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Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy —

Part 4: Harness excitation methods

Véhicules routiers — Méthodes d'essai d'un véhicule soumis à des perturbations électriques par rayonnement d'énergie électromagnétique en bande étroite —

Partie 4: Méthodes d'excitation des faisceaux

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

This fourth edition cancels and replaces the third edition (ISO 11451-4:2013), which has been technically revised.

The main changes are as follows:

— extension of BCI frequency range,

— addition of TWC test method,

— update of test plan and test report requirements,

— update of Annexes A, B and C for consistency with ISO 11452-4:2020.

A list of all parts in the ISO 11451 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy —

Part 4: Harness excitation methods

1 Scope

This document specifies harness excitation methods for testing the electromagnetic immunity of electronic components for passenger cars and commercial vehicles regardless of the propulsion system (e.g. spark-ignition engine, diesel engine, electric motor).

The bulk current injection (BCI) test method is based on current injection into the wiring harness using a current probe as a transformer where the harness forms the secondary winding. The tubular wave coupler (TWC) test method is based on a wave coupling into the wiring harness using the directional coupler principle.

The TWC test method was developed for immunity testing of automotive components with respect to radiated disturbances in the GHz ranges (GSM bands, UMTS, ISM 2,4 GHz). It is best suited to small (with respect to wavelength) and shielded device under test (DUT), since in these cases the dominating coupling mechanism is via the harness.

The electromagnetic disturbance considered in this document is limited to continuous narrowband electromagnetic fields.

ISO 11451-1 gives definitions, practical use and basic principles of the test methods.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11451-1, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11451-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Test conditions

The applicable frequency range of the BCI and the TWC test methods are direct functions of the transducer characteristics (current probe or tubular wave coupler). More than one type of transducer may be required to cover the applicable frequency range.