PD ISO/TR 7637-5:2016

BSI Standards Publication

Road vehicles — Electrical disturbances from conduction and coupling

Part 5: Enhanced definitions and verification methods for harmonization of pulse generators according to ISO 7637

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee AUE/32, Electrical and electronic components and general system aspects (Road vehicles).

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2016

ISBN 978 0 580 91677 9
ICS 43.040.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2016.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TR 7637-5:2016

TECHNICAL REPORT

ISO/TR 7637-5

First edition
2016-11-01

Road vehicles — Electrical disturbances from conduction and coupling —

Part 5: Enhanced definitions and verification methods for harmonization of pulse generators according to ISO 7637

Véhicules routiers — Perturbations électriques par conduction et par couplage —

Partie 5: Amélioration des définitions et des méthodes de vérification pour l'harmonisation des générateurs d'impulsions selon la norme ISO 7637

Reference number
ISO/TR 7637-5:2016(E)

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Foreword

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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).

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For an explanation on 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.

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects.*

A list of all parts in the ISO/TR 7637 series can be found on the ISO website.

Introduction

Pulses in vehicles are generated by different switching events of electrical loads connected to the supply system and coupled via the wiring harness to other components or wires. For test purpose, these pulse phenomena are simulated by pulse generators and coupled via coupling structures to the wiring of a device under test. The test pulses are not real pulses but representatives for the wide range of pulse shapes, amplitudes, source resistances and pulse energy observed in vehicles. The definition of the test pulses and the coupling structures are described in ISO 7637-1, ISO 7637-2 and ISO 7637-3. Based on the standard definition, test equipment has been developed and is commercially available.

The experience with existing test equipment shows some difficulties in terms of result reproducibility for the same DUT dependent on the used generator, which is caused by different realization of test generators coupling and decoupling networks. The intention of this document is to describe the background for these variances and to define methods for harmonization of different generator behaviour.

TECHNICAL REPORT **ISO/TR 7637-5:2016(E)**

Road vehicles — Electrical disturbances from conduction and coupling —

Part 5: Enhanced definitions and verification methods for harmonization of pulse generators according to ISO 7637

1 Scope

This document proposes extended definitions for pulse generators and verification methods necessary for harmonization of different generators used for pulse testing in accordance to ISO 7637-2 to ensure the comparability and reproducibility of test results independent on generator types. It presents generator verification results based on current definitions of ISO 7637-2, which shows significant differences depending on the used generator type and explains the technical background of the variances.

This document is based on ISO 7637-1, ISO 7637-2 and ISO 7637-3.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 http://www.iso.org/obp

3.1
device under test
DUT
one single component or a combination of components as defined to be tested

3.2
ground plane
GP
flat conductive surface whose potential is used as a common reference

Note 1 to entry: Where applicable, the test voltage should also be referenced to the ground plane.

4 Test pulse generator description

4.1 Existing generator description

The main parts of pulse generators are the pulse shaping and coupling networks, (important for generating and applying the test pulses to the DUT) and the decoupling network (important for protecting the connected power supply and effecting the pulse coupling to DUT). A block diagram is shown in Figure 1.