



**International
Standard**

ISO 11451-3

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

**Part 3:
On-board transmitter simulation**

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

Partie 3: Simulation des émetteurs embarqués

**Fourth edition
2024-06**

This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

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
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test conditions	1
5 Test location	2
5.1 General.....	2
5.2 Absorber lined shielded enclosure (ALSE).....	2
5.3 Outdoor test site.....	2
6 Test instrumentation	2
6.1 General.....	2
6.2 Signal sources.....	3
6.2.1 Transmitters with antenna outside the vehicle.....	3
6.2.2 Transmitters with antenna inside the vehicle.....	3
6.3 Power monitoring.....	3
6.3.1 General.....	3
6.3.2 Dual directional coupler.....	3
6.3.3 Low loss coaxial cable.....	4
6.4 Vector network analyser (VNA).....	4
6.5 Antennas.....	4
6.5.1 Simulated on-board transmitters.....	4
6.5.2 Simulated portable transmitter.....	5
6.6 Stimulation and monitoring of the vehicle.....	5
7 Test set-up	5
7.1 Transmitters with antenna outside the vehicle.....	5
7.2 Transmitters with antenna inside the vehicle.....	8
7.2.1 General.....	8
7.2.2 Simulated portable transmitters.....	8
8 Test procedure	9
8.1 General.....	9
8.2 Test plan.....	9
8.3 Test method.....	10
8.3.1 Transmitters with antenna outside the vehicle.....	10
8.3.2 Transmitters with antenna inside the vehicle.....	11
8.4 Test report.....	12
Annex A (normative) Net power characterization procedure	13
Annex B (informative) Typical characteristics and use of transmitters	26
Annex C (informative) Characteristics of simulated portable transmitter antenna	29
Annex D (informative) Function performance status classification (FPSC)	50
Bibliography	51

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

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 11451-3:2015), which has been technically revised.

The main changes are as follows:

- change of the frequency range from 1,8 MHz – 5,85 GHz to 1,8 MHz – 6 GHz;
- suppression of test methodology with commercial transmitters;
- use of modulation from ISO 11451-1;
- addition of new [Annex A](#) with description of test methodology for net power characterization procedure;
- addition in [Annex C](#) of microwave broadband dipole antenna and HF broadband sleeve antenna;
- addition of [Annex D](#) on function performance status classification (FPSC).

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 3: On-board transmitter simulation

1 Scope

This document specifies methods for testing the immunity of passenger cars and commercial vehicles to electromagnetic disturbances from on-board transmitters connected to an external antenna and portable transmitters with integral antennas, regardless of the vehicle propulsion system (e.g. spark ignition engine, diesel engine, electric motor).

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 and the following 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/>

3.1

integral antenna

permanent fixed antenna which may be built-in, designed as an indispensable part of the portable transmitting device

3.2

peak power sensor

power sensor that allows direct measurement of the peak power of the modulated carrier signal

3.3

average power sensor

power sensor that allows direct measurement of the average power of the modulated carrier signal

4 Test conditions

The applicable frequency range of the test method is 1,8 MHz to 6 GHz.