INTERNATIONAL STANDARD

ISO 11452-2

Third edition
2019-01

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

Part 2: Absorber-lined shielded enclosure

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

Partie 2: Chambre anéchoïque

Reference number
ISO 11452-2:2019(E)

© ISO 2019



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Test conditions ... **1**
5 Test location ... **2**
6 Test apparatus and instrumentation ... **2**
6.1 General ... 2
6.2 Measuring equipment ... 2
6.3 Stimulation and monitoring of DUT ... 3
7 Test set-up for DUT powered by an unshielded power system ... **3**
7.1 Ground plane ... 3
7.2 Power supply and AN ... 3
7.3 Location of DUT ... 4
7.4 Location of test harness ... 4
7.5 Location of load simulator ... 4
7.6 Location of field generating device (antenna) ... 4
8 Test setup for DUT powered by a shielded power system ... **11**
8.1 Ground plane ... 11
8.2 Power supply and AN ... 11
8.3 Location of DUT ... 11
8.4 Location of test harness ... 12
8.5 Location of load simulator ... 12
8.6 Location of field generating device (antenna) ... 13
9 Test method ... **31**
9.1 General ... 31
9.2 Test plan ... 31
9.3 Test procedure ... 32
9.3.1 General ... 32
9.3.2 Substitution method ... 32
9.3.3 Field calibration ... 32
9.3.4 DUT test ... 33
9.4 Test report ... 33
Annex A (informative) **Remote/local grounding** ... **34**
Annex B (informative) **Function performance status classification (FPSC)** ... **36**
Bibliography ... **37**

© ISO 2019 – All rights reserved

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 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electric and electronic equipment*.

This third edition cancels and replaces the second edition (ISO 11452-2:2004), which has been technically revised.

The main changes compared to the previous edition are as follows:

a) introduction of reference to additional artificial networks (HV-AN, AMN, AAN) for DUT powered by a shielded power system;

b) precisions for ground plane dimensions;

c) suppression of the minimum distance requirement between rear of horn antenna and absorbers;

d) addition of test set-up descriptions and Figures for DUT powered by a shielded power system;

e) suppression of Annex A relative to artificial networks which are now defined in ISO 11452-1; and

f) update of previous Annex C to be in line with new functional performance status classification (FPSC) format.

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.

© ISO 2019 – All rights reserved

Introduction

Immunity measurements of complete vehicles are generally able to be carried out only by the vehicle manufacturer, owing to, for example, high costs of an absorber-lined shielded enclosure (ALSE), the desire to preserve the secrecy of prototypes or a large number of different vehicles models.

For research, development and quality control, a laboratory measuring method can be used by both vehicle manufacturers and equipment suppliers to test electronic components.

© ISO 2019 – All rights reserved

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

Part 2: Absorber-lined shielded enclosure

1 Scope

This document specifies an absorber-lined shielded enclosure method for testing the immunity (off-vehicle radiation source) of electronic components for passenger cars and commercial vehicles regardless of the propulsion system (e.g. spark-ignition engine, diesel engine, electric motor). The device under test (DUT), together with the wiring harness (prototype or standard test harness), is subjected to an electromagnetic disturbance generated inside an absorber-lined shielded enclosure, with peripheral devices either inside or outside the enclosure. It is applicable only to disturbances from continuous narrowband electromagnetic fields. See ISO 11452-1 for general test conditions.

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 11452-1:2015, *Road vehicles — Component 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 11452-1 apply.

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

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

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

4 Test conditions

The applicable frequency range of the absorber-lined shielded enclosure test method is 80 MHz to 18 GHz.

The user shall specify the test severity level(s) over the frequency range. Suggested test levels are included in Annex B.

Standard test conditions shall be according to ISO 11452-1 for the following:

— test temperature;

— supply voltage;

— modulation;

— dwell time;

© ISO 2019 – All rights reserved