

ISO/TR 17716:2025-06 (E)

Road vehicles - Electrical disturbances from narrowband radiated electromagnetic energy - Radiated immunity for V2X

Contents

Page

- Foreword..... iv
- Introduction..... v
- 1 Scope..... 1**
- 2 Normative references..... 1**
- 3 Terms, definitions and abbreviated terms..... 1**
 - 3.1 General..... 1
 - 3.2 Abbreviated terms..... 1
- 4 Overview of V2X..... 3**
 - 4.1 V2X description..... 3
 - 4.2 Legislation and standards..... 4
 - 4.2.1 ISO/TR 4804 – Automated driving systems safety..... 4
 - 4.2.2 ISO 22737 – Low-speed automated driving (LSAD) systems..... 4
 - 4.2.3 ISO 17515-3 – Intelligent transport systems – LTE-V2X..... 6
 - 4.2.4 List of other ISO standards..... 7
 - 4.2.5 ITU-R related standard..... 7
 - 4.3 Technical characteristics of V2X..... 7
- 5 Introduction of radiated immunity testing for components with V2X..... 7**
 - 5.1 General..... 7
 - 5.2 Introduction of link communication connection..... 8
 - 5.3 Communication indicators for monitoring..... 8
 - 5.4 Testing results with communication monitoring..... 8
 - 5.4.1 General..... 8
 - 5.4.2 Fault cases of V2X component (DUT) in Tx mode..... 9
 - 5.4.3 Fault cases of V2X component (DUT) in Rx mode..... 11
 - 5.5 Summary..... 12
- 6 Introduction of radiated immunity testing for vehicles with V2X..... 12**
 - 6.1 General..... 12
 - 6.2 Link communication connection introduction..... 13
 - 6.3 Introduction of V2X scenario simulation..... 13
 - 6.4 Testing results with functions monitoring..... 16
 - 6.4.1 General..... 16
 - 6.4.2 Fault cases of V2X functions in Rx mode..... 16
 - 6.4.3 Fault cases of vehicle in Tx mode..... 19
 - 6.4.4 Fault cases of GNSS..... 19
 - 6.4.5 Fault cases of cellular..... 19
 - 6.5 Summary..... 20
- 7 Test hints..... 20**
 - 7.1 Link parameters description..... 20
 - 7.1.1 DSRC..... 20
 - 7.1.2 PC5 in C-V2X..... 21
 - 7.1.3 GNSS..... 21
 - 7.2 Link antenna location description..... 21
 - 7.2.1 General..... 21
 - 7.2.2 Link antenna location for vehicle..... 22
 - 7.3 Exclusion band consideration..... 24
 - 7.4 Monitoring examples description..... 24
 - 7.5 Filtering examples..... 26

Annex A (informative) Typical characteristics of V2X (DSRC, C-V2X, cellular)	27
Annex B (informative) Specification and NCAP related to V2X scenarios	40
Bibliography	46