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Standard Specification for Dedicated Short Range Communication (DSRC) Physical Layer Using Microwave in the 902 to 928 MHz Band[1]

This standard is issued under the fixed designation E 2158; 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.

INTRODUCTION

FOREWORD

This specification is intended to form a part of a series of standards defining the framework of DSRC link in the North American Intelligent Transportation Systems (ITS) environment. In addition to this specification, Subcommittee E17.51 (and other committees) will issue other standards to form a complete set of standards for the DSRC link.

The Physical Layer Task Group consists primarily of experts from the telecommunications and transport sectors. The most active participating companies and organizations are: equipment manufacturers, systems integrators, toll and turnpike agencies, research consultants, and interested groups and associations.

Recommendations and decisions made by the United States Federal Communications Commission (FCC) and Industry Canada have served as references in the preparation of this specification (refer to Section 2—Referenced Documents).

Additional inputs came from experts from Europe and Japan (see Appendix X1—Bibliography).

This specification is applicable to operations in Canada, Mexico and the US to the extent allowed by national regulatory agencies

INTRODUCTION

DSRC is intended to meet the requirements for many of the applications that need short range communication as defined by the National ITS Architecture and the Intelligent Transportation Society of America. These applications include Advanced Traveller 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).

This specification comprises requirements for Open Systems Interconnection (OSI) Layer 1 in the 902 to 928 MHz Location and Monitoring Service (LMS) band for DSRC. This specification does not include associated measurement procedures for verification of the requirements. Measurement guidelines will be developed in another document as a separate work item.

The presented requirements distinguish between default and optional parameter values. Procedures for using optional parameters include consideration of upper OSI layers. The elaboration of such procedures will be subject to further work within Subcommittee E17.51.

This specification provides information for onboard equipment based on active as well as backscatter technologies, and allows for interoperability between systems based on both of these technologies. Furthermore, this specification allows for mixed time, frequency, and space division multiple access approaches.

This specification is conceived for the 2+10+2 MHz part, — 902 to 904 MHz, 909.75 to 919.75 MHz, and 919.75 to 921.75 MHz, of the LMS band. The 902 to 904 MHz region is used for unmodulated carriers to provide backscatter capability in this portion of the band. All of these frequencies in the LMS band are currently available for use in the US and Canada.

This specification contains requirements that minimize interference between sites and between active and backscatter systems. The active legacy systems currently operate and will continue to operate uplinks and downlinks on the 915.00 and 915.75 MHz center frequencies. This specification adds the possibility of operating new active downlink center frequencies on and between 915.00 and 918.75 MHz. However, the primary active downlink operating frequencies will be 915 and 918.75

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