

Australian/New Zealand Standard™

**Vehicles, boats and internal combustion  
engines—Radio disturbance  
characteristics—Limits and methods of  
measurement for the protection of on-  
board receivers**



## **AS/NZS CISPR 25:2010**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TE-003, Electromagnetic Interference. It was approved on behalf of the Council of Standards Australia on 1 April 2010 and on behalf of the Council of Standards New Zealand on 7 May 2010.

This Standard was published on 21 May 2010.

---

The following are represented on Committee TE-003:

Association of Consulting Engineers Australia  
Australian Broadcasting Corporation  
Australian Chamber of Commerce and Industry  
Australian Communications and Media Authority  
Australian Industry Group  
Australian Information Industry Association  
Australian Subscription Television and Radio Association  
Consumer Electronics Suppliers Association  
Department of Defence (Australia)  
Electrical Compliance Testing Association  
Energy Networks Association  
Engineers Australia  
Free TV Australia  
Ministry of Economic Development (New Zealand)  
National Measurement Institute  
SingTel Optus  
Society of Automotive Engineers, Australasia  
Telstra Corporation  
University of Western Australia  
Wireless Institute Australia

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at [www.saiglobal.com.au](http://www.saiglobal.com.au) or Standards New Zealand web site at [www.standards.co.nz](http://www.standards.co.nz) and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

---

*This Standard was issued in draft form for comment as DR AS/NZS CISPR 25.*

---

Australian/New Zealand Standard™

**Vehicles, boats and internal combustion engines—Radio disturbance characteristics—Limits and methods of measurement for the protection of on-board receivers**

Originated as AS/NZS CISPR 25:2004.  
Second edition 2010.

**COPYRIGHT**

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6140

ISBN 978 0 7337 9583 1

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-003, Electromagnetic Interference, to supersede AS/NZS CISPR 25:2004.

The objective of this Standard is to develop limits and methods of measurement regarding radio disturbance characteristics, for the protection of receivers used on board vehicles, boats, and on devices.

This Standard is identical with, and has been reproduced from IEC CISPR 25, Ed. 3.0:2008, *Vehicles, boats and internal combustion engines—Radio disturbance characteristics—Limits and methods of measurement for the protection of on-board receivers* and its Corrigendum 1 (January 2009). The corrections to Figures 1 and 4 set out in the Corrigendum have been incorporated into this Standard.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which it applies. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

## CONTENTS

	<i>Page</i>
Introduction .....	iv
1 Scope .....	1
2 Normative references .....	2
3 Terms and definitions .....	3
4 Requirements common to vehicle and component/module emissions measurement .....	6
4.1 General test requirements and test plan .....	6
4.2 Shielded enclosure .....	8
4.3 Absorber-lined shielded enclosure (ALSE) .....	8
4.4 Measuring instrument .....	9
4.5 Power supply .....	10
5 Measurement of emissions received by an antenna on the same vehicle .....	11
5.1 Antenna measuring system .....	11
5.2 Method of measurement .....	13
5.3 Examples of limits for vehicle radiated disturbances .....	14
6 Measurement of components and modules .....	16
6.1 Test equipment .....	16
6.2 Conducted emissions from components/modules – Voltage method .....	18
6.3 Conducted emissions from components/modules – current probe method .....	26
6.4 Radiated emissions from components/modules - ALSE method .....	30
6.5 Radiated emissions from components/modules – TEM cell method .....	40
6.6 Radiated emissions from components/modules – Stripline method .....	47
Annex A (informative) Flow chart for checking the applicability of CISPR 25 .....	48
Annex B (normative) Antenna matching unit – Vehicle test .....	49
Annex C (informative) Sheath-current suppressor .....	51
Annex D (informative) Guidance for the determination of the noise floor of active vehicle antennas in the AM and FM range .....	52
Annex E (normative) Artificial network .....	55
Annex F (informative) TEM cell dimensions .....	56
Annex G (informative) Radiated emissions from components/modules – Stripline method .....	58
Annex H (informative) Interference to mobile radio communication in the presence of impulsive noise – Methods of judging degradation .....	66
Annex I (informative) Items under consideration .....	69
Bibliography .....	70

## INTRODUCTION

This International Standard is designed to protect on-board receivers from disturbances produced by conducted and radiated emissions arising in a vehicle.

Test procedures and limits given are intended to provide provisional control of vehicle radiated emissions, as well as component/module conducted/radiated emissions of long and short duration.

To accomplish this end, this standard:

- establishes a test method for measuring the electromagnetic emissions from the electrical system of a vehicle;
- sets limits for the electromagnetic emissions from the electrical system of a vehicle;
- establishes test methods for testing on-board components and modules independent from the vehicle;
- sets limits for electromagnetic emissions from components to prevent objectionable disturbance to on-board receivers;
- classifies automotive components by disturbance duration to establish a range of limits.

NOTE Component tests are not intended to replace vehicle tests. Exact correlation between component and vehicle test performance is dependent on component mounting location, harness length, routing and grounding, as well as antenna location. Component testing, however, permits components to be evaluated prior to actual vehicle availability.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

---

**Australian/New Zealand Standard****Vehicles, boats and internal combustion engines—Radio disturbance characteristics—Limits and methods of measurement for the protection of on-board receivers**

---

**1 Scope**

This International Standard contains limits and procedures for the measurement of radio disturbances in the frequency range of 150 kHz to 2 500 MHz. The standard applies to any electronic/electrical component intended for use in vehicles, trailers and devices. Refer to International Telecommunications Union (ITU) publications for details of frequency allocations. The limits are intended to provide protection for receivers installed in a vehicle from disturbances produced by components/modules in the same vehicle. The method and limits for a complete vehicle are in Clause 5 and the methods and limits for components/modules are in Clause 6. Only a complete vehicle test can be used to determine the component compatibility with respect to a vehicle's limit.

The receiver types to be protected are, for example, broadcast receivers (sound and television), land mobile radio, radio telephone, amateur, citizens' radio, Satellite Navigation (GPS, etc.) and Bluetooth. For the purpose of this standard, a vehicle is a machine, which is self-propelled. Vehicles include (but are not limited to) passenger cars, trucks, agricultural tractors and snowmobiles. Annex A provides guidance in determining whether this standard is applicable to particular equipment.

The limits in this standard are recommended and subject to modification as agreed between the vehicle manufacturer and the component supplier. This standard is also intended to be applied by manufacturers and suppliers of components and equipment which are to be added and connected to the vehicle harness or to an on-board power connector after delivery of the vehicle.

This International Standard does not include protection of electronic control systems from radio frequency (RF) emissions, or from transient or pulse-type voltage fluctuations. These subjects are included in ISO publications.

Since the mounting location, vehicle body construction and harness design can affect the coupling of radio disturbances to the on-board radio, Clause 6 of this standard defines multiple limit levels. The level class to be used (as a function of frequency band) is agreed upon between the vehicle manufacturer and the component supplier.

CISPR 25 defines test methods for use by vehicle manufacturers and suppliers, to assist in the design of vehicles and components and ensure controlled levels of on-board radio frequency emissions.

Vehicle test limits are provided for guidance and are based on a typical radio receiver using the antenna provided as part of the vehicle, or a test antenna if a unique antenna is not specified. The frequency bands that are defined are not applicable to all regions or countries of the world. For economic reasons, the vehicle manufacturer must be free to identify what frequency bands are applicable in the countries in which a vehicle will be marketed and which radio services are likely to be used in that vehicle.

As an example, many vehicle models will probably not have a television receiver installed; yet the television bands occupy a significant portion of the radio spectrum. Testing and mitigating noise sources in such vehicles is not economically justified.