bus Interface Network (BIN). The document also specifies...

The document defines the tests and system requirements implemented according to the system specifications. Furthermore, it defines the channels used for testing the transceiver, and...

The test harness that makes up this channel can simulate various electrical communication channels. It aims to provide a system-level electrical twisted-pair automotive Ethernet solution.

Technical requirements and test methods.

--Part 8.100 Mbit/s Electrical Ethernet Transmission Media, Components and Testing. This document defines ISO/IEC/IEEE 8802-3 Transmission media, channel performance, and testing methods for automotive Ethernet. This aims to provide information on link channels using electrical twisted-pair cabling as the transmission medium.

Specific technical requirements and testing methods.

--Part 9: Data Link Layer Requirements and Conformance Test Procedures. This document defines the data link layer requirements and conformance test procedures.

This document aims to provide requirements and test procedures for devices and systems with network bridging capabilities.

--Part 10: Network Layer to Transport Layer Conformance Testing Procedures. This document defines the conformance testing procedures from the network layer to the transport layer.

Setup, test interfaces, and test cases. The aim is to provide a comparison of device-level