
**Road vehicles — Test methods for
electrical disturbances from electrostatic
discharge**

*Véhicules routiers — Méthodes d'essai des perturbations électriques
provenant de décharges électrostatiques*



Reference number
ISO 10605:2008(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web 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	3
5 Test location.....	3
6 Test apparatus and instrumentation.....	3
6.1 ESD generator	3
6.2 Discharge tips	4
6.3 Discharge current specifications	4
6.4 Coupling and ground reference planes.....	6
6.5 Insulation block.....	6
6.6 Insulation support.....	7
7 Discharge modes	7
7.1 General.....	7
7.2 Contact discharge mode.....	7
7.3 Air discharge mode	7
8 Component immunity test method (powered-up test)	7
8.1 General.....	7
8.2 Test plan	8
8.3 Test procedure for direct discharges	8
8.4 Test procedure for indirect discharges	10
9 Component packaging and handling test method (unpowered test).....	12
9.1 General.....	12
9.2 Test plan	12
9.3 Test procedure	12
10 Vehicle test method	15
10.1 General.....	15
10.2 Test plan	15
10.3 Test procedure	15
11 Test report	18
Annex A (normative) Current target specification and verification of ESD generator	19
Annex B (informative) Standard target drawings and target verification method.....	23
Annex C (informative) Function performance status classification (FPSC)	35
Annex D (informative) Test method guidance — Generator resistor value and air or contact discharge	39
Annex E (informative) Rationale for air discharge generator verification	42
Annex F (informative) Optional test set-up and procedure for electronic modules (powered-up test).....	44
Bibliography	50

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 10605 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This second edition cancels and replaces the first edition (ISO 10605:2001), which has been technically revised.

Introduction

The familiar electrostatic discharge, due to former charge build-ups generated, for example, when moving about inside a vehicle or getting out of it, has assumed greater significance with the increase of vehicle electronic modules. Tests simulating the electrostatic discharge of humans, in common use by various industries, were examined and it was determined that they were not fully applicable to the automotive environment. As a consequence, tests tailored to the automotive environment were developed.

Tests that simulate an electrostatic discharge (ESD) into a vehicle electrical system are based on the human ESD model. Sensitive electrical devices can be adversely affected by energy either coupled or radiated from electrostatic discharges. This International Standard describes ESD tests that are applicable to both automotive electronic modules and vehicles.

Road vehicles — Test methods for electrical disturbances from electrostatic discharge

1 Scope

This International Standard specifies the electrostatic discharge (ESD) test methods necessary to evaluate electronic modules intended for vehicle use. It applies to discharges in the following cases:

- ESD in assembly;
- ESD caused by service staff;
- ESD caused by occupants.

ESD applied to the device under test (DUT) can directly influence the DUT. ESD applied to neighbouring parts can couple into supply and signal lines of the DUT in the vehicle and/or directly into the DUT.

This International Standard describes test procedures for evaluating both electronic modules on the bench and complete vehicles. This International Standard applies to all types of road vehicles regardless of the propulsion system (e.g. spark-ignition engine, diesel engine, electric motor).

This International Standard is based in part on IEC 61000-4-2 and describes vehicle-specific requirements.

This International Standard does not apply to pyrotechnic modules.

2 Normative references

The following referenced documents are indispensable for the application 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 7637-1, *Road vehicles — Electrical disturbances from conduction and coupling — Part 1: Definitions and general considerations*

ISO 11452-1, *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 7637-1 and ISO 11452-1 and the following apply.

3.1

air discharge

test method characterized by bringing the test generator electrode close to the device under test (DUT); the discharge is by arcing on the DUT