
**Road vehicles — Electrical disturbances
from conduction and coupling —**

Part 3:

**Electrical transient transmission by
capacitive and inductive coupling via
lines other than supply lines**

*Véhicules routiers — Perturbations électriques par conduction et par
couplage —*

*Partie 3: Transmission des perturbations électriques par couplage
capacitif ou inductif le long des lignes autres que les lignes
d'alimentation*



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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.

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 7637-3 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 7637-3:1995), which has been technically revised. It also incorporates the Technical Corrigendum ISO 7637-3:1995/Cor.1:1995.

ISO 7637 consists of the following parts, under the general title *Road vehicles — Electrical disturbances from conduction and coupling*:

- *Part 1: Definitions and general considerations*
- *Part 2: Electrical transient conduction along supply lines only*
- *Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

Introduction

Experience collected over a long period of immunity testing of instruments, equipment and devices under test (DUTs) shows that a test simulating transient coupling phenomena is needed for a sufficient coverage of the wide range of electric and electromagnetic interferences. The knowledge of these facts is common among electromagnetic conductivity (EMC) experts, and many companies have developed such coupling tests.

The fast transient test uses bursts composed of a number of fast transients, which are coupled into lines of electronic equipment in particular input/output (I/O) lines. The fast rise time, the repetition rate and the low energy of the fast transient bursts are significant to the test.

The slow transient test uses a single pulse similar to that used for conducted transient, applied a number of times to the DUT.

During system development, the production wiring harness is not available and the vehicle's electrical noises are not known. The test shall therefore be performed with the worst case situation, which is represented by the capacitive and inductive coupling described in this part of ISO 7637.

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Road vehicles — Electrical disturbances from conduction and coupling —

Part 3:

Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines

1 Scope

This part of ISO 7637 establishes a bench top test for the evaluation of the immunity of devices under test (DUTs) to transient transmission by coupling via lines other than supply lines. The test transient pulses simulate both fast and slow transient disturbances, such as those caused by the switching of inductive loads and relay contact bounce.

Three test methods are described in this part of ISO 7637:

- the capacitive coupling clamp (CCC) method;
- the direct capacitive coupling (DCC) method; and
- the inductive coupling clamp (ICC) method.

NOTE The applicability of the three test methods is shown in Table 1.

Only one test method need be selected for slow transients and only one method need be selected for fast transients.

This part of ISO 7637 applies to road vehicles fitted with nominal 12 V, 24 V or 42 V electrical systems.

For transient immunity, Annex B provides recommended test severity levels in line with the functional performance status classification (FPSC) principle described in ISO 7637-1.

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 7637-2, *Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only*