



U.S. Department of
Transportation

Intelligent Transportation Systems Standards Fact Sheet



ASTM E2213-02

Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems — 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications

November 2002

Overview

Standards for dedicated short range communication (DSRC) are intended to meet the requirements of applications that depend upon transferring information between vehicles and roadside devices, as defined in the National ITS Architecture. Typically, this type of communication occurs between moving vehicles entering a communications zone and fixed roadside communication equipment. An example of where DSRC may be used is in toll collection where vehicle identity data can be relayed to toll collection authorities within the area surrounding a tollbooth. Applications using DSRC fall into many transportation areas, including advanced traveler information systems (ATIS), commercial vehicle operations (CVO), advanced vehicle control systems (AVCS), electronic toll and traffic management systems (ETTM), advanced public transportation systems (APTS), and advanced transportation management systems (ATMS).

To obtain a copy of this standard, please contact:

American Society for Testing and Materials (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428
Tel: (610) 832-9585
Fax: (610) 832-9555
Web site: www.astm.org

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What is this standard for?

This standard, **ASTM E2213-02 – Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems — 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications**, describes a medium access control layer (MAC) and physical layer (PHY) specification for wireless connectivity using dedicated short-range communications (DSRC) services. This standard is based on and refers to the Institute of Electrical and Electronics Engineers (IEEE) standard 802.11 (*Wireless LAN Medium Access Control and Physical Layer specifications*), and standard 802.11a (*Wireless LAN Medium Access Control and Physical Layer specifications High-Speed Physical Layer in the 5 GHz band*). This standard is an extension of IEEE 802.11 technology into the high-speed vehicle environment. It contains the information necessary to explain the difference between IEEE 802.11 and IEEE 802.11a operating parameters required to implement a mostly high-speed data transfer service in the 5.9-GHz Intelligent Transportation Systems Radio Service (ITS-RS) band or the Unlicensed National Information Infrastructure (UNII) band, as appropriate

Who uses it?

This standard is intended for equipment manufacturers, system integrators, toll and turnpike agencies, regulatory agencies, research consultants, and other interested individuals and groups.

How is it used?

This standard is used for wide area (multi-lane, open road) and lane-based applications to deliver high-speed, wide-bandwidth messages between vehicles entering a communications zone and roadside communication equipment. It enables accurate and valid message delivery between moving or stationary vehicles and fixed or portable roadside communication equipment through an air interface. It does not, however, include associated measurement guidelines for verification of the requirements in the standard. The high speed, assured data-delivery nature of this standard fully supports private enterprise delivery of information to vehicles using the UNII band such, as entertainment audio and video.

Scope

This standard, **ASTM E2213-02 – Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems — 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications**, provides wireless wide-bandwidth, high-speed communications over short distances between information sources or transaction stations on the roadside and mobile radio units, between mobile units, and between portable units and mobile units. The communications generally occur over line-of-sight distances of less than 1000 meters between roadside units and high-speed, low-speed, or stopped vehicles, or between high-speed vehicles. This specification also offers regulatory bodies a means of standardizing access to the 5.9 GHz frequency band for the purpose of interoperable communications to and between vehicles at line-of-sight distances on the roadway.

More specifically, this standard:

- Describes the functions and services required by a DSRC- and IEEE 802.11-conformant device to operate in a high-speed mobile environment;
- Refers to IEEE 802.11 MAC procedures;
- Defines the 5.9 GHz DSRC signaling technique and interface functions that are controlled by the IEEE 802.11 MAC;
- Permits the operation of a DSRC or IEEE 802.11 conformant device within a wireless local area network (LAN) that may coexist with multiple overlapping DSRC communication zones or IEEE 802.11 wireless LANs; and
- Describes the requirements and procedures to provide for the privacy of user information being transferred over the wireless medium and authentication of the DSRC or IEEE 802.11 conformant devices.

Related documents

[ASTM E2158-01 – Standard Specification for Dedicated Short Range Communication \(DSRC\) Physical Layer Using Microwave in the 902-928 MHz Band](#)

[ASTM PS 105-99 – Standard Provisional Specification for Dedicated Short Range Communication \(DSRC\) Data Link Layer](#)

[IEEE Std 1455-1999 – Standard for Message Sets for Vehicle/Roadside Communications](#)

IEEE Std 802.11-1999 – Information Technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control and Physical Layer specifications

IEEE Std 802.11a-1999 – Information Technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control and Physical Layer specifications: High Speed Physical Layer in the 5 GHz band