Designation: E 2213 – 03

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[1]

This standard is issued under the fixed designation E 2213; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification[2] describes a medium access control (MAC) and physical layer (PHY) specification for wireless connectivity using dedicated short-range communications (DSRC) services. This standard is based on and refers to IEEE Standards 802.11, *Wireless LAN Medium Access Control and Physical Layer Specifications*, and 802.11a, *Wireless LAN Medium Access Control and Physical Layer Specifications High-Speed Physical Layer in the 5 GHz Band*, with permission from the IEEE society. This specification is meant to be an extension of IEEE 802.11 technology into the high-speed vehicle environment. As presented here, this specification contains just enough information 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. Potential operations within the Unlicensed National Information Infrastructure (UNII) Band are also addressed, as appropriate.

1.2 *Purpose*—The purpose of this specification is to provide wireless communications over short distances between information sources and transactions 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 m between roadside units and mostly high speed, but occasionally stopped and slow moving, 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.

1.3 Specifically, this specification accomplishes the following:

1.3.1 Describes the functions and services required by a DSRC and IEEE 802.11 compliant device to operate in a high-speed mobile environment.

1.3.2 Refers to IEEE 802.11 MAC procedures.

1.3.3 Defines the 5.9 GHz DSRC signaling technique and interface functions that are controlled by the IEEE 802.11 MAC.

1.3.4 Permits the operation of a DSRC conformant device within a DSRC communications zone that may coexist with multiple overlapping DSRC communication zones.

1.3.5 Describes the requirements and procedures to provide privacy of user information being transferred over the wireless medium and authentication of the DSRC or IEEE 802.11 conformant devices.

2. Referenced Documents

2.1 *IEEE Standards:*

802.11 Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications[3]

802.11a Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications—Amendment 1: High-Speed Physical Layer in the 5 GHz Band[3]

2.2 *Federal Document:*

CFR 47 Title 47 on Telecommunication[4]

3. Terminology

3.1 *Definitions*—See IEEE 802.11, Clause 3, in addition to the following information:

3.1.1 *onboard unit (OBU)*—an onboard unit (OBU) is a DSRC transceiver that is normally mounted in or on a vehicle, but which in some instances may be a portable unit. An OBU can be operational while a vehicle or person is either mobile or stationary. The OBUs receive and contend for time to transmit

[1] This specification is under the jurisdiction of ASTM Committee E17 on Vehicle–Pavement Systems and is the direct responsibility of Subcommittee E17.51 on Vehicle Roadside Communication.

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[2] This specification is based on IEEE 802.11, 1999 Edition and IEEE 802.11a, 1999 Edition. This specification explains the DSRC parameters as an extension of the IEEE 802.11 and IEEE 802.11a documents.

[3] Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., P.O. Box 1331, Piscataway, NJ 08854-1331

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

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